Project/Programme title: Coastal Resilience to Climate Change in Cuba through Ecosystem Based Adaptation – ¨MI COSTA¨.

Baseline Project Evaluations

- Final Evaluation Report UNDP/GEF Project: "Mainstreaming and Sustaining Biodiversity Conservation in three Productive Sectors of the Sabana Camagüey Ecosystem". (June 2015)

- Terminal Evaluation Report UNDP/GEF Project "Enhancing the prevention, control and management of invasive alien species in vulnerable ecosystems in Cuba". (December 2016)

- Mid Term Evaluation Report UNDP/AF Project "Reduction of environmental vulnerability to coastal flooding through Ecosystem Based Adaptation (EBA) in the southern provinces of Artemisa and Mayabeque. (November 2017)

Final Evaluation of UNDP/GEF project: Mainstreaming and Sustaining Biodiversity Conservation in three Productive Sectors of the Sabana Camagüey Ecosystem

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GEFSEC Project ID: 43827
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Executing Agency: Agencia de Medio Ambiente of the Ministry of Science, Technology and Environment (CITMA)

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1 Acronyms and Abbreviations

AOP	Annual Operational Plan
AZCUBA	Sugar Cane Business Group (Grupo Empresarial Azucarero)
BD	Biodiversity
CDR	Combined Delivery Report
CGB	Forest Rangers
CIM	Marine Research Centre
CITMA	Ministry of Science, Technology and the Environment
CNAP	National Centre for Protected Areas
CPAP	Country Programme Action Plan
CPD	Country Programme Document
CUC	Cuban Convertible Peso
CUP	Cuban Peso
DMA	Environment Directorate (CITMA)
EA	Executing Agency
EFI	Integrated Forestry State Company (Empresa Forestal Integral)
EMED	Executive Company of Donations (Empresa Ejecutora de Donativos)
ENPFF	National Enterprise for the Protection of Flora and Fauna
FORMATUR	Tourism Training System of Cuba (Sistema de Formación para el Turismo de Cuba
GEF	Global Environment Facility
GIS	Geographic Information System
IA	Implementing Agency
ICM	Integrated Coastal Management
IES	Ecology and Systematics Institute
IPF	Institute of Physical Planning

M&E	Monitoring and Evaluation
MINAG	Ministry of Agriculture
MINAL	Ministry of Food Industry
MINAZ	Ministry of Sugar Industry
MINCEX	Ministry of Foreign Trade and Foreign Investment
MINFAR	Ministry of Armed Forces
MININT	Ministry of Interior
MINTUR	Ministry of Tourism
MPA	Marine Protected Area
NGO	Non-governmental organization
NP	National Park
ONIP	National Bureau for Fish Inspections
PA	Protected Area
PIR	Project Implementation Report
PMU	Project Management Unit
ProDoc	Project Document
QOR	Quarterly Operational Report
RSC	Regional Service Centre
SNAP	National Protected Areas System
SRF	Strategic Results Framework
TE	Terminal Evaluation
UMA	Environmental Units
UNDP CO	United Nations Development Program Country Office
UNDP	United Nations Development Program
USD	United States Dollars
ZBREUP	Zone under Special Regime of Use and Protection

ZBRMIC	Zone Under Regime of Integrated Coastal Management

2 Executive Summary

Table 1: Project Summary Table

Project Title:	Mainstreaming and Sustaining Biodiversity Conservation in three Productive Sectors of the Sabana Camagüey Ecosystem			
GEF Project ID:	43827		*At endorsement (Million US$)*	*At completion* (Million US $)*
UNDP Project ID:	3254	GEF financing:	4,119,498	4,050,728.78 (amount disbursed by FE but remaining funds earmarked)
Country:	Cuba	IA/EA own:		
Region:	LAC	Government:	22,032,000	54,229,980
Focal Area:	Biodiversity	Other:	1,521,178	1,521,178
FA Objectives, (OP/SP):	GEF 5, BD, SP2	Total co-financing:	23,353,178	59,801,887
Executing Agency:	Environment Agency (AMA) of the Ministry of Science, Technology and Environment (CITMA)	Total Project Cost:	27,472,676	63,852,615.78
Other Partners Involved:		ProDoc Signature (date project began):		March 2008
		(Operational) Closing Date:	Proposed: March-2014	Actual: Sep. 30, 2015

Overview of objective and methodology for Final Evaluation

This Final Evaluation (FE) was undertaken between April and June 2015 and adhered fully to the UNDP/GEF guidelines and Terms of Reference for this consultancy. Key issues addressed were project relevance, effectiveness, efficiency, sustainability, and impact. The methodology included a detailed review of all relevant project documentation. This was followed by an 11-day mission involving extensive interviews with stakeholders, site visits to five provinces across the country, and a presentation of the initial evaluation findings to representatives of AMA, UNDP Cuba, the project's biodiversity advisors and outcome coordinators, Ministry of External Trade and International Relations (MINCEX), and the Department of International Affairs of CITMA (GEF Focal Point). Follow-up communication with the PMU to fill in remaining gaps and a detailed analysis of the findings led to the preparation of the draft and final reports. Finally, the complete report was translated into Spanish.

Brief project description

The Sabana Camaguëy ecosystem harbours high levels of marine and terrestrial biota and terrestrial endemism, associated with significant variety of habitats. The main threats to the nationally and regionally important biodiversity (BD) of SCE stem from the tourism, fisheries and agricultural/livestock sectors. The project goal is to protect the marine and coastal biodiversity of global significance in the productive landscapes and seascapes of the Sabana-Camagüey Ecosystem of Cuba, while contributing to the country's social and economic development. The project objective is to promote operational changes within three key productive sectors to enable biodiversity conservation in the SCE and to support these

changes through improvements to the enabling environment. This was to be achieved through four planned Outcomes:
Outcome 1: A strengthened enabling environment will exist for the financial, institutional, environmental and social sustainability of biodiversity conservation in the tourism, fisheries and agriculture-livestock sectors in the SCE
Outcome 2: The tourism sector develops in accordance with the conservation of marine and terrestrial ecosystems within the SCE
Outcome 3: Sustainable fisheries are practiced within the SCE so that fish populations and marine ecosystem functions are maintained and/or restored.
Outcome 4: The declining sugar cane industry transitions into sustainable land use practices, with greatly reduced negative impacts on the coastal region of the SCE.

MAIN FINDINGS

Project Execution

The Environment Agency managed this project efficiently and conscientiously. High levels of communication and coordination among the EA and key stakeholders played an important role in the effectiveness of the project. Project planning was carried out in a participatory manner. Moreover, the EA employed adaptive management successfully on various occasions to deal with changes in the national context in terms of socio-economic policies, extreme weather events and other factors. In terms of monitoring and evaluation, regular quarterly and annual reporting, visits to field sites and activities such as the inception workshop and Mid-Term Review were satisfactorily implemented. The project did experience some difficulties in monitoring some of the ecological indicators, particularly the marine ones, due to various factors such as unavailability of vessels, high costs of renting those that were available, difficulties obtaining permits to rent vessels for scientific use from tourism authorities, and the time lags in observing ecological changes.

Project Implementation

As Implementing Agency for this project, UNDP effectively carried out its functions, including financial oversight and technical support, to support the achievement of project results. There was frequent communication between the PMU and the UNDP. UNDP monitored budgetary execution on an ongoing basis, participated in meetings to follow up on procurement issues, and processed payment requests efficiently. UNDP supported the preparation of the annual Project Implementation Reports (PIRs) and regularly visited provincial sites. It should also be noted that UNDP CO reviewed project publications before they went to print and advocated for an emphasis on communication and information dissemination. Moreover, the UNDP Regional Service Centre supported knowledge management by funding the publication of two documents to highlight project experiences.

Project Results and Sustainability

This third phase of UNDP/ GEF support to the government of Cuba's intervention in the SCE focused on promoting Integrated Coastal Management and mainstreaming biodiversity conservation in the key productive sectors of tourism, fisheries and agriculture. The project successfully led to greater levels of coordination between CITMA and these sectors, thus strengthening inter-sectoral planning and environmental management. Valuable lessons were learned on integrating conservation in productive sector activities, such as the validity of developing policy instruments to support adoption of sustainable practices, the importance of widely disseminating pilot experiences to promote upscaling, and the need for long-term engagement with productive sectors to ensure lasting impact. It was considered highly relevant by stakeholders and benefitted from high levels of participation from a wide array of actors and

extensive inter-institutional collaboration. Co-financing amounts exceeded projections and contributed to significant project ownership.

In line with Outcome 1, the project led to a strengthened enabling environment for biodiversity conservation in productive sectors and enhanced sustainability. The project played a key role in the development and implementation of Integrated Coastal Management programs. An ICM methodology was adapted to the Cuban context and is now being used as a tool for environmental management. Seven Zones under ICM (so-called ZBRMICs) were officially declared in the SCE (as well as additional ZBRMICs outside of the SCE). Through the project, a wide variety of ICM measures were implemented, such as nature tourism, reforestation, protection of fisheries resources, and controlled livestock husbandry, among others. ICM Boards were set up for each of the ZBRMICs as a system of governance to oversee implementation of the ICM Programs. This is consistent with the greater level of decentralization in Cuba. A legal proposal for the establishment of an Advisory Board on ICM for the entire country was also developed through the project but is pending formal approval; this would be charged with conflict resolution and maintenance of an ecosystem-based approach. A second key result of this Outcome was environmental education and capacity building. A network of Capacity Building Centres for ICM was established with 20 such Centres in the SCE. Local governments, community members, CITMA specialists, productive sectors and others received extensive training and increased their level of understanding of the biodiversity values in the SCE, ICM and sustainable production.

The project disseminated lessons learned and information from the project, primarily through workshops, exchanges, audiovisual and printed material. The latter included publications on biodiversity, ICM, and sustainable financing, among others. The large amount of information produced through the three phases of intervention in the SCE is now available in an information repository. Media coverage, the production and airing of documentaries and participation in events served to increase project visibility. Further work to disseminate key project outputs to local and national stakeholders as well as within the UNDP and GEF systems would be useful to highlight the achievements and lessons learned through this biodiversity mainstreaming project, which represents one of the first of its kind in the Latin American and Caribbean region.

In order to enhance the financial sustainability of biodiversity mainstreaming, the project carried out research on sustainable financing, looking both at successful international models and at the specific pilot projects implemented through the project, for which economic valuations were carried out to assess the costs and benefits of different sustainable production practices. Such economic valuations were novel for Cuba and pave the way for future work on payments for environmental services. A proposal was developed for the Ministry of Tourism, which would involve charges to tour operators that would be reinvested in biodiversity conservation in productive sectors. This proposal is still being discussed and requires substantial follow-up in the future as this could represent an important financial mechanism for sustainability.

Numerous project achievements can be highlighted in the tourism, fisheries and agricultural sectors. For tourism, workshops were held to train tourism managers, tour operators, tourism workers, and personnel of the National Protected Areas System, reaching a total of 14,000 individuals over the course of the project. A fully equipped Centre for Sustainable Tourism Development was established within the School for Advanced Studies in Hospitality and Tourism of the province of Ciego de Avila (belonging to the FORMATUR system) and classrooms associated with the Centre were equipped in the remaining four provinces involved in the project, in order to carry out activities related to this sector. In terms of biodiversity conservation, the curriculum was strengthened and teachers trained. In addition, project funding supported the maintenance of the Coral Reef Early Warning Voluntary Monitoring Network. Several pilot projects for nature tourism were designed and established in association with the National Centre for Protected Areas, which has led to an increase in the numbers of tourists participating in such

activities (please see the recommendations section for particular issues that need to be addressed). The project had a significant impact on the development of tourism sector guidelines and planning strategies to promote biodiversity-friendly practices. For example, sustainable tourism indicators for ecologically sensitive areas (outside of protected areas) were designed and were validated through their application in 21 tourist hotels in the main SCE tourist zones. A manual of best practices in the hotel industry was developed and a manual of best practices in ecological gardening was produced. The project developed a draft national standard on the construction of roadways in fragile ecosystems (small cays), which is pending formal approval. In order to strengthen the incorporation of environmental criteria and considerations in planning for the tourism (and other) sectors, environmental planning was carried out and approved for nine municipalities, which will be integrated into existing land use plans for these territories.

Substantial biophysical information was collected to better understand the state of the fisheries, which supported the approval of key policies to ensure the sustainability of the fisheries, such as the national ban on bottom trawling in 2012. Training, technical assistance and exchanges for fishermen, inspectors and decision makers were carried out. Pilot projects to promote sustainable fishing alternatives were also put in place focusing on sponge cultivation, oyster cultivation and oceanic fisheries (demersal fisheries). These have provided tangible socio-economic benefits and some replication is already occurring.

With regard to biodiversity-friendly agriculture, livestock and forestry production, the project supported research and land use zoning at the level of productive units (UBPCs), as well as capacity building. Sustainable and diversified agricultural production models were tested. Buffalo management was strengthened to reduce environmental impacts on coastal ecosystems through training, purchase of materials, and the development of a draft national standard on the sustainable management of confined buffalo in coastal ecosystems, which is in the process of formal approval. The project supported the introduction of native tree species and trays with cells at nurseries. Reforestation and natural forest management were carried out, leading to an increase in forest coverage. An additional unexpected result of this Outcome was the development of a proposal for biological corridors, in light of the increased pressures on land through a recent government decision to allocate idle lands to individuals for agricultural production.

The project contributed to key impacts in terms of stress reduction and the creation of an enabling environment favoring BD conservation, through the training of productive sectors on how to mainstream biodiversity, development of tools such as best practice manuals, and contribution of data to support the approval of policies such as a national bottom trawling ban, to name a few. Overall, the project led to 3510.05 km² of seascape under biodiversity-friendly management in the fisheries sector, which includes 3498.58 km² under legal protection in fisheries reserves. Indirect benefits were experienced over an area of 27,877.74 km² of landscape and 4,811 km² of seascape. Through the project, 882 ha were reforested (both for conservation and for production in plantations) and a total of 41,809 ha of natural coastal forest was managed through the project.

A determination of the final project impact on indicators of the ecological status of key ecosystems is complicated by the fact that not all indicators were measured at project end and that external factors have a significant impact on the health of these ecosystems. Nevertheless, the available data generally pointed to positive global environmental benefits. The overall area of mangroves increased and coral reef coverage was maintained. There were no significant differences in fish biomass compared to the baseline in the sites that were assessed, as per the target in the Strategic Results Framework. In the case of seagrass beds, the results were mixed, likely due to the impact of bottom trawlers over many years and the lengthy recovery period. Sampling of contaminant loads associated with agricultural activities showed that some values remained stable, others decreased, and some increased; this was attributed to the fact that the monitoring was carried out in the rainy season while the baseline was established in the dry season. In addition to the project's environmental impacts, it put in place models for sustainable productive

practices, led to new jobs and increased incomes for local inhabitants of the Sabana Camagüey ecosystem.

As mentioned previously, further work to put in place financial mechanisms to reinvest funds in biodiversity mainstreaming are needed. The project did succeed, however, at promoting increased sectorial investments in biodiversity conservation. In terms of the institutional and governance framework, socio-political, and environmental issues, these are not considered to pose any substantial risks to sustainability.

Best practices

- *High level of training and participation of local governments in project activities, such as CBCs and ICM Programs*
- *Extensive coordination with a large number of key stakeholders*
- *Excellent communication among the national, provincial and municipal levels of coordination*
- *Pilot projects addressed productive sector interests as well as Ministerial objectives and helped address community problems*
- *Emphasis on education and environmental training at all levels, including the community level*
- *South-South cooperation for exchanges of information and experiences and to take advantage of regional expertise*
- *Synergy with other projects to maximize efficiencies*
- *Development of regulatory norms and best practice manuals based on project results in order to increase sustainability of project impact*
- *Incorporation of ICM in the curricula of educational/ technical training centres*
- *ICM Programs were developed in a participatory manner and the associated ICM Boards incorporate all key stakeholders*
- *Pilot projects were designed during project preparation phase*
- *Productive sectors managed activities to integrate biodiversity conservation directly*
- *Continuity of UNDP/GEF support for the Sabana Camagüey ecosystem over three phases increased impact. As an example, actions carried out during Phase 3 of the project built on the land use planning carried out in Phase 1 of the project, which identified ecologically sensitive areas with high biodiversity value, as well as on the Strategic Plan that was developed.*

Recommendations to build on lessons learned and to guide future actions

<u>Recommendations related to project design</u>

- *Carefully select environmental impact indicators to ensure that they are realistic and that changes can be observed in time span of project*
- *Clearly explain the methods used to establish baseline values for all indicators in the ProDoc*
- *Dedicate sufficient resources in M&E Plan budget to monitor ecological indicators, including at project end*
- *Negotiate agreements during PPG phase for the use of vessels in coastal/marine monitoring*

<u>Recommendations to guide project execution</u>

- *Report on indicators with quantitative data if the baselines do so and employ the same units/methods of measurement to facilitate comparison*
- *Measure all indicators at project closure to determine final project impact*
- *Obtain the commitment of relevant institutions to track both co-financing and leveraged resources*
- *Ensure that all necessary materials for productive technological innovations are purchased*
- *Carry out final workshop before final evaluation*

Recommendations to guide future projects

Recommendations for financial sustainability:

- *Continue to develop financial mechanisms to support the implementation of sustainable productive activities in key sectors that affect biodiversity*
- *Promote institutional coordination at the central level to achieve an integrated vision on ICM and secure agreement on relevant financial mechanisms*

Recommendations to maximize impacts of pilot sustainable productive sector activities and promote further replication/upscaling

- *Publish succinct pamphlets on the pilot projects to promote replication*
- *It is recommended that CNAP follow-up on the nature tourism products developed with the project through the National Commission on Sustainable Tourism to ensure that there is sufficient support for their management and promotion*
- *Continue promotion of nature tourism products*
- *Translate nature tourism material into English, including at Visitor Centres*
- *Ensure that the pilot project experiences under the direction of AZCUBA are shared with MINAG*

Recommendations to maximize environmental impact:

- *Follow-up with IPF and tourism developers to ensure that BD considerations are incorporated in the construction and operation of new tourism developments, including in the cays of the province of Camagüey*
- *Develop biological corridors to consolidate BD conservation in the landscape, including protected and productive areas*
- *Follow up on system of environmental indicators for productive sectors and on sustainable tourism indicators to ensure their formal approval*
- *Promote use of native species in coastal reforestation*
- *Continue to provide training and environmental education in the long-term*

Recommendations for further information dissemination and knowledge management:

- *Increase accessibility of the information in the repository*
- *Earmark funds to continue to print out key project outputs and disseminate project results and experiences within Cuba and internationally*
- *UNDP Cuba Country Office to ensure that lessons learned from this BD-2 project and key documents that systematize the project experience are shared within the UNDP system and with GEF*

Table 2: Ratings of Project Performance

Criteria:			
1. Monitoring and Evaluation	Rating	2. IA& EA Execution	Rating
M&E Design at Entry	Satisfactory	Quality of UNDP Implementation	Highly Satisfactory
M&E Plan Implementation	Satisfactory	Quality of Execution- Executing Agency	Highly Satisfactory
Overall quality of M&E	Satisfactory	Overall quality of Implementation/ Execution	Highly Satisfactory
3. Assessment of Outcomes	Rating	4. Sustainability	Rating
Relevance	Relevant	Financial resources:	Likely
Effectiveness	Satisfactory	Socio-political:	Likely
Efficiency	Highly Satisfactory	Institutional framework and governance:	Likely
Overall Project Outcome/Results rating	Satisfactory	Environmental:	Likely
		Overall likelihood of sustainability:	Likely
Impact	Significant		

Ratings for Effectiveness, Outcomes, Efficiency, M&E, I&E Execution are on a *six-point scale of Highly Unsatisfactory to Highly Satisfactory*. Ratings of sustainability are on a four-point scale from Highly Unlikely to Likely. Ratings of relevance are on a two-point scale (Relevant or Not relevant) and ratings of impact are on a three-point scale (Negligible, Minimal and Significant).

3 Introduction

3.1 Purpose of the Evaluation

1. This Final Evaluation (FE) is a compulsory requirement of the Global Environment Facility (GEF) and the United Nations Development Program (UNDP) and was instigated by the UNDP Cuba Country Office in its role as Implementing Agency (IA) for this project. The evaluation adheres to the guidance, rules and procedures for such evaluations as defined by UNDP and GEF.

2. UNDP GEF-funded project evaluations have the following objectives (UNDP 2012):

- To promote accountability and transparency, and to assess and disclose the extent of project accomplishments;
- To synthesize lessons that can help to improve the selection, design and implementation of future GEF financed UNDP activities;
- To provide feedback on issues that are recurrent across the UNDP portfolio and need attention, and on improvements regarding previously identified issues.
- To contribute to the overall assessment of results in achieving GEF strategic objectives aimed at global environmental benefits;
- To gauge the extent of project convergence with other UN and UNDP priorities, including harmonization with other UN Development Assistance Framework (UNDAF) and UNDP Country Programme Action Plan (CPAP) outcomes and outputs.

3.2 Key Issues Addressed

3. As per UNDP/GEF guidelines, this Final Evaluation assessed the following five criteria:

- Relevance, defined as the extent to which the activities are suited to local and national development priorities and organizational policies, taking into consideration changes over time.
- Effectiveness, that is, the extent to which the results have been achieved or the likelihood of their achievement.
- Efficiency: the extent to which results have been delivered with the least costly resources possible, also called cost-effectiveness or efficacy.
- Sustainability: the likely ability of an intervention to continue to deliver benefits for an extended period of time after completion. Projects need to be financially, socially and environmentally sustainable.
- Impact: verifiable improvements in ecological status, verifiable reductions in stress on ecological systems, or indications that progress is being made towards achievement of stress reduction and/or ecological improvement (through process indicators).

4. The report covers the following main aspects: introduction to the evaluation; summary of project; analysis of project design and implementation (including the M&E system); level of achievement of project results; likely sustainability of project outcomes; conclusions, best practices, lessons learned, and recommendations to guide future projects. As per the Terms of Reference (TORs), various issues were rated on a scale that ranges from Highly Satisfactory to Highly Unsatisfactory.

3.3 Methodology of the Evaluation

5. The Final Evaluation involved preparatory work, a 10-day in-country mission, and drafting of the final evaluation report. Details are provided in the following paragraphs:

A) Evaluation Preparation:

6. The preparatory phase included a review of all relevant project documentation, such as the Project Document, annual Project Implementation Reviews (PIRs), Annual Operational Plans (AOPs), Combined Delivery Reports (CDRs), Quarterly Operational Reports (QORs), the inception report, Mid-term Evaluation report, and a wide variety of other project products. The documents studied are listed in Annex 3.

7. The Lead Project Evaluator participated in a teleconference with the project's Regional Technical Adviser (Lyes Ferroukhi) from the UNDP Regional Service Centre for Latin America and the Caribbean (RSC LAC) to review expectations for the evaluation and issues to assess in detail.

8. An Inception Report was prepared with a mission programme and further details of the methodology for the evaluation.

B) Evaluation Mission:

9. The evaluation team met with the Environment and Energy Unit of UNDP Cuba to discuss UNDP's perceptions of the project's achievements, constraints and lessons learned and to review the mission programme. Additional meetings and communication took place in Havana with national coordinators of the Project Management Unit, project advisors, and key institutions such as the Environment Directorate of CITMA, Tropical Geography Institute, Centre of Fisheries Research, FORMATUR (Ministry of Tourism), AZCUBA, National Enterprise for the Protection of Flora and Fauna (ENPFF, which belongs to the Ministry of Agriculture), and the Institute of Physical Planning (IPF).

10. In addition to the meetings in Havana, field visits were carried out in the five provinces that participated in the project, namely, Matanzas, Villa Clara, Sancti Spiritus, Ciego de Ávila and Camaguëy. The list of stakeholders interviewed and/or who participated in meetings can be found in Annex 1 of this report, and includes diverse actors such as provincial CITMA delegates and project coordinators and, municipal government representatives, ICM specialists (directors of the Capacity Building Centres for ICM in the municipalities), agricultural and fisheries cooperatives, a representative of the State Forestry Service, community members and others.

11. On the last day of the mission, the Lead Project Evaluator gave a presentation of the initial findings to the UNDP CO, the project coordinators from AMA, project biodiversity advisors, Outcome coordinators, representatives of the Ministry of External Trade and International Relations (MINCEX), and the Department of International Affairs of CITMA (GEF Focal Point) and the President of the Environment Agency.

12. The mission itinerary is included in Annex 4.

C) Report preparation:

13. In the process of preparing the final report, further information was requested of the UNDP CO and the Project Management Unit (PMU) to obtain additional documents and to seek clarification on different issues. The project material was reviewed with a focused attention on project outcomes and outputs as well as sustainability. A detailed analysis of the findings of the mission and of the project information was undertaken and a draft report prepared in English, as per the guidelines and Terms of Reference (please see Annex 5 of this report).

14. The second international consultant and the national consultant reviewed the draft and provided input, and the report was then translated it into Spanish. The report was then reviewed by the Executing Agency (EA) and the IA and a final report was prepared incorporating the feedback.

3.4 Structure of the Evaluation

15. The structure of the Final Evaluation adhered to the Terms of Reference prepared by UNDP Cuba and approved by the UNDP-GEF Regional Service Centre (RSC) (please see Annex 5). UNDP Guidelines for Evaluators as well as GEF evaluation policies were followed, as well as the specific expectations of the Implementing Agency (IA), Executing Agency (EA), and UNDP RSC.

4 Project Description and Development Context

4.1 Project Start, Expected Duration and Funding

16. The Project Document (ProDoc) was signed in March 2008 with a planned closure date of March 2014 (6-year implementation period). The first disbursement was made in June 2008 and the inception workshop also took place that same month. The total GEF project grant was USD 4,119,498 and committed co-financing was 23,353,178 in local currency.

17. The project received an extension from March 2014 to March 2015, such that the final project duration was seven years. Given the need to conclude a few specific activities, financial closure will take place in September 2015.

4.2 Problems that the Project Seeks to Address

18. The Sabana Camaguëy ecosystem is located in an area of approximately 465 km in the central north zone of Cuba, between Punta Hicacos in the west and Nuevitas Bay in the east. The main threats to the biodiversity (BD) of the Sabana Camaguëy ecosystem (SCE) stem from the tourism, fisheries and agricultural/livestock sectors. Tourism infrastructure in the cays of the Sabana Camaguëy archipelago has resulted in substantial habitat fragmentation, land conversion, impacts on flora and fauna and introduction of exotic/ invasive species on several of the cays. Causeways have led to changes in natural hydrological and sediment dispersion patterns and biological patterns of fish and marine biota. Tourism operations often employ management practices that harm biodiversity, such as failure to adequately treat wastewater or dispose of solid waste and use of exotic ornamental plants. Tour operators can also harm ecosystems, such as coral reefs, through pollution and the inappropriate anchoring of diving boats.

19. In terms of the fishing sector, overfishing, use of unsustainable fishing gear and practices and

inadequate management of aquaculture have contributed to declining fish stocks and negative impacts on marine ecosystems. Overfishing has resulted in changes to the trophic balance in coral reefs and to a decline in average coral cover. In addition, illegal fishing activity has led to reductions in key species. Fishing stocks have also been seriously impacted by the use of gear such as set nets and bottom trawls, and practices such as fishing in spawning and nursery areas. The aquaculture facilities that are present in the SCE have been associated with wastewater problems, the escape of cultured species, and eutrophication. In addition, the building of causeways and other infrastructure has had negative impacts on marine ecosystems and fisheries stocks.

20. Coastal and marine biodiversity has also been affected by the agriculture and livestock activities taking place on land through soil and water degradation (inappropriate land preparation techniques, high run-off rates, excessive extraction of rgroundwater, etc.). This can affect seagrass beds and associated biota, and lead to contamination from agrochemicals and salinization of coastal areas, among other impacts. Livestock management practices, including the increase in wild water buffalo populations, have been associated with loss of native vegetation and soil erosion. The production of solid and liquid agricultural wastes without sufficient agricultural waste treatment policies and processes represents another problem for BD in the SCE. Finally, non-native species are often used in reforestation with the result that the native coastal forest ecosystems, along with the ecosystem services they provide, are being diminished.

21. The main barriers that prevent these threats from being adequately addressed as described in the ProDoc include:

- Limited integrated planning and institutional coordination
- Incomplete regulatory framework and guidelines governing sectoral impacts on biodiversity.
- Information gaps on biodiversity and integrated coastal management
- Low awareness and understanding of biodiversity issues and sustainable development options
- Productive sector priorities focused on short-term economic benefits
- Absence of models for biodiversity-friendly alternative livelihoods
- National economic structures

22. The project design specifically addresses these barriers.

4.3 Immediate and Development Objectives of the Project

23. The Project Goal is to protect the marine and coastal biodiversity of global significance in the productive landscapes and seascapes of the Sabana-Camagüey Ecosystem of Cuba, while contributing to the country's social and economic development.

24. The Project Objective is to promote operational changes within three key productive sectors to enable biodiversity conservation in the SCE and to support these changes through improvements to the enabling environment.

25. The following four Outcomes were identified to achieve the Project Objective:

Outcome 1: A strengthened enabling environment will exist for the financial, institutional, environmental and social sustainability of biodiversity conservation in the tourism, fisheries and agriculture-livestock sectors in the SCE
Outcome 2: The tourism sector develops in accordance with the conservation of marine and terrestrial ecosystems within the SCE
Outcome 3: Sustainable fisheries are practiced within the SCE so that fish populations and marine ecosystem functions are maintained and/or restored.
Outcome 4: The declining sugar cane industry transitions into sustainable land use practices, with greatly reduced negative impacts on the coastal region of the SCE.

4.4 Expected Results

26. The Strategic Results Framework (SRF) contained in Section II of the ProDoc presents the Project Objective and four Project Outcomes, including specific indicators, baselines and targets. The project is expected to lead to substantial global environmental benefits. The SCE is regionally important as a result of the high diversity of marine and terrestrial species, significant levels of endemism of terrestrial flora and fauna, and substantial numbers and diversity of migratory birds that depend on the area en route from North America to Southern destinations. The project was designed to benefit key species, such as endemic plant and animal species, flamingos and other threatened birds, marine turtles, manatee, dolphins, crocodiles and others. In addition, the project aims to contribute to the maintenance of globally important ecosystems in cays, marine shelf and mainland watersheds, including mangrove forests, dry forest and coastal shrub systems, coral reefs and seagrass beds. The selected project impact indicators related to biodiversity include measurements of the biological health of coral reefs, seagrass beds and mangroves, measurements of the biological health of indicator fish species, the area of seascape benefitting from biodiversity friendly management by productive sectors (sustainable fisheries) and the area within SCE benefitting indirectly over the long-term by changed productive sectors.

4.5 Main Stakeholders

27. The main stakeholders involved in the project are described in detail in the ProDoc in the Stakeholder Analysis and in the Annex containing the Stakeholder Involvement Plan, including their mandates, interest in the project and possible conflicts.

28. The Environment Agency (AMA) within the Ministry of Science, Technology and Environment (CITMA), was the project's Executing Agency. AMA coordinated the project's intersectoral activities under Outcome 1, including the establishment of the Integrated Coastal Management Authority, the information repository, capacity building network for ICM, and sustainable financing. Various institutes belonging tos AMA (Institute of Systematic Ecology (IES), Institute of Oceanology (IDO), and Institute of Tropical Geography (ITG)), together with the Direction of International Affairs of CITMA, and the CITMA Provincial Delegations participated in the project. The Ministries of Tourism, Fisheries, Agriculture and Sugar Industry coordinated the technical groups for Outcomes 2-4 and guided implementation of the pilot projects in the productive sectors, policy and legal changes and capacity building. This was the first time in the three phases of the GEF intervention in Sabana Camagüey that the productive sector Ministries assumed these responsibilities (as opposed to CITMA) and that they requested the financial resources for these activities. The ProDoc indicates that the Ministries were actively involved in the design of the project and perceived clear benefits to their participation in the project. In terms of the Ministry of Tourism, the project provided an opportunity for it to diversify the tourism products on offer through the promotion of nature-related tourism and development of best practice manuals to address BD conservation. The project supported the efforts of the Ministry of Food

Industry (which includes Fisheries) to reverse the declining fishing stocks and provide fisherfolk with alternative livelihoods. The Ministry of Sugar Industry (now AZCUBA), which is responsible for the conversion of lands that had been devoted to sugar cane production to other land uses, benefitted from sustainable agricultural, livestock and forest management models. The mandate and project role of other Ministries, regional, provincial and local governments and entities as well as NGOs is described in the Stakeholder Involvement Plan of the ProDoc.

5 Findings

5.1 Project Design/ Formulation

(Satisfactory)

- **Analysis of project objectives and components, Strategic Results Framework (project logic/strategy, indicators)**

29. The Project logic was clearly presented with four Outcomes, one focused on intersectorial aspects, sustainability of actions to mainstream BD conservation in the productive sectors and improved planning and three Outcomes focusing on each of the main sectors affecting BD (tourism, fisheries, and agriculture). The proposed interventions were appropriate to address the main barriers that have been preventing the threats to marine and coastal biodiversity in the SCE from being effectively tackled. The ProDoc included substantial detail on each of the Outcomes as well as on outputs and activities, which helped guide project execution. In addition, the pilot projects were designed in detail and agreed upon with local stakeholders during the project preparation phase, which proved very useful in directing activities. This sped up the start-up of the pilot projects and also permitted sufficient time for their replication to other sites. The pilot projects were designed to support local livelihoods while promoting sustainable productive activities. This was particularly important in the context of major policy changes in Cuba, including the change in land use of approximately one million hectares of land from sugar cane production to other land uses and the associated closure of sugar cane plants, which led to approximately 14,000 people for whom alternative jobs needed to be found . The project design adopted a strategic approach in identifying possible feasible alternative livelihoods on these converted lands. In addition, during project implementation, set nets were banned in 2008 and bottom trawling was banned nationwide in 2012, such that the promotion of the three different fisheries options identified at the project design stage was also highly relevant.

30. It should be noted that the project builds strategically on the achievements of the first two phases of GEF intervention in the SCE. The first two phases focused on elements such as development of an Environmental Strategic Plan for the region, establishment of priority protected areas, setting up of a framework for Integrated Coastal Management, establishing biodiversity monitoring, and strengthening sustainable tourism guidelines. This third phase was focused on actions outside of protected areas by working with the main productive sectors that affect BD in the land and seascape, setting up the enabling environment to support changes in the productive sectors and strengthening sustainability of project impacts. The decision to adopt a BD-2 approach[1] provided added value to this third phase and enabled Cuba to gain experience in integrating BD conservation with productive sectors. It should be noted that a substantial part of the budget was allocated to the productive sectors. In addition, the design and implementation of environmental planning and Integrated Coastal Management Programs added value to this third and final GEF project intervention in the Sabana Camaguëy ecosystem.

[1] As per GEF Biodiversity Focal Area, Strategic Outcome 2: Mainstreaming Biodiversity in Productive Sectors.

31. The Strategic Results Framework was well formulated, the indicators included were generally "SMART"[2] and quantitative baseline and target values were included for all of them. However, some of the ecological indicators and targets were later considered ambitious by the Implementing Agency (IA) and Executing Agency (EA). Specifically, at the Objective level, four impact indicators were identified to assess project impact on key ecosystems and selected indicator fish species and to determine the area directly and indirectly benefitting from changes to the productive sectors. It proved difficult to measure the expected changes in some of these indicators after the seven-year project, especially because some depended on assumptions such as the ban on bottom trawling being in place by project start-up (which did not occur until 2012). Please see Table 5 and section on Global Environmental Benefits for further detail. At the Outcome levels, a relatively large number of indicators was selected to measure project impacts in the three productive sectors. A few of the indicators at the Outcome level also proved rather ambitious such as the "increase in revenues from taxes and fees on tourism activities invested in biodiversity conservation within the SCE", particularly because such financial mechanisms had never before been implemented in the Cuban context. For Outcome 4, the stakeholders interviewed felt that the targets for some of the pilots were too high with respect to the production of crops, which would have little impact on biodiversity conservation compared to reforestation activities.

32. One aspect of the project design that was overly ambitious in the Cuban context was the design of a meta-database with links to individual databases; it was assumed that access to this information system would be fully internet-based but this proved difficult given the limited internet connectivity and narrow broadband width in the country. The costing of this element during project implementation proved prohibitive at around USD 250,000, and consequently this element had to be redefined. An additional element of the ProDoc that in hindsight might not have been the most appropriate was the creation of an Integrated Coastal Management Authority at the ecosystem level with economic independence to manage and to protect biodiversity in the territory; this was not deemed feasible during project implementation and the decision was made to develop Integrated Coastal Management authorities at the local level, in addition to an ICM Advisory Body (this is still in the proposal stage).

33. Finally, there was an error in the target value for one of the indicators; the target for the "area within the SCE benefitting indirectly over the long term by changed productive sectors in the terrestrial landscape" was 22,800 km², when this figure actually exceeded the total area of the watersheds of 19,800 km². The target could therefore not possibly have been met.

- **Assumptions and Risks**

34. The following risks were included in the Project Document:

- The three levels of government (national, provincial and local) and various sectors (tourism, fisheries, agriculture) cannot agree on coordinated efforts for resource management
- The Ministry of Fisheries (now Ministry of Food Industry) is unwilling to establish and enforce strong fisheries regulations
- The Ministry of Sugar (now AZCUBA) chooses to adopt a short-term economic basis for deciding on appropriate uses of converted sugar cane producing lands.
- The Ministry of Tourism is unwilling to develop options apart from the traditional and profitable “sun and beach” model.

[2] Specific, measurable, achievable, realistic and time-bound.

35. All had low risk ratings, with the exception of the last, which was given a medium risk rating. Appropriate mitigation measures were identified for each of these risks. As is usually the case with UNDP/GEF projects, it would have been useful to have included the risk of climate change and how this issue could potentially affect achievement of the proposed project objectives, and to have identified associated mitigation measures where feasible. Additional risks were later identified and included in project PIRs, such as hurricanes, procurement issues and institutional changes.

- **Planned Stakeholder Participation**

36. The main stakeholders with a vested interest in the project were described in the Stakeholder Analysis section of the ProDoc, including the Ministry of Science, Technology and Environment (CITMA), and the four productive sector Ministries, namely, Ministry of Tourism, Ministry of Agriculture, Ministry of Fisheries and Ministry of Sugar Industry. The ProDoc also provided detailed information on all stakeholders in terms of their responsibilities and proposed form of participation in the project. A Table with stakeholder mandates, possible conflicts and conflict avoidance measures was carefully prepared, reflecting a sound analysis of planned stakeholder participation (please see Section II, Part IV: Stakeholder Involvement Plan of ProDoc for more details). The Stakeholder Involvement Plan also included a list of all the stakeholders that were consulted during project preparation, and a description of the Information dissemination, consultation, and related activities carried out in the PPG phase.

- **Replication Approach**

37. The project design included a strong replication strategy, with a number of elements to maximize upscaling during and after the project. The ProDoc included plans, targets and budget allocations for pilot project replication during the project implementation period. In addition, there is potential for further replication within the five provinces involved in the project, as they also have Southern coastal lines, and beyond to other provinces in Cuba and to other countries in the Caribbean. Various project elements included in the design that strengthen the enabling environment for mainstreaming BD conservation in productive sectors support replication, such as increased technical capacities, sustainable financing and strengthened policies. The many aspects of the project that responded to sectoral interests, such as the promotion of nature tourism and small livestock rearing with the use of ecological fertilizers, also supported replication. Finally, information dissemination and wide participation of stakeholders, including from the productive sectors, facilitate replication of project achievements. Information sharing was initially planned through the Capacity 2015 Project as part of the Integrated Learning and Application Network for countries in the region.

- **UNDP Comparative Advantage**

38. UNDP Cuba had a strong comparative advantage to implement this project due to its extensive experience in implementing environment and natural resource projects, including the first two phases of the GEF interventions to support biodiversity conservation in the Sabana Camaguëy ecosystem. The agency has had an office in Cuba since 1975, which facilitates the provision of administrative and technical guidance and financial oversight. The Country Office's portfolio in the Environment and Energy Unit includes 16 projects at the moment, including four in the biodiversity focal area (three Full-Sized Projects and one Enabling Activity). The Unit is staffed by three Program Officials and two Program Assistants, as well as four staff members working on specific projects. UNDP Cuba also acts as the Implementing Agency for the GEF Small Grants Program (GEF SGP), which provides funding for community-based and collaborative management initiatives, including in the biodiversity focal area. As will be described later in this report, the project was able to achieve synergies with the SGP.

- **Linkages between Project and Other Interventions within the Sector and Lessons from Other Relevant Projects Incorporated Into Project Design**

39. First and foremost, it is important to mention that this third phase of the GEF intervention in Sabana Camaguëy took into consideration and built on the achievements and lessons learned from the first two phases. The third UNDP/GEF project in the SCE that is the subject of this evaluation builds on elements such as the strategic planning, strengthening of the protected areas in the ecosystem and biodiversity monitoring, among other actions carried out with the first two projects.

40. The ProDoc also details how the project will coordinate and share information and lessons learned with the following environmental projects/ initiatives under development or implementation at the time of writing of the ProDoc:

- UNDP-GEF project "Demonstration of Innovative Approaches to the Rehabilitation of Heavily Contaminated Bays in the Wider Caribbean";
- "Integrating Watershed & Coastal Area Management in Caribbean SIDS (IWCAM)", a regional project of 13 Caribbean countries;
- GEF project "A Transboundary Diagnostic Analysis and Strategic Action Programme for the Gulf of Mexico Large Marine Ecosystem (GOM/LEM)" (note that Cuba did not end up participating in this initiative);
- GEF Small Grants Programme (SGP);
- UNDP-GEF project "Strengthening the National System of Protected Areas";
- Proposed GEF Country Programme Partnership (CPP), which will provide support to Cuba in combating land degradation, desertification and drought.

5.2 Project Implementation- Monitoring and Evaluation (Design at entry and Implementation)

(Overall quality of M&E: Satisfactory)

- **Monitoring and Evaluation Design at entry (Satisfactory)**

41. The design of the Monitoring and Evaluation Plan is rated as Satisfactory. The ProDoc included a summary of the M&E plan and an Annex with greater details on M&E activities, including a project inception workshop and preparation of inception report, quarterly progress reports, annual project reviews/project implementation reports (APRs/PIRs), periodic monitoring through site visits, mid-term review, final evaluation, annual audits, learning, and knowledge sharing. All M&E activities were separately budgeted with responsible parties assigned. The total budget for implementing the M&E plan was US$ 184,500, and in the end approximately USD 140,000 was spent. The allocation of additional funds during project implementation to M&E could have facilitated the monitoring of various indicators at project closure, given the significant unexpected increases in the cost of renting boats for marine monitoring.

42. In addition to the description of the standard M&E activities, the M&E section of the ProDoc provided information on the technical and scientific monitoring protocols to be used, which were developed during the previous two phases of the GEF intervention in the Sabana Camaguëy region.

43. The Strategic Results Framework (SRF) included clear and quantitative Objective and Outcome level indicators. However, as detailed in the Project Design section, some of these indicators were deemed

ambitious and difficult to measure in the timespan of the project.

- **Monitoring and Evaluation Implementation (Satisfactory)**

44. The EA implemented its M&E functions diligently. An inception workshop was carried out June 11-12 2008 with participation of 43 individuals representing a wide array of institutions, such as UNDP RSC, UNDP CO, different levels of CITMA and representatives of the productive sectors. This was a useful forum to discuss issues that could affect project performance, to identify necessary adjustments to the project strategy based on changes in the project context, and to present the project's Monitoring and Evaluation Plan, among other issues that are reflected in the inception report.

45. The Strategic Results Framework guided project implementation. In addition, project reporting during project implementation was satisfactory. The PMU regularly submitted QORs and PIRs, with the exception of QORs in the beginning of the project when two major hurricanes caused project delays. There were no problems noted in terms of the candor of reporting or quality of the reports. The tracking tool for BD2 projects was completed in 2009, 2010 and 2012 (at the time of the Mid-Term Evaluation). The final tracking tool was submitted in June 2015; it was filled out comprehensively and additional detail was provided for various questions.

46. The national coordinators regularly visited the provincial project sites for monitoring purposes and to carry out checks of the equipment and supplies purchased with project funds. In addition, as detailed in the Project Execution section, the project coordinators maintained regular communication and provided regular support to stakeholders.

47. A Mid-Term Review was carried out in January 2012. The MTR resulted in a detailed assessment of project progress and made a number of recommendations, such as the importance of focusing efforts on ensuring the financial sustainability of the project and the need to make some adjustments to Outcome 4 to achieve expected results. The majority of the recommendations were addressed by the PMU, with a few that were not considered feasible in the remaining time period of the project, such as adjusting indicators in the Strategic Results Framework. Financial audits were carried out in 2009, 2010, 2011 and 2013, as mentioned in the Finance section of this report, with no major findings noted.

48. A Project Steering Committee was established including representatives of AMA, Ministry of Tourism, MINAL, MINAGRI and AZCUBA. This high-level body met at project inception and after the Mid-term Evaluation and will meet again at project closure. In addition, the full Project Management Unit carried out project monitoring functions by reviewing achievements during annual meetings, which included the national project coordinators, provincial coordinators, coordinators of each of the project outcomes and project advisors. These annual meetings were considered by stakeholders to have been very useful in facilitating information exchange and guiding project execution.

49. Some difficulties were experienced with regard to monitoring of some of the ecological indicators, despite the fact that the EA made substantial efforts to do so. This was due to the difficulty of Cuban personnel to obtain permits to rent boats belonging to tourist enterprises; the lack of available boats to carry out monitoring at the times required; and the increased costs of renting boats. This set of circumstances was largely outside of the control of the PMU, and it is for this reason that the rating for M&E implementation is still Satisfactory. Unfortunately, it contributed to a situation in which the majority of the ecological indicators were not measured at project closure, although they were measured between 2011 and 2013, depending on the indicator. Given that one of the obstacles faced for final monitoring was monetary, the Recommendations section specifies that more funding should be budgeted for future projects, to take into consideration possible increases in the associated costs.

50. Another issue related to monitoring was that progress on indicators was not always reported in the same way or using the same method of measurement as the established baseline and target values. This makes it more difficult to monitor progress, especially for those not directly involved in the project. For example, the sectorial investment figures were not always reported in the PIRs as cumulative totals (but as annual figures), even though the targets were cumulative. Also, the total area of mangroves was not reported as such in the 20111 PIR but rather simply as a description (this was corrected in the 2014 PIR).

51. The ratings provided in the latest PIR in 2014 were relatively consistent with those included in this Final Evaluation, which was carried out in 2015, as shown in the following table.

2014 PIR:

	Rating of Progress toward meeting development objective	*Rating of implementation progress*
National Project Manager	Satisfactory	Satisfactory
UNDP Country Office	Highly Satisfactory	Satisfactory
UNDP Regional Technical Adviser	Highly Satisfactory	Satisfactory

FE Ratings:

Overall quality of Monitoring and Evaluation	Satisfactory
Overall quality of project Implementation/ Execution	Highly Satisfactory
Overall quality of project outcomes	Satisfactory

5.3 Implementing and Executing Agency –Implementation, execution, coordination and operational issues

(*Overall quality of Implementation/Execution: (Highly Satisfactory)*

Implementing Agency Execution *(Highly Satisfactory)*

52. UNDP effectively took on the responsibilities of Implementing Agency, as well as additional tasks to support achievement of project results. Communication between the PMU and the UNDP was said to have been smooth and regular. UNDP provided ongoing support for project implementation on a variety of issues, including financial oversight and technical support. With regard to procurement, UNDP participated in regular meetings with the EA and MINCEX to provide follow-up given the delays and obstacles in purchasing/ importing goods needed by the project. UNDP also regularly followed up on budgetary execution and processed payment requests efficiently. According to interviews, UNDP Finances Unit, Monitoring and Evaluation Unit and Energy and Environment Unit all carried out their functions effectively with a view to solving any problems that arose, demonstrating competency, professionalism and commitment.

53. In terms of the preparation of the annual Project Implementation Reports (PIRs), UNDP support included: (i) preparing guidelines for the project team to complete the PIR and explaining changes to the template, etc. (ii) holding meetings with the project team to conduct technical discussions, provide advice

and seek clarifications regarding indicators, outputs, lessons learned, adjustments, etc..

54. UNDP visited provincial sites on various occasions and participated in different workshops. In addition, the UNDP Permanent Representative attended an Environment Week event in one of the participating provinces, which helped increase project visibility. UNDP CO provided support in terms of the communication of project achievements and has been pushing this issue in particular since 2011. This included reviewing project publications before they went to print. The UNDP Regional Service Centre also funded the publication of two user-friendly documents on the experiences of the project in 2011.

Executing Agency Execution (*Highly Satisfactory)*

55. The Environment Agency (AMA) is located within the Ministry of Science, Technology and the Environment (CITMA), which is responsible for the development of environmental policies for Cuba. CITMA has an organizational structure with representatives in each province, which facilitated project execution. AMA was thus well positioned to act as Executing Agency for this project and carried out its responsibilities in a highly satisfactory manner. AMA had previous experience as EA for other UNDP/ GEF projects, including the prior project in Sabana Camagüey, meaning that it has been managing interventions in this ecosystem for the past 12 years, which gave it a thorough understanding of the main stakeholders and previous actions carried out to address prevailing threats. In addition, since the National Protected Areas Centre (CNAP) used to pertain to the AMA, the agency was responsible for the execution of the Strengthening the National Protected Areas System project. Currently, AMA is responsible for several other UNDP/GEF projects, including Operational Program 15 (Sustainable Land Management, with five projects); "A Landscape Approach to the Conservation of Threatened Mountain Ecosystems"; and "Reduction of vulnerability to coastal flooding through ecosystem-based adaptation in the south of Artemisa and Mayabeque provinces" (GEF Adaptation Fund). AMA is also executing an UNDP project on environmental foundations for local food security (known as the BASAL project) and directs the Technical Ozone Office.

56. The Project Management Unit (PMU) consisted of two national-level project coordinators (the Project Director and Project General Administrator); five provincial coordinators; and coordinators of the technical groups for each of the four project Outcomes (note that the first Outcome was coordinated by the Project Director). Various advisors supported the PMU, including two scientific advisors with expertise on terrestrial and marine biodiversity from the Institute of Systematic Ecology and from the Institute of Oceanology, respectively, an advisor on Sustainable Financing, an advisor on environmental law and an advisor on Protected Areas. Terms of References were prepared for all the members of the PMU so that the division of responsibilities was clear. Please see Annex 6 for a summary of the structure of the PMU.

57. The PMU effectively managed the project to achieve the project's objectives, maintaining the overall vision of what the project hoped to achieve. It consisted of well-respected professionals who were considered to have taken on their functions diligently based on the results reviewed by the evaluation team and on the interviews carried out during the evaluation mission. They prioritized tasks effectively and, as detailed in the Adaptive Management section, adjusted to changing circumstances as necessary. The PMU was also able to convene key stakeholders on many occasions during project implementation. There were few staff changes within the PMU, which facilitated continuity.

58. Stakeholders interviewed during the evaluation indicated that there was a high level of communication and coordination between the national project coordinators and the provincial coordinators and other key actors. The flow of information and support provided was ongoing via phone, email and visits. The national project coordinators were considered to have regularly consulted with, and

responded rapidly to requests from the provincial and local levels, which was well received. Moreover, technical inputs and ideas raised at the provincial level were taken into consideration by the project. The national project coordinators also regularly requested inputs and information from the provincial coordinators. The latter provided progress reports to the national coordination every three months to keep them updated. The national coordinators visited project sites and participated in project events regularly. The project also organized a large number of workshops and opportunities for exchanges among relevant stakeholders.

59. As detailed in the M&E section, reports were complete and handed in on time. Planning was carried out diligently and with sufficient detail. AOPs were discussed each year in a participatory manner with stakeholders before being finalized for approval by the government. As each Outcome involved different stakeholders, the sectorial coordinators of each Outcome discussed the AOPs and the annual procurement plans with relevant stakeholders and they were then shared with the national project coordination. The approval of these AOPs involved several different agencies, including MINCEX and UNDP. In 2012, the government approval of the AOP was delayed due to institutional changes with regard to these processes. The materials and equipment funded through the project and distributed to the local levels were carefully controlled by the PMU.

60. Risk management is considered to have been carried out effectively. Some risks included in the ProDoc ended up materializing, resulting in the adoption of mitigation measures by the project. Other new risks emerged and were also taken into consideration (please see Adaptive Management section for more details).

61. The Steering Committee for this project consisted of the President of the Environment Agency (AMA), the Director General of the Training System of the Tourism Sector (FORMATUR) belonging to the Ministry of Tourism, Director of the Fisheries Research Centre of MINAL, Director of Livestock of AZCUBA, and Director of the State Forestry Service of MINAG. It met on three occasions- for the inception workshop, after the Mid-term Review and it will meet again at project closure. In addition to these meetings, the Project Director met with individual members when critical issues arose. The Project Director felt that such a high-level committee should not meet more frequently as there were other instances available to support project decision-making. These include the annual meetings that were carried with the entire Project Management Unit, including national coordinators, provincial coordinators, and sectoral Outcome coordinators. These meetings were held in March of each year to discuss the progress of the previous year and plans for the coming year. As of 2010, the meetings were held in conjunction with those of the coordinators of the Capacity Building Centres to increase efficiencies.

- **Finance**

62. Financial management was carried out effectively for the project and expenses were adequately reconciled against the Combined Delivery Rates prepared by UNDP Cuba. Annual budgetary execution rates fluctuated from year to year from a low of 42% in the first full year (2009) to a high of 112% in 2013. As is the case for other UNDP/GEF projects in Cuba, procurement was an issue that affected spending rates, owing to the limited availability of suppliers to Cuba, the shipping distances, and time lags related to government checks and balances of imported goods. This led to delays in different activities such as fisheries research and monitoring of ecological indicators and affected budgetary execution. The delivery rate in 2012 was also affected by delays in the approval of the AOP by the government due to institutional changes. By the time of the Terminal Evaluation, the cumulative budgetary execution was high at 98%, with all remaining funds accounted for. Table 3 provides a summary of expenditures per Outcome and per year, along with the amounts included in the ProDoc and in the AOPs and delivery rates. Financial closure is planned for September 30, 2015.

63. The financial audits on the project that were managed by UNDP Cuba were carried out in 2009, 2010, 2011 and 2013, with no major findings noted. The only main issue mentioned were some delays in budgetary execution, which was related to the previously mentioned procurement difficulties in Cuba (lack of sufficient providers, etc.). Besides these audits, a number of national audit and control processes were carried out, sometimes as many as three times a year (for example in 2014), without any significant findings.

Table 3: Summary of Expenditures by Outcome and Year (in USD)

Year	2008	2009	2010	2011	2012	2013	2014	2015 I Trim.	Total budget
Outcome 1									
Total Project Budget as in PRODOC	158,128.00	147,835.00	123,542.00	168,355.00	117,355.00	113,281.00			828,496.00
Amount in AOP		267,864.00	254,508.71	375,948.00	241,863.10	232,006.00	43,250.00	6,000.00	
Amount disbursed	138,441.44	40,549.99	208,477.76	165,753.39	115,580.30	176,626.02	39,492.03	848.48	885,769.41
Delivery rate		15%	82%	44%	48%	76%	91%		107%
Outcome 2									
Total Project Budget as in PRODOC	384,634.00	288,983.00	165,768.00	188,507.00	158,132.00	115,092.00			1,301,116.00
Amount in AOP		250,129.00	231,280.32	310,735.00	270,976.00	265,364.03	126,575.00	31,276.42	
Amount disbursed	99,370.20	12,825.08	103,538.75	146,992.54	56,962.94	349,389.97	126,569.42	18,409.44	914,058.34
Delivery rate		5%	45%	47%	21%	132%	100%		70%
Outcome 3									
Total Project Budget as in PRODOC	357,495.00	238,376.00	141,178.00	217,635.00	141,178.00	38,109.00			1,133,971.00
Amount in AOP		354,055.00	434,212.81	113,515.00	118,814.42	200,228.96	56,000.00	17,000.00	
Amount disbursed	73,940.57	178,158.08	351,133.54	151,129.82	-58,681.56	235,233.51	18,388.06	1,818.18	951,120.20
Delivery rate		50%	81%	133%	-49%	117%	33%		84%
Outcome 4									
Total Project Budget as in PRODOC	358,101.00	177,482.00	105,586.00	60,904.00	22,859.00	29,810.00			754,742.00
Amount in AOP		338,673.00	204,651.00	196,825.00	199,220.57	127,184.05	21,000.00	2,000.00	
Amount disbursed	109,151.78	277,433.13	38,318.93	194,740.67	294,883.03	176,856.10	16,333.16	0.00	1,107,716.80

Delivery rate		82%	19%	99%	148%	139%	78%		147%
Project Management									
Total Project Budget as in PRODOC	20,033.00	20,029.00	15,279.00	15,278.00	15,278.00	15,276.00			101,173.00
Amount in AOP		14,587.00	24,059.00	66,550.00	34,014.40	28,080.00	30,000.00	40,000.00	
Amount disbursed	30,362.20	8,818.94	23,745.29	47,717.90	26,866.28	16,115.12	31,562.08	6,876.22	192,064.03
Delivery rate		60	99	72	79	57	105		190
Total budget in ProDoc	1,278,391.00	872,705.00	551,353.00	650,679.00	454,802.00	311,568.00	0.00		4,119,498.00
Total amount in POA		1,225,308.00	1,148,711.84	1,063,573.00	864,888.49	852,863.04	276,825.00	96,276.42	
Total disbursed	**451,266.19**	**517,785.22**	**725,214.27**	**706,334.32**	**435,610.99**	**954,220.72**	**232,344.75**	**27,952.32**	**4,050,728.78**
Total delivery rate		**42**%	**63**%	**66**%	**50**%	**112**%	**84**%	**29**%	**98**%

- **Co-financing**

64. A total of $27,353,178 in co-financing was committed in the ProDoc from the government of Cuba, WWF Canada, UNDP, Ecodesarrollo and Capacity 2015. The final co-financing received exceeded the target at 59,801,887 (please see Table 4), due to increases in the support provided by the government of Cuba (54,229,980 instead of 22,032,000).

65. Total co-financing was calculated annually based on the data provided by the sectors, the provincial coordinators, and the institutes of the Environment Agency (AMA). Co-financing came mainly in the form of the payment of the salaries of the Project Management Unit at the national and provincial levels, provision of premises for the establishment of Capacity Building Centres, electricity costs, fuel costs for tractors used in sustainable agriculture activities, and posts for live fences, among others. Additional co-financing above and beyond commitments in the ProDoc came primarily from the Ministries of Science, Technology and Environment; Fisheries;, AZCUBA; Agriculture; and Forestry and Tourism, and from local governments, which provided funding for activities such as the development of proposals for biological corridors, preparation of nurseries, and the establishment of two additional sponge farms. The substantial amount of co-financing provided for this project supported achievement of the project's objectives and is a demonstration of the high levels of commitment and ownership from the government of Cuba.

66. Additional funds were also leveraged during project implementation, such as for participation of personnel in different events. In accordance with the recommendations of the MTE, the project began to track these amounts but found that the data they were receiving from institutions was not reliable due to a reluctance on their part to provide this information.

Table 4: Summary of Co-financing

Co-financing (type and source)	UNDP financing (USD)			Government (National Currency)			Other sources (USD)			Total (US$)		
	Amount in ProDoc	Amonts committed after ProDoc approval	Funds spent	Amount in ProDoc	Amounts committed after ProDoc approval	Funds spent	Amount in ProDoc	Amounts committed after ProDoc approval	Funds spent	Amount in ProDoc	Amounts committed after ProDoc approval	Funds spent
Grants	4,119,498		4,050,729	22,032,000		54,229,980	984,178		984,178	27,135,676		59,264,887
Credit												
Equity												
In-kind							537,000		537,000	537,000		537,000
Non-grant instruments*												
Other types												
Total	**4,119,498**		**4,050,729**	**22,032,000**		**54,229,980**	**1,521,178**		**1,521,178**	**27,672,676**		**59,801,887**

- **Adaptive Management**

67. The EA successfully adopted an adaptive management approach on several occasions due to various changes in the context of the project since its development. This includes some adjustments to the pilot projects, which had been developed in 2004/2005 but only began to be implemented in 2008. With Outcome 3, two of the three proposed fisheries related pilot projects were substituted by two others (see Outcome 3 summary). For Outcome 4, for one of the pilots (UBPC Guamuta), it was decided to dedicate more funds to reforestation and to reduce the focus on crops since the latter would not have a significant impact on biodiversity conservation, especially given that the area was located within a migratory bird route. There were also some adjustments in the implementation time of the pilot projects as a result of four hurricanes that struck Cuba in 2008. This resulted in the prioritization of actions under Outcomes 1 and 4 and the decision to postpone implementation of some actions under Outcomes 2 and 3.

68. Changes to socio-economic policies in Cuba led to some project adjustments. One key government change was the decision to allocate idle lands to private individuals in usufruct for agricultural production. The EA and project Steering Committee felt that this represented a new project risk that could increase pressure on natural resources and biodiversity in productive landscapes. As a result, the project decided to begin exploring the concept of biological corridors for each province of the SCE to create greater interconnections among protected areas, biodiversity patches, forests and productive land in which sustainable practices are being carried out. This element was not originally conceived in the project design. By project end, a proposal for a biological corridor was developed. Other policy changes included the introduction of a new law permitting foreign investment, commitments to greater decentralization to the municipal level, and provisions for workers to become self-employed.

69. There were also several institutional changes since the project was designed. The Ministry of Sugar Industry became a state-owned sugar cane business group (AZCUBA company) and a significant proportion of the lands they managed were destined for agricultural production and were then transferred to the Ministry of Agriculture (MINAG). As a result, in 2009, three of the four planned pilot projects were located on MINAG lands. To maintain continuity, the EA decided to maintain the designated coordinator from AZCUBA to oversee the sustainable agriculture and buffalo activities for Outcome 4, especially because he had strong ties with MINAGRI, while MINAGRI continued to oversee the aspects related to nurseries and reforestation. Another change was that the Ministry of Fisheries became a structure within the Ministry of Food Industry (MINAL). Also, the institution that had taken the lead on the issue of Integrated Coastal Management (ICM), the Centre for Environmental Information, Management and Education (CIGEA) was dissolved in 2013. The EA maintained close dialogue with all relevant institutions to ensure that these institutional changes would not affect project execution.

70. The project coordination team also had to deal with delays in government approvals of AOPs and substantial periods of time when no imports were permitted, notably in 2012. At these times, the PMU focused on activities that did not require the purchase of goods and services and benefitted from substantial national co-financing in order to keep the project moving.

71. The Institute of Tropical Geography employed adaptive management to design the information system for the Sabana Camaguëy project. In the context of limited internet connectivity and the prohibitive costs of improving the system nationally, the Institute developed an alternative information system, which permitted both intranet access nationally (through INFOGEO) and internet access internationally (through the GEOTECH network).

72. The project also demonstrated adaptive management by incorporating new topics that were not emphasized in the ProDoc, such as climate change. Adaptation measures to reduce the impacts of climate change were introduced through the project, such as the construction of pathways to protect sand dunes.

- **Stakeholders/ Partnership Arrangements**

73. The project team worked with various partners to increase project reach and to obtain support for achievement of the project objectives. For example, the project formed partnerships with:

- Associations of agricultural producers, namely, the Cuban Association of Animal Production, which includes the Association of Buffalo Producers, and the Cuban Association of Agroforestry Technicians (ACTAF) to provide training and support for the implementation of sustainable agricultural practices.
- Research centres, universities and scientists. For example, the project worked with the Universities of Matanzas and Cienfuegos, which led to the strengthening of the Master's of Integrated Environmental Management and Doctoral programmes by incorporating the issue of ICM.
- Mundo Latino, Cuba's television producer, for the production of documentaries and audiovisual material to communicate project messages to a wider audience.
- Centro de Investigaciones de Bioalimentos (CIBA), which guided implementation of one of the pilot projects related to buffalo production in the municipality of Bolivia.
- National Union of Construction Architects and Engineers of Cuba (UNAICC) to complement the expertise of these professionals with information on biodiversity conservation for the design and construction of infrastructure in fragile ecosystems.

5.4 Project Results/ Effectiveness

Overall results (attainment of objectives) (*Satisfactory*)

Effectiveness (*Satisfactory*)

Outcome 1: A strengthened enabling environment will exist for the financial, institutional, environmental and social sustainability of biodiversity conservation in the tourism, fisheries and agriculture-livestock sectors in the SCE. This Outcome included the following Outputs:

Output 1.1: Integrated Coastal Management Authority (ICMA) to coordinate the planning and activities of diverse government and social stakeholders within the Sabana Camagüey Ecosystem
Output 1.2: Environmental education and capacity building for local inhabitants and participants in the three productive sectors to enable participation in activities for integrated coastal management and mainstreaming of biodiversity conservation into productive sectors in the Sabana Camagüey ecosystem.
Output 1.3: Lessons learned on integrated coastal management, and the mainstreaming of biodiversity conservation in the tourism, fisheries and agriculture/livestock sectors, available for dissemination within Cuba and internationally

Output 1.4: Institutional, policy and legal frameworks in place to support mechanisms for the long-term financing of conservation and sustainable use of biodiversity within the targeted productive sectors of the SCE

74. The project played an essential role in the institutionalization of the concept of ICM in Cuba (in methodological, institutional and regulatory terms). This represents a systemic change in terms of greater intersectoral planning, coordination and implementation of activities. The methodology for ICM was adapted to the Cuban context and the country has gained valuable experience in its implementation. A National Resolution was approved for the Certification of ZBRMICs. Seven zones under Integrated Coastal Management (ZBRMICs) were then declared in the Sabana Camagüey ecosystem and for each ZBRMIC, ICM Programs were developed and approved, which serve as tools for environmental management. Not only have Integrated Coastal Management Programs been established in the SCE but in other areas of Cuba as well as a result of the project (67% of the total area of ZBRMICs are in the SCE). As such, stakeholders have gained experience in the application of ICM practices and increased awareness of what it means in practice. In one of the municipalities of the SCE (Martí in the province of Matanzas) there is even a designated day each year to celebrate ICM, which has become an annual community celebration.

75. The project design originally proposed the created of an Integrated Coastal Management Authority at the Sabana Camagüey ecosystem level to be charged with inter-sectoral coordination and information sharing. In 2008, as a result of the project, SCE was the first territory that was implementing this form of governance at the ecosystem level. As of 2009, the process had spread to other ecosystems and regions. As new territories were incorporated, it was determined that the creation of a technical/administrative super-structure for the SCE was no longer the most appropriate strategy. Moreover, during the project's execution in 2010-2011, there was a significant move toward greater decentralization in the country. As a result, seven local Integrated Coastal Management Authorities were established, approved by CITMA, for the seven certified ZBRMICs. These seven areas cover 16 municipalities. These Authorities are composed of key institutional and sectoral stakeholders and are chaired by the municipal governments, which are responsible for implementing the ICM Programs and have the ability to convene stakeholders, request action, legalize actions, and so forth. The local Authorities meet regularly to approve actions and to assess progress in implementing the ICM programs. CITMA's municipal-level representatives are responsible for overseeing implementation of the Programs. Self-evaluations to evaluate the effectiveness of the ICMAs suggest that these Authorities have strengthened over time and that they are functioning effectively. It should be noted that besides the three sectors targeted by the project, the establishment of local ICM Authorities and ICM Programs also benefitted the oil industry, specifically, in the Varadero-Cárdenas area where there is ongoing oil exploitation and where environmental recommendations were provided and implemented.

76. The idea that the project has promoted is that these seven Authorities would be supported by an Advisory Board to be established at the national level, which would primarily support environmental conflict resolution and ensure that an ecosystem view is maintained above and beyond local interests, in addition to playing a coordinating role and supporting inter-sectoral dialogue. Through the project, a proposed Resolution was developed to modify the existing Resolution on ICM by mandating the creation of an Advisory Board for ICM for Cuba[3]. This Advisory Board would not constitute a new institution but

[3] Given that there are already a large number of certified ZBRMICs in Cuba and that many of the ecosystems are of national (and even international) importance, the proposal is for a nation-wide Advisory Board, which would include SCE.

would involve different authorities from the national, provincial level and municipal levels[4] who would provide advice. This is considered a more sustainable arrangement than what was originally proposed. The Resolution is in the process of review for formal approval.

77. To support the ICM Authorities and other key stakeholders, a repository of information on the SCE was developed. Due to internet connectivity issues, the design and operation of this system was modified from its original conception. It is managed by the Institute of Tropical Geography with both intranet and internet access to project data sets and information (from all three phases). In addition, a project website was developed with project information and outputs. The information repository that was developed for the project has expanded beyond its original remit to include information on other projects across the country as well. Besides the repository, project outputs are available and are referred to regularly at the Capacity Building Centres (CBCs) in the municipalities and are available at institutes such as the Institute of Oceanography and the Institute of Systematic Ecology.

78. A second key output envisioned by the project under this Outcome was environmental education and capacity building of local inhabitants and people involved in the three productive sectors to facilitate ICM and biodiversity mainstreaming in the sectors. To this end, the project led to the creation/ consolidation of 20 Capacity Building Centres for Integrated Coastal Management in municipalities of the Sabana Camagüey ecosystem and two additional CBCs outside of the ecosystem, which surpassed the original project expectations (20 CBCs instead of 12). At the national level, the Environmental Education section of the Environment Agency's Environmental Directorate provides guidance to the Centres. The Centres have become important focal points for environmental education, training, workshops/events, distribution of teaching material, dissemination of best practices, and research, enabling environmental issues to be integrated in the work of institutions, productive sectors and community members. According to the interviews carried out during the evaluation, the CBCs constitute one of the most important project impacts.

79. Extensive capacity building has taken place at the CBCs with local authorities, productive sector workers, community members and other stakeholders to support ICM implementation. The training activities identified in the annual workplans of each CBC are based on an assessment of each municipality's training needs. The CBCs are also used regularly by municipal governments and other stakeholders for discussions and meetings, and by the agriculture and fisheries sectors (the tourism sector uses its own school and facilities). During the project, annual meetings of all the CBCs of the SCE took place to facilitate the exchange of information and experiences among them. The project funded equipment and infrastructure for the Centres (such as computers and TVs), while the government provided the venues and continues to assume the operational costs (electricity, maintenance, etc.). The provincial CITMA delegations assumed and continue to assume the staffing costs. Based on interviews, the cost for their continued operation will be assumed by CITMA, in the absence of any cost-sharing mechanisms with the sectors at the moment.

80. The project has dedicated substantial efforts to disseminating lessons learned and information from the project. This was achieved primarily through workshops, exchanges, and production of printed and audiovisual material, including panels that were presented at different events such as World Biodiversity Day. Various publications resulted from the project on topics such as the Sustainable

[4] The ICM Advisory Board would include, but not be limited to: the Ministry of the Revolutionary Armed Forces, Civil Defense, Ministry of the Interior, Ministry of Food Industry, Ministry of Agriculture, Institute of Physical Planning, National Water Resources Institute, Ministry of Tourism, Ministry of Public Health, and others.

Financing Program, economic valuations of the pilot projects, experiences in ICM, and a Manual of Best Practices for hotels. A book was also published with inputs from 24 authors on the fauna of the SCE. A final publication summarizing project experiences and learning about the economic value of biodiversity in productive terrestrial and marine landscapes; describing the status of ecosystems; and addressing key issues such as sustainable production alternatives, invasive alien species, climate change and biological corridors, is in the process of being prepared. Documentaries and clips have also been produced, largely through a partnership with Cuba's television producer, Mundo Latino, including a nature series with six documentaries and a documentary on sustainable buffalo management. While there were no staff members within the PMU specifically dedicated to communications, project advisors and partners supported the production of project publications. In 2014, a communication strategy was developed and implemented to mark the 20-year milestone of project work in the SCE, which resulted in a day with panel discussions, substantial newspaper articles and radio programs, interviews with key actors on national television, and other communication outputs. Besides the publications and media coverage at the national level, participating provinces also carried out their own information campaigns, with TV, radio and press coverage. Some provinces also prepared CDs with project information.

81. The final Output under this Outcome was perhaps the most challenging for the project, and involved the putting in place of institutional, policy and legal frameworks to support mechanisms for the long-term financing of conservation and sustainable use of biodiversity within the targeted productive sectors of the SCE. In this respect, stakeholders concurred that the progress made was very significant and groundbreaking in the Cuban context. A Sustainable Financing team of experts was assembled. This led to a publication on Sustainable Financing, which looked at international models for the financing of BD mainstreaming in the productive sectors. The national case studies were included in a publication on economic valuations, which assessed the costs and benefits of the different pilot production practices promoted by the project. This was complemented by training of institutional stakeholders (economists from key institutions and demonstration areas) on the concept of sustainable financing mechanisms. A proposal was developed for the tourism sector based on willingness to pay and other research, which would involve charging tour operators a fee that would revert back to addressing these issues. According to the ProDoc, the project was going to propose rules for how such funds would then be divided among key actors. However, by project end, this proposal had not yet been assessed by the Ministry of Tourism, and cooperation agreements with key sectors and with government have not been reached on this issue. In addition, the implementation of the ICM programs involves an assessment of the financial resources required by the different sectors to implement the environmental measures; the idea is that eventually these costs would all be included in their annual planning and that the process of economic decentralization and local government empowerment would facilitate this process. As such, mechanisms to ensure the long-term financing of BD integration in tourism, fisheries and agriculture require further work.

Outcome 2: The tourism sector develops in accordance with the conservation of marine and terrestrial ecosystems within the SCE. This Outcome includes the following Outputs:
Output 2.1: Awareness and capacity building for adoption of environmentally sustainable practices by tourism sector stakeholders
Output 2.2: Development of nature related tourism at two pilot demonstration sites within the Sabana Camagüey ecosystem
Output 2.3: Capacity building to enable replication of demonstration strategies for nature related tourism throughout the Sabana Camagüey ecosystem
Output 2.4: Sustainable financing mechanisms to support long-term mainstreaming of biodiversity conservation into tourism sector policies and activities
Output 2.5: Tourism sector regulations and planning strategies and processes that integrate biodiversity friendly practices

82. Extensive capacity building was carried out with the tourism sector. Workshops were held to train tourism managers, tour operators, and tourism workers, as well as personnel of the National Protected Areas System, reaching a total of 14,000 people over the course of the project. Training events included an itinerant workshop for nature tourism guides to enable the guides to observe different nature tourism products firsthand. The project played an important role in providing advice and guidance to tourism companies on practices to employ for environmental management. Various actions were taken to build awareness levels among tourists, such as the production and distribution of pamphlets on the biodiversity values of the SCE and on the need to conserve water and energy. A "spot" was also produced that was broadcast on local TV channels.

83. Another significant project accomplishment worth highlighting was the establishment of a fully equipped Centre for Sustainable Tourism Development within the National System of Tourism Schools (FORMATUR), in the main school for tourism training in the country, located in the Ciego de Avila province. This was an additional impact that had not been specifically included in the ProDoc that increases the sustainability of project impact. This Centre provides a space and the equipment for training to take place. The curriculum of the School was strengthened with regard to environmental best practices in tourism in all subjects, teachers received training on sustainable tourism, and a CD on the topic was produced for teachers. The other four schools associated with the Centre for Sustainable Tourism Development were also equipped through project funding. The fact that this Outcome was coordinated by FORMATUR (the National Training System for Tourism), which is responsible for training tourism managers and workers in the country played an important role in these achievements.

84. Project funding supported the maintenance of the Coral Reef Early Warning Voluntary Monitoring Network, based in the Institute of Oceanography (IDO). IDO provided important complementary national funding to operate the network of data gathering, as well as the personnel to process, elaborate and disseminate the bulletin distributed continuously from 2003 (second phase of GEF support) to date (2015). This provides information for dive centre operators on coral bleaching so that measures can be taken to reduce tourism pressures in these areas. The project supported training as well as the production of a manual on how to carry out the monitoring. In addition, the project supported monitoring of water quality in beach and coral reef diving sites and CDs with information on diving sites.

85. Four pilot projects for nature tourism were designed and established, as well as a Visitor Centre. The sites were somewhat modified compared to proposals in the ProDoc[5] on the advice of an international consultant and due to the lack of a boat with sufficient capacity for the originally designed pilot and the fact that it was deemed overly ambitious. The nature projects have led to an increase in the number of visitors participating in nature-based activities compared to the baseline. By project end, the following nature tourism products had been developed/ promoted:

Nature Tourism product	**Location**	**Description of product and project support**
Jeep safari adventure	APRM Jobo Rosado, Yaguajay, Sancti Spíritus	Safari tour to various cays and to the Jobo Rosado protected area. Project supported production of documentary on the product, promotional material, and a study on economic feasibility of this tourism product (case study was included in the Sustainable Financing publication under

[5] The ProDoc had originally proposed six nature packages at the Buena Vista Biosphere Reserve and replication in the Gran Humedal del Norte.

		Outcome 1)
Kayak adventure	Caguanes National Park, Yaguajay, Sancti Spíritus	Kayaking tour through protected area. Project funded purchase of kayaks and production of documentary
Tour of mangroves	La Redonda Lagoon, Morón, Ciego de Ávila	Guided boat tour through mangrove forest and visit to Visitor Centre Project funded establishment of Visitor Centre, promotional material
Flamingo observation (additional replication site for nature tourism)	Río Máximo Wildlife Refuge, Province of Camagüey	Bird watching at significant flamingo nesting site Project funded delimitation of protected area, binoculars, telescope, computer, projector, tractor parts.
Visitor Centre in Santa María key	Near Buena Vista Biosphere Reserve	Visitor centre to describe values of the SCE Project support for establishment of Visitor Centre (not yet complete)

86. Many of the nature tourism products developed are the only ones of their kind in Cuba and have enabled stakeholders to gain highly relevant experience in diversifying their tourism product by offering other options besides the traditional "sun and sand " model. The preexisting tourism products that were strengthened with the project have been approved by the National Nature Tourism Commission, while the new products should also be approved by this Commission. The numbers of tourists visiting in nature tourism products increased by project end, particularly national tourists. Benefits to local community members were analyzed for the La Redonda pilot project, and there is potential for benefits to livelihoods with some of the other pilots as well. In a few cases, there are issues that need to be addressed to maximize the potential of these nature tourism products to attract tourists to nature tourism activities. For example, the two Visitor Centres have an attractive wall exhibit with information on the biodiversity values of the areas, but this is currently only provided in Spanish. In the Río Máximo flamingo observation nature product, the co-financing from the National Enterprise for the Protection of Flora and Fauna (ENPFF) is pending to complete the construction of a rancho for tourists. During the evaluation, ENPFF indicated in an interview that it was committed to providing this co-financing. Pressures from illegal fishing that have contributed to a significant reduction in flamingo nests also need to be addressed at this pilot project.

87. To promote replication, some marketing was carried out, including at national fairs such as the National Nature Tourism Fair (TURNAT), and to a limited extent international fairs (given that the latter were found to be very expensive). Ongoing marketing will be important to continue to increase nature tourism in Cuba to these and other sites and to promote further replication.

88. One proposed Output that has proven to be more difficult is the development of financial mechanisms to generate income for the mainstreaming of biodiversity conservation into the tourism sector. The project carried out studies, such as on the revenues and costs of nature tourism activities at the Jobo Rosado protected area, a study on Willingness to Pay among tour operators, and on the feasibility of nature tourism products. After consultations, the project developed a proposal for revenue generation that was presented to the Ministry of Tourism, which would involve charging tour operators a fee for visitation to fragile ecosystems (a type of payment for environmental services), with the idea being that this would then be available for biodiversity conservation. However, the proposal has not been approved at this point and this key element of financial sustainability has not therefore not been assured. As noted in the Recommendations section, it is vital that substantial follow-up be undertaken on this.

89. The project had a significant impact on the development of tourism sector guidelines and planning strategies to promote biodiversity friendly practices. This aspect fully complements the extensive capacity building and awareness raising activities that were carried out. The previously developed Sustainable Tourism Indicators for ecologically sensitive areas were revised to incorporate BD considerations[6]. Prior to the project, such indicators only existed for protected areas, but this project proposed indicators for areas outside of PAs. These are pending approval but are nevertheless already being applied in 21 hotels in the SCE. The Tourism Master Plan for the SCE was also updated each year by the Institute of Physical Planning, with the project providing recommendations and comments through CITMA.

90. Land use planning has been carried out in all of Cuba, but was done without taking into consideration environmental issues. In order to strengthen the incorporation of environmental criteria and consideration in planning for the tourism sector, one of the key project achievements was to introduce environmental planning in nine municipalities of four provinces (the only province that has not completed the planning in any of its municipalities is Villa Clara). This exceeds the expectation of having a total of five municipalities of the SCE with completed environmental plans. Based on the interviews undertaken, there is significant commitment to continue expanding the number of municipalities that have carried out this exercise. The methodology was developed by the Institute of Tropical Geography and agreed upon with the main stakeholders, was validated in one municipality of the project (Yaguajay) and then replicated in eight other municipalities. The Institute of Physical Planning (IPF) plans to replicate the methodology to the other municipalities across the country. It includes the collection of biophysical and socio-economic information and production of different maps at the municipal level, followed by an assessment of land use potential based on these environmental characteristics and the degree of compatibility of the natural landscapes with different anthropogenic activities. Climate change forecasts were also taken into consideration. The PMU felt that this was a necessary step toward the future realization of strategic environmental impact assessments, which could not be achieved during the time period of the project as had originally been envisioned. The environmental planning methodology has begun to be applied to other areas of the country and is also being used by other projects, such as the BASAL project.

91. A Manual on Environmental Best Practices with guidelines for staff in the hotel industry was developed and has been distributed to tourism industry stakeholders. According to the stakeholders interviewed, the guidelines are beginning to be implemented, which actually helps hotels increase their star ratings. However, new constructions are being planned in the cays of the Camagüey province and there is some concern because developers have indicated that they do not have the appropriate equipment to reduce impacts on biodiversity. This issue requires ongoing follow-up post-project. A Manual on Best Practices in Ecological Gardening was also produced. The use of native species in hotel landscaping was promoted through training and through the establishment of micro-nurseries at hotels and the production of a list of appropriate species to use. In addition, the project identified the invasive alien species present in the ecosystem.

92. It is also important to mention that the project succeeded in developing a draft norm/ decree with specific guidelines on the construction of roadways in fragile ecosystems (small cays). The norm is being discussed among stakeholders and its formal approval is pending. The development of this national standard forms part of the government plan with CITMA having responsibility for this, and it is therefore expected to conclude after the project. Once approved, either in its current state or with some revisions (and stakeholders indicate that they feel that it will be approved), compliance with the norm will be

[6] They take into consideration issues such as management of coasts, energy and water, as well as solid, liquid and hazardous wastes.

mandatory across the country. This will not only benefit the tourism industry but also the transportation industry.

Outcome 3: Sustainable fisheries are practiced within the SCE so that fish populations and marine ecosystem functions are maintained and/or restored. This Outcome included the following Outputs:

Output 1: Biophysical and socio-economic information necessary to make well informed decisions on necessary regulations, fisheries practices and sustainable fisheries development activities.
Output 3.2: Appropriate fisheries regulations and practices of benefit to the stabilization and/or partial recovery of fish populations and of species and habitats of global importance.
Output 3.3: Pilot projects to demonstrate sustainable livelihood alternatives for fishermen affected by new restrictions on fishing effort and practices Output 3.4: Fishermen and decision-makers within the SCE supporting fishing levels and practices that conserve biodiversity

93. Significant baseline biophysical information was collected to better understand the state of the fisheries and enable well-informed decisions to be made in terms of necessary regulations and fisheries practices. For example, data on commercial fish populations by species, annual variations due to stress factors, and historic fish catches were gathered, as well as data on private sports fisheries. Much-needed research was carried out to determine breeding and spawning areas; establish a baseline on habitat recovery since imposition of partial bans on bottom trawling; identify sources of contamination and undertake water quality and sediment sampling. The speed of the currents was measured in all the bridges of the causeways and a report presented to the highest level of the Environmental Authority, warning of the potential consequences if appropriate measures are not taken. Monitoring was also carried out to ensure compliance with fishing regulations, including during closed fishing seasons. In some cases, joint expeditions among different research centres were carried out for this research (such as with IDO, CIP, and universities). Despite some instances when monitoring could not be carried out due to the lack of an appropriate vessel, a substantive amount of valuable data was gathered through this Outcome. In addition to the biophysical information, surveys were carried out to determine socio-economic impacts of the changes in regulations and fishing practices.

94. The project provided support, information and knowledge for the development of key policies to ensure the sustainability of fisheries, such as the prohibition of bottom trawling in 2012 and set nets in 2008 and the review of the proposal on minimum legal sizes of fish. In this respect, the research undertaken through the project and equipment purchased to carry out this research were instrumental in providing the data needed to support the policy changes. Workshops were held to educate fishing inspectors of the National Office of Fisheries Inspections, the Coastguard, the Fish Landing Bureau (*Buro de Capturas*) and other personnel on these changes, on species identification, and other topics. The project also supported research on fish aggregations, which could provide valuable data for future measures, such as species quotas. In addition, the Centre for Fisheries Research developed a Manual on Fishing Gear in 2013, which is expected to be printed shortly and then disseminated widely, but which does not integrate all the recommendations made by the project team on biodiversity considerations (although BD is mentioned in the introduction).

95. One of the key Outputs under this Outcome was the implementation of pilot projects to provide alternatives to fishermen affected by new regulations on fishing gear and restrictions on fishing effort. Three pilot projects were established to promote sustainable fishing alternatives. Two of the originally conceived pilot projects were not implemented, namely, the use of flotation devices to attract fish and blue crab harvesting. For the former, this was due to the difficulty in maintaining such devices in the high seas, and for the latter, this was because of declines in blue crab populations. The final pilot projects that were promoted were:

- Offshore/ deep water fishing;

- Sponge cultivation; and
- Mangrove oyster cultivation.

96. These pilot projects have generally been successful, leading to tangible benefits for fishermen and fishing cooperatives. The establishment of the pilot projects was supported by training and development of technical manuals. Economic feasibility case studies were carried out on these alternatives, as highlighted in other sections of this report.. In total, approximately 63 workers are now gaining their livelihoods from these alternatives. To promote replication of the pilot project experiences, there were many exchanges and information dissemination with other fishing cooperatives. As a result, some replication is occurring, including in one instance, with the support of the GEF Small Grants Program, such that the number of total beneficiaries is likely to rise. There are not yet any formal established mechanisms to ensure the availability of government funding to further replicate these pilot projects among state-owned fisheries cooperatives. Nevertheless, the government considers investments in mangrove oyster cultivation and high seas fishing as priorities.

97. For the deep sea fishing pilot project, equipment was purchased to outfit two vessels with appropriate fishing gear. Catches of high-value fish species such as *pargo de alto* (*Lutjanus vivanus*) have increased as a result. To ensure the sustainability of the deep sea fishery, the Centre for Fisheries Research is engaged in ongoing monitoring of population sizes and needs to continue to do so[7].

98. With regard to sponge cultivation, the project purchased equipment such as a main boat, a dinghy and monofilament to establish a sponge farm with the Caibarién fishing cooperative. Further replication of sponge production has already occurred, with an additional sponge farm in Caibarien (set up using the cooperative's own funds) , one in the municipality of Martí, and a fourth being planned in Punta Alegre in Ciego de Avila province with support from the SGP. The marketing of production from these farms is secured through a French company, which is interested in supporting replication to other areas of Cuba. The oyster cultivation project involved the cultivation of oysters using oyster shells and monofilament as the substrate instead of mangrove branches, thus providing clear environmental benefits. Yields have been favourable and replication is occurring as well. A manual on sustainable mangrove oyster cultivation was produced.

99. In order to ensure that fishermen and decision makers support the regulatory changes, training, technical assistance, and exchanges were facilitated by the project, for example, on the use of GPS and nautical maps, and on minimum fish sizes. Fishermen also participated in workshops on the fishing alternatives promoted by the project.

Outcome 4: The declining sugar cane industry transitions into sustainable land use practices, with greatly reduced negative impacts on the coastal region of the SCE. This Outcome included the following Outputs:
Output 4.1: Land use planning/zoning for former sugar cane lands and facilities within the SCE, based on landscape level ecological and socio-economic assessments;
Output 4.2: Establish management and technical capacity for biodiversity friendly agricultural, livestock and forestry production on former sugar cane lands;
Output 4.3: Demonstrate pilot strategies for sustainable management of water buffalo on former sugar cane lands;
Output 4.4: Demonstrate pilot strategies for biodiversity friendly production on former sugar cane lands;
Output 4.5: Sustainable forest management of biodiversity-rich coastal forests within the SCE.

100. Planning/ zoning of land use was carried out for the four Basic Units of Cooperative Production

[7] Specifically, it is carrying out Productivity Susceptibility Analysis.

(UBPCs) participating in the project, as it relates to forestry and agricultural activities, based on databases, GIS information, and ecological studies (of soil types etc.) The project thus supported the development of plans at the level of the UBPCs for the geographic distribution of farm activities. Information on the native species to incorporate in their lands was also generated. Water and sediment quality was monitored in some sites and the impacts of different management practices on key resources (water, soil, vegetation) and on biodiversity were studied.

101. The project carried out extensive capacity building on BD-friendly agricultural, livestock, and forestry production and provided environmental advice, including for producers within the UBPCs, technicians/ professionals, and managers. This included workshops to facilitate information exchanges. The sustainable practices carried out at the pilot sites resulted in some increases in economic incentives for workers due primarily to increased productivity and production. For example, higher earnings at UBPCs stemmed from increases in buffalo and beef meat and milk production. Incomes for workers from forestry activities also benefitted from existing incentives related to high plant survival rates.

102. The pilot projects for sustainable management of water buffalo had very positive impacts. Animals that had been on the loose were captured and workers were trained on sustainable management practices. Various management practices were put in place, such as setting up fences, reforestation, installation of windmills, use of milking machines, and use of manure to produce ecological fertilizer. Delays in one of the pilot project sites linked to frequent staffing changes led to the decision to partner with the Centro de Investigación de Bioalimentos (CIBA) rather than with the UBPC in that particular area (in the municipality of Bolivia). The experience gained and documented on buffalo management (especially in the UBPC Yarual and Nela) contributed to the fact that CIBA, working together with producers, instructor, researchers from specialized centres and decision-makers from key organizations took on the responsibility of drafting and circulatinga proposed Cuban norm on the sustainable management of confined water buffalo in coastal zones. This proposal has already gone through several rounds of debate and is expected to be approved this year (2015), as it has been included within the National Standard Program for 2015- 2016. Approval would convert it into a mandatory national standard that would apply to all of the entities involved in buffalo livestock management that share these conditions in the country.

103. The pilot projects related to agriculture, livestock, and forestry activities on UBPCs (so-called integrated agricultural production models) involved activities such as the building of stables for small livestock, production of biogas, use of wind turbines, and establishment of silvopastoril systems. While this was described as a separate Output from buffalo management in the ProDoc, in actuality, UBPCs often combined buffalo raising with other agricultural, livestock and forestry activities. Project support included planning to designate zones for grazing, silvopastoril systems, forestry, and organic crops; promotion of good practices; provision of equipment and technology (computers, windmills, etc.); awareness raising, training and provision of teaching material. The pilot projects were favourably viewed by participants and communities, particularly because of the impacts they had felt from the closure of sugar plants.

104. Finally, the project led to the establishment of nurseries and the introduction of trays with in-built cells to increase production, reduce production costs, increase quality of plants, and improve working conditions. One issue to note with the cell technology is that is does not always provide enough space for larger native tree species seeds to grow. Also while the ProDoc specifically highlighted the use of native species, both native and fast growing exotic species were grown in the nurseries. Stakeholders indicated that this was due to the Cuban government's policy of establishing plantations with fast-growing species to meet the country's energy demands. However, as some of these species are actually invasive, there is a disconnect with the Invasive Alien Species strategy being developed through another UNDP/GEF project this issue needs to be given greater thought.

105. Both reforestation and natural forest management (management of natural regeneration) were carried out for the purposes of production on farm plantations and conservation of coastal forests. Research was carried out to identify the key coastal areas for reforestation and 114 species that are able to survive in the generally saline conditions were identified. Community members contributed their time to the actual planting . The project's main contribution was the introduction of native species for reforestation, and greater understanding on different native species that can be successfully grown (although exotic species were also used in the reforestation activities). Furthermore, the project led to a significant increase in forest coverage, enhancing connectivity and coastal protection. Targets established in forest management plans were met.

106. Economic valuation studies were carried out in the UBPC Nela of Yaguajay, in the UBPC Yarual of Bolivia and in the UBPC Guamuta de Matanzas. The practices promoted were found to be viable in the short or medium term depending on the practice. The pilot projects have increased the number of jobs in the area, provided more meat and milk for the community, and have resulted in environmental benefits, such as increased avian biodiversity. Stakeholders interviewed indicated that some cooperatives would have the resources for replication and others less so. AZCUBA itself has identified 123 cooperatives (AZCUBA, MINAGRI, individual) in which replication of stables for small livestock could occur. To support information exchange and replication, some material was produced, such as a documentary on buffalo production and flyers. Furthermore, with the approval of the national standard on sustainable buffalo management in coastal ecosystems, replication of these practices is expected to occur.

107. During project implementation, the national context changed as a result of the government decision to distribute land to individuals interested in agricultural production. As a result, the project decided to design a proposal of Biological Corridors in each province to ensure connectivity between PAs and different categories of land use. This exercise was carried out together with decision makers and forestry sector specialists.

Table 5: Level of Achievement of Project Objective and Outcomes based on Project Indicators

Description of Indicator	**Baseline Level**[8]	**Target Level at end of project**	**Level at 30 June 2014 (*Comments of PMU*)**[9]	**Terminal Evaluation Comments**
Objective**:** The fisheries, tourism and agriculture sectors in Sabana Camagüey adopt operational changes that enable biodiversity conservation.				
1. Key measurements of biological health of coral reefs, sea grass beds & mangroves within SCE stabilize or improve:				
1.1. Avg. coral cover of sea bottom	12%	0% decrease	The PMU did not consider it necessary to carry out the final assessment as planned for the following reasons: "*Significant changes in coral cover attributed to coral reef management actions are not expected. Significant change in coral cover could take place only due to eventual effects of natural events such as hurricanes or coral disease (including bleaching), but it is not the objective of this logframe assessment. The Coral Reef Volunteer Early Warning Monitoring Network (operated by the Project since 2003) reports biannually on the state of corals throughout the island coast. Their reports during this period revealed that there were no strong coral bleaching events in the SCE.* *It is therefore concluded that there should still be 0% decrease at the end of the project with regard to local human intervention (expected*	Coral cover assessment in 2011 found an average coral cover of 15.9%, above the baseline. In 2013, six sampling stations that had not been previously measured in 2011 were assessed and the average coral cover in the SCE was 11.7%, which was not considered significantly different from the baseline. Due to the ongoing work of the Coral Reef Volunteer Early Warning Monitoring Network which leads to the production of biannual reports on the state of corals; the fact that no changes were expected; and the relatively high cost of the expeditions, no further monitoring was carried out in 2014/2015. No further changes were expected in part because the coral reef cover was already relatively low and the main coral species present are the ones that are more resistant to changes in the environment, and in part because there were no hurricanes in this period nor high intensity

[8] The baseline data was determined in 2004/2005 during the project preparation phase.

[9] This column presents the information as presented by the PMU in the 2014 PIR. Some small edits to the English were made to the text by the evaluator.

			0% decrease)."	coral bleaching events. Based on the available data gathered by the project and by the Coral Reef Volunteer Monitoring Network, the target seems to have been achieved in terms of 0% decrease, however, comprehensive data from all sites was not gathered at project end. It is recommended that future ProDocs clarify from the outset the monitoring that will and will not be carried out by project end and how this monitoring will link with ongoing monitoring (in this case in terms of the Coral Reef Volunteer Early Warning Monitoring Network).
1.2. Total area of mangroves	1,627 km2	0% decrease	"*The Governmental decision [in terms of the moratorium on mangrove deforestation] is maintained. Sporadic monitoring has been carried out at the Project area. Loss of mangrove surface areas (illegal cutting) has not been in evidence during this PIR period."*	The government declared a moratorium on mangrove deforestation in 2010, in recognition of the important role of this ecosystem in coastal protection. As such, any cutting of mangroves is now illegal. In 2011, 150 stations and 20 sample plots were evaluated with satellite images and the total area of mangroves was found to be 1,6366 km2[10], exceeding the target slightly. By the Final Evaluation, the area of mangroves was 1,907.28 km^2 (in the cays and mainland), representing an increase of 280.28 km^2 in area. As such, the target was exceeded for this indicator.
1.3. Density of sea grass beds (shoots/m2)	548.8	0% decrease	"*The time lapse between the monitoring (August 2012) and the PIR date (June 2014) is too short to detect any change in sea grass beds as a result of the bottom trawling ban. Seagrass bed recovery take many years (up to decades, depending on different factors, climatic among*	The Project Management Unit indicated that this indicator was dependent on the assumption of a ban on bottom trawling at project outset (or before) but a full ban did not occur until 2012. Bottom trawling has had a very destructive impact on the density of

[10] The PIR did not report the figure for total mangrove area at the time, but this information was provided upon the request of the evaluator during the FE.

			them). Therefore as was proposed by MTE, and reported in the PIR for the 2011/2012 period, this indicator was removed from the logframe. It was not considered necessary to make a final assessment of the indicator (given that bottom trawling is forbidden, a 0% decrease is expected) *The project is reporting as a lesson learned, that in the marine environment, performance indicators should not include those for which biodiversity responses take a long time to be detected*."	seagrass beds in general and the recovery period for this ecosystem takes a significant amount of time, which is why the PMU decided not to carry out a final comprehensive assessment. The PMU had requested the elimination of this indicator from the logframe for these reasons, but it was decided not to submit this request officially to GEF Secretariat. It is expected that with the bottom trawling ban, the density of seagrass beds will increase over time. The density of seagrass beds was determined in specific areas under Outcome 3. North of Villa Clara province, sampling carried out in 2013 showed no significant difference in shoot density compared to the baseline. Data in Cayo Puto from 2013 indicated a 0% decrease compared to the baseline.
2. Key measurements of biological health of selected indicator fish species within SCE stabilize or improve:				
2.1. Average size of parrotfish	15.02 cm.	0% decrease	"*It was not considered necessary to measure this indicator because of the short time elapsed since the 2012-2013 assessment. No significant change in sizes was expected attributable to coral reef fishery management. Thanks to the full ban of bottom trawling by 2012 through Fishery Resolution 503, much greater survival of juvenile parrot fishes inhabiting neighbouring sea grass beds is expected to occur. Increase in size, however, is linked to increase in sea grass cover, therefore increases in size are not expected for several years. Given the short time pending, there should be close to 0% size decrease at the end of the project with regard to fishing*."	Data from 2011 specified that the average size was 12.2 cm, based on random sampling (a statistical analysis was not carried out). Data reported in the 2013 PIR for stations that remained unsampled in 2011 showed that at Cruz del Padre and La Vela cays, the average size of parrotfish was 13.0 cm (±7.1); the difference from the baseline was not deemed significant. Given the key policy change to prohibit bottom trawling, it is expected that parrotfish sizes will increase over time. Nevertheless, it would have been useful to have gathered data on all the indicators at project end as had been established in the Strategic Results Framework. In the future, it is recommended that all

				indicators be measured at project end, *even if* changes are not expected or the target is not expected to be met. if human or financial resources are limited, end-of-project monitoring is even more important than monitoring the indicators at midpoint, as it enables the final project impact to be determined.
2.2. Average size of snappers	19.02 cm	0% decrease	*It was not considered necessary to measure this indicator because of the short time elapsed since the 2012-2013 assessment. No significant change in sizes was expected attributable to coral reef fishery management. Thanks to the full ban of bottom trawling by 2012 through Fishery Resolution 503, much greater survival of juvenile snappers inhabiting neighbour sea grass beds is expected to occur. Given the short time pending, there should be almost 0% size decrease (due to bottom trawling ban) at the end of the project."*	Based on 2011 monitoring data, the average size of the snappers was 19.3 cm. Data reported in the 2013 PIR for stations that had not been sampled in 2011 showed that average snapper size was 18.8 (±7.8), which was not considered significantly different from the baseline. Given the key policy change with the prohibition of bottom trawling, it is expected that snapper sizes will increase over time.
2.3. Average size of groupers	19.61 cm	0% decrease	"*It was not considered necessary to measure this indicator because of the short time elapsed since the 2012-2013 assessment. No significant change in sizes was expected attributable to coral reef fishery management. Thanks to the full ban of bottom trawling by 2012 through Fishery Resolution 503, much greater survival of juvenile groupers inhabiting neighbour sea grass beds is expected to occur. Given the short time pending, there should be almost 0% size decrease (due to bottom trawling ban) at the end of the project."*	Based on 2011 monitoring data, the average size of the groupers was 26.4 cm, which was not considered significantly different from the baseline. Data reported in the 2013 PIR for stations that had not been sampled in 2011 showed that average grouper size was 22.5 (±7,7). Given the key policy change with the prohibition of bottom trawling, it is expected that grouper sizes will increase over time.
3. Area of seascape within SCE benefiting from biodiversity friendly management by productive sectors (sustainable fisheries)	0 km2	2,770 km2 (Target identified in 2005)	*3378 km2*	3510.05 km² The figure by the time of the Final Evaluation was 3510 km², which corresponds to the 3499 km² that received legal protection as fisheries reserves, the 11 km² of the high seas fisheries

				pilot project and the 0.05 km² corresponding to the sponge and oyster cultivation pilot projects. The target for seascape area benefitting from more biodiversity friendly management practices was therefore exceeded.
4. Area within SCE affected benefiting indirectly over the long term by changed productive sectors:				
4.1. Landscape	0 km2	22,800 km2	*15,721.94 km2. "This figure is the sum of 5, 124.2 km2 (forest, livestock and agriculture areas, plus the area of certified municipalities under ICM=10 597.74 km2. The decrease in area with respect to the last year is due to the fact that some state lands have been delivered to private producers to be used for agriculture purposes. The project is advocating for the inclusion of these lands within the ICM and biological corridors areas, which is an issue still being discussed.* *A proportion of the 2,863.2 hectares are forest areas planted with native species that were promoted by the Project."*	Significant progress was made by project end (15,722 km2) toward the target in terms of the area benefitting from changed productive sectors. The target was not fully reached due to the transfer of some lands that had been under ICM to private individuals for agricultural production, as per a change in state policy. While this factor was outside of the control of the project, the PMU took action to address this increased risk on the landscape by developing a proposal for biological corridors.
4.2. Seascape	0 km2	8, 311 km2	22 800 km2	The value of 22,800 km2 included in the 2014 PIR was an error. The actual total area of seascape benefitting both directly and indirectly from the project is **8,311 km**2. This corresponds to the project target which actually looked at the *total* area (rather than focusing only on the indirect area). Taking into consideration only the area benefitting indirectly, this area would be **4,801 km2** as a result of water exchange among water bodies (benefits from reduced land-based pollution and sedimentation); the passive transport of larvae and active transport of juveniles and

				adults of fish species (benefits from sustainable fishery practices); changes to the sector in other municipalities of the SCE; and replication.
Outcome 1: A strengthened enabling environment will exist for the financial, institutional, environmental and social sustainability of biodiversity conservation in the tourism, fisheries and agriculture / livestock sectors in the SCE.				
1. % of hotels in ecologically sensitive areas within the SCE that are built according to planning guidelines that have incorporated biodiversity conservation recommendations (developed during project by tourism sector).	0	0.75	*"100% of new hotels (2) were constructed according to the locations and rules established in the existing Master Plan. The Environmental Authority is consulted during the undertaking of this assessment in order to determine if these rules have been taken into account or not. As a part of this entity, the SCE Project is consulted too. Nevertheless, and independently of this, and even though recommendations about biodiversity conservation issues are provided, the equipment used to construct infrastructure works is obsolete and some biodiversity impacts occur."*	The two hotels built in Ciego de Ávila adhered to the Sustainable Tourism Master Plan guidelines in terms of location and rules. As mentioned in PIRs, due to the nature of the available construction equipment, there are still some negative impacts on BD.
2. Frequency of access to an Environmental Information System for the Sabana Camagüey Ecosystem (SIAESC) by key stakeholders, including:		Frequency of access to an Environmental Information System for the Sabana Camagüey Ecosystem (SIAESC) by key stakeholders, including:	*"The following figures refer to the access frequency in % of selected stakeholders in terms of using technical information about the SCE, which is available at Municipality Centers, provinces and national institutes that participate in the Project [...]The planned self-automation was not deemed viable due to the limited existing connectivity in the country's municipalities. To solve this problem large financial resources not available through the Project would be required. Such expenses could not be agreed or be paid by the Government as a priority"*	Project outputs (from all three UNDP/GEF projects) available at the municipal Capacity Building Centres serve as a vital source of information on the Sabana Camagüey ecosystem, project activities, achievements, and tools developed through the project. Many municipalities did not have an information repository before the project and much of the ecological and other studies carried out on the SCE have been done through the UNDP/GEF interventions. The percentages of use by the different stakeholders represent estimates.
2.1. SCE municipal authorities	0% usage	0.75	0.8 *"At the municipal level, use happens in the*	The target was achieved.

			Capacity Building Centers for Integrated Coastal Management. These entities are considered focal points for spreading environmental information. "	
2.2. State enterprises	0% usage	0.6	0,8 *"Users are now aware that the Project organized an Information database and Repository on SCE.*	The target was achieved as state enterprises access information on the project through the CBCs, national institutes such as AMA, IES and IDO, and through the internet/intranet system set up at the Institute of Tropical Geography.
2.3. CITMA, EIA licensing authorities	0% usage	0.9	0,9 *"Users are now aware that the Project organized an Information Repository on SCE.*	The target was achieved as CITMA and EIA licensing authorities access information on the project through the CBCs, national institutes such as AMA, IES and IDO, and through the internet/intranet system set up at the Institute of Tropical Geography
3. Financial sustainability of biodiversity mainstreaming activities:				
3.1. % of operating costs of ICMA derived from sector based resources/mechanisms	0	0.5	*"The situation is similar to that reported before (in Midterm Evaluation Report and PIR 2013). During this PIR period the SCE Project continued working on proposals [...] in support of the Commission that will ultimately approve the proposal. The Project Direction continues highlighting how the issue of institutional sustainability of ICMA will be guaranteed. "*	A proposal was initially developed to be considered by the Intergovernmental Commission on Natural Resources for the development of an Advisory Board for the SCE. but later it was decided to submit a proposal to the Minister of CITMA for the establishment of a wider Advisory Board for Prioritized Ecosystems, which includes SCE. Its functioning would be based on the experience gained in the intervention areas belonging to this ecosystem. This Board has not yet been established but the plan is to secure funding for it both from the environmental sector and from the productive sectors. At the level of the individual ZBRMICs that

				have been formally established, the operational costs of the local ICM boards are currently covered mainly by the government, including the provincial CITMA delegations.
3.2. Increase in sector budgets for actions related to environmental conservation in the SCE:				
3.2.1 Tourism Sector	$2,820,000	$4,075,000	*"In this PIR period, 12 275 000 USD were spent through Cuban State budget mechanisms. The tourist enterprises in charge of sanitation services collected around 21 800 m3 of waste. These wastes were classified for reuse. Some 119 000 m2 of beaches were cleaned and about 98 000 m2 of dune were rehabilitated. "*	The cumulative project total is 44,015,660**.** The target was therefore significantly exceeded. The expenditures were related to the maintenance of dunes, management of solid waste and recycling, tertiary treatment of liquid waste, beach cleaning, landscaping using native species, establishment of nurseries with native species, and national and provincial personnel dedicated to Outcome 2, among others.
3.2.2 Fisheries and Agriculture sectors	$456,700 and $3,959,770 respectively	$840,697 and $6,667,281 respectively	*"In this PIR period: $200,000 in the fisheries sector and 970 000 in the agriculture sector"*	The cumulative total investment over the course of the project is 2,359,700 for fisheries. This corresponds to the costs to ensure compliance in the area with fisheries regulations related to biodiversity conservation, actions related to the elimination of bottom trawling, and the salary of national personnel from the Centre for Fisheries Research who supported Outcome 3, and of provincial bodies that executed the pilot projects, among others. The cumulative total investment over the course of the project is 7,035,700 for the agricultural/ forestry sector. The targets were therefore exceeded. Expenditures included preparation of areas for agriculture, small and large livestock rearing, purchase of posts for live fences, contracts to organizations for the construction of

				revolcaderos in the buffalo UBPCs, maintenance and expansion of infrastructure in nurseries for forestry, and support for pilot projects, among others.
Outcome 2: The tourism sector develops in accordance with the conservation of marine and terrestrial ecosystems within the SCE.				
1. % of new hotels in ecologically sensitive areas within the SCE that are planned with specific guidelines for biodiversity conservation in the following categories:				
1.1. With liquid waste treatment systems (tertiary treatment plants)	0.5	1	100% (2 hotels)	As mentioned for the similar indicator at the Objective level, the two hotels adhered to the Master Plan guidelines on construction. New hotels proposed for construction in the Camagüey province have not yet been built so it is not yet clear whether they will be planned based on these specific guidelines for BD conservation.
1.2. Use of native vegetation in gardens and landscaping	0.59	1	*100% (2 hotels)* *"Existing hotels have established micronurseries within their premises with native plants (in the cays).*	Micronurseries have permitted the use of native plants in these two hotels and at other existing hotels. The project also developed a manual on best practices in ecological gardening.
2. Percentage of visitors to the SCE participating in nature related activities	0.05	0.1	*"12%. This figure increased significantly because of domestic tourism participation in Protected Areas (pilot sites). This increase happened mainly in the areas of La Redonda Lake and Jobo Rosado Protected Area"*	The target with regard to percentage of visitors to SCE participating in nature related activities was exceeded.
3. Increase in the percentage of tourist packages that offer alternative models to “sun and sand”	0	0.1	*0.08 (8%). There has been a slight increase in alternative tourist packages in this period, In addition there has been an increase in the number of participants in nature excursions, over all, domestic tourism.*	The project contributed to an increase in tourist packages offering alternative models, however, the traditional sand and sun model is still the main tourism model in Cuba. Ongoing promotion of alternatives is required. Progress was made with the target nearly but

				not fully met.
4. # of new roads built following biodiversity friendly construction guidelines in ecologically sensitive areas	0	1	*Like the last year, no new roads were constructed during this PIR period; only some internal access roads to the new hotels that were designed and built according to the established Cuban standards.* *The National Standard proposal on road design and construction proposed by the project, including specific parameters which consider ecosystem fragility, was approved by the Environmental Sector Standard Committee last year .* *In this PIR period, in agreement with the yearly plan, this proposal will be circulated to be discussed at the expert level (universities, sectors) at the end of the present year.*	New large hotel constructions have been proposed for the Camagüey province but the associated roads have not yet been built. The project developed a draft norm/ decree with specific guidelines on the construction of roadways in fragile ecosystems (small cays). This is norm is in being reviewed by stakeholders, with some ongoing discussion on the issue of road width for secondary roads. If/once approved, all new roads built in ecologically sensitive areas will have to take into consideration biodiversity-friendly construction guidelines.
5. Decrease in coral reef mortality from diving activity	Less than 10%	Stable	*The programmed final coral cover assessment was not considered necessary. Further significant changes in coral cover attributed to coral reef management were not expected, with respect to the figures reported in previous PIRs (the same dive charge capacity has been in use for the past several years).* *Thus, significant change in coral cover could take place due to eventual action of natural events such as hurricanes or coral disease (including bleaching), but it is not the objective of this logframe assessment. Furthermore, most of the remaining coral species are environmentally resistant ones (e.g. Siderastrea siderea., Porites astreoides, Millepora complanata). It is concluded that there should still be 0% decrease at the end of the project with regard to local human impact.*	The PMU indicated in previous PIRs since the ProDoc was signed that the correct formulation of the indicator should have been percentage of decrease in coral reef damage (rather than mortality) from diving activity. This is because measurement of mortality would have required complex and costly scientific investigations and would not reflect the specific impact of diving activity. This indicator was measured in 2010 and 2011. In 2010, the average percent of damaged corals was 2.6% of counted corals, with a minimum of 0% and a maximum of 5.2% in 11 diving points of two diving localities. In 2011, 2.97% of counted corals were damaged, with a minimum of 0% and a maximum of 7% in 23 diving points of four diving localities (these localities were not measured in 2010). Based on the reformulated indicator, the target was achieved.
6. Revenues from taxes and fees on	$0	$200,000/ye	*During this PIR period, the discussions and*	This indicator was considered quite ambitious

tourism activities invested in biodiversity conservation within the SCE		ar	*analysis with representative tour operators continued to advance, related to a possible financial mechanisms to be implemented to contribute to biodiversity conservation, based in a part on tour operators' incomes.*	in the Cuban context given the economic policies. While proposals were developed through the project, unfortunately, the target was not met with regard to revenues from taxes and fees being reinvested in BD conservation.
Outcome 3: Sustainable fisheries are practiced within the SCE so that fish populations and marine ecosystem functions are maintained and/or restored				
1. Number of persons deriving incomes at least equal to that previously earned in commercial fishing, from the following sustainable practices:				
1.1. Cultivation of sponges	0 fishermen	14 fishermen	*The motor for the second vessel is ready, and at the moment there are 15 fishermen engaged in this task, working on the sponge farm.* *Another sponge farm is being replicated given the good results of the one promoted by the project.*	The target number of people deriving income from sponge cultivation was exceeded with 15 fishermen. This is expected to continue to rise as a result of a third sponge farm that will likely be inaugurated in June 2015 in the municipality of Martí, province of Matanzas, and that would involve an additional 6 workers.
1.2. Oceanic fisheries	0 fishermen	22 fishermen	*"The three vessels of this task are actually working (24 persons). An increment in the catches of deep snappers and groupers, specifically silk snapper ("pargo del alto"), was observed."*	The target number of people deriving income from oceanic fisheries was exceeded with 24 fishermen.
1.3. Cultivation of mangroves oysters	0 fishermen	36 fishermen	*"After the incorporation of a vessel with a new motor, 24 persons are working on the cultivation of mangrove oysters."*	A total of 24 people are benefitting from the cultivation of mangrove oysters (representing 67% of target). Oyster production has decreased over the last years due to environmental factors, including the passage of hurricanes, and the damming of some rivers which increased salinity levels and reduced nutrients, leading to a reduction in the areas with potential for oyster production.
2. Number of hectares of seascape	0 hectares	90 000 hect	*349 858 ha*	The target was vastly exceeded. The total area

under legal protection and demarcated for fishery reserves (estimate based on UNESCO guidelines of 12% of total fishing area - to be confirmed during year 1 of the project)				of 349,858 ha represents the area demarcated as fishery reserves[11] during the project implementation period. This figure exceeds UNESCO guidelines of 12% of total fishing area demarcated as fishery reserves.
3. Number of incidents of illegal fish catches per unit effort of enforcement per year within the SCE decreases	19.8 incidents / inspector in 2004	40% decrease	*"The number of incidents has remained the same (5 incidents/inspector, 75%). From now on, the work of the fishery inspectors will be executed by the coastguard authorities."*	The target was significantly exceeded as the number of incidents per inspector was reduced by 75% compared to the baseline to an average of 5 incidents per inspector. It should be noted, though, that the number of inspectors increased significantly compared to the baseline.
4. % of fish captured by commercial fisherman in bottom trawl nets and set nets that are below the legal size limit is reduced				
4.1. Bottom trawl nets	0.65	0.1	*"Eradication of bottom trawlers has been completed in the entire country"*	This indicator regarding the percentage of fish below the legal size limit in bottom trawl nets is not applicable, as the use of such nets has been prohibited since 2012.
4.2. Set nets	0.47	0	*"Eradication of set nets has been completed in the entire country."*	The indicator regarding percentage of fish below the legal size limit in set nets is not applicable, as the use of such nets has been prohibited since 2008.
5. Stabilization of habitat and fish stock conditions after bottom trawling ban in north of Villa Clara Province:				
Health of seagrass beds (shoots/m2)	250	0% decrease	*"The programmed final sea grass bed shoot density assessment was not considered*	Sampling carried out in 2013 showed no significant difference in shoot density (average

[11] This includes Las Loras fishing reserve established in 2011 and a second fishery reserve that was established in 2012 in the province of Villa Clara where fishing is prohibited.

North of Villa Clara Province			*necessary because of the recent monitoring (In 2013). Significant changes in seagrass condition attributed to bottom trawling were not expected after the ban was implemented in 2012 through Fishery Resolution 503. Significant changes in sea grass shoot density could take place only due to eventual hurricanes, but it is not the objective of this log frame assessment. It is concluded that there should still be 0% decrease at the end of the project with regard to bottom trawling driven impact."*	= 213.7 shoots/m2). No final assessment was carried out in 2014/2015.
Health of seagrass beds (shoots/m2) Bahía de Nuevitas - Playa Bagá	350	0% decrease	*"This assessment area was decided to be removed in 2011 (because it is not currently a good fishing area due to both the effect of pollution coming from a river and that the bottom is predominantly softly muddy: see PIR-2013). Taking into account similar conditions in a nearby location (Cayo Puto) and the fact that baseline data was in the same magnitude as Playa Bagá, it was proposed to include this site as an alternative .* *According to this new baseline, there was 0% decrease in 2013.* *It is not considered necessary to make a final assessment in 2014 after such a short time span, and we take 2013 (in "Cayo Puto") as the end point indicator (0% decrease)."*	Data gathered in 2013 on an alternative site Cayo Puto indicated a 0% decrease in the health of seagrass beds. This was deemed to be the final assessment in 2013 due to the length of time to perceive changes in seagrass beds.
Increase in fish biomass (grams/m2) Nazabal region	0.57	0% decrease	*"The assessment of this area was cancelled due to reasons explained "*	This area was removed from the analysis because it was determined that it did not represent a good fishing area as a result of the pollution from the river and the fact that the bottom is predominantly soft mud.
Increase in fish biomass (grams/m2) Caibarién Zone	1.06	0% decrease	*"The original aim of this indicator was to assess the biomass of fish populations to show the effectiveness of the ban of bottom trawling (chinchorros). Given that "chinchorros" were effectively eliminated only on 2012, detectable*	Data from 2011 indicated that there was a decrease in fish biomass at 11 stations to 0.54 grams/m2, which was likely due to overfishing and to the activities of five bottom trawlers at that time. Further assessments were not made.

			changes in fish communities are not expected to occur in such a short time. *As it is known, degraded sea grass bed recovery is too slow, the same that happens with depleted fish biomass recovery, which depends on the recovery of seagrasss beds. For that reason, it was decided not to spend resources to assess changes induced by the ban of bottom trawling, the outcomes of which will very probably not be perceptible, and assessment objective will not be achieved either. Seagrass bed recovery could take up to decades."*	The PMU has indicated that the indicator was dependent on the assumption of the ban on bottom trawling being enforced earlier than 2012 to enable the seagrass beds to recover. However, indicators should be selected to measure project impact rather than to measure the impacts of an external policy, in this case, the ban on bottom trawling.
Increase in fish biomass (grams/m2) Puerto de Sagua	0.68	0% decrease	*"The original aim of this indicator was to assess the biomass of fish populations to show the effectiveness of the ban of bottom trawling (chinchorros). Given that "chinchorros" were effectively eliminated only on 2012, detectable changes in fish communities are not expected to occur in such a short time.* *As it is known, degraded seagrass beds recovery is too slow, the same what happens with depleted fish biomass recovery, which depends on the recovery of seagrass beds. For that reason, it was decided not to spend resources to assess changes induced by the ban of bottom trawling, the outcomes of which will very probably not be perceptible, and the assessment objective will not be achieved either. Seagrass bed recovery could take up to decades".*	No assessments were made of this indicator. In 2011, the PMU reported that there was still a bottom trawler operating in the area. This was eliminated in 2012 but the PMU indicated that it would take time to perceive recovery. Despite this reasoning, this evaluation considers that the indicator should still have been monitored, as the monitoring of indicators in the SRF constitutes an essential element of the M&E Plan.
Outcome 4: The sugar cane industry transitions into sustainable land use practices, with greatly reduced negative impacts on the coastal region of the SCE				
1. No. of hectares within the SCE formerly dedicated to sugar cane production now under biodiversity friendly agriculture, livestock and/or forestry management in pilot projects (demonstration and				

replication sites)				
1.1. Guamuta Cooperative Farm – Sergio Gonzalez Enterprise (demonstration site)				
1.1.1. Protected Forest	0 hectares	145 hectares	*111.2 hect* *"In the case of Guamuta demonstrative site, the total of hectares achieved in this PIR period (1492.2 hectares) is higher than the total compared to the total of target hectares planned (1023 hectares). This is because of plans for specific land uses (livestock area, various crops) were modified during project life. The total sum is a higher value than the target."*	The target in terms of protected forest was not quite reached, though progress was made with 111 ha.
1.1.2. Plantation Forest (native and exotic species)	8.3 hectares	578 hectares	*551 hect*	The target in terms of area of plantation forest planted was almost reached with 551 ha, using both native and exotic species. It would have been useful to track the area of each to determine how much of the forest was planted with native species.
Fruit trees	3.1 hectares	67 hectares	*150 hect*	The target for area under fruit trees was exceeded at this demonstration site.
1.1.3. Various Crops	9.4 hectares	91 hectares	*30 hect*	There was less area used for crop production than planned by project end. This was due to the decision that crop production would not achieve the greatest impact on biodiversity in this area that is associated with migratory of birds.
1.1.4. Livestock area	0 hectares	142 hectares	*650 hect*	The livestock area exceeded the project target significantly, as a result of a reduction in the area devoted to various crops (a decision made by the sector)..
1.2. Montelucas Cooperative Farm (Unidad Proletaria Enterprise) (replication site)				

1.2.1. Forest (natural and plantation)	4.0 hectares	300 hectares	*220 hect*	Progress was made in terms of natural and plantation forest though the target was not fully met. It would have been useful to track the area planted with native versus exotic species.
1.2.2. Fruit trees	1.0 hectares	50 hectares	*26 hect*	The target under fruit trees was not reached.
1.2.3. Various Crops	16.6 hectares	80 hectares	*19 hect*	The target for area with crops was not reached.
1.2.4. Livestock area	844.2 hectares	1,605 hect	*"756 hectares (This figure includes the 756 hectares in this PIR period. In the total of items there was a decrease from 2230 to 1021 hectares (46%) in this period. This is due to delivered lands to be used for sheep and goats rising, for a small amount devoted to sugar cane, and varied crop cultures. These changes in land use do not affect biodiversity conservation."*	The target for livestock area was not reached. |It should be noted that in Montelucas Cooperative Farm, some lands were transferred to other uses, such as sugar cane production, as well as sheep and goat production with sustainable production methods.
2. Area of sustainable, biodiversity-friendly management of livestock (buffalo):				
2.1. La Magdalena Cooperative Farm (Aracelio Iglesias Enterprise) (demonstration site)	0 hectares	1520 hect	*4920 hect* *"This value is higher than the total planned target."*	The area under sustainable buffalo management significantly exceeded the project target.
2.2.Yarual Cooperative Farm (Bolivia Enterprise) (replication site)	0 hectares	1220 hectares	*2000 hect* *"This value is higher than the total planned target."*	The area under sustainable buffalo management significantly exceeded the project target.
3. Number of local inhabitants benefiting directly from sustainable livelihoods in biodiversity friendly agriculture, forestry, or livestock raising at the pilot sites				
3a. Guamuta Cooperative Farm	0 persons	552 persons	*380 persons*	Target number of beneficiaries at Guamuta Cooperative Farm was not fully met. Many people decided to exploit the land as

				independent users (usufruct).
3b. Monte Lucas Cooperative Farm	0 persons	596 persons	*420 pers*	Target number of beneficiaries at Monte Lucas Cooperative Farm was not fully met. Many individuals decided to exploit the land as independent users.
3c. La Magdalena Cooperative Farm	0 persons	24 persons	*1500 persons (Elevation of the figure with respect to PIR 2013 is a result of a detailed revision in all demonstrative sites. A total of 375 families live in this Cooperative Farm and through the use of these sustainable practices, a total of 1500 persons are directly benefiting.*	Target number of beneficiaries at La Magdalena Cooperative Farm was greatly exceeded.
3d. Yarual Cooperative Farm	0 persons	24 persons	*82 persons*	Target number of beneficiaries at Yarual Cooperative Farm was significantly exceeded. When assessing the total number of beneficiaries at the four cooperative farms, the cumulative total exceeds the sum of the project targets.
4. Number of persons employed on all reconverted sugar lands within SCE benefiting indirectly from demonstration of sustainable livelihoods opportunities for these lands	0 persons	14000 pers	*7700 persons*	The target was not met in terms of indirect beneficiaries of demonstration of sustainable livelihoods. The target was believed to be very ambitious. Furthermore, some idle lands were transferred to individuals for agricultural use. Nevertheless, the number of indirect beneficiaries is still high at 7700 people.
5. Area of natural coastal forest protecting coastal and marine biodiversity:				
a)Chambas Municipality (Ciego de Avila province)	1246 hectares	2 246 hect	*1750 hect (609 ha native species)*	The target for the municipality of Chambas was not reached.
b. Bolivia Municipality (Ciego de Avila province)	2000 hectares	3959 hect	*2945 hect (234 ha native species)*	The target for the municipality of Bolivia was not reached.
c. Moron Municipality (Ciego de Avila province)	4000 hectares	4300 hect	*4616 hect (460.2 ha native species)*	The target for Moron Municipality was exceeded.

d. Minas Municipality (Camagüey Province)	8000 hectares	8500 hect per year	*8948 hect (1560 ha native species)*	The target was reached at Minas.
e. Marti Municipality (Matanzas Province) (replication site)	21075 hect	23441 hect	*23550 hect (Information not available on native species)*	The target for the municipality of Marti was reached.
6. Decrease in organic contaminant loads, measured in Nitrogen (NT), Potassium (PT), and Biological Oxygen Demand (DBOsed), from converted sugar cane lands to inshore marine areas and reef areas				
W Bahía de Cárdenas:	NT=34.65 micromol/L, PT=0.31 micromol/L, BODsed=3.65 mg/g (Please note that the baseline had erroneously been reported as the BOD of the water, not of the sediment with a value of 1.57 mg/L)	Stable or less than baseline level:	*Changes related to management actions were not expected to occur during this PIR period and in the remaining short time of the project. However, changes could take place associated to variability of rainfall intensity or the occurrence of extreme meteorological events. Impacts of anthropogenic origin (e.g., land based pollution) are not expected either. In the case of the eventual occurrence of significant stressors, the relevant institution with the technical support of the project would take the relevant actions to avoid major impacts on coastal ecosystems. Extreme climatic events did not occur since the 2013 assessment.* *In the present time we have learnt and consider that such very high intra-annual variability of water/sediment quality indicators is not appropriate for assessing project performance at an inter-annual scale if the purpose is to assess changes associated to management actions.* *For that reason, it was not considered necessary to plan a final term assessment after such a short time. We also consider that conditions are still close to stable (with its intrinsic variability) compared to the baseline.*	2013 data: NT= 60.84 micromol/L, PT= 0.64 micromol/L, BODsed = 4.82mg/g The PMU indicated that the values may have been negatively impacted by a very rainy season, whereas the baseline was gathered in a dry season. It is important in the future to ensure that indicators are measured under the same conditions as the baseline to permit comparison.

W Bahía de Santa Clara:	NT = 27.29 micromol/L, PT=0.40 micromol/L, BOD sediment = 3.4 mg/g (Please note that the baseline had erroneusly bee nreported as the BOD of the water, not of the sediment with a value of 2.31 mg/L)	Stable or less than baseline level	*Changes related to management actions were not expected to occur during this PIR period and in the remaining short time of the project. However, changes could take place associated to variability of rainfall intensity or the occurrence of extreme meteorological events. Impacts of anthropogenic origin (e.g., land based pollution) are not expected either. In the case of the eventual occurrence of significant stressors, the relevant institution with the technical support of the project would take the relevant actions to avoid major impacts on coastal ecosystems. Extreme climatic events did not occur since the 2013 assessment.* *In the present time we have learnt and consider that such very high intra-annual variability of water/sediment quality indicators is not appropriate for assessing project performance at an inter-annual scale if the purpose is to assess changes associated to management actions.* *For that reason, it was not considered necessary to plan a final term assessment after such a short time. We also consider that conditions are still close to stable (with its intrinsic variability) compared to the baseline.*	2013 data: NT= 25.03 micromol/L, PT= 0.47 micromol/L, BODsed = 4.35mg/g NT and PT were stable compared to the baseline, while BODsed increased somewhat. The PMU indicated that this may have been due to the fact that the measurement was made during the rainy season. As mentioned for the previous indicator, it is important to measure indicators under the same climatological conditions as the baseline to facilitate comparison.
Ensenada de Carbó (Bahía Buenavista):	NT=175.41 micromol/L, PT=5.00 micromol/L, BODsed=4.05 mg/g (Please note that the baseline had erroneusly bee nreported as the BOD	Stable or less than baseline level	*Changes related to management actions were not expected to occur during this PIR period and in the remaining short time of the project. However, changes could take place associated to variability of rainfall intensity or the occurrence of extreme meteorological events. Impacts of anthropogenic origin (e.g., land based pollution) are not expected either. In the case of the eventual occurrence of significant stressors, the relevant institution with the technical support of the project would take the relevant actions to avoid major impacts on*	2012 data: NT=76.15 micromol/L, PT=0.33 micromol/L, BOD (sediment) = 3.47mg/g Although the PMU has explained why further assessments after 2012 were not carried out because of the assumption of no further changes, this evaluation considers that end-of-project monitoring should have been carried out to provide quantitative figures to back up

	of the water, not of the sediment with a value of 5.58 mg/L)		*coastal ecosystems. Extreme climatic events did not occur since the 2013 assessment.* *In the present time we have learnt and consider that such very high intra-annual variability of water/sediment quality indicators is not appropriate for assessing project performance at an inter-annual scale if the purpose is to assess changes associated to management actions.* *For that reason, it was not considered necessary to plan a final term assessment after such a short time. We also consider that conditions are still close to stable (with its intrinsic variability) compared to the baseline.*	these assumptions (the sample applies to the following indicator).
Cerca del Río Máximo	NT=15.52 micromol/L, PT=0.88 micromol/L, BODsed=2.80 mg/g (Please note that the baseline had erroneusly bee nreported as the BOD of the water, not of the sediment with a value of 1.97 mg/L)	Stable or less than baseline level	*Changes related to management actions were not expected to occur during this PIR period and in the remaining short time of the project. However, changes could take place associated to variability of rainfall intensity or the occurrence of extreme meteorological events. Impacts of anthropogenic origin (e.g., land based pollution) are not expected either. In the case of the eventual occurrence of significant stressors,, the relevant institution with the technical support of the project would take the relevant actions to avoid major impacts on coastal ecosystems. Extreme climatic events did not occur since the 2013 assessment.* *In the present time we have learnt and consider that such very high intra-annual variability of water/sediment quality indicators is not appropriate for assessing project performance at an inter-annual scale if the purpose is to assess changes associated to management actions.* *For that reason, it was not considered necessary to plan a final term assessment after such a short time. We also consider that*	2012 data: NT=25.29 micromol/L, PT=0.82 micromol/L BOD sediment= 2.95 mg/g NT increased, PT was stable, BOD increased. It is believed that the increase in NT and BOD was due to the fact that the measurements were taken in a rainy season after a long dry season, and as such there was sediment discharge as well as a breakdown of the organic material that had accumulated on the ocean floor.

			conditions are still close to stable (with its intrinsic variability) compared to the baseline.	

5.5 Efficiency

108. The project is considered to have used GEF funds very efficiently. The salaries of the Project Management Unit, including national and provincial project coordinators, technical coordinators of Outcomes 2-4 and project advisors, were all covered by co-financing, as is always the case for projects in Cuba. This freed up more funding for project activities. In addition to the government support for project personnel costs, there was substantial co-financing in terms of the provision of venues for the Capacity Building Centres, electricity costs, and various pilot projects expenses, among others. Other donors, such as WWF Canada and Ecodesarrollo, also contributed resources to the project. The final co-financing amount significantly exceeded the amount committed in the ProDoc.

109. High levels of participation of different institutions, research centres and productive enterprises greatly increased the scope of what the project could achieve with the given funds (see Partnerships section). Moreover, the project created synergies with other projects to jointly carry out various project activities and to maximize impacts. For example, the training of tour operators on nature tourism was carried out in conjunction with the UNDP/GEF Southern Archipelagos project to share costs. The project also liaised with the UNDP/GEF Small Grants Program, resulting in support for an additional sponge farm. Another example of efficiency since 2010 is the fact that annual meetings of the Project Management Unit, including national coordinators, provincial coordinators and sectoral coordinators, were held in conjunction with meetings of the experts associated with the Capacity Building Centres/ ICM.

5.6 Country Ownership and Relevance

110. Stakeholders interviewed concurred that the project was highly relevant. As pressures on the natural resources of the Sabana Camagüey ecosystem from tourism, agriculture, and fisheries increase, the need to ensure greater sustainability becomes increasingly recognized. In addition, sectors such as fisheries and nature tourism depend directly on the biodiversity present in the SCE.

111. The government has shown strong ownership of the project. The project Outcomes related to tourism, fisheries and agriculture were the responsibility of the Ministries representing these key sectors, which served to enhance their involvement in the initiative and dissemination of the results. Generally, there were very high levels of participation of stakeholders at national, provincial and local levels and from various institutes, which signaled substantial support for the project's objectives. As described in detail in the co-financing section, government co-financing exceeded original projections significantly.

112. One key indication of country ownership of the project is the incorporation of numerous issues tackled by the project into national policies as well as various proposed new norms. These include:
- approval of Resolution on the declaration of Zones Under Integrated Coastal Management (ZBRMICs)
- approval of seven Zones under Regime of Integrated Coastal Management (ZBRMICs) in the Sabana Camagüey ecosystem;
- approval of nine environmental planning exercises in municipalities;
- development of proposed Cuban norm on sustainable management of confined buffalo in coastal zones, which is in an advanced stage of discussion within the parliamentary system;
- drafting of proposed norm on the sustainable construction of roadways in fragile ecosystems (small cays), also pending approval; and
- proposed resolution modifying existing ICM resolution to integrate an ICM Advisory Board, taking into consideration the increasing number of ZBRMICs in important ecosystems of the country.

113. The project is also contributing to the development and use of new sectoral guidelines and plans, such as the manuals of best practices for hotels and for ecological gardening in the tourism sector and a system of indicators of tourism sustainability that takes into account biodiversity. In the fisheries sector, a Strategy for the Development of Aquaculture is being put forth by the Fisheries Department of the Ministry of Food Industry, which incorporates project experiences in sponge and oyster cultivation.

114. Further political support is still required to continue progress on the issue of financial sustainability and to put in place national policies to increase the financial resources available for integrating BD considerations in key sectors. In addition in some cases, there are opportunities to enhance government support for specific activities initiated with the project. For example, for the sustainable tourism project in Rio Máximo Wildlife Refuge, which was a replication of the originally proposed pilots, the state-owned company responsible for managing the protected area (National Enterprise for the Protection of Flora and Fauna) has not yet provided co-financing to complete the tourism infrastructure developed with project, although they have signaled their commitment to do so (they indicated that they have the budget and material resources to do so in 2015).

5.7 Mainstreaming of UNDP Priorities

115. The Sabana Camagüey project successfully mainstreamed key UNDP priorities, notably poverty reduction, disaster reduction, gender equity, and South-South cooperation. The project also contributed to UNDP Cuba's strategic priorities.

Poverty reduction

116. The pilot projects carried out under Outcomes 2-4 for the tourism, fisheries and agricultural sectors, respectively, were designed to provide new models of sustainable livelihoods. With regard to agriculture, the project design focused strategically on providing alternatives to farmers who lost their employment when there was a significant reduction in national sugar cane production and the closure of several sugar cane plants. This involved promoting sustainable agriculture, including small-animal husbandry, buffalo rearing and forestry. These pilots were associated with increased incomes and food availability for communities (milk, meat). The pilot projects in the fisheries sector also came at an opportune moment, in light of the declines in coastal fishery catches and the government prohibition of bottom trawling in 2012. The project promoted oyster cultivation, sponge cultivation and high seas fishing through pilot projects and their replication. The oceanic fisheries pilot projects led to increased quality and quantity of fish of high commercial value and better prices. Between 2008 and 2013, the catch of silk snapper increased from 2 metric tonnes to 16 metric tonnes, with the technological improvements introduced by the project. Sponge cultivation was found to be profitable and sales to a French buyer were high; for example, USD 21,000 in sales were made for the fishing cooperative. Oyster cultivation was also financially viable for participants. Besides the income obtained from aquaculture, the greater distribution of revenues over time represents another benefit. For example, oysters can be harvested from the oyster farm when there are wild oyster harvesting bans in place. Both oyster and sponge cultivation were traditional practices that had been lost but were revitalized with these pilot projects. Finally, in terms of tourism, project funding led to the development/ strengthening of nature tourism products, which could increase incomes for locals living near protected areas, particularly when the associated services are privately run, as is planned to be the case with the kayaking pilot project.

117. Economic valuation studies were carried out to determine the costs and benefits of the different productive alternatives promoted by the project. Most were found to be economically feasible in the short or medium term. Initial investments were required for many of these alternatives, which were usually

recovered quickly (e.g., in terms of animal husbandry).

Gender

118. The project coordination at the national and provincial levels and the Capacity Building Centres were led by a significant proportion of women, reflecting the overall high participation of women in the Cuban professional workforce. For example, both the Project Director and Project General Administrator are female and 19 of the 22 Capacity Building Centres are directed by women.

119. A number of the pilot projects with key productive sectors provided benefits to women. Notably, several nurseries were set up for reforestation, using the technology of trays with built-in cells (*tubetes)*. Interviews carried out during the Final Evaluation with female workers indicated that this technology greatly improved their working conditions, as they no longer needed to work on the ground. Women also participated in important numbers in the oyster and sponge cultivation pilot projects. On the Basic Units of Cooperative Production where biodigestors were established, working conditions for women were improved through the use of gas stoves, reducing the need to cook with fuelwood. Environmental education in some communities participating in the project highlighted the importance of reusing materials, which led to some initiatives by women to craft dolls and other products.

Disaster risk reduction and climate change

120. The project took into consideration disaster risk reduction and climate change and their linkages with ICM and biodiversity conservation in several ways. The Integrated Coastal Management Programs developed at the municipal level include actions to reduce vulnerability and adapt to climate change. Moreover, the environmental plans incorporated climate change forecasts as one of the layers in the analysis. There are numerous examples of activities promoted by the project in cooperation with key productive sectors that address climate change, such as:

- Building of pathways on dune systems to help conserve these ecosystems, which protect coastlines from coastal hazards, such as erosion and flooding, and from the effects of climate change, such as increasing sea levels (together with Ministry of Tourism);
- Use of native plants in hotel establishments because these require less watering and therefore represent an adaptive measure under conditions of water scarcity (with Ministry of Tourism);
- Reforestation of coastal forests to help protect coastlines from extreme weather events and help mitigate climate change (with the Ministry of Agriculture), including planting of mangroves in one specific area of the municipality of Bolivia;
- Support for Coral Reef Early Warning Voluntary Monitoring Network, to monitor coral bleaching, which is associated with climate change;
- Construction of stables for small livestock, such as goats, which reduces mortality during drought conditions (together with AZCUBA and the Ministry of Agriculture).

121. To highlight project actions and achievements in this respect, the final publication of the project includes a chapter on biodiversity and climate change.

South-South cooperation

122. There were various occasions of South-South cooperation and information sharing. For example, representatives of five municipalities in the SCE presented their experiences of ICM at the municipal level at the World Congress on Ocean Science (COLACMAR) in September, 2013. Also in 2013, the project presented information on the participation of local communities in aspects related to the

Convention on Biological Diversity (CBD) at the Eighth Meeting of the Working Group of Article 8j at the Secretariat of CBD Headquarters in Montreal, Canada. Project achievements were also shared at the VIII Congress of Protected Areas held in Havana in 2013.

Contribution to UNDP Country Program

123. The project is consistent with the agreed priorities outlined in the UNDP Country Programme Document (CPD) and the Country Program Action Plans (CPAPs) for 2008-2012 (which was extended to include 2013) and 2014-2018. One of the key themes of the 2008-2012 CPD is Environment and Energy for Sustainable Development and one of the expected results is the promotion of strategies for the conservation and sustainable use of biodiversity in protected ecosystems and productive sectors. One of the thematic areas of the 2014-2018 CPD includes Environmental Sustainability and Disaster Risk Management. Accordingly, UNDP Cuba will work toward integrating environmental considerations and risk reduction with economic development and the integrated management of ecosystems to strengthen resilience to the impacts of climate change, in the context of Cuba's environmental strategy.

5.8 Sustainability

Institutional and governance framework sustainability (Likely)

124. The project succeeded in significantly strengthening the institutional and governance framework for Integrated Coastal Management and in increasing the ability of key productive sectors to integrate BD considerations. The following paragraphs will highlight key achievements in this respect, which have also been described in detail in the Results section. Extensive capacity building was carried out throughout the project (as well as in the first two projects implemented in the ecosystem), leading to greater abilities among key institutions and sectors to implement sustainable productive practices and to manage impacts. It is important to mention that 20 Capacity Building Centres were established and equipped through the project, and two others were established outside of the SCE. Based on interviews with stakeholders, these will continue to be used as venues for capacity building in the future. In addition, the issues of ICM and sustainable production were integrated into the curricula of learning institutes, such as the University of Matanzas and the Costatenas Group (in the case of ICM) and the System of Schools for the Development of Tourism Capacity in the entire country(sustainable tourism).

125. The project initiative led to a Resolution in 2009 on the requirements and procedures for the Declaration of Zones under Integrated Coastal Management (ZBRMIC). In addition, with project support, proposals for three important policies were developed, including for the sustainable management of confined buffalo in coastal zones and for the sustainable construction of roadways in small cays. Work is also being carried out to update the resolution on the Declaration of ZBRMICs in order to include an article for the creation of an ICM Advisory Board. A total of seven ICM Programs were developed and formally approved, covering 16 municipalities, complemented by two-year ICM plans, which set out clear responsibilities. Local ICM Boards were established for each of these programs to monitor implementation of the Programs. CITMA representatives at the municipal level provide oversight in terms of compliance with the Programs. The project also resulted in nine municipalities carrying out environmental planning for the first time, using and validating a methodology that was developed through the project by the Institute of Tropical Geography . This is starting to be applied elsewhere in Cuba through the Institute of Physical Planning. These environmental plans are integrated and complement the existing land use plans.

126. A manual of best practices for hotels was developed, which was disseminated to hotels in the area, as well as a manual on ecological gardening to promote greater use of native plant species by hotels. There is ongoing work to review proposed indicators of sustainable tourism outside of protected areas, which if approved, would apply to the entire country and would be mandatory. With regard to fisheries, a manual on fishing gear was developed by the Centre of Fisheries Research, however, this does not include specific text on biodiversity apart from one mention in the introduction. While further work to strengthen the policy framework, particularly within key sectors, is still required, the project impacts in this respect are considered sustainable. Moreover, existing accountability systems are believed to be effective in terms of assuring the sustainability of these impacts.

Socio-political sustainability(Likely)

127. There are no significant socio-political risks to project sustainability. Recent decisions by the government demonstrate commitment to protecting Cuba's natural resources; in this respect it is worth highlighting the 2012 prohibition of trawling throughout the country, the 2008 national prohibition of set nets, as well as the moratorium on mangrove deforestation. In addition, during the project implementation period, a resolution on Integrated Coastal Management was approved in 2009 that outlines the requirements and procedures for the declaration of ZBRMICs. The government committed substantial co-financing to the project and provided the physical venues for the Capacity Building Centres as well as staffing and other costs, such as electricity and maintenance of infrastructure.

128. The project succeeded in increasing awareness levels and attitudes among governments, communities and sectoral interests on the values of the Sabana Camagüey ecosystem and on sustainable productive practices that reduce threats to BD. Environmental education at the local level was also integrated into the project, enhancing social support for conservation and sustainable livelihoods. This work, particularly with sectors and communities, needs to be ongoing to ensure that BD conservation remains a priority, as pressures on the ecosystems and natural resources of the archipelago are expected to increase in the future, particularly in light of the changing relations with the USA. Livelihood needs can threaten biodiversity, which is why the pilot projects put in place through the project are so relevant and require further replication.

Financial sustainability (Likely)

129. The project dedicated significant efforts to the issue of financial sustainability. This contributed to the fact that the key sectors now invest greater resources in sustainable activities (this was one of the indicators in the project SRF and the target was surpassed). Incomes have also increased from implementation of the sustainable productive activities introduced through the pilot projects. For example, strengthened buffalo management has substantially increased revenues for agricultural cooperatives through sales of milk and meat (as well providing food for the workers' consumption); both the high sea fishing and the sponge cultivation have been successfully marketing the products; and forestry workers received additional bonuses as a result of high plant survival rates. These positive economic impacts mean that stakeholders have a vested interest to continue to implement the practices.

130. Through the project, economic valuation studies were carried out on pilot projects to analyze incomes, expenses, and other factors, which was the first time such studies were carried out in the Cuban context. The results showed that many of the activities are feasible in the short or medium term. There are some initial investments required but in many cases these are low (such as in sponge and oyster cultivation) and/or recovered quickly. It should be noted that not all the benefits of the pilot projects were quantified; for example, with the sustainable buffalo production, the value of reduced soil compaction and thus decreased land degradation were not included in the analysis, suggesting that the benefits of such

practices are even higher if all ecosystem services are taken into account. The economic analyses carried out provide information that will help Cuba with the future development of economic instruments. To expand on this work on financial sustainability, Cuba plans to submit a project in GEF-6 focused on economic valuation of ecosystem services.

131. The formal approval of Integrated Coastal Management programs in many municipalities means that annual municipal plans need to incorporate activities to implement the programs and that the programs will have an associated budget. In addition, stakeholders are actively seeking funding through other projects, both at the national and international levels, to support implementation of ICM actions and sustainable productive activities. A number of recent developments in Cuba in terms of economic policy strengthen the financial sustainability of project impacts. Many municipalities will now have access to funds to manage themselves, as a result of the decision in 2013 that 1% of incomes from municipal-level companies will revert back to them. Other sources of funding include money for communities from the Fund for Local Development, funds from FONADEF for reforestation, and from the National Environmental Fund for projects addressing environmental problems. In addition, agricultural cooperatives are no longer state-owned they can therefore manage their own financial resources and can request credit from banks.

132. On the other hand, it must be mentioned that financial resources are limited for activities such as promotion of sustainable productive activities, national workshops, fisheries research, surveillance and biodiversity monitoring (especially in marine areas where the costs of vessels and fuel are higher). As a result, it is likely that there will be somewhat of a reduction in the scale of activities carried out with the project, although the evaluators consider that all of the main activities initiated by the project will continue to be carried out after the project. As an example of funding limitations, the evaluation team learned firsthand of the limited resources available for the management of the Rio Máximo wildlife refuge and promotion of nature tourism there, despite its potential to be a significant tourism attraction as the largest flamingo nesting site in the Caribbean. The funds that come in from tourists here and elsewhere generally do not revert back to the protected areas to increase sustainability. It is also a reality in Cuba that there is little money available to provide maintenance to equipment and to purchase new equipment and supplies should they be needed, since it is difficult for state institutions to import goods. Developers of proposed new hotels in the cays of Camagüey province have indicated that they do not have all the equipment to implement best construction practices to reduce BD impacts. Continued efforts to identify the necessary funds for financial sustainability will therefore be very important.

Environmental sustainability (Likely)

133. The Sabana Camagüey ecosystem is highly vulnerable to extreme events and to climate change. Hurricanes pass by the Northern coast of Cuba and their frequency is expected to increase under climate change. Climate change scenarios also predict significant rises in sea levels. Impacts are already being felt, with increase in coral bleaching events, for example. As a result, ecosystems such as coral reefs, mangroves and seagrass beds are at risk. However, the project took important steps to reduce vulnerability and promote adaptation through environmental planning, which was carried out in nine municipalities and which took into consideration climate change scenarios. In addition, the Integrated Coastal Management Programs for 16 municipalities in the SCE incorporate actions to adapt to climate change (please see Mainstreaming disaster risk reduction and climate change section for more details).

5.9 Global Environmental Benefits/ Impacts

134. The project contributed to key impacts in terms of stress reduction and the creation of an enabling environment that favours BD conservation, which is expected to lead to global environmental benefits. In particular, fisheries data gathered through the project supported the introduction of a government policy to prohibit bottom trawling nationwide in 2012, which will have huge benefits for seagrass beds and the sustainability of the fish populations at an ecosystem scale. Project activities also led to greater awareness among key sectors on how to integrate biodiversity conservation into their productive activities; it contributed to increased sectorial investments in BD mainstreaming; and it produced tools such as best practice manuals that are expected to increase adoption of sustainable productive practices. As highlighted in the sustainability section, there are no substantive risks to the permanence of project impacts, but further follow-up on the development of financial mechanisms for BD mainstreaming and for upscaling of pilot project activities in particular will be important.

135. The project logical framework included several indicators of ecological impact related to the maintenance of the baseline values for mangrove area, coral reef coverage, biomass of key fish species and area of seagrass beds. The final project impact on these indicators is difficult to define in a definitive manner due to three main factors: 1) the baseline was calculated four years before project implementation began (in many cases in 2004 during the PPG phase); 2) not all indicators were measured at project end, leading to limitations in the final data available; and 3) external factors have a significant impact on the health of these key ecosystems, such as bottom trawling (in particular on seagrass beds and fish biomass).

136. The data that were gathered were generally in line with the targets established in the Strategic Results Framework, with a few exceptions. The area of mangroves increased by 280 km^2 by project end, exceeding the project target (which was to maintain the same area as the baseline). This increase can be attributed to reforestation through the project combined with the government moratorium in 2010 on mangrove deforestation. Coral reef coverage was maintained (and in one case increased), at least until the time that the latest sampling was carried out in 2013, as per the indicator established in the Strategic Results Framework. In addition, coral reef damage in key diving sites was maintained at less than 10%. This is despite the fact that coral reefs have shown a general decline throughout the Caribbean as a result of climate change-associated ocean warming, and more extreme high temperature events, contributing to an increase in coral bleaching. In the case of seagrass beds, these were damaged substantially by the impact of bottom trawlers over many years. This activity was only finally outlawed in 2012, more than halfway through the project. Project monitoring suggests that seagrass density showed a 0% decrease in one site (as per the target for this indicator), decreased in another site and was not measured in a third site. While biomass of fishes is dependent on the recovery of these seagrass beds, the sampling that was carried out in 2011 and 2013 indicated that there were no statistical differences in fish biomass compared to the baseline, in line with the target for this indicator. Finally, sampling of contaminant loads associated with agricultural activities showed that some values remained stable, others decreased and some increased (such as BOD in some areas). This was believed to be due to the fact that the sampling was carried out during the rainy season, while the baselines were established in the dry season. The details related to level of achievement of each of the ecological indicators can be found in Table 5.

137. Overall, the project led to 3510 km^2 of seascape under biodiversity-friendly management by the fisheries sector. Indirect benefits were also experienced over an area of 27,878 km^2 of landscape and 4,811 km^2 of seascape. Through the project, 882 ha were reforested (both for conservation and for production in plantations) and a total of 41,809 ha of natural coastal forest was managed through the project. The area under legal protection has also increased, with 3498.58 km^2 (349 858 ha) included in fisheries reserves. In addition to the various environmental impacts, the project put in place models for

sustainable productive practices, led to increases in employment and increased incomes for local inhabitants of the Sabana Camagüey ecosystem, as detailed elsewhere in this report.

5.10 Conclusions

138. The Environment Agency and UNDP Cuba Office managed this project efficiently and conscientiously. High levels of communication and coordination among the EA, IA and key stakeholders played an important role in the effectiveness of the project. Project planning was carried out in a participatory manner at all times. Moreover, the EA employed adaptive management successfully on various occasions to deal with changes in the national context related to socio-economic policies, extreme weather events and other factors. In terms of monitoring and evaluation, regular quarterly and annual reporting, visits to field sites and activities such as the inception workshop and Mid-Term Review were satisfactorily carried out. The project did experience some difficulties in monitoring some of the ecological indicators, particularly the marine ones, due to various factors such as unavailability of vessels, high costs of renting those that were available, delays in obtaining permits from the Cuban authorities, and the time lags in observing ecological changes. As such, not all indicators were measured at project end. As Implementing Agency, UNDP provided effective support in terms of budgetary execution and procurement, M&E, technical inputs, revisions of publications, and knowledge management in general.

139. The project led to the publication of a large number of documents on the SCE related primarily to biodiversity, ICM, and sustainable financing. The large amount of information produced through the project is now available in an information repository that has both intranet and internet access, though internet connectivity issues still affect the ability to download some of the heavier documents. Media coverage and participation in events at local and international levels served to increase project visibility. Further work to disseminate key project outputs to local and national stakeholders as well as within the UNDP and GEF systems would be useful to highlight the achievements and lessons learned in this groundbreaking biodiversity mainstreaming project.

140. This third phase of UNDP/ GEF support to the government of Cuba's intervention in the SCE focused on consolidating Integrated Coastal Management and integrating conservation with sustainable production activities. It was considered highly relevant by stakeholders and benefitted from high levels of participation of a wide array of actors and extensive inter-institutional collaboration. Co-financing amounts exceeded projections and contribute to significant project ownership.

141. Capacity building and training were extensive and were facilitated by the creation/ consolidation of a network of Capacity Building Centres for ICM that includes 20 of such Centres in the SCE. Local governments, community members, CITMA specialists, productive sectors and others increased their level of understanding of the biodiversity values in the SCE, of ICM and of sustainable production. The project played a key role in the development and implementation of Integrated Coastal Management. An ICM methodology was adapted to the Cuban context and is now being used as a tool for environmental management. The majority of Zones under ICM (so-called ZBRMICs) can now be found in the SCE. Through the project, a wide variety of ICM measures were implemented, such as environmentally-friendly tourism and nature tourism, reforestation, protection of fisheries resources, sustainable agricultural management, and controlled livestock husbandry, among others. ICM Boards were set up for each of the ZBRMICs as a system of governance to oversee implementation of the ICM Programs. A legal proposal for the establishment of an Advisory Board on ICM for the entire country was also developed through the project but is pending formal approval. In addition, the project had a key role in promoting the development of environmental plans and their approval so that environmental considerations are taken into consideration in land use planning. Such plans were developed in nine

municipalities.

142. Valuable lessons were learned on integrating conservation with productive sectors, such as the validity of developing policy instruments to support adoption of sustainable practices, the importance of widely disseminating pilot experiences to promote upscaling, and the need for long-term engagement with productive sectors to ensure lasting impact. The project successfully led to greater levels of coordination between CITMA and the productive sectors of tourism, fisheries and agriculture, thus strengthening environmental management. The detailed information on achievements related to each sector are described in the body of this report, but to summarize, valuable tools were produced such as best practice manuals, and policy instruments were proposed, such as a national standard on the sustainable management of buffalo in coastal ecosystems and construction standards for roads in sensitive ecosystems (cays). Extensive training and research increased the adoption of sustainable practices in the three key sectors. It should also be noted that besides these sectors, the oil industry and the transportation sector also benefitted from the project through the establishment of local ICM authorities and ICM programs and through the development of a draft norm on the construction of roadways in sensitive ecosystems.

143. Pilot projects were established to put in place technological innovations and to provide communities with tangible socio-economic benefits by engaging in sustainable practices. Diverse nature tourism products were developed and promoted in associated with protected areas. Sponge cultivation, oyster cultivation and high-seas fisheries pilot projects were established, with some replication already occurring due to the positive socio-economic and environmental impacts. Sustainable and diversified agricultural production models were tested and native species were introduced in reforestation for conservation and in plantations. Buffalo management was also strengthened to reduce environmental impacts on coastal ecosystem and maximize socio-economic benefits.

144. Finally, the project carried out research on the costs and benefits of different sustainable production practices. Such economic valuations were novel for Cuba and pave the way for future work on payments for environmental services. A proposal was developed for the Ministry of Tourism that would involve charges to tour operators to be reinvested in biodiversity conservation in productive sectors. This proposal still requires substantial follow-up in the future as this could represent an important financial mechanism for sustainability. Other elements of financial sustainability were promoted by the project such as increased sectorial investments in biodiversity mainstreaming. In terms of the institutional and governance framework, socio-political, and environmental issues, these are not considered to pose any substantial risks to sustainability.

145. The next sections of the report describes the many best practices employed by the project, which are of relevance to future GEF projects to enhance effectiveness, efficiency and impact. Recommendations arising from this evaluation are then provided with regard to project design, project execution and further activities to carry out to build on project achievements.

5.11 Best practices

- *High level of training and participation of local governments in project activities, such as Capacity Building Centres and ICM Programs*

The project worked closely and maintained regular communication with municipal governments for project activities related to all of the project Outcomes. The municipal government representatives and directors that were interviewed during the evaluation were highly supportive of what the project was able

to accomplish, including the development and implementation of Integrated Coastal Management Programs, the establishment of Capacity Building Centres as well as increased awareness on ICM and the values of the Sabana Camagüey ecosystem. In addition, the results of the pilots projects, such as on nature tourism, were highly valued by local governments due to their significant social and economic impacts on the communities. The ongoing interaction with municipal governments and channeling of information to them served to enhance local ownership and will strengthen sustainability, particularly given that follow up on the implementation of ICM Programs is their responsibility. In addition, this approach is consistent with the Cuban government's policy shift toward greater decentralization.

- *Extensive coordination with a large number of key stakeholders*

As has been the experience with other UNDP/GEF projects in Cuba, this project facilitated a substantial amount of coordination and collaboration among different stakeholders, including national, provincial and municipal governments, productive sectors, scientific institutes and teaching staff. This contributes to significantly greater project impact. The coordination achieved with different entities of productive sectors should be highlighted as this is a complex undertaking. Many research centres and academic institutions were also involved in the project, such as the Institute of Oceanology (IDO), Institute of Systematic Ecology (IES), CIEC (Coastal Ecosystem Research Centre), the Institute of Tropical Geography and others. Through the project, they increased their level of cooperation, including by carrying out joint expeditions, as well as their ties with the productive sectors.

- *Excellent communication among the national, provincial and municipal levels of coordination*

There was regular communication between the national project coordinators and the designated project coordinators in each of the five provinces of the project, based on the results of the interviews carried out during the Final Evaluation. This included regular e-mail communication, phone calls and visits by the PMU to the provinces. Every three months, the provincial coordinators provided written updates to the national PMU on activities in each province, including those of the Capacity Building Centres and the Integrated Coastal Management Boards.

- *Pilot projects addressed productive sector interests as well as Ministerial objectives and helped address community problems*

Stakeholders interviewed indicated that the pilot projects responded to specific sectoral and Ministerial interests and provided tangible benefits to stakeholders. This contributed to high levels of uptake and replication. For example, within the fishing sector, the need to reduce pressures on the traditional coastal fisheries was recognized and the three alternatives promoted were all feasible alternatives that captured the interests of stakeholders. The buffalo pilot projects were another example, as these helped producers address the problem of wild buffalo populations and low productivity.

- *Emphasis on education and environmental training at all levels, including the community level*

The project supported a very large number of workshops with representatives of key productive sectors, such as fishermen, fishing inspectors, agricultural workers, tourism managers and workers, as well as with institutional actors. At the community level, primary school children were educated on the values of the Sabana Camagüey ecosystem through partnerships with Circles of Interest[12]. The project even led to the establishment of an Integrated Coastal Management day in the municipality of Martí, province of Matanzas. The strong emphasis on training, education and awareness raising led to a significantly higher

[12] These *círculos de interés* are a coordinated set of community-based after-school activities dedicated to increasing exposure to science and to scientific careers among K-12 students in Cuba.

level of awareness within the communities on the natural values of the Sabana Camagüey ecosystem and on sustainable productive activities. In some cases, this was measured using 'before and after' surveys.

- *South-South cooperation for exchanges of information and experiences and to take advantage of regional expertise*

On several occasions during project implementation, there were opportunities for exchange and information dissemination with experts from other countries of the region. For example, five representatives of the Capacity Building Centres participated in a conference in Uruguay to share their experiences. In addition, regional expertise was utilized in order to hire international consultants for the project when necessary.

- *Synergy with other projects to maximize efficiencies*

The PMU coordinated various project actions with other projects to reduce costs and to facilitate stakeholder interaction. For example, the itinerant training of tour operators was carried out together with the UNDP/GEF Southern Archipelagos project to enable them to see the different nature products on offer in person and to learn of their environmental values. Cooperation took place with the UNDP/GEF Invasive Alien Species (IAS) project in terms of management of buffalo and identification of IAS in the SCE. Synergies were also achieved with the UNDP/GEF Small Grants Program, which resulted in its support for the replication of one of the pilot projects.

- *Development of regulatory norms and best practice manuals based on project results in order to increase sustainability of project impact*

The project led to the development of two draft governmental norms awaiting formal approval as well as best practice manuals related to biodiversity mainstreaming in productive sectors. Examples include the draft norm on sustainable management of buffalo, draft norm on road construction in sensitive ecosystems and the best practice manual for the hotel industry. Such tools contribute substantially to project sustainability.

- *Incorporation of ICM in the curricula of educational/ technical training centres*

The visit to the technical university in Matanzas revealed that the topic of ICM had been incorporated in existing master's and doctoral training programs. In addition, the creation of the Sustainable Tourism Development Centre within FORMAT (the country's main tourism training institute) represents a key achievement that is strengthening the emphasis on sustainable tourism in all the courses taught.

- *ICM Programs were developed in a participatory manner and the associated ICM Boards incorporate all key stakeholders*

The participatory process employed to develop the ICM Programs increased ownership and levels of participation in relevant activities among locals. In addition, the local ICM Boards that were established to ensure implementation of the Programs include all key stakeholders and are chaired by the municipal governments.

- *Pilot projects were designed during project preparation phase*

While this should be standard design practice, it is not always the case that the pilot projects are fully designed and agreed upon during the project preparation phase. In this project, they were and this enabled

their implementation to begin more quickly and facilitated their replication, despite the fact that some modifications needed to be made during implementation.

- *Productive sectors managed activities to integrate biodiversity conservation directly*

Sectoral coordinators were designated for each of Outcomes 2-4 to take responsibility for the project outputs and achievement of objectives. FORMATUR, MINAL, AZCUBA and MINAGRI carried out planning and supervision of activities. The institutions also requested project funds from the national Project Director in line with the Annual Operational Plans that they developed jointly with relevant stakeholders. This increased ownership of project results among key sectors that affect biodiversity.

- *Continuity of UNDP/GEF support for the Sabana Camagüey ecosystem over three phases increased impact*

The Cuban government perceived the intervention as a three-phase process from the outset and was able to obtain support from GEF for three consecutive projects. As a result of this support, stakeholders indicated that greater impact could be achieved. Each project built on the achievements of the former project in a logical manner but went a step further. As an example, actions carried out during Phase 3 of the project built on the land use planning carried out in Phase 1 of the project, which identified ecologically sensitive areas with high biodiversity value, as well as on the Strategic Plan that was developed .Capacity building, policy changes, pilot projects and other activities were carried out during a period of over 20 years and the project is considered to have laid the basis for all subsequent GEF projects in Cuba. The fact that this third project had an implementation period of six years (which was later extended to seven) also contributed to the continuity of the intervention.

Recommendations to build on lessons learned and to guide future actions

<u>Recommendations related to project design</u>

- *Carefully select environmental impact indicators to ensure that they are realistic and that changes can be observed in time span of project*

Some of the environmental impact indicators selected proved to be problematic because short-term changes are not typically evident and because recovery times for these ecosystems are long (such as for seagrass beds). It is therefore important to carefully analyze the indicators to be included in any project's Strategic Results Framework and ensure that they are not dependent on assumptions outside of the control of the project (for example, elimination of a particular aggressive fishing technique by a certain date).

- *Cleary explain the methods used to establish the baseline values for all indicators in the ProDoc*

With this project, in the case of the baseline measurements of contaminant loads, the specific climatological conditions under which the values were obtained were not sufficiently explained in the ProDoc. As a result, when subsequent measurements were taken during project implementation, the conditions were not necessarily the same such that reliable data comparisons could not be made to measure changes over time. For this reason, additional detail on the calculation of baselines should be included in Project Documents.

- *Dedicate sufficient resources in M&E Plan budget to monitor ecological indicators, including at project end*

There were unforeseen increases during project implementation in the cost of renting vessels for coastal/ marine environmental monitoring, which increased the cost of planned expeditions. In order to avoid this

problem in future projects, a cushion of additional funds needs to be included in the M&E budget, to ensure that the full final monitoring of environmental impact can be undertaken, in line with UNDP/GEF project requirements.

- *Negotiate agreements during PPG phase for the use of vessels in coastal/marine monitoring*

One of the issues experienced when it came time to monitor coastal/marine impact indicators was the difficulty accessing the required vessels. Tourism boats were often unavailable as were boats belonging to other institutions and this made monitoring more difficult and also affected the periodicity and timing of monitoring. For this reason, to the extent possible, agreements should be negotiated during the PPG phase for the use of specific vessels at specific times for project monitoring. The difficulty experienced in some cases in renting vessels is another issue that the project grappled with, but one for which there are no easy solutions.

Recommendations to guide project execution

- *Report on indicators with quantitative data if the baselines do so and employ the same methods of measurement to facilitate comparison*

This is critical to enable the level of progress against the baseline to be assessed. This was not always done with this project. For example, the data reported on mangroves in the years when the ecosystem was assessed did not specifically report a figure for total area of mangrove as per the baseline. For the information on sectorial investments, the baseline was reported as a cumulative total, whereas each PIR reported on the annual total; in the case of this indicator, both the annual and the cumulative totals should have been reported so that the project impact against the baseline could have been readily determined. It would also be useful where feasible to indicate whether the values reported (for example, on size of fish) are statistically significant compared to the baseline and on the level of significance employed.

- *Measure all indicators at project closure to determine final project impact*

It is recommended that all indicators be measured at project end, *even if* changes are not expected or the target is not expected to be met. If human or financial resources are limited, end-of-project monitoring is even more important than monitoring the indicators at midpoint, as it enables the final project impact to be determined.

- *Obtain the commitment of relevant institutions to track both co-financing and leveraged resources*

In the case of this project, the national-level project coordinators had trouble obtaining reliable information on leveraged resources from institutions and so were not able to determine the final amount of leveraged resources. At project outset, a commitment from relevant institutions to track these figures should be sought.

- *Ensure that all necessary materials for productive technological innovations are purchased*

For a few of the plant nurseries, MINAGRI purchased the planting trays with built-in cells *(tubetes*) without the associated irrigation system or tables, with the result that these trays are not currently being used. It is important that purchase orders be prepared carefully for any new technology to ensure their full utility.

- *Carry out final workshop before final evaluation*

In order for the feedback from stakeholders to inform the final project evaluations, it is recommended that the concluding workshop be carried out beforehand. This was not done in this case because of the desire to ensure that the final evaluation was carried out within the established time frames.

Recommendations to guide future projects

Recommendations for financial sustainability:

- *Continue to develop financial mechanisms to support the implementation of sustainable productive activities in key sectors that affect biodiversity*

Through the Sabana Camagüey project, economic valuation studies were carried out for various sustainable productive activities. In addition, a proposal was developed for tour operators that would include a fee to be reinvested in protected areas. This proposal is still being discussed with the Ministry of Tourism. The issue of payments for environmental services and reinvestment of a portion of incomes from sectors in conservation activities (and in protected areas management) is a novel one for Cuba and one that still requires substantial work and follow-up for it to be consolidated into concrete financial mechanisms. The further development of incentives needs to be prioritized as this issue is absolutely vital for the financial sustainability of sustainable production in the tourism, fisheries and agricultural sectors.

- *Promote institutional coordination at the central level to achieve an integrated vision on ICM and secure agreement on relevant financial mechanisms*

This includes institutions such as Cuba's Central Bank, MINAG, CITMA, and the Ministry of Finance and Prices. This will be key to effective inter-institutional collaboration and to the adoption of policies to increase the financial sustainability of sustainable productive practices.

Recommendations to maximize impacts of pilot sustainable productive sector activities and promote further replication/upscaling

- *Publish succinct pamphlets on the pilot projects to promote replication*

In partnership with different institutes, the project coordination unit developed a number of useful publications to share findings, data and lessons learned, including about the pilot projects. Many of these are books or longer documents. In order to promote further replication of the pilot projects across the country, it would be useful to prepare simple pamphlets on each pilot project experience, summarizing the main elements, materials needed, results of economic evaluation studies and contact information to find out more. This could be a relatively cost-efficient way of sharing the pilot projects experiences and achievements in the post- project context in which there may be less opportunities to meet in person. Each productive sector could then disseminate the pamphlets to relevant stakeholders.

- *It is recommended that CNAP follow-up on the nature tourism products developed with the project through the National Commission on Sustainable Tourism to ensure that there is sufficient support for their management and promotion*

This is particularly important for the tourism products that have not yet been completely established, those for which management problems have arisen, or where further promotion is required to increase visitation levels. For example, with Rio Máximo, the National Enterprise for the Protection of Flora and Fauna has not yet provided co-financing to complete the construction of facilities for the tourism product

developed with the project and illegal fishing has contributed to a significant drop in flamingo nesting at the site. Such issues could be raised by CNAP at this National Commission to secure support in their resolution.

- *Continue promotion of nature tourism products*

The project supported the development, and in many cases, implementation of attractive nature tourism products. As a result, new nature products entered the market and participation in nature activities has increased. However, there still remains much potential to further promote these products and to promote many other nature products across the country. The nature tourism industry in Cuba is still in its nascent stages, while the traditional sun and sand model remains the mainstay.

- *Translate nature tourism material into English, including at Visitor Centres*

Due to budgetary restrictions, the Visitor Centre posters that were developed with project support were only in Spanish. Given the large numbers of tourists visiting Cuba who speak English and the expected increases in the future, it is important to ensure that all such promotional and educational material be bilingual and to verify the quality of the translations. Future pilot projects to promote nature tourism should therefore include sufficient budget for translations in order to attract international tourists.

- *Ensure that the relevant pilot project experiences under the direction of AZCUBA are shared with MINAG*

When project implementation began, all the land formerly under sugar cane cultivation was the responsibility of AZUBA but in 2009, over half of these lands were transferred to MINAG (Ministry of Agriculture). As such, three of the four pilot projects were on MINAG lands. Since the pilot projects were already underway, it was decided that the coordinator of Outcome 4 from AZCUBA would continue to be responsible for the implementation of the sustainable agriculture and buffalo components. Effective coordination between the two institutes was achieved. Nevertheless, it is recommended that the experience gained by AZUBA be fully shared with MINAG to promote further replication of the sustainable production models, such as sustainable buffalo management (based on the requirements of the national standard, which is in the process of formal approval). In terms of sustainable practices with small livestock, this is currently being promoted only on AZCUBA lands, however, should this policy change in the future, it would be useful for AZCUBA's experience to be shared with MINAG for further upscaling (once the technological package is fully validated).

<u>To maximize environmental impact:</u>

- *Follow-up with IPF and tourism developers to ensure that BD considerations are incorporated in the construction and operation of new tourism developments, including in the cays of the province of Camagüey*

Since last year (2014), new pressures have surfaced in terms of proposed large hotel developments in the cays of the province of Camagüey. These ongoing developments will need to be monitored carefully to promote consistency with the environmental land use planning for these areas and adherence to the best practices manual for hotels. Note that such pressures could also arise in other provinces.

- *Develop biological corridors to consolidate BD conservation in the landscape, including protected and productive areas*

With the recent introduction of a government policy to distribute lands to individual Cubans for agricultural production, the project recognized that pressures on environmental resources and BD could increase. As a result, biological corridors for each province in the SCE were proposed to provide linkages between protected areas, forests, and areas under sustainable production. It is recommended that these corridors be consolidated and formally approved to build on the initial steps taken by the project.

- *Follow up on system of environmental indicators for productive sectors and on sustainable tourism indicators to ensure their formal approval*

In order to ensure that they are used to monitor the integration of environmental considerations in productive sectors, the proposed environmental indicators and sustainable tourism indicators require final approval and formal adoption. For the environmental indicators, this approval should come from CITMA as part the national system of environmental indicators. This will enable continued monitoring over time of the extent of mainstreaming of BD in productive sectors.

- *Promote use of native species in reforestation*

The project supported the inclusion of native species in nurseries in various locations and the purchase of trays with built-in cells. Exotic species are also grown in these nurseries and used in forestry activities in order to meet energy needs with fast-growing species. Some of these exotic species are actually invasive alien species such as Casuarina (*Casuarina equisetifolia*) and Algarroba de la India (*Albizia procera)*, and there is therefore somewhat of a disconnect between the Invasive Alien Species Strategy developed through another UNDP/GEF project currently under implementation in Cuba and the country's forestry policies. It is recommended that MINAG gain further experience on different native species and ensure that tree nurseries provide the appropriate conditions for their growth, with a view to further increasing the use of native tree species in forestry and in reforestation for conservation purposes.

- *Continue to provide training and environmental education in the long-term*

Spanning 20 years over the three phases, the interventions in the SCE had the opportunity to have a significant impact on levels of awareness of community members, stakeholders, governments and other stakeholders of the BD values of the Sabana Camagüey ecosystem and the need to implement sustainable productive practices. Relevant stakeholders will need to continue to provide opportunities for training and environmental education after the project in order to maintain the progress achieved and to continue to promote sustainable practices in the coastal and marine areas of the ecosystem.

<u>Recommendations for further information dissemination and knowledge management:</u>

- *Increase accessibility of the information in the repository*

Many of the project publications and outputs have been uploaded on a specific Sabana Camagüey project website. In addition, the Institute of Tropical Geography, a project partner, developed an information repository with all the project documents, which is part of a larger Environmental Information System the creation of which was supported by the project. It is recommended that the Institute enter additional metadata to facilitate access to the information repository (using search engines) and make the link between the project website and information repository more evident . In addition, linkages to the websites of those provinces that created their own local project website or included project information on their intranet should be established (such as Matanzas and Villa Clara).

- *Earmark funds to continue to print out key project outputs and disseminate project results and experiences within Cuba and internationally*

Given the significant results achieved in the Sabana Camagüey ecosystem over a period of 20 years and the valuable experience gained through this project on ICM and on working with productive sectors, further dissemination of project results within Cuba and to other countries of the region would be very useful. The planned final publication should be widely shared and uploaded to the internet-based information repository for access by other countries. In addition, it is important that CITMA and key sectors identify funds for further printing of key project products, such as the manual on best practices for the hotel industry and the manual on ecological gardening.

- *UNDP Cuba to ensure that lessons learned from this BD-2 project and key documents that systematize the project experience are shared within the UNDP system and with GEF*

To increase the visibility of the project's impacts within the UNDP and GEF systems, and to share the valuable lessons learned from working on biodiversity mainstreaming with productive sectors, it is recommended that the UNDP Cuba widely share available materials and promote the production of succinct documents that summarize the experience.

Annex 1: List of Stakeholders Interviewed and/or Present in Final Evaluation Meetings

PARTICIPANT	Institution/ Organization
Mercedes Arellano Acosta	Director of SCE Project; AMA-CITMA
Edelmira Castro Blanco	GEAM, Coordinator of forestry activities of project
Andrés Ramírez Baffi	Coordinator of Outcome 4 of Project, AZCUBA
Servando Valle Valle	Coordinator of Outcome 3, CIP-MINAL
Leda Menéndez Carreras	Terrestrial biodiversity advisor of SCE project, CENBIO-IES –CITMA
Gricel Acosta Acosta	Program Official, Focal Point for Environment and Energy, UNDP-Cuba
Alain Muñoz Caravaca	Monitoring, Evaluation and Knowledge Management Official, Environment and Energy, UNDP-Cuba
Natalia Polanco Domínguez	General Administrator, SCE Project; AMA-CITMA
Pedro Alcolado Menéndez	Coastal marine biodiversity advisor of Sabana Camagüey project; AMA-CITMA
Pedro J. Ruiz Hernandez	National Focal Point of GEF; CITMA
Gisela Alonso Domínguez	President of AMA
Libertad Roda Fernandez	Coastal marine biodiversity activity coordinator, Institute of Oceonology -AMA
Cayetano Casado	Program analyst, Environment and Energy, UNDP-Cuba
Nelvis Gómez Campos	Ecologist, Delegation of CITMA in Matanzas
Angel Alfonso Martínez	Provincial Coordinator of Project in Matanzas province
Leyda Finalé de la Cruz	Dean, Fac. Technical Sciences U. de Matanzas
Ramón Quiza Sardiñas	Deputy Dean F.C.T. U. De Matanzas
Juan Alfredo Cabrera	University of Matanzas
María del Pilar Almeida	University of Matanzas
Martí municipality, Matanzas province	

Lenas Sánchez Dual	CITMA - Martí
Marixx Herz Valdés	Vicepresident CAM-Martí
Ramiro Ruiz Ruiz	President of CAM -Martí
Mercedes Falcon Perdomo	Secretary CAM- MArtí
Hernadez M.	1ª Vicepresident CAM-Martí
Cayo Santa María, Villa Clara province	
Julio Santarén	Director CESAM -CITMA, Villa Clara province
Eduardo Veiga Jiménez	Coordinator of Outcome 2 of project, FORMATUR, MINTUR
Edelkis Rodriguez Mova	Provincial Project Coordinator, Villa Clara province, CESAM/ CITMA
Dorqis Sardrey Herrera	Caguanes National Park, Sancti Spíritus province
Armando Falcón Méndez	Caguanes National Park
Norgis V. Hernadez Lopez	Caguanes National Park
Carlos M. Diaz	DME Planning P. Popular
Osmani León Pll….	UEB Bufalina Nela
Dulce María de la Cruz	UEB Bufalina Nela
José A. Rodriguez Gayo	CITMA ….
Isabela de Sagua, Villa Clara province	
Orlando Gonzalez Hernadez	Fisheries Operations (Fishery Enterprises, Caibarién, Villa Clara province)
Fidel Morales N…..	Council P. Isabela
Edallis Rodriguez Moyo	Coordinator PSC
Ketiusca Fernández	CITMA Sagua
María del Carmen Velasco Gómez	Delegate of Minister of CITMA in Villa Clara
Grace Casas Martínez	CBC Board/ ICM, Sagua la Grande municipality, CESAM/ CITMA
Monte Lucas	
Ehalu Morales	UBPC Monte Lucas
Leticia Salas Castellanos	CESAM, CITMA
Amaury Casa Delgado	UBPC Monte
Marilen Dávila Santos	UBPC Monte Lucas
Eliodoro García Mederos	UBPC Monte Lucas

Miguel A. López	UBPC Monte Lucas
Finca Forestal Bonilla	
Jedrais A. Morciego Adan	Farm
Marcia Mejía Romero	Worker on Farm
Yohana Morciego Adan	Worker on Farm
Yanana Collazo Meía	Worker on Farm
René Gonzalez Verdecia	Worker on farm
Ernesto Maceo Banga	Worker on farm
Luis Adai Mejía	Worker on farm
Morón	
Yareysi Brito Rodríguez	CBC Board/ ICM CITMA Ciro Redondo municipality
Eusebio Rosales Ordoñez	Provincial Forestry
Meide… Bauel Ibañez	Morón Forestry
Juan Antonio Gómez Díaz	CBC Board/ICM CITMA Primero de Enero municipality
Sady Pantoja Aguila	CAM Morón
Raymé Jiménez Onosa	Municipal University Centre Morón
Yuleidys Martinez Abad	CBC Morón
Zulina Diaz Montes	CBC Morón
Ana Maezdes Ceré	CBC Bolivia
Luis A. Uldes Clz	CIBA
Hiliaysis Tapia Argüelles	CIBA
Minas municipality, Camaguey province	
Bárbara Espert Castellanos	Municipal University Centre
Miguel Enrique Avila Gálvez	Municipal Education Department
Lourdes Cristina Comalbo	Municipal University Centre
Osmany Geraldo Serrano	Municipal University Centre
Carmen Membrides Cabello	CBC Board/ ICM, Minas municipality, CITMA, Camaguey province
Andrea Armas Rodriguez	Provincial delegate of CITMA-Camagüey province
Dafent Sanchez de Cesp	Esp. Flora y Fauna
Adelaide Jiménez Castellano	SEF (State Forestry Service), Minas

	municipality
Yusimíe Florat González	Vicepresident of CAM Poder Popular Minas
Eds… Romero Cardoso	Director of Forestry Minas
Darge Blanco …	Secretary of CAM Minas
Yalixi Machado Matos	Silviculture Unit Minas
Adalaberto Marrero Hernández	Principal Specialist on Silviculture, Provincial Enterprise, Camagüey
Nereida Junco Garzón.	Provincial project coordinator, Camaguey province
Vivero Sebastopol	Minas
Yaandré Velazco Luna	Silvicultural Unit Minas
Teodoro Días García	Silvicultural Unit
Iais Días Días	Silvicultural Unit
Antonio Matos Castillo	Silvicultural Unit Minas
Masdanie Velazco Fernández	Silvicultural Unit Minas
Elsa Adan Quevedo	Silvicultural Unit Minas
Tomas Gonzales Colón	Silvicultural Unit Minas
Julio Nieves Nieves Napolez	Silvicultural Unit Minas
María Pérez Fontes	Silvicultural Unit Minas
Ilianni Pérez Padrón	Silvicultural Unit Minas
Leidiana Giraldo Gutiérrez	Silvicultural Unit Minas
Juana Rodrïguez Hernández	Silvicultural Unit Minas
Mailen Löpez Umpierre	Silvicultural Unit Minas
Rosa Jiménez Vidal	Silvicultural Unit Minas
CCC/ICM Chambas, Ciego de Avila province	
Yakelyn Quintero Martinéz	CBC Board/ ICM Municipality of Chambas
Zulima Díaz Montes	Specialist in Environmental Planning for SCE, CITMA (selected municipalities)
Yulia Bolaño Montero	Vicepresident
Julio V. Santana Cruz	CITMA
Raúl Gomez Fernandez	Provincial project coordinator, Ciego de Avila province
Angreil Pérez Buchillón	CITMA
Daymiesí Contreras García	Journalist, Local Radio Station

AZCUBA	
Vicente Evora Blanco	AZCUBA, Director of Livestock Rearing
Rafael S. Rivacoba	AZCUBA, Specialist in International Affairs
Luis Barrios Marianor	AZCUBA, Specialist
CITMA - Environment Directorate	
Teresa Dolores Cruz Sardinas	Environment Directorate, project advisor on legal affairs
Gloria Gómez País	Environment Directorate, project advisor on sustainable financial mechanisms
Instituto Geografía Tropical	
Francisco Cejas Rodriguez	IGT, specialist in charge of administration of SCE information repository
Mei Emi Rodriguez	IGT, specialist
Yoel Cuzaú Fajardo	IGT, designer of environmental information system for SCE
MINTUR- FORMATUR	
Cecilia Moleón Mejías	Deputy Director, International Collaboration,
Fernando Vázquez Castro	Deputy Director R&D
Luis Felipe Fernandez Sierra	Methodology R&D
Fisheries Research Centre (CIP), MINAL	
Rafael Tizol Correa	Director, CIP
Yadira Gonzalez Columbé	Specialist DRI-CITMA
José M. Guzman Menendez	Specialist on terrestrial biodiversity in SCE, IES
Carlos a Méndez García	International Relations Department -CITMA
Rio Maximo Faunal Refuge	
Loidy Vázquez Ramos	Director of FR

Annex 2: Interview Questions

Note that the consultants prepared specific questions that were tailored to each particular stakeholder based on this general list.

Project Formulation

- How relevant is the project and its objectives to the country's national priorities?
- Were the project's objectives and components clear, practicable and realistic within its time frame?
- To what extent did stakeholders participate in the project design process?
- Were the capacities of the executing institution and counterparts properly considered when the project was designed?
- Were lessons from other relevant projects properly incorporated in the project design?
- Were the partnership arrangements properly identified and roles and responsibilities negotiated prior to project approval?
- Were counterpart resources (funding, staff, and facilities), enabling legislation, and adequate project management arrangements in place at project entry?
- Were the project assumptions and risks well articulated in the Project Document?

Project Results and Impact

- Please comment on the level of achievement of each of the main indicators / targets set in the logical framework to date.
- What do you consider to be the project's main achievements?
- What were the project's main limitations?

Sustainability

- Are there social or political risks that may threaten the sustainability of project outcomes?
- Is there sufficient stakeholder awareness and ownership in support of the project's long-term objectives?
- Are there financial risks that may jeopardize the sustainability of project outcomes? Has a mechanism been installed to ensure financial and economic sustainability once GEF assistance ends?
- Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits?
- Are requisite systems for accountability and transparency, and required technical know-how, in place?
- Are there ongoing activities that may pose an environmental threat to the sustainability of project outcomes?

Project Implementation

- How effectively did the PMU manage the project?
- Please comment on the executing modality of this project.
- Can you comment on the performance of UNDP as Implementing Agency?
- Was there an appropriate focus on results by the implementing and executing agencies?
- Please comment on the quality of risk management

- Were managing parties responsive to significant implementation problems (if any)?
- Was the chosen executing agency for project execution suitable, given the project design?

Monitoring and evaluation

- Please comment on the adequacy of the M&E plan and the logical framework.
- Were baseline conditions, methodology and roles and responsibilities well articulated at project start-up?
- Was the M&E Plan sufficiently budgeted and funded during project preparation and implementation?
- Were the indicators provided in the Project Document effectively used to measure progress and performance?
- Were progress and financial reporting requirements/ schedules complied with, including the timely delivery of well-developed monitoring reports (PIRs)?
- Were follow-up actions, and/or adaptive management, taken in response to monitoring reports (PIRs) and to the MTE?
- Were PIR self-evaluation ratings consistent with the MTE and TE findings? If not, were these discrepancies identified by the project steering committee and addressed?

Adaptive Management

- Were there any changes in planned project outputs and activities? If so, did they have a significant impact on the expected project outcomes?
- Why were the changes brought on? (e.g., due to weaknesses in the initial project design or due to changes in the social, political and/or environmental circumstances in the project area)?
- Were the project's changes articulated in writing and then considered and approved by the project steering committee?

Stakeholders

- Did the project involve the relevant stakeholders through information sharing and consultation and by seeking their participation in project design, implementation, and M&E?
- Did the project consult with and make use of the skills, experience, and knowledge of the appropriate government entities, non-governmental organizations, community groups, private sector entities, local governments, and academic institutions in the design, implementation, and evaluation of project activities?
- Were the perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process taken into account while taking decisions?

Country Ownership

- Please comment on the level of national ownership of this project.
- Were the relevant representatives from government and civil society involved in project implementation, including as part of the project steering committee?
- Has the government enacted legislation and/or developed policies and regulations in line with the project's objectives?

Project Finance

- Is there sufficient clarity in the reported co-financing to substantiate in-kind and cash co-financing from all listed sources?

- Were there significant differences in the level of expected and actual co-financing and if so, what were the reasons for these differences?
- Were externally funded project components well integrated into the GEF supported components?
- Did the extent of materialization of co-financing have an effect on project outcomes and/or sustainability?
- Were there additional leveraged resources committed during project implementation?

Mainstreaming

- Did the project have any positive or negative effects of the project on local populations and on livelihoods?
- Have gender issues been taken into account in project design and implementation? If so, how and to what extent?
- Is there evidence that the project outcomes have contributed to better preparations to cope with natural disasters?
- Do the project objectives conform to agreed priorities in the UNDP country programme document (CPD) country programme action plan (CPAP), and UN Development Assistance framework (UNDAF)?

Lessons Learned and Recommendations

- Please comment on any lessons learned as a result of this project.
- Please comment on best practices employed.
- Please provide recommendations with regard to actions that should be carried out to improve project execution.

Annex 3- Documents consulted during evaluation

Álvarez de Zayas, A., J. M. Guzmán Menéndez, Ferro Cisneros, S. 2013. Los Viales en el Archipiélago Sabana-Camaguëy: Impactos, sus Causas y Alternativas de Mitigación.

Álvarez de Zayas, A., L 2013. Inversión en Cayos Pequeños: Recomendaciones para evitar, atenuar y mitigar impactos ambientales.

AMA. Project Implementation Reports for 2009, 2010, 2011, 2012, 2013 and 2014.

AMA. AOPs for 2010, 2011, 2012, 2013 and 2014.

AMA. QORs for 2009, 2010, 2011, 2012, 2013 and 2014.

AMA. 2013. Sabana Camaguëy: Una Experiencia de Manejo Integrado Costero para Compartir.

AMA. 2013. Potenciando la Conservación de la Biodiversidad Mediante la Evaluación Económica y Ambientalmente Sostenible de Actividades Productivas en el Ecosistema Sabana Camaguëy, Cuba.

AMA. 2008. Proyecto PNUD/GEF Sabana Camagüey III-Informe Del Taller De Inicio Del Proyecto.

AMA. 2015. Borrador de Publicación Final.

AMA. 2013. Proyecto PNUD/ GEF Sabana Camagüey: 20 años en la Ejecución del Plan Estratégico Ambiental para la Protección de la Biodiversidad en el Ecosistema. Presentación Powerpoint.

Arellano Acosta, Daniela de la Mercedes. 2013. Impactos del Proyecto Sabana Camaguëy.

Arellano Acosta, Daniela de la Mercedes. Esquema de la Unidad de Manejo del Proyecto.

Arellano Acosta, Daniela de la Mercedes. Publicaciones del Proyecto 2012-2015.

Arellano Acosta, Daniela de la Mercedes. 2015. Recomendaciones de la EMT. Plan de respuesta y actualización del cumplimiento.

Arellano Acosta, Daniela de la Mercedes. Minutas de Reunión de UMP. 2010.

Arellano Acosta, Daniela de la Mercedes. 2012. Principales Lecciones Aprendidas Documentadas por el Proyecto.

Arellano Acosta, Daniela de la Mercedes. Resultado 1: Documento Avances Hacía los Objetivos de Desarrollo.

Arellano Acosta, Daniela de la Mercedes. Resultado 2: Documento Avances Hacía los Objetivos de Desarrollo.

Arellano Acosta, Daniela de la Mercedes. Resultado 3: Cumplimiento Sustantivo 2012-2015.

Arellano Acosta, Daniela de la Mercedes. Resultado 4: Cumplimiento Sustantivo 2012-2015.

CITMA and Project |Management Unit. Consideraciones para la elaboración de un nuevo proyecto de Resolución sobre el Manejo Integrado Costero. Versión 21 de enero del 2015.

Consultados Asociados, S.A. Informe de Auditoría (2013).

Euroaudit, DFK International, and CIH, S.A., Informe Final de Auditoría (2009).

Guillermo M Caille, Guillermo M., Tania Ammour and Marta Rosa Muñoz Campos. 2012. Mid-Term Evaluation of project.

Martin, Gustavo, Juan Mario Martínez, Jorge Olivera, Odil Duran, Marlen García, Wendy Arredondo, Obllurys Cárdenas, Jackeline Leal, Eduardo Salinas, Maricela Quintana, Leonor Méndez and Others. 2011. Modelo De Ordenamiento Ambiental. Aplicación Práctica En El Municipio Yaguajay.

Saker Labrada, Mariana. 2014. Campaña De Comunicación del Proyecto Sabana Camaguëy-Cumplimiento. Informe para la Agencia de Medio Ambiente.

Sánchez Trujillo, R., F., Carlos M. Delgado Castro, M.C Servando V. Valle Gómez. 2013. Manual de Artes de Pesca.

UNDP and Government of Cuba. 2005. Project Document for "Mainstreaming and Sustaining Biodiversity Conservation in three Productive Sectors of the Sabana Camagüey Ecosystem" project.

UNDP. Combined Delivery Reports for 2010, 2011, 2012, 2013 and 2014.

UNDP Evaluation Centre. 2012. Project Evaluations. Guidance for conducting terminal evaluations of UNDP supported, GEF financed projects.

Various. PowerPoint Presentations given during Terminal Evaluation.

Annex 4: Itinerary

WORK ITINERARY FOR EVALUATORS

SABANA CAMAGÜEY PROJECT

WORK PROGRAM OF FINAL EVALUATION

20 to 30 April

No.	Date, time[13]	**Activity**	Place	Participants
1	Monday 20	Arrival in airport of Havana	Airport	Project Coordinators
2	Tues 21, 09:00 – 10:15	Meeting with UNDP CO	UNDP Cuba Office/ Havana	UNDP CO staff/ Havana.
	10:30 – 12:00	Meeting with Project Management Unit and UNDP CO.	UNDP Cuba Office/ Havana	Project Director, Project General Administrator, scientific advisors for the project on biodiversity, coordinators of the agricultural, forestry and fisheries sectors, Representatives of AMA.
	13:00 -13:30	Administrative issues and lunch break		
	15: 30 – 16:30	Meeting with National Focal Point of GEF Cuba and with Directors of Environment Agency (Agencia de Medio Ambiente), CITMA, Cuba		Project Director, Project General Administrator,

[13] Note that some of the times were adjusted when meetings extended past the allotted time.

				scientific advisors for the project on biodiversity.[14]
	16:30 – 18:30	Discussions with Project team (Director, Administrator, scientific advisors on terrestrial and coastal biodiversity, sectorial coordinators for fishing, agriculture and forestry). Exchanges about the work and places to visit in the provinces. Questions from evaluators.	Project Office	In addition, the coordinators of the project in IDO and IES will participate.
3	Wednesday 22, 07:00	Departure for province of Matanzas, municipality of Martí		Project Director, Project General Administrator, Scientific Advisors on BD.
	10:30 – 12:30	Province Matanzas: Meeting with the Vice President of the municipal government, with the Provincial Project Coordinator and with specialists of the municipality of Martí. Assessment of the project work, impacts, and institutional, social, and financial sustainability; Role and work of CBC/ICM. Implementation of ICM in municipality. Expectations with regard to replication of experience (sponges) in the fishing sector. The forestry work in the Guamuta UBPC and its impact on the environmental context at the provincial scale, in terms of increasing ecological connectivity. Visit to the forestry nursery of the municipality of Martí.	CBC/ICM municipality of Martí	Ángel Alfonso, Daniel Martínez, ICM Head in municipality of Martí.
	18:00 Meeting at Visitor Centre at 22:00	Province of Villa Clara: Arrival at Santa María cay. Accommodation. Exchange with Provincial Project Coordinator, with the tourism project coordinator and with local authorities. Information on the state of the RB Buenavista Visitor Centre.	Hotel cayo Santa María	Provincial Project Coordinator, tourism project coordinator and local authorities
4	Thursday 23 08:00 - 15:00	Province of Villa Clara: Visit to CBC/ICM Sagua La Grande. Work of the ICM Office in the resolution of problems and conflicts. Experience with oyster and sponge cultivation in the fisheries sector. Visit to the agricultural Basic Unit of Cooperative Production (UBPC) Montelucas.	CBC/MIC Sagua, UBPC Montelucas	Project coordinator for the province of Villa Clara, Board of CBC/ICM municipality, Project Board UBPC Montelucas.
	17:00	Province of S. Spíritus: Exchange with the Provincial Project Coordinator of the ICM Office and CBC/ ICM. Exchange on the experience with sustainable financing for the conservation of biodiversity in the animal husbandry sector (buffalo). Implementation of buffalo rearing with sustainable practices. Social impact of the project in the territory and development of nature tourism. Accomodation in Los lagos de Mayajigua.	Municipal ICM Office	Project coordinator for the province of S. Spiritus, Director of ICM Office Yaguajay, Director of Project and Economist of the Nela

[14] Note that all meetings with stakeholders also included a period of time when the evaluators asked questions directly without the presence of the Project Management Unit.

				UBPC.
5	Friday 24, 08:30 – 10:00	Visit to CBC/ ICM of municipality of Chambas. Exchanges regarding the project impact with the municipality.	CBC/ICM municipality	Board CBC/ICM municipality
	11:00 – 13:00	Province of Ciego de Ávila: Exchange with the Provincial Project Coordinator in the CBC/ ICM of the municipality of Morón. Presentation of the status of the model of environmental planning adopted by municipalities of the ESC of the province.	CBC/ICM Morón	Provincial Project Coordinator, Board of CBC/ ICM of municipalities of SC, specialist of environmental planning, CIBA and buffalos. Other participants of the territory.
	13:30 – 15:00	Visit to the Laguna La Redonda, municipality of Morón, showcasing of nature tourism experience. Lunch. Continuation of trip to the province of Camagüey.	La Redonda	Project coordinator of tourism sector
	18:00 – 20:00	Province of Camagüey. Arrival in the city of Camagüey. Meeting with the Provincial Project Coordinator. Accommodation.	Venue at the hotel.	Provincial Project Coordinator.
6	Saturday 25, 09:00 – 19:00	Visit to the CBC/ ICM of the municipality of Minas. Work of the CBC/ ICM. Impact of the project on the implementation of nature tourism in the Rio Máximo Faunal Refuge. Visit to the Sebastopol nursery. Dinner	CBC/ ICM venue	Provincial Project Coordinator, Board of CBC/ ICM, Forestry and tourism representative (Rio Máximo Faunal Refuge)
	19:00	Return trip to Havana, with overnight on the way in Los Lagos de Mayajigua, Yaguajay		
7	Sunday 26, 08:30	Return to Havana. Work of the Evaluation Team in the preparation of the presentation on initial findings.		
8	Monday 27 10:00- 13:00	Work of the Evaluation Team to prepare presentation on initial findings.		Evaluation team
	14:00-16:00	Interview with Director of agricultural and forestry sector		Project Director, sector coordinator
	16:00-18:30	Meeting with PMU to answer additional questions of lead evaluator		Project Director, General Administrator, scientific advisors for project on biodiversity
9	Tuesday 28, 10:00 am – 12:00	Meeting of Evaluation Team with Environment Directorate (DMA), CITMA: extent of integration of project results in the institutional framework	CITMA Headquarters, Havana	Director of Environment of CITMA and designated civil servants, Project Director,

				scientific advisors
	14:30 – 16:00	Visit to the Institute of Tropical Geography (centre for the capture, processing and storage of the information of the Sabana Camagüey project, information repository and dissemination)	Institute of Tropical Geography	General Director, Technological Deputy Director, administrator of SIAESC (Environmental Information System for the SCE)
	16:00 – 17: 30	Meeting with the General Management of the Tourism Ministry (FORMATUR), charged with participation of the sector in the project at the central level.	Headquarters of FORMATUR, MINTUR	General Director, Deputy Directors (2)
10	Wednesday 29, 09:00 -10:30	Meeting with national directors of the fishing sector	Centre of Fisheries Research, MINAL	Project Director
	11:00-13:30	Work of the evaluation team to prepare the presentation on the initial evaluation findings.		Evaluation team.
	14:00 – 17:00	Meeting with Program Official for Environment and Energy, UNDP, other UNDP staff members and project coordinators to present initial findings of evaluation report.		GEF Focal Point, Environment Agency representatives, members of project team and others.
	Thursday 30	Return of consultants to their respective countries.		

Annex 5: Terms of Reference

SABANA CAMAGUEY PROJECT
TERMS OF REFERENCE FOR THE FINAL EVALUATION

Country:	CUBA
ATLAS Award ID:	0043827
PIMS Number:	3254
GEF Focal Area:	Biodiversity
GEF Strategic Objective:	OP2
GEF Budget (USD):	4,119,448
Co-Financing Budget (USD):	22,032,000
Project Document Signature date:	March 2008
Date of first disbursement:	June 2008
Original Planned Closing Date:	March 2014
Executing Agency:	CITMA/ AMA
Date of Project Closure	September 2015

1. INTRODUCTION

UNDP/GEF Monitoring and Evaluation (M&E) Policy

The Monitoring and Evaluation (M&E) policy for UNDP/GEF project has four objectives:

- to monitor and evaluate results and impacts;
- to provide a basis for decision making and any necessary amendments and improvements;
- to promote accountability for resource use;
- to document, provide feedback on, and disseminate lessons learned.

To ensure effective project M&E, a mix of appropriate tools is used continuously throughout the lifetime of the project, such as: periodic monitoring of indicators, mid-term evaluations, audit reports and final evaluations.

In accordance with UNDP/GEF M&E policies and procedures, all full size or medium projects funded by GEF should carry out a mid-term review in the third year and a final evaluation upon completion of the fifth year of the project.

These terms of reference pertain to the Final Evaluation of the Mainstreaming and Sustaining Biodiversity Conservation in three Productive Sectors of the Sabana Camagüey Ecosystem project. For issues related to content and methodology of the evaluation, reference is made to the Guidelines for GEF projects (version for Evaluating Teams).

Brief Project Description

See Complete ToRs or ProDoc.

1. ASPECTS RELATED TO NATIONAL POLICIES THAT HAVE AFFECTED PROJECT IMPLEMENTATION

The model to modernize Cuba's economy, detailed in the Guidelines of the Economic and Social Policy of the Party and the Revolution, approved and entered into force in April 2011, puts in place measures with a view to the decentralization of many activities that were formally centralized only by the state.

Developments that have had a decisive impact on the implementation of the project include: the approval and implementation of self-employment; the operationalization of a Tax System and the associated payment of taxes by state entities and individuals; the gradual implementation of forms of local empowerment, such that municipalities now have autonomy in terms of economic management in areas that are not strategically important for the area or the country; the planned distribution of idle lands for agricultural exploitation to individuals interested in the establishment of cooperatives, some linked to the demonstration units of the project (such as UBPC Guamuta and UBPC Montelucas); as well as the generation of policies that include the staged development of nature tourism in the country.

These actions are directly linked to Outcome 1, Output 1.1, Integrated Coastal Management Authority (ICMA) and to Output 1.4, which is focused on the development of a Program of Sustainable Financing for biodiversity conservation and the proposals to make for the adoption of decisions at the relevant levels based on the results of the financial analyses carried out with the selected demonstrative productive units, in accordance with the project design and in relation to the three key sectors.

The impacts of the changes have also been felt in the execution of relevant activities under Outcome 2, Outputs 2.2 and 2.3 (development of nature tourism in two demonstration pilot sites and replication of the successful demonstrations of nature tourism strategies, respectively) and with Outcome 4, Output 4.4, focused on implementing demonstrations of biodiversity-friendly production on lands formerly dedicated to sugar cane.

In the case of Outcome 1, Output 1.1, local empowerment, which is of great interest to local stakeholders, there is a strong argument in favour of establishing an Advisory Board on ICM for SCE, to ensure sustainability supported by an ecosystem approach and the principles that govern it (without taking into consideration the ecosystem vision and its impact on the sustainability of the environmental services that they provide and that constitute, to a large extent, the economic basis of the territories).

In terms of Output 1.4, Activity 1.4.3, "development and implementation of specific mechanisms for the generation of sustainable funds", the structure of the project was designed so that this activity summarizes and is the theme of the economic valuations of the productive pilot projects, carried out by the three key sectors of the project. These are the first economic valuations carried out in Cuba associated with the conservation of biodiversity, in the context that this natural resource is used in productive activities being carried out by different economic sectors.

These impacts will be highlighted as part of the assessment of each of the aforementioned Outcomes, Outputs, and Activities of the project.

2. OBJECTIVES OF THE FINAL EVALUATION

- Analysis and reporting on the level of adherence to the recommendations made in the MTE, in terms of corrective actions, those to reinforce project benefits, and those directed at extending accomplishments, with an emphasis on the former.
- Based on the latest PIR of June 2014 review the level of achievement of the project objective in terms of the indicators of the logical framework, with this achievement being expected between the last PIR (June 2014) and this FE.
- Carry out a comprehensive analysis to determine to what extent the fundamental premises that are the basis of project implementation have been achieved, in accordance with its design, in terms of:

  - strengthening of inter-institutional coordination, through the creation of systemic and institutional capacities in the territories of the five provinces and municipalities that they cover, led by the creation of an Integrated Coastal Management Authority (or Board or Body), at that level.

  - The development of sustainable financial mechanisms for the conservation of biodiversity and conservation linked to activities to manage tourism, fisheries, forestry and agriculture/ livestock management in the vicinity of the protected areas, with the productive activities of the larger landscape. The extent to which project actions have led to the introduction of the proposed mechanisms, within the scope of the adoption of institutional decisions.

  - General assessment of the added value of Phase 3 of the project (productive landscapes, sustainability of the effects of GEF's interventions), as part of a long strategy of intervention of the Government of Cuba in the Sabana Camagüey Ecosystem. Evaluate how this phase has contributed to the conservation of ecosystems of global importance in the Sabana Camagüey Ecosystem in the long term.

  - Achievement of the project Outcomes, Outputs, and Activities in terms of implementation and execution.

  - Identification of detailed recommendations for each expected project Outcome and its target, with proposals for corrective measures that should be recommended to the government, for future implementation, in order to consolidate the environmental, institutional, financial and social sustainability of the Outcomes and impacts of the project.

  - Capacity of the national counterpart to support the project in terms of mobilization of co-financing/ coordination. Levels of co-financing obtained to date.

3. SCOPE OF THE FINAL PROJECT EVALUATION

The Final Evaluation should be based on the five main criteria, which are: relevance, effectiveness, efficiency, results, and sustainability. These criteria will be defined based on a series of questions that should cover the following aspects of the project:

- Detailed analysis of the achievement of the indicators of the Project Logical Framework, and their targets, throughout the project, and especially, what was achieved and reported on in the last PIR (June 2014) and to date, in terms of pending actions in the short term.
- Capacity of the project to mobilize funds, in terms of co-financing; creation of partnerships with NGOs (national and international) specialized and interested in the topics of the project; level of coordination with other national and external partners.
- Assessment of the activities oriented at the long-term sustainability of the actions carried out with the project.
- Detailed analysis of the stakeholders directly and indirectly involved in the project.
- Scope and level of support and coordination provided by the UNDP Country Office as the Implementing Agency for the project.
- Analysis of the risks and mitigation plan.
- The evaluation team should present an analysis of the level of fulfillment of the recommendations made by the Mid-Term Evaluation team, which were accepted, for each aspect analyzed and for each expected outcome, which will facilitate the preparation of an action plan by the Project Management Unit to address these recommendations.
- Means by which the project contributed to systemic changes in the key productive and environmental sectors of the country, in the SCE, and potentially the entire country.

In addition, the following specific aspects should be addressed, including:

- Contributions to theoretical approaches related to environmental management in coastal zones.
- ICM in the project area. Extent to which the ICM authorities have been institutionalized, from the local level to the ecosystem scale. Impact of the ICM Authorities on the conservation of biodiversity in their areas, on the productive sectors and on the ecosystem approach. Updating of the content and scope of the ICM Advisory Board for the SCE.
- Network of Capacity Building Centres for ICM. Growth during the time period of the project, compared to the planned total. Functioning. Relevance. Results. Impacts.
- Work with communities and creation of capacities to carry out ICM with key stakeholders.
- M&E system implemented by the project to evaluate the performance and results of ICM, from the local level. Ascertain degree of acceptance by the Environmental Authority for its implementation.
- Sustainability of ICM in the SCE, once the project intervention ends. Institutional and financial elements that ensure this.
- Assessment of the effectiveness of the activities carried out by the project in terms of increasing the sustainable performance of the tourism sector in the ecosystem: project contributions to increasing the key role that it should play in the institutional development of nature tourism. Indicators of sustainability of tourism. Level of validation achieved. Advances in the proposed mechanisms for the financial sustainability of the sector, in terms of the approaches that the project was to introduce.
- Level of success within the fishing sector in applying demonstrative sustainable fisheries practices and replication of sponge cultivation, and in the establishment and application of Fisheries Resolution 503 of 2012 on the banning of bottom trawlers in Cuba and the proposed Resolution of the sector to declare one area as a Special Use and Protection Zone (ZBREUP),

where based on the agreement adopted, fishing would be completely prohibited, or certain fishing would be accepted (lobster, sea cucumbers, sponges) that does not affect the marine habitat.

- Improvement in the systems for agricultural and forestry production, through the adoption of sustainable practices introduced by the project, in the lands formerly dedicated to the sugar cane industry and their institutional sustainability. Extent to which the management practices will have an impact on the conservation of biodiversity.
- Sustainable methods for the management of small and large livestock in the pilot agricultural areas. Upscaling to the ecosystem level.
- Management and use of waste from agricultural and livestock raising activities.
- Assessment of the productive alternatives for the sustainable management of natural resources put in place. Analysis of the productive systems; evaluation of the ecological functions.
- Contribution of the project in the analysis of sustainable financing approaches that were developed at the level of systems of production (agriculture, livestock raising, fishing and tourism activity) as productive sectors that make use of ecosystem goods and services. Impacts and contributions toward the adoption in the short term of national financial policies related to financing for the conservation of biodiversity.
- Role of the project in the promotion of biological corridors and creation of connectivity routes, by carrying out reforestation with native species. Advances achieved, expected results in terms of their impacts on future policies to be put in place for the forestry sector.
- Fulfilment of the forestry management plans with the use of native species, establishment of nurseries for this purpose.
- Extent to which the project took advantage of, supported, and disseminated the existing agricultural and livestock management experiences in the country, for their adoption on lands that were formerly dedicated to sugar cane production.

4. EXPECTED EVALUATION DELIVERABLES

It is expected that the project evaluation team will develop three products that are described in the Guide for GEF project evaluations (Annex 1) :

- An Inception Report, which will be developed and submitted prior to the visit of the consultants to Cuba;
- An oral presentation of the main findings of the evaluation to the UNDP Country Office (CO) and the Project Team (Management Unit) before the conclusion of the visit, to allow for clarification and validation of key findings;
- Final Evaluation Report, which will be in line with the description in the Guide for Evaluations (Report Outline). The Final Evaluation Report must be submitted in Spanish and in English.

5. METHODOLOGY OR APPROACH TO THE EVALUATION

In so far as possible, The MTE report will be structured in accordance with the guidelines of the Guide for Evaluations (Annex 1). It is recommended that the evaluation team present its proposal for conducting the evaluation, which will be included in the Inception Report. The list of documents to be reviewed by the evaluation team is found in Annex 3.

6. EVALUATION TEAM

The Team of Evaluators will consist of two international and one national specialist, all with over 10 years of professional experience and postgraduate training related to the project. Their professional profiles will include a wide range of skills and knowledge, expertise in carrying out analyses and project evaluations and skills in technical aspects related to the conservation and sustainable use of biodiversity , as well as experience in social and economic development, and the linkages of these with public policies of the environmental sector. The evaluators should also have updated knowledge of the strategies and policies of the GEF.

Preference will be given to evaluators with experience working in Latin America and the Caribbean. In addition, the evaluators must have a good knowledge of Spanish and English as the working languages for this assignment.

The consultants in charge of the Final Evaluation will be subject to the ethical standards referred to in the Guide and must sign the Code of Conduct (Annex 4) once they accept the assignment.

One evaluator will serve as Team Leader and will be responsible for submitting the evaluation report. This Leader will coordinate with the rest of the team to define the methodology of the work and the timing of their inputs for the report and the final revisions.

Table 1 - Profiles of the evaluators

First and last names/ country of origin	**Responsibility within evaluation team**	**Experience**
Alexandra Fischer	Evaluation Team Leader	Extensive experience in the design and evaluation of UNDP/ GEF projects for the conservation of biodiversity, in particular marine/ coastal biodiversity. International consultant for UNDP for Latin America and the Caribbean. Formerly consultant for the Convention on Biological Diversity, IDRC and the National Association for the Conservation of Nature (ANCON), among others. Expert in evaluation of natural resources.
Manuel Roberto Gondim de Andrade, Brazil, based in Chile	Member	Fishing engineer. Doctorate of Economics in the Public Sector. National coordinator of the UNDP/GEF project on globally important biodiversity (Chilean coast). Consultant and coordinator of the project to support the Network of Aquaculture in the Americas. Consultant of CEPAL on economic aspects related to the Global Program of Action for the Protection of Marine Habitat of the activities carried out in the terrestrial areas and the agreement on high seas fishing for the inclusion of economic aspects related to the management of coastal and marine biodiversity. Evaluator of UNDP/GEF projects.
Aida Ramírez	National member of the evaluation team.	Will have the role of advising the others members of the evaluation team on issues related to the national context. In addition, as a result of her professional experience, will be able to contribute to the analysis carried out for Outcome 4. Master's in Biological Sciences, specializing in nutritional biochemistry. DrC. National veterinary biochemistry. Executive Secretary of Scientific/

		technical problems/ programs on issues related to milk and beef production, pastures, feed, pork production, poultry, veterinary pharmaceuticals, biotechnology applied to animal health and reproduction. CECT and ACC, Havana, Cuba. 1975-1992. Manager of National Programs of Science and Technological Innovation on issues related to protein production and animal feed using biotechnological means, sustainable biotechnologies, plant improvement and plant genetic resources.

Independently of the specific profiles of the consultants who are members of the evaluation team, the following general aspects should be evaluated:

- Level of achievement of the goal of the project and the specific objectives. Lessons learned (including lessons that can improve the design and implementation of other UNDP/GEF projects), as well as organizational and development learning.
- Executing capacity of the different levels of the project (municipal, provincial, key productive sectors), carefully assessing the demonstrated ability to carry out their specific responsibilities.
- How the different bodies interacted with each other, and how they maintained a clear definition of roles and responsibilities.

7. IMPLEMENTATION ARRANGEMENTS

The UNDP Country Office in conjunction with the Project Management Unit will be responsible for the coordination and logistical arrangements for the evaluation and will also provide support to the Evaluation Team (transportation, lodging, office space, communications, etc.). They will pay the per diems and contractual payments in a timely manner, as well as organize the site visits.

The evaluation team will meet with UNDP Cuba at the beginning and end of the mission. Teleconferences will be organized with the Regional Technical Advisor (RTA) in charge of the project in the UNDP Regional Service Centre in Panama. Other meetings may be arranged as deemed necessary by any of the parties.

Payment details:

The evaluators will be hired using project funds. The payment schedule is 50 % upon delivery of the first draft of the evaluation report to UNDP Cuba. The remaining 50% will be paid once the final report has been completed and approved by UNDP Cuba and UNDP/GEF-RSC(upon signature by UNDP Cuba and UNDP RCE of Annex 5) .. The quality of the final report will be evaluated by UNDP Cuba and UNDP/GEF-RSC. If the quality of the report does not meet the standards or requirements of UNDP/GEF, the evaluators will be asked to rewrite or revise the document (as often as necessary) before the final payment is made.

The hiring of the international evaluators will be funded by the budget provided by GEF for the project and the national evaluator will be part of Cuba's contribution to the project, apart from the expenses incurred from their participation in activities outside of their province of residence. In this respect, they will receive the same amount for per diems as the other members of the evaluation team.

Timeline

The evaluation will be carried out in the period between March and May 2015.

Upon signature of the contract, the documents listed in Annex 3 will be sent to the consultants. Based on the revision of the documents, the consultants will have two weeks to prepare and send the Inception Report to the UNDP Country Office. The UNDP Country Office and the Project Management Unit will review the Inception Report and will correspond with the Evaluating Team to refine the report based on the suggestions of both offices. The Inception Report should be finalized no more than 2 weeks after it is first submitted by the Evaluation Team (ET). After this, the Evaluation team will carry out a 10-day mission to Cuba which will include the following activities:

- Meeting with the UNDP Country Office and teleconference with UNDP Regional Technical Advisor;
- Meetings with key stakeholders in the country (decision makers of the Environmental Authority and key productive sectors involved in the project);
- Joint revision of all the material available with a focused attention on the Outcomes and Outputs of the project.

  - Observation and review of completed field activities (development of capacities, awareness raising/ education, sustainable use demonstration activities, demonstration of implemented tourism activities, community development, etc.)

  - Meetings with beneficiaries and key stakeholders, including representatives of local authorities, local environmental authorities, key stakeholders in the communities, etc.

The first draft of the Evaluation Report will be submitted by the ET to the UNDP Cuba Country Office within three weeks of the end of the mission.

The UNDP Cuba Country Office together with the Project Management Unit will have two weeks to review the Evaluation Report and return it to the evaluators with comments.

The presentation of the Final Evaluation Report will occur no more than two weeks after the evaluators have received the comments from the UNDP Cuba Country Office.

The report will be considered finalized once the expectations for the evaluation have been met and the quality of the report meets the standards and requirements of UNDP/GEF. The UNDP Country Office and the UNDP Regional Office will sign the form in Annex 5 to confirm their acceptance of the final report.

Annex 6: Project Management Unit

Project Management Unit (UMP)

CITMA: Project coordination and General Administration (Environment Agency).
Advisor on Terrestrial Biodiversity (Institute of Systematic Ecology)
Advisor on Marine Biodiversity (Institute of Oceanography)
Advisor on Sustainable Financing, Environment Directorate, CITMA
Advisor on Environmental Law, Environment Directorate, CITMA
Advisor on Protected Areas, National Protected Areas Centre
Provincial Project Coordinators in the 5 provinces of the SCE
MINTUR: Executive Coordinador. School of Higher Studies in Tourism, FORMATUR, Ciego de Ávila, MINTUR
MINAL (formerly MIP): Coordinator for the sector. Deputy Director of Centre for Fisheries Research (CIP)
AZCUBA (formerly MINAZ): Animal Husbandry Directorate.
MINAG: Coordinator of the sector, Mountain Agriculture Enterprise (Forestry).

Fisheries
(Management of Centre for Fisheries Research

Tourism
(FORMATUR, MINTUR)

Agriculture / Animal Husbandry /Forestry
(Animal Husbandry Directorate AZCUBA)

Technical Working Groups

Fisheries
Municipal Landings Control Bureau of Caibarién (province of Villa Clara)

Office of Fisheries Inspection

Tourism
Centre for Sustainable Tourism Development, Ciego de Ávila (Executive Coordinator of project)
FORMATUR schools in the other 4 provinces of SCE,
Tourism Companies (Cubanacán, Gran Caribe, Gaviota, Marinas and Náuticas Marlin), Emprestur, Hotel managers, tour operators
Pilot project areas: Jobo Rosado APRM, administered by the National Enterprise for the Protection of Flora and Fauna (ENPFF, MINAG), Caguanes NP, administered by CITMA, Laguna La Redonda, administered by MINTUR, Río Máximo Forest Reserve (ENPFF).

Agriculture/Animal Husbandry/ Forestry
Mountain Agriculture Enterprise, GEAM, MINAG (forestry activity)

UBPC Guamuta, UBPC Nela, UBPC Monteluca, IBPC Yarual, Chambas, Morón, Minas, Martí municipal nurseries
Cuba Association of Animal Production (NGO)
Bio Research Centre, CITMA, Ciego de Ávila

Annex 7: Signed Evaluation Consultant Code of Conduct Agreement Forms (see separate files)

TERMINAL EVALUATION

ENHANCING THE PREVENTION, CONTROL AND MANAGEMENT OF INVASIVE ALIEN SPECIES IN VULNERABLE ECOSYSTEMS IN CUBA

Dichrostachys cinerea - marabú

Dr. Silvia R. Ziller, Forest Engineer, International Evaluator

Dr. Mercedes Arellano Acosta, Geophysical Engineer, National Evaluator

DECEMBER 2016

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I PROJECT IDENTIFICATION

Project Title: Enhancing the Prevention, Control and Management of Invasive Alien Species in Vulnerable Ecosystems in Cuba

Project type: FSP

Project number (GEF): 71327 4

Project number (PNUD): 3990 5

Evaluation period: September 2016 – December 2016

Terminal evaluation report date: December 2016

Country: Cuba

GEF operational program: Biodiversity

GEF strategic program: SP7 Invasive alien species

Executing agency: Ministry of Science, Technology and Environment (CITMA), National Center for Protected Areas (CNAP)

Terminal evaluation members: Silvia R. Ziller (Lead) and Mercedes Arellano

Acknowledgements: The Terminal Evaluation members thank the UNDP Country Office in Cuba, the Project Management Unit, and all people in Cuban governmental agencies as well as all people in provincial agencies and communities where the project was implemented for their support and collaboration in the evaluation process. We would also like to thank all the people who were directly or indirectly involved in the project who contributed to the development of project activities and provided information to our findings.

II EXECUTIVE SUMMARY

PROJECT SUMMARY TABLE

Project title:	Enhancing the Prevention, Control and Management of Invasive Alien Species in Vulnerable Ecosystems in Cuba			
GEF project ID:	3955		*Upon GEF endorsement (Million US $)*	*At completion* (Million US $)*
UNDP project ID:	78464	GEF financing:	USD 5.018.182	USD 4.866.586,38 on 30 Sep 2016 (97%)
Country:	Cuba	IA / EA own (UNDP):	USD 50.000	USD 50.000
Region:	Latin America / Caribbean	Government:	CUP 9.950.000	**CUP 11.200.250**
GEF Focal area:	Biodiversity	Other:	n/a	n/a
GEF Operational program / Strategic priority):	GEF 5, BD 7	Total co-financing:	CUP 10.000.000	**CUP 11.200.250**
Executing agency:	National Center for Protected Areas (CNAP)	Total project cost:	15.018.182	16.268.432
Other partners involved:		PRODOC signature (Project began):		14-Jun-2011
		(Operational) Closing date:	Proposed: 30-Jun-2016	Actual: **31-Dic-2016**

PROJECT DESCRIPTION

Three main approaches were defined in order to reach project objectives:

a) strengthening the political and legal frameworks and coordination mechanisms to prevent, detect, control, and manage the spread of invasive alien species (IAS);
b) increasing knowledge, capacity and communication among stakeholders for effective prevention, detection, and management of IAS;
c) strengthening institutional capacities to ensure effective implementation of prevention, detection and management actions of IAS for the conservation of biodiversity.

PROJECT RATINGS TABLE

Criteria:			
1. Monitoring and evaluation	**Rating**	**2. IA / EA implementation**	**Rating**
M&E design at beginning	**S**	Quality of UNDP implementation	**HS**
M&E plan implementation	**HS**	Quality of EA implementation	**HS**
General M&E quality	**S**	General quality of implementation	**HS**
3. Evaluation of outcomes		**4. Sustainability**	
Relevance	**R**	Financial:	**L**
Effectiveness	**HS**	Socio-political:	**L**
Efficiency	**S**	Institutional / governance	**L**
General outcome rating	**HS**	Environmental	**ML**
		General sustainability rating	**ML**
		5. Impact	**S**

Note: Ratings are: Highly Satisfactory (HS), Satisfactory (S) Moderately Satisfactory (MS), Moderately Unsatisfactory (MU), Unsatisfactory (U), Highly Unsatisfactory (HU).
Relevance ratings are: Relevant (R) or Irrelevant (I).
Project sustainability ratings are: Moderately Unlikely (MU), Unlikly (U), Moderately Likely (ML) and Likely (L).
Impact ratings are: Significant (S), Minimal (M), Negligible (N).

SUMMARY OF CONCLUSIONS, RECOMMENDATIONS, AND LESSONS LEARNED

CONCLUSIONS

All targets defined in the PRODOC have been reached and all products generated under commendable financial management within the implementation time frame.

The limitations observed in the terminal evaluation are of technical order, which is not surprising given that this is the first approach to IAS management in the country.

The project contributed to improve environmental management at the national level and strengthen ties of the environmental sector with other relevant sectors.

Gaps in the National Strategy for the Environment and the National Biological Diversity Program were filled with the inclusion of actions on IAS.

More than 1,000 professionals from about 30 national and local institutions (in provinces and municipalities) have improved their knowledge and understanding of IAS in Cuba.

Technical documents for management and monitoring IAS were produced to consolidate experiences and knowledge gained from project implementation.

Considering that the science of IAS is relatively new in Cuba, promoting capacity building and information workshops in different provinces was a key strategy to improve the level of understanding of IAS in the country.

The increase in the amount of co-financing initially planned is a significant indicator of commitment by the Cuban government towards action on IAS.

RECOMMENDATIONS

Increase IAS management efforts in terms of area and number of species.

Plan and execute activities included in the five sections of the "National Program to Prevent, Manage and Control IAS in the Republic of Cuba" (2012-2020).

Plan and execute activities included in the five sections of the "National Program to Prevent, Manage and Control IAS in the Republic of Cuba to the principal employees in the environmental sector, productive sectors related to IAS issues, research centers and universities related to Biology and Agronomy.

Develop and propose approval of regulations for the Early Warning System to ensure its consolidation in the Cuban institutional framework.

Consolidate and officially publish alien species lists with respective regulations that clarify permitted and restricted use for each species or group of species.

Establish specific regulations for IAS to be contemplated with economic incentives.

Not use the Risk Analysis Guide for Alien Species because it is highly subjective.

Revise the Screening Method for Alien Species Lists.

Screen species for the alien species lists in two stages.

Revise the Management Effectiveness Methodology.

Maintain and continue updating the Invasive Alien Species Management Information System.

Widely disseminate the AIS Management Information System.

Integrate at least 20-30% of native species to productive landscapes to improve ecosystem functions and other benefits.

Plan management actions for areas, not species.

Totally exclude the use of non-native species, planting only native ones, in restoration of natural areas. Planting non-native species in restoration sites in natural areas does not contribute to ecosystem functioning.

Not use species already identified as IAS for landscaping or other secondary uses.

Future projects and actions:

Recommendations on the relevant components for IAS governance and management projects should include: national and provincial policies and regulations on biodiversity conservation include IAS; capacity building; development of a national information system or database; publication of official IAS lists; development of early detection and rapid response networks; formal recognition of IAS management as a priority for protected areas and other areas relevant to biodiversity conservation; mainstreaming native species into productive landscapes; climate adaptation practices linked to IAS.

Future actions based on project implementation

Widely disseminate the Early Warning System so the general public understands the procedures to contribute information on IAS occurrences.

Develop specific regulations for IAS in productive systems.

Develop economic incentives for the use of native species for several purposes.

Expand IAS management other species focusing on sites rather than species.

Identify and produce native species and make them available to replace some IAS in use.

Consider chemical control as a tool for invasive alien plant management.

Consider biological control as a feasible control method for *Melaleuca quinquenervia* because many of the areas now invaded are not accessible on foot or on boat.

LESSONS LEARNED

Concerning project management

IAS prevention, management and control projects catalyze the involvement of sectors which are not often part of environmental management.

Regular meetings organized in one province at a time allowed project participants to share, exchange, teach and learn from activities under implementation.

Assigning coordinators for each province improved the efficiency of technical and financial management.

The production of detailed quarterly reports by provincial coordinators allowed the PMU to supervise ongoing activities, understand difficulties and constraints, and provide support as necessary.

Inclusion of IAS issues in national policies and regulations combined with capacity building and public information provided a robust guarantee of sustainability for project activities.

Concerning project implementation

Integration of several sectors related to environmental management and natural resource use, as well as the academic – scientific sector, is key in IAS management projects.

The high accomplishment rate of the project was due to cooperative work, regular meetings in different areas, good communication with coordinators, annual lessons learned workshops, and regular visits to project sites.

The inclusion of IAS issues in massive media is an effective way of involving the general public in providing information for the early warning system.

The existence of biodiversity monitoring programs contributes to the understanding of the effects of climate change on ecosystems and species.

The perception and knowledge of community members is key in the interpretation of environmental changes due to climate change.

The insertion of IAS issues in the educational system and in Pedagogical Universities contributes to extending the knowledge gained through the project to future generations.

III ACRONYMS AND ABBREVIATIONS

ACTAF	Cuban Technical Association of AgroForestry Professionals
AMA	Environmental Agency
ANAP	National Association of Small Farmers
ANC	National Aquarium of Cuba
AOP	Annual Operational Plan
BD	Biological Diversity
CDP	Project Steering Committee
CDR	Combined Delivery Report
CDR	Combined Delivery Report
CGB	Forest Ranger Corps
CGF	Frontier Guard Corps
CICA	Environmental Inspection and Control Center
CIGEA	Environmental Information, Management, and Education Center
CITMA	Ministry of Science, Technology, and Environment
CNAP	National Center for Protected Areas
CNSV	National Center for Plant Biosecurity
CPD	Country Program Document
CSB	National Center for Biological Security
CSR	Regional Services Center
CUC	Convertible Cuban pesos
CUP	Cuban pesos
EA	Executing Agency
EMED	Company for Importation of Goods, Equipment and Donations (part of MINCEX)
ET	Evaluation Team
GEF	Global Environment Facility
GIS	Geografic Information System
IA	Implementing Agency
IAS	Invasive Alien Species
IES	Institute of Ecology and Systematics
IMV	Institute of Veterinary Medicine
INSMET	Institute of Meteorology
M&E	Monitoring & Evaluation
MANUD	UN Development Assistance Framework
MINAG	Ministry of Agriculture
MINAL	Ministry of Food Industry
MINCEX	Ministry of External Trade
MININT	Ministry of Interior
MINSAP	Ministry of Public Health
MINTUR	Ministry of Tourism
MITRANS	Ministry of Transport
MNHN	National Natural History Museum
MTE	Mid-Term Evaluation
NGO	Non-governmental Organization
OP	GEF Operational Program
ORASEN	Environmental Regulations and Nuclear Security Office
PIR	Project Implementation Report
PMU	Project Management Unit
QOR	Quarterly Operational Report
QOR	Quarterly Operational Report
SEF	State Forest Service
SNAP	National Protected Area System
SRF	Strategic Results Framework
TE	Terminal Evaluation
ToR	Terms of Reference
UMA	Environment Units
UNDP	United Nations Development Program
UNDP CO	UNDP Country Office
WWF	World Wide Fund for Nature

1 INTRODUCTION

According to UNDP and GEF M&E policies and procedures, all regular and medium size projects implemented by the UNDP and financed by the GEF must undergo a terminal evaluation once completed. This terminal evaluation was executed between September and December, 2016. The TE mission covered visits to participating institutions and sites where project activities were developed, between October 3rd and 13, 2016.

1.1 PURPOSE OF EVALUATION

To verify whether all objectives and goals set at the beginning of the project were fulfilled, or how much was accomplished, based on the indicators defined in the Strategic Results Framework (SRF). Assess project implementation in terms of relevance, efficiency, and effectiveness in fulfilling the expected outcomes, sustainability, and impact, using the GEF rating scales. Point out the project main accomplishments, difficulties, and lessons learned. Assess the technical quality of outcomes, products, and programs developed through the project. Make recommendations for continuing activities after project termination, as well as for other GEF funded projects to benefit from successful management and outcomes.

1.2 SCOPE AND METHODS

The Evaluation Team (ET) was formed by an international evaluator (Dr. Silvia R. Ziller, The Horus Institute for Environmental Conservation and Development, Brazil, with expertise on IAS), as Team Lead, and a national evaluator (Dr. Mercedes Arellano, of the National Environmental Agency). Both evaluators signed the Code of Conduct of the United Nations Evaluation Group (UNEG) before leaving for the evaluation mission. The highest ethical standards were applied during the entire evaluation, with respect to all confidential information received and transparency about methods used.

Before setting out on the mission, the ET assessed relevant project documents. The PRODOC, the MTE, and the 2015 PIR were especially useful. Budget reviews, M&E tools, and the strategic results framework were thoroughly studied, among other documents (Annex 5.5). The products (outputs) generated by the project team on methodologies, management programs, monitoring protocols, and the information, early detection, and monitoring systems, as well as other documents such as the PIR 2016, were reviewed during or after the mission. Results of these reviews are included in the findings section of this document, and led to a number of recommendations (section 4).

The “Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-financed projects” was used as a basis for the evaluation. The TE was conducted with a focus on the UNDP criteria of Relevance, Effectiveness, Efficiency, Sustainability, and Impact. Questions considered relevant by the ET were added to the ones suggested in the ToR.

During the field visits and meetings with participants, the ET tried to maximize participation by all involved in project activities, from government employees to NGOs, scientists and professors, and people from communities. The UNDP Country Office staff and the PMU were interviewed

on the first day of the mission, providing relevant information on the outcomes and project development and management.

Despite the recommendation in the ToR for a meeting with the GEF/UNDP Regional Technical Assistant, Lyes Ferroukhi, for advice on relevant information to be gathered during the mission, he was not available due to emergency situations in other countries. The UNDP CO staff informed him of progress, but it wasn't until after the mission that he was able to meet briefly with Dr. Mercedes Arellano to discuss priority recommendations.

The ET visited project sites selected by the PMU in different provinces, where each local group made presentations of activities and outcomes. Once the presentations were concluded, the PMU would leave the room to allow the ET to freely talk to the participants who represented several institutions, organizations, and communities. The questionnaire used (Annex 5.6) helped guide the evaluation and maintain focus on the five evaluation criteria, although they were adjusted to each specific context and audience, their knowledge and role in the project (Annex 5.3).

The TE schedule was well planned and efficient. Visiting some of the project sites was very important for understanding the context of project implementation and IAS management, as well as observe the degree of involvement of persons, communities and organizations. The provincial coordinators who presented the work undertaken were especially important as indicators of commitment, interest and knowledge about implemented activities. The travel hours between sites were useful to gather complementary information from the PMU, which greatly contributed to the proper understanding of many details. The time dedicated to the mission was sufficient. Even though it was not possible to reach Santiago de Cuba due to the recent damage caused by hurricane Matthew, the ET considered that enough information had been gathered from the sites visited. Further interaction between the ET and the PMU by email was important for clarifications, information exchange, and requests for complementary documents.

At the end of the mission, in La Habana, the ET made a presentation on findings to the UNDP staff and PMU. The information was organized by evaluation criteria, to which the ET added a section on limitations and risks. The ET then produced the draft Terminal Evaluation Report, which was reviewed by the UNDP and the PMU. This report is the final version, to which all relevant comments and additional information provided during the review were incorporated. We hope that the technical explanations, recommendations, and lessons learned are useful for continued actions on IAS management in Cuba, as well as for new projects to be funded in the future for Cuba and other countries on the management of invasive alien species.

1.3 TERMINAL EVALUATION REPORT STRUCTURE

a) Project Identification and Executive Summary.

b) Introduction, objectives, scope and methods, brief description and context of development.

c) Findings on project formulation, project implementation and outcomes.

d) Conclusions, recommendations, best and worst practices, and lessons learned.

e) Annexes.

2 PROJECT DESCRIPTION AND CONTEXT OF DEVELOPMENT

2.1 PROJECT START AND DURATION

The project was officially started on June 14, 2011, when the PRODOC was signed. The total duration of the project amounts to five years and six months, closing on December 31, 2016.

2.2 PROBLEMS THAT THE PROJECT SOUGHT TO ADDRESS

The project was designed to protect vulnerable freshwater and terrestrial ecosystems, species and genetic diversity in Cuba from the impact of IAS. To meet this objective, national and institutional policies were strengthened, and technical and institutional capacities improved for IAS management. Multi-sectoral cooperation was sought for the effective implementation of policies, capacities and practical management actions. Practical management focused on the control of priority IAS was implemented in natural areas and productive landscapes.

2.3 IMMEDIATE AND DEVELOPMENT OBJECTIVES OF THE PROJECT

Three main strategies were designed to achieve the expected outcomes: (a) strengthening political, regulatory and legal frameworks on IAS while building cooperation mechanisms among relevant sectors, institutions, and stakeholders; (b) building capacity and technical knowledge, and disseminating public information; and (c) implementing early detection and rapid response actions in the field while strengthening institutional capacity for IAS prevention, control and management.

All Cuban provinces were involved, represented by a large number of government agency stakeholders, researchers and scientists, NGOs and communities in project sites. The National Strategy for IAS was incorporated in the National Strategy for the Environment for 2014- 2020 and shall guide further implementation once the project is concluded.

2.4 BASELINE INDICATORS ESTABLISHED

Objective / Outcomes	**Indicators**
Globally significant biodiversity in vulnerable ecosystems safeguarded by building capacity at the systemic level to prevent, detect, control, and manage the spread of Invasive Alien Species (IAS) in Cuba.	Increased effectiveness of IAS management framework measured through GEF Tracking tool.
	Increase in area under improved IAS management.
	Priority given to BD issues in the prevention, control, and management of IAS, measured by: - investments in IAS activities by MINAG, MINAL, MITRANS, CITMA y MINSAP. - % of quarantine, risk analysis, and EIAs that incorporate analysis of impact of IAS on BD. - % of management plans that include species recuperation and/or ecosystem restoration and rehabilitation activities.
	Native species addition or status change on IUCN list red list.
Outcome 1: Operational IAS policy, legal,	Comprehensive national and sectoral policy and legal framework in place by establishing a national IAS strategy and establishing, updating, and/or complementing the following regulations: black list and gray list, risk analysis, EIA, protocols, normative documents and quarantine mechanisms, monitoring and surveillance, early warning and rapid

regulatory, and coordination frameworks that prevent, detect, and manage the spread of IAS and mitigate impact of IAS on biodiversity are strengthened and implemented.	response system, ballast waters and ship hulls, plant protection/health legislation, and procedures for elaboration management plans.
	Methodologies to develop indicators to measure compliance with environmental legislation.
	Economic incentives and disincentives control the introduction and use of IAS in production sectors and facilitate management of IAS.
	Institutional framework for IAS control between stakeholders and across sectors legally backed.
Outcome 2: Stakeholder capacity, know- how, and communications are enhanced for effective IAS prevention, detection, and management.	Number of knowledge products developed.
	Increased stakeholder skill-set and knowledge on scientific bases, legal 11tools and management approaches for IAS control.
Outcome 3: Institutional capacities are strengthened to ensure the effective implementation of prevention, detection, and management of IAS mitigate their impact on BD and ecosystem services.	# of penalties enforced related to violation of IAS regulations. # of illegal point of entry detections.
	# of IAS under monitoring and surveillance as part of early warning system.
	IAS management actions are implemented to eradicate, contain and/or control existing IAS species threatening native flora and fauna in 7 biodiversity critical wildlands and productive areas.
	Implementation of IAS monitoring system measures effect of management actions and tracks IAS impact on ecosystems, habitats, species, and genetic diversity.
	Frequency of use of IAS Information System by key national and local actors: - regulatory authorities and management experts; - academic and research institutes; - productive sectors; - other sectors.

2.5 MAIN STAKEHOLDERS

A large number of government agencies and institutes, universities, and NGOs were listed for involvement in the project from the design phase, as listed below. Most of these organizations participated in project design in workshops held for the purposes of leveraging participation and requesting contributions to project goals and outcomes.

1. Republic General Customs (AGR)
2. Ministry of Science, Technology and Environment (CITMA)
   - 2.1 Environment Direction (DMA)
   - 2.2 National Protected Area Center (CNAP)
   - 2.3 Environmental Regulations and Nuclear Security Office (ORASEN)
     - Center for Environmental Inspection and Control (CICA)
     - Center for Biological Security (CSB)
   - 2.4 Environmental Agency (AMA)
     - Institute of Ecology and Systematics (IES)
     - National Aquarium of Cuba (ANC)
     - National History Museum (MNHN)
   - 2.5 Provincial Environmental Studies Centers (from provinces where project sites were established)
3. Civil Aeronautics Institute of Cuba

4. Ministry of Higher Education (MES)
5. Ministry of Construction
6. Ministry of Agriculture (MINAG)
    6.1 State Forest Service (SEF)
    6.2 Integrated Forest Companies
    6.3 National Center of Plant Security (CNSV)
    6.4 Institute of Veterinary Medicine (IMV)
    6.5 National Company for the Conservation of Flora and Fauna
    6.6 Institute of Forest Research
    6.7 National Center for Plant Protection
7. Ministry of Food Industry (MINAL)
    7.1 Independent Department of Science
    7.2 Center of Fisheries Research
8. Ministry of Revolutionary Armed Forces (MINFAR)
9. Ministry of Interior (MININT)
    9.1 Forest Ranger Corps
    9.2 Frontier Guard Corps
10. Ministry of Public Health (MINSAP)
11. Ministry of Transport (MITRANS)
    11.1 Maritime Inspection and Security Direction

2.6 EXPECTED OUTCOMES

Outcome 1: Operational IAS policy, legal, regulatory, and coordination frameworks that prevent, detect, and manage the spread of IAS and mitigate impact of IAS on biodiversity are strengthened and implemented.

Outcome 2: Stakeholder capacity, know-how, and communications are enhanced for effective IAS prevention, detection, and management.

Outcome 3: Institutional capacities are strengthened to ensure the effective implementation of prevention, detection, and management of IAS mitigate their impact on biodiversity and ecosystem services.

3 FINDINGS

3.1 PROJECT FORMULATION AND DESIGN

3.1.1 Strategic results framework

Objective / Outcomes	Indicators	Target (at end of project)	ET assessment of indicators[1]
Globally significant biodiversity in vulnerable ecosystems safeguarded by building capacity at the systemic level to prevent, detect, control, and manage the spread of Invasive Alien Species (IAS) in Cuba.	Increased effectiveness of IAS management framework measured through GEF Tracking tool.	Total punctuation 23 (or 79%)	Objective indicator as used in GEF Tracking Tool
	Increase in area under improved IAS management.	At least 75,000 ha under IAS management.	Objective indicator. The original expectations in area adjusted in the 2nd year of project implementation to: **At least 20,000 ha under IAS management.** It would be important to register outcomes for natural areas and productive landscapes separately.
	Priority given to BD issues in the prevention, control, and management of IAS, measured by: - investments in IAS activities by MINAG, MINAL, MITRANS, CITMA y MINSAP. - % of quarantine, risk analysis, and EIAs that incorporate analysis of impact of IAS on BD. - % of management plans that include species recuperation and/or ecosystem restoration and rehabilitation activities.	2% increase in IAS specific investment. - 100% of quarantine, risk analysis, and EIAs incorporate BD analysis. - 100% of management plans for 26 species include these activities.	The first indicator is not clear because there is no baseline for the 2% increase investment. Objective indicator. Objective indicator for management plans written during project implementation.
	Native species addition or status change on IUCN list red list.	- No addition or status change to any native species on the red list due to effects of IAS.	This indicator is very hard to measure because many factors may influence changes in status of a threatened species, as well as its inclusion in the red list of species.
	Comprehensive national and sectoral policy and legal framework in place by establishing a national IAS	IAS regulations established, updated and complemented.	Although not quantitative, this indicator can be measured based on changes in policy and legal frameworks to include IAS.

[1] These comments are meant to improve performance of future projects, as well as for continued activities after project termination.

Outcome 1: Operational IAS policy, legal, regulatory, and coordination frameworks that prevent, detect, and manage the spread of IAS and mitigate impact of IAS on biodiversity are strengthened and implemented.	strategy and establishing, updating, and/or complementing the following regulations: black list and gray list, risk analysis, EIA, protocols, normative documents and quarantine mechanisms, monitoring and surveillance, early warning and rapid response system, ballast waters and ship hulls, plant protection/health legislation, and procedures for elaboration management plans.	National IAS strategy approved and 50% planned activities effectively implemented.	Indicator is sufficient to register progress.
	Methodologías to develop indicators to measure compliance with environmental legislation.	Methodologies proposed to develop indicators that measure compliance with environmental legislation.	Indicator is sufficient to register progress.
	Economic incentives and disincentives control the introduction and use of IAS in production sectors and facilitate management of IAS.	Three economic incentives or disincentives drafted and approved.	Measuring the application of incentives without further measures may lead to negative results, as IAS tend to be disseminated once they gain value, or because incentives are not sufficient to improve environmental conditions or native species rehabilitation. This indicator must be associated with effective results such as the increase of native species populations or effective restoration of invaded areas with native species.
	Institutional framework for IAS control between stakeholders and across sectors legally backed.	An advisory forum exists composed of experts from key sectors. National IAS Subgroup coordinates the development and implementation of IAS National Strategy. Coordination mechanisms for early warning system and information system established between 9 key regulatory authorities and other key actors.	This indicator would be more effective if outcomes due to meetings of the advisory forum were considered. This indicator would be more effective if outcomes due to meetings of the National IAS Subgroup were considered. This indicator would be more effective if responses by the early detection system were registered, e.g. number of early warnings and resulting response once the coordination mechanism is established.
Outcome 2: Stakeholder capacity, know- how, and communications are enhanced for effective	Number of knowledge products developed.	Methodologies are standardized and implemented for IAS inventory, ecosystem vulnerability assessments, risk analysis, EIA, economic valuation and cost	Objective indicator.

IAS prevention, detection, and management.		–benefit analysis, and management actions for 26 IAS. Information system designed and includes information regarding species lists, quarantine mechanisms, risk analysis and EIA, early warning response, monitoring and control, management, and coordination between institutions. IAS monitoring system contains baseline information and key indicators.	Objective indicator. Objective indicator.
		IAS monitoring system contains baseline information and key indicators.	Objective indicator.
	Increased stakeholder skill-set and knowledge on scientific bases, legal 15tools and management approaches for IAS control. Increased public knowledge and participation and stakeholder support for IAS prevention, detection, and management.	Training for and skills applied by: - 50 ballast water and ship hull contamination control specialists. - 200 specialists in IAS science； - 100 specialists in monitoring of IAS applying skills; - 30 technicians in GIS trained and applying skills; - 800 regulatory authorities, environmental managers, and representatives of the productive sectors trained in current IAS legislation; - 60% of inspectors technically qualified to apply IAS regulations. - at least 35% personnel trained are men and 40% of personnel trained are women. - 80% of participants in public awareness awareness campaigns and workshops report increased awareness of threats.	Objective indicator. Objective indicator.

Outcome 3: Institutional capacities are strengthened to ensure the effective implementation of prevention, detection, and management of IAS mitigate their impact on BD and ecosystem services.	# of penalties enforced related to violation of IAS regulations. # of illegal point of entry detections.	Reduced number of penalties imposed. Increased number of entry point detections.	These two indicators initially referred to an increase in both penalties and illegal detections, then were modified. It is difficult to attribute a decrease in the number of penalties to project activities, as many external variables can be of influence. If project actions raised enough awareness to the point of decreasing penalties, it would be more logical to also register less illegal detections at points of entry. On the other hand, if because of the influence of project activities there were more control action by government agents, it would make sense to have an increase in both penalties and detections. These indicators, therefore, seem to contradict one another. A baseline needs to be clearly set for these indicators to be properly interpreted, as well as changes in control or detection efforts, in regulations that lead to penalties or other factors that may influence the results. The information provided on these indicators has not been sufficient for the ET to conclude on their effectiveness.
	# of IAS under monitoring and surveillance as part of early warning system.	Ten IAS monitored as part of early warning system.	Objective indicator, but it does not include (or does not refer to) other species early detections that may pose eradication opportunities, and which are an essential part of early detection systems. A better indicator would consider the number of species alerts that were not on the list of priorities.
	IAS management actions are implemented to eradicate, contain and/or control existing IAS species threatening native flora and fauna in 7 biodiversity critical wildlands and productive areas.	Management actions implemented for 10 IAS results in reduced predation, loss of habitat, and/or inter-specific competition - containment of *Perna viridis*.	This indicator is very difficult to measure. It would be more feasible to use “area restored with native species”, “area recovered for productive use with non-native + native species”, “increase in endemic/native species populations”. The indicator on *Perna viridis* was changed to “containment in Bahía de Cienfuegos.
	Implementation of IAS monitoring system measures effect of management actions and tracks IAS impact on ecosystems, habitats, species, and genetic diversity.	Management actions for 5 IAS monitored and evaluated and 5 indicators that track IAS impacts on ecosystems, habitats, species, and genetic diversity are measured.	Objective indicator.
	Frequency of use of IAS Information System by key national and local actors:	Respectively: - 70%	The indicator is objective and was supposed to be assessed by interviews with potential users. This is a time-consuming

	- regulatory authorities and management experts; - academic and research institutes; - productive sectors; and - other sectors.	- 70% - 50% - 30%	method, and might not generate enough responses if carried out from a distance, as many people might not respond.

3.1.2 Assumptions and risks

The risks considered in the PRODOC are discussed in this section. Some of them may be realistic in any project, especially the risk that changes in national priorities may lower the level of importance of the project goal. Others are inherent to some of the activities developed, and to the geographic location of Cuba, which is exposed to extreme climatic events such as hurricanes. These risks were well considered in the project design as well as during implementation. Examples of risk management are explained in sections 3.2.1 on adaptive management and 3.3.6 on sustainability.

Conflicts of interest that might delay implementation of activities carried out with productive sectors were anticipated in the project design. The use of economic incentives as a strategy to involve key productive sectors greatly reduced this risk, as species that are either economically advantageous or a nuisance in production systems were prioritized for management. Because of this strategy the sectors were open to work on IAS management. Sites where IAS control is in place and proves profitable in recovering degraded areas for production purposes serve as demonstration areas, and catalyze more action.

The risk of changes in national priorities was mainly dealt with by incorporating IAS issues in national policies and regulations, a key strategy to reduce the risk of losing resources invested in project activities and increase sustainability.

Risks posed by climate change effects may cause disturbance in natural areas and productive landscapes, therefore facilitating invasion by non-native species. A monitoring network coordinated by the National Meteorological Institute has been established for a few priority IAS and native species functioning as indicators. An early detection and rapid response system was set up in order to identify new invasion *foci* and other environmental emergencies. Restoration of degraded areas as a result of IAS management is expected to increase ecosystem resilience.

As more practical actions are developed, the cost of eradication and control may become an obstacle to IAS management. So far, management costs have been appropriated by different government agencies in charge of such areas, and some economic incentives encourage control actions. A key strategy to deal with this risk is to detect initial invasions, of lower cost and higher viability in terms of effective management. Because IAs management has only recently been included in the National Protected Area System operational plan for the period 2014-2020, in a few more years it will be possible to verify the feasibility, cost and effectiveness of control actions started within the scope of the project.

Once the project ends, at least some of the activities implemented tend to be reduced or terminated for lack of funding, at least until more funds are available. Many of the participants in different provinces asserted their commitment in continuing management and monitoring actions, but the risk of lack of funds for materials, equipment or labor is realistic in any project. The productive sectors involved, on the other hand, stand better chances of continuing with the work, as part of the activities were underway before and were mostly improved by influence of the project, and all are of economic interest. Other funds available for environmental work in Cuba have been listed, mainly from FONADEF (forest development fund). The UNDP team is also committed to locating more funding opportunities to continue project activities.

Other risks to be considered are:

- Changes in personnel which received training on IAS in the mid and long terms may reduce the current awareness of IAS issues in government agencies and weaken practical actions in place. A large number of people have participated in capacity building events, so it is hoped that more interest will be raised as time passes, and more people trained and involved.
- Implementation risks were well managed by the PMU. Although significant changes occurred, these did not hinder achievements. Among such risks are difficulties and delays in importing materials for project implementation; fluctuation in the exchange rate between US dollars and Euro, the currency Cuba is obligated to use to pay for imported materials due to the US embargo; challenges in working with professionals of many different areas (education, meteorology, biology) and institutions, as well as with rural workers in accepting new technologies. The most significant management risk to project implementation was the closing of the original executing agency (CIGEA) and transfer to the National Protected Area Center (CNAP), whose directors accepted conducting activities beyond their scope of work to ensure all project goals were completed. This risk had not been anticipated, but was very well governed, with positive management results.

3.1.3 Lessons from other relevant projects

As no former projects with a broad approach on IAS had been carried out in Cuba, there were no other local projects to be used as a base for project design. Scientific data were incorporated as well as directives of national environmental policies and priorities established for biodiversity conservation. International references used were mainly programs, decisions and recommendations of the Convention on Biological Diversity.

3.1.4 Planned stakeholder participation

The involvement of relevant government agencies and institutes in the project was planned from the phase of project design. One of the best practices this project has adopted was promoting workshops even before the official start to include suggestions from participants in the project design and foster ownership. Once the project began, people were aware of its goals and of their own roles in implementation, which helped consolidate participation and commitment.

Many participating institutions allocated resources to contribute to implementation, mainly in terms of technical personnel and financing activities and materials. They have stated their commitment in continuing to conduct the activities started during the project and in applying new regulations on IAS, lessons learned, and the methods determined for IAS management and monitoring.

3.1.5 Replication approach

The project was designed to maximize the replication potential of methods, procedures, management practices and lessons learned at the national and international levels. Management and monitoring actions were tested and replicated across the country; methodological documents were produced to ensure that references are available for future replication. The emphasis on capacity building and public information was defined for the same

purpose. Papers and experiences were presented in scientific meetings in different countries. Replication actions during implementation are detailed in section 3.3.7.

3.1.6 UNDP comparative advantage

The UNDP CO in Cuba has been acting as implementing agency since the 1990s, having much experience in managing GEF projects. The UNDP CO structure and capacity ensured swiftness and precision in project implementation. Some examples are detailed in the adaptive management section 3.2.1. UNDP networks are relevant for dissemination of documents, practices and lessons learned.

3.1.7 Linkages between project and other interventions within the sector

Three workshops with national experts were organized in the design phase of the project in order to include their contribution to goals and expected results, and the selection of priority IAS and management sites. The project was also introduced to people in relevant productive sectors at this time so they could understand their role in implementation. Government regulatory authorities were addressed in the design phase, especially the National Center for Plant Health and Veterinary Medicine Institute, both under the Ministry of Agriculture; the Center for Biological Security and the Center for Environmental Inspection and Control, both part of the Environmental Regulations Office which is under the Ministry of Science, Technology and Environment (CITMA), among others. The most relevant sectors involved from the beginning are the the Ministry of Agriculture, the Ministry of Tourism, the Ministries of Education Higher Education, the fisheries division of the Ministry of Food Industry, the Forest Rangers Corps of the Ministry of Interior, relevant scientific institutes all over the country, research centers in different areas, and academic institutions, among others.

3.1.8 Management arrangements

The PMU made arrangements with many institutions from the design phase of the project for their participation and co-financing. Promoting workshops from the earliest stages was strategic to involve the necessary organizations throughout implementation. These arrangements facilitated implementation from the beginning, as roles and responsibilities were already defined and agreed upon.

According to the PRODOC, the project governing structure is a Management Committee with representation at a higher level of the Ministry of Science and Technology (CITMA), Ministry of International Cooperation (MINCEX), and the UNDP as Implementing Agency. The other members represent the main sectors in charge of implementation: agriculture (MINAG), which includes the forestry sector; food industry (MINAL), which includes fisheries; the Ministry of Interior (MININT), represented by the Forest Rangers Corps (CGB) and Frontier Guards Corps (CGF); and the Ministry of Transport (MITRANS) for regulations developed with the Maritime Security and Inspection Directory.

Following the hierarchy, the project governing structure is formed by a National Coordination Group initially managed by the Center for Integrated Management and Environmental Education (CIGEA) with representatives from other CITMA institutions (CNAP, ORASEN-CICA-CSB, FMA, AMA, IES, ANC, CEAC, MNHN), Ministry of Agriculture (SEF, CNSV, IMV), Ministry of Interior (CGB), Ministry of Food Industry (Independent Science Department), Ministry of

Tourism (DSIM), Ministry of Public Health (MINSAP) and NGOs Pro-Naturaleza, Antonio Núñez Jiménez Foundation, ACTAF and ANAP.

The Project Management Unit strucuture was maintained as originally defined in the PRODOC, with an Executive Director, a Technical Coordinator, a Financial and Operational Manager, one Coordinator for each of the expected results, and five technical experts.

At the provincial level the PMU assigned 15 Provincial Coordinators and 15 Technical Coordination Committees, one per province, and a National IAS Subgroup (Biodiversity Group).

3.2 PROJECT IMPLEMENTATION

3.2.1 Adaptive management

Changes in the internal organizational structure of the Ministry of Science and Technology (CITMA) caused the original executing agency CIGEA to be extinguished. The role was taken on by the National Protected Area Center (CNAP) in the beginning of 2013, so the National Coordination Group was also managed by CNAP from then on. Although many administrative challenges arose due to this change, it did not affect project implementation and CNAP kept its role until the end of the project. The original arrangements agreed upon before project start were maintained during implementation despite the change in executing agency and should last after the project is terminated.

In the project design, 26 IAS (13 plants and 13 animals) were selected as priorities. As the activities developed, other two species were included in the initial list: the giant African snail (*Achatina fulica*) and the Mediterranean brown spider (*Cyrtophora citricola*), for the risks they posed and eradication opportunities in the early detection and rapid response system.

Monitoring IAS and native species behavior due to the effects of climate change had not been contemplated in the project design. Activities were included in the project during implementation. An agreement was signed with the Institute of Meteorology, considered the best organization to interpret monitoring climatic data and contribute to designing preventative measures to environmental and social impacts. Joint work between professionals in biology and in meteorology became essential in this search of better ecosystem and community resilience due to impacts of climate change.

The PMU also realized that the number of project sites had to be increased during implementation. From 31 planned sites, the project expanded to 60. This increase was necessary because of climate change monitoring and to improve coverage of the early warning system. The brown spider, green mussel, and giant African snail required surveys in new sites. This was a considerable increase in scale, only possible because of government structures already in place in the provinces, and created more opportunities for disseminating information and improving local capacity on IAS and climate change adaptation. The increase in the number of sites also allowed those already in charge of management actions to share and replicate their knowledge to new areas, especially when the IAS were the same, and to consolidate effective IAS management methods.

3.2.2 Partnership arrangements (with relevant stakeholders involved in the country/region)

As formerly explained, partnership arrangements were established in the design phase of the project, engaging more than 30 institutions who contributed with technical advice as well as financial commitments to implementation.

These initial arrangements were maintained, if not improved, during implementation:

- the **Project Management Unit** was maintained with the same people assigned throughout most of the project;
- the **National IAS Subgroup (Biodiversity Group)** made valuable contributions in the process of incorporating the National Strategy for IAS to the National Biological Diversity Program 2016 – 2020;
- the **15 Provincial Coordinators** and respective Technical Coordination Committees performed their roles throughout the project. This arrangement proved very functional for the implementation of activities in the 60 project sites.

The initial organizational arrangements are essential for the sustainability and continuity of the activities so far implemented. The role of regulatory agencies in increasing sustainability is of high relevance, as references on IAS have been incorporated into governmental structures.

Soon after the project started in June, 2011, the PMU visited all provinces, and especially the selected work sites, in order to present the objectives, goals and expected results to local authorities. This contributed to increase local ownership of the project.

The Plant Security System and the CITMA regulatory agency, for example, actively participated in implementation since the project design phase, introducing changes to existing regulations and approving protocols and procedures developed through the project. Additionally, CITMA environmental research centers were involved at the provincial level.

Interaction with the Ministries of Education and Higher Education was extremely relevant for including IAS issues to all educational levels as part of environmental education. This achievement has great potential for changing the way future generations perceive ecosystem fragility and sustainability, therefore increasing the likelihood of sustainable use of natural resource.

Personnel in the forestry sector, present in nearly all project sites, recognized that impacting IAS have been planted in Cuba, and that current practices need to be improved.

Technical improvements along with feral buffalo captures for sustainable breeding were implemented with partnership arrangements made with the specific productive sector.

Despite early arrangements, the results achieved in the area of fisheries are not as significant for several reasons. The lion fish (*Pterois volitans*) is not a species of economic interest because fishing is difficult due to its sheltering behavior. The green mussel (*Perna viridis*), although edible, cannot be commercialized or cultivated in the two bays where it is now present because the waters are contaminated. Therefore, potential human health problems restrain its removal for consumption. The ET considers that, even though these cases do not contribute to economic gains, they bring balance to the project work with productive sectors. Not all IAS create economic opportunities, but they have to be managed all the same. So some of the species

prioritized generate financial gains, while others need to be dealt with because they pose problems to economic activities as well as the conservation of native species and ecosystem functioning. If the public involved in fishing understands that the lion fish is a threat to the sustainability of the activity, its continued control is justified to maintain low impact levels, the biological diversity of coral reefs, and the economic viability of fisheries.

Universities and NGOs participated in capacity building workshops organized by the PMU at the national level. At the provincial level, the NGOs Foundation Dr. Antonio Nuñez Jiménez for Man and Nature (Project CCambio) and Pro Naturaleza (in Santiago de Cuba) participated in project activities through their work with rural communities. The Cuban Technical Association of AgroForestry Profesionals (ACTAF) and the National Association of Small Farmers (ANAP) participated in capacity building workshops. The National Botanical Garden of the University of La Habana provided support in research, monitoring, workshops, courses, and capacity building.

Although usual in GEF projects, no **Project Board** was formed because the PMU was already represented by the organizations that would constitute it: UNDP, CITMA and MINCEX. The PMU met systematically twice a year and also promoted annual lessons learned meetings including a larger number of participants. In order to avoid multiplying the number of meetings with the same representatives, the UNDP was consulted about duplicating the roles of the same people and institutions, and decided that the Project Board did not need to be constituted under this title, as the PMU already played the same role. A specific meeting with the three agencies is planned for the end of 2016, before the final project workshop, to ensure that the role of Project Board is fulfilled. The Project Board always existed in practical terms as the PMU.

The three organizations represented in the PMU have made significant decisions on changes during implementation, as highlighted in the adaptive management section 3.2.1. Once discussed and decided by the PMU, meetings were held with provincial coordinators and changes were also presented and discussed in the annual lessons learned meetings.

As the project ends, the Ministries and their institutions continue to develop the work under their responsibilities in harmony with the functions conferred to them by the Cuban State.

Other projects carried out in Cuba have been used for reference and exchange during implementation. The Sabana-Camaguey sustainable development project executed between 1993 and 2015 developed regulations for sustainable buffalo breeding to which the director of the project under evaluation was asked to contribute. The contents of these regulations, now in process of approval, were used in the work developed with the buffalo management companies.

Monitoring protocols were adopted from the GEF project entitled “Archipelagos of Southern Cuba” for standardization across the country. Exchanges with the Project on Desertification and Drought funded by the Country Association Program took place for common interest in sustainable land use for agriculture.

The National Aquarium has been implementing a project on lion fish since 2007, called “Preliminary studies on the presence of lion fish in Cuban waters”. While information was available from this former project, the project under evaluation provided materials and resources for improving monitoring actions and promoting capacity building workshops.

The Institute of Ecology and Systematics had formerly developed a database for invasive alien plants, as well as lists of invasive vertebrates and invertebrates. These were readily made available for use in the project and shall be inserted in the IAS Information System (SIMEEI).

Synergies with several projects were reported from the Camaguey province. While the Beach Maintenance Program promoted the removal of *Casuarina equisetifolia*, other projects focused on the agricultural-grazing sector: Sustainable Land Management, Marabu (*Dichrostachys cinerea*) Biomass, and Mainstreaming Agro-Ecology and Environmental Bases for Local Food Sustainability, the latter financed by the European Union to support climate change adaptation in Cuba.

When the GEF requested that climate change related activities be included in the project (they were not in the initial design), the PMU sought collaboration with the project entitled "Evaluation of potential impacts of climate change on biodiversity and development of adaptation strategies in two regions of fragile ecosystems in Cuba", managed by several national and local institutions, while coordinated by the World Wildlife Fund (WWF) and the Foundation Antonio Núñez Jiménez for Nature and Man.

Collaboration was also established with the Cattle Adaptation project, funded by Care France since 2011. This project has developed activities in several provinces and set up a geographic information system, biophysical models of cultivation and agro-meteorological applications. The equipment provided is relevant for the measurement of meteorological variables for monitoring the effects of climate change in the project under evaluation. The practices adopted for improved cattle production have also benefitted the development of project activities and the economic sector.

3.2.3 Feedback from M&E activities used for adaptive management

Implementing effective communication among project participants was key to ensure feedback, make use of lessons learned and adapt activities as necessary to achieve project goals.

Besides delivering timely reports as requested in GEF procedures, the PMU requested provincial coordinators to deliver detailed quarterly reports. The project director realized that the reports improved communication between provincial coordinators and other participants in the provinces. These reports were written in greater detail than demanded by the UNDP and compelled the provincial coordinators to contact project personnel in all sites, as they had to contribute information. Each coordinator sent a report to the PMU, which was then able to assess all ongoing activities, make decisions for improved development and produce the reports requested by the UNDP and GEF.

Two meetings per year were held to complement written reports. One project site was chosen each time in order to allow participants to see more activities in the field, exchange experiences and information, and compare methods and results. Many participants also gathered in the annual lessons learned meetings for the same purposes. Communication between people and institutions was well articulated by the PMU, and no complaints at all were voiced to the ET in this regard during the visits to project sites or in La Habana. This communication effort has certainly ensured the integration of participants in different provinces, and generated a broader understanding of the context of IAS, as well as learning opportunities. These strategies should benefit future projects for their effectiveness and inclusive approach.

As the Early Warning System started to work, the PMU found it necessary to expand action to more sites in order to increase coverage. Beginning with 31 sites, the project expanded its activities to 60. This increase was also deemed necessary for better representation of ecosystems and habitats in the project. In some cases, the same IAS was chosen for management in distinct sites to foster information exchange between sites and comparisons of data and monitoring results.

Another example of adaptive management following feedback can be mentioned from the passage of hurricane Sandy in 2012. It crossed Santiago de Cuba and affected the marine area where lion fish monitoring activities were taking place. As no more lion fishes were found once the hurricane had passed, project participants asked the local fishermen for help in understanding what had happened. The fishermen found that lion fishes were living at greater depth, over 20 meters, which reduced catches in the monitoring exercises. At the same time, people from communities mentioned changes in environmental conditions, such as feeling hotter, changes in crab migration routes and in flowering and fruiting periods of certain plants. The project team then realized the value of local knowledge and started to involve local people in monitoring to help them interpret changes and monitoring data. Specific capacity building workshops were then organized for community members to maximize their potential in contributing to project outcomes.

Some technical quality issues were observed in a number of activities implemented which lacked adequate responses to monitoring efforts. These are covered in detail in the Effectiveness section, in Findings.

3.2.4 Project finance

Project funds were used as planned and as stated in annual operational plans. This project has set a very positive reference in planning and use of financial resources, as well as for timely delivery reports. Although only 12% of the annual budget was used in the first year of implementation, financial execution was well improved in the second year and excellent in the following years, as detailed in the table below:

Year	Annual financial planning (US $)	Annual financial execution (US $)
2011	321,300	38,567.60
2012	1,407,023	913,512.56
2013	1,399,822	1,157,883.76
2014	1,300,000	1,328,207.53
2015	1,233,900	1,210,282.77
2016	369,727.78	218,132.16*
Total		**4,866,586.38****

* Amount on 30 September, 2016 – corresponds to 59% of total annual budget
** Amount on 30 September, 2016 - corresponds to 97% of total project budget ($ 5,018,182.00)

Co-financing exceeded the amount initially planned of CUP 10.000.000,00, closing at CUP 11.200.250,00. This is a positive indication of commitment by governmental agencies as well as by professionals involved in project activities. In kind values provided by NGOs were not registered because they participated mainly in training workshops.

The co-financing table is presented below:

Co-financing (typo and source)	UNDP financing (US $)			Government (CUP)		
	Amount in PRODOC	Amount committed after PRODOC approval	Funds provided	Amount in PRODOC	Amount committed after PRODOC approval	Funds spent
UNDP **IN KIND**	50,000	50,000	50,000			
FONADEF – Forestry Development Fund **CASH**				3,000,000	3,000,000	6,000,000
NATIONAL FUND FOR THE ENVIRONMENT (FNMA) **CASH**				2,000,000	2,000,000	1,000,250
NATIONAL SCIENCE AND TECHNOLOGICAL INNOVATION PROGRAMS **IN KIND**				2,000,000	2,000,000	1,250,000
CITMA **IN KIND**				2,950,000	2,950,000	2,950,000
TOTAL			**50,000**	**9,950,000**	**9,950,000**	**11,200,250**

The UNDP audit conducted in 2015 did not accuse any findings, so no action plan was necessary for adjustment. The same results were indicated for former years in the Mid-Term Evaluation, so no additional comments are applicable. The 2016 audit had not been conducted when the terminal evaluation was carried out.

3.2.5 Monitoring and Evaluation: design at entry and implementation (*)

Rating: **HIGHLY SATISFACTORY**

The base of the monitoring and evaluation plan is the strategic results framework, which contains the project objective, three outcomes and respective indicators of achievement. Monitoring activities, from continuous supervision by the project director and the PMU, gradual progress measured by the UNDP, planned annual meetings and participant meetings twice a year were executed without apparent difficulty, and the results were used to guide adaptation and continued improvement.

The Project Implementation Reports (PIR) and Quarterly Progress Reports (QPR) were reviewed and conform to expectations. The Mid-Term Evaluation was very useful in clarifying progress until 2014. The MTE conceded very positive ratings for progress towards all goals. The 13 recommendations indicated in the EMT were considered and followed up by the PMU. Some of the activities are yet to be completed, and only one was not finished because of externalities related to community capacity, as explained below:

- a few acquisitions ordered in 2016 are still pending and will then be presented to the EMED (company in charge of importing goods, equipment and donations, part of MINCEX). These should be completed before project closing;
- in the EMT it was recommended that local projects were written by people in communities and project sites to help fund the activities in place. The lesson learned in this case is that the people are not prepared enough to write proposals, but expect the project team to do it for them. This activity was therefore not completed, as the project team was not able to develop new proposals with community members. This is not surprising, since project writing is an unknown universe for people in rural communities;

- IAS issues were included in the annual capacity building workshop organized by the Center for Biological Security for the Republic General Customs in 2015. The course had not yet been scheduled for 2016, so this recommendation requires further verification;
- the IAS Management Information System is to be posted on a website to increase access. It will be inserted in the National Protected Area Management Information System (SIGAP), currently under construction;
- the final publication of project documents including lessons learned, IAS management and other results is in process and shall be completed before project closing;
- the Project Board has been functioning in practice as the Project Management Unit, formed by the three key institutions in charge of the project (UNDP, CITMA and MINCEX), as explained in el section 3.2.2.

The project team has generated a commendable reference in terms of management and implementation, the expected results were achieved despite many difficulties and challenges; there are no problems reported from financial management audits; and all expected results were fulfilled within established deadlines. The technical issues concerning some of the products are explained in the Results 3.3.1 and Recommendations (item 4) sections.

3.2.6 UNDP and Implementing Partner implementation / execution (*) coordination, and operational issues

Rating: **HIGLY SATISFACTORY**

The advantages of working with the UNDP have already been explored in section 3.1.6. Besides fulfilling its role as implementing agency, the UNDP team provided support to the PMU in complex situations. For example, when delivery of materials and equipment purchased for importation was delayed, the UNDP followed up constantly, held quarterly meetings with providers, and picked up materials upon arrival when the port was not able to promptly deliver them. The UNDP team also ascertained that reports and products were handed in on time by holding meetings with the PMU ahead of time and offering help with procedures when needed. This support was highly valued by the PMU.

Project implementation was exemplary in dealing with problems and finding solutions to ensure that the expected results were achieved. Financial management was impeccable and observant of transparency, punctuality and efficiency in spending, accounting and reporting. Resources had been used up to 97% on 30 September, 2016, three months before official project closing. The remaining funds were needed for the final workshop, publication of project outputs and other smaller expenses, and should reach 100% by project closing.

3.3 PROJECT RESULTS

3.3.1 Overall results (attainment of objectives) (*)

Rating: **HIGHLY SATISFATORY**

Project implementation and monitoring are commendable and have generated important reference for the management of GEF projects. The completion of expected outcomes contributes directly to global objectives. The achievements also contribute to establishing new

environmental management practices, as IAS were not a relevant issue in Cuba before this project was implemented.

The competence demonstrated by the project director in all aspects of management was relevant to the achievement of all expected results. The project team proved knowledgeable in their interaction with a large number of organizations and professionals of different areas, which was also key for project achievements.

The most significant achievements are those which ensure that IAS will continue to be treated as relevant problems in environmental management. The topic is nearly new in Cuba, and was approached for the first time at the national level as well as incorporated in national policies and regulations (National Strategy for the Environment – National Biodiversity Program, National Protected Area System Operational Plan 2014-2020, Resolution 190 produced by the Center for Biological Security, Plant Health System and Instruction 5/2011 on ballast water inspection).

Capacity building and public information workshops were organized in all provinces for more than 1,000 participants. Workshops were also held for communities in project sites. The inclusion of IAS issues in all educational levels with support from the Ministries of Education and Higher Education tends to gradually increase outreach and contribute to IAS awareness and understanding of impacts by the general public. Institutional capacity was strengthened with technical capacity, equipment and materials.

Productive sectors were involved in managing IAS that are a nuisance in productive landscapes or of economic interest. Economic incentives helped promote control of selected IAS.

An assessment of project outputs showed that some of the methodologies developed need to be improved for continued use once the project ends. Although in nearly all meetings held with participants during the field visits, as well as in the PRODOC, there was frequent mention of the ecosystem approach, this principle was not applied in several of the sites visited. Because the project main objective refers to protecting biodiversity, this principle should have been better mainstreamed throughout project activities, including indicators to help guide implementation. Rather than reducing IAS populations *per se*, the goals must focus on restoring biodiversity, gaining resilience and maintaining ecosystem services both in natural areas and in productive landscapes. The omission of this principle is covered in detail in the section on effectiveness 3.3.3. This analysis is expected to contribute to the improvement of future actions derived from or continued after the project is terminated, as well as in planning new projects for IAS management.

A summary of progress and results is presented in the table below:

Objective / Outcome	Indicators	2011 Baseline	2016 Target (at the end of project)	2016 Situation at end of project	TE Comments	Rating
Globally significant biodiversity in vulnerable ecosystems safeguarded by building capacity at the systemic level to prevent, detect, control, and manage the spread of Invasive Alien Species (IAS) in Cuba.	Increased effectiveness of IAS management framework measured through GEF Tracking tool.	10 points (34%)	Total punctuation 23 (or 79%)	27 points	Although the GEF Tracking Tool was completed accordingly by the PMU, two of the criterions would be more appropriately fulfilled if complementary action was taken: criterion 3 (System established to use monitoring results from the methods employed to manage priority pathways in the development of new and improved policies, regulations and management approaches for IAS) was selected for issue 4 (IAS Strategy Implementation Prevention). An early warning system has been established in Cuba, but it is not focused on priority pathways as described in issue 4 (which refers to Aichi Target 9). The project actions have reached level 3, but have not completed levels 1 and 2. This is because Aichi Target 9 was adjusted to the Cuban reality and is not focused on pathways as the original target. Although a pathway approach is used in IAS monitoring, it is important to hold a workshop with experts to identify priority pathways and vectors for IAS in the near future, as this would improve prevention and the capacity of the early warning system. Pathway and vector identification should cover species introductions and their dissemination in the country once introduced. Pathway and vector maps can contribute to swift management in terms of containment and control in the Early Warning System as well as in border control. The second rating refers to criterion 6 on best management practices. The project team selected a bonus point for the last criterion (Objective measures indicate that the restoration of habitat is likely to occur in the target area). This probability may be real for many project sites in natural areas, but is not realistic for for some of the natural areas and the productive landscapes. In these sites, other IAS or non-native species have been planted or reoccupied the areas where the target IAS were removed. The	HS

Objective / Outcome	Indicators	2011 Baseline	2016 Target (at the end of project)	2016 Situation at end of project	TE Comments	Rating
					ecosystem approach was not applied. This has led to recommendations detailed in section 4. The overall rating obtained is higher than the initial expectation even without this bonus point, as all targets were fulfilled. Although the bonus point is not realistic for some of the project site, there is no need to eliminate it, as it should suit most of the situations.	
	Increase in area under improved IAS management.	Less than 5,000 ha under IAS management.	At least 20,000 ha under IAS management.	Target exceeded: 20,500 ha under IAS management.	It would be interesting to register the number of hectares in natural areas x productive landscapes separately, as the latter are often not replaced by native species.	HS
	Priority given to BD issues in the prevention, control, and management of IAS, measured by: - investments in IAS activities by MINAG, MINAL, MITRANS, CITMA y MINSAP.		2% increase in IAS specific investment.	2% increase in specific investment is maintained (MINAG, MINAL, CITMA). The Maritime Inspection and Security Directory of the Ministry of Transport participated in workshops, meetings and courses, and contributed to the Resolution on ballast water, but did not make a financial contribution. The Ministry of Public Health was never involved in the project.	The increase in IAS investment came from the MINAG (buffalo management, quarantine lab and others); the MINAL invested in aquaculture and lion fish and catfish captures; CITMA provided funds to the Scientific, Technical and Technological Research Fund and to pay for the salaries of those involved in the project. The Ministry of Tourism invested in the conservation and restoration of beaches (controlling IAS such as casuarina). Although the MITRANS and MINSAP never contributed financially to the project, the amount of co-financing initially expected was exceeded by about 10%.	HS
	- % of quarantine, risk analysis, and EIAs that incorporate analysis of impact of IAS on BD.	0% of quarantine, risk analysis, and EIAs include assessments of biological diversity.	- 100% of quarantine, risk analysis, and EIAs incorporate BD analysis.	100% quarantine, risk analysis and EIA incorporate biological diversity assessments.	The inclusion of biological diversity and IAS in national quarantine and EIA procedures is an outstanding result that few countries have managed to attain.	HS
	- % of management plans that include species recuperation and/or ecosystem restoration and rehabilitation activities.		- 100% of management plans for 26 species	- 100% of 42 management plans for 27 species include these activities.	Although the management plans are based on the ecosystem approach, some inconsistencies were observed in the field. The focus has been on	S

Objective / Outcome	Indicators	2011 Baseline	2016 Target (at the end of project)	2016 Situation at end of project	TE Comments	Rating
			include these activities.		species rather than ecosystem management, and in a number of areas the IAS under management were replaced by other IAS. The use of specific indicators for habitat restoration rather than on reducing IAS populations *per se* may contribute to actual application of the ecosystem approach in continued or new actions.	
	Native species addition or status change on IUCN list red list.	Red list of threatened species exists and is continuously updated.	No addition or status change to any native species on the red list due to effects of IAS.	No addition or status change to any species on the red list.	It is very hard to attribute this result to project activities because many external variables may interfere in the process. This indicator was not considered valid for lack of specific evidence.	--
Outcome 1: Operational IAS policy, legal, regulatory, and coordination frameworks that prevent, detect, and manage the spread of IAS and mitigate impact of IAS on biodiversity are strengthened and implemented.	Comprehensive national and sectoral policy and legal framework in place by establishing a national IAS strategy and establishing, updating, and/or complementing the following regulations: black list and gray list, risk analysis, EIA, protocols, normative documents and quarantine mechanisms, monitoring and surveillance, early warning and rapid response system, ballast waters and ship hulls, plant protection/health legislation, and procedures for elaboration management plans.	Key IAS regulations do not exist or outdated.	IAS regulations established, updated and complemented.	Regulations revised, updated and implemented.	The inclusion of IAS issues in national policies and regulations is a very significant outcome, and should contribute to more awareness and investment in preventing new introductions, inadequate use of IAS and their management. It should also result in the inclusion of IAS in environmental priorities.	HS
				Early warning system is functional.	The Early Warning System is in place and functional despite the lack of formal regulations.	HS
				Screening method for lists of alien species developed.	Because species lists are part of the indicator, one gets the idea that they are one of the expected results of the project. But the target was to develop a methodological guide to screen species into the different lists. The guide requires adjustments detailed in section 4 and covered under Effectiveness (Section 3, Findings).	MS
		Draft of National IAS Strategy.	National IAS strategy approved and 50% planned activities effectively implemented.	National IAS Strategy included in National Strategy for the Environment approved for 2016-2020.	The National IAS Strategy was approved by CITMA and IAS management was included in the National Protected Area Plan for 2014-2020, part of the National Strategy for the Environment.	HS

Objective / Outcome	Indicators	2011 Baseline	2016 Target (at the end of project)	2016 Situation at end of project	TE Comments	Rating
	Methodologies to develop indicators to measure compliance with environmental legislation.	No indicators exist to measure compliance with environmental legislation.	Methodologies proposed to develop indicators that measure compliance with environmental legislation.	A proposal of indicators was developed; it needs to be discussed by a larger group, then approved by the group, and made official.	The proposal is available and in process of discussion by government agencies in charge of regulations (National Environmental Indicators Group, National Biological Diversity Group, National Mechanism for Biological Security and IAS Early Warning System). These organizations must validate and then adopt the approved indicators. This will exceed the time of project implementation, as initially anticipated.	HS
	Economic incentives and disincentives control the introduction and use of IAS in production sectors and facilitate management of IAS.	No economic incentives or disincentives exist for IAS.	Three economic incentives or disincentives drafted and approved.	Five incentives approved and implemented for lion fish, melaleuca, water hyacinth, marabu and African catfish.	Economic incentives have been approved and are under implementation with funds from government institutions. Complementary regulations must be established for IAS under incentives to avoid their spread and reduce the risk of new invasion areas. Exit strategies to cease their use must also be prepared so they can be replaced by native or non-invasive species in the future to avoid dependency upon IAS by communities and productive sectors.	MS
	Institutional framework for IAS control between stakeholders and across sectors legally backed.	No advisory forum exists.	An advisory forum exists composed of experts from key sectors.	Advisory Forum functional as part of the early warning system for technical assessment of reported species.	The Advisory Forum is functional and essential to the Early Warning System because of the wide range of species that may be reported.	HS
		No coordination groups exist for IAS.	National IAS Subgroup coordinates the development and implementation of IAS National Strategy.	National working subgroup on IAS established within the National Biological Diversity Group has a deliberative function.	The IAS working subgroup was formally established and is linked to the Biological Diversity Group in charge of implementing CBD decisions at the national level. This subgroup has been active since the beginning of the project and supervises the implementation of the National IAS Strategy.	HS
		Coordination mechanism between regulatory agencies and across sectors for early warning and	Coordination mechanisms for early warning system and information system established between 9 key regulatory	Legal regulations required to establish the Coordination Mechanism proposed by the Center for Biological Security, analyzed and approved by the organizations involved.	Although the regulations that formalize the Coordination Mechanism are still in the process of approval, the coordination mechanism is functional.	HS

Objective / Outcome	Indicators	2011 Baseline	2016 Target (at the end of project)	2016 Situation at end of project	TE Comments	Rating
		information system is negotiated.	authorities and other key actors.			
Outcome 2: Stakeholder capacity, know-how, and communications are enhanced for effective IAS prevention, detection and management.	Number of knowledge products developed.	No standard methodologies for IAS.	Methodologies are standardized and implemented for IAS inventory, ecosystem vulnerability assessments, risk analysis, EIA, economic valuation and cost –benefit analysis, and management actions for 26 IAS.	All methodological documents planned were produced (IAS management plans; economic evaluation and cost-benefit analysis guide; risk analysis; EIA; development of alien species lists; assessment of management effectiveness).	Technical inadequacies were observed in some of the methodologies (risk analysis, screening for species lists and assessment of management effectiveness). These require revision or complementation for use once the project ends. The risk analysis methodology is especially compromised and should not be used.	S
		No IAS information system exists.	Information system designed and includes information regarding species lists, quarantine mechanisms, risk analysis and EIA, early warning response, monitoring and control, management, and coordination between institutions. IAS monitoring system contains baseline information and key indicators.	Information system version 4.0 is developed and made available in DVDs. Users receive updates in DVDs every six months until project closes. The online system will be included in the National Protected Area Information System (SIGAP) website, in development. The SIMEEI contains information on 34 IAS by end of project.	The system includes information on only 34 IAS, although IAS inventories are available in the country with more than 500 plant species and other biological groups that need to be appended. It is a pity that this information was not appended during project implementation, as it would increase interest by potential users. The system does not contain all elements listed in the indicator. During the mission, academics declared special interest in the reference section. The system needs to be updated and include more data before it is considered really useful. It is considered to be in an intermediate state now, and requires further work for consolidation.	S
		No IAS monitoring system exists.	IAS monitoring system contains baseline	Monitoring system developed with baseline for the effects of climate change.	Besides defining a baseline for monitoring climate change, collaboration with the INSMET involving people from communities was innovative and became a new reference for institutions in Cuba.	HS

Objective / Outcome	Indicators	2011 Baseline	2016 Target (at the end of project)	2016 Situation at end of project	TE Comments	Rating
			information and key indicators.			
	Increased stakeholder skill-set and knowledge on scientific bases, legal tools and management approaches for IAS control.	- Low skill-set and knowledge among key stakeholders.	Training for and skills applied to: - 50 ballast water and ship hull contamination control specialists. - 200 specialists in IAS science - 100 specialists in monitoring of IAS applying skills; - 30 technicians in GIS trained and applying skills; - 800 regulatory authorities, environmental managers, and representatives of the productive sectors trained in current IAS legislation; - 60% of inspectors technically qualified to apply IAS regulations. - at least 35% personnel trained are men and 40% of personnel trained are women.	All established goals were reached and the the expected number of participants was exceeded for some groups: - 50 ballast water and ship hull contamination control specialists; - 700 specialists in science; - 400 specialists in monitoring of IAS applying skills; - 65 technicians in GIS trained; - 800 regulatory authorities, environmental managers, and representatives of the productive sectors trained in current IAS legislation; - 70% of inspectors technically qualified to apply IAS regulations, of which 40% are women. - 62.5% of project coordinators are women.	The benefits of the many workshops organized during project implementation will produce more results in the future. Widespread knowledge of IAS should promote its inclusion in the environmental agenda and project activities should be continued regardless of project closing, as well as in new projects to be developed and in research activities.	HS
	Increased public knowledge and participation and stakeholder support for IAS prevention, detection, and management.	- Low awareness among political leaders, IAS using sectors, schools and public.	- 80% of participants in public awareness awareness campaigns and workshops report increased	80% of target groups increased their level of information and knowledge on IAS and their impacts.	Target was accomplished.	HS

Objective / Outcome	Indicators	2011 Baseline	2016 Target (at the end of project)	2016 Situation at end of project	TE Comments	Rating
			awareness of threats.			
Outcome 3: Institutional capacities are strengthened to ensure the effective implementation of prevention, detection, and management of IAS mitigate their impact on BD and ecosystem services.	# of penalties enforced related to violation of IAS regulations.	100 (baseline determined in year 2 of project implementation).	Reduced number of penalties imposed.	91% (2% reduction between 2015 and 2016); 9% reduction compared to baseline.	Although the numerical indicators were completed, this indicator is hard to measure because the results may be due to external factors such as differences in the level of inspections. The ET was unable to reach a clear conclusion about this indicator, especially because it contradicts the one on detections.	MS
	# of illegal point of entry detections.	70 (baseline determined in year 2 of project implementation).	Increased number of entry point detections.	78 (2% increase between 2015 and 2016); 9% increase compared to baseline.	Although the numerical indicators were completed, this indicator is hard to measure because the results may be due to external factors; besides, this indicator contradicts the former one – if less penalties are applied because there is more awareness, there should also be less detections; alternatively, if the control efforts are intensified, there should be more penalties and more detections. It makes more sense that both indicators vary in the same direction. The indicator was initially designed like this, then changed during project development.	MS
	# of IAS under monitoring and surveillance as part of early warning system.	Lion fish has incipient early warning system.	Ten IAS monitored as part of early warning system.	10 IAS prioritized for monitoring.	Monitoring has been extended to 10 priority species, but the most relevant feature of this system is that it remains open to new species that may be reported.	HS
	IAS management actions are implemented to eradicate, contain and/or control existing IAS species threatening native flora and fauna in 7 biodiversity critical wildlands and productive areas.	Some management actions implemented.	Management actions implemented for 10 IAS results in reduced predation, loss of habitat, and/or inter-specific competition	42 management plans for 27 species in 60 sites implemented.	Management efforts have been extended to 60 sites. The ecosystem approach has to be better implemented to ensure results in conservation, and avoid replacement of managed IAS by other IAS.	S
		Perna viridis has only been found in Cienfuegos Bay.	Containment of *Perna viridis* in Cienfuegos Bay. 10 other bays will be checked for the presence of *Perna*	*Perna viridis* is contained in Cienfuegos Bay. 11 other bays were prospected, but no green mussels were found.	Green mussel control efforts are important and need to be continued to contain its distribution. The recently reviewed regulations on ballast water and hull fouling must be strictly applied to the bays where the species is present to avoid further dissemination.	S

Objective / Outcome	Indicators	2011 Baseline	2016 Target (at the end of project)	2016 Situation at end of project	TE Comments	Rating
			viridis, and a specific strategy will be defined for each site where it is found (target added in year 2 of project implementation).	Five eradication campaigns were carried out in Mariel Bay, and the population has declined. More control efforts are required to reach eradication.	Eradication is considered viable in the Mariel Bay, but requires continued control efforts and monitoring that will go beyond the time of project implementation. It is important to assess the feasibility of eradication at the end of the project and ensure continuation, or change the strategy to continued control and containment.	S
	Implementation of IAS monitoring system measures effect of management actions and tracks IAS impact on ecosystems, habitats, species, and genetic diversity.	IAS monitoring system is not implemented.	Management actions for 5 IAS monitored and evaluated and 5 indicators that track IAS impacts on ecosystems, habitats, species, and genetic diversity are measured.	Methodology has been applied to 42 management plans under implementation.	The methodology suits the project well as it includes indicators that are relevant to measure management effectiveness in complementary targets such as community involvement, provision of equipment for governmental institutions in charge, and economic aspects. The management effectiveness methodology needs to be revised once the project ends because IAS management effectiveness should be measured on the base of habitat restoration regardless of who does the work or if species are valued economically (details in section 4).	HS
	Frequency of use of IAS Information System by key national and local actors: - regulatory authorities and management experts; - academic and research institutes; - productive sectors; - other sectors.	0% 0% 0% 0%	70% 70% 50% 30%	Targets were reached in terms of distribution of the SIMEEI, but real percentages of usage have not been measured.	These indicators were not measured properly, and would require the PMU to conduct many interviews across the country. Indicators were measured for distribution, not usage. During the mission it became clear that project participants know the system exists and many have seen it, but usage is restricted due to structural difficulties in the provinces such as lack of computers. The information system was more widely disseminated to project participants and within the National Protected Area System, but needs more visibility especially for use by academics and productive sectors. Usage will continue to be restricted once it is online due to general lack of connectivity, but governmental agencies and scientific institutions should have better access and greatly increase usage. Forest Ranger Corps representatives in provinces consider the printed materials more useful.	MS

3.3.2 Relevance (*)

Rating: **RELEVANT**

Invasive alien species are rated as the second cause of biodiversity loss, with impacts compared to the effects of climate change. In protected areas, they are the major cause of loss of species, habitat and ecosystem services.

At the international level, project objectives are aligned with GEF priority strategies, including climate change, which was incorporated at a later stage in the project, as it was not part of the original design.

The project contributes to fulfilling goals of several international agreements ratified by the Cuban government:

- Convention on Biological Diversity. The Aichi targets were adjusted to the Cuban reality. Aichi Target 9 on IAS is in perfect harmony with the project objectives and outcomes:

  > "**Target 9:** Guidelines, methodologies, procedures and management plans for the prediction, surveillance, detection, eradication, management and control of IAS are implemented in natural ecosystems, productive landscapes and their surroundings for the conservation of Cuban biological diversity."

- Convention on Migratory Species of Wild Animals: improved control levels avoid the introduction of IAS as well as management actions for already established IAS.
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention). IAS management actions in one of the project sites, the Zapata Wetland, contributes to fulfilling strategic goal 1 of the Ramsar Strategic Plan 2016 – 2024, which includes Aichi Target 9 (of the CBD) on IAS applied to wetlands.
- Although not ratified by Cuba, the Convention on the Law of the Sea is covered in the project, in agreement with Article 196: "States shall take all measures necessary to prevent, reduce and control pollution of the marine environment resulting from the use of technologies under their jurisdiction or control, or the intentional or accidental introduction of species, alien or new, to a particular part of the marine environment, which may cause significant and harmful changes thereto."

At the regional level, the project contributes to:

- the Convention for the Protection and Development of the Marine Environment in the Wider Caribbean; and to
- the Specially Protected Areas and Wildlife Protocol (SPAW) of the aforementioned convention, which requires regulations to prohibit the introduction of alien species.

At the national level, project outcomes are highly relevant as this is the first national approach to IAS on a wide scale and for establishing management and monitoring sites in all provinces, therefore creating references and disseminating technical knowledge to CITMA representatives and many other organizations involved in implementation:

- The National Strategy for IAS was developed and included as a program in the National Biological Diversity Program of the National Strategy for the Environment as approved for 2016 – 2020;

- a program of work for IAS was included in the Strategic Plan of the National Protected Area System for 2014 – 2020;
- IAS were inserted in the Decree on plant protection of the Plant Health System in accordance with the International Plant Protection Convention (IPPC);
- Instruction 5/2011 on ballast water was updated with the Maritime Inspection and Security Directory, which is especially relevant because Cuba has not ratified the Convention on Control and Management of Ships Ballast Water and Sediments neither the Convention on the Law of the Sea;
- IAS were included in Resolution 190 on Biological Security;
- IAS were inserted in the National Program for Environmental Education, which covers all levels of education in the country.

Besides successfully including IAS issues in policies and regulations, a baseline for monitoring the effects of climate change on IAS and native species was established, and reference guides produced. The Institute of Meteorology is in charge of coordinating monitoring efforts along with professionals in biological science.

Implementation of climate change monitoring led to the involvement of community members for their perception of environmental changes, creating tangible and intangible benefits at local, national, and global levels.

An IAS information system was developed for national reference and will be incorporated in the National Information System on Protected Areas (SIGAP).

The Early Warning System has been established and is functional under responsibility of the Forest Guard Corps.

The development of a specific legal document on the conservation of biological diversity has been mentioned as relevant for including several topics, such as IAS, but no progress has been made for this purpose. Even with policies still underway or to be developed, IAS management is advancing due to project activities under implementation.

3.3.3 Effectiveness and efficiency (*)

3.3.3.1 Effectiveness

Rating: HIGHLY SATISFACTORY

The project was highly effective in achieving all expected outcomes, although a few products require revision and management practices will benefit of a stronger focus on ecosystem restoration. The wider project objective is in harmony with national policies and strategies for the conservation of biological diversity in Cuba. The relevance of preventing the introduction and spread of, eradicating and controlling IAS has been widely acknowledged.

Outcome 1: **National policies and regulations have been strengthened** as detailed before in the section on Relevance. There were no specific regulations or policies for IAS in Cuba before this project was implemented.

An **Early Warning System** was established and is functional despite the lack of specific regulations that must be developed in the future to ensure continuity.

Some of the project activities have **catalyzed the involvement of sectors** which most often do not participate in biodiversity conservation projects, such as the Frontier Guard Corps, General Customs and the Maritime Inspection and Security Directory.

IAS issues were included in **quarantine, surveillance and control procedures** which should improve the prevention of illegal and involuntary species introductions to Cuba. Risk analysis will be adopted to assess voluntary introductions (details on the methodology are discussed in Outcome 2 below, as the risk analysis method developed is inadequate). IAS will be considered in Environmental Impact Assessment (EIA) procedures. Screening procedures for alien species to be included in national lists were defined (details on the methodology are discussed in Outcome 2 below, as this method requires revision). Model IAS management plans were developed and applied to 42 sites throughout the country.

The **involvement of productive sectors** was strategically managed by promoting economic incentives financed by government agencies to control priority IAS. Although three incentives were initially planned, five incentives were approved and applied to: the lion fish (*Pterois* spp.) in marine areas, African catfish (*Clarias gariepinus*) in the Zapata wetland and in the Delta del Cauto Fauna Reserve, marabu (*Dichrostachys cinerea*) in productive landscapes, water hyacinth (*Eichhornia crassipes*) for handicrafts in Santiago de Cuba, and melaleuca (*Melaleuca quinquenervia*) in the Zapata wetland for wood and oil. As a result of these control efforts, the populations of these IAS have diminished, but complementary activities are required to secure habitat restoration.

Because attributing value to an IAS to which economic incentives are applied can lead to an increase in its distribution due to human interest in cultivation it is important to establish regulations for their use. This should help contain spread and limit distribution, especially to areas where the species are not present. It is equally relevant to define exit strategies for these IAS of economic value (e.g. catfish) so they can be replaced by non-invasive species as their populations decline or eradication may be achieved. The economic incentive strategy deserves some refinement in this regard to ensure that positive results for the conservation of biodiversity are achieved and that the investment made contributes to protecting Cuban biodiversity, the main objective of this project (more details in Result 3).

The proposal of **indicators to measure compliance with environmental legislation**, developed with participating institutions, generated a long process of validation with the National Environmental Indicators Group, the National Biological Diversity Group, the National Mechanism on Biological Security and the group in charge of the Early Warning System. Approval is still in process and is expected to go beyond project duration.

An **Advisory Forum** was formed to provide support to the Early Warning System, as well as a **National Coordination Subgroup** for IAS which is part of the National Biological Diversity Group, in charge of implementing CBD decisions at the national level. The national subgroup has taken on the role of supervising the implementation of the IAS program included in the National Strategy for the Environment. The forum and working group are formalized and functional.

The **Coordination Mechanism** between regulatory agencies was developed by the Center for Biological Security, analyzed and approved by the organizations involved. The coordination mechanism is in use although the legal regulation that establishes it is still in process for

approval. Approval tends to take longer than project duration, but the mechanism is functional in practice and serves as an indicator of institutional commitment.

Outcome 2: all **methodologies, protocols, management plans, and information and monitoring systems** initially planned have been developed. A total of 42 management plans, 18 monitoring protocols, 4 methodological guides, 17 field guides and other publications, including teaching materials for schools, were produced. Several masters degree dissertations and doctorate thesis in process, as well as scientific publications, were also mentioned during the mission.

Some of the methodologies developed have conception errors that restrain their use. Detailed explanations are given below, while resulting recommendations are described in section 4 (Conclusions, Recommendations and Lessons Learned).

The **Risk Analysis for Alien Species** is highly subjective and will not be effective. Results will vary depending on the person who runs the analysis according to his/her skills, professional background and interests. The method does not provide pre-established, scientific-based criteria for the analysis, but gives the analyst the challenging task of identifying risks and impacts for each species as well as the likelihood of their occurrence and the significance of the consequences. This method can nearly only be conducted by experts in the species of interest, which is not recommended for any risk assessment procedure as it tends to create biased results. The method does not consider specific characteristics and ecological attributes of different biological groups. The methodology developed through the project must not be used (see recommendations in section 4). Risk analysis protocols must include specific criteria that represent risk of invasion and be prepared for application by any professional with a background in environmental sciences who is able to understand the technical terms and implications of the questions asked. The system needs to be impartial, and does not work well when it is too open to interpretation. Subjectivity creates an added risk of highlighting species potential benefits while minimizing negative impacts, especially for species of interest in production systems. As IAS science is acknowledged as a new field of science in many countries, including Cuba, the lack of technical background can easily thwart the analysis for lack of personal reference or knowledge of IAS impacts. Risk analysis must be run by professionals who work on biological diversity conservation and are not experts on the species in question, to reduce subjectivity. Risk analyses must produce the same results when conducted by different analysts. Risk analysis protocols in use in several countries are formed by questions the analyst has to answer based on existing data with all information sources listed to ensure transparency and prevent the use of unreferenced knowledge. These systems have been in use for years, use the best scientifically validated predictors consistent with invasion potential by distinct biological groups and are available for adoption in any country.

The **Screening Method for Defining Black, Grey or White Alien Species Lists** has one main conceptual problem. It accumulates points for the species under analysis due to risks it may pose to the environment like any risk analysis, but the 4th step deducts a significant amount of points if the species is valued for production purposes and may generate potential benefits of human interest. The objective of the method is to identify the level of risk a species can pose to biodiversity, society or the economy for inclusion in the respective alien species list. Deducting points due to economic interest tends to generate a false result and not identify invasiveness

properly; this result would assume that if a species can generate benefits it is not invasive, creating a bias that is negative for biodiversity concerns and masks the expected result. Usefulness and invasiveness are not directly related and have to be considered separately. The second problem this same deduction creates is that one of the main drivers of biological invasion is propagule pressure, i.e., the higher the frequency and abundance of the species under analysis, the more opportunity it has to become invasive. As species of economic interest are most often readily disseminated by people, economic interest works in favor of biological invasions. This is one of the most important criteria used in risk analysis protocols as a feature that increases risk along with history of invasion elsewhere, and should not be used to reduce the punctuation in the methodology proposed. The 6th step of the method refers to "approved" and "not approved" species, which seems not to make sense with the intent of defining the list a species should be placed in. And last, this method cannot be considered validated because the analyses of all 14 species assessed produced the same result (species belongs in the black list). The validation process needs to show that the method is able to separate species according to risk or potential impact and place them in the respective lists. Besides, 10 of the 14 species assessed are of agricultural interest, while only 4 species are of biodiversity concern, the focus of this project. This methodology is a type of risk assessment that uses criteria from well known risk analysis protocols as a base, and could be more functional than the risk analysis methodology proposed except for condoning species of potential economic value.

The method for **Evaluating Management Effectiveness** is adequate for activities established within the scope of the project, in which management actions are as important as community involvement, dissemination of information on IAS impacts, institutional capacity and application of economic incentives. Once the project ends, however, these indicators are not adequate to measure management effectiveness. While institutional capacity is an essential element and community involvement is much desired in certain areas, the percentage of people engaged is not relevant for management success. In order to leave a functional method for future use, the methodology needs to be revised so that the indicators of management effectiveness focus on factors such as number of managed hectares, recovery of native species populations and number of hectares rehabilitated for production. These results are not dependent on who or how many people are involved.

The **IAS Management Information System** (SIMEEI) in its 4th version contains information on 34 species at project closing, 16 plants and 18 animals. The conceptual basis is well defined and functional. The gradual inclusion of more species and data is crucial to increase the level of interest and usage of the system. There are substantial lists available in the country, with more than 500 species in the National list of invasive plants in Cuba (Bissea v. 9, 2015), as well as lists of alien invasive vertebrates and some invertebrates, compiled by the Ecology and Systematics Institute. The indicator for the SIMEEI includes a number of data sets that require improvement: species lists, quarantine mechanisms, risk analysis and EIA, early warning response, monitoring and control, management, and coordination between institutions. IAS monitoring system contains baseline information and key indicators.

The 18 **IAS monitoring protocols** for IAS behavior were developed by different groups in distinct provinces. Complementarily, the Institute of Meteorology was put in charge of monitoring six sites for effects of climate change. No former baseline existed for climate change monitoring, and no records of behavioral changes of IAS and native species had been recorded before. The

effectiveness of these protocols will be best verified after a few more years of monitoring, but valid information has already been recorded.

A significant capacity building effort was achieved, involving large numbers of people and professionals in **general information and thematic workshops**. Higher numbers of people than originally planned participated in some workshops. A number of 200 people was planned for general information workshops, but at the end of the project 500 people had participated; from 100 people expected to participate in monitoring workshops, the number went up to 400. Of the current inspectors, 60% were to be trained; 70% participated, of which 40% were women. The other training workshops achieved the numbers initially planned. The fact that a large number of people received information on IAS for the first time in Cuba builds up relevant knowledge in institutions and creates replication potential. The effects of capacity building will be noted as more time goes by, especially if IAS continue to be treated as a relevant issue in environmental management and policy, more science and information is produced and natural resource management adopts more sustainable practices.

Dissemination efforts of problems caused by IAS focused mainly on communities in different provinces. A communication strategy was applied to the general public in three phases, beginning with information on the project, then disclosing information to improve knowledge, and finally developing educational materials. The effectiveness of these campaigns is difficult to measure, and no specific efforts were made to interview people after their general application.

Outcome 3: **institutional capacities were strengthened** for IAS management with capacity building workshops, provision of equipment and materials, and experience gained from practical management actions implemented in 60 sites across provinces, 43 of which are natural areas, and 17 productive landscapes. Practical implementation was key to consolidate theoretical approaches and incorporate IAS management in institutional routines.

After **the green mussel** (***Perna viridis***) **was found and contained** in Cienfuegos Bay, the PMU decided it was important to survey other ten bays of the archipelago not previously covered by the project. The Advisory Forum participated in the decision, which served as a positive test of its effectiveness. Three eradication efforts were carried out in Mariel Bay, but continued action is needed in order to achieve it.

The **indicators on changes in penalties and detections** are not coherent. At project start (PRODOC), both indicators pointed in the same direction, an increase in penalties and in detections, which is a logical consequence of increased control. These indicators were later changed to measure a reduction in the number of penalties, and an increase in the number of detections at border posts. If the project actions were effective to the point of raising general awareness to reduce illegal actions, it should be logical to expect a decrease in both indicators: less penalties, because people would be more aware of IAS problems, and less detections, as people would avoid introducing species or biological material. On the other hand, if control efforts are increased, the tendency is to apply more penalties as well as increase the number of detections. As the indicators point in opposite directions, they seem contradictory and were either not properly conceived or not properly explained. The PMU was unable to provide a clear explanation of these indicators. Besides, it is not clear whether the percentages achieved are of

real significance in changes of behavior or control, as it is difficult to attribute these results to project activities, as many other external factors may influence the results.

The **Early Warning System** did not previously exist in Cuba to attend to environmental emergencies. An incipient lion fish monitoring system was in development by the National Aquarium when the project began. Collaboration between projects led to an improved monitoring system that was expanded to other areas along the coastline. Collaboration was sought with the Biology Faculty of the La Habana University for studies on lion fish poison and reproduction. Lion fish control was supported by the application of economic incentives, and the fishes were promoted for human consumption. Most important, the early warning system is flexible in receiving alerts on any species, and the CGB verifies each occurrence in the field. This is essential for the system to work, as new species not yet identified may be detected while eradication is viable. Early detection of the giant African snail enabled its eradication on different sites by the CGB, where 49,382 snails were collected and incinerated until the end of September, 2016; the monitoring and control range of the green mussel (*Perna viridis*) was increased to enable eradication of new *foci* and prevent its spread. Information to the early warning system can be reported by telephone or email. The system and its means need to be more thoroughly informed to the public for increased collaboration. A new position in the Forest Rangers Corps headquarters was created for coordination of the system, indicating governmental commitment, and forest rangers received training throughout the provinces.

IAS management was developed in natural areas, usually protected areas, and in productive landscapes. Management plans were focused on species, not on areas or habitats. IAS have been controlled in most of the natural sites, but inconsistencies observed during the mission require corrections and improvement for future work. In one of the sites visited, Topes de Collantes, removal of one of the priority IAS left the area exposed to invasion by other IAS, which were then not controlled, frustrating restoration goals. These other IAS present in the same site were not controlled because they were not in the priority list or in a management plan. They occupied the managed area without further interference from the control team, which should be securing the establishment of native species (e.g. African tulip tree *Spathodea campanulata* was removed but *Casuarina equisetifolia* trees remained as well as white ginger *Hedychium coronarium* and *Malvaviscus penduliflorus* in the undergrowth, which allowed them to colonize and dominate the site). All these IAS are included in the National Invasive Plant List in Cuba published in 2015, which should be used as a reference for control and restoration. Another conceptual issue was observed as plants used in restoration efforts in natural forests included alien fruit trees (avocado *Persea americana* and guava *Psidium guayava*) also present in the National Invasive Plant List. The plantation of non-native species does not contribute to restoration and creates future risk of invasion (both species mentioned have histories of invasion in different countries). Monitoring in these areas should have caused the local team to revisit the site, control the other IAS that had taken over even though they were not on the priority list of the project, and remove wrongly planted species. If only target IAS are removed without considering the habitat to be restored, results for the conservation of biodiversity and ecosystem services are easily lost, as well as the investment in management.

Similar practices were observed in productive landscapes, where the IAS marabu (*Dichrostachys cinerea*), sweet acacia (*Acacia farnesiana*) and catclaw mimosa (*Mimosa pigra*) were removed to rehabilitate land for pasture and complemented with plantations of alien species for shade

and forage, including lead tree (*Leucaena leucocephala*), a worldwide IAS known for its aggressiveness that had been assessed in the project and classified as part of the black list of species. Other alien species planted are also included in the National List, such as horseradish tree (*Moringa oleifera*) and tree marigold (*Tithonia diversifolia*). The same misconception was applied to fruit orchards in community gardens where marabu (*Dichrostachys cinerea*) was removed, as species planted were nearly all non-native, such as mango (*Mangifera indica*), starfruit (*Averrhoa carambola*) and loquat (*Eriobotrya japonica*). Although some of these species may not become invasive, they do not contribute to ecosystem balance or the maintenance of ecosystem services which are also essential in production systems, and do not contribute to protect native biodiversity as stated in the project objective. ***In the current scenario of highly fragmented natural areas and climate change, the ecosystem approach included in the project design needs to be applied extensively to all project sites and beyond to increase ecosystem resilience by including native species in productive landscapes. This approach can improve connectivity between remaining natural areas, favor gene flow, maintain habitats that provide essential ecosystem services such as conservation and production of water, thermal regulation, pollination and natural biological control of pests, among others.*** Accordingly, although some non-native species may be important in production systems, their containment and the inclusion of at least a percentage of native species in productive landscapes is essential for the main objective of this project to be achieved (see recommendations in section 4).

Two consequences of economic incentives applied to African catfish require adaptation and improvement in the Zapata wetland: (a) the decrease in the population of catfish led to an increase in the population of tilapia, another IAS present in the wetland which will maintain the pressure on endemic and other native species. Tilapias need to be controlled as much as catfish for any positive results to be achieved in conservation, but no action was taken upon this finding. This shows the need to improve the conceptual basis of management actions; (b) as a result of added value to catfish, new breeding grounds have been set up without official permits, increasing the risk of new invasions and further threat to native species. These consequences are not uncommon when dealing with economic incentives. If a species has value, many will want to breed it. The MINAL is now developing regulations for African catfish, but it will be authorized for breeding because it has become an important food alternative. These negative consequences call for improved application of the concept of adaptive management with an ecosystem approach. Recommendations are included for this purpose in section 4.

The same conceptual issue has been observed in management, whether of African catfish or of invasive plants. The main goal of managing IAS is not to remove them from the environment, but to restore natural areas and populations of native species to foster environmental sustainability and avoid species extinctions. This was the purpose of this project.

Difficulties in ceasing the use of alien species already acknowledged as invasive were noted for the use of widely recognized IAS as part of the recently established plant collection of the Camagüey Botanical Park. While the African tulip tree (*Spathodea campanulata*) is prioritized for control in Topes de Collantes, it was recently planted in the Botanical Park (as well as other globally acknowledged invasive plants *Acacia mangium*, *Acacia nilotica*, Brazilian pepper *Schinus therebinthifolius* and neem *Azadirachta indica*) by people involved in the project. If investment on control is being made, but the same species keep being planted, no positive results will be

achieved in the future, as new sources of propagules will establish from plantations and because any person can collect seeds and disseminate them further (see recommendations in section 4).

The **Monitoring and Indicator System for IAS in fragile ecosystems in Cuba** (SIMON) was developed to define standards in data collection, initially for five IAS, and for selecting five indicators of IAS impact on ecosystems, habitats, species and genetic diversity. A total 18 monitoring protocols were developed for 17 species, with five indicators for invasion status, five for ecosystem vulnerability, and five for management effectiveness. The number of protocols developed surpassed the number initially planned.

A second monitoring effort was included in the project with focus on **Effects of climate change on the spread of IAS**, led by the Institute of Meteorology in collaboration with experts in biological science and involvement of community members in monitoring sites. Institutional capacities were developed for this purpose, creating a new line of work and establishing a baseline for continued monitoring of climate change effects on species and ecosystems. In the medium-term, as more data is gathered, a risk assessment methodology for impacts of climate change will be developed on adaptation measures to reduce species and ecosystem vulnerability. The **Guide for Compiling Atypical Behavior** serves as conceptual base for this program.

Usage of the **IAS Management Information System** (SIMEEI) was verified during the mission. Although many people who participated in project implementation are aware of the system, its use has been very limited due to structural restrictions in the provinces, especially the lack of computers. Representatives of the Forest Rangers Corps find the printed materials more useful, as the SIMEEI is only installed in their headquarters in La Habana for lack of computers in the provinces. Apart from the structural circumstances, the system was basically made available to project participants and within the National Protected Area System. It needs to be given more visibility for broader use, especially for academics and productive sectors. Academics mentioned that the publications included in the system are highly valued and have been widely used. Inclusion of other IAS already identified in Cuba should increase the level of interest and usefulness of the system. The general public has restricted access to the system because it is distributed individually in DVDs. Posting the system online will also promote its use among those who enjoy internet connectivity, mainly governmental agencies, academics and scientists. The indicators in the strategic results framework were not measured for usage, only in terms of DVD distribution, so no appraisal has been carried out, as it would require conducting numerous interviews with a large number of people who received the system DVDs.

3.3.3.2 Efficiency

Rating: SATISFATORY

The project financial management was assessed as exemplary because the activities progressed well in combination with resource allocation. Yearly financial planning and execution were excellent especially from the 3rd year of implementation. On 30 September, 2016, three months before official closing, 97% of the budget had been used, and the remaining funds compromised for the final workshop, printing the many publications, and other pending activities. The requested reports were appropriately delivered and provide clear and organized information. The budget allocation for monitoring and evaluation was adequate and sufficient. No problems

in execution were ever identified in annual UNDP audits or in national audits, corroborating transparency and high management capacity.

According to the Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects, **efficiency is measured by the extent to which results have been delivered with the least costly resources possible**. A contextual issue in Cuba prevents cost optimization: the need to import nearly all the materials used in the project, even paper and pens (which cannot be avoided in the case of Cuba, a developing country subjected to an embargo by the United States). The costs and taxes of importation, as well as delays in delivery, contribute to lower the efficiency of the project. This problem was at least in part outweighed by the high management effectiveness of the CNAP and the involvement of institutions that committed employees as well as co-financing resources for implementation. As this is a contextual problem, it has not been considered to lower the ranking of Efficiency.

The second issue that reduces efficiency are the application of **economic incentives.** There is no doubt that they have been relevant to rehabilitate areas for production, especially from dense thickets of marabu (*Dichrostachys cinerea*), for controlling catfish (*Clarias gariepinus*) and lion fish (*Pterois volitans*). As explained before in the Effectiveness section, the cost-benefit of these actions would be higher if natural areas had been occupied with native species, and productive landscapes included native species in rehabilitation. Replacing IAS under control by other non-native species is not cost-effective because it does not contribute to the conservation of natural diversity, neither to ecosystem resilience or services. Some recommendations have been included in the final section of this report for improving efficiency especially in productive landscapes.

Other issues refer to IAS management in some natural areas and in productive landscapes which have not contributed to protecting Cuban biodiversity. Control methods are often only mechanical, which imply the need for many repetitions as plants sprout back. Half of the methodological guides developed require revision and cannot be used as conceived. The IAS Information System needs to be thoroughly complemented with data on species and other topics listed in the indicator in the logical framework. These issues are explained in detail in the section on Effectiveness and will not be repeated here.

3.3.4 Country ownership

The project was conceived in alignment with the UNDP country program and national priorities under the direction of Ministries responsible for the environment, biosecurity and primary production. Policies and regulations were adjusted to include IAS at the national level, improving the visibility, knowledge, capacity and management of IAS in Cuba.

The Cuban government has demonstrated strong ownership of the project and its outcomes. The main implementing agencies are regulatory agencies, Forest Rangers Corps and Frontier Guards Corps of the Ministry of Interior, the National Center for Plant Health and the Institute of Veterinary Medicine of the Ministry of Agriculture, the Center for Biological Security and the Center for Environmental Inspection and Control, the latter part of the Ministry of Science, Technology and Environment (CITMA). The project was implemented under the responsibility of these Ministries, which asserts the participation of their subordinate agencies in executing defined activities, disseminating results and providing long-term maintenance. Broad

participation was sought at the national, provincial and local levels, and included research and education institutions. Complementarily, the Ministries of Education and Higher Education were involved to include IAS issues in all educational levels. This level of involvement proved to be of substantial value to the achievement of project outcomes.

An evidence of country ownership is the inclusion of IAS issues in several national policies. Environmental management was strengthened with the incorporation of IAS in regulations that were adjusted for the specific purpose (details in the section on Relevance).

Technical documents produced have been officially approved to become procedures for several management and monitoring activities, improving environmental management in Cuba. Although some of these documents will require review, the process is in place for administrative purposes:

- methodological guide for the development of IAS management plans;
- methodological guide for economic evaluation and cost-benefit analysis;
- risk analysis;
- environmental impact assessment procedures including IAS;
- methodological guide for screening alien species for alien species lists;
- methodological guide for assessing IAS management effectiveness.

The government fulfilled its co-financing commitment, surpassing the initially committed amount by 10%. Many of the roles and activities in the project were gradually incorporated in the responsibilities of professionals involved in implementation, especially in protected area management, but also in productive sectors, with the final goal of restoring or rehabilitating invaded areas.

3.3.5 Mainstreaming

The project objectives and targets have local, regional and international relevance for their focus on biological diversity of global importance, the development of institutional and professional capacities and the inclusion of IAS in national policies and regulations, creating references for other GEF projects and other countries.

The project is in harmony with priorities set by the UNDP in the document “UN Development Assistance Framework”, the UNDP Country Program and action plans established for 2008-2012 and extended until 2018. Environment and energy for sustainable development are key topics in the Development Assistance Framework. Strategies for conservation and sustainable use of biological diversity in protected ecosystems and productive landscapes are among the expected results. One of the thematic areas selected for 2014-2018 includes environmental sustainability and disaster management. UNDP Cuba will therefore associate environmental issues with disaster management by promoting economic development and integrated ecosystem management to improve resilience to the effects of climate change. These issues are covered in the National Strategy for the Environment.

This project integrates environmental management and sustainability, contributing to UNDP priorities in Cuba. Although less directly, the project implemented actions for poverty mitigation by applying economic incentives to foster IAS control, generating economic benefits.

The effect of capacity building and information workshops can be seen in project sites and nearby communities who are now able to discuss IAS and their impacts. The relevance of the project as a source of information and new opportunities in natural resource management is widely acknowledged. Feral buffalo captures from natural areas to confined breeding grounds using solar energy for electrified fencing is a good example of mainstreaming biodiversity priorities to productive sectors. Other examples include fruit production for consumption and sale in home gardens rehabilitated from marabu thickets; use of invasive fishes as a food source; use of water hyacinth fibers for handicrafts; and community involvement in environmental monitoring for changes in natural phenomena and in IAS management. Further efforts are needed to mainstream biodiversity conservation and sustainable use into production landscapes and productive sectors by including native species in the landscape matrix.

As impacts from climate change were identified as a risk to project sustainability, the UNDP recommended the inclusion of a specific activity for adaptive management in 2013. The development of a monitoring system led to mainstreaming IAS and climate change information to new sites and establish close collaboration between the Institute of Meteorology, biological sciences and community members.

Although no concern on gender balance was included in the project design, women had significant participation in project implementation. Coordination roles in project activities were 62.5% occupied by women. Women were also visibly involved in project activities, taking up technical roles as well as other work such as production of seedlings in nurseries. The Cuban legislation contributes to gender balance, as no distinctions are made in terms of labor rights and salaries. In the meetings held during the terminal evaluation mission, 40% of participants were women.

3.3.6 Sustainability (*)

Overall rating: **MODERATELY LIKELY**

3.3.6.1 Financial sustainability

Rating: **LIKELY**

Financial sustainability was one of the key concerns of the project from the beginning. Economic incentives for IAS control were one strategy applied for long term management. Government agencies provided funds to pay for five economic incentives during project implementation to avoid any dependency on GEF funds, while government employees were given responsibilities in contributing to ongoing activities. National policies and regulations were adjusted to include IAS management (details in section 3.3.2 on Relevance). This may be the highest guarantee of sustainability for the future, as well as the commitment reiterated by many participants from several institutions to continued action and maintenance of economic incentives of interest to productive sectors.

Another example of interest in continuing project activities is the submission of new projects by scientific institutions. The National Aquarium and the National Environmental Agency is funding the the “Ecology of marine invasive species in Cuba: lion fish (*Pterois volitans/miles*) and green mussel (*Perna viridis*)” project from 2015 until 2017. These species were prioritized in the GEF project under evaluation. The “Invasive alien and opportunistic species in natural ecosystems

and agro-ecosystems of Western Cuba" project has been approved for the Institute of Ecology and Systematics, starting in 2017. Several new projects requesting national funding, especially from FONADEF, were mentioned during the mission interviews. The UNDP has reiterated its role in maximizing opportunities for continued action in collaboration with other projects implemented by the UNDP in the country.

Because the management of IAS was included in the operational plan of the National Protected Area System, the government has endorsed the commitment to finance management activities.

3.3.3.2 Socio-economic sustainability

Rating: **LIKELY**

Social awareness of problems posed by IAS in natural areas has increased due to workshops and information disseminated during project implementation.

Economic incentives and project support to reclaim invaded areas (especially by marabu *Dichrostachys cinerea*) have shown communities in project sites that rehabilitation is a viable effort for increasing productive areas. Positive examples shall contribute to continuing activities regardless of project closing.

In Camaguey, for example, actions to revert marabu infestations to productive areas are ongoing to fulfill the initially established targets: at the end of September 2016, 70% of 407ha, 73% of 98ha, and 125% relative to 1,534ha had been cleared. The total area considering all three sites is up to 105% of the total area planned for clearing, but the work is continuing and expected to reach 100% in all sited by the first quarter of 2017. The project will be formally terminated by then. Many people professed their commitment and interest in continuing the work despite project closing. Some people said that once they gained knowledge on IAS, land management lessons have been learned and have become part of their work routine.

Project activities involving productive sectors were successful mainly because benefits were generated from IAS control. There is no doubt that IAS perceived as a nuisance or damaging to production systems or society are better acknowledged and that it is easier to join forces for IAS management. On the other hand, those IAS considered useful by people are not so easily accepted as problems, and tend to be used regardless of their invasiveness (e.g. *Leucaena leucocephala* in the project, *Acacia mangium* along major roads). Conflicts of interest were avoided during the project due to the benefits generated, but will arise once management needs to be extended to species considered useful. Although some IAS will probably continue under control or be targeted for eradication, others are still in current use and function as propagule sources for new invasions. It is precisely this relativity in judging species that creates some level of risk to future actions, especially as species in production systems or secondary uses are chosen for management or regulations because they threaten indigenous species. Conflicts of interest in this regard are part of the challenges of IAS management everywhere and were observed in some of the project sites, as explained in the Results section as well as in some of the recommendations in greater detail. Regulations on the use of these species will be needed, although this process most often faces much resistance from interested sectors. Socio-economic sustainability was ranked as Probable despite these issues due to the strong governmental commitment observed and the reiterated declarations of interest and continuity by people interviewed during the mission.

3.3.6.3 Sustainability of institutional framework and governance

Rating: **LIKELY**

The Cuban commitment with the protection of natural resources is reflected in the national environmental legislation. The institutional framework and governance were strengthened as IAS issues were inserted in national policies and regulations (see section on Relevance for details). Government agencies have compromised to (a) mainstream acquired knowledge to the institutions in charge of IAS prevention, control, and management; (b) apply regulations and use methodologies developed through the project, such as monitoring protocols and management plans; (c) use the systems developed on IAS information, early warning and monitoring. The National Strategy for the Environment incorporated the national IAS strategy as part of the National Biodiversity Program 2016-2020 and IAS management was included in the National Protected Area System 2014-2020, enforcing practical management actions at least in coming years. Inclusion in the National Environmental Education Program shall have a catalyzing effect for the dissemination and sustainability of of IAS issues in different respects, increasing the likelihood of sustainability in environmental and productive management.

3.3.6.4 Environmental sustainability

Rating: **MODERATELY LIKELY**

While the Early Warning System implemented through the project increases the chances of rapid action against new invasions, the insertion of IAS in national policies and regulations provides some guarantee of continued management, at least until 2020, when the policy documents will again be revised.

Extreme climatic events are listed among the environmental risks to the sustainability of project activities in the Guidance for Conducting Terminal Evaluations of UNDP-supported, GEF-financed Projects. Cuban ecosystems are exposed to relatively frequent hurricanes due to its geographic location. Apart from functioning as vectors of introduction of IAS, these extreme events create open spaces and disturbed areas susceptible to invasion by IAS that are part of the landscape. In a similar manner, the long period of drought in the past two years also creates disturbance in natural ecosystems and increases the chances of biological invasions.

Although some areas invaded by alien species were rehabilitated for production purposes and restored for conservation through the project, the rural landscape is dominated by non-native species, including IAS in production systems and planted along major roads as energy stocks, for shade and other secondary uses. These plants are sources of propagules for biological invasion, and the more spread out they are, the higher their chances of reaching disturbed sites. Replacing these IAS which are not essential in production for native species is a way of increasing resilience in this fragile landscape, reducing the chances of invasion after extreme climatic events and other effects of climate change. The climate change monitoring system established may provide data for the development of other adaptation measures and increased resilience for the future. As explained in the results section, IAS cannot be allowed to recolonize areas regained through IAS management, and native species have to be mainstreamed into productive landscapes to function as corridors between natural fragments, increase the chances of conservation of endemic and threatened species, produce propagules for neighboring areas, maintain ecosystem services and achieve sustainability in the long term.

A moderately likely rating was attributed to environmental sustainability mainly because of the GEF concern for extreme climatic events and because of the wide distribution of IAS in the landscape. Native species need to be mainstreamed into productive landscapes to replace the IAS under control and to increase ecosystem resilience after extreme climatic events and other disturbance. With 20% of the territory in protected areas, improving connectivity is key for several reasons already mentioned and to avoid their isolation in a matrix of non-native species. This is one of the biodiversity objectives in the GEF-6 Programming Directions, and should improve ecosystem connectivity, genetic reserves, resilience and ecosystem services which are essential for production as much as for the conservation of biological diversity.

3.3.7 Replication approach and potential

The most important achievement of replication potential during implementation was probably the inclusion of IAS issues in the education system, as new generations will disseminate and apply their knowledge in all areas of work, management of natural resources and future administration.

Regular meetings of project participants catalyzed activities in development throughout the provinces and promoted exchanges of information and practical experience.

Actions in place within the project were replicated with resources of participating institutions. The Punta de Palma agricultural company in Pinar del Rio adopted the solar electric fencing model for buffalo breeding provided through the project and purchased two extra solar modules to increase the number of confined buffalos captured from natural areas. FONADEF funds were used to control marabu (*Dichrostachys cinerea*) in the Limones Tuabaquey Protected Area and at the Guaimaro Cooperative in Camaguey. The Institute of Ecology and Systematics will start a new project on IAS in 2017. According to the Institute, the number of young scientists interested in IAS has increased and more masters dissertations, doctorate thesis, and other publications are being written due to the influence of project activities.

Project participants have disseminated and exchanged information and experience with colleagues from countries in the region in scientific meetings (Dominican Republic, Panama and Mexico).

Model interventions in national policies and regulations, as well as model documents developed for monitoring and management, have replication potential to other areas and other projects.

Once the project is terminated the UNDP and GEF shall disseminate the outcomes and outputs to other countries and projects, especially in the Caribbean for the similarity of environmental conditions.

3.3.8 Impact (*)

Rating: **SIGNIFICANT (S)**

Environmental benefits at the global, regional and local levels

Cuba is the largest and most biologically diverse island in the Caribbean, with a high percentage of endemic species.

The most direct impact on environmental benefits at the global level is the incorporation of IAS management in the National Protected Area System. There are 211 protected areas in Cuba, 120

of which have infrastructure to carry out practical management activities. IAS management is essential to ensure the conservation of many endemic species in different ecosystems, as it represents the main cause of biological diversity loss in protected areas. Among the 60 project sites where practical action and monitoring have been developed, 43 are natural areas (and 17 located in productive landscapes). Direct positive impacts are the increase of resilience of natural systems and the conservation of native species. These are apprenticeship and replication sites for future action. *Casuarina equisetifolia* has been eradicated from several beach areas where it caused erosion and loss of beach space for tourism.

Another specific example is the control of *Scaevola sericea* on the beach in Guanahacabibes National Park. Invasion by this plant has changed the habit of a native shrub, *Tournefortia gnaphalodes*, due to competition effects. Controlling the invasive plant maintains the native species in its normal shape. Although it may be difficult to determine the exact ecological effects of IAS, it is not difficult to perceive consequential changes. More monitoring time will generate data for interpreting such changes and also registering the positive impacts of IAS control and eradication.

The Early Warning System functions as an important complement to control actions across the country, as it increases the chances of eradication upon the detection of incipient populations of IAS while control costs are still low and more viable.

No direct evidence has been registered in ecological *status* except in areas restored with native species in part of the project sites. Continued monitoring should provide numerical data of environmental improvement in the near future as long as the actions are sustained and reinvasion of managed sites is contained. Although no numerical data is so far available, the removal of IAS and regeneration or plantation of native species implies stress reduction and ecological improvement. Considering the implementation of management activities achieved within the project, most benefits are likely to generate ecological improvement at the local level in natural areas. The inclusion of IAS management in the Operational Plan of the National Protected Area System is an opportunity to extend management to generate benefits at the ecosystem level.

The scenario without the project would disclose current biological invasions spreading to the limits of ecosystems. The control actions implemented increase the chances of effective ecosystem and species conservation.

The sustainability of ecological improvement will depend on continued management, effectiveness of management and monitoring, and on the early warning system. For the moment, commitments are made until 2020, which may be enough time for IAS management to become a routine in protected areas and other priority sites for conservation. The consolidation of these actions will depend on financial resources, especially as small populations are eradicated and larger invasions in more complex and costly situations have to be confronted.

Livelihood improvement within communities involved in the project

The strategy of applying economic incentives for IAS control with productive sectors and rural communities created income generation opportunities as well as improvement in management practices, production technologies and equipment provided by the project. People in charge of production systems have gained capacity, as have those who collaborated for the rehabilitation

of invaded sites and in control efforts of catfish, lion fish, and water hyacinth. The main experiences to be registered demonstrate that it is worth clearing marabu thickets to reinstate economic production; using clean technologies such as solar systems to contain and manage former feral buffalos with gains in meat and milk production; using melaleuca, marabu and leucena wood to reduce wood extraction from natural forests; and that the increase in area available for production by communities and production cooperatives leads to increased income generation. As a result of marabu control, for example, the Provincial Company for the Conservation of Flora and Fauna of Pinar del Rio obtained 107,124 kg of vegetal charcoal during project implementation, worth 35,897.00 CUC from sales and a subsidy of 144,547.36 Cuban pesos (CUP).

Long term effects

IAS issues were widely discussed and promoted for the first time at the national level and included in national policies and regulations. Many institutions which participated in implementation have stated their commitment in continuing the activities started within the scope of the project. The likelihood of sustainability in most aspects is high. The monitoring system in place shall provide solid information on concrete ecological results in the future.

4 CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNED

4.1 CONCLUSIONS

All targets defined in the PRODOC have been reached and all products generated under commendable financial management within the implementation time frame. The limitations observed in the terminal evaluation are of technical order, which is not surprising given that this is the first approach to IAS management in the country. The ET hopes that the recommendations listed below help guide the continuity of activities implemented through the project as well as future action and new projects funded by the GEF and other international and national sources, improve the technical quality of some of the products developed and provide guidelines for practical management so the ultimate goal of protecting biological diversity in Cuba can be achieved.

The project contributed to improve environmental management at the national level and strengthen ties of the environmental sector with productive sectors (fisheries, cattle, agriculture, forestry), marine and terrestrial environmental regulations, and institutes in charge of scientific research.

Gaps in the National Strategy for the Environment and the National Biological Diversity Program were filled with the inclusion of IAS. Technical knowledge has been made available and regulations have been adjusted to include IAS prevention, control and management at the national level.

More than 1,000 professionals from about 30 national and local institutions (in provinces and municipalities) have improved their awareness and knowledge of IAS in Cuba.

Technical reference documents for management and monitoring were produced to consolidate the experience and knowledge gained through project implementation.

Considering that the science of IAS is a relatively new topic in Cuba, in many Latin American countries and other parts of the world, promoting capacity building and information workshops in different provinces was a key strategy to improve the level of understanding of IAS in the country. Establishing practical activities in 60 sites across the country was equally important as the feasibility of control actions in restoring natural areas and rehabilitating invaded areas for production purposes has been demonstrated.

The increase in the amount of co-financing initially planned is a significant indicator of government commitment to IAS management as much as the inclusion of IAS in relevant policies.

4.2 RECOMMENDATIONS

As these recommendations are a product of the terminal evaluation, there will be no time for implementation within the project timeframe. They are therefore expected to be useful in continued activities started during the project and routine management of IAS at different levels, as well as for new projects to be developed at the national or international levels.

4.2.1 Corrective actions for the design, implementation, monitoring and evaluation of the project

The ET agrees with the findings of the MTE on **project design**. The outcome titles in the strategic results framework create overlaps which were fortunately avoided in practice through exemplary management. The outcomes should be clearly organized in three main topics: policies and regulations, capacity building, and management actions.

The **indicators** in the strategic results framework are mostly objective, although a few are difficult to measure for reasons of cost or effort, and two indicators are confusing and therefore difficult to account for. The last indicator in the Objective section is "Native species addition or status change on IUCN list red list". Many environmental and anthropogenic factors influence this indicator. For example, an environmental disaster such as a hurricane could be the cause of new species included in the list; or if no reviews of the red list were made during project implementation, no species would be added. None of these factors are related to project activities. Indicators should point directly at project outcomes to avoid dubious interpretation of results.

The first **indicator** in Outcome 1 lists a number of products to be developed. Although it includes grey and black IAS lists, the idea had always been to provide a screening method for the different alien species lists. A direct review based on this indicator would infer that these products have not been developed, especially as all outputs related to technical methodologies are part of Outcome 2. Alien species lists should not have been included in this indicator for Outcome 1.

The **indicators** on improved control are confusing because they are contradictory (see Results section for greater detail). According to the indicators, increased surveillance should generate a decrease in the number of penalties and an increase in the number of detections at border points. These results depend on the control efforts applied in either case, and are therefore difficult to compare between different years unless the effort remains exactly the same. Besides, if control efforts are increased, it would be more logical to expect an increase (not a decrease) in the number of penalties; or, supposing that awareness had greatly been increased through the project, both the application of penalties and the number of detections at border points should decrease. The baseline and logic of these indicators is not clear or straightforward, so the percentages achieved do not provide a clear idea of progress, and it is not possible to judge their relevance.

A slight divergence in the evaluation of the **GEF Tracking Tool** was noted. It is related to the modification of CBD Aichi Target 9 to conform to Cuban priorities. The original target in the Tracking Tool is focused on IAS pathways: "*By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment*", while the Cuban target is in perfect harmony with project the objective and outcomes: "*Guidelines, methodologies, procedures and management plans for the prediction, surveillance, detection, eradication, management and control of IAS in natural ecosystems and productive landscapes and their surroundings are implemented for conserving Cuban biological diversity*". Tracking Tool issue 4 (*IAS Strategy Implementation Prevention*) measures progress towards the original Aichi target, beginning by identifying priority pathways (criteria 1-2). This exercise was never done because

it is not part of project design, and not relevant to the Cuban version of the Aichi target. For this reason, the Tracking Tool diverged from the reality of the project. The ET considered the ranking chosen by the PMU correct at level 3, although instead of: "*System established to use monitoring results from the methods employed to manage priority pathways in the development of new and improved policies, regulations and management approaches for IAS*", it should use "*priority species*". Despite the Aichi target reformulation in Cuba, the ET **recommends that a priority pathway and vector analysis** is carried out in the near future to contribute to the Early Warning System and to improve intercepting priority pathways at border posts or throughout the country.

4.2.2 Actions to follow up or reinforce initial benefits from the project

The following recommendations are subdivided according to their relevance to the main project objective; Ouctome 1 – policies and regulations; Outcome 2 – methodologies, protocols and programs; and Outcome 3 – practical IAS management.

4.2.2.1 Project objective

Increase IAS management efforts in terms of area and number of species. A total of 20,500 hectares were managed during project implementation in natural areas and productive landscapes. To achieve the objective of protecting the biological diversity of Cuba, which is highly relevant in the long term, it is crucial that management efforts are continued and expanded to other areas of importance for the conservation of biodiversity. As management is continued, effectiveness must increase to cover other IAS not prioritized by the project and to ensure restoration with native species as well as inclusion of native species in productive landscapes. Areas restored in natural sites and in productive landscapes should be registered separately.

4.2.2.2 Outcome 1

Plan and execute activities included in the five sections of the "National Program to Prevent, Manage and Control IAS in the Republic of Cuba" (2012- 2020).

Distribute the "National Program to Prevent, Manage and Control IAS in the Republic of Cuba" (2012 - 2020) to the principal employees in the environmental sector, productive sectors related to IAS issues, research centers and universities related to Biology, Agronomy and other professions that include natural resource management. The document contains significant information and contributes to improve the national environmental culture.

Develop and request approval of regulations for the Early Warning System to ensure its consolidation in the Cuban institutional framework. This system is highly relevant for the eradication of new *foci* of biological invasions, as well as to optimize management efforts and resources.

Consolidate and officially publish alien species lists with respective regulations that clarify permitted and restricted uses for each species or group of species. The lists can be developed in categories according to the risk posed by each species, their usage in productive systems, and the feasibility of their containment and control. Species that are not considered significantly useful or can be replaced by native or non-invasive ones should be prohibited, while the ones considered relevant in production systems require specific regulations on their use. The National Invasive Alien Plant List is an excellent reference to aid in the development of the alien species

lists, which should be officially published and updated periodically. The ET also recommends that, for ethical reasons of many nations, the alien species lists be named “prohibited”, “restricted” and “permitted” or analogous terms to be defined, rather than “black”, “grey” and “white” lists.

Establish specific regulations for IAS to be contemplated with economic incentives. In order to minimize the risks (explained in section 3.3.3) of establishing permanent markets for IAS due to the application of economic incentives, as well as of fostering new invasions because of increased value and distribution, specific regulations should be developed for each species. Cultivation or breeding must be restricted to avoid spreading IAS to new areas; surveillance must be increased in areas where these species receive incentives; and they must be included as priorities in the Early Warning System. IAS regulations can help balance the use of incentives with rational management for as long as these species are deemed necessary in production systems. **Developing exit plans for economic usage** as the species populations decline or in case eradication becomes viable is equally important. Plans may include the gradual replacement of IAS by transferring incentives to the cultivation of native species with similar functions or replacement with non-native species of low invasion risk. These gradual replacement efforts should begin while the IAS populations still supply established demands or interest. It will be important to request support from academic and research institutions to define lists of alternative native species for production purposes per ecosystem in the country, considering different potential uses such as landscaping, energy stocks, wood, firewood, poles, production of honey, shade in pasture areas, hedges, and others. Once again, the National Invasive Plant List is an excellent reference of species to be avoided.

If other economic incentives are defined for more IAS in the future, it is recommended to **develop specific regulations** for each one **before incentives are applied** to avoid potential negative effects and increase surveillance and control in target areas.

4.2.2.3 Outcome 2

A relevant collection of technical products on several aspects of IAS has been generated during project implementation. Recommendations for some of the products that require corrections or improvement are made below. A detailed explanation of the technical issues noted in these documents is available in section 3.3.3.1 on Effectiveness.

Not use the Risk Analysis Guide for Alien Species. The main reason for this recommendation is the high degree of subjectivity of the method developed, which tends to create inconsistent and biased results. Risk analysis protocols have been developed by biosecurity agencies in Australia, New Zealand and a scientific institution in England, then adjusted to the reality of several countries with excellent results. These protocols were also adjusted to the reality of Latin America and are available for general use. Protocols for plants, terrestrial vertebrates and fishes reach 90% precision in the results of risk assessment and should be considered for adoption in Cuba rather than trying to develop a new system. The ET strongly recommends that the Risk Analysis Guide for Alien Species is not used because the results will not comply with expected standards to safeguard biodiversity. Adapting or developing risk analysis protocols is a time-consuming task that requires testing a large number of species. Adopting protocols that have been tested is a better strategy so that time and resources can be best used for management and other necessary tasks.

Revise the Screening Method for Alien Species Lists. This method uses most of the criteria included in globally used risk analysis protocols, and could almost function as a risk analysis method. This methodology requires a revision of step 4 (see section 3.3.3.1 on Effectiveness), which deducts points if there is economic interest on the IAS under evaluation. This consideration tends to produce false results on invasive potential, as it assumes that species of interest for production do not become invasive. Once adjusted, this method needs to be validated, as all results for the 14 species evaluated so far were the same (black list). Validation will only be completed once the method is proven to screen species for all three lists. The ET therefore **recommends**: (a) to adjust the methodology by removing the step on economic value and making complementary adjustments regarded necessary; (b) run other species analysis, from well known invasive alien species to species that have not become widely invasive, such as the forestry species *Tectona grandis* and *Gmelina arborea*, and some ruderal plants, to validate the screening capacity of the method for the three separate lists. It is important to prioritize alien species that pose threats to biodiversity (only 4 species formerly screened) rather than species of agricultural interest (10 species formerly screened) to comply with the project objective and produce a support tool for environmental management. In order to verify consistency, different people should apply the method to the same species and arrive at similar results, i.e., inclusion of the species in the same list. If different people obtain different results the method is not consistent and cannot be used or requires further adjustment. The international risk analysis protocols mentioned for replacement of the risk analysis guide developed within the project can also be used as a screening tool and may be considered as an alternative to the time-consuming task of adjusting this methodology.

Screen species for the alien species lists in two stages. During the TE it was observed that, although a species might be indicated for the black list, it does not become prohibited. For this reason we recommend that the screening process be executed in two stages. The first stage is equivalent to a risk analysis, and must provide a solid notion of the species invasiveness disregarding any potential positive benefits (step 4 of the methodology). When a species indicated to the black list is deemed important for production purposes it is reevaluated in the 2nd screening phase, which refers to **risk management**. If use of the species is to be continued, specific regulations to enforce control and surveillance as well as restrictions to secondary uses need to be developed. In general, a species is allowed for a particular productive purpose only, while other uses are no longer allowed (e.g. it cannot be used as an ornamental plant or pet). In the evaluation carried out in stage 2 the use of a species must be assessed considering (a) feasibility of species containment in productive areas – this is nearly impossible when seeds are dispersed by birds, bats or other animals, but more viable when dispersed by wind or water; (b) specific regulations limit its use and prevent dissemination across the landscape; (c) support to producers and surveillance to ensure restrictions are respected; (d) inclusion in the Early Warning System to increase the chance that occasional cultivation escapes are detected and controlled. These measures may still be too feeble to prevent new invasions. Complementary measures could include setting up a fund with resources generated by IAS in commercial functions, which would be used in rapid response situations; or restrict species use to very specific areas where containment is more feasible due to environmental or geographic conditions. Specific measures have to be defined per species or group of species used for the same function or with similar biological traits, and must also consider proximity to relevant

natural areas that may be impacted, the occurrence of endemic or threatened species, and cost-benefit ration if the species has to be kept under control because it easily escapes cultivation.

Revise the Management Effectiveness Methodology. As explained in section 3.3.3.1 on Effectiveness, this method was well designed to measure effectiveness in the specific context of the project, but is no longer adequate for routine management actions. The most adequate indicator to effective management is the recovery of native species populations, especially when endemic species are part of the assembly, as well as exclusive recolonization by native species in natural areas. In productive landscapes there tend to be more non-native species, but native species have to be part of the rehabilitation process as well for reasons already explained. For management effectiveness considering the ecosystem approach, some variables to be used as indicators are:

a) in natural areas: increase in the frequency and abundance of native species, especially endemic, free of competition with alien species; and area under management practices considered in good restoration condition, free of alien species;
b) in productive landscapes: area rehabilitated for productive use, which may include alien but preferably non-invasive species and, necessarily, the mainstreaming native species in rehabilitation design (ideally at least 20-30% native species are used in forming wooded areas for shade for the cattle, corridors along rivers and streams or as hedgerows to improve connectivity between natural vegetation fragments, establish fruit orchards that include native species, etc., to ensure that the rural landscape becomes more resilient and maintains ecological functions).

Other social and economic factors may be taken into consideration as aggregated value to IAS management (community involvement, individual initiatives for control or plantation of native species, etc.), but should be recorded separately. If so, a valuable register of activities continued from project implementation will be maintained as well as an indication of changes once the project ends without affecting management effectiveness.

Maintain and continue updating the Invasive Alien Species Management Information System (SIMEEI). Appending all IAS already identified in Cuba is a priority (National Invasive Alien Plant List, 2015, alien vertebrates and invertebrates compiled by the Institute of Ecology and Systematics, data received from collaborators, scientific publications and other means), as well as the information contained in the respective indicator in the logical framework: quarantine mechanisms, risk analysis and EIA, early warning response, monitoring and control, management, and coordination between institutions. In order to consolidate the SIMEEI the ET recommends that an Administrator or Group of Administrators is formally instituted and in charge of requesting, receiving, validating and appending new data. In order to broaden the scope of the system and give it more visibility, the ET recommends that a network of collaborators is formed by experts in the several biological groups, professionals in the National Protected Area System, scientific and research institutions and NGOs, as well as others who might contribute to system updates and data validation.

Widely disseminate the IAS Management Information System (SIMEEI). Many IAS are present both in natural areas and in productive landscapes, therefore generating problems for conservation but also for tourism, agriculture, pasture, forestry and other productive sectors. For this reason, the information system has to be made accessible to a wide range of users. Even

if an online version of the SIMEEI is hosted by the Protected Area Information System, links to the SIMEEI have to be inserted in websites of national environmental agencies, universities, scientific institutions, landscaping associations, agricultural agencies, including fisheries and cattle production, tourism and others on pets and aquarium fishes, and NGOs working with communities, environmental education and sustainable land use. The SIMEEI shall also be made known to international networks specializing on IAS for visibility and potential collaboration, such as the I3N databases in several countries in Latin America, ISSG (Invasive Species Specialist Group) and GIASIP (Global Invasive Alien Species Information Partnership). Although the system only contains national data, it will be an important reference to other countries, as many IAS are widespread and all information available corroborates invasion capacity and adds to prevention, early detection and control experience, as well as biological and ecological data relevant to IAS management.

4.2.2.4 Outcome 3

These recommendations refer to practical management actions and mainstreaming biodiversity concerns and native species in productive landscapes.

Integrate at least 20-30% of native species to productive landscapes. Some limitations on effectiveness were covered in the respective section (3.3.3.1). As explained, establishing management programs per species may have created difficulties in the perception of how to apply the ecosystem approach in restoration and rehabilitation efforts. Productive landscapes require ecosystem services as much as, or even more than, natural areas. The ET recommends including 20-30% of native species in productive landscapes to improve ecosystem functions and other benefits already mentioned. Many native species can be used to replace non-natives and IAS for shade, energy stocks, wood, forage, and other uses such as ornamental plants. This recommendation is in agreement with Objective 4 of the GEF-6 Programming Directions: "*Mainstream biodiversity conservation and sustainable use into production landscapes/seascapes and sectors*".

Plan management actions for areas, not species. Given the experiences observed in some project sites, the ET recommends that in the future management efforts focus on areas rather than species, to ensure the use of the ecosystem approach and achieve successful restoration. As indicated in the recommendations for Outcome 2, restoration indicators must focus on native species occupation of managed areas after IAS removal. The respective guidelines for management programs might require some updating to include this approach.

Totally exclude the use of alien species, planting only natives, in restoration of natural areas. Planting alien species, even if of low risk of invasion, in restoration sites in natural areas does not contribute to ecosystem functioning, as they are not part of natural cycles and do not contribute to ecological balance. Besides, they may become invasive in years to come. The current environmental context is made of much instability due to the effects of climate change and to species adaptation and evolution in sites of introduction. There are no "safe" species, especially when records of invasion are known from other parts of the world.

Not use species already identified as IAS for landscaping or other secondary uses. Species already acknowledged as invasive should no longer be used for landscaping or other secondary uses. This recommendation is derived from the recent use of invasive alien plants to form the

collection of the Camaguey Botanical Park. These plants (*Spathodea campanulata*, *Acacia mangium*, *Acacia nilotica*, *Schinus therebinthifolius* and neem *Azadirachta indica*), as well as other IAS used in project sites, should be removed before they produce seeds and establish new invasion *foci*. The National Invasive Plant List is an excellent reference on plants to be avoided. In the case of the Botanical Park, invasive plants may be presented to the public in printed materials or other digital means along with the reasons why they are not planted in the gardens, their potential impacts and management complexities. This recommendation is aligned with the National Strategy for IAS developed through this project, Objective 1: "Revise social and productive programs to promote the use of native species and discourage the introduction of IAS."

4.2.3 Proposals for future directions underlining main objectives

Recommendations for other projects to be developed for IAS governance and management. The main project targets are highly relevant in developing IAS governance, awareness and management in any country. It is important that each project identifies mechanisms to maximize the likelihood of sustainability of implemented activities from the beginning. The inclusion of IAS issues in policies and regulations is a key strategy, as well as its incorporation in the mandates of relevant government agencies in charge of natural resource management and primary production. Identifying funding sources and establishing funding mechanisms is the third key aspect that requires continuity in the long term.

New projects should include the following elements/outputs, especially when approaching IAS issues for the first time:

a) inserting IAS issues in national and provincial policies and regulations on the conservation of biodiversity and sustainable use of natural resources by productive sectors. The expected results should include a national strategy for IAS; inclusion of IAS management in protected area systems and other areas of relevance to biodiversity; establishing legal bases for IAS control and eradication according to technical recommendations; adoption of risk analysis protocols for biological invasions to screen requested introductions; improved border control to prevent accidental and illegal introductions; development of regulations for the use of relevant IAS in production systems in forestry, agriculture, pasture management, aquaculture, landscaping and others, establishing restrictions for general usage while allowing continued production for specific purposes as long as considered relevant and of difficult substitution;
b) participation of agricultural, forestry, education and health sectors, especially for policy and regulation development, but also in capacity building and public information;
c) capacity building for professionals in different areas linked to natural resources and conservation, professors and scientists in research and education institutions. These people are future catalyzers of the IAS problematic in each country. Capacity building for practical IAS management is key to ensure effectiveness and best results in conservation, restoration and high cost-benefit;
d) implement a national information system or database. Information forms the base for policies, species lists, management references, risk analyses, and much more. It provides practical references to professionals who use species in restoration, rehabilitation, environmental impact studies, production and landscaping, as well as influences

scientific research in the search of solutions for existing problems and to understand their impacts. Databases also have social functions in guiding decisions about ornamental plants to use or keep in the garden as well as about the adoption of pets;

e) a publication of an official list of IAS e.g. with categories (prohibited and permitted under restrictions to be defined by agencies in charge of environmental regulations). Official lists tend to change people's concepts of species use in restoration, gardening and landscaping projects (ornamental plants tend to represent the highest percentage among invasive plants in most countries), forestry, land reclamation in productive landscapes and use of forage species, fisheries, pets and aquarium species, among others. Species lists also result in an indirect need to identify native species that can fulfill some of the roles currently given to IAS, which represents a cultural rather than biological issue especially in high biodiversity countries. Cultural changes are part of the challenge of IAS management, especially when promoting the value and potential uses of native species as well as their intrinsic value for ecological balance and maintenance of ecosystem services. The publication of alternative species to IAS for specific uses is also a relevant strategy and requires involvement of professionals from scientific institutions;

f) develop an early detection, rapid response system including experts of many institutions for support on taxonomy and practical action. There may be several early warning systems, e.g. one focused on protected areas, other on border control, etc. The identification of priority vectors and pathways of species introductions and spread must be part of the process;

g) inclusion of IAS management as a priority for protected areas and other relevant areas for the conservation of biodiversity and ecosystem services with technical capacity available for sound decisions on prevention, eradication and control measures using all tools available. Management objectives must be linked to restoring areas or habitats in natural areas, not simply removing IAS. The ecosystem approach should be applied at all times to natural areas and productive landscapes. Acknowledged IAS must be excluded from natural ecosystems, public nurseries and donation initiatives;

h) insertion of native species in productive landscapes for secondary uses. Native species must be identified and listed for specific purposes per ecosystem or region for substituting IAS in some production systems and in secondary usage (wind breaks, shade, hegderows, ornamental use, and others). This recommendation is is in agreement with Objective 4 of the GEF-6 Programming Directions: "*Mainstream biodiversity conservation and sustainable use into production landscapes/seascapes and sectors*";

i) especially in the Caribbean region, where islands are susceptible to extreme climatic events while the number of endemic species is often very high, develop best practices for climate change adaptation mainstreaming native species into the landscape and productive systems to increase resilience and avoid invasions facilitated by hurricanes or other extreme events.

The following recommendations refer to actions initiated through the project:

Widely disseminate the Early Warning System so the general public understands the procedures to report IAS occurrences, as well as to seek support from the scientific community and NGOs for records of IAS in research sites and other areas of work. Forming a larger network of people with control skills in time tends to increase capacity and IAS eradication success. Another interesting alternative is to consolidate an early warning system for protected areas linked to the broader system coordinated by the Forest Rangers Corps with support from the academic and scientific community who use these areas for research or education purposes.

Develop specific regulations for IAS in productive systems (e.g. *Leucaena leucocephala*, *Acacia mangium*), including the IAS not prioritized by this project and those to which economic incentives are applied (*Clarias gariepinus*).

Develop economic incentives for the use of native species for several purposes, from ornamental use and landscaping to production of wood, firewood, fruits and other sub-products, as well as breeding native fishes in their respective watersheds and similar examples.

Expand IAS management to other species focusing on sites rather than species. Aside from prioritizing species, it is also relevant to prioritize areas for IAS management based on technical criteria such as (a) eradication opportunities of initial invasion; (b) presence of threatened species; (c) presence of endemic species in restricted populations; (d) infrastructure and institutional capacity for effective management actions; (e) landscape matrix that facilitates restoration; and others to be defined according to each local context. This should help avoid the removal of some IAS while others occupy the space intended for native species.

Identify and produce native species and make them available to replace some IAS in use. This is meant for the medium term and may include non-native species of low invasion risk verified through risk analysis. The work developed during the project between environmental agencies and productive sectors using economic incentives as a control strategy is relevant and should not terminate with the project. Many people whose work involves the use of natural resources tend to easily understand biological invasion problems by species that cause harm to their activities. But when the species they use for production are recognized as invasive, acceptance is much more difficult. People commonly insist in continuing to use the same IAS they extract benefits from despite their impacts on other species, habitats or ecosystems. They also tend to believe they have the capacity to control or contain IAS from spreading or causing impact. The positive relations established between project staff and productive sectors were due to the focus on species that were either detrimental to production or brought economic benefits from fishing for catfishes and lion fish, or capturing feral buffalos for confinement. Conflicts of interest were hence avoided. In the future it will be necessary to manage other IAS not contemplated in this project, which could mean that the use of some IAS considered beneficial should be discontinued or they should be gradually replaced. Conflicts of interest tend to emerge then, as considered in the risk section of the PRODOC. The cattle producers, for example, can easily understand that marabu (*Dichrostachys cinerea*), *Mimosa pigra* and *Acacia farnesiana* are invasive, but have not stopped planting *Leucaena leucocephala* despite its invasiveness because it is useful for forage. Careful management can certainly help contain invasions, but it is not feasible to assume that management can be sufficient to prevent spread in the long term. The catfish (*Clarias gariepinus*) creates even more risky situations, as the agencies in charge of

aquaculture will not be able to control every fish tank or prevent the escape of larvae, fry or fingerlings to natural water bodies, or deter illegal cultivation. The forestry sector uses trees with solid invasion history in other countries, such as *Acacia mangium*, to form energy stocks along the major roads and other rural areas, increasing their opportunities to spread and invade from these pathways. This is precisely the issue the CBD Aichi Target 9 aims to prevent. To mitigate these problems it will be important to identify and produce native species and make them available for use in productive systems and landscapes. Alien species with no history of invasion and low risk indicated by risk analysis can also be considered for use although no ecological benefits will result. This recommendation contributes to Objective 3 of the National Strategy for IAS: "Promote communication actions related to the prevention, control and management of IAS as well as alternatives for their use" and is in agreement with Objective 4 of the GEF-6 Programming Directions: "*Mainstream biodiversity conservation and sustainable use into production landscapes/seascapes and sectors*".

In agreement with the National Strategy for IAS, Objective 2: **"**Investigate and evaluate environmentally sound methods (mechanical, chemical, biological or their combination) to control and eradicate IAS":

Consider chemical control as a tool for invasive alien plant management. The ET observed some resistance to the use of herbicides as a control option for invasive alien plants in natural areas, a common concern due to feared potential impacts. Herbicides are important tools to improve management effectiveness and reduce control repetitions on the same plants and areas. Chemical control reduces management costs and increases effectiveness, often eliminating 100% of treated plants with one single application when appropriate herbicides are used. The use of a herbicide called Potreron was mentioned during the field visits. Picloram is one of the active ingredients of this product, and can persist in the environment up to 2-3 years before it is totally decomposed. Herbicides made of active ingredients that decompose faster should be sought for use in IAS management. The active ingredient Triclopyr is especially effective for woody plants (trees and shrubs), while products made with Glyphosate are more effective for herbs and grasses. These products are decomposed in 20 to 45 days on average and even faster in hot and humid environments. Technological improvement of herbicides have generated viable and important tools to control invasive alien plants in natural areas with excellent levels of safety to people and the environment. These are low volume applications and, as 90-100% of plants are eliminated after one single application, these areas are not subjected to repeated treatment. These active ingredients are not excreted through plant roots, hence are contained in tree stumps on which they are applied. Glyphosate is most often sprayed on plant leaves. Careful applications can be precise and not affect neighboring plants nor the soil. Protective gear must be used at all times and all recommendations on herbicide labels must be followed carefully.

Consider biological control as a feasible control method for *Melaleuca quinquenervia* because many of the areas invaded are not accessible on foot or by boat. As in the case of herbicide use, resistance to the possibility of biological control was felt among project participants during field visits. The ET recommends that an expert group is formed to learn more about biological control of *melaleuca* in the Florida Everglades, where it has successfully reduced invasion. This is an

important opportunity because a number of control agents have already been identified and released with confirmed effectiveness. It will be necessary to test the specificity of these control agents in Cuba to make sure no harm would result to other plants. The high relevance of biological control in this specific case is due to the characteristics of invaded areas, wetlands that prevent direct access to the trees. As the project contributed to the installation of a new quarantine laboratory, the infrastructure and safety requirements for testing control agents should be in place. Research may take a number of years, but if it works there will be a real chance of restoring the Ciénaga de Zapata, the largest wetland in the Caribbean. While control possibilities are limited for lack of access to important areas invaded, containment might be the best strategy, so new invasions in accessible areas should be prioritized for control to avoid further spread.

4.3 BEST AND WORST PRACTICES IN ADDRESSING ISSUES RELATING TO RELEVANCE, PERFORMANCE AND SUCCESS

Many of the worst practices observed in this project can be useful to other GEF projects. The identification of these issues have the sole purpose of improving future actions regardless of project termination.

Invasive alien species were widely discussed for the first time in Cuba through this project. It cannot be expected that all people understand this complex issue on the first approach, and the mere fact that many people now know what IAS are or the problems they can cause is highly relevant. Work on the issue has to be continued so that all the products generated in this project can be applied, tested, learned from, and constantly improved. IAS are persistent problems that need to be addressed from many angles, from policy and science to practical management.

4.3.1 Best practices

Including IAS issues in the Cuban legal context, especially in the National Strategy for the Environment, the National Protected Area System and other relevant regulations.

Including IAS in the national education system at all levels with support from the Ministries of Education and Higher Education.

Promoting workshops with key agencies and institutions from the moment the project was approved, even before the official first meeting. Active participation of institutions was encouraged from the design phase and resulted in high ownership of project activities.

Development and functioning of the Early Warning System based on the Forest Rangers Corps existing structure and establishment of a new position in the national CGB headquarters to coordinate the system.

Inclusion of large numbers of people in capacity building and information workshops, many of which learned about IAS for the first time.

Establishment of provincial coordination structures and project sites throughout the country, handing over responsibilities to many government agencies as well as involving communities and productive sectors.

Integrating IAS management into productive sectors, initially considered a risk to the project due to possible conflicts of interest. The results are due to mature and experienced management

by the PMU in settling agreements and finding ways to generate benefits around a complex environmental issue.

Community participation in monitoring the effects of climate change, as technical staff realized the relevance of local perception and knowledge in detecting and interpreting environmental changes.

Annual workshops on lessons learned used as a base for planning activities for the following year and promoting information and experience exchange among project participants throughout the country.

Production of detailed quarterly reports from each province used as an effective means of communication and supervision to adjust or improve activities in development.

4.3.2 Worst practices

Allowing IAS controlled by project staff to be replaced by other IAS in some project sites. Invasive plant control efforts in rural areas were wasted when they were replaced by other IAS in pastures (e.g. *Moringa oleifera*, *Leucaena leucocephala*, *Tithonia diversifolia*); marabu (*Dichrostachys cinerea*) thickets were replaced by alien fruit trees; control of priority invasive plants in natural areas led to colonization by other invasive alien plants (Topes de Collantes); and the lack of action on tilapia (*Oreochromis* sp.) by project participants in charge of management when its population increased as a result of catfish (*Clarias gariepinus*) control. These practices are serious faults in terms of environmental management and in failing to understand the basis of invasion biology and to apply the ecosystem approach which is used as a conceptual base for this project.

Planting IAS already acknowledged as invasive in Cuba. While some IAS were prioritized for control, other alien species were being planted as part of a restoration effort in forest areas (Topes de Collantes). One of the IAS under control in Topes de Collantes was recently planted in the new Camaguey Botanical Park along with other known invasive plants, creating potential new sources of future invasion. This indicates the need to improve the conceptual basis of IAS science, and is a common problem in all parts of the world as well as a challenge in IAS management. All species mentioned are listed as invasive in the National Invasive Plant List, which should be more used as a reference for project implementation and practical management. People involved in IAS management need to better understand the implications of using IAS and their own limitation in containing their dissemination.

4.4 LESSONS LEARNED

Project management

IAS prevention, management and control projects function as catalyzers for the involvement of sectors which are not often part of environmental management, such as the Forest Rangers Corps, the Frontier Guards Corps, General Customs, agencies working on maritime security and inspections, and productive sectors.

Regular meetings organized in one province at a time allowed project participants to share, exchange, teach and learn from activities under implementation, creating references that did not formerly exist for IAS management.

Assigning coordinators for each province improved the efficiency of technical and financial management.

The production of detailed quarterly reports by provincial coordinators allowed the PMU to supervise ongoing activities, understand difficulties and constraints, and provide ongoing support.

Inclusion of IAS issues in national policies and regulations combined with capacity building and public information provided a robust guarantee of sustainability for project activities.

Project implementation

Integration of several sectors related to environmental management and natural resource use, as well as the academic – scientific sector, is key in IAS management projects.

The high accomplishment rate of the project is due to cooperative work, regular meetings in different areas, good communication with coordinators, annual lessons learned workshops, and regular visits to project sites by the PMU.

The inclusion of IAS issues in massive media is an effective way of involving the general public in reporting IAS occurrences to the early warning system.

The existence of biodiversity monitoring programs contributes to the understanding of the effects of climate change on ecosystems and species.

The perception and knowledge of community members is key in the interpretation of environmental changes due to climate change.

The insertion of IAS issues in the educational system and in Pedagogical Universities contributes to extending the knowledge gained through the project to future generations.

5 ANNEXES

5.1 TERMS OF REFERENCE (TOR)

TÉRMINOS DE REFERENCIA DE LA EVALUACIÓN FINAL

PROJECT PNUD/GEF **"Mejorando la prevención control y manejo de especies exóticas invasoras en ecosistemas vulnerables de Cuba" (PIMS 3990).**

INTRODUCCIÓN

De acuerdo con las políticas y los procedimientos de SyE del PNUD y del GEF, todos los Projects de tamaño mediano y regular respaldados por el PNUD y financiados por el GEF deben someterse a una evaluación final una vez finalizada la ejecución. Estos términos de referencia (TdR) establecen las expectativas de una Evaluación Final (EF) del Project GEF/PNUD **"Mejorando la prevención control y manejo de especies exóticas invasoras en ecosistemas vulnerables de Cuba" (PIMS 3990).**

Cuadro sinóptico del Project

Título del Project:	Mejorando la prevención, control y manejo de especies exóticas invasoras en ecosistemas vulnerables de Cuba.			
Identificación del Project del GEF:	3990		*al momento de aprobación (millones de USD)*	*al momento de finalización (millones de USD)*
Identificación del Project del PNUD:	78464	Financiación del GEF:	5,018,182	5,018,182
País:	Cuba	IA y EA poseen:	n/a	n/a
Región:	LAC	Gobierno:	9.950,000	13,830,500
Área de interés:	Biodiversidad	Otro (UNDP/Cuba):	50,000	50,000
Programa operativo:	OP 7	Cofinanciación total:	10,000,000	13,880,500
Organismo de Ejecución:	CITMA/CNAP	Gasto total del Project:	5,018,182	5,018,182
Otros socios involucrados:	-Ministerio de la Agricultura -Ministerio del Interior -Ministerio de Transporte	Firma del documento del Project (fecha de comienzo del Project):		14/06/2011
		Fecha de cierre (Operativo):	Propuesto: 29/06/2016	Real: 31/12/2016

OBJETIVO Y ALCANCE

El Project se diseñó para proteger los ecosistemas vulnerables de agua dulce y terrestre, las especies y la diversidad genética en Cuba, de los impactos negativos de las especies exóticas invasoras. Más específicamente, el Project tiene el objetivo de salvaguardar la biodiversidad de significación global en ecosistemas vulnerables, mediante la creación de capacidades a nivel sistémico para prevenir, detectar controlar y manejar la diseminación de especies exóticas invasoras en Cuba. Se planteó alcanzar esta meta y objetivo mediante el fortalecimiento de las políticas institucionales y las capacidades técnicas necesarias para manejar estas especies, estimulando la cooperación multisectorial para la efectiva implementación en el campo. Alcanzar este estado requirió de trabajo en las estrategias operacionales siguientes: (i) fortalecer el marco político y legal sobre las especies exóticas invasoras; (ii) construir mecanismos de coordinación efectivos entre todos los sectores involucrados, entre instituciones relevantes y en asociación con los actores claves; (iii) incrementar el conocimiento científico sobre la biología y comportamiento de estas especies, sobre la introducción de especies exóticas invasoras, dispersión, impactos y opciones de manejo entre las instituciones claves, responsabilizadas con el control; (iv) incrementar la concienciación pública general sobre las especies exóticas invasoras y sus impactos; y (v) mejorar la efectividad del manejo en el campo para garantizar la salvaguarda de la biodiversidad.

Es un Project de alcance nacional, donde participan todas las provincias del país, con siete Áreas de intervención y cerca de 60 sitios de trabajo, de los cuales, más de 20 sitios son Áreas Protegidas, con distintas categorías de manejo; ecosistemas naturales y

ecosistemas productivos. En el Project participan más de 200 especialistas y técnicos, pertenecientes a 30 instituciones, que incluyen el sector científico; la Academia y los principales sectores económicos del país, tales como, Agricultura, Forestal, Ganadero, Pesca, Turismo y otros.

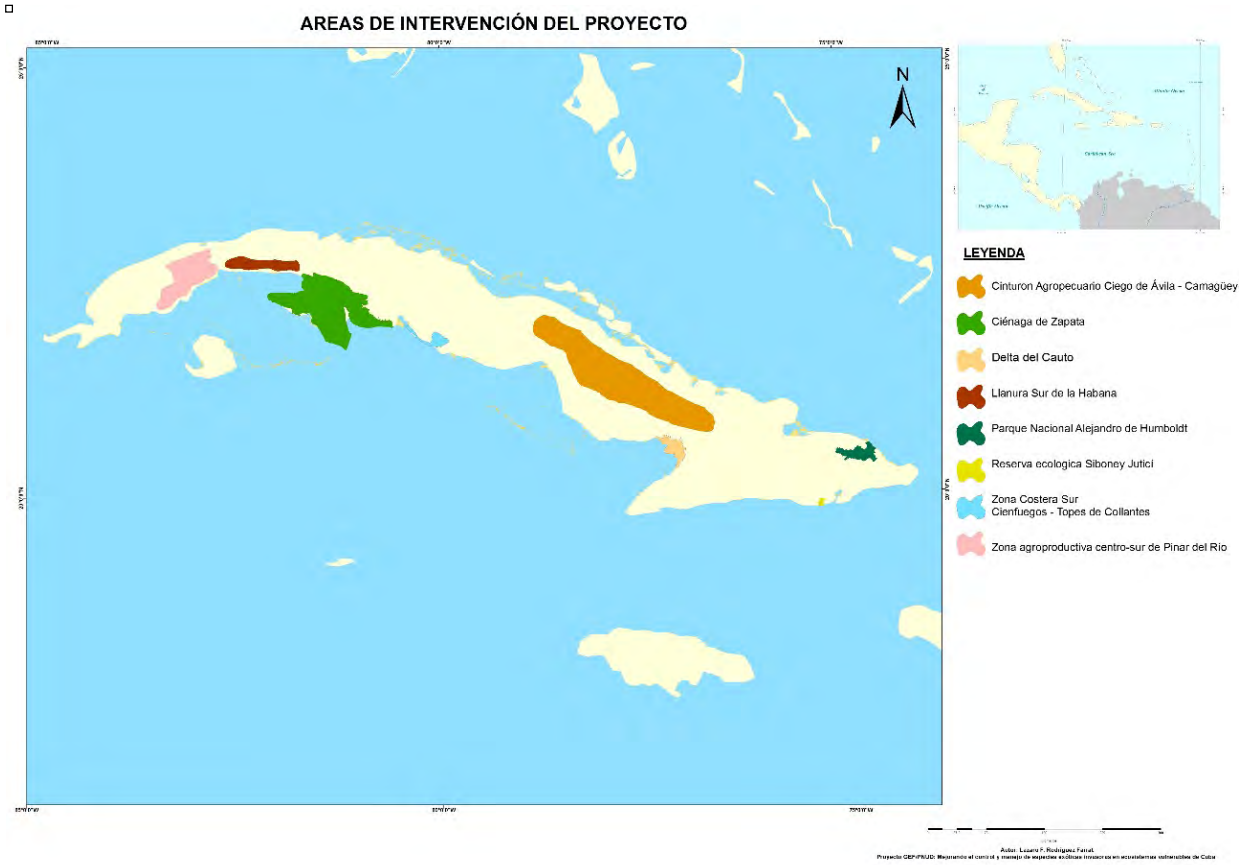

Figura 1- El área del Project abarca todo el Archipiélago cubano con 7 áreas de intervención en la zona terrestre y toda la zona costera - marina, alrededor del mismo.

El archipiélago cubano está situado en las Antillas Mayores y comprende 4.196 islas y cayos. La isla principal (Cuba), con una extensión de 1.250 kilómetros de Este a Oeste, está bordeada por cuatro grupos de islas. El archipiélago tiene una superficie total de 110.921 km2, el 89% de la superficie total de las Antillas. Gran parte de la superficie terrestre se compone de extensas llanuras, que cubren aproximadamente el 79% de la superficie terrestre total. Cuba tiene la mayor diversidad de especies en las Indias Occidentales, con más de 6.500 especies de plantas superiores registradas, posiblemente, un 2,2% del total mundial, 350 especies de aves, incluyendo muchas especies migratorias, 147 especies de reptiles y anfibios, 42 de mamíferos y 13.000 especies de invertebrados. Gran parte de la biota es única, por el alto nivel de endemismo de la misma, como elemento principal a destacar dentro de los valores y características de la biodiversidad cubana y la otra característica significativa es la diversidad de hábitat y ecosistemas. En relación con el nivel de endemismo, baste señalar que más del 52% de la flora cubana y más del 32% de la fauna de vertebrados son endémicas. Como puede verse, el endemismo es especialmente alto entre las plantas, pero, debe también señalarse que hay grupo de la fauna, como los moluscos, la herpetofauna y los insectos, en los cuales, el endemismo está entre el 80 y el 90% de las especies, de ahí que, es evidente que prácticamente toda la biodiversidad cubana, tiene significación e importancia global.

Las condiciones climáticas extremas, la diversidad de hábitat, la evolución geológica y el aislamiento geográfico de la isla, son factores que hacen posible el alto nivel de endemismo pero, al mismo tiempo, la condición de fragilidad y vulnerabilidad de muchos de los ecosistemas cubanos. Más del 75% de la biota endémica se ve ahora amenazada, y el 36% clasificadas como amenazadas a nivel global (Vales et al., 1998). La Unión Internacional para la Conservación de la Naturaleza (UICN) mediante su lista roja indica que 294 especies se encuentran amenazadas, incluyendo 163 especies de plantas, 49 especies de anfibios, 28 especies de peces y 17 especies de aves. También revela que 131 especies de animales y 163 especies de plantas están clasificadas como en peligro crítico, en peligro o vulnerables.

Los principales ecosistemas de la isla son marinos, marino-costeros, y terrestres. Entre los más importantes de los ecosistemas marinos, son se encuentran los arrecifes coralinos, los que bordean más del 95% de las tierras de Cuba. También, los pastos marinos dominados por *Thalassia testudinum*, comprenden más del 50% de la de la plataforma insular y constituyen, junto con los arrecifes coralinos y los manglares, los tres ecosistemas más productivos del océano. Entre los principales ecosistemas marino-costeros están los humedales cubanos, estando los más significativos localizados en la Ciénaga de Zapata (Provincia de Matanzas), el Humedal Delta del Cauto (Provincias Granma y Las Tunas), y la Ciénaga de Lanier (Isla de la Juventud), todos los cuales están clasificados como Sitios Ramsar. Estos ecosistemas están marcados por su riqueza de especies, productividad y altos niveles de aves, mayormente acuáticas y migratorias. El Humedal de La Ciénaga de Zapata no solamente tiene la más alta riqueza de especies de aves de la Isla (258 de 368 reportadas en el archipiélago), sino también, el mayor número de aves endémicas, algunas de ellas, endémicos locales.

El Project se enfoca en los ecosistemas más vulnerables en Cuba, pues entre las áreas de intervención, se encuentran los dos humedales más importantes de Cuba, la Ciénaga de Zapata en la región occidental y el Delta del Río Cauto, en la región oriental; ecosistemas montañosos de alta biodiversidad, en la región occidental, central y oriental, entre las áreas protegidas, se encuentran 5 parques nacionales, 3 Reservas de Biosfera; 2 Sitios RAMSAR y toda la zona costera - marina del archipiélago cubano, con más de 4 000 pequeñas islas y cayos, alrededor de la isla principal. Se diseñó el Project para trabajar con 26 especies, 13 de flora y 13 de fauna, pero ha sido necesario añadir 3 especies de fauna, por su detección durante la ejecución del Project, la araña parda mediterránea (Cyrtophora citricola); el ácaro rojo de las palmáceas (Raoiella indica) y el caracol gigante africano (Achatina fulica) que se reportó por vez primera en Cuba, en Junio de 2014. En relación con las especies de plantas, se comenzó la prospección y monitoreo de una especie correspondiente a la vegetación de costa arenosa, la Scaevola sericea, reportada ya en varios lugares del país.

Las especies exóticas invasoras (EEI) han sido identificadas en la Estrategia Ambiental Nacional y su Plan de Acción 2007-2010 y en la Estrategia actual, como una seria amenaza a la biodiversidad cubana, y son considerados como una de las principales causas de pérdida de biodiversidad en el país. Esta vulnerabilidad se debe principalmente al carácter insular del país y su alto nivel de endemismo, así como su gran diversidad de especies y de ecosistemas. En la base de datos mundial sobre especies invasoras de los grupos en Especies Invasoras de la UICN, 63 especies invasoras han sido identificadas. Al menos 43 de ellos son consideradas EEI; entre ellos, los árboles, las hierbas, anfibios, insectos, aves, peces, reptiles, plantas acuáticas, corales y mamíferos. Esto, a su vez, es una seria amenaza para muchos ecosistemas vulnerables de la isla. Es importante destacar que las EEI en general afectan a ecosistemas específicos; su comportamiento invasor no es necesariamente uniforme a través de paisajes. Por lo tanto, los impactos de las EEI en la biodiversidad cubana dependen principalmente de las características del ecosistema, resiliencia y vulnerabilidad.

Los principales tipos de impactos se pueden clasificar como: la depredación directa de las especies nativas, la competencia por los recursos, la hibridación con especies nativas sin control, la interferencia con los servicios de los ecosistemas (es decir, el secuestro de carbono y la regulación del clima, purificación del agua y del aire, control de plagas y enfermedades, el aprovisionamiento de los alimentos) y la aceleración de la propagación de otras especies exóticas. Muchos sectores se ven afectados, tanto directa como indirectamente, por el desplazamiento de especies nativas por las EEI y la colonización de los ecosistemas, incluyendo la agricultura, la pesca, la energía, el agua, el turismo y el comercio. Sus impactos en los ecosistemas más frágiles (montañas, tierras húmedas, los ecosistemas costeros y marinos) pueden ser graves.

La prevención, detección y manejo de las EEI juega un rol fundamental en los planes de adaptación al cambio climático. El manejo exitoso de EEI reduce la vulnerabilidad de los ecosistemas naturales y garantiza su capacidad para ofrecer bienes y servicios y mitigar los impactos negativos sobre la diversidad biológica. El Project ha abordado el cambio climático fundamentalmente a través del establecimiento de un sistema de alerta temprana y el sistema nacional de monitoreo para las EEI.

El Project está estructurado en 4 componentes o resultados fundamentales, 3 de ellos de carácter técnico puramente y uno sobre la gestión administrativa del Project.

La siguiente tabla muestra las especies seleccionadas, las principales vías de introducción, impactos a los ecosistemas donde se establecen, así como los usos y una categorización con relación a su potencial invasor a nivel mundial.

Tabla 1. EEI clave y sus impactos.

EEI	Vías de entrada	Impacto	Donde	Usos	Está entre las 100 peores invasoras del mundo
FLORA					
Marabú *(Dichrostachys cinerea*)	Ornamental en jardines caseros	Invade hábitat naturales, deviene dominante, desplazando la vegetación nativa; forma bosques mono específicos; afecta la capacidad productiva de suelos; afecta las palomas de llanuras	Bosques, paisajes productivos	Alimento a ganadería, leña, cercas vivas, Madera, fijador de nitrógeno, control de erosión	No
Aroma *(Acacia farnesiana)*	Introducida con la ganadería	Coloniza paisajes agrícolas; menos agresiva que el Marabú o Weyler	Principalmente paisajes productivos, así como zonas costeras secas, sabanas y llanuras	Flores para perfume; las flores tienen propiedades medicinales	Sí, de *mearnsii* sp.
Weyler *(Mimosa pellita)*	Introducida con la ganadería	Coloniza paisajes agrícolas; Invade habitats naturales y deviene dominante, desplazando la vegetación; forma bosques mono específicos; afecta la capacidad productiva del suelo	Principalmente en paisajes productivos, en zonas húmedas		Sí, de *pigra* sp.
Pomarrosa *(Syzygium jambos*)	Ornamental o fruta, traída por franceses a fines del siglo 18 – principios del siglo 19	Invadidos bosques de galería de la provincia de Pinar del Rio, causando la eliminación de >45 especies de árboles, resultando en un bosque mono específico; pérdida de nichos tróficos de fauna terrestre y acuática; causa cambios en los flujos de agua	Zonas riparias	Frutos comestibles	No
Charagüito *(Inga punctata)*	Introducida en la última mitad del siglo 20 para la ganadería	Invade hábitats naturales y deviene dominante, desplazando la vegetación nativa y áreas donde la Pomarrosa está muriendo	Zonas riparias	Frutos comestibles	No
Ipil ipil *(Leucaena leucocephala)*	Introducido para reforestación en la segunda mitad del siglo 20	Coloniza rápida, desplaza la vegetación nativa y causa decrecimiento de la fauna asociada	Ecosistemas no boscosos	Sombra y alimento para ganadería; controla el crecimiento de Aroma y Weyler; fijador de nitrógeno; adecuado para reforestación en ecosistemas secos; en sistemas silvopastoriles puede servir como corredores biológicos	Sí
Cayeput *(Melaleuca quinquenervia)*	Introducido como ornamental a principios del siglo 20	Invade hábitat naturales y deviene en bosques mono específicos; disturba los hábitat de la flora y fauna nativa; muy alto ritmo de evapotranspiración, tiene potencial para decrecer la cantidad de agua dulce almacenada y de hecho, ser peligrosa para especies tales como el cocodrilo cubano, el manjuarí, las tortugas, peces locales, anfibios y aves	Humedales	Medicinal, insecticida natural	Sí
Casuarina *(Casuarina equisetifolia)*	Introducida para reforestación a principios del siglo 20	Fragmentación de hábitat, desplazamiento de la vegetación, acidificación de arenas, acelera la erosión de la playa	Costa	Adecuada para la reforestación, fijador de nitrógeno, cercas vivas, leña	No
Tulipan Africano *(Spathodea campanulata Beauv*)	Introducido para reforestar en Topes de Collantes	Invade agresivamente tierras agrícolas y forestadas; se reporta vinculada al incremento de los ritmos de mortalidad en abejas y pequeñas aves	Agricultura tropical y bosques	Ornamental y sombra para el café	Sí

EEI	Vías de entrada	Impacto	Donde	Usos	Está entre las 100 peores invasoras del mundo
Malva de Caballo *(Sida ulmifolia)*	Traído en semillas agrícolas	Desplazamiento de vegetación nativa; tóxico para la ganadería, vacuna y equina	Bosques, pastos, zonas riparias		No
Piña de ratón, Maya *(Bromelia pinguin)*	Introducida para uso como cerca viva	Desplazamiento de la vegetación; provee un nicho para ratas y mangosta	Bosques semi deciduos, sabanas	Propiedades Medicinales; cercas vivas	No
Algarrobo de la India *(Albizia procera)*	Introducida como planta para sombra del ganado	Desconocido	Coloniza áreas disturbadas.	Adecuada para reforestación; Madera Buena para muebles, herramientas, postes, papel; forraje	No
Jacinto de agua *(Eichhornia crassipes)*	Introducida como ornamental	Bloquea los flujos de agua e afecta el movimiento de los botes, peces; bloquea la luz del sol a alcanzar debajo de la superficie del agua, reduciendo la biodiversidad; reduce la disponibilidad de oxígeno y la posibilidad de otras plantas para la fotosíntesis	Ecosistemas de agua dulce	Mejora la calidad del agua debido a su habilidad para absorber contaminantes; alimento animal; usos artesanales	Sí
FAUNA					
Pez gato (Clarias gariepinnus)	Introducido para acuicultura, más tarde escapada a sistemas de agua naturales	Predador omnívoro, causando la eliminación de especies nativas y endémicas, amenazadas, en particular el manjuarí, un pez antiguo, considerado un fósil viviente, solo encontrado en la Ciénaga de Zapata	Humedales y ríos	Consumo humano	Sí, de *batrachus* sp.
Mejillón verde (Perna viridis)	Descarga de aguas de lastre o limpieza de sentinas	Altamente invasiva, coloniza el sistema de raíces de los mangles, desplazando especies nativas; en Bahía de Cienfuegos afectando instalaciones industriales	Zonas Costeras	Consumo humano; uso artesanal y alimento animal	No
Pez león *(Pterois volitans)*	Descargado a partir de un Acuario en la Florida, al medio natural, fue la vía de que llegara a las costas de Cuba, a fines del 2007	Predador muy voraz; predación directa sobre las especies nativas; competición; sobrepoblación; afectación potencial a la langosta por competición por el hábitat	Ecosistemas marinos, principalmente, los arrecifes coralinos	Consumo humano y potencialmente uso medicinal	No
Bufalo *(Bubalus bubalis*)	Introducido para la producción de carne y leche	Deteriora ecosistemas naturales; invade sistemas agrícolas y destruye los cultivos; actúa como vector de enfermedades (rabia y tuberculosis) al ganado	Predominante-mente en sistemas agropecuarios	Consumo humano de carne y leche	No
Perro silvestre o jíbaro *(Canis familiaris)*	Entró a Cuba con los colonizadores, que los trajeron como mascotas	Predador de especies nativas y endémicas tales como el almiquí (*Solenodon cubanus*), la jutía, aves terrestres, reptiles, y cangrejos; vector para rabia y otras enfermedades	A lo largo de los ecosistemas de la isla		Sí, de *lupus familiaris*
Gato Silvestre o jíbaro *(Felis silvestres catus)*	Entró a Cuba con los colonizadores, que los trajeron como mascotas	Predador de especies nativas y endémicas tales como el almiquí (*Solenodon cubanus*), la jutía, aves terrestres, murciélagos, reptiles, y cangrejos; vector para rabia y otras enfermedades	A lo largo de los ecosistemas de la isla		Sí
Puerco jíbaro o silvestre *(Sus scrofa)*	Entró con los colonizadores para consumo humano	Predador de pequeños vertebrados e invertebrados (moluscos, cangrejos); moviendo con el hociqueo las raíces en grandes áreas de vegetación nativa y disemina las semillas, disturbando proceso ecológicos tales como la sucesión y la composición de especies	A lo largo de los ecosistemas de la isla		Sí

EEI	Vías de entrada	Impacto	Donde	Usos	Está entre las 100 peores invasoras del mundo
Mangosta *(Herpestes auropunctatus)*	Introducido para controlar las poblaciones de ratas en las plantaciones de caña de azúcar	Ha causado la extinción de especies en otras islas de las Antillas; Predador de muchas especies incluyendo pequeños mamíferos, aves, lagartijas, moluscos, insectos; vinculada a la desaparición de la jutía y predador del almiquí	A lo largo de los ecosistemas de la isla		Sí, de *javanicus* sp.
Rata Negra *(Rattus rattus)*	Entró en los buques	Consume moluscos; predador de huevos de aves, reptiles, muchos invertebrados, especies de plantas y mamíferos, incluyendo el almiquí y la jutía; plaga en caña de azúcar, cacao, y plantaciones de frutas y sitios de almacenaje; vector de enfermedades	A lo largo de los ecosistemas de la isla		Sí
Rata Gris *(Rattus norvegicus)*	Entró en los buques	Plaga en las plantaciones de arroz y de caña de azúcar; plaga en lugares de almacenamiento de alimentos; vector de leptospirosis	A lo largo de los ecosistemas de la isla		No
Ratón doméstico *(Mus musculus)*	Entró en los buques	Consume semillas de especies nativas; Dispersa EEI de plantas; plaga agrícola; vector de enfermedades	Predominantemente en paisajes agrícolas y asentamientos humanos		Sí
Pájaro vaquero *(Molothrus bonariensis)*	Entró volando	Compite por sitios de nidificación de otras especies, afectando su reproducción y comportamiento.	Hábitat forestales		No
Hormiga de fuego *(Wasmannia auropunctata)*	Entró en semillas de agricultura	Compite por recursos con otras hormigas; en otros países es una plaga en bosques disturbados y áreas agrícolas	Bosques disturbados; y tierras agrícolas		Sí

Tabla 2. Lista de áreas y especies priorizadas

	Sur de Pinar del Río y Sierra del Rosario	Llanura Habana Matanzas	Ciénaga de Zapata	Zona Costera Cienfuegos-Trinidad y Topes de Collantes	Ciego de Ávila-Camaguey-Las Tunas	Delta Río Cauto	Parque Nacional Alejandro de Humboldt y Reserva de la Biosfera Baconao
Ecosistema	M, W, P	P	W	C, M	P	W	M, C
FLORA							
Marabú *(Dichrostachys cinerea)*	X*			X*	X*	X	X*
Aroma *(Acacia farnesiana)*				X	X		X*
Weyler *(Mimosa pellita)*				X	X		X
Pomarrosa *(Syzygium jambos)*	X			X			X
Charagüito *(Inga punctata)*	X						
Ipil ipil *(Leucaena leucocephala)*		X*		X			X*
Cayeput *(Melaleuca quinquenervia)*			X*				
Casuarina *(Casuarina equisetifolia)*			X*				X

	Sur de Pinar del Río y Sierra del Rosario	Llanura Habana Matanzas	Ciénaga de Zapata	Zona Costera Cienfuegos-Trinidad y Topes de Collantes	Ciego de Ávila-Camaguey-Las Tunas	Delta Río Cauto	Parque Nacional Alejandro de Humboldt y Reserva de la Biosfera Baconao
Tulipan Africano *(Spathodea campanulata Beauv*)	X			X*			X
Malva de Caballo *(Sida acuta)*					X		
Pina de ratón, Maya *(Bromelia pinguin)*					X*	X	
Algarrobo de la India *(Albizia procera)*					X*		
Jacinto de agua *(Eichhornia crassipes)*						X	
FAUNA							
Pez gato *(Claria gariepinnus)*	X		X*			X	X
Mejillón verde *(Perna viridis*)				X*			
Pez león *(Pterois volitans)*	X		X	X	X	X	X
Búfalo *(Bubalus bubalis*)	X*				X*		
Perro jíbaro o silvestre *(Canis familiaris)*						X	X
Gato jíbaro o silvestre *(Felis silvestres catus)*						X	X
Puerco jíbaro o Silvestre *(Sus scrofa)*							X
Mangosta *(Herpestes auropunctatus)*					X*		X
Rata negra *(Rattus rattus)*					X		X*
Rata gris *(Rattus norvegicus)*							X
Ratón doméstico *(Mus musculus)*							X
Pájaro vaquero *(Molothrus bonariensis)*							X
Hormiga de fuego *(Wasmannia auropunctata)*				X*			

Ecosistemas: W=Humedal; C=Costero-Marino; M=Montaña; P=Productivo (Forestal, Pesquero, Agrícola, Ganadería)

[1]El pez león se trabajará en todas las áreas costeras del Project;

*Acciones de manejo Experimentales para EEI han sido realizadas en estas áreas.

Objetivo del Project. Resultados, Productos y Actividades

Objetivo del Project: Salvaguardar la diversidad biológica de importancia global en ecosistemas vulnerables, a través del desarrollo de capacidades a nivel sistémico para prevenir, detectar, controlar y manejar la diseminación de Especies Exóticas Invasoras (EEI) en Cuba.

Tabla Resumen de los Resultados- Productos y Actividades

Resultado 1: Fortalecidos los marcos político, legal y regulatorio y los mecanismos de coordinación para prevenir, detectar, controlar y manejar la diseminación de EEI.	
Salida 1.1: Regulaciones sobre EEI establecidas, actualizadas y complementadas	La meta de esta salida es establecer nuevas regulaciones donde sea necesario, actualizar las regulaciones para que aborden de mejor forma las EEI y complementar las regulaciones con metodologías que guíen la aplicación de esas regulaciones. Esto incluye el establecimiento de directrices para la clasificación de las listas negra y gris de EEI, lo que requerirá definir las metodologías a utilizar.
Salida 1.2 Estrategia Nacional para las EEI aprobada y el 50% de las actividades planificadas, efectivamente implementadas	La meta esperada es la elaboración de una estrategia Nacional para el manejo de EEI, con la participación de los sectores priorizados.
Salida 1.3 Propuesta de metodologías para desarrollar indicadores para medir el cumplimiento de la legislación ambiental	La meta será desarrollar metodologías que guíen la elaboración de indicadores para monitorear y evaluar la ejecución y observancia de las leyes y regulaciones, lo que permitirá un manejo adaptativo del marco político y legal para las EEI.
Salida 1.4 Se elaboran y aprueban tres incentivos o desincentivos económicos.	El enfoque de esta salida es desarrollar incentivos y desincentivos económicos apropiados para el uso e introducción de EEI en sectores productivos, que pudieran complementar medidas legales para el control de EEI y generar recursos financieros para un control sostenible de las EEI. Un primer orden de acción aquí será la revisión y evaluación de las alternativas existentes y de los incentivos económicos actualmente aplicados y analizar lo que puede ser aplicado en el contexto del control de EEI
Salida 1.5 Creación de un Foro Asesor compuesto por expertos de los sectores clave	Las salidas 1.5, 1.6, y 1.7, comparten la meta general de la integración de un marco institucional que conduzca las actividades a nivel nacional entre las instituciones participantes y a través de los sectores para asegurar una efectiva implementación de las acciones.
Salida 1.6 Un Sub-grupo Nacional coordina el desarrollo y aplicación de la Estrategia Nacional para las EEI	
Salida 1.7 Establecidos los mecanismos de coordinación para los sistemas de alerta temprana y de información entre las 9 autoridades regulatorias clave y otros actores clave	
Resultado 2: Ampliada la capacidad de los involucrados el conocimiento, y la comunicación, para una efectiva prevención, detección y manejo de las EEI	
Salida 2.1 Metodologías estandarizadas e implementadas para el inventario de EEI, la evaluación vulnerabilidad de los ecosistemas, el análisis de riesgo, la evaluación de impacto ambiental, la valoración económica y análisis de costo-beneficio y las acciones de manejo para 26 EEI.	La meta de esta salida es estandarizar metodologías que incrementen el conocimiento sobre la biología, comportamiento, niveles y vías de contaminación, amenazas y opciones potenciales de manejo de las EEI. Esto incluye la complementación y actualización del inventario de EEI, indicando prioridades por especies y ecosistemas, con propuestas de opciones de manejo y niveles de restricción basados en el análisis de riesgo.
Salida 2.2 Sistema de Información diseñado y en funcionamiento, que incluye información sobre las listas de especies, los mecanismos de	La meta de esta salida es diseñar el sistema de información para EEI (SIMEEI), para proveer la información existente, así como la generada por el Project para facilitar la toma de decisiones y

cuarentena, análisis de riesgo y EIA, alerta temprana y respuesta rápida, monitoreo y control, manejo y coordinación entre instituciones.	los usuarios de las EEI para lograr decisiones mejor informadas sobre la prevención, detección y manejo de las EEI, para la salvaguarda de la biodiversidad y los ecosistemas en Cuba.
Salida 2.3 El Sistema de monitoreo para EEI contiene la información de línea base y los indicadores clave	La meta de esta salida es diseñar el sistema de monitoreo que seguirá el impacto de las EEI sobre la biodiversidad y los ecosistemas, las investigaciones y los resultados de las acciones de manejo implementadas.
Salida 2.4 Entrenamientos y Capacitación a públicos metas	La meta de esta salida es incrementar el conocimiento sobre bases científicos, herramientas legales y enfoques de manejo para la prevención y manejo por la vía de entrenamientos y producción y distribución de materiales didácticos.
Salida 2.5 Campañas de concienciación pública	Es incrementar el conocimiento y participación y apoyar a las instituciones en la prevención, detección, manejo y la erradicación, a través de la campaña nacional de comunicación y educación ambiental, en la que se utilizarán una variedad de posters, materiales divulgativos, guías de identificación y otros materiales.
Resultado 3: Fortalecidas las capacidades institucionales para asegurar la efectiva implementación de la prevención, detección y manejo de las EEI para salvaguardar la biodiversidad.	
Salida 3.1 Incrementadas el número de multas impuestas e incrementado el número de detecciones en los puntos de entrada	La capacidad incrementada resultará en la reducción de la tasa de entrada de EEI y reducción de su dispersión en las fronteras nacionales
Salida 3.2 Diez EEI monitoreadas como parte del sistema de alerta temprana.	La meta de esta salida es fortalecer las capacidades de las instituciones clave que estarán involucradas en la implementación del sistema de alerta temprana
Salida 3.3 Acciones de manejo implementadas para 10 especies de EEI, que resulten en la reducción de actividades de predación, disminución en la pérdida de hábitats y/o reducción de la competencia inter-específica.	La meta de esta salida será la implementación actual de acciones de manejo de EEI, para contener, controlar y/o erradicar EEI existentes que amenazan a la flora y fauna nativa en 7 áreas críticas para la biodiversidad, áreas silvestres protegidas, no protegidas y áreas productivas

Circunstancias especiales ocurridas desde el inicio del Project

Durante los años 2011, 2012 y 2013 hubo una compleja situación en el país, que estuvo caracterizada por el desabastecimiento generalizado de insumos; esto obligó a implementar cambios de estrategia en la dinámica de la ejecución financiera y en el plan de adquisiciones del Project.

En el año 2012, segundo año de ejecución del Project, Cuba fue azotada por el paso del huracán Sandy. Este fenómeno meteorológico extremo desbastó las provincias orientales. Esta situación agravó aún más el tenso escenario económico en el que se desarrolla la isla y tuvo repercusión directa en el cumplimiento de las actividades previstas en el Project. Esto generó retraso en los cronogramas previstos para la importación de determinados insumos y la ejecución de algunas tareas de carácter técnico en los territorios, previstas a cumplirse en el año 2013. Se logró mitigar este impacto aplicando medidas adaptativas.

En el marco de la transformación del modelo de desarrollo económico, se han estado produciendo cambios en la estructura de la administración del Estado que han tenido incidencia en el Project. Entre ellos, se tomó la decisión por el Ministerio de Ciencia, Tecnología y Medio Ambiente (CITMA), de disolver el Centro de Información, Gestión y Educación Ambiental (CIGEA), coordinador del Project de EEI y distribuir sus funciones en otras estructuras del CITMA. En este caso, y por el estrecho vínculo que tiene con el Project, se decidió pasar la coordinación del Project, al Centro Nacional de Áreas Protegidas (CNAP), lo que implicó todo un proceso de ajuste y organización administrativa. Este traspaso del Project al nuevo centro ocurrió en febrero del 2013.

En el año 2013, se publicó, por el Instituto de Meteorología, el libro titulado "Impactos del Cambio Climático y Medidas de Adaptación en Cuba", el cual incluye un capítulo dedicado a la Diversidad Biológica. Esto ha resultado una contribución importante a la implementación del Project y especialmente, a la salida de Valoración de los Efectos del Cambio Climático a la Diversidad Biológica nativa y a los ecosistemas y la dispersión de las Especies Exóticas Invasoras.

Durante la implementación del Project se han aplicado, como resultado del trabajo de diferentes comisiones gubernamentales, una serie de trasformaciones en el marco legal y en el ordenamiento de las Instituciones Centrales del Estado, que tienen relación directa con los recursos naturales. Estas comisiones han trabajado en el perfeccionamiento de la política regulatoria en materia ambiental, con énfasis en las zonas costeras. Como resultado de este empeño se han establecido nuevas regulaciones en materia de política ambiental, como ha sido la reciente moratoria sobre los bosques de manglares. Esta decisión establece una prohibición total del uso de los manglares, posibilitando la recuperación y restauración de estos ecosistemas, lo que constituye una prioridad en adaptación ante los efectos del cambio climático.

También se han desarrollado en la esfera económica del país elementos que pudieran potenciar el uso de las especies exóticas invasoras, como son: el fomento y aplicación de incentivos económicos a actividades productivas con beneficio ambiental, y la aprobación de una política que promueve el uso de fuentes renovables de energía, lo que incrementará el uso de la biomasa forestal para estos fines.

Un elemento a considerar es el aumento creciente de la actividad turística a lo largo de todo el país y su tendencia creciente. Esto ha potenciado la ampliación y construcción de nuevas instalaciones. Se debe evitar que el crecimiento de este sector no conlleve a la utilización inadecuada de las Especies Exóticas Invasoras y a su dispersión.

Finalmente, resulta un elemento significativo la incorporación de la Estrategia Nacional sobre Especies Exóticas Invasoras, en las acciones a desarrollar en la Estrategia Ambiental Nacional, en el Programa Nacional de la Diversidad Biológica y en el Plan Estratégico del Sistema Nacional de Áreas Protegidas, para el ciclo 2014-2020.

ENFOQUE Y MÉTODO DE EVALUACIÓN

Se ha desarrollado con el tiempo un enfoque y un método general2 para realizar evaluaciones finales de Projects respaldados por el PNUD y financiados por el GEF. Se espera que el Equipo Evaluador (EE) enmarque el trabajo de evaluación utilizando los criterios de relevancia, efectividad, eficiencia, sostenibilidad e impacto, según se define y explica en la Guía para realizar evaluaciones finales de los Projects respaldados por el PNUD y financiados por el GEF. Se redactó una serie de preguntas que cubre cada uno de estos criterios incluidos en estos TdR (Anexo C). Se espera que el EE modifique, complete y presente esta matriz como parte del Informe inicial de la evaluación, y la incluya como anexo en el Informe final.

La evaluación debe proporcionar información basada en evidencia que sea creíble, confiable y útil. Se espera que el EE siga un enfoque participativo y consultivo que asegure participación estrecha con homólogos de gobierno, en particular el Centro de Coordinación de las Operaciones del GEF, la Oficina en el País del PNUD, el equipo del Project, el Asesor Técnico Regional del

[2] Para obtener más información sobre los métodos de evaluación, consulte el Manual de planificación, seguimiento y evaluación de los resultados de desarrollo, Capítulo 7, pág. 163

GEF/PNUD e interesados clave. Se espera que el EE realice una misión de campo en Cuba, incluidos los siguientes sitios del Project: Santiago de Cuba, Camagüey, Sancti Spíritus, Ciénaga de Zapata, Península de Guanahacabibes. Las entrevistas se llevarán a cabo con las siguientes organizaciones e individuos como mínimo:

Institución	**Ministerio**	Roles y funciones	**Forma de participación/impacto**
Entidades del gobierno central			
Centro Nacional de Áreas Protegidas (CNAP)	CITMA	Entidad rectora en la planificación de las áreas protegidas en Cuba. Dirige metodológicamente, supervisa y controla el Sistema Nacional de Áreas Protegidas	Dirigir y supervisar la ejecución del Project.
Centro de Inspección y Control Ambiental (CICA)	CITMA	Órgano de control, protección e inspección del CITMA. Asegura el respaldo a las regulaciones relacionadas con el medio ambiente. Supervisa los procesos de Evaluación de Impacto Ambiental, autoridad CITES nacional, control de acceso a la biodiversidad	Control, aportar información, entrenamientos relativos a Evaluación de Impacto Ambiental y manejo de flora y fauna
Centro Nacional de Seguridad Biológica	CITMA	Autoridad regulatoria en materia de Bioseguridad	Control, aportar información, entrenamientos relativos a Evaluaciones de Análisis de Riesgo y manejo de flora y fauna
Acuario Nacional de Cuba (ANC)	CITMA	Ampliar las capacidades de conocimientos y conservación del medio natural.	Participación en programas de investigación y monitoreo y de Comunicación y Educación Ambiental. Capacitación en temas de ecología marina.
Museo Nacional de Historia Natural (MNHN)	CITMA	Ampliar las capacidades de conocimientos y conservación del medio natural.	Participación en programas de investigación y monitoreo y de Comunicación y Educación Ambiental. Capacitación en temas de ecología marina.
Instituto de Ecología y Sistemática (IES)/ Centro Nacional de Biodiversidad (CeNBio)	CITMA	Incremento del conocimiento de la biodiversidad sistemático y ecológico, contribuyendo a su conservación y uso sostenible en ecosistemas naturales y regenerados, incrementando sus contribuciones al desarrollo científico y socioeconómico en Cuba y el Caribe.	Ampliar las capacidades de conocimientos y conservación de los ecosistemas costeros y la biodiversidad. Participar en investigación y monitoreo de las especies involucradas en el Project.
Instituto de Oceanología (IDO)	CITMA	Ampliar las capacidades de conocimientos y conservación del medio marino.	Aporte de especialistas y técnicos para la investigación, monitoreo, talleres, cursos y actividades de capacitación.
Empresa Nacional para la protección de la Flora y la Fauna	MINAG	Responsable del manejo de un grupo importante de los sitios de trabajo del Project.	Aporte de especialistas y técnicos para la investigación, monitoreo, talleres, cursos y actividades de capacitación.
Dirección Nacional Forestal	MINAG	Hacer cumplir lo legislado en la Ley 85 Ley Forestal y su Reglamento, Velar por el uso adecuado del FONADEF, aprobar los Projects solicitados al FONADEF para el patrimonio forestal y la fauna silvestre y realizar el proceso de Certificaciones a los tenentes del recurso forestal en sitios de trabajo.	Cofinancista del Project por el gobierno
Instituto de Medicina Veterinaria	MINAG	Protección de la salud animal, incluida la protección contra enfermedades exóticas y el desarrollo de sistemas de vigilancia.	Control, vigilancia y protección en materia de salud animal en las áreas que son sitios de trabajo del Project, aportar información, y coordinar el Sistema de Alerta Temprana y Respuesta Rápida.

Institución	Ministerio	Roles y funciones	Forma de participación/impacto
Centro Nacional de Sanidad Vegetal	MINAG	Protección de la sanidad vegetal en frontera, su impacto ambiental, el uso de semillas y variedades de calidad y Diagnóstico de plagas.	Control, vigilancia y protección en materia de salud vegetal en las áreas que son sitios de trabajo del Project, aportar información, y coordinar el Sistema de Alerta Temprana y Respuesta Rápida.
Dirección de Ciencias y Regulaciones Pesqueras	MINAL	Cuerpo regulador del MINAL. Contribuye al uso correcto de los recursos pesqueros. Prepara, consulta y propone para aprobación las medidas necesarias para el uso sostenible de los recursos pesqueros.	Aporte de información y entrenamiento para diversos actores.
Centro de Investigaciones Pesqueras (CIP)	MINAL	Investigación y monitoreo necesarios para la evaluación, control y manejo adecuado de los recursos pesqueros	Aporte de recursos humanos y materiales para la coordinación y ejecución de capacitación, investigación y monitoreo en relación con las EEI.
Cuerpo de Guarda Bosques (CGB)	MININT	Órgano de control, protección e inspección del MININT. Asegura el cumplimiento de regulaciones relacionadas con el patrimonio forestal, los suelos y el medio ambiente.	Control, vigilancia y protección de áreas que son sitios de trabajo del Project, aportar información, y coordinar el Sistema de Alerta Temprana y Respuesta Rápida.
Tropas Guardafronteras (TGF)	MININT	Órgano de control, protección e inspección del MININT. Asegura la protección de las costas y las fronteras nacionales. Asegura la seguridad nacional.	Apoyar la protección y vigilancia de zonas costeras en el área del Project.
Jardín Botánico Nacional (JBN). Universidad de La Habana	MES	Ampliar las capacidades de conocimientos y conservación de las especies vegetales y ecosistemas.	Aporte de especialistas y técnicos para la investigación, monitoreo, talleres, cursos y actividades de capacitación.
Ministerio del Comercio Exterior y la Inversión Extranjera. (MINCEX)	MINCEX	Coordinación y asesoría sobre la instrumentación y coherencia con las políticas de estado y gobierno respecto a la colaboración económica.	Aprobar, supervisar y controlar las ejecuciones del Project según su mandato institucional.
Entidades regional/ provinciales			
Unidades de Medio Ambiente	CITMA	Control y supervisión de la gestión ambiental en las provincias. Coordinación y Control de la implementación del Project en los sitios de trabajo	Coordinación de actividades con actores provinciales. Coordinar e implementar el sistema de monitoreo y evaluación del Project. Supervisión y control del uso de los recursos del Project.
Centro de investigaciones de Ecosistemas Costeros (CIEC)	CITMA	Investigación, monitoreo, educación ambiental, consultorías ambientales, entrenamientos y manejo de ecosistemas y ecosistemas costeros.	Aporte de recursos humanos y materiales para la coordinación y ejecución de capacitación, educación ambiental, investigación y monitoreo ambiental.
Centro de Estudios Ambientales de Pinar del Río (ECOVIDA)	CITMA	Investigación, monitoreo, educación ambiental, consultorías ambientales, entrenamientos y manejo de ecosistemas y biodiversidad.	Participación en programas de monitoreo. Aporte de recursos humanos y materiales para la coordinación y ejecución de capacitación, educación ambiental, investigación, monitoreo y evaluación ambiental.
Centro Oriental de Ecosistemas y Biodiversidad (BIOECO)	CITMA	Investigación, monitoreo, educación ambiental, consultorías ambientales, entrenamientos, y manejo de biodiversidad y ecosistemas.	Aporte de recursos humanos y materiales para la coordinación y ejecución de capacitación, educación ambiental, investigación y monitoreo ambiental.

Institución	Ministerio	Roles y funciones	Forma de participación/impacto
Centro de Investigaciones Ambientales de Camagüey (CIMAC)	CITMA	Gestión de Projects científicos y tecnológicos, y servicios con perfil ambiental.	Aporte de recursos humanos y materiales para la coordinación y ejecución de capacitación, educación ambiental, investigación y monitoreo ambiental.
Centro de Estudios Ambientales de Cienfuegos (CEAC),	CITMA	Investigación, monitoreo, educación ambiental, consultorías ambientales, entrenamientos y manejo de ecosistemas y ecosistemas costeros y terrestres.	Aporte de recursos humanos y materiales para la coordinación y ejecución de capacitación, educación ambiental, investigación, monitoreo y evaluación ambiental.
Órgano CITMA Ciénaga de Zapata	CITMA	Gestión y control de recursos naturales en la Península de Zapata.	Aporte de recursos humanos y materiales para la coordinación y ejecución de capacitación, educación ambiental, investigación, monitoreo y evaluación ambiental.
Centro de Servicios ambientales de Sanctí Spíritus	CITMA	Investigación, monitoreo, educación ambiental, consultorías ambientales, entrenamientos y manejo de ecosistemas y ecosistemas costeros y terrestres.	Aporte de recursos humanos y materiales para la coordinación y ejecución de capacitación, educación ambiental, investigación, monitoreo y evaluación ambiental.
Centro de Servicios Ambientales de Villa Clara(CESAM)	CITMA	Investigación, monitoreo, educación ambiental, consultorías ambientales, entrenamientos y manejo de ecosistemas y ecosistemas costeros y terrestres.	Aporte de recursos humanos y materiales para la coordinación y ejecución de capacitación, educación ambiental, investigación, monitoreo y evaluación ambiental.

El EE revisará todas las fuentes de información relevantes, tales como el documento del Project, los informes del Project, incluidos el IAP/IEP anual y otros informes, revisiones de presupuesto del Project, examen de mitad de período, informes de progreso, herramientas de seguimiento del área de interés del GEF, archivos del Project, documentos nacionales estratégicos y legales, y cualquier otro material que el EE considere útil para esta evaluación con base empírica. En el Anexo B se incluye una lista de documentos que el equipo del Project proporcionará al EE para el examen.

CRITERIOS Y CALIFICACIONES DE LA EVALUACIÓN

Se llevará a cabo una evaluación del rendimiento del Project, en comparación con las expectativas que se establecen en el Marco Lógico del Project y el Marco de resultados constante el Anexo A, que proporciona indicadores de rendimiento e impacto para la ejecución del Project, junto con los medios de verificación correspondientes. La evaluación cubrirá mínimamente los criterios de: relevancia, efectividad, eficiencia, sostenibilidad e impacto. Las calificaciones deben proporcionarse de acuerdo con los siguientes criterios de rendimiento. Se debe incluir la tabla completa en el resumen ejecutivo de evaluación. Las escalas de calificación obligatorias se incluyen en el Anexo D.

Calificación del rendimiento del Project			
1. Seguimiento y Evaluación	**calificación**	**2. Ejecución de los IA y EA:**	**calificación**
Diseño de entrada de SyE		Calidad de aplicación del PNUD	
Ejecución del plan de SyE		Calidad de ejecución: organismo de ejecución	
Calidad general de SyE		Calidad general de aplicación y ejecución	
3. Evaluación de los resultados	**calificación**	**4. Sostenibilidad**	**calificación**
Relevancia		Recursos financieros:	
Efectividad		Socio-políticos:	
Eficiencia		Marco institucional y gobernanza:	
Calificación general de los resultados del Project		Ambiental:	
		Probabilidad general de sostenibilidad:	

FINANCIACIÓN/COFINANCIACIÓN DEL PROJECT

La evaluación valorará los aspectos financieros clave del Project, incluido el alcance de cofinanciación planificada y realizada. Se requerirán los datos de los costos y la financiación del Project, incluidos los gastos anuales. Se deberán evaluar y explicar las diferencias entre los gastos planificados y reales. Deben considerarse los resultados de las auditorías financieras recientes, si están disponibles. El EE recibirá asistencia de la Oficina en el País (OP) y del Equipo del Project para obtener datos financieros a fin de completar la siguiente tabla de cofinanciación, que se incluirá en el informe final de evaluación.

Cofinanciación (tipo/fuente)	**Financiación propia del PNUD (millones de USD)**		**Gobierno (millones de USD)**		**Organismo asociado (millones de USD)**		**Total (millones de USD)**	
	Planificado	**Real**	**Planificado**	**Real**	**Planificado**	**Real**	**Real**	**Real**
Subvenciones								
Préstamos/concesiones								
• Ayuda en especie								
• Otro								
Totales								

INTEGRACIÓN

Los Projects respaldados por el PNUD y financiados por el GEF son componentes clave en la programación nacional del PNUD, así como también en los programas regionales y mundiales. La evaluación valorará el grado en que el Project se integró con otras prioridades del PNUD, entre ellos la reducción de la pobreza, mejor gobernanza, la prevención y recuperación de desastres naturales y el género.

IMPACTO

El EE valorará el grado en que el Project está logrando impactos o está progresando hacia el logro de impactos. Los resultados clave a los que se debería llegar en las evaluaciones incluyen si el Project demostró: a) mejoras verificables en el estado ecológico, b) reducciones verificables en la tensión de los sistemas ecológicos, y/o c) un progreso demostrado hacia el logro de estos impactos.

CONCLUSIONES, RECOMENDACIONES Y LECCIONES

El informe de evaluación debe incluir un capítulo que proporcione un conjunto de conclusiones, recomendaciones y lecciones.

ARREGLOS DE IMPLEMENTACIÓN

La Oficina de País del PNUD de conjunto con la Unidad de Manejo del Project, asumirán la responsabilidad de la coordinación y arreglos logísticos de la Evaluación Final, así como también, apoyarán al EE (transportación, alojamiento, espacio en oficinas, comunicaciones, etc.) y en tiempo proveerán los viáticos y pagos contractuales y también organizarán las misiones en los sitios (visitas).

El EE se reunirá con el PNUD Cuba al comienzo y al final de la misión. Se organizarán teleconferencias con el Asesor Técnico Regional a cargo del Project en el Centro Regional del PNUD en Panamá. Otras reuniones podrán ser concertadas de ser considerado necesario por alguna de las partes.

CRONOGRAMA Y RESULTADOS DE LA EVALUACIÓN

La evaluación se realizará durante el período comprendido entre los meses de agosto y noviembre del 2016, con el siguiente cronograma de actividades.

Actividad/ Resultado	Contenido	Período	Comentarios
1. Envío de documentos al EE	Documentos listados en el Anexo B	A la firma del contrato	OP del PNUD envía documentos al EE.
2. Informe inicial del EE	Contiene aclaraciones sobre el proceso de Evaluación y la metodología.	A partir de la recepción de los documentos, el EE dispondrá de 2 semanas para revisar y enviar un borrador de Informe de Inicio a la Oficina de País del PNUD para revisión. El Informe de Inicio final deberá estar concluido en un plazo máximo de 2 semanas desde el envío del borrador por el EE.	El EE lo presenta a la OP del PNUD. La OP y la Unidad de Manejo de Project lo revisarán e intercambiarán con el EE hasta su versión final acordada.
3. Misión a Cuba	El EE realiza una misión a Cuba de 10 días de duración.	No más de 4 semanas posterior a la firma del contrato y envío de documentos al EE.	• Reunión con la Oficina de País del PNUD y teleconferencia con el Asesor Técnico Regional del PNUD. • Encuentros con los actores claves del país (decisores de la Autoridad Ambiental y sectores productivos clave participantes en el Project). • Revisión conjunta de todos los materiales disponibles con la atención enfocada a los resultados y productos del Project • Visita a sitios del Project, seleccionados por la Unidad de Manejo del Project en consulta con la Oficina de País. • Una presentación oral de los principales hallazgos de la Evaluación para permitir su aclaración y validación.
4. Borrador del Informe final de Evaluación	Informe completo, (según plantilla en Anexo F) con anexos	Dentro del plazo de 3 semanas de concluida la misión de evaluación	La Oficina del PNUD Cuba de conjunto con la Unidad de Manejo de Project, tendrá 2 semanas para la revisión del borrador de Informe y retornarlo al EE con los comentarios correspondientes
5. Informe final de Evaluación en idiomas español e inglés*	Informe revisado	Dentro del plazo de 2 semanas después haber recibido los comentarios del PNUD sobre el borrador.	Enviado a la OP para cargarlo al ERC del PNUD. Cuando se presente el informe final de evaluación, también se requiere que el EE proporcione un 'itinerario de la auditoría', donde se detalle cómo se han abordado (o no) todos los comentarios recibidos en el informe final de evaluación.

** El Informe se considerará finalizado cuando se haya cumplido con las expectativas de la evaluación y su calidad cumpla con los estándares o requisitos del PNUD/GEF. La Oficina de País del PNUD y la Oficina Regional de PNUD firmarán el formulario en el Anexo G, para confirmar su aceptación del informe final.

COMPOSICIÓN DEL EQUIPO

El EE estará compuesto por 2 evaluadores, 1 evaluador internacional y 1 evaluador nacional. Los consultores deberán tener experiencia previa en evaluación de Projects similares. Es una ventaja contar con experiencia en Projects financiados por el GEF. Uno de los evaluadores será designado líder del equipo y será responsable de la finalización del informe. Los evaluadores seleccionados no deben haber participado en la preparación o ejecución del Project ni deben tener ningún conflicto de intereses con las actividades relacionadas al Project.

Los miembros del equipo deben reunir las siguientes calificaciones:

- Experiencia profesional relevante de 10 años como mínimo
- Conocimiento sobre el PNUD y el GEF
- Experiencia previa con las metodologías de seguimiento y evaluación con base empírica
- Conocimiento técnico sobre las áreas de interés previstas

Perfiles de los evaluadores

Evaluador/ procedencia	Responsabilidad	Conocimientos Técnicos	Experiencia
1 (internacional)	Jefe del Equipo	• Experto(a) en Biodiversidad y ecosistemas, con énfasis en gestión y control de especies exóticas invasoras. • Dominio de las metodologías y herramientas que se aplican en el proceso de evaluación de Projects GEF-PNUD enfocados en la conservación de la biodiversidad.	Experiencia exitosa demostrada: • En la dirección y supervisión de equipos evaluadores de Projects GEF-PNUD en temas de biodiversidad; • En aspectos relacionados con la investigación, gestión y control de especies exóticas invasoras.
1 (nacional)	Miembro	• Experto(a) en temas ambientales, con énfasis en temas de Biodiversidad y ecosistemas. • Amplio dominio de las metodologías que rigen los procesos de formulación, gerencia y evaluación de Projects GEF-PNUD enfocados en la conservación de la biodiversidad. • Sólido conocimiento del contexto institucional y de políticas nacionales y sectoriales.	Experiencia exitosa demostrada: • En la formulación y gerencia de Projects de investigación, la asistencia técnica, y la preparación y realización de programas dirigidos al manejo de la biodiversidad. • En procesos de creación de capacidades, planificación de estrategias y conciliación con actores territoriales.

ÉTICA DEL EVALUADOR

Los consultores de la evaluación asumirán los más altos niveles éticos y deberán firmar un Código de conducta (Anexo E) al aceptar la asignación. Las evaluaciones del PNUD se realizan de conformidad con los principios que se describen en las 'Directrices éticas para evaluaciones' del Grupo de Evaluación de las Naciones Unidas (UNEG).

MODALIDADES Y ESPECIFICACIONES DE PAGO

%	Hito
10%	A la entrega del Informe de Inicio
40%	Después de la presentación y aprobación del primer borrador del informe final de evaluación.
50%	Después de la presentación y aprobación (OP del PNUD y ATR del PNUD) del informe final definitivo de evaluación.

ANEXOS

Anexo A: Marco lógico del Project
Anexo B: Lista de documentos que revisarán los evaluadores
Anexo C: Preguntas de evaluación
Anexo D: Escalas de calificaciones
Anexo E: Formulario de acuerdo y código de conducta del consultor de la evaluación
Anexo F: Esbozo del informe de evaluación
Anexo G: Formulario de autorización del informe de evaluación

ANEXO A: MARCO LÓGICO DEL PROYECTO

Estrategia de Project	**Indicadores objetivamente verificables**				
Meta	Proteger los ecosistemas vulnerables marinos, acuáticos y terrestres, especies y diversidad genética de Cuba del impacto negativo de las especies exóticas invasoras				
	Indicadores	**Linea base**	**Objetivo**	**Fuentes de verificación**	**Riesgos y Suposiciones**
Objetivo del Project **Salvaguardar la diversidad biológica de importancia global en ecosistemas vulnerables, a través del desarrollo de capacidades a nivel sistémico para prevenir, detectar, controlar y manejar la diseminación de especies exóticas invasoras (EEI) en Cuba.**	Incremento de la efectividad del manejo de EEI medido a través del seguimiento del GEF	Puntuación total 10 (o 34%)	Puntuación total 23 (o 79%)	Seguimiento del GEF para salvaguardar la biodiversidad	Cambios institucionales, causan cambios en las prioridades.
	Incremento de áreas con manejo de EEI	Menos de 5000 ha con manejo de EEI	Al menos 75 000 ha tienen manejo de EEI	Planes de manejo	Crisis económica extrema , la cual obliga a reorientar las prioridades nacionales, reduciendo las prioridades con relación a la prevención y manejo de EEI Cambio climático acelerando la dispersión de las EEI
	Prioridad dada a la Diversidad Biológica en los temas de la prevención, control y manejo de EEI, medida por: Evaluaciones de las actividades con las EEI por MINAG, MINAL, MITRANS, CITMA y MINSAP - % de cuarentena, análisis de riesgos y evaluaciones de impacto ambiental que incorporen el análisis de impacto de las EEI en la DB - % de planes de manejo que incluye la recuperación de especies y/o restauración de ecosistemas y actividades de rehabilitación.	-- tdb al comienzo del Project -0% de cuarentena, análisis de riesgo y evaluaciones de impacto ambiental con la incorporación del análisis de la DB - tdb al comienzo del Project	Se incrementa en un 2% las evaluaciones de EEI. -100% de cuarentena, análisis de riesgo y evaluaciones de impacto ambiental con la incorporación del análisis de la DB -100% de los planes de manejo para 26 especies incluidas en esas actividades	- Reportes de presupuesto - Cuarentena, análisis de riesgo y reportes de las evaluaciones de impacto ambiental. - Planes o programas de manejo.	
	Adición de especies nativas o cambio de status en la lista roja de la UICN	Existe una lista roja de especies amenazadas y es continuamente actualizada.	No hay adición ni cambia el status de ninguna especie nativa en la lista roja debido a los efectos de las EEI	Lista Roja de UICN	

Resultado 1: .Fortalecimiento del marco político, legal y regulatorio, y de los mecanismos de coordinación para prevenir, detectar, controlar y manejar la diseminación de las Especies Exóticas Invasoras y mitigar sus impactos en la diversidad biológica.	Política integral nacional y sectorial y marco legal, estableciendo una estrategia de IAS actualizada, cumpliendo las siguientes regulaciones: Lista negra y lista gris, análisis de riesgo, EIA, protocolos, documentos normativos y mecanismo de cuarentena, monitoreo y vigilancia, sistema de alerta temprana y respuesta rápida, aguas de lastre y contaminación del casco de los buques, protección de plantas/certificado de sanidad, y procedimientos para la elaboración de planes de manejo.	-No existen regulaciones especificas para EEI o están desactualizadas. -Propuesta de Estrategia Nacional de EEI	1.1 Regulaciones en EEI establecidas, actualizadas y complementadas[1.] 1.2 Estrategia Nacional de EEI aprobada e implementado de forma efectiva, el 50% de las actividades planificadas.	Propuesta de Estrategia Documentos con propuestas	Crisis económica extrema , la cual obliga a reorientar las prioridades nacionales, reduciendo las prioridades con relación a la prevención y manejo de EEI
	Metodologías para el desarrollo de indicadores para medir de acuerdo a la legislación ambiental.	No existen indicadores para medir acorde a la legislación ambiental.	1.3 Metodologías propuestas para desarrollar indicadores que midan acorde a la legislación ambiental	Documentos con propuestas de metodologías	
	Incentivos y desincentivos económicos para el control de la introducción y uso de las EEI en los sectores productivos y facilitar el manejo de las mismas.	-No existen incentivos o desincentivos económicos en relación a las EEI.	1.4 Propuestos y aprobados tres incentivos o desincentivos económicos.	Documentos con propuestas	
	Marco de trabajo institucional para el control de las EEI entre los actores claves y pasando posteriormente a los sectores de forma legal.	-No existe un foro asesor.	1.5 Existe un foro asesor compuesto por expertos pertenecientes a sectores claves[2].	-Lista de asesores	
		No existen grupos de coordinación para las EEI	1.6 Subgrupo de coordinación nacional[3] para desarrollar e implementar la Estrategia Nacional de EEI. 1.7 Mecanismos de coordinación establecidos entre 9 autoridades regulatorias[4] y otros actores claves para el sistema de alerta temprana y el sistema de información.	Agenda de trabajo	

		No existen los mecanismos de coordinación entre las autoridades regulatorias para la implementación de un sistema de alerta temprana y el uso de los sistemas de información sobre EEI.		Acuerdos de trabajo entre actores claves.	- Sectores productivos comprometidos a participar en la prevención y manejo de las EEI.
Resultado 2 **Mejoramiento de la capacidad de todos los actores involucrados, del conocimiento y la comunicación, para la efectiva prevención, detección, control y manejo de las EEI.**	Cantidad de capacidades desarrolladas	No existen metodologías estandarizadas para las EEI	2.1 Metodologías estandarizadas para el inventario de EEI, evaluación de vulnerabilidad de los ecosistemas, análisis de riesgo, evaluación de impacto ambiental y valoración económica y análisis de costos beneficio y planes de manejo para 26 EEI priorizadas.	Metodologías estandarizadas.	
		No existe un sistema de información de EEI	2.2 Diseño de un Sistema de Información de EEI que incluye información sobre las listas de especies, los mecanismos de cuarentena, análisis de riesgos y evaluación del impacto ambiental, la respuesta de alerta temprana, el seguimiento y control, gestión y coordinación y coordinación entre las instituciones.	Sistema de Información de las EEI	
		No existe un sistema de monitoreo de EEI	2.3 Sistema de monitoreo que contiene la información de la línea base e indicadores claves	Sistema de monitoreo con información de la línea base e indicadores.	
	Incremento de las capacidades con bases científicas, herramientas legales y enfoques de gestión para el control de las EEI	Poco conocimiento por parte de los actores claves	2.4 Entrenamiento y habilidades aplicadas para: -50 especialistas en los temas de agua de lastre y en control de la contaminación del casco.	Reportes de los entrenamientos -SIAE reportes	

	Incrementado el conocimiento y la participación pública , y el apoyo de los actores claves en la prevención, detección y manejo de las EEI	Escasa conciencia del tema entre los líderes políticos, los sectores que hacen uso de las EEI, las escuelas y público en general.	-200 especialistas en la parte de investigación[1] -100 especialistas en monitoreo de EEI - 30 técnicos capacitados en SIG[2]. -800 de las autoridades regulatorias, gestores del medioambiente y representantes de los sectores productivos formados en la actual legislación de las EEI - 60% de los inspectores técnicamente capacitados para aplicar las regulaciones. - Al menos el 35%del personal capacitado son hombres y el 40% son mujeres. 2.5 80% de participantes en campañas de conciencia pública y reportes de talleres que incrementan la conciencia sobre las amenazas.	Documentos de la Campaña de Comunicación - Carteles, artículos sobre el tema, folletos. -Propuesta en los planes de estudio.	Sectores productivos comprometidos a participar en la prevención y manejo de las EEI. Voluntad comunitaria para participar en el sistema de alerta temprana y las acciones de manejo.
Resultado 3 **Fortalecimiento de las capacidades institucionales para asegurar la implementación efectiva de la prevención, detección, control y manejo de las EEI para salvaguardar**	Número de contravenciones impuestas por la violación de las regulaciones en materia de EEI y el número de detecciones de las introducciones ilegales en los puntos de frontera. Número de EEI bajo monitoreo y vigilancia como parte del sistema de alerta temprana.	Tbd al comienzo del Project. Incipiente sistema de alerta temprana para el pez león.	3.1 Incremento del número de contravenciones impuestas y de las detecciones en frontera. 3.2 10 EEI monitoreadas como parte del sistema de alerta temprana	-SIAE reportes -Reportes de aduana -Reportes del sistema de alerta temprana -Reportes del control de manejo -Reportes de monitoreo	Instituciones comprometidas en la prevención y manejo de las EEI. Sectores productivos comprometidos a participar en la prevención y manejo de las EEI.

la diversidad biológica.	Acciones de manejo son implementadas para erradicar, contener y/o controlar las EEI que amenazan la flora y la fauna nativa en 7 áreas con biodiversidad critica y en áreas productivas. Implementación del sistema de monitoreo midiendo el efecto de las acciones de manejo y el impacto de las EEI sobre los ecosistemas, hábitat, especies y diversidad genética. Frecuencia del uso del sistema de Información por actores claves nacionales y actores locales: - Institutos académicos y de investigaciones. - Sectores productivos -Otros sectores	Algunas acciones de manejo implementadas Perna viridis solo se encuentra en la Bahía de Cienfuegos. El sistema de monitoreo de las EEI no está implementado.	3.3 Se reduce la predación, la pérdida de hábitat y /o la competición inter específica, como resultado de la implementación de acciones de manejo para 10 EEI. Contención de *Perna viridis* 3.4 Acciones de manejo para 5 EEI monitoreadas y evaluadas y 5 indicadores que midan los impactos de las EEI sobre los ecosistemas, hábitat, especies y diversidad genética. -70% -70% -50% -30%	Reportes periódicos de monitoreo Encuestas Conteo automático	Sectores productivos comprometidos a participar en la prevención y manejo de las EEI

ANEXO B: LISTA DE DOCUMENTOS QUE REVISARÁN LOS EVALUADORES

Documento	Contenido general	Origen
Marco de Asistencia de Naciones Unidas para el Desarrollo MANUD 2014-2018	Documento programático con las líneas directivas estratégicas acordadas por el Sistema de las Naciones Unidas y el Gobierno cubano.	PNUD/Gobierno
Programa de País PNUD	Plan de acciones previsto por el PNUD para dar respuesta al MNUD.	PNUD
Documento del Project (PRODOC)	PRODOC firmado por el PNUD y Gobierno de Cuba.	PNUD/Gobierno
Matriz de Marco Lógico	Indicadores de Marco Lógico del Project y su evolución.	PNUD
Reporte de Implementación del Project (PIR)	Reporte Implementación del Project (PIR) anual: 2015, 2016.	PNUD
Plan Operativo Anual (POA)	Planes de Trabajo Anuales: 2015, 2016.	PNUD
Informe combinado de gastos (CDR)	Emitido por el PNUD, a partir de la información que contiene ATLAS. Revisión y aprobación por la Dirección del Project.	PNUD
Informe Final de la evaluación de Medio término	Incluye Informe, recomendaciones y respuestas	Equipo Project
Revisiones presupuestarias	Aprobadas pro Gobierno y PNUD para reflejar ajustes hechos al presupuesto	PNUD
Prioridades estratégicas del GEF (GEF 6 Programming Directions)	Documento programático con los criterios de elegibilidad para el área focal de Biodiversidad del GEF	GEF/ a entregar por oficina PNUD en Cuba

ANEXO C: PREGUNTAS DE EVALUACIÓN

Criterios de evaluación - Preguntas	Indicadores	Fuentes	Metodología
Relevancia: ¿Cómo se relaciona el Project con los objetivos principales del área de interés del GEF y con las prioridades ambientales y de desarrollo a nivel local, regional y nacional?			
• ¿Cómo el Project apoya el área focal de biodiversidad y las prioridades estratégicas del GEF?	• Existencia de una clara relación entre los objetivos del Project y el área focal de biodiversidad del GEF.	• Documentos del Project. • Estrategias y documentos del GEF.	• Análisis de documentos. • Entrevistas con personal del PNUD y del Project.
• ¿Cómo el Project apoya las prioridades ambientales y de desarrollo a nivel nacional?	• Grado en el que el Project apoya el objetivo de manejo sostenible de la biodiversidad en la ENB.	• Estrategia Ambiental Nacional. • Programa Nacional de Diversidad Biológica. • Plan del Sistema Nacional de Áreas Protegidas.	• Análisis de documentos. • Entrevistas con personal del PNUD y del Project.
Efectividad: ¿En qué medida se han logrado los resultados y objetivos previstos del Project?			
• ¿Ha sido el Project efectivo en alcanzar los resultados esperados?	• Ver indicadores en el marco de resultados estratégicos/marco lógico del Project.	• Documentos del Project. • Reportes de avance trimestral y anual. • Equipo del Project e interesados clave.	• Análisis de documentos. • Entrevistas con interesados clave. • Entrevistas con el equipo del Project.
• ¿Cómo se manejaron los riesgos y supuestos del Project?	• Identificación de riesgos y supuestos durante la planeación y el diseño del Project.	• Documentos del Project. • Reportes de avance anual. • Equipo del Project, PNUD e interesados clave.	• Análisis de documentos. • Entrevistas.
Eficiencia: ¿El Project se implementó de manera eficiente en conformidad con las normas y los estándares internacionales y nacionales?			
• ¿Han sido utilizado el enfoque de gestión basada en resultados durante la implementación del Project mediante herramientas de gestión como el marco lógico y los planes de trabajo, así como los cambios realizados a estos? • ¿Han sido los sistemas financieros y contables adecuados para la gestión del Project y para producir información financiera precisa y a tiempo? • Ha sido la ejecución del Project tan efectiva como fue propuesta originalmente (planeado vs. actual)? • El cofinanciamiento ha sido según lo planeado? • Cómo los recurso financieros y adquisiciones realizadas han contribuido al logro de los objetivos del Project?	• Disponibilidad y calidad de los reportes financieros y de progreso. • Puntualidad y adecuación de los reportes entregados. • Nivel de discrepancia entre el gasto planeado y el ejecutado. • Cofinanciamiento planeado vs. actual. • Correlación entre la ejecución financiera y de adquisiciones y los resultados obtenidos por el Project.	• Reportes de avance trimestral y anual. • Plan Operativo Anual. • Reportes de ejecución financiera.	• Análisis de documentos. • Entrevistas claves.

	• Calidad del reporte de gestión basada en resultados (reportes de progresos, monitoreo y evaluación).		
Sostenibilidad: ¿En qué medida hay riesgos financieros, institucionales, socioeconómicos o ambientales para sostener los resultados del Project a largo plazo?			
• ¿Qué estrategias de sostenibilidad ha definido el Project? ¿Cómo las ha manejado durante la gestión del Project? • ¿Cuáles son los principales desafíos que pueden dificultar la sostenibilidad de los resultados del Project? ¿Cómo se han abordado desde el Project?	• Cambios que podrían significar desafíos al Project.	• Documentos del Project. • Equipo del Project. • PNUD. • Otros actores.	• Análisis de documentos. • Entrevistas.
Impacto: ¿Hay indicios de que el Project haya contribuido a reducir la tensión ambiental o a mejorar el estado ecológico, o que haya permitido avanzar hacia esos resultados?			
• ¿Cómo ha contribuido el Project a salvaguardar la diversidad biológica de importancia global en ecosistemas vulnerables del impacto de las Especies Exóticas Invasoras?	• Grado en que el Project ha contribuido a la conservación de la diversidad biológica de importancia global del impacto de las Especies Exóticas Invasoras.	• Documentos del Project. • Equipo del Project. • Otros actores.	• Análisis de documentos. • Entrevistas.
• ¿En qué medida el Project ha generado beneficios indirectos o directos así como incentivos económicos a las comunidades y principales sectores productivos, considerando el contexto actual de transformaciones económicas, a partir de la implementación de las alternativas de uso que promovió el Project?	• Nivel de impacto del Project en las comunidades y principales sectores productivos.	• Documentos del Project. • Equipo del Project. • Otros actores.	• Análisis de documentos. • Entrevistas.

ANEXO D: ESCALAS DE CALIFICACIONES

<table>
<tr><th>Calificaciones de resultados, efectividad, eficiencia, SyE y ejecución de AyE</th><th>Calificaciones de sostenibilidad:</th><th>Calificaciones de relevancia</th></tr>
<tr><td rowspan="2">6: Muy satisfactorio (MS): no presentó deficiencias
5: Satisfactorio (S): deficiencias menores
4: Algo satisfactorio (AS)
3: Algo insatisfactorio (AI): deficiencias importantes
2: Insatisfactorio (I): deficiencias importantes
1: Muy insatisfactorio (MI): deficiencias graves</td><td rowspan="2">4. Probable (P): Riesgos insignificantes para la sostenibilidad.
3. Algo probable (AP): riesgos moderados.
2. Algo improbable (AI): Riesgos significativos.
1. Improbable (I): Riesgos graves.</td><td>2. Relevante (R)
1. No Relevante (NR)</td></tr>
<tr><td>Calificaciones de impacto:
3. Significativo (S)
2. Mínimo (M)
1. Insignificante (I)</td></tr>
<tr><td colspan="3">Calificaciones adicionales donde sea pertinente:
No corresponde (N/C)
No se puede valorar (N/V)</td></tr>
</table>

ANEXO E: FORMULARIO DE ACUERDO Y CÓDIGO DE CONDUCTA DEL CONSULTOR DE LA EVALUACIÓN

Los evaluadores:

1. Deben presentar información completa y justa en su evaluación de fortalezas y debilidades, para que las decisiones o medidas tomadas tengan un buen fundamento.
2. Deben divulgar todos los resultados de la evaluación junto con información sobre sus limitaciones, y permitir el acceso a esta información a todos los afectados por la evaluación que posean derechos legales expresos de recibir los resultados.
3. Deben proteger el anonimato y la confidencialidad de los informantes individuales. Deben proporcionar avisos máximos, minimizar las demandas de tiempo, y respetar el derecho de las personas de no participar. Los evaluadores deben respetar el derecho de las personas a suministrar información de forma confidencial y deben garantizar que la información confidencial no pueda rastrearse hasta su fuente. No se prevé que evalúen a individuos y deben equilibrar una evaluación de funciones de gestión con este principio general.
4. En ocasiones, deben revelar la evidencia de transgresiones cuando realizan las evaluaciones. Estos casos deben ser informados discretamente al organismo de investigación correspondiente. Los evaluadores deben consultar con otras entidades de supervisión relevantes cuando haya dudas sobre si ciertas cuestiones deberían ser denunciadas y cómo.
5. Deben ser sensibles a las creencias, maneras y costumbres, y actuar con integridad y honestidad en las relaciones con todos los interesados. De acuerdo con la Declaración Universal de los Derechos Humanos de la ONU, los evaluadores deben ser sensibles a las cuestiones de discriminación e igualdad de género, y abordar tales cuestiones. Deben evitar ofender la dignidad y autoestima de aquellas personas con las que están en contacto en el transcurso de la evaluación. Gracias a que saben que la evaluación podría afectar negativamente los intereses de algunos interesados, los evaluadores deben realizar la evaluación y comunicar el propósito y los resultados de manera que respete claramente la dignidad y el valor propio de los interesados.
6. Son responsables de su rendimiento y sus productos. Son responsables de la presentación clara, precisa y justa, de manera oral o escrita, de limitaciones, los resultados y las recomendaciones del estudio.
7. Deben reflejar procedimientos descriptivos sólidos y ser prudentes en el uso de los recursos de la evaluación.

ANEXO F: ESBOZO DEL INFORME DE EVALUACIÓN[3]

i. Primera página:
- Título del Project respaldado por el PNUD y financiado por el GEF
- Números de identificación del Project del PNUD y GEF
- Plazo de evaluación y fecha del informe de evaluación
- Región y países incluidos en el Project
- Programa Operativo/Programa Estratégico del GEF
- Socio para la ejecución y otros asociados del Project
- Miembros del equipo de evaluación
- Reconocimientos

ii. Resumen ejecutivo
- Cuadro sinóptico del Project
- Descripción del Project (breve)
- Tabla de calificación de la evaluación
- Resumen de conclusiones, recomendaciones y lecciones

iii. Abreviaturas y siglas
(Consulte: Manual editorial del PNUD[4])

1. Introducción
- Propósito de la evaluación
- Alcance y metodología
- Estructura del informe de evaluación

2. Descripción del Project y contexto de desarrollo
- Comienzo y duración del Project
- Problemas que el Project buscó abordar
- Objetivos inmediatos y de desarrollo del Project
- Indicadores de referencia establecidos
- Principales interesados
- Resultados previstos

3. Hallazgos
(Además de una evaluación descriptiva, se deben considerar todos los criterios marcados con (*)[5])

3.1 Diseño y formulación del Project
- Análisis del marco lógico (AML) y del Marco de resultados (lógica y estrategia del Project; indicadores)
- Suposiciones y riesgos
- Lecciones de otros Projects relevantes (p.ej., misma área de interés) incorporados en el diseño del Project
- Participación planificada de los interesados
- Enfoque de repetición
- Ventaja comparativa del PNUD
- Vínculos entre el Project y otras intervenciones dentro del sector
- Disposiciones de Administración

3.2 Ejecución del Project
- Gestión de adaptación (cambios en el diseño del Project y resultados del Project durante la ejecución)
- Acuerdos de asociaciones (con los interesados relevantes involucrados en el país o la región)

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[3] La longitud del informe no debe exceder las *40* páginas en total (sin incluir los anexos)

[4] Manual de estilo del PNUD, Oficina de Comunicaciones, Oficina de Alianzas, actualizado en noviembre de 2008

[5] Con una escala de calificación de seis puntos: 6: Muy satisfactorio, 5: Satisfactorio, 4: Algo satisfactorio, 3: Algo insatisfactorio, 2: Insatisfactorio y 1: Muy insatisfactorio.

- Retroalimentación de actividades de SyE utilizadas para gestión de adaptación
- Financiación del Project:
- Seguimiento y Evaluación: diseño de entrada y ejecución (*)
- Coordinación de la aplicación y ejecución (*) del PNUD y del socio para la ejecución y cuestiones operativas

3.3 Resultados del Project

- Resultados generales (logro de los objetivos) (*)
- Relevancia (*)
- Efectividad y eficiencia (*)
- Implicación nacional
- Integración
- Sostenibilidad (*)
- Impacto

4. Conclusiones, recomendaciones y lecciones

- Medidas correctivas para el diseño, la ejecución, seguimiento y evaluación del Project
- Acciones para seguir o reforzar los beneficios iniciales del Project
- Propuestas para direcciones futuras que acentúen los objetivos principales
- Las mejores y peores prácticas para abordar cuestiones relacionadas con la relevancia, el rendimiento y el éxito

5. Anexos

- TdR
- Itinerario
- Lista de personas entrevistadas
- Resumen de visitas de campo
- Lista de documentos revisados
- Matriz de preguntas de evaluación
- Cuestionario utilizado y resumen de los resultados
- Formulario de acuerdo del consultor de la evaluación

ANEXO G: FORMULARIO DE AUTORIZACIÓN DEL INFORME DE EVALUACIÓN

Informe de evaluación revisado y autorizado por

Oficina en el país del PNUD

Nombre: _____

Firma: _____ Fecha: _____

ATR del GEF/PNUD

Nombre: _____

Firma: _____ Fecha: _____

5.2 MISSION ITINERARY

MINISTERIO DE CIENCIA TECNOLOGÍA Y MEDIO AMBIENTE

CENTRO NACIONAL DE AREAS PROTEGIDAS

Calle 18 A No. 4114 e/41 y 47 Playa. C.P. 11300
Telf: 202 7970 Fax: 204 0798

PROYECTO PARA EL MANEJO DE ESPECIES EXÓTICAS INVASORAS

Programa de Visita para Evaluación Final Project

Fecha: 2 al 13 de octubre

Llegada de la evaluadora internacional: Domingo 2 de octubre - recogida en el aeropuerto

Día 3 de octubre

Sesión Mañana

9:00 am Reunión con el PNUD. Equipo Evaluador y Oficina del PNUD en el país.

10:30 am Reunión Inicial con PNUD, MINCEX, DRI, Dirección CNAP y la Unidad de Manejo.

Sesión Tarde

2:30 pm. Reunión con la Unidad de Manejo del Project.

4:00 pm Encuentro con Directivos del CITMA

Día 4 de octubre

Llegada a Península de Guanahacabibes 11:00 am

- Presentación por la Coordinadora provincial del trabajo realizado por la provincia, en cuanto a sitios y principales resultados alcanzados y sus impactos.
- Presentación sobre los valores de la Reserva Biosfera- Parque Nacional Guanahacabibes. Resultados de trabajo en la salida de Cambio Climático.
- Recorrido a los sitios: Playa El Holandés y Playa La Barca (Tortugas)

2:00 pm Almuerzo en: Estación de Guardabosque

Salida hacia Pinar del Río: Visitar los sitios Casa de la Miel y Comunidad El Valle

Ciudad de Pinar del Río

6:00 pm Encuentro en el Museo de Historia Natural, con las instituciones de ECOVIDA y otras del Grupo de Coordinación provincial.

Noche en Pinar del Río (Hotel Vuelta Abajo)

Día 5 de Octubre

Visita a Empresa Punta de Palma

8:30 am Presentación de los resultados de este sitio

Recorrido por el sitio donde fue colocado 1 módulo de cercas eléctricas.

Almuerzo en la Empresa Bufalina Punta de Palma

2:00 pm Salida hacia Ciénaga de Zapata

Noche en Ciénaga de Zapata

Día 6 de Octubre

9:00 am Reunión en Órgano CITMA con las instituciones participantes en la salida de Incentivos económicos que se aplican en el Parque Nacional Ciénaga de Zapata.

Recorrido por: Ranchón elaborado con *Melaleuca* y degustación de productos elaborados con claria

Almuerzo en: Órgano CITMA Ciénaga de Zapata

2:00 pm Salida hacia Sancti Spíritus

Noche en Trinidad

Día 7 de Octubre

9.00 am Reunión en Trinidad con las instituciones del territorio.

11:00 am Recorrido por Paisaje Natural Protegido Topes de Collantes, experiencia de Control Biológico.

2:00 pm Almuerzo en Topes de Collantes

Salida hacia Camagüey

Alojamiento en la Ciudad de Camagüey

Sábado 8 de Octubre

9:00 am Reunión en Camagüey con las autoridades de la provincia que forman el Grupo de Coordinación Provincial

11:00 am Visita a Empresa Ganadera de Guáimaro, sector productivo

3:00 pm Almuerzo en Guáimaro

Noche en Camagüey

Domingo 9 de octubre

Regreso a La Habana

Lunes 10 de Octubre

Trabajo del equipo evaluador

Martes 11 de octubre

9:00 am Reunión con las instituciones científicas y las autoridades regulatorias

1:00 pm Almuerzo en Acuario Nacional de Cuba

2:00 pm Reunión con el equipo de coordinación del Project

Miércoles 12 de Octubre

8:00 am Trabajo del equipo evaluador

2:30 pm Reunión de conclusiones preliminares PNUD

Jueves 13 de octubre

Regreso de la evaluadora internacional a su país

5.3 LIST OF PERSONS INTERVIEWED

5.3.1 La Habana

Fecha: 3 de octubre del 2016

Lugar: Oficina del PNUD en La Habana

No.	Nombres y apellidos	Actividad, Organismo
1	Alfredo Martínez Arteaga	Administrador Project
2	Dalia Salabarría	Directora Project EEI
3	Gricel Acosta Acosta	Oficial Programa MAE, PNUD/Cuba
4	Laura Castro Muñoz	Directora Técnica y Jefa de Resultado
5	Mercedes Arellano Acosta	Miembro Equipo Evaluación
6	MSc. Pedro J. Ruiz Hernández	Funcionario DRI, CITMA
7	*Nombre no legible*	Funcionario, MINCEX- Cuba
8	Patricia Fernández	Funcionaria, PNUD/Cuba
9	Sílvia R. Ziller	Jefa Equipo Evaluación
10	Tomas Escobar Herrera	Funcionario, PNUD/Cuba
11	Yamilka Caraballo	Funcionaria, PNUD/Cuba

Encuentro del EE con autoridades del CITMA

Lugar: Agencia de Medio Ambiente

No.	Nombres y apellidos	Cargo	Institución
1	Ing. Carlos A. Díaz Maza	Director	CNAP
2	Dra. Marina Martínez Díaz	Funcionaria	CICA
3	Dra. Maritza García García	Presidenta	AMA
4	Lic. Martha Prado Guevara	Especialista Relac. Int.	AMA
5	Dra. Viana B. Barceló Pérez	Jefa Dpto. Inspección	CSB
6	MSc. Pedro J. Ruiz Hernández	Funcionario	Dir. Relac. Internacionales
7	Dr. Vladimir Guevara Velazco	Director	Centro del Clima, INSMET

Reunión con la Unidad de Manejo del Project

Lugar: CNAP, La Habana

No.	Nombres y apellidos	Cargo	Institución
1	Adrián Quintana Hernández	Encargado del SIMEEI	CNAP
2	MSc. Alfredo Martínez Arteaga	Administrador Project	CNAP
3	Ing. Carlos A. Díaz Maza	Director	CNAP
4	Dra. Dalia Salabarría Fernández	Directora del Project	CNAP
5	MSc. Laura M. Castro Muñoz	Directora Técnica y Jefa de Resultado	CNAP
6	MSc. Lázaro F. Rodríguez Farrrat	Jefe de Resultado	IES
7	MSc. Raúl Cabeza Pérez	Jefe de Resultado	CNAP

5.3.2 Provincia de Pinar del Río

Fecha: 4 de octubre del 2016

El Dr. Miguel Brugera Amaro y la MSc. Damary Gallardo, Delegado del CITMA y Coordinadora del Project en la provincia, respectivamente, dieron la bienvenida al EE acompañado por la Directora del Project y los miembros de su UMP. Siguiendo el Programa acordado, el EE visitó los sitios de intervención del Project, donde sostuvo entrevistas con las personas que se relacionan a continuación.

Parque Nacional Guanahacabibes

No.	**Nombres y apellidos**	**Actividad**	**Institución**
1	Abel Sosa Prieto	Especialista	Cuerpo Guardabosques
2	Diosmedes Garcia Valladares	Especialista	PN Guanahacabibes
3	Ismael Fernández Medero	Educación Ambiental	PN Guanahacabibes
4	José Alberto Camejo Lima	Especialista	PN Guanahacabibes
5	Juan Cordero Lahera	Especialista	PN Guanahacabibes
6	Kenia Ledesma Moreira	Presidenta Consejo Popular G.	Gobierno Local
7	Lázaro Márquez Llauger	Director PN Guanahacabibes	ECOVIDA- CITMA
8	Mary Félix Cruz Ginart	Educación Ambiental	ONG "Félix Varela"
9	Miguel Lazo Martínez	Representante Comunidad G.	Gobierno Local
10	Osmani Borrego Fernández	Especialista	PN Guanahacabibes
11	Vladimir Azcuy Jiménez	Jefe CGB circuito Guanahacabibes	MININT
12	Yeny Luz Cordero Medina	Representante de escuelas locales	MINED

Coordinación Provincial del Project y entidades miembros

Local: Museo de Historia Natural de Pinar del Río

No.	**Nombres y apellidos**	**Actividad**	**Institución**
1	Carlos A. Miranda Sierra	Centro Meteorológico Provincial	CITMA
2	Freddy Delgado Fernández	Investigación Científica	ECOVIDA- CITMA
3	Giraldo Malagón Menéndez	Director Centro Meteorológico	CITMA
4	Idalia López Pedré	Directora UMA Provincial	CITMA
5	Leonardo Ramírez Medina	Director	Museo Historia Nat.
6	Luis W. Martínez Degrá	Decano	Facultad Universidad
7	Marco A. Saz Silva	Gestión Económica	Museo CITMA
8	Marta Bonilla Vichot	Profesora	Universidad P del Río
9	Reinaldo García Díaz	Especialista	Serv. Forestal P del Río
10	Susana Vélez Veliz	Projects	Emp. Pecuaria MINAG
11	Yusniel Massola Bernal	Gestión Ambiental	UMA – CITMA

Fecha: 05 de octubre de 2016

Empresa Pecuaria Punta de Palma, MINAG – Pinar del Río

No.	**Nombres y apellidos**	**Actividad**
1	Enrique Coz Millet	Especialista
2	José I, Baños Díaz	Asesor Jurídico
3	Juan A. Herrera Pérez	Jefe de Alimentación Pecuaria
4	Miguel A. López Acosta	Director de la Empresa
5	Susana Veliz Veliz	Especialista de Projects

5.3.3 Provincia de Matanzas

Fecha: 06 de octubre de 2016

Local: Ciénaga de Zapata

No.	Nombres y apellidos	Actividad
1	Andrés Hurtado Consuegra	Especialista Técnico Hidrógrafo
2	Carlos Torres Rodríguez	Jefe Servicio Est. Forestal C. Zapata
3	Francisco Medina Tejera	Especialista, Jefe Grupo Técnico
4	Jorge L. Jiménez Hernández	Director Órgano CITMA C. Zapata
5	Leyaní Caballero	Educación Ambiental
6	Pablo Bouza Rodríguez	Director Emp. Conservación C. Zapata
7	Reynaldo Santana Aguilar	Especialista Medio Ambiente
8	Yadira Rosario Troche	Educación Ambiental (Socióloga)

5.3.4 Provincia de Sancti Spíritus

Fecha: 07 de octubre de 2016

Local: Topes de Collantes y Trinidad

No.	Nombres y apellidos	Actividad
1	Alexey Rodriguez Medina	Director Protección al Medio
2	Braily Sañudo Milián	Director REDS Bamburanao
3	Ernesto Pulido García	Especialista Gestión Amb. CITMA S. S.
4	Iraida Rodríguez Gallo	Especialista CGB provincial
5	Jesús Toledo Medina	Especialista, Empresa Agro Forestal S.S.
6	Jorge L. Camacho	Director Complejo Topes de Collantes
7	Julio Pavel García Lahera	Investigador, Jardín Botánico S.S.
8	Leonardo Cuza Quiñonez	Director Centro Servicios. Amb. S.S.
9	Manuel Banlomo Cruz	Director UEB AGF municipal Trinidad
10	Norlys Albelo Filgueira	PNP Topes de Collantes
11	Tamara Vilva García	Técnico AGF municipal Trinidad

5.3.5 Provincia de Camagüey

Fecha: 08 de octubre de 2016

Local: Coordinación provincial del Project

No.	Nombres y apellidos	Actividad	Institución
1	Adolis Barro Martinez	RE Limones Tuabaquey	CITMA
2	Ana María Rodríguez	Especialista AP CITMA	CITMA
3	Arenayda Manzanares	CITMA Camagüey	CITMA
4	Dafnet Sanchez de Céspedes	Especialista ENPFF	MINAG
5	Hector Fonseca	Secretaria de Projects	ACTAF
6	Irma Martín Sánchez	Coordinadora Provincial Project	CITMA
7	Irving Pérez Pimentela	CITMA Camagüey	CITMA
8	Jorge Azobar Pérez	Director Parque Botánico	CITMA
9	José M. Plasencia Fraga	Centro Investigaciones MA Camagüey	CITMA
10	Juan Carlos Vazquez Perez	Director RE Limones Tuabaquey	CITMA
11	Lisbet Font Vila	Jefa Unidad Medio Ambiente CITMA	CITMA
12	Maida Fumero Mollinedo	Centro Meteorología Provincial	CITMA

No.	Nombres y apellidos	Actividad	Institución
13	María Elena Zequeira	Centro Investigaciones MA Camagüey	CITMA
14	Nélida Varela Ledesma	Unidad de Medio Ambiente CITMA Prov.	CITMA
15	Oscar H. Borroto Sánchez	Profesor Univ. Facultad C. Agropecuarias	Universidad de Camagüey
16	Rebeca González	Centro Investigaciones MA Camagüey	CITMA
17	Rosario Camejo Martínez	Presidenta	ACPA
18	Roselia Iglesias Marante	Ciencia y Técnica CITMA Camagüey	CITMA
19	Yelena Estévez Armas	Unidad de Medio Ambiente CITMA Prov.	CITMA

Local: UBPC de Guáimaro

No.	Nombres y apellidos
1	Armando Cabrera Cabrera, miembro
2	Edilberto Montaña Acosta, miembro
3	Evelio Mayedo Mayedo, miembro
4	Miriam Peláez Peláez, miembro
5	Rodolfo Delgado Monteagudo, Jefe UBPC
6	Volodia Pelaez del Toro, miembro
7	Yadir Lopez Pelaez, miembro

5.3.6 La Habana

Fecha: 11 de octubre de 2016

Local: Acuario Nacional de Cuba

No.	Nombres y apellidos	Actividad, Organismo
1	Armando Luis Payo Hill	Director Instituto Ecología y Sist., CITMA
2	Bertha Crespo Urquiola	Jefatura Nac. CGB. MININT
3	Carmen Ferras Álvarez	Instituto Ecología y Sistemática , CITMA
4	Lilian San Martin Echemendia	Jefatura Nac. CGB, MININT
5	Marina Martínez Díaz	CICA - CITMA
6	Nilia Ana Dalmendray Gómez	Regulaciones Pesqueras, MINAL
7	Pedro P. Chevalier	Acuario Nacional de Cuba
8	Vladimir Guevara Velazco	Director Centro del Clima INSMET, CITMA

Fecha: 12 de octubre de 2016

Local: Oficina del PNUD, La Habana

Reunión de conclusiones de la evaluación

No.	Nombres y apellidos	Actividad, Organismo
1	Alfredo Martínez Arteaga	Administrador Project
2	Carlos Alberto Díaz Maza	Director del CNAP
3	Dalia Salabarría	Directora Project EEI
4	Gricel Acosta Acosta	Oficial Programa MAE, PNUD/Cuba
5	Laura Castro Muñoz	Jefa de Resultado
6	Mercedes Arellano Acosta	Miembro Equipo Evaluación
7	Patricia Fernández	Funcionaria, PNUD/Cuba
8	Silvia Ziller	Jefa Equipo Evaluación
9	Tomas Escobar Herrera	Funcionario, PNUD/Cuba
10	Yamilka Caraballo	Funcionaria, PNUD/Cuba

5.4 SUMMARY OF FIELD VISITS

Aspectos comunes observados en las áreas visitadas

- Las actividades han sido conducidas con un alto grado de compromiso;
- las relaciones transparentes entre los niveles básicos de ejecución del Project (CNAP, UMP, Coordinadores Provinciales, sitios), han propiciado que no hayan estado presentes potenciales conflictos o disparidad de criterios que no se hayan analizado oportunamente.
- Hay reconocimiento de la importancia del fortalecimiento de la relación interinstitucional entre las autoridades ambientales territoriales y nacional, con el sector forestal para la eficaz prevención, control y monitoreo de las EEI.

PROVINCIA DE PINAR DEL RÍO

- **Delegación del CITMA**

El EE fue recibido por el Delegado del CITMA en la provincia quien manifestó su alta valoración por los impactos y lecciones aprendidas que dejará este Project en la provincia y sobre el valor de sus resultados, que fortalecen la actividad ambiental en general, sobre todo, durante el trabajo con sectores productivos que resultan fundamentales para el desarrollo territorial. El Project ha sido una enseñanza de cómo trabajar con estos y otros sectores de la economía.

- **Parque Nacional Guanahacabibes (Reserva de la Biosfera)**

El EE presenció una presentación elaborada por el MSc. Lázaro Márquez Llauger, el Lic. Osmani Borrego Fernández y la MSc. Dorka Cobián Rojas, quienes en el Project se ocupan las responsabilidades de Director del Parque Nacional y Especialistas, respectivamente.

La presentación incluyó información sustantiva sobre esta APRM, en cuanto a generalidades, características climáticas; elementos geológicos y geomorfológicos; objetos del monitoreo: especies claves, ecosistemas prioritarios; especies exóticas invasoras; muestra de planillas de campo para la validación de protocolo y aplicación de un software para análisis de vegetación de playas. Se presentaron resultados parciales del monitoreo del pez león, así como evidencias de torneos organizados para la pesca del pez león.

La presentación muestra el trabajo desarrollado con la comunidad vinculada al APRM, partiendo de la descripción de sus condiciones socioeconómicas y los trabajos desarrollados con el Project (Festival de Aves Migratorias, Festival Comunitario de tortugas marinas, limpieza de playas, entre otros). Describe el trabajo con los Grupos Ambientales Comunitarios, creados al nivel de todas las comunidades de la Reserva de esta Biosfera, capacitación, realización de acciones de saneamiento ambiental en las comunidades y concursos de conocimientos, relacionados con las EEI. Integración de la comunidad al empleo de las EEI con fines económicos; aplicación práctica de la guía para la observación de eventos anómalos y aparición (presencia de grandes volúmenes de sargazo, migración de pelicanos blancos, migración de cangrejos rojos) de EEI en áreas naturales; evaluación de los efectos de las temperaturas extremas sobre la comunidad de peces en una laguna (Caleta Larga); monitoreo de los efectos del clima sobre las especies de interés para la producción melífera. Los pobladores locales constituyen una fuente importante de información primaria sobre la presencia de especies exóticas invasoras y sobre eventos anómalos.

Lecciones aprendidas y expuestas por esta área de intervención del Project

- Los pobladores locales constituyen una fuente importante de información primaria sobre la presencia de especies exóticas invasoras y sobre eventos anómalos.
- La caracterización climática del área es importante para establecer el contexto general, pero se requiere levantar información del microclima para estudios más detallados.

- La existencia de programas de monitoreo de la biodiversidad permite determinar con mejor precisión los efectos de la variabilidad climática sobre los ecosistemas.
- Las prácticas y saberes tradicionales de las comunidades locales hacen un aporte decisivo e insustituible al conjunto de medidas definidas para la gestión ante los eventos del cambio climático.
- Los reportes periódicos de ejecución constituyen una herramienta muy útil para sistematizar la captación de información primaria y para estandarizar procedimientos.

Parte sustancial de la visibilidad dada al Project en esta área, ha estado basada en estas investigaciones que han generado 9 artículos, publicados en revistas científicas nacionales y extranjeras, presentados 16 trabajos en eventos científicos nacionales e internacionales, incluido el IV Congreso Mundial de Reservas de Biosfera, junto a la difusión en órganos nacionales de difusión masiva como la radio y la televisión.

- **Coordinación Provincial del Project y entidades miembros**

En 26 diapositivas la Coordinación Provincial mostró una panorámica de la ejecución del Project en la provincia que tiene 5 sitios de intervención. Entre paréntesis se señala las EEI objeto de su atención directa a los efectos del Project:

1) APRM San Ubaldo- Sabanalamar (marabú, claria), 2) Empresa Pecuaria Punta de Palma (búfalos), 3) Jardín Botánico Provincial (evaluación del cambio climático y comportamiento de las EEI), 4) RB Sierra del Rosario (pomarrosa - *Syzygium jambos* y charaguito *Inga punctata*), 5) PN Península de Guanahacabibes (evaluación del cambio climático y comportamiento de las EEI). Relaciona los principales impactos del Project en cada uno de estos sitios, junto a un resumen detallado del cofinanciamiento por cada uno de ellos. Por ultimo define los componentes que considera garantizaran la sostenibilidad de los resultados:
   - salida mediante las acciones de la Estrategia Ambiental (nacional, provincial);
   - seguimiento mediante los Programas de Manejo de cada una de las áreas;
   - proyección de acciones en los Planes de Reducción de Desastres;
   - salida mediante los nuevos estudios de Peligro, Vulnerabilidad y Riesgos;
   - seguimiento desde el trabajo con la Junta de Áreas Protegidas mediante instrumentos de gestión que implementa la UMA.

- **Empresa Pecuaria Punta de Palma**

Empresa dedicada a trabajar con los búfalos como EEI. De acuerdo con la información reportada, capturan alrededor de 200 búfalos/año, seleccionando para la cría los que no están enfermos de tuberculosis (TB) y brucelosis (BB), que son las enfermedades más comunes que presentan. Tienen 2.000 en total confinados, en ordeño, con cercas eléctricas, suministradas por el Project. Potencian el apoyo del Project en los avances logrados por la empresa.

Las actividades de capacitación estuvieron dirigidas al trabajo en las comunidades, la captura ilícita de búfalos, así como a la trasmisión de enfermedades como la TB y la BB en la manipulación si no se cumplen con las medidas higiénico - sanitarias.

PROVINCIA DE MATANZAS

- **Órgano CITMA Ciénaga de Zapata**

Ciénaga de Zapata es una APRM, una de las Reservas de la Biosfera de Cuba y el humedal mejor conservado de El Caribe insular, con una diversidad de recursos bióticos y abióticos reconocidos nacional e internacionalmente. Este sitio del Project ha trabajado en el aprovechamiento económico de dos EEI, la claria y la melaleuca y en la aportación de información a los sectores correspondientes (pesquero y

forestal) durante sus análisis para la aplicación de incentivos económicos. La captura de la claria es artesanal en 5 áreas de pesca. Han mantenido el esfuerzo pesquero y han disminuido las capturas por sobrexplotación de la especie. Los pescadores reciben un salario medio/mes= 1900.00 CUP.

En el caso de la melaleuca se mostró a través de diapositivas, la aplicación del enfoque ecosistémico. Brindaron evidencias (fotos) en relación con el ecosistema herbazal de ciénaga existente en cayo Ramona, donde actualmente el Project trabaja en la eliminación de *Melaleuca* quinquenervia y en la restauración con especies propias del lugar como Yana (*Conocarpus erecta)* y otras, bajo un enfoque ecosistémico aplicado con el objetivo de proteger los palmares para la nidificación de aves como la cotorra, catey y carpinteros y eliminar la presencia de esa EEI.

Este es uno de los seis sitios en que se vienen realizando investigaciones relacionadas con el cambio climático y comportamiento de las especies. En este contexto, aprovechan la alianza con la ONG "Fundación Antonio Núñez Jiménez" que trabaja con las comunidades en el Project "CCamBio", que cuenta con el apoyo del Fondo Mundial para la Naturaleza (WWF).

PROVINCIA DE SANCTI SPIRITUS

- **Municipio de Trinidad y visita al Paisaje Natural Protegido Topes de Collantes**

El EE sostuvo un encuentro con las autoridades de la provincia.

Antes del recorrido por el área el EE contó con una amplia información (presentaciones con diapositivas, de videos realizados, plegables promocionales del Project). Hubo una presentación central sobre las actividades en los sitios de implementación del Project en este lugar. Se expuso el trabajo con las EEI seleccionadas (marabú, tulipán africano, leucaena, pomarrosa), con información sobre las hectáreas trabajadas, las recuperadas y resultados económicos, dados por la producción de carbón para la exportación de 2822 sacos con 20 kg c/u. 10.500 postes para cercas fueron consumidos por las propias unidades perteneciente a la UEB Silvícola Trinidad así como 383 m^3 producción de madera, 32 toneladas de forrajes y leña para combustible que se comercializaron en diferentes entidades del territorio. Se expuso el trabajo desarrollado con el pez león, la actualización del listado de especies nativas para cada biotopo y ecosistema trabajados y se unifican las técnicas de monitoreo de las áreas priorizadas. Refirieron los impactos logrados en los sitios en cuanto a educación de las comunidades.

PROVINCIA DE CAMAGÜEY

- **Coordinación provincial del Project**

El EE sostuvo una reunión inicial con las instituciones que forman parte de la Coordinación Provincial y tuvo acceso a una amplia información acerca de los resultados obtenidos por el Project en la provincia. De esta reunión, las principales incidencias se pueden resumir como sigue:

  - La provincia tiene cuatro áreas de intervención en el Project.
  - La eliminación del marabú ha beneficiado a las comunidades, por lo que ha sido favorecida la adopción de convenios para la cría de ganado porcino en las áreas antes infestadas. Según se liberaban las hectáreas de EEI, fueron plantados productos agrícolas y ejecutadas acciones para el desarrollo pecuario con ganado menor, inclusive, para la producción de leche de cabra, la cría de pollos de ceba destinados a la venta a las comunidades y fomento de pastos en áreas antes infestadas. Producidas 12.9 toneladas de carbón vegetal a partir del marabú eliminado, que también ha sido utilizado en la producción de postes para cercas. Eliminada la casuarina en los 16 km de playa en Santa Lucía. En coordinación con la ONG ACTAF se eliminó el marabú en el municipio C. M de Céspedes. Realizado un amplio trabajo con las comunidades.
  - La Coordinación del Project en la provincia trabajó en la preparación de viveros con especies nativas para el establecimiento de las mismas donde antes había EEI, con excepción de las

áreas infestadas que fueron recuperadas para la producción de alimentos. Establecieron alianzas con la ONG ACTAF durante el desarrollo de un Project sobre el uso del marabú para la producción de biomasa. Con el Project quedó fortalecida una Maestría en Manejo Sostenible de Tierras y otra en Educación Ambiental que se desarrollan en la provincia y conocimientos difundidos en general durante la celebración del taller provincial "Biodiversidad y manejo de Especies Exóticas Invasoras (2014 y 2015)".

- **UBPC Constitución de Guáimaro**

El EE recibió una información detallada del trabajo de esta UBPC dedicada a la eliminación de marabú (1125.3 ha infestadas cuya eliminación sigue en curso) mediante su manejo y empleo para postes y producción de carbón vegetal. Cuenta con 135 miembros, de ellos, 13 son mujeres, y tienen un Comité de Género a través del que las mujeres desarrollan trabajos antes casi exclusivamente desarrollados por los hombres.

Con el Project se vinculan las actividades como el silvopastoreo, crianza de ovino, caprino, porcino, construcción y reparación de cercas, siembra de pastos. Incremento de la producción de leche. En cuanto a superación de los trabajadores, se organizó una capacitación sobre uso sostenible del recurso suelo en sinergia con el Project GEF/PNUD "Manejo Sostenible de Tierras".

Es una de las áreas del Project dedicada a las investigaciones sobre cambio climático y comportamiento de las EEI. Se identificaron parcelas para la realización de estos estudios, estableciéndose como indicador la relación entre variables meteorológicas y su variación con respecto a la producción de leche y carne. Los resultados de observaciones preliminares en dos lugares determinados (potreros) conducen a las siguientes consideraciones:

- temperaturas muy altas en el 2015, disminuyen la producción de leche en ambos potreros;
- escasez de precipitaciones en el 2015, disminuyen la producción de leche en ambos potreros;
- aumenta la temperatura en el 2015, se afecta la producción de carne;
- escasez de precipitaciones en el 2015, disminuye la producción de carne en el potrero.

Se observa que en las áreas liberadas de marabú tiene lugar una mayor producción de leche y carne por la adopción de prácticas de adaptación al cambio climático, como la provisión de más sombra para el ganado, y el uso de cercas eléctricas y confinamiento para mejoría de los pastos.

Nota final:

Miembros de la Unidad de Manejo del Project acompañaron al EE a todas estas visitas. Al final de las presentaciones en cada sitio, los miembros de la UMP se retiraban para darle al EE la oportunidad de establecer un diálogo directo y transparente con los ejecutores del Project, haciendo uso del cuestionario de preguntas establecidas y presentadas en el Anexo 5.6.

5.5 LIST OF DOCUMENTS REVIEWED

Before the mission

Documento	Origen
Documento del Project (PRODOC)	PNUD – Gobierno de Cuba
Informe combinado de gastos (CDR) 2011 - 2015	PNUD
Informe de la Evaluación de Medio Término (EMT) - 2014	Evaluadores y equipo del Project
Marco de Asistencia de Naciones Unidas para el Desarrollo 2014- 2018	PNUD – Gobierno de Cuba
Matriz de Marco Lógico	PNUD
Plan Operativo Anual 2015 y 2016	PNUD
Prioridades estratégicas del GEF	GEF
Programa de País	PNUD
Reporte de Implementación del Project (PIR) 2015	PNUD
Revisiones presupuestarias	PNUD
Estrategia Nacional de Biodiversidad 2016 – 2020	CITMA
Programa del Sistema Nacional de Áreas Protegidas 2014 - 2020 – Programa de control y manejo de especies exóticas invasoras	CITMA - CNAP

During and after the mission

Reporte de Implementación del Project (PIR) 2016 - resumen	PNUD
Guía de evaluación de riesgos para especies exóticas	Producto del Project
Metodología para un proceso de selección de EEI dirigido a establecer las listas negra, gris y blanca	Producto del Project
Propuesta del sistema de alerta temprana y respuesta rápida de especies exóticas invasoras de la República de Cuba	Producto del Project
Guía metodológica para la valoración de la efectividad de la implementación de los programas de manejo de EEI	Producto del Project
Sistema de información para el manejo de EEI	Producto del Project
Planes de manejo para EEI – 13 resúmenes ejecutivos	Producto del Project
Protocolos de monitoreo de EEI (17 especies) y de fenología	Producto del Project
Programa Nacional para prevenir, manejar y controlar las especies exóticas invasoras en la República de Cuba (2012 – 2020)	Producto del Project
Valoraciones económicas de las especies exóticas invasoras	Producto del Project
Informe trimestral producido por la Coordinadora Provincial de Santiago de Cuba enero – marzo 2016 ref. Reserva Ecológica Siboney-Juticí y reporte de cofinanciamiento	Informe del Project
Documentos de auditorías financieras 2015	

5.6 EVALUATION QUESTION MATRIX

Criterios de evaluación – Preguntas	Indicadores	Fuentes	Metodología
Relevancia: ¿Cómo se relaciona el Project con los objetivos principales del área de interés del GEF y con las prioridades ambientales y de desarrollo a nivel local, regional y nacional?			
¿Cómo el Project apoya el área focal de biodiversidad y las prioridades estratégicas del GEF?	Existencia de una clara relación entre los objetivos del Project y el área focal de biodiversidad del GEF.	• Documentos del Project. • Estrategias y documentos del GEF.	• Análisis de documentos. • Entrevistas con personal del PNUD y del Project.
¿Cómo el Project apoya las prioridades ambientales y de desarrollo a nivel nacional?	Grado en el que el Project apoya el objetivo de manejo sostenible de la biodiversidad en la ENB.	• Estrategia Ambiental Nacional. • Programa Nacional de Diversidad Biológica. • Plan del Sistema Nacional de Áreas Protegidas.	• Análisis de documentos. • Entrevistas con personal del PNUD y del Project.
¿De qué maneras el Project da apoyo a las prioridades nacionales ambientales?	Inclusión del tema en políticas y regulaciones nacionales.	• Marcos legales ajustados o elaborados.	• Análisis de resultados y documentos del Project.
Efectividad: ¿En qué medida se han logrado los resultados y objetivos previstos del Project?			
¿Ha sido el Project efectivo en alcanzar los resultados esperados?	Ver indicadores en el marco de resultados estratégicos/marco lógico del Project.	• Documentos del Project. • Reportes de avance trimestral y anual. • Equipo del Project e interesados clave.	• Análisis de documentos. • Entrevistas con interesados clave. • Entrevistas con el equipo del Project.
¿Cómo se manejaron los riesgos y supuestos del Project?	Identificación de riesgos y supuestos durante la planeación y el diseño del Project.	• Documentos del Project. • Reportes de avance anual. • Equipo del Project, PNUD e interesados clave.	• Análisis de documentos. • Entrevistas.
¿El Project involucró a las partes interesadas a través del intercambio de información y consulta, y se promovió su participación en el diseño, implementación y S&E?	Número de instituciones involucradas.	• Documentos del Project. • Participantes del Project.	• Análisis de documentos. • Entrevistas
¿El Project consultó y aprovechó las habilidades, la experiencia y el conocimiento de las entidades gubernamentales competentes, las organizaciones no gubernamentales, grupos comunitarios, entidades del sector privado, gobiernos locales e instituciones académicas en el diseño, implementación y evaluación de las actividades del Project, con vistas a generar impactos ambientales efectivos?	Número de instituciones involucradas. Número de sectores distintos involucrados.	• Documentos del Project. • Lista de instituciones involucradas.	• Análisis de documentos. • Entrevistas con participantes.
¿Cuáles considera usted que son los principales logros y limitaciones del Project?	Percepción de relevancia y de limitaciones por parte de los participantes.	• Participantes del Project en distintos sitios.	• Entrevistas con participantes.

Eficiencia: ¿El Project se implementó de manera eficiente en conformidad con las normas y los estándares internacionales y nacionales?			
• ¿Ha sido utilizado el enfoque de gestión basada en resultados durante la implementación del Project mediante herramientas de gestión como el marco lógico y los planes de trabajo, así como los cambios realizados a estos? • ¿Han sido los sistemas financieros y contables adecuados para la gestión del Project y para producir información financiera precisa y a tiempo? • Ha sido la ejecución del Project tan efectiva como fue propuesta originalmente (planeado vs. actual)? • El cofinanciamiento ha sido según lo planeado? • Cómo los recurso financieros y adquisiciones realizadas han contribuido al logro de los objetivos del Project?	• Disponibilidad y calidad de los reportes financieros y de progreso. • Puntualidad y adecuación de los reportes entregados. • Nivel de discrepancia entre el gasto planeado y el ejecutado. • Cofinanciamiento planeado vs. actual. • Correlación entre la ejecución financiera y de adquisiciones y los resultados obtenidos por el Project. • Calidad del reporte de gestión basada en resultados (reportes de progresos, monitoreo y evaluación).	• Reportes de avance trimestral y anual. • Plan Operativo Anual. • Reportes de ejecución financiera.	• Análisis de documentos. • Entrevistas claves.
Sostenibilidad: ¿En qué medida hay riesgos financieros, institucionales, socioeconómicos o ambientales para sostener los resultados del Project a largo plazo?			
• ¿Qué estrategias de sostenibilidad ha definido el Project? ¿Cómo las ha manejado durante la gestión del Project? • ¿Cuáles son los principales desafíos que pueden dificultar la sostenibilidad de los resultados del Project? ¿Cómo se han abordado desde el Project? • ¿Existen riesgos sociales o políticas que puedan poner en peligro la sostenibilidad de los resultados del Project? • ¿Hay suficiente conciencia de los interesados y apropiación de los objetivos a largo plazo del Project? • ¿Existen aspectos financieros que puedan poner en riesgo la sostenibilidad de los resultados del Project? ¿Se ha instalado un mecanismo para asegurar la sostenibilidad financiera y económica una vez que termine la asistencia del GEF? • ¿Los marcos jurídicos, las políticas y las estructuras y procesos de gobernabilidad en el que opera el Project plantean riesgos que puedan poner en riesgo la sostenibilidad de los beneficios del Project?	• Cambios que podrían significar desafíos al Project.	• Documentos del Project. • Equipo del Project. • PNUD. • Otros actores.	• Análisis de documentos. • Entrevistas.
Impacto: ¿Hay indicios de que el Project haya contribuido a reducir la tensión ambiental o a mejorar el estado ecológico, o que haya permitido avanzar hacia esos resultados?			
• ¿Cómo ha contribuido el Project a salvaguardar la diversidad biológica de importancia global en ecosistemas	• Grado en que el Project ha contribuido a la conservación de la diversidad biológica de	• Documentos del Project. • Equipo del Project. • Otros actores.	• Análisis de documentos. • Entrevistas.

	vulnerables del impacto de las Especies Exóticas Invasoras?	importancia global del impacto de las Especies Exóticas Invasoras.		
	• ¿En qué medida el Project ha generado beneficios indirectos o directos así como incentivos económicos a las comunidades y principales sectores productivos, considerando el contexto actual de transformaciones económicas, a partir de la implementación de las alternativas de uso que promovió el Project?	• Nivel de impacto del Project en las comunidades y principales sectores productivos.	• Documentos del Project. • Equipo del Project. • Otros actores.	• Análisis de documentos. • Entrevistas.

5.7 QUESTIONNAIRE USED AND SUMMARY OF RESULTS

Criterios de evaluación – Preguntas	
Relevancia: ¿Cómo se relaciona el Project con los objetivos principales del área de interés del GEF y con las prioridades ambientales y de desarrollo a nivel local, regional y nacional?	
¿Cómo el Project apoya el área focal de biodiversidad y las prioridades estratégicas del GEF?	Las acciones del Project están alineadas con los objetivos globales del GEF para mejorar la sostenibilidad de los sistemas de áreas protegidas y reducir amenazas a la diversidad biológica, así como con la estrategia del GEF-5 con vistas a generar mejores estructuras de gestión para prevenir, controlar y manejar las EEI. La Evaluación de los Ecosistemas del Milenio ha identificado las EEI como una de las cinco principales causas de pérdida de diversidad biológica. La amenaza de las EEI es parte de las tres prioridades elegidas para el GEF-6, juntamente con la pérdida de hábitat y la sobreexplotación. El Project ha también logrado establecer una línea de base para el monitoreo de los efectos del cambio climático en 6 sitios de Cuba, en respuesta a la necesidad de adaptación a esos efectos, lo que incluye "el manejo, la conservación y la restauración sostenibles de ecosistemas para proveer servicios que ayuden a las personas adaptarse a los efectos adversos del cambio climático". También el género ha sido considerado, con la participación estimada en 40% de mujeres en las actividades del Project y la ocupación de mujeres en los cargos de gestión de 62,5%. La reducción de la pobreza fue indirectamente contemplada con el establecimiento de incentivos económicos para el control de cinco EEI en Cuba.
¿Cómo el Project apoya las prioridades ambientales y de desarrollo a nivel nacional?	El Project estuvo desde su diseño alineado con las prioridades nacionales y el plan para el país del PNUD y bajo la dirección de los Ministerios responsables de los temas ambientales, de bioseguridad y de producción primaria. La temática de las EEI fue incorporada en las políticas públicas nacionales y en los planes a corto y mediano plazos, asociados a la implementación de esas políticas.
Efectividad: ¿En qué medida se han logrado los resultados y objetivos previstos del Project?	
¿Ha sido el Project efectivo en alcanzar los resultados esperados?	El Project ha cumplido con todas las metas, plazos y productos planteados al inicio. La efectividad es alta, aunque se hayan señalado algunas cuestiones de orden técnico que necesitan de mejoras, conforme a lo indicado en las recomendaciones.
¿Cómo se manejaron los riesgos y supuestos del Project?	La gestión de adaptación fue muy bien dirigida, especialmente por el cambio de la institución de dirección, que pasó del CIGEA al CNAP en 2013. Diversas cuestiones de adaptación fueron bien implementadas a lo largo de la ejecución como resultado del seguimiento de las acciones y de la realización de los talleres anuales de lecciones aprendidas, como la inclusión de nuevas EEI como prioridad del Project y la incorporación de un componente de monitoreo para el cambio climático. No hubo retraso en las actividades y se logró cumplir los plazos y productos esperados.
¿El Project involucró a las partes interesadas a través del intercambio de información y consulta, y se promovió su participación en el diseño, implementación y S&E?	Las instituciones clave fueron involucradas en el Project desde la fase de diseño y participaron extensivamente de las actividades, incluso comprometiendose en su continuidad después del término del Project. Talleres de información y consultas fueron realizados entre la aprobación y el taller formal de inicio, permitiendo a las instituciones vinculadas comprender y participar de todo el proceso. Entre las actividades de S&E, la UMP adoptó la estrategia de realizar talleres anuales de lecciones aprendidas que orientaron los planes de trabajo para los años siguientes y propiciaron un fuerte intercambio de informaciones y experiencias entre los participantes de todas las provincicas.
¿El Project consultó y aprovechó las habilidades, la experiencia y el conocimiento de las entidades gubernamentales competentes, las organizaciones no gubernamentales, grupos comunitarios, entidades del sector privado, gobiernos locales e instituciones académicas en el diseño, implementación y evaluación de las actividades del Project, con vistas a generar impactos ambientales efectivos?	La UMP del Project ha logrado incluir en los talleres de información y de capacitación un público muy amplio y diverso. Muchas de las instituciones, comunidades en 17 sitios de paisajes productivos y personal involucrado en la gestión de 43 sitios naturales han participado más directamente en las actividades desarrolladas. Las ONGs y las entidades académicas participaron principalmente de los talleres, habiendo un Project paralelo sobre cambio climático dirigido por una de las ONGs. Los gobiernos locales estuvieron bien informados y apoyando las actividades. Durante la misión, y durante las entrevistas, nadie se quejó sobre falta de información o de oportunidad en participar del Project, lo que es un logro significativo, pues fallas de comunicación suelen ocurrir. Los comentarios recibidos durante la EF fueron siempre muy postivos sobre el aprendizaje y las acciones en curso, así como se comentaba sobre la relevancia de la continuidad de las acciones iniciadas. En una ocasión se planteó dificultades para la continuidad por la posible falta de de recursos, pero de manera general sin duda los compromisos asumidos, especialmente por las agencias de gobierno, fueron reafirmados con confianza.

¿Cuáles son los principales logros y limitaciones del Project?	De manera general, las personas entrevistadas mencionan como logro más importante la capacitación y la información recibida sobre las EEI, así como el aprovisionamiento de materiales y equipamientos para acciones prácticas. En las comunidades se resaltó las oportunidades de recuperación de áreas invadidas por el marabú para uso productivo, las mejoras en la producción por la captura y mejor manejo de los búfalos y otras ventajas económicas. Durante las entrevistas practicamente nadie quiso mencionar cualquier hecho negativo sobre el Project.
Eficiencia: ¿El Project se implementó de manera eficiente en conformidad con las normas y los estándares internacionales y nacionales?	
• ¿Ha sido utilizado el enfoque de gestión basada en resultados durante la implementación del Project mediante herramientas de gestión como el marco lógico y los planes de trabajo, así como los cambios realizados a estos?	• Sí, la UMP utilizó las herramientas de gestión disponibles y creó un procedimiento ejemplar de evaluación y seguimiento con la realización de reuniones anuales de lecciones aprendidas a partir de las cuales se hizo la planificación adaptada para el año siguiente.
• ¿Han sido los sistemas financieros y contables adecuados para la gestión del Project y para producir información financiera precisa y a tiempo?	• Los sistemas financieros fueron adecuados y en las auditorías realizadas no se identificó cualquier problema. La gestión del PNUD como AI ayudó la UMP a cumplir los plazos establecidos para los informes y productos.
• Ha sido la ejecución del Project tan efectiva como fue propuesta originalmente (planeado vs. actual)?	• Sí, el Project fue muy bien dirigido. Los productos y actividades planificados fueron generados dentro del plazo de ejecución del Project y algunas de las metas fueron sobrecumplidas en relación a lo planificado.
• El cofinanciamiento ha sido según lo planeado?	• El cofinanciamiento ha excedido el valor inicialmente planteado, de CUP 10.000.000 a 11.200.250.
• Cómo los recursos financieros y adquisiciones realizadas han contribuido al logro de los objetivos del Project?	• La implementación de las actividades prácticas para realizar el manejo de las EEI, no habría sido viable sin los materiales y equipamientos adquiridos, que han mejorado la capacidad y la estructura de diversas instituciones y áreas protegidas para realizar el trabajo de manejo de las EEI.
Sostenibilidad: ¿En qué medida hay riesgos financieros, institucionales, socioeconómicos o ambientales para sostener los resultados del Project a largo plazo?	
• ¿Qué estrategias de sostenibilidad ha definido el Project? ¿Cómo las ha manejado durante la gestión del Project?	• La principal acción para la sostenibilidad es la inserción de la problemática de las EEI en políticas nacionales y en el plan de acción del sistema de áreas protegidas, además de ajustes en regulaciones relevantes y en el plan nacional de educación ambiental. También la institucionalización de la temática de las EEI en los organismos de gobierno y sectores productivos involucrados en el Project y las capacitaciones desarrolladas.
• ¿Cuáles son los principales desafíos que pueden dificultar la sostenibilidad de los resultados del Project? ¿Cómo se han abordado desde el Project?	• Los riesgos principales están asociados al aporte de menos recursos para la financiación de actividades, aunque esté asegurada la inclusión del manejo de las EEI en el Plan del SNAP 2014-2020; la generación de conflictos de intereses con los sectores productivos que utilicen las EEI; y la ausencia de especies nativas en áreas de recuperación en paisajes productivos, que crea riesgos ambientales y disminución de la resiliencia de los ecosistemas.
• ¿Existen riesgos sociales o políticas que puedan poner en peligro la sostenibilidad de los resultados del Project?	• La legislación ambiental cubana y la inclusión de la temática de las EEI en políticas nacionales y regulaciones legales, aseguran la continuidad del trabajo iniciado. Por otro lado, las personas entrevistadas afirman su compromiso de continuidad, alegando que han adquirido conocimientos que no se pueden perder y aprendido lecciones para el manejo de la tierra que están incorporadas en su rutina. Un riesgo probable es que, en la medida en que se busque manejar las EEI que son de interés productivo, los sectores específicos se sientan perjudicados y se creen conflictos de intereses.
• ¿Hay suficiente conciencia de los interesados y apropiación de los objetivos a largo plazo del Project?	• El Project ha abordado lo relativo a las EEI de manera amplia por primera vez en Cuba. Sin duda hay mucho más conocimiento y conciencia sobre los problemas derivados de las EEI y sus impactos, especialmente por las instituciones y personal técnico directamente involucrado, que se ha declarado comprometido con la continuidad de las actividades iniciadas. No es posible afirmar que sea suficiente. Nuevos talleres y capacitaciones serán siempre necesarios, y los resultados del Project serán mejor evaluados al pasar el tiempo, especialmente por lo relativo a su continuidad.

• ¿Existen aspectos financieros que puedan poner en riesgo la sostenibilidad de los resultados del Project? ¿Se ha instalado un mecanismo para asegurar la sostenibilidad financiera y económica una vez que termine la asistencia del GEF?	• Recursos: se desarrollaron incentivos económicos para el control de las EEI, pagados con recursos de instituciones de Cuba; todas las personas involucradas en el Project están vinculadas a instituciones y sus salarios no han dependido del Project; el tema ha sido incluido en el Plan del Sistema Nacional de Áreas Protegidas de Cuba para el periodo 2014- 2020, por lo que el financiamiento de su ejecución constituye una responsabilidad estatal.
• ¿Los marcos jurídicos, las políticas y las estructuras y procesos de gobernabilidad en el que opera el Project plantean riesgos que puedan poner en riesgo la sostenibilidad de los beneficios del Project?	• Los marcos jurídicos, políticas, estructuras y procesos de gobernabilidad constituyen la mejor garantía de sostenibilidad de las acciones del Project y de la inclusión definitiva de la temática de las EEI en la gestión ambiental nacional, por todos los logros obtenidos por la UMP en esa actividad específica.
Impacto: ¿Hay indicios de que el Project haya contribuido a reducir la tensión ambiental o a mejorar el estado ecológico, o que haya permitido avanzar hacia esos resultados?	
• ¿Cómo ha contribuido el Project a salvaguardar la diversidad biológica de importancia global en ecosistemas vulnerables del impacto de las Especies Exóticas Invasoras?	• Se ha implementado el manejo de las EEI en 43 sitios naturales, en la gran parte en áreas protegidas, con diversos ejemplos de erradicación local (ej. *Casuarina* en diversas playas) y operaciones de control en curso. Esas acciones llevan a la interrupción o a la mitigación de los efectos negativos de las EEI en esos sitios y van a servir como modelos de replicación para muchas otras áreas protegidas.
• ¿En qué medida el Project ha generado beneficios indirectos o directos así como incentivos económicos a las comunidades y principales sectores productivos, considerando el contexto actual de transformaciones económicas, a partir de la implementación de las alternativas de uso que promovió el Project?	• Se ha establecido cinco incentivos económicos que son pagados por organismos gubernamentales para el control de EE; removido poblaciones significativas de búfalos ferales de áreas naturales mediante su eliminación o confinamiento y mejorado el manejo con cercas eléctricas y paneles solares, lo que ha aumentado la producción; creado oportunidades de producción artesanal con el uso del jacinto de agua; pagos por la pesca del pez león; e incentivos de remuneración adicional por la pesca de la claria. Además, las áreas infestadas con marabú, en distintos sitios, fueron recuperadas para la producción ganadera, la plantación de frutales y otros fines. Los beneficios indirectos están en la restauración de áreas naturales y la inclusión de especies nativas en parte de los paisajes productivos, mejorando la resiliencia y la provisión de servicios ecosistémicos fundamentales para las comunidades y para la conservación de la diversidad biológica.

5.8 EVALUATION CONSULTANT AGREEMENT FORM

Los evaluadores:

1. Deben presentar información completa y justa en su evaluación de fortalezas y debilidades, para que las decisiones o medidas tomadas tengan un buen fundamento.
2. Deben divulgar todos los resultados de la evaluación junto con información sobre sus limitaciones, y permitir el acceso a esta información a todos los afectados por la evaluación que posean derechos legales expresos de recibir los resultados.
3. Deben proteger el anonimato y la confidencialidad de los informantes individuales. Deben proporcionar avisos máximos, minimizar las demandas de tiempo, y respetar el derecho de las personas de no participar. Los evaluadores deben respetar el derecho de las personas a suministrar información de forma confidencial y deben garantizar que la información confidencial no pueda rastrearse hasta su fuente. No se prevé que evalúen a individuos y deben equilibrar una evaluación de funciones de gestión con este principio general.
4. En ocasiones, deben revelar la evidencia de transgresiones cuando realizan las evaluaciones. Estos casos deben ser informados discretamente al organismo de investigación correspondiente. Los evaluadores deben consultar con otras entidades de supervisión relevantes cuando haya dudas sobre si ciertas cuestiones deberían ser denunciadas y cómo.
5. Deben ser sensibles a las creencias, maneras y costumbres, y actuar con integridad y honestidad en las relaciones con todos los interesados. De acuerdo con la Declaración Universal de los Derechos Humanos de la ONU, los evaluadores deben ser sensibles a las cuestiones de discriminación e igualdad de género, y abordar tales cuestiones. Deben evitar ofender la dignidad y autoestima de aquellas personas con las que están en contacto en el transcurso de la evaluación. Gracias a que saben que la evaluación podría afectar negativamente los intereses de algunos interesados, los evaluadores deben realizar la evaluación y comunicar el propósito y los resultados de manera que respete claramente la dignidad y el valor propio de los interesados.
6. Son responsables de su rendimiento y sus productos. Son responsables de la presentación clara, precisa y justa, de manera oral o escrita, de limitaciones, los resultados y las recomendaciones del estudio.
7. Deben reflejar procedimientos descriptivos sólidos y ser prudentes en el uso de los recursos de la evaluación.

5.9 PROJECT CONTRIBUTION TO THE MILLENIUM DEVELOPMENT GOALS

Objetivo de Desarrollo Sostenible	Situaciones globales seleccionadas y difundidas por el PNUD	Resultados del Proyecto y su tributo a los ODS
Objetivo 1: Poner fin a la pobreza en todas sus formas en todo el mundo	836 millones de personas aún viven en la pobreza extrema. Aproximadamente una de cada cinco personas vive con menos de $ 1,25 dólares americanos por día en las regiones en desarrollo.	El Proyecto ha proporcionado fuentes de empleo e ingreso a comunidades costeras dedicadas a la pesca, con la dotación de un incentivo económico por la captura por exceso de la claria (*Clarias gariepinus*) y del pez león (*Pterois* spp.), EEI que han invadido amplias zonas de Cuba, afectando el hábitat de otras especies de interés comercial o conservacionista; comunidades afectadas con la eliminación del marabú (*Dychrostachys cinerea*), EEI de amplia distribución en toda Cuba; y el empleo del jacinto de agua (*Eicchornia crassipes*), otra de las EEI que el proyecto ha promovido para la fabricación de objetos artesanales haciendo uso de sus fibras.
Objetivo 2: Poner fin al hambre, lograr la seguridad alimentaria y la mejora de la nutrición y promover la agricultura sostenible.	A nivel mundial, la proporción de personas desnutridas en las regiones en desarrollo se ha reducido casi a la mitad desde 1990, del 23,3% en 1990-1992 al 12,9% en 2014-2016. Sin embargo, una de cada nueve personas en el mundo hoy día (795 millones) está todavía desnutrida.	La captura y mayor disponibilidad/oferta de claria para el consumo humano es una contribución al mejoramiento de la alimentación de las comunidades asociadas o no a la presencia de esta especie. La recuperación de tierras cultivables, con la eliminación de diferentes EEI, es una contribución importante a la seguridad alimentaria.
Objetivo 3: Garantizar una vida sana y promover el bienestar para todos en todas las edades.	Cada día mueren 17.000 niños y niñas menos que en 1990, pero más de seis millones de niños y niñas siguen muriendo cada año antes de cumplir los cinco años.	El proyecto ha fortalecido las capacidades institucionales nacionales pertinentes, que aseguran la implementación efectiva para la prevención, detección, control y manejo de las EEI con la finalidad de proteger la diversidad biológica de Cuba; desarrolló e implementó un sistema de alerta temprana que permite la detección oportuna ante la aparición de EEI tales como el caracol gigante africano (Achatina fulica), vector de enfermedades importantes e invasor en áreas urbanas. El sistema contribuye a la protección de las personas de enfermedades transmitidas por EEI a través de mecanismos para el control de estas especies y la sensibilización de la población, en general, sobre los riesgos que las mismas generan.

Objetivo 7: Garantizar el acceso a una energía asequible, segura, sostenible y moderna para Todos.	1.3 mil millones de personas dependen de la madera, el carbón o residuos animales para cocinar y calentarse.	El incentivo económico creado para la extinción del marabú, ha proporcionado que el carbón, fabricado con esta especie, se haya coinvertido en un rubro de exportación con incidencia en los ingresos personales, en pesos cubanos convertibles, de quienes participan en el corte y producción. Se ha adoptado sistemas de cercas eléctricas solares para la contención de los búfalos recuperados de áreas naturales.
Objetivo 8: Promover el crecimiento económico sostenido, inclusivo y sostenible, el empleo pleno y productivo y el trabajo decente para todos.	El desempleo mundial aumentó de 170 millones en el 2007 a casi 202 millones en el 2012, de los cuales unos 75 millones son mujeres y hombres jóvenes.	La recuperación de tierras productivas mediante la eliminación y control de las EEI. La generación de empleos a partir del aprovechamiento de estas especies y el desarrollo de actividades productivas, resultan una contribución importante a este objetivo y al cumplimiento de sus metas.
Objetivo 13: Adoptar medidas urgentes para combatir el cambio climático y sus efectos.	De 1901 a 2010, el nivel del mar aumentó 19 cm al expandirse los océanos a causa del calentamiento y derretimiento del hielo. La extensión del hielo del Mar Ártico se ha reducido sucesivamente en cada década desde 1979, donde por cada década se ha perdido 1.07 millones de km² de hielo.	El Proyecto documentó información sobre comportamientos anómalos e indicios de cambios medioambientales, en especies, en ecosistemas, asociados o no al cambio climático (observación del comportamiento invasivo de especies, blanqueamiento de corales, distribución expansiva de especies, mareas de sargazos). Le confiere un gran valor metodológico para acciones futuras asociadas a las investigaciones relacionadas con especies y ecosistemas afectados por impactos del cambio climático. Es de destacar que los objetivos de esta salida del proyecto, estuvieron dirigidos a evaluar el posible efecto del CC en la dispersión de las EEI y su impacto sobre las especies nativas, los ecosistemas naturales y productivos. El conocimiento de estos efectos, mediante el programa que el proyecto implementó en 6 sitios seleccionados, podrá ser un aspecto clave para la identificación de acciones en los planes de mitigación y adaptación y al aumento de la resiliencia de los ecosistemas naturales.

Objetivo 14: Conservar y utilizar en forma sostenible los océanos, los mares y los recursos marinos para el desarrollo sostenible.	Los océanos cubren tres cuartos de la superficie de la Tierra. Al nivel mundial, los niveles de la pesca de captura están cerca de la capacidad productiva de los océanos, con capturas en el orden de 80 millones de toneladas. El 40% de los océanos del mundo está fuertemente afectado por la actividad humana, lo que incluye contaminación, bancos pesqueros agotados, y la pérdida de los hábitats.	El pez león ha invadido gran parte de las costas de Cuba y de otros países de la región. El proyecto ha demostrado formas de captura y ha promocionado su control y su empleo como alimento de las comunidades, promoviendo concursos para la degustación de la especie. Valoró otras especies en ecosistemas costeros y marinos; trabajó en el estudio, monitoreo y control del mejillón verde (*Perna viridis*), que constituye también una especie de importancia económica. En adición a los aspectos anteriores, se señala que el control de estas especies y el estudio de efectos del cambio climático desarrollados en el Proyecto juegan un papel importante en la conservación de los ecosistemas costeros y marinos.
Objetivo 15: Proteger, restablecer y promover el uso sostenible de los ecosistemas terrestres, efectuar una ordenación sostenible de los bosques, luchar contra la desertificación, detener y revertir la degradación de las tierras y poner freno a la pérdida de la diversidad biológica.	Alrededor de 1.6 mil millones de personas dependen de los bosques como medio de vida. Esto incluye a unos 70 millones de indígenas y poblaciones tradicionales. Los bosques son el hogar de más del 80% de todas las especies terrestres de animales, plantas e insectos.	El Proyecto contribuye a poner freno a la perdida de diversidad biológica, con aportes sustantivos al fortalecimiento de la gestión ambiental de Cuba y de la región en materia de prevención, control y manejo de EEI. Permite el establecimiento de políticas nacionales, base legal, herramientas regulatorias y metodológicas generalizables, como son: · Lineamientos metodológicos para la elaboración de programas de manejo de EEI. · Guía metodológica para la evaluación económica de EEI. · Metodología para el análisis de costo-beneficio. · Análisis de riesgos. · Evaluaciones de impactos ambientales. · Metodología para el desarrollo de listas negra, gris y blanca de EEI. · Metodología para la evaluación de la efectividad de los programas de manejo de EEI. · Actualización del inventario nacional de EEI. · Sistema de Monitoreo y edición de protocolos para diferentes especies. · Sistema de Información para las EEI.

		· Sistema de Alerta Temprana y de Respuesta Rápida. · Mecanismos para el establecimiento de cuarentena, monitoreo y vigilancia, alerta temprana y respuesta rápida, entre otros. · Participación del Proyecto en la actualización del Decreto Ley sobre protección de plantas, del Sistema de Sanidad Vegetal, en la elaboración de la instrucción legal relacionada con el control de aguas de lastre. · Elaboración y difusión de materiales didácticos para la capacitación de actores de diferentes sectores de la sociedad, junto a la inserción del tema de las EEI en el sistema de educación (primaria, secundaria, media y superior) de Cuba. · Inserción de la temática de las EEI en la Estrategia Nacional de Diversidad Biológica de Cuba y su Programa de Acción 2014- 2020 · Inclusión de las acciones a desarrollar por Cuba en materia de EEI en el plan 2014- 2020 del Sistema Nacional de Áreas Protegidas, lo que les confiere la sostenibilidad financiera mínima para que tales acciones sean ejecutadas. Por otra parte, el proyecto concluyó en el año 2016 con unas 20.500 hectáreas bajo manejo mejorado de las principales EEI existentes en Cuba.

5.10 EVALUATION TEAM REPLIES TO COMMENTS ON THE DRAFT REPORT

COMENTARIOS	RESPUESTA DEL EQUIPO EVALUADOR
PNUD	
Criterio 4 – Sostenibilidad socio económica y ambiental	Clarificaciones adicionales para esos dos puntos fueron incluidas en la versión final del informe. La calificación de la sostenibilidad socio económica fue cambiada para **Probable** tomando en cuenta de los argumentos de la AMA, CNAP y UMP. La sostenibilidad ambiental no fue cambiada porque se considera coherente la calificación de Algo Probable de acuerdo con los criterios de la Guía para la Conducción de la Evaluación Final de los Proyectos Implementados por PNUD con financiamiento del GEF, indicada para su aplicación por parte del EE en los TOR recibidos.
AMA, CNAP, UMP **PARTE I – CRITERIOS**	
Criterio 1 **Monitoreo y Evaluación**: Se califica como Satisfactoria en cuanto al Diseño del Seguimiento y Evaluación. En este caso consideramos que en las páginas 16 y 17 se destaca el buen diseño, la buena preparación, la buena estructura y coordinación del proyecto, a la cual se le denomina como excelente, ejemplar y de referencia para otros proyectos. Dentro de los elementos que fundamentan nuestra posición se encuentran las calificaciones de los PIR en los cuatro años anteriores, especialmente los dos últimos, en los cuales fueron evaluados como altamente satisfactorios los componentes DO Rating y el IP Rating tanto en la oficina nacional PNUD, como en la Regional. Sobre esta base quisiéramos se considerara la modificación de la calificación otorgada.	En esta sección se evalúa el diseño del S y E al comienzo y en la implementación. En cuanto a diseño y formulación del Proyecto, la EMT la califica de Satisfactorio y no de Muy Satisfactorio y en las secciones 14, 15 y 16 de este acápite explica muy bien el porqué de esa evaluación. En ningún caso se lo atribuye a que por enfocarse en especies no se ha logrado alcanzar resultados de conservación en ciertas áreas de intervención, además, la EMT no cuestiona el enfoque en especie. Se ha mantenido la calificación de Satisfactorio para el diseño del proyecto porque hay elementos de los componentes que se sobreponen y son un poco confusos; algunos de los indicadores no son claros, no están en el componente más apropiado o consideran más el progreso que los resultados efectivos; y el enfoque en especies ha dificultado la visión más amplia de buscar resultados para la conservación de la diversidad biológica en ciertas áreas de intervención. Por eso la calificación debe ser Satisfactoria y se refiere al diseño del proyecto, no a la implementación.
Criterio 2 Implementación del Plan de Seguimiento y Evaluación que es la que constituye parte importante del proyecto, se califica de Muy Satisfactorio y en la calificación general, se da Satisfactorio. Solicitamos reevaluar la calificación propuesta.	La Coordinación del Proyecto tiene razón a partir de los argumentos que facilita y después de revisar nuevamente que, en efecto, la evaluación de los PIR en la casi totalidad de los años del Proyecto, las componentes DO Rating e IP Rating fueron evaluadas con la calificación de Altamente Satisfactorias, a los niveles del PNUD Oficina de País y Regional. Esto valida no sólo la calidad de la in formación reportada sino, también, el óptimo desempeño anual del Proyecto y el cumplimiento de los indicadores de su marco lógico en tiempo y forma. En acuerdo a esos hallazgos, la calificación del SyE fue indicada como MS (Muy Satisfactoria). **Sobre la calificación general**: en acuerdo a la Guía para la Conducción de la Evaluación Final de los Proyectos Implementados por PNUD con financiamiento del GEF, la calificación general no puede ser más alta que una de sus partes; por eso la calificación general debe ser S (Satisfactoria).

Criterio 3 – Eficiencia Quisiéramos se analizara nuevamente la calificación de Satisfactorio en el criterio de Eficiencia ya que en la página 50, se habla de una ejecución financiera del proyecto como de Ejemplar, por el buen y balanceado ritmo del desarrollo de las actividades técnicas, el uso de los recursos y la ejecución financiera. También se dice que el desempeño de la planificación y de la ejecución financiera por años ha sido Excelente, se destaca que 3 meses antes del cierre del proyecto, la ejecución del presupuesto anda por más del 9O%; que los informes periódicos han sido entregados con puntualidad y son claros, organizados y transparentes y el presupuesto planificado para las actividades de Seguimiento y Evaluación, ha sido adecuado. Se expresa también que las Auditorias del PNUD, así como las nacionales, no han registrado problemas a lo largo del proyecto, confirmando la transparencia y la capacidad de gestión. Los dos elementos que se alegan para dar esta calificación son: todos los medios, equipos y materiales han tenido que ser importados, y el otro, es la aplicación de incentivos económicos en actividades productivas, que aunque es evidente que eso propició un mayor interés y compromiso de los sectores productivos, la dificultad que se señala es que la reforestación en estas áreas, no fue realizada con especies nativas. Esto entonces implicaría que dejarían de ser paisajes o ecosistemas productivos, Nuestro sistema socio político y económico, sitúa al hombre en el centro, y para satisfacer las necesidades alimentarias de los casi 13 millones de habitantes del país se requiere un aprovechamiento de la superficie recuperada para la actividades agroproductivas. En este proyecto, con respecto a los ecosistemas productivos, la estrategia fundamental ha sido el control y manejo de las Especies Exóticas Invasoras (EEI) en aras de recuperar tierras cultivables, mientras que en áreas naturales y las que conforman el Sistema Nacional de Áreas Protegida (SNAP), la estrategia fundamental es la de conservación.	No hay duda de que la ejecución financiera fue impecable, y eso está claro y reiterado en el informe. Pero en acuerdo con la Guía para la Conducción de la Evaluación Final de los Proyectos Implementados por PNUD con financiamiento del GEF, la eficiencia se mide por el alcance de los resultados con máximo costo-beneficio. Por eso no se puede dejar de mencionar el tema de las importaciones, aunque no sea algo que la coordinación del proyecto pueda controlar, por ser el contexto del país. Eso no es lo más importante. La eficiencia es comprometida por la aplicación de incentivos económicos y acciones de control de EEI que no generan resultados para la conservación de la diversidad biológica, conforme explicado en detalle en la sección sobre Efectividad del informe de la evaluación final. Las observaciones a partir de la misión que han llevado a esas conclusiones son: a) áreas naturales: en Topes de Collantes se ha invertido en el manejo de EEI en ecosistema de bosques naturales altamente comprometidos por la invasión de EEI, sacando p.ej. tulipán africano, pero permitiendo la ocupación posterior por la mariposa, la casuarina y otras EEI. De esa forma, el alcance de los resultados con máximo costo beneficio es mínimo, pues no hay repercusión en la conservación de la biodiversidad. Además, se ha plantado en el bosque nativo, para recuperación, especies como el aguacate y la guayaba, de especial habito en la dieta cubana, pero que son exóticas y no favorecen la restauración. En las visitas a otras áreas naturales no vimos acciones de restauración con el mismo nivel de detalle, por eso no nos es posible saber en cuántos sitios fueron realizadas acciones similares. Entendemos que el enfoque en especies, en esos casos, fue comprendido de forma literal y que el indicador utilizado fue, erróneamente, la disminución de la población de la especie bajo control sin considerar el ambiente como unidad para la restauración. Igualmente se nos han comentado durante la misión que en una de las playas donde fueron removidas las casuarinas se ha plantado *Terminalia catappa* en sustitución, otra EEI que está en la lista nacional de EEI para Cuba y que es reconocida internacionalmente por sus impactos sobre ambientes costeros. Esas acciones demuestran fallas de comprensión de las bases técnicas del trabajo de gestión de especies exóticas invasoras y necesitan ser corregidas en la continuidad de las acciones. El incentivo económico para el control de claria en la Ciénaga de Zapata no ha producido los resultados de conservación esperados por dos motivos: primero, al disminuir la población de claria ha aumentado la población de tilapia, que es una EEI globalmente reconocida con impactos de extinción de especies en diversos países. Eso no generó ninguna acción de respuesta de parte del proyecto, como de incluir la tilapia en los incentivos para que fuera también controlada para favorecer la recuperación de las 14 especies endémicas de peces y otras especies nativas (el objetivo mayor). Como en el caso de las plantas, el enfoque de trabajo sobre la especie (claria) perjudicó el resultado final y le faltó al equipo la visión de enfoque ecosistémico que retrata el objetivo principal del proyecto y que forma parte de los planes de manejo; el segundo motivo es que se ha observado la cría ilegal de claria como consecuencia de su valoración económica, lo que crea riesgos de su introducción a otros ambientes acuáticos y la expansión de su actual distribución. Esa consecuencia era algo previsible por pasar comúnmente cuando se aplican incentivos económicos a especies invasoras sin un plan complementario de prevención que incluye normativas de uso de la especie que no permita su cría en cautiverio o su transporte fuera del área donde es invasora. Para salvaguardar la biodiversidad de Cuba, objetivo principal del proyecto, es necesario asegurar la ocupación/restauración por especies nativas en áreas naturales después de las acciones de manejo y no usar especies exóticas en la restauración. En los casos mencionados y posiblemente en otros sitios donde se siguió esta línea de acción, los recursos no llevaron al alcance de los resultados esperados y creemos que la evaluación de eficiencia sobre la base del costo-beneficio está adecuada como siendo Algo Probable. Las prácticas equivocadas necesitan ser corregidas, tratándose de un proyecto encaminado a salvaguardar la biodiversidad del país. En este contexto, estas son prácticas que se deben difundir y apoyar su generalización. b) Paisajes productivos: en ningún momento se dijo que se debería hacer "*reforestación en estas áreas … con especies nativas*" … "*que dejarían de ser paisajes o ecosistemas productivos*" (comentario de la AMA, CNAP y UMP). Lo que está dicho es que en proyectos cuya finalidad es la conservación de la biodiversidad, es

	fundamental incluir especies nativas en los paisajes productivos, especialmente para usos secundarios como sombra para el ganado, para mejorar la resiliencia y la conservación de servicios ambientales que son esenciales a los sistemas de producción y a la conservación de la diversidad biológica. Ese argumento es de alta relevancia porque en los paisajes productivos prácticamente solamente se encuentran especies exóticas que no logran ejercer funciones de conexión entre fragmentos de áreas naturales etc. conforme detallado en el informe. Igualmente está reconocida la importancia de sacar el marabú para uso pastoril, pero se podría sin duda plantar especies nativas para cercas vivas, sombra y confort térmico del ganado y de las personas como alternativa a EEI. Remplazar marabú por leucaena (una especie que fue reconocida como de alto riesgo de invasión por el proyecto) no trae ningún beneficio a la diversidad biológica y no sería prioridad para la financiación de proyectos con ese objetivo. También se observó el potencial de mejorar el manejo con el uso de control químico para evitar el brote de plantas invasoras, pues reduce en mucho los costos de repetición del control. Otra consecuencia es que el abordaje de mantener el enfoque en utilizar solamente especies exóticas en esos paisajes crea riesgos ambientales de sostenibilidad ambiental y especialmente para la conservación de la diversidad biológica. También en los jardines productivos se ha sustituido el marabú por frutales exóticos sin considerar la posibilidad de inclusión de especies que tienen utilidad indirecta porque traen equilibrio ecológico a los ecosistemas productivos. Esos factos demuestran inconsistencias técnicas y la necesidad de mejorar la eficiencia de aplicación de los recursos destinados a alcanzar el objetivo más importante del proyecto (salvaguardar la biodiversidad de Cuba). c) de las 6 guías metodológicas desarrolladas, tres necesitan de revisión. Esas razones están claramente explicadas, especialmente en la sección sobre Efectividad del informe, y están retratadas en las recomendaciones para la continuidad de las acciones del proyecto y para futuros proyectos con la intención de que se mejore la visión y se busque incorporar la diversidad biológica natural en los sistemas de producción. La relevancia de hacerlo está reconocida en el Objetivo 4 del Programa del GEF-6 (Integrar la conservación de la diversidad biológica y el uso sostenible en paisajes productivos terrestres y marinos y sectores productivos). No se ha puesto el mismo nivel de detalle de explicaciones en el ítem sobre Sostenibilidad para evitar la repetición, ya que está explicado en detalle anteriormente (en Efectividad). Por esas razones creo que la calificación está adecuada. Aun cuando este Proyecto tiene como objetivo, desarrollar capacidades al nivel sistémico para que se logre prevenir, detectar, controlar y manejar la diseminación de Especies Exóticas Invasoras (EEI) en Cuba para salvaguardar la diversidad biológica de importancia global en ecosistemas vulnerables, el EE solamente pudo constatar en los sitios visitados que no se han llevado a cabo acciones concretas que muestren que la eliminación de EEI en las áreas de intervención ha conllevado la plantación de otras especies exóticas que no apuntan hacia el cumplimiento del objetivo del Proyecto. En cuanto a los incentivos relacionados con el impacto y proliferación del marabú y la claria en Cuba, se señala que gran cantidad de área e individuos, respectivamente, de estas especies, ha disminuido, en gran medida, gracias a los incentivos económicos establecidos. Si algunos pobladores aislados comienzan a criar claria en un estanque para su consumo o para la venta ilícita, o a sembrar marabú para fabricar carbón y venderlo, gracias a los resultados de este ¨Proyecto, ya existe la base de conocimientos y el sustento legal, político-ambiental que permitirá a las autoridades competentes establecer las penalidades que estas acciones generen, pues los decisores sectoriales pertinentes están mejor preparados para entender la importancia de detener estas acciones. Actuaciones futuras deberán considerar cómo incluir en el sistema de contravenciones ambientales las penalidades por concepto de criar o fomentar el desarrollo de EEI en los paisajes naturales o productivos, por personas jurídicas o naturales.

Criterio 4 – Sostenibilidad socio política **Sostenibilidad,** se le solicita al equipo evaluador sea reanalizada la calificación y a continuación, fundamentamos los criterios. Criterio de sostenibilidad socio - política y el de sostenibilidad ambiental, se da la calificación de Algo Probable (AP), con lo cual no estamos de acuerdo. Durante el recorrido de la evaluación a diferentes sitios, las evaluadoras pudieron constatar el compromiso institucional, de los gobiernos locales, de la población, el sentido de pertenencia que sintieron en los lugares visitados, por parte de los entrevistados, como se menciona en las páginas de la 51 a la 56.	No hay duda sobre el compromiso del gobierno con la continuidad de las acciones del proyecto, especialmente por su inclusión en marcos legales y políticas relevantes. Eso está bien destacado en el informe. En términos sociales, lo que crea un riesgo de discontinuidad es la aceptación parcial de cuales especies exóticas son invasoras. Hasta el momento se ha trabajado con especies que son consideradas problemas en sistemas productivos, como el marabú y la aroma, u oportunidades, como los búfalos ferales. Con eso se ha evitado los conflictos de interés que van a surgir una vez que especies que forman parte de los sistemas de producción requieran de manejo, como la leucaena y *Acacia mangium*. Considerando que esas especies no fueron priorizadas en el Proyecto, el equipo evaluador acepta cambiar la calificación de esta criterio para Probable y les pide atención a las recomendaciones para trabajar con EEI insertadas en sistemas productivos en la continuidad de las acciones.
Criterio 4 – Sostenibilidad ambiental En igual condición para la sostenibilidad ambiental, pudieron conocer y entrevistar a expertos y directivos de la esfera ambiental, donde, desde 1997, se aprobó la Ley de Medio Ambiente, Estrategia Ambiental, Estrategia Nacional sobre Diversidad Biológica y Estrategia Nacional de Educación Ambiental, en las cuales se reconoce el tema de EEI como una prioridad, y es por ello, que sus planes de acción incluyen esto tanto a nivel provincial como nacional. En este mismo sentido, es importante destacar como nuestro país en desarrollo y bloqueado económicamente por casi 6 décadas, cuenta con un Sistema Nacional de Áreas Protegidas, que abarca más del 20% del territorio nacional, eso sólo se logra con una Política ambiental definida y una voluntad política consecuente.	No se ha cuestionado en el informe el compromiso declarado por los participantes del proyecto ni la relevancia del SNAP (comentarios de la AMA, CNAP y UMP). La calificación de la sostenibilidad ambiental se debe a dos factores principales que no son controlables por el gobierno o la coordinación del proyecto. Entre los criterios de riesgos a la sostenibilidad indicados en la Guía para la Conducción de la Evaluación Final de los Proyectos Implementados por PNUD con financiamiento del GEF, seguida por el EE dando cumplimiento a lo indicado en los TdR de esta evaluación, está la ocurrencia de eventos climáticos que generan impactos ambientales. La posición geográfica de Cuba expone sus ecosistemas a huracanes relativamente frecuentes que abren espacios para la ocupación por EEI que estén en el paisaje, además de funcionar como vectores de introducción de EEI. Conforme mencionado en el informe, la presencia de especies exóticas invasoras ampliamente distribuidas en paisajes productivos, incluso para usos secundarios como sombra y para fines estéticos, así como a lo largo de las principales carreteras del país, establecen fuentes de propágulos de esas especies que logran colonizar rápidamente los espacios abiertos y los ambientes disturbados por esos eventos. De manera similar, las consecuencias de la sequía que asola a Cuba crean disturbios y abren espacio para la colonización por especies exóticas invasoras. Con 20% del territorio en áreas protegidas es de alta relevancia mejorar la conectividad de esas áreas por todas las razones ya explicadas anteriormente. Esos riesgos son importantes y se espera que el monitoreo del cambio climático pueda ayudar, en el futuro, a definir otras medidas además de las recomendaciones incluidas en el informe para mejorar la resiliencia y la conservación de las especies de Cuba. Igualmente habrá que ajustar las prácticas de restauración y de manejo de EEI conforme explicadas anteriormente. La calificación más adecuada es Algo Probable, incluso reforzada por las cuestiones técnicas explicadas anteriormente en el ítem sobre Eficiencia.
Criterio 4 – Sostenibilidad (general)	En acuerdo a la Guía para la Conducción de la Evaluación Final de los Proyectos Implementados por PNUD con financiamiento del GEF, la calificación general tiene que seguir la calificación más limitada entre los criterios. Por eso se pone como Algo Probable, en acuerdo con la sostenibilidad ambiental.

5.11 PROJECT MANAGEMENT UNIT COMMENTS TO FINAL REPORT

Ministerio de Ciencia, Tecnología y Medio Ambiente
Centro Nacional de Areas Protegidas
Calle 18 A No. 4114 e/41 y 47 . Playa. C.P. 11300
Telf: 202 7070 Fax: 204 0798

La Habana, 31 de Enero 2017
Año 59 de la Revolución

Sra. Gricel Acosta
Oficial de Programa
Oficina PNUD Cuba

Estimada Gricel:

Encuentre adjunto nuestros comentarios sobre el documento de Informe de la Evaluación Final del proyecto GEF/PNUD: Mejorando la prevención, control y manejo de especies exóticas invasoras, en ecosistemas vulnerables en Cuba.

Con el objetivo de no seguir dilatando más este proceso y partiendo de los procedimientos establecidos para este tipo de evaluaciones, solicitamos al PNUD, que los comentarios que adjuntamos, sean anexados al Informe de la Evaluación Final.

En espera de sus comentarios, le saluda afectuosamente,

Msc. Carlos Alberto Diaz Maza
Director Centro Nacional de Áreas Protegidas.

Rs: 30/2017

Telf/Fax: (537) 2040798, Telf: (537) 2027970, E-mail: carlosdiaz@snap.cu

COMENTARIOS DE LA UMP y el CNAP SOBRE EL INFORME DE EVALUACION FINAL DEL PROYECTO SOBRE EEI.

Ante todo, queremos agradecer los cambios realizados por el Equipo Evaluador en las evaluaciones y en los criterios expresados en el informe, después de los comentarios realizados al informe anterior, sin dudas, compartir estos comentarios permitirá mejorar las acciones de proyectos futuros sobre el tema.

Después de analizar el documento enviado por el Equipo Evaluador expresamos los siguientes comentarios:

1. En cuanto a la tabla de Calificación, mantenemos nuestro desacuerdo con la calificación de AP en relación con la Sostenibilidad Ambiental y sigue sin satisfacernos la respuesta brindada por las evaluadoras en relación con este tema.

2. En cuanto a las Recomendaciones, aunque en sentido general, estamos de acuerdo con ellas, queremos expresar algunos comentarios:

a). Las recomendaciones relacionadas con la elaboración y propuesta de aprobación de un documento normativo con bases legales para el Sistema de Alerta Temprana y Respuesta Rápida; consolidar y publicar oficialmente las listas de especies exóticas, acompañadas de las regulaciones pertinentes y la de establecer regulaciones específicas para las EEI integradas a sistemas productivos y para las cuales se van a establecer incentivos económicos, las trasladaremos a los Organismos competentes, pues el proyecto ya concluyó y las instituciones pueden trabajar en el futuro en estas recomendaciones.

b). En el caso de la recomendación que plantea No utilizar la Guía de Evaluación de Riesgos, sugerimos que diga: Revisar la guía.., tal como se plantea en las recomendaciones relacionadas con otras metodologías.

c). Consideramos que las dos recomendaciones relacionadas con el método de selección de especies para las listas, debieran unirse.

d). Queremos aclarar que lo que se plantea al final del párrafo del inciso c), del criterio 3, sobre las actuaciones futuras, que debieran incluirse en el sistema de contravenciones ambientales, ya están incluidas en las Sistema Regulatorio Ambiental.

Msc. Carlos Díaz Maza
Director CNAP

Dra. Dalia M. Salabarría Fernández
Directora del proyecto

PROJECT UNDP / CUBA

Reduction of environmental vulnerability to coastal flooding through Ecosystem Based Adaptation (EBA) in the southern provinces of Artemisa and Mayabeque.

Corporate Thematic Area:
MID TERM EVALUATION REPORT

MID TERM ASSESSMENT

NOVEMBER 1, 2017

Country:	CUBA
ATLAS Award ID:	69416 (Project ID)
PIMS Number:	5090
AF Budget (USD):	USD 6,067,320
Co-Financing Budget (USD):	CUP 5,052,700
Project Document Signature date:	19 de June 2014
Date of first disbursement:	September del 2014
Original Planned Closing Date:	May 2019
Executing Agency:	AMA del CITMA
Date of Project Closure	May, 2019

Evaluation Team

Néstor Windevoxhel, Carolina Murcia y Lourdes Mugica

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I.- EXECUTIVE SUMMARY

The mangrove ecosystem of the south coast of the provinces of Artemisa and Mayabeque has suffered a strong deterioration in recent decades due to the cutting of the red mangrove and anthropogenic changes in the hydrology of the region. As a consequence, the structure of the mangrove has been modified and this, in turn, limits its ability to protect the coast against erosion, sea level rise and extreme weather events. The manifestation of the mangrove degradation is the increase in the saline intrusion in the soil, the retreat of the coast of at least 150 meters and the severe floods during tropical storms, which put at risk human lives, the productive systems and the biodiversity on the south coast of Cuba. These manifestations will continue to be exacerbated by the sea level rise and extreme climatic events generated by climate change, in particular the increase in intensity and frequency of storms and hurricanes.

The UNDP Project entitled: "Reducing Environmental Vulnerability to Coastal Floods through Ecosystem Based Adaptation (ABE) in the southern provinces of Artemisa and Mayabeque", better known as the Living Mangrove Project, aims to "increase the Resilience of the inhabitants of the coastal municipalities of the provinces of Mayabeque and Artemisa to the effects of climate change ". To this end, the project focuses on mitigating and partially reversing the physical impacts of climate change in marine coastal areas through the Ecosystem Based Adaptation (EBA) principle. In this project, the EBA relies on the ecological restoration of the mangrove, especially the red mangrove strip and the swamp forests (component 1 of the project). In addition, it relies on the integration of the EBA principle into territorial management plans for coastal zones (component 2) and the creation of a favorable environment at the regional level for the implementation of these plans (component 3).

This report presents the mid-term evaluation of the project, which analyzed the three components described above and evidenced those aspects that require adjustments in future project designs, particularly in terms of their assumptions, experimental design and definition of indicators. This evaluation took place in the period between October 1 and November 15 and was based on analysis of documents and reports and a visit to the project (Oct 16-20, 2017) in which the relevant actors were interviewed in both the implementing entities as in the beneficiary entities of the project.

This evaluation concludes that, according to the performance indicators identified in the Logical Framework, the project has generally advanced satisfactorily, despite variations in its administrative context and personnel changes. This level of compliance is testimony to the adaptive capacity of the current implementing team and of the stakeholders involved in the process.

It was determined that, while some of the indicators have already been met satisfactorily, others have delays according to the schedule. On the other hand, the project has managed financial and material resources effectively to achieve the goals, despite a lag observed in

budget execution. These delays both in budget execution and in meeting targets are due to two important factors: First, there were major drawbacks and adjustments in the import system, which has generated delays in the process of acquisition of inputs and has mainly affected the compliance with component 1, which was the most dependent on imports. Second, the project has not had a good internal information management policy and strategy. This shortcoming became evident as a result of the change in project management personnel and their respective responsibilities at the beginning of 2017.

Variations in the administrative context and staff changes during this period and the corresponding level of compliance are testimony to the adaptive capacity of the implementing team and the stakeholders involved in the process.

In addition to the execution related to the indicators of the Logical Framework, in this evaluation it was observed during the interviews and workshops carried out in the two provinces and its 6 corresponding municipalities, that locally there is a high level of public participation and understanding on the part of the local actors of the origin of the deterioration of the mangrove, of the concept of ABE and of the benefits that this can bring to the region. This high level of public awareness is important for the long-term sustainability of the project, and is the product of the various communication tools and abundant training activities carried out by the project.

The interest of the provincial and municipal authorities visited for the development of the project and its potential impact was also observed. It should be noted, however, that compliance verifiers have some inconsistencies that must be resolved with an in-depth analysis of the primary information sources. It is recommended to move from the discourse or the indication in documents prepared by the implementing team to concrete actions that demonstrate both the impact of the interventions in the mangrove and the capacity of the provincial and municipal governments to apply by their own means the concepts and practices promoted by the the project.

Among the recommendations, the following stand out:

a) A more formal job of managing project information is required, especially with respect to the verifiers of each indicator. As well as, the information of some verifiers for the activities and products presented by the implementing team are inconsistent and not available in an organized and easy to consult system. Therefore, specific recommendations were made to adequately document the results, especially with a view to the final evaluation of the project.
b) Although a series of activities are being carried out to help the rehabilitation of the mangrove and the swamp forest, it is currently not possible to make a differential analysis between the methods used and their cost / benefit effectiveness of the different interventions. Therefore, we recommend that the design of the intervention strategy in the mangrove be reviewed using an experimental approach

to clarify the relationship between the effectiveness of each type of intervention and its final purpose. Additionally, it is necessary to determine the cost / benefit ratio of the application of the ABE with a view to extrapolating to larger spatial scales and transcending the local impact at the municipal, provincial level at the national level. Recommendations are made to develop impact indicators and an implementation design of the interventions that allows to quantify the cost / effectiveness ratio of each of them.

c) The delay in executing the budget must be met. This may require the need for a temporary none cost extension.

The evidence shows that the project has mostly achieved the results and that the delays in the scope of some of its results and in the financial execution observed to date can be overcome with the follow-up of the recommended measures to ensure an evaluation mission successful ending.

ACRONYMS AND ABBREVIATIONS (*acronym in Spanish)

Acronym	Meaning
EBA	Ecosystem Based Adaptation
AF	Adaptation Fund
AI	Implementation Agency *
AMA	Environment Agency *
BASAL	Environmental Bases for Local Food Security*
CBD	Biodiversity Agreement*
CC	Climatic Change
CDR	Committee for Revolution Defense*
CEO	Director Executive office
CGB	Forest Guard Corp*
CITMA	Ministry of Science, Technology and Environment*
DPP	Direction of Programs and Projects from CITMA (AMA)*
DRI	Direction of International Relationships from CITMA*
EAF	Agroforestry company*
EE-MTR	Midterm Evaluation Team
EIF	Integral Forestry Companies*
EMDC	Staff of Civil Defense*
EMIDICT	Import, Export and Distribution Company for Science and Technology
ENPFF	National Company for Flora and fauna Protection*
FMC	Cuban Women Federation*
FONADEF	National Forest Development Fund*
FORMATUR	Center for Turism Training*
GAF	Agroforestry Group
GEF	Global Environmental Fund
ICIMAR	Institute of Sea Sciences*
ICRT	Cuban Institute of Radio and Television*

IES	Ecology and Systematics Institute*
IGT	Institute of Tropical Geography*
INAF	Institute of Agroforestry Reasearch*
INRH	National Institute of Hydraulic Resources*
IPF	Institute of Physical Planning*
MEP	Ministry of Economy and Planning*
MES	Ministry of Higher Education*
MINAGRI	Ministry of Agriculture*
MINAL	Ministry of the Food Industry*
MINAZ	Ministry of the Sugar Industry*
MINCEX	Ministry of External Affairs and Investment*
MINED	Ministry of Education*
MINFAR	Ministry of the Revolutionary Army*
MININT	Ministry of the Internal Affairs*
MINTUR	Ministry of Tourism*
MTR	Midterm Review
OIN	Office of National Implementation*
POA	Anual Operative Plan*
PMU	Project Management Unit.
PPR	Project Progress Report
PRODOC	Project Document
SEF	State Forest Service*
SMART	Methodology to define objectives (specific, measurable, achievable, relevant and with definite time)
SNAP	National System of Protected Areas*
ToR	Terms of Reference
TTs	Tracking Tools
UA	University of Artemisa*
PMU	Project Management Unit*

UNAH	Agrarian University of Havana*
UNDP	United Nations Programe Development

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II.- INTRODUCTION

The Mid-Term Review Team (EE-MTR) of the UNDP has prepared this report Project entitled: "Reducing Environmental Vulnerability to Coastal Floods through Ecosystem-Based Adaptation (EBA) in the South of the provinces of Artemisa and Mayabeque "Manglar Vivo". The assessment mission was conducted between 15 and 22 October 2017, following the guidelines of the "Evaluation Guide UNDP GEF-funded projects" in its version for external evaluators.

The Mid-Term Review has the following main objectives:

1. To Achieve and understanding of the project´s progress at its midpoint implementation.
2. To establish the circumstances, challenges and opportunities that the project has faced in its implementation and to propose actions for mitigating the challenges and leveraging opportunities.
3. To identify the lessons learned during the first half of the implementation process.
4. To provide specific recommendations to lay the foundation for a successful project completion.

The mission was carried out on the basis of a participatory, transparent and open process to allow all stakeholders to internalize these lessons and build their capacity towards a successful project completion.

This report´s general objective is to present the evaluation team´s vision/understanding of the project and the analysis and results of the review of documents, field observations and interviews of institutional and local stakeholders, in the context of the Logical Framework matrix and the description of the PRODOC. The process also identified the adaptive management actions taken during the project´s first three years of implementation.

The methodology and the main tools used during the evaluation mission included, but were not limited to, the following activities:

- Briefing and debriefing meetings with UNDP-Havana follow-up team.
- Meetings with national and provincial representatives of the implementing agencies of the project. The list of participants is shown in APPENDIX 6.
- Field visits to observe the main activities of project implementation in the Mangroves and Coastal Forests in the provinces of Mayabeque and Artemisa.
- Visits or meetings with actors involved in project implementation processes (Universities, Mundo Latino, among others).

- Consultation workshops in each of the two provinces to identify the main benefits and challenges, as well as proposed actions to address the most important challenge in each of the provinces of Mayabeque (33 people) and Artemisa (30 people).
- Review of the documentation provided by the Project Implementing Unit.
- Review of administrative documentation at the project office that included, among other things; examples of agreements and MOUs, budget execution, purchase contracts and procurement procedures.
- Discussion of the main findings at the end of the assessment mission and review of any information gap with the Project Director and Advisor. This included a presentation of the proposed general structure of the MTR final report.

This MTR report was based on the "Guidance for conducting midterm reviews of UNDP-supported, GEF-financed projects". Below is a summary of its contents:

The **"home page"** presents information that identifies the UNDP project, followed by an "executive summary" and a section with "acronyms and abbreviations".

The **"introduction"** indicates the purpose of the evaluation, the key issues to be addressed and the evaluation´s methodology, including the relevant actors interviewed and visits made to selected implementation sites of the “Manglar Vivo” Project. It also introduces the assessment team of the MTR and affidavits of ethical aspects of confidentiality and conduct.

The section **"project and its development context"** gives information about the beginning and duration of the project, the problems that the project proposes to address, the project´s immediate objectives, key actors, expected results, as well as expenditure and financial information. It also includes a summary of the main achievements and expected results, as well as the activities and products of the project to be considered in the MTR.

The section **"achievements, challenges and results"** presents the findings and recommendations, and analyzes and evaluates the project´s formulation and implementation progress (i.e., implementation approach, management model, logical framework and proposed indicators, technical team and key actors, the use of information technologies, inter-institutional working relationships and the technical capabilities associated with the project and its role).

Ratings are given to monitoring and evaluation, stakeholder participation and replicability (according to the guidelines established in the "Guidance for conducting midterm reviews of UNDP-supported, GEF-financed projects").

This section also analyzes the **financial planning and co-financing of the Project, contrasting programmed vs executed**; as well as compliance with the application of the concept of incremental costs. The sustainability and role of the project in improving the national/local staff skills are also evaluated.

The section **"conclusions, recommendations and lessons learned"** presents a synthesis project´s progress and recommendations for corrective measures, if any, for the design, implementation, monitoring and evaluation of the project in the final phase.

A first draft of the report was expected to: i) provide the Project Management Unit and the evaluation team the opportunity to verify that they share the same understanding about the evaluation; ii) motivate a discussion and analysis between the Project Management Unit and the evaluation team of the MTR that allows adjusting the results of the evaluation where possible and necessary, based on facts and without compromising the evaluation team's criteria; and iii) improve the overall understanding of the “Manglar Vivo” and guide its progress towards achieving its goals at the end of the project.

The evaluation team consisted of three people listed below with a brief summary of their areas of expertise and backgrounds:

M.Sc. Néstor Windevoxhel (Venezuelan), Leader of the Evaluating Team, is an expert in wetlands and marine and terrestrial biodiversity in productive landscapes. He contributed to the mission his abilities in environmental management of marine / coastal zones, economic valuation of mangroves, management and evaluation of environmental projects and conservation of biodiversity.

Dr. Carolina Murcia (Colombian) is an expert in ecological restoration and conservation of tropical ecosystems. She holds a professional certification in ecological restoration awarded by the Society of Ecological Restoration. She contributed her expertise in project design and evaluation of landscape level ecological restoration, as well as management of integrated projects of biodiversity conservation and professional capacity building in conservation and restoration.

Dr. Lourdes Mugica (Cuban) is an expert in ecology of aquatic birds in anthropic and natural ecosystems of Cuba and Professor in the Faculty of Biology, University of Havana. She contributed with her expertise in conservation and biodiversity, as well as coordination and evaluation of biodiversity conservation projects. Furthermore, Dr. Mugica appraised the international evaluation team on the forms of organization and work of Cuban institutions at national and local levels.

III.- DESCRIPTION OF THE PROJECT AND ITS CONTEXT OF DEVELOPMENT.

3.1.- THE "MANGLAR VIVO" PROJECT

The project "Reduction of environmental vulnerability to coastal flooding through Ecosystem-Based Adaptation (EBA) in the southern provinces of Artemisa and Mayabeque" aims to reduce the vulnerability of communities in the southern coastal area of the provinces of Artemisa and Mayabeque (Cuba) to the coastal erosion, floods and marine intrusion caused by climate change. This region of the country is subject to a high vulnerability to climate change not only because of its condition as a tropical island but also due to the high degree of deterioration of mangrove ecosystems, which already lack the capacity to protect the coast from the changes caused by the sea level rise and hurricanes. Additionally, the intense use of the water resource in the basin, both for agricultural and livestock purposes and for human consumption, are contributing factors to the reduction of the ecological flow of fresh water necessary to maintain the health of the mangrove, which affected the conditions of the mangrove forest and reduced its resilience.

The project is financed by the Adaptation Fund and is implemented locally by the UNDP Office in Cuba. Its execution is in charge of the Ministry of Science, Technology and Environment (CITMA) and the Ministry of Agriculture (MINAGRI). This is an investment project with a budget of US $ 6,067,320 and a counterpart of 1: 1 contributed by Cuba, mainly represented by staff salaries. The execution period is from October 1, 2014 to September 30, 2019.

The project seeks to reduce the vulnerability of the southern coast of the Provinces of Artemisa and Mayabeque, through the Ecosystem-Based Adaptation Strategy (EBA). In such a way that the project focuses on three types of activities (Components):

a. Component 1. The recovery of coastal ecosystems, but mainly the outer fringe of the mangrove, dominated by red mangrove (*Rhizophora mangle*), and swamp forest ecosystems, which are floodable ecosystems located between the mangrove zone and the fringe. Mainland. This component is based on the planting of mangroves on 1,290.6 [1] hectares between Surgidero de Batabanó and Punta Mora and the rehabilitation of 1,711.9 hectares of the mangroves between Majana and Surgidero de Batabanó, as well as the elimination of invasive alien species and enrichment with native species of 4,315.5 hectares of lagoon or swamp forests.
b. Component 2. The inclusion of strategies based on EBA in the management plans of the coastal zone and the productive agricultural area, achieved through training and

[1] Values for both indicators planting mangrove Batabanó for rehabilitation of mangroves in Artemisa differ between Prodoc and logical framework. The values reported here are those of the logical framework.

awareness campaigns for the community and decision makers. This component is expected to result in (a) plans for adaptation to the CC in both provinces and the six municipalities, (b) at least one group in four of the municipalities, which are made up of 15 members of the community, and that are focused on environmental and adaptation issues, and (c) 35 educational institutions (between primary, secondary, universities and pedagogical institutes) with study programs that incorporate topics of adaptation to CC. In addition, it is expected, according to PRODOC, that at least 17 audiovisual products, 3 local TV programs, 5 local radio programs and 2 newspaper articles on adaptation issues have been created and disseminated.

c. Component 3. The creation of a favorable environment at the regional level for the effectiveness and sustainability of investments in adaptation measures. This component is based on the production of information on the costs and benefits of the EBA accessible to decision makers and planners and on the strengthening of institutions that allow the updating and implementation of action plans based on EBA. From this component, at the end of the project, at least 3 training activities for coastal technical activities and 3 activities for inspections of coastal areas by regulatory authorities and provincial / municipal governments are expected at the end of the project. In addition, three studies are expected to estimate the cost / benefit ratio of the application of the ABE approach.

3.2.- CONTEXT OF THE PROJECT

3.2.1.- Geography and environmental and social vulnerability

The Republic of Cuba is an archipelago located in the Caribbean Sea, on the Tropic of Cancer. This geographical position determines a tropical climate influenced by the trade winds and the warm current of the Caribbean. The country is made up of more than 1,600 islands, islets and keys, of which the largest element is the island of Cuba. The island of Cuba has an extension of 105,007 km2, or 95% of the land portion of the country. The narrow and elongated shape of the island (1,250 km long and 31-191 km wide) gives it a large coastal extension of 5,746 km long [2]..

Because of its condition as an island nation, its shape and geographical location, Cuba has a double level of vulnerability to climate change. On the one hand, the rise in sea level (27 cm by 2050 and up to 85 cm by 2100) threatens coastal erosion, reduction of the area of the islands and marine intrusion in the coastal aquifers. On the other hand, the projected increase in the intensity and frequency of the hydro-meteorological events that take place annually in the center of the Atlantic Ocean and move in a general W-NW direction, subjects

[2] República de Cuba. 2015. Segunda Comunicación Nacional a la Convención Marco de las Naciones Unidas sobre Cambio Climático. La Habana. http://unfccc.int/resource/docs/natc/cubnc2.pdf consultado 28 Oct 2017

Cuba to the rigor of cyclones and hurricanes that put on a high risk the life and infrastructure of the country. For example, during the first ten years of this century, 78% of the hurricanes that have arrived to Cuba have been intense, in contrast to a historical figure of 26%.[3]

This extrinsic vulnerability is exacerbated by the management of natural resources in the last century that has damaged coastal ecosystems and their ability to stabilize the coast. The Cuban coast is divided into three types: rocky substrate coast with emerged marine terraces, rocky substrate coast with cliffs without marine terraces and sandy-silt-peaty substrate coast partially flooded and with mangroves[7]. This last type, typically populated by mangrove ecosystems, is the most extensive, but also the most sensitive to erosion and coastal management, since it has a soft, easily erodible substrate, which is maintained thanks to the characteristics of the ecosystem. that occupies it. Therefore, the protection of the coastal strip of most of the country depends on the health of the mangrove ecosystem.

The mangrove is one of the most productive ecosystems on the planet, which provides both wood biomass with rates that reach 2 ton/ha/year as breeding areas and habitat for countless species of fish, waterfowl, crustaceans and mollusks. The mangrove ecosystem is dominated by several species of halophilic trees (tolerant to salinity), and distributed in homogeneous stands arranged in parallel bands to the coast (zonning).

The identity of these species varies from one region to another in the tropics and subtropics, but typically the species that is in direct contact with the sea belongs to the genus *Rhizophora* which is characterized by being very hardwood trees, short stature and having prop roots or pneumatophores over the water. At the same time these roots retain the mud and the substrate between them in such a way, that the mangroves are are considered stabilizers of the coasts because they resist the onslaught of the waves and winds; without their presence the coasts erode, especially during the tropical storms[4].

The other species that make up the mangrove ecosystem inhabit the innermost fringes, they are taller trees, but without adaptations that allow them to tolerate the effect of sea swells, and in the absence of the first strip of red mangrove, they are gradually knocked down by storms and the waves.

The mangrove ecosystem and particularly Red mangrove (*Rhizophora mangle*), is very sensitive to salinity changes caused by inappropriate management of water resources that help balance the coastal salinity, extraction of timber and pollution. In Cuba these 3 factors had contributed to its degradation and generated biodiversity lost, and reduction in fish and agricultural production in the coastal zones.

[3] Prodoc..
[4] Ellison, A. M. 2000. Mangrove restoration: do we know enough? Restoration Ecology 8:219-29.

Cuban mangrove forest cover 5,647 Km^2 nationwide equivalent to 5.1% of the total area of the country and 26 % of the forest area in 2002[5], but it had been damaged by wood extraction and more extensively by inappropriate management of water resources that reduced the fresh water flow to the coast[7]. These is particularly evident in Mayabeque, Artemisa and Pinar del Rio provinces, in the south coast, with the first, Mayabeque, been the most affected[7].

A recent project was developed in Cuba to determine the danger and vulnerability of the marine coastal areas, the current state of the coasts, and their risk level in relation to the possible impact of climate change. This analysis was the base for the scientific support to the Government Plan to face Climatic Change in the Republic of Cuba (approved on April 2017), known as "Tarea Vida". The "Tarea Vida" established in the task number 5 the necessity to achieve the mangrove recovery, a clear objective of this project.

The Project focused on an 84 Km long stretch in the south coast of Artemisa and Mayabeque provinces covering 6 municipalities, Artemisa, Alquízar and Güira de Melena in Artemisa and Batabanó, Melena del Sur and Güines in Mayabeque. These 6 municipalities have a high strategic value as they contain the most productive regions in the country in relation to agriculture and fishery production[3]. Besides that their mangrove forest are highly impoverished[2,2] and they have associated a high density of human settlements in nearby areas. Besides that they are located in the narrower segment of the island, where the land lost due to sea level rise may have more impact.

Mangrove mortality, particularly red mangrove (*R. mangle*), that occupies the most external coastal strips, had been mainly caused by water diversion to the agricultural district and the urban settlement associated, and for timber extraction without control to produce charcoal for domestic use. The mangrove disappearance has exposed the coast to erosion due to the wind and waves impact in a way that the coast line moved back until the next mangrove stripe, composed basically by black mangrove (*A. germinans*). But black mangrove is not an effective barrier against sea waves and storms, because its roots are not very deep and they have a monopodial structure; in this way a gradual mortality is observed in the second mangrove stripe in Mayabeque and Artemisa coastlines.

Both the recounts made by coastal inhabitants in Mayabeque and Artemisa and the remainder of mangrove wood submerged in the sea indicated that in some points the coastline had moved back at least 150 m. The life quality of many local populations had been reduced because some beaches that used to be summer resorts have desapeared[7].

Besides that the absence of a life barrier protecting the coast from the battering of the waves during tropical storms, may cause infrastructure lost and risk locals life. Some hurricanes hitting Cuba in the current century had produced pushing in over the sea about 2 km inland.

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[5] Menéndez Carrera, L. & J. M. Guzmán Menéndez. 2002. Los manglares del Archipiélago Cubano: Aspectos generales, pp. 1-116, En Menéndez Carrera, L & J. M. Guzmán Menéndez (Eds), Ecosistema de manglar en el Archipiélago Cubano. Editorial Academia, La Habana, Cuba. UY/2002/SC/ECO/PI/2UNESCO/MAB

The coastal retreat has produced the saline intrusion through the aquifer in the underground Karst limestone rock[7]. According to the interviews made during the mission, saline intrusion reached 18 km inland. This is a high risk for agriculture, fresh water access for human consumption and the natural ecosystems with a low tolerance to salinity in the soil. The vulnerability is exacerbated by the practice of getting water from the aquifer to irrigate the cultures or for human consumption, a basic necessity if we consider that Artemisa and Mayabeque are the main food production provinces in this region of the country and that part of the water consumed in Havana comes from this aquifer as well. So there are projects focus on maximizing water uses to reduce the pressure on coastal ecosystems in the section about context below.

3.2.2.- Relevant political context.

Artemisa and Mayabeque are the smallest provinces in the country (with the exception of Havana). Traditionally, the zone had been the main source of agricultural food and water for an important part of the country (including La Habana) since colony times; With 6 years already, both provinces, that were originally part of Havana province, are the most recently created in Cuba. This separation was accompanied by a change in the local government administration that was known as ¨the experiment¨. In the new administration the position of President of the provincial and municipal Popular Power are separated from their respective administration Councils. In this way they are trying to get more transparency in the government and decentralize the decision making process since the council define the government plan and the budget, the assembly approve it and the government enforce its accomplishment.

The colloquially called ¨experiment¨ was initially planned for 18 months, but it had been ratified several times, for the porpoise to be replied in the rest of the country

3.2.3.- Institutional context:

The Project ¨Manglar Vivo¨ continue and contribute with several initiatives looking for increasing costal resiliency in the southwest of the country and its adaptation to climate change. Among them are the following;

- The project “Application of a regional approach to the management of marine and coastal protected areas in the southern archipelagos of Cuba”, financed by GEF/UNDP, was focus in the protection of the coastal marine protected areas.
- The project “Creation of capacities for the coordination of information and monitoring systems/sustainable land management in areas with water resource management problems”, financed as well by GEF/UNEP, is focus on the Habana-Matanzas plains, in spite of it does not have an ecosystem Based Approach, it is trying to alleviate the negative causes and effects of ecosystem degradation through the promotion of sustainable agricultural practices. This project is part of the association project of the country association program CPP-OP15 financed by GEF/UNDP which aims to "Support the Implementation of the National Action

Program to Combat Desertification and Drought in Cuba" that is aligned with the recommendations of the United Nations Convention to Combat Desertification (UNCCD). Its purpose is to introduce the Sustainable Land Management approach (MST) in the actions of prevention of degradation, recovery and rehabilitation of degraded lands, as well as in adapting to the extreme conditions of severely degraded ecosystems and in mitigating the effects of drought.

- The project "Environmental Bases for Local Food Security (BASAL)" financed by the European Unión/COSUDE, is focused in the strengthening of local capacities to monitor the climate and incorporate the environmental components in the socio-economic development plans. The target areas of the project are the municipalities Los Palacios (Pinar del Rio), Güira de Melena (Artemisa) and Jimaguayú (Camagüey).
- The project "Evaluation of the climate change potential impact on biodiversity and development of adapt strategies in 2 Cuban regions with fragile ecosystems¨ financed by EU/WWF seeks to develop national and local capabilities and assess the vulnerability of biodiversity and communities to climate change, as well as to establish adaptation strategies.

- The Project "Enhancing the prevention, control and management of invasive alien species in vulnerable ecosystems in Cuba" financed by GEF/UNDP included Havana Matanzas plains and specially the coastal zones in Mayabeque and Artemisa as intervention areas.

One of the basic premises and assumptions of the project, (which was not explicitly established in the PRODOC) but, was observed during the interviews and work meetings during the evaluation mission, was that the Logical Framework of the Living Mangrove project, considered only the coast and did not consider the root causes of the problem that are at the level of the basins that modulate the health (stability and resilience) of the mangrove. The main justification for not considering the issues of water management in the basin, precisely, was that the projects described above will ensure the restitution and conservation of the hydrological conditions of the basin.

The explanation is valid and acceptable in order to avoid duplication of effort, however, this approach requires a much closer relationship than that observed with projects such as BASAL, that allows greater certainty about, for example, the recovery of the flow of fresh water that drains superficially or underground to the mangrove, based on improvements in water use procedures that are clearly demonstrable.

IV.- ACHIEVEMENTS, CHALLENGES AND RESULTS

As indicated in the initial report, the results of the evaluation are summarized based on the findings and recommendations. These were supported on:

1. Analysis of relevant and available documentation. In general basic information of the project was ordered and available.
2. Interviews and work meetings coordinated and organized by the implementing team.
3. Field visits during the days of the evaluation mission carried out between October 15 and 21.
4. Workshops held with the actors in the provinces of Mayabeque and Artemisa, according to the results included in Appendix 4.
5. Meetings with strategic project partners, organized prior to the mission.
6. In response to requests for specific information, after visits, we got almost all the information but in few cases information was not available or in the format required. Due this reasons in some cases the findings have some level of uncertain which is not affecting the results neither the recommendations.
7. Follow-up meetings with members of the implementation team on specific topics.

It should be noted that, with the exception of indicators 1.1, 1.2 and 1.4, the Logical Framework does not have an expected progression of the scope of the results for the medium term. Therefore, based on the presentation of the project implementation team that showed the planning of results to the life of the project as a Gaussian curve, the consultant team assumed that it would be expected to achieve an execution of 50% of the results with respect to what is proposed in the PRODOC for the life of the Project.

The summary of the main findings made during the midterm evaluation is presented below.

4.1.- SUMMARY OF FINDINGS - PROVEN FACTS DURING THE MISSION-.

General Findings

- The Project Management Unit is made up of a young team of well-prepared, cohesive and committed professionals.
- Change in the staff in particular at lead level of the Project Managements Unit (PMU). In March of 2017, after 2.5 years of the project, Mrs. Sheila Chang, Project Director, was replaced by Mr. Luis David Almeida, who until that point was in charge of the technical coordination of the project, these and other changes in directors of components have generated important challenges for the implementation and order in the available information.
- The approval of the National Plan to face climate change impacts "locally called “Tarea Vida" by the Central Government in Cuba, has established an unplanned opportunity to very effectively promote knowledge of the project and its importance

and has created an incentive for its gear in the local, provincial and national political agenda.

About the design of the Project;

- Design weaknesses in the Logical Framework. In particular on the coherence between Problem, Threats, Objectives, Activities, Results and Indicators.
- Imprecision in the experimental design of the interventions of mangrove ecosystems and swamp forest rehabilitation, which did not allow:
    - Discriminate the success factors of each strategy.
    - Establish mechanisms for replication.
    - Identify mechanisms for long-term sustainability.
    - Take into account opportunities to scale up, to use it as mechanisms of implementation of "Tarea Vida".
- The objectives and indicators should be elaborated under the SMART methodology and focus on Impact Indicators rather than performance indicators.
- The interventions are very attached to the proposed tasks by the PRODOC, but there is no evidence of a clear and standardized protocol to select the most appropriate interventions in each intervention areas.

On the budgetary performance and the scope to the MTE of the implementation;

- The project has a delay of approximately 21% in financial execution. However, it is expected to increase its executive capacity in year 4, as long as supplies arrive in a timely manner.
- The budgetary counterpart has already been reached (142%), mainly due to:
    - At the beginning of the project in the absence of supplies, the implementing organizations provided them as a counterpart.
    - Salaries for work in the mangrove, went through a reclassification process, from 300 pesos to 1200 pesos per month.
- There was a high dependence on imports, which affects the speed of implementation of the project.
- The restructuring of the import system. During the second year, imports were transferred to a dependency of the Ministry of Science, Technology and Environment, EMIDICT, which had no experience with importing the necessary supplies for this project, which has generated a delay in the execution of the project budget as well as in the implementation of field activities and attrition in the personnel.

Compliance with the goals to the life of the project will require:

- Most project indicators are met with very few exceptions; however, in all cases it can be expected that the indicators will be met by the end of the project life, examples of these are:
    - Indicators 1 and 3 of Component 1.

- Indicator 3 of Component 2.
- Indicator 3 of Component 3.

- Specific references, quantitative data on the scope and comments on each indicator are presented in the evaluation table located in Appendix 2.

Project results verification and their performance.

While the team has a large number of files and documents accumulated, there is no clear and organized structure of their files and the information they contain, which allows access to information quickly and verify compliance of each indicator in the PRODOC.

It was not possible to obtain verifiers for all the indicators and results of the project.

- It was evidenced that there are discrepancies between the reports of the PPR and the records that the members of the implementing team have of the performance of the indicators annually.
- It was evidenced that the responsibility of monitoring the indicators and their due documentation is spread over the members of the implementing team.
- There is a lot of information that exists but that is not necessarily reflected in the written reports (for example, in the PPR).

About communication;

- There is abundant written/publish and video information (more than the amount expected for the MTE) that has been used and may continue to be used during future implementation.
- The communication and knowledge management strategy cited and shared as a product, describes in a similar way the logic of intervention presented by the team and was sufficient to make the evaluation. However, it was evident that there is no detail that allows identifying specific audience per strategy, the messages for each one and the adaptation of the communication products by audience.
- Communication is strongly oriented to the mangrove ecosystem. Without losing this strength, communication is required to be more explicit about the ecological importance of the swamp forest, the economic alternatives and their sustainable use.
- The stakeholders, local governments, forestry companies, and representatives of involved institutions, which indicate that the project has managed to communicate its achievements to these actors, evidenced a high level of satisfaction and participation.
- An institutional appropriation of the project and its activities by all the participants in workshops and interviews was evidenced, which indicates that the project has been effective in communicating its importance to these actors.
- There was great clarity in the members of the communities interviewed and participants in the workshops, of the importance of rehabilitation and conserving the mangrove as a mechanism to increase social resilience to climate change.

Project sustainability and its impacts.

The Logical Framework lacks indicators of impact and sustainability. Therefore, this evaluation does not allow determining these two parameters. However, the following was evidenced on this matter during the interviews and workshops:

- It was evidenced during the interviews, that unplanned activities have been carried out but that they are results of the work of the project and that they indicate an additional impact, for example:
    - Application of the method of restoration in the Province of Havana and in the Province of Guantánamo.
    - The development of new courses on Mangroves and EBA in the beneficiary provinces, but not with funds or other project resources.
- There is limited awareness on stakeholders about the role of swamp forests in the recovery of the mangrove ecosystem in the EBA approach.
- There is, based on the observed, a limited exposure of the economic alternatives used to promote the project, for example, coal production, honey production or fisheries, which are cited in the PRODOC and which were mentioned in workshops and interviews during the mid-term evaluation.
- There were evidences, during meetings and the workshops, of community knowledge and ownership of the project its expected impacts and the benefits obtained to date.

4.2.- PROJECT STRATEGY.

The Logical Framework Analysis.

The logical framework of the project shows in a simple and direct way the process of implementing the actions proposed by the project to achieve its goals. It was evident during the evaluation mission that this LF was created in the context of a series of interventions and parallel projects, cited in the context section, which imply a series of assumptions that were never made explicit in the LF, as would have been ideal.

In a similar way, it was identified that the LF did not have the general vision of a holistic strategy to approach the problems to be solved, focusing only on very specific aspects of the mangrove rehabilitation. In addition, their indicators were practically all indicators of short-term performance in all cases. This has resulted in several effects:

- First, the project reached by the time of the midterm evaluation, important results, but did not consider specific impacts that have already been achieved, such as the promotion of EBA's work in other areas of the country, specifically in (the Havana Bay area and in the coastal area of Guantanamo province).
- Similarly in terms of training and communication, it was identified during the MTE that Mundo Latino has used materials produced for the “Manglar Vivo” Project in

other national communication initiatives using the experience, footage and materials generated through the project.

- The second effect has been that local schools and circles of interest have also carried out training and promotion activities without direct project support, in a clear sign of long-term sustainability.
- Third, the indicators related to mangrove recovery focus mostly on mangroves planting, excluding indicators of the real impact on the persistence and resilience of ecosystems.
- Finally, it is perceived that the academic profiles and job profiles generated in the MINAGRI (INAF, EFI and SFS) could be applicable in the rest of Cuba. However, we make the caveat that this perception is not based on a rigorous analysis of the supporting documentation on academic and work profiles, as they were not available at the time of the evaluation.

The evaluation team suggested developing a complementary logical framework, not to change it but to improving it by the incorporation of elements that will allow the project implementation team to explore means to measure the possible impacts of their actions. Appendix 10 includes an example of such a revised framework.

Design Review

Based on the analysis of the Logical Framework, the documentation review and the interviews, workshops and visits during the evaluation mission, an interpretation of what could be the general intervention logic of the Project was constructed. It should be noted, however, that it is based on an observation limited to a few days and an incomplete set of documents that limited the possibilities of EE work and therefore is not intended to be exhaustive.

The products of the activities of the “Manglar Vivo” Project continue with the following sequence of intervention:

Background

The southern coast of the provinces of Artemisa and Mayabeque has a high degree of human intervention that has modified the landscape in fragments with the consequent elimination and degradation of mangrove forests, which means that they have the lowest rates of health in the Western region of Cuba. This intervention has historical elements; the capital of Cuba was originally founded and established in 1514 by the conquistador Pánfilo de Narváez (under the command of Diego Velázquez de Cuéllar) with the name of Villa de San Cristóbal de La Habana. Its original location was at the mouth of the Onicaxinal River near Mayabeque beach, on the south coast of Cuba, until in 1519 it was moved to its current location.

During the colonial period, the forest ecosystems in the project area received a very large impact due to the forestry and agricultural activity in the area. The forestry activity is the one that has impacted the most, particularly, due to uncontrolled logging in natural forests (mangrove, woodlands swamp and deciduous forests), effects that are still persistent, given that this is one of the most important agricultural regions in the country and the closest one to the city of Havana.

The introduction of invasive alien species (encouraged by being more productive) and the construction of canals that altered the water system, lead to an increase in coastal erosion, a problem that is compounded by the extraction of water for human and industrial consumption, mainly from the City of Havana and adjacent provinces. Due to the joint effect of these actions, the area is exposed to an increase in coastal erosion, salinity and high probabilities of flooding in the face of meteorological events such as hurricanes and cold fronts, and in general it is highly vulnerable to the effects of climate change (CC) and particularly to the rise in sea level.

The project area was identified in the analysis of the mangroves of Cuba as the most degraded mangrove of the coast of Cuba and therefore one of the most sensitive areas to the impact of the effects of climate change which compromises the resilience of the ecosystems as well as the social resilience in the coastal strip of 84 kilometers where the project decides to intervene.

The region in which the project is located has great demands for water for industry, agriculture and human consumption, and even supplies fresh water to the city of Havana. In this context it is evident that the management of the basin represents a precondition that allows specific investments in coastal wetlands and mangroves in particular, to be effective.

It is important to mention that freshwater flow and availability due rehabilitation on the hydrological patterns will be a precondition that can affect the chances of success of investments in the rehabilitation or restoration of the Mangrove or its ecological services. However, as was seen in the context section, “Manglar Vivo” project was deigned on the assumption that other associated projects that are operating in the region will guarantee that freshwater and other enabling conditions that make the results of the projects in the basing will ensure sustainability of “Manglar Vivo” project investments.

Intervention Logic

The optimal conditions for the mangroves development in the Neotropics are:

1. Tropical or subtropical temperatures between 15 to 40 degrees centigrade.
2. Variable salinities between freshwater and low salinity between 0 and 25 PPM.
3. High luminosity conditions, high radiation levels and sufficient hours of light exposure (10-14 hours of brightness).
4. Low coastal energy conditions located in the intertidal belt.
5. Edaphology dominated by alluvial origin sediments and dominated by organic material.
6. High nutrient content, nutrient capture or retention and export of organic material.
7. Low to moderate impact of consumption (depredation) by other organisms in particular of propagules.

These are values or average ranges of conditions in which the mangrove develops its biological potential, placing the major structural developments. These conditions are typically associated with the mouths of large tropical rivers and estuaries. The mangroves also determine a particular spatial distribution depending on many conditions and characteristics. The combination of the factors described above, determine a particular spatial distribution of the mangrove to which its structure and many of its functions can be associated.

Mangroves in the southern region of Cuba, according to the PRODOC, are characterized by a complex but clear structure, with an area facing the coast dominated by red mangrove (R. mangle). This coastal strip allows preventing the impacts of waves and tides in the coastal areas. This zone is followed inland by a range of variable amplitude of forests dominated by black mangrove (*A. germinans)* with occurrences of red mangrove (R. mangle) and white mangrove (*Laguncularia racemosa*). This second zone has periodic influence of tidal water and also seasonal influence of fresh water coming from the mainland, both underground and runoff. This zone is followed by a mixed forest strip, with variable combinations of black mangrove, red mangrove and white mangrove in areas with greater influence of fresh water, with the presence of mangrove buttonwood (*Conocarpus erectus*) in areas less subject to flooding. Associated with the mangrove, and not less important, is the swamp forest or woodlands swamps that border a wetland area located between the forests of the mainland or the agricultural crops and the mangrove swamp. This area is a reservoir of fresh water that provides greater hydraulic stability to the mangrove.

The structure described above was altered by all the uses and extraction of the mangrove, in particular the red mangrove, the derivation of fresh water, the degradation of the swamp forest and the effect of climate change. This situation as a whole led to a gradual loss of the red mangrove strip in the immediate area to the coast, as well as to the salinization of the soils and waters that favored the establishment and dominance of the black mangrove. As

a result, the ecosystem was transformed and becoming more sensitive to the effects of climate change that have led to the loss of the red mangrove strip and have made it more sensitive to coastal erosion and saline intrusion. As a consequence, the coast has been eroded quickly, even destroying the forest dominated by black mangroves, which is not able to withstand the swell of the waves and falls by mechanical effects, especially due to the impact of hurricanes and storms.

The project proposes to increase the resilience of the inhabitants to the effects of climate change through an ecosystem-based approach, through the recovery of the ecosystem and its protective function for which the natural zonation of the mangrove in this region of the South coast of Artemisa and Mayabeque. To do this, it is necessary to recover the composition and structure of the mangrove forest and the forest ecosystems of the adjacent wetlands in order to regain their function in the coastal zone and the ecosystem services that protect the coastal strip, increase the breeding sites for fish and shellfish populations, soil retention and reduction of the effects of CC in general.

The project aims to demonstrate that the recovery of the zonation of the mangrove with its associated structural profile is the most efficient approach in terms of costs / benefits to face the effects of CC at the country level and that Cuba has the appropriate social structure to carry out rehabilitation tasks in a sustainable manner, involve local communities and institutionalize and extend the lessons learned to other coastal communities.

With this porpuse, in-situ rehabilitation activities have been carried out during the project, combined with training, education and extension activities, while involving local communities and decision-makers in both the productive and the productive sectors.the municipal and provincial governments. The measure of success of the project should then be oriented according to the PRODOC to the number of hectares of mangrove in which it has been possible to restore or rather rehabilitate the coastal profile on which the coastal protection functions of the mangroves in the Artemisa and Mayabeque regions depend.

The first component has focused on the restoration processes of coastal ecosystems, initiating their actions with hydraulic re-habilitation allowing the entry of fresh water into the mangrove forest and restoring the laminar flow. The project has focused on the sectors between Punta Mora and Majana, in order to reduce the impact of floods and in particular, the salinization of the forest with the consequent degradation of R. mangle and its replacement by *A. germinans*. However, the sector between Batabanó and Punta Mora entails a major intervention, since the whole coastal strip of red mangrove (*R. mangle*) that will be established again in front of the current strip of privet mangrove (*A. germinans*) has been lost.) in such a way as to establish an effective barrier against the onslaught of the sea and its corresponding erosion. Indicators to measure the success of this component are related to the area of restored forest, as well as the area of inland forest ("swamp forest"),

which borders on agricultural areas, as well as the control and use of species exotic species introduced for commercial purposes, in particular *Casuarina equisetifolia*.

Component two focuses on the integrated and participatory management of coastal ecosystems to increase resilience to CC and involves both local governments and the community as a whole. Hence, the first two indicators of the success of this component are related to the number of development plans that effectively include the ABE approach and the number of municipal and provincial governments with knowledge management systems that incorporate this approach. For the first time, local governments must include the ABE approach in their development plans for adaptation to climate change, they have included the concept in their plans, but progress is needed in information management processes for decision-making.

At the community level, work is being done to create support groups for the project that are capable of addressing climate issues and adaptation to CC in the 4 municipalities, and that local schools adopt CC topics and their adaptation in their study programs. Currently, it is perceived that progress has been made in this field and it is necessary to document the advances and impacts of this process, given that we do not have quantitative data available to verify them, which must be ensured by the time of the final evaluation. The educational and awareness-raising work of the community will be complemented with the creation of various audiovisual products and materials for the media in general that have already been produced and will allow the results and products of the project to be properly disseminated (fifth indicator) and to promote their extension to other coastal areas.

Component three focuses on ensuring the effectiveness and sustainability of adaptation actions by establishing a favorable environment at the regional level. It focuses on institutional strengthening at the government level and its influence on the community. It is a fundamental component for the long-term sustainability of the project and its expansion to other areas. It has focused on providing training opportunities and technical support to coastal communities by local governments in order to incorporate the EBA approach, in addition this component is related to government activities of supervision and refers to the inspection activities carried out by the local enterprises or governments, both municipal and provincial, in order to incorporate the EBA approach.
The recent approval of the National Plan for confronting climate change ("Tarea Vida") has served as an opportunity to position the project. Both the Government and civil society are aware of the "Tarea Vida", so the project is being framed in this context. All the institutions involved in the project actions and the ABE approach (Provincial and municipal governments, Ranger Corps, Coastguard and Fisheries Inspection Office) are being strengthened with new concepts supported by case studies and new regulations and methodologies that allow them to recognize costs and benefits of EBA as new tool to make it available to decision makers.

4.3.- PROGRESS TOWARDS RESULTS.

4.3.1.- Component 1

Strategy.

This component seeks to recover coastal ecosystems to increase resilience to climate change and reduce the impact of coastal flooding. The component has four expected outputs: (a) The establishment of 1,290.6 hectares of red mangrove along the coast, (b) the rehabilitation of 1,711.9 hectares of mangrove ecosystem, (c) the production of a species management plan for invasive alien species (IAS) and their implementation in 7,318 hectares, and (d) the rehabilitation and enrichment of species in 4,315.5 hectares of marsh forest. This strategy is being implemented in the following way:

1.1. Restoration of the red mangrove coastal belt (Rhizophora mangle) between Surgidero de Batabanó and Punta Mora

Red mangrove in the coastal strip between Surgidero de Batabanó and Punta Mora (Prov. Mayabeque) presents one of the highest levels of degradation in the country. There, the outermost belt of mangrove towards the sea is almost gone, exposing Black mangrove trees, which are typically distributed in a second belt behind the red mangrove. Because of its architecture, the black mangrove does not withstand the onslaught of waves, especially during storms, nor does it retain sediment. Therefore, a persistent black mangrove mortality has been observed with a concurrent receding of the coastal line (Figure 1). In these conditions, the red mangrove does not recover on its own.

Figure 1. Black mangrove tree uprooted by the waves. Coast line is devoid of red mangrove.

Red mangrove mortality in the Mayabeque province was initially caused by uncontrolled logging and changes in the area´s water regime, caused by the Mayabeque River channeling and road construction parallel to the coast (e.g., the road that communicated Batabanó with Mayabeque Beach), which interfered with nutrient and fresh water laminar flow into the mangrove. As of 2012, all the mangroves in Cuba are under the guise of coastal protection forests, which prohibit logging.

Figure 2. Channel feeding the mangrove with fresh water.

The coast of Artemisa´smunicipality was also affected by the construction of a dike parallel to the coastline (at an average of 200 meters inland), with the objective of retaining fresh water and avoiding saline intrusion into the soil. This dike is now traversed by several channels that allow fresh water passge towards the coast, with the purpose of
restablishing the mangrove´s water balance. However, these channels have little flow and strength, thus the easily sediment and clog up, failing to fulfill their function.

Figure 3. Palisades established to reduce wave force and promote red mangrove establishment and growth.

Activities for the reestablishment of the red mangrove coastal belt include: (a) dredging and maintaining the freshwater channels towards the mangrove to lower the salinity to levels tolerated by the red mangrove (Figure 2)), (b) establishing palisades in the sea a few meters from the coast to reduce the force of the waves on the substrate (Figure 3), (c) selectively removing black mangrove trees to partially open the canopy and (d) planting red mangrove propagules beneath the black mangrove forest. Seed sowing was initially carried out using individually spaced propagules. However, the staff of the implementation team indicated that the project advisor (Dr. Luz Esther Sánchez) recommended to sow them in groups of three (triads) and in aggregations of 15 to 25 triads (islands) to stimulate intra-specific competition and increase litter retention (Figure 4).

Figure 4. Red mangrove islands sowing system that involves planting the seeds in clusters of triads (three seeds sowed together),

1.2. Mangrove ecosystem restoration between Majana and Surgidero de Batabanó.

The red mangrove of the coast located between Majana and Surgidero de Batabanó (Prov. Artemisa) is at an intermediate degree of degradation. There is a strip of mangrove on the coastline, however, where it is partially degraded and rehabilitation is being carried out by sowing propagules.

In this sector, mortality was also caused by logging and by the establishment of a 54 km long dam, parallel to the coast (about 200 meters on average), which extends from Majana to Batabanó. The function of this dam is to retain the fresh water from the surface runoff coming from the north, so that it accumulates and by counter-pressure it prevents saline intrusion that previously affected agriculture and water quality. This saline intrusion is the

product of the low pressure of the aquifer, caused by water extraction in the agricultural region. Although the dam partially and temporarily solved the problem of saline intrusion, it caused a change in the surface water regime of the coastal zone, which negatively affected the mangrove. To counteract the negative effect of the dam, channels were cut to carry fresh surface water to the coast, but those require constant maintenance of sediment cleaning.

In this region, the recovery techniques described in the previous section are also applied, except that there are no palisades along the coast, and that mangrove is being planted in areas completely devoid of mangroves behind the black mangrove line (see Figure5).

Figure 5. Red mangrove plantation. The tree behind Vicente Núñez, Chief of the "Brigada de Alquízar" grew spontaneously. Plants on the lower left corner were palnted in 2016. The plant of the lower right corner was planted in 2015.

1.3. Elimination and/or control invasive alien species in coastal wetlands between Majana y Punta Mora to improve ecosystem resilience.

Flooded forests between the mangrove and the mainland have been colonized by several Invasive Alien Species (IAS), which include the Tropical Almond tree (*Terminalia catappa*), casuarina (*Casuarina equisetifolia*), leucaena (*Leucaena leucocephala*) and "marabú" (*Dichrostachys cinerea*). These species compete with native species and hinder their recruitment, which reduces their biological diversity and resilience. This strategy involves the formulation of a management plan, which initially was determined to be focused only on casuarina. Marabú and leucaena were not included as they are not considered a major threat in this region. However, the project is also controlling the Tropical Almond tree, because it was determined that its impact on the swamp forest ecosystems was even stronger casuarina´s. In addition, casuarina is experiencing high levels of mortality related to changes in the water table, anyway. Tropical Almond tree control is being carried out by cutting and harvesting adult trees (Figure 6).

Figure 6. Two workers in the process of cutting the trunk of Tropical Almond tree that had been felled.

1.4. Restoration and enrichment of woodlands along the landward limit of the coastal wetland belt.

To facilitate the recovery of the swamp forests that have been affected by logging and the invasion of alien species, enrichment is being carried out with native tree species in the swamp forests between Majana and Punta Mora. This management involves the creation and assembly of nurseries, domestication for mass propagation of native tree species and seedling planting.

Indicators

This components success will be measured by:

1. Area (measured in number of hectares) with mangrove planting established at the coast between Batabanó and Punta Mora. This value is reported by the local agroforestry companies, who are responsible for planting, and verified by the State Forestry Service-SEF three years after sowing based on measures of survival and vigor of the plants. This indicator is measured in hectares per year.
2. Area (measured as number of hectares) of mangrove rehabilitated by sowing propagules between Majana and Surgidero de Batabanó. This value is reported by the local agroforestry companies, who ae responsible for planting, and verified by the State Forestry Service-SEF three years after sowing based on measures of survival and vigor of the plants. This indicator is measured in hectares per year.
3. Number of IAS management plans developed.
4. Total area of inland forests that limits the wetland with the arable land, which has been enriched with native species. This value is reported by the local agroforestry companies, who are responsible for planting, and verified by the State Forestry Service-SEF three years after sowing based on measures of survival and vigor of the plants. This indicator is measured in hectares per year.

Progress towards results

The evaluation of the progress of results for this component has several challenges. The first one is that a discrepancy was observed in the expected values per year between the PRODOC, the Logical Framework of the Project and the cumulative values expected in accordance with the PPR II. The differences between the PRODOC and the Logical Framework are due to an adjustment made a-posteriori to the Logical Framework and registered in the memories of the Start-up Workshop.

Also, discrepancies were observed between the values reported in the different information sources: i.e., their agroforestry company audiovisual presentations to the review team at the MTR, the values reported by the Coordinator of Component 1 during presentations and the values reported in the PPR II. For the purposes of the evaluation, only the values

reported by the managers of the Agroforestry Enterprises were used, considering that they are the primary source of information.

The third limitation is that there is no correspondence between the periods established by the Logical Framework and the report periods used in the Agroforestry companies (EAF) [6] and the PPRS. In other words, the project goals are defined for project-years (i.e., September-August), while the period comprised by the advance reported by the EAFs is not clear and the PPRs are in periods that do not correspond to either (PPR-I covers the period September 2014-July 2015 and PPR-II covers the period August 2015-December 2016). In the case of the EAF reports and the PPRs, only global values are reported, not monthly, so that there is no way to establish a correspondence of the degree of progress to a certain date. Therefore, the degree of progress used is calculated relative to the value of the final indicator for year 5 and not with the expected values for the medium term.

Fourth, the EE-MTR has not had the SFS certifications at its disposal. Thus, the results presented by the UMP and the EAF could not be verified.

Additionally, the delivery of the requested documentation was either late or never occurred; specifically the management plans for the IAS (which was available in the cloud but in compressed format and thus not accessible) and the mangroves and swamp forest intervention plans were not available. This prevented a careful analysis of the relevant documents or the opportunity to clarify doubts with the implementing team. The PMU inform that the original proposed interventions only included red mangrove planting at the stands along the coast, but that other strategies were added later as proposed by the project´s technical advisor. The implementing team indicated that there is no written work protocol to guide the implementation.

Finally, the time for evaluation and field visits was too short to personally corroborate and reconcile with the PMU, the EAF and the SFS the data provided by the different sources of the sown and planted areas and the project progress calculations for indicators 1.1., 1.2 and 1.4.

[6] The first report of EAF Mayabeque (dated December 28, 2015) states that it presents results corresponding to the "first year of the project (2014-2015)". The corresponding report of the EAF Costa Sur, of the same date, establishes that it presents results corresponding to "Activities executed in the areas of intervention until date ...". Likewise, the report of EAF Costa Sur, dated December 2, 2016, presents "Activities executed in the areas of intervention until date ..." and that of the EAF Mayabeque dated December 28, 2016 reports results corresponding to "... second year of the project (2015-2016) ".

Indicator 1.1-

There has been red mangrove planting in Mayabeque; however, it is difficult to establish its progress relative to the project´s midterm value because there are no official numbers of planting levels at the project´s midterm. In addition, there are inconsistencies between the reports submitted by the Mayabeque EAF, the values reported in the PPRs and the values reported in the presentations during the MTE, as shown in table 1. It is possible that these inconsistencies are partly due to the fact that each report uses different cut-off dates (Table 1). However, according to the values reported for the first two years by the EAF Mayabeque, by December 2016, 94% of the goal for the first two years had been met. The two PRPs report higher values than the EAF reports, showing 102% compliance by December 2016. Values reported during the MTE presentations coincide with those of the EAFs. If the data presented during the visit, which have not yet been delivered to UNDP, is considered, the project would have accomplished almost 100% of what was expected by the end of year 3, according to the Logical Framework. This represents 60% of the 5-years project´s total area (Table 1).

In contrast, SFS reported areas that do not correspond to the values of the other two sources. Taking the totals reported at the date of the visit, the observed implementation is 35% below PMU´s reports. According to the PMU, these discrepancies are due to the fact that SFS figures only include the work done in the canals, the firebreaks and the palisades, but not the planted areas. This is because the first three years necessary to certify the establishment of the sown areas have not yet elapsed.

At the time of evaluation, the MTE team examined the signed reports of the forestry companies, which contained data on seeding and planting of the intervened areas. The MTE team also obtained data from the PMU that allowed intuitive evaluation of the restoration process. Verifiable data of the impact achieved should await certification from the State Forest Service (SFS), which is the authority responsible for determining the establishment of the forest plantations, at least 3 years after the initial intervention. **The differences in compliance exhibited by the different sources are relevant because, at the final evaluation the data from the different sources should be properly reconciled. In particular, it should be well established how many hectares are certified by the SFS as established plantations and how much area was intervened but not yet old enough to be certified.**

Indicator 1.1, of the project´s logic framework, does not include other activities that were conducted in the intervention areas and that could be verified during the visit. Activities such as channel cleaning, palisade establishment, and black mangrove canopy thinning could increase the probability of success of mangrove establishment.

Table 1. Expected and reported number of hectares planted at Mayabeque each project year. Degree of compliance (in percent) of the values reported by each source, relative to values expected at the time of each report, and to the value expected for project´s total.

Project year	Logic Framework indicator (ha)	% of total expected	Area reported by EAF-Direct[1]	Area reported by EAF-Stand[1]	Area reported in PPR-II Dec 2016	Area reported by PMU at MTR Oct 2017[2]	Area certified by SFS (ha)[3]
1	74.8	5.8%	17.0	72.1	85	75	212.5
2	333.5	25.8%	62	311.7	333.5	312	117
3	498.8	38.6%				499	243
4	333.5	25.8%					
5	50.0	3.9%					
TOTAL	**1,290.6**	100.0%	**79.0**	**383.8**	**418.5**	**886.0**	**572.5**
% accomplished with respect to LF	Of value established by TORs (408.3ha.)			94.00%	102.50%	94.78%	80.70%
	Of Project´s total			29.74%	32.43%	68.65%	44.36%

Source
[1] Signed reports by EAF Mayabeque
[2] PPT presentation: Felipe V. Cárdenas Crespo, Coordinator, EAF Mayabeque.
[3] PPT presentation: Idania Padilla Cantillo. Chief, Servicio Estatal Forestal Mayabeque.

Indicator 1.2-

As in Mayabeque, mangrove sowing in Artemisa has progressed, albeit with a greater lag, at least until the second year. Data from the EAF and PPRs reports, as of December 2016, shows implementation of only 54% of the expected value to that date. If values presented by the PMU during the visit were considered, which have not yet been presented in a PPR nor verified with the reports of the EAF or the SFS, compliance at the end of year 3 would be 86.4%. This means that the project would be in the process of closing the gap, but still 13% below the indicator. The level of compliance to date is 67% of the total value of the project (Table 2).

Table 2. Expected and reported number of hectares planted at Mayabeque each project year. Degree of compliance (in percent) of the values reported by each source, relative to values expected at the time of each report, and to the value expected for project´s total.

Project year	Logic Framework indicator (ha)	% of total expected	Area reported by EAF-Direct[1]	Area reported by EAF-Stand[1]	Area reported in PPR-II Dec 2016	Area reported by PMU at MTR Oct 2017[2]	Area certified by SFS (ha)[3]
1	139.1	8.1%	13.9	148	143.8	148	148
2	618.7	36.1%	41.4	267.4	582.7	426.5	206.8
3	575.2	33.6%				577.7	Not reported
4	263.6	15.4%					
5	115.3	6.7%					
TOTAL	**1,711.9**	**100.0%**	**55.3**	**415.4**	**726.5**	**1,152.2**	**354.8**
% accomplished with respect to LF	Of value established by TORs (753.8ha.)			54.82%	95.87%	75.81%	46.82%
	Of Project´s total			24.27%	42.44%	67.31%	20.73%

Source

[1] Reports signed by EAF Costa Sur

[2] PPT presentation: Engineer Rodrigo Fernández Moreno, Technical specialist, Artemisa.

[3] PPT presentation: Engineer Amalia Ramos Mojena. Section chief, Servicio Estatal Forestal, Artemisa.

SFS reports sown areas consistent with the other sources for year 1, but only a value equivalent to 48.5% of the other sources for year two. There is still no certification for the third year. These data correspond to the years of the project. SFS also reports seedling survival ranging between 85 and 97%, according to the report of the Compañía Agroforestal de Artemisa (Power Point submitted to the Review Team).

Similar to Mayabeque, indicator 1.2 does not reflect other activities observed during the mission that have been carried out to increase the likelihood of successful establishment of the mangrove, such as clearing or restoration of canals and opening the canopy by removing black mangrove.

Indicator 1.3.-

The IEE Management Plan is not available for analysis and verification. However, Component 1´s coordinator reported the production of such a management plan for 20 invasive alien species. He also reported control work on four invasive alien species carried

out in 65 hectares. During the visit, the PMU spoke of control tasks of Tropical Almond *(T. catappa*) and Casuarina (*C. equisetiflia*). The reports of the SFS do not mention verification of areas with eradication of EIS. However, the indicator would be fulfilled as long as there is a management plan and it is being implemented.

Indicator 1.4.-

Enrichment work in the coastal wetland forests has progressed, but also shows lag, as shown in table 3. Relative to the plan established by the Logic Framework, the degree of progress by December 2016 was between 84.4% and the 100%, depending on the source of information. According to PPR-II, execution at December 2016 was 100% of expected values, surpassing the values reported by the EAF and the PMU by 13-16%. Furthermore, it should be noted that there are inconsistencies within the PPR-II in the values reported for this indicator between the "rating" and "Project indicators" tabs.

According to the results presented during the visit (which have not yet been delivered to UNEP) 87% of the hectares expected at that time would have been implemented by the end of year 3; that is, there would be a 13% lag. On the other hand, the information provided by the SFS for this indicator in the presentations made during the MTE is incomplete because SFS only reported values for Artemisa in year 1. Reports for that province, indicate seeding of 16,939 seedlings of 18 native species in wetland forest. The EAF of Mayabeque did not report the corresponding data. Thus, verification of this aspect is lagging behind significantly.

Table 3. Expected and reported number of enriched hectares in the coastal wetland forests planted of Artemisa and Mayabeque each project year. Degree of compliance (in percent) of the values reported by each source, relative to values expected at the time of each report, and to the value expected for project´s total.

Project year	Logic Framework indicator (ha)	% of total expected	Area reported by EAF-Direct[1]	Area reported by EAF-Stand[1]	Area reported in PPR-II Dec 2016	Area reported by PMU at MTR Oct 2017[2]	Area certified by SFS (ha)[3]
1	99.9	2.3%	20.00	85.00	99.9	100	46.10*
2	1,301.3	30.2%	145.6	1097.5	1301.3	1157.9	Not reported
3	1,422.2	33.0%				1206.1	Not reported
4	1,075.8	24.9%					
5	416.2	9.6%					
TOTAL	**4,315.5**	100.0%		**1,182.5**	**1,401.2**	**2,464.0**	**46.1**

% accomplished with respect to LF	Of value established by TORs (1401.2ha.)	83.39%	100.00%	89.77%	3.29%
	Of Project´s total	27.40%	32.47%	57.10%	1.07%
Notes and sources	[1] Reports signed by EAF Costa Sur [2] PPT presentations: Engineer Rodrigo Fernández Moreno, Technical specialist, Artemisa and Felipe V. Cárdenas Crespo, Coordinator EAF Mayabeque. [3] PPT presentations: Engineer Amalia Ramos Mojena. Section Chief Servicio Estatal Forestal, Artemisa and Idania Padilla Cantillo. Chief, Servicio Estatal Forestal Mayabeque * Only reported for Artemisa				

Comments to indicators 1.1, 1.2 y 1.4.

Both the PRODOC and the Logic Framework focus exclusively on measuring the project´s result as the number of hectares intervened. It is also expected that, given a survival of 85%, this will translate in 85% of the area actually established. Thus, the indicator of forest establishment is also measured in hectares. The MTE-Review Team found that these metrics are inappropriate for the type of work involved, because they do not reflect an ecological reality.

It was observed that there is no explicit intervention protocol and that several techniques are combined without a prior design or standardized criteria applied among all the work teams. In this case, the interventions are specific, immersed in existing ecosystems; therefore, individual mortality does not really translate into an area metric expressed in hectares as intended. This finding is important, although it does not really affect the progress accomplished by the Project.

As far as the field inspection allowed, it seemed that each intervention affects an area of a few square meters and there is no regularity in its spatial distribution within the forest, nor is there any other form of standardization to ensure that the effort made for each stand is proportional to the stand´s area. According to the PMU, the interventions are carried out in an “effective area” that corresponds to anywhere between 10 and 20% of the total stand. There is no standardization neither of the percentage of the area to be intervened nor of its location; except that all interventions are concentrated in the first 30 m from the beach inland. Therefore, it is difficult to determine if the intervention investment is appropriate for the conditions of each stand. In any case, absence of a protocol formally adopted by all the parties makes it difficult to consider these rather discretional criteria. Thus, the recommendation to have an intervention protocol is important.

Likewise, in the coastal forest the interventions in the understory are distributed irregularly and unpredictably, depending on the location of the clearings. Therefore, to achieve greater precision during the final evaluation and to facilitate medium-

and long-term monitoring of the interventions, it is recommended to map carefully all the areas in which the interventions have been carried out.

On the other hand, it is not clear how seed or propagule survival and establishment are being quantified, given that these are not easily differentiated from those that are established naturally (except in cases where they have been planted in triads). It is important that all new seedlings planted in the remainder of the project are marked individually to properly quantify their survival and establishment.

Because it is not possible to independently evaluate the impact of each of the intervention strategies, nor is it possible to establish the cost-benefit values for each, it is recommended to adopt an experimental approach such as the one proposed in Appendix 8.

Finally, none of the indicators reflects the effort devoted to complementary tasks that are necessary for mangrove rehabilitation, such as channel cleaning, opening of black mangrove canopy, or black mangrove seedling removal. According to the PMU, the intervention plan for all the coast edge stands initially included only red mangrove planting. However, advice from the research institutes and from consultant Dr. Luz Esther Sánchez, the intervention activities were changed to include new strategies that would increase the probability of restoration success. However, to this report´s date those interventions are not yet formalized in a protocol. Therefore, it is recommended that the PMU keeps a quantitative and spatially explicit record of these activities, in order to include this information in the cost/benefit analysis.

Adaptive management

The project demonstrates a reasonable level of short-term adaptive management in its formulation and implementation.

In terms of project planning, the PPR-I indicates that changes were made in the formulation of the quantitative targets per year during the start-up workshop. This change was caused by a delay in approving the project and the lag that this caused relative to sowing periods that should coincide with the rainy season.

Finally, in year 2, the project hired Dr. Luz Esther Sánchez as technical advisor for component 1. According to the members of the Implementing Team, she made a series of recommendations on planting methods, the objective of which is to increase the competition between propagules and thus increase growth rates and vigor among the survivors. In addition, he made recommendations to increase leaf litter and substrate retention in between the developing seedlings.

4.3.2.- Component 2

The review of the existing documentation and the visits to the actors allowed to verify the general compliance of the results of component 2 in the project. A review was made based on the indicators of PRODOC finding the following.

4.3.2.1.- Number of development plans, provincial and municipal that incorporate the ABE.

Process that considered:

1. Review of development strategies.
2. Meetings of the productive sector and the government agencies that operate in the area.
3. Training for the participating groups (government representatives, political organizations, CAM, journalists, specialists) in the following topics:
   - Impacts and adaptation to CC
   - Strategic ecosystems
   - Adaptation Based on Ecosystems
   - Economic valuation
   - BASAL-PVR

This process according to the progress reports was completed in two provincial development plans and six municipal plans with the EBA incorporated. Of the copies of these provincial plans there is in fact mention of the EBA, however, considering the way in which the indicators of the PRODOC Logical Framework are defined, the mention in the provincial development plans of Mayebeque and Artemisa obtained after the mission demonstrates the fulfillment of the goal given that the mere mention of the conservation of mangroves as a measure of adaptation to climate change would allow the goal to be met.

Given that the plans mention the EBA but do not establish specific work activities, it is recommended that mechanisms be established to evaluate every six months the specific actions in the provincial and municipal plans that are carried out to implement the ABE approach in their respective territories as a better measure of the impact of the project in this sense, which is documented and compiled verifiers that can be shared during the final evaluation of the project.

One element that should be mentioned and highlighted is that the recent approval of the National Plan for tackling climate change locally known as “Tarea Vida” represented a huge opportunity for the project, because three of its five objectives speak specifically on issues related to the scope of the project “Manglar Vivo” and one mentions the mangroves as a means of adaptation and coastal protection. As the” Tarea Vida”, a National policy in Cuba was evident during all visits and interviews Assessment Mission, actors at all levels know

and understand the importance of the task LIFE and recognize that the project represents a means to implement at least some of the important principles of this initiative.

4.3.2.2.- Number of municipal and provincial governments with knowledge management systems incorporating the EBA.

The project has developed a model for monitoring and evaluating its management with all the information produced by the project, in order to ensure that local and municipal governments have access to all products produced. The evaluation team felt that these developments are very important and requested to know the knowledge management system, but due to time constraints it was not possible to access it.

According to the interview with the Project Manager about the management system, it was felt that the system that provides access to information is good and necessary, but not sufficient, since it gives the impression that it does not necessarily allow to made better inform decisions to the authorities of the municipal or provincial governments.

A knowledge management system should provide information to facilitate decision making and also provide training to technical representatives of provincial and municipal governments, training for use of the resources provided and established by the project once it ends. The evaluation team suggests:

- Develop a file of evidences or verifiers of each of these products.
- Study the possibility of transforming the current information database into a mechanism for the evaluation of status and decision making for provincial and municipal authorities.

As a reference, the products identified with the implementing team are presented as part of the achievements for this indicator include:

1. Instruments developed according to the inputs of the evaluation team.

- 2 Agreements (University UH-FCOM and UNAH)
- 4 Training classrooms (Batabanó, Cajío, Artemisa and Mundo Latino)
- 2 Educational-communicative workshops
- 2 Electronic bulletins
- Internet spaces (AMA, INAF, IES, and local sites)
- 8 Publications
    - Manual of Forest Nurseries for the Restoration of Wetlands (2017)
    - Manual of Forest Nurseries for the Restoration of Coastal Ecosystems (2017)
    - Forest Nursery Control Notebook
    - Article "Relocation of the fern Maxonia apifolia"
    - Article "Characterization of vegetation, coverage and salinity in mangrove forests south of Güira de Melena, Artemisa, Cuba".
    - Brochure "Planting Niches"

- Invasive Exotic Species management plan
- Abarema aureum management recommendations.
- EBA Brochure (in progress)
- Characterization of the Regional Population Framework (ongoing)

- 1 Educational Kit (book and board game)
- 1 Database with documents and products reached by the Project at present.
- Participation in 10 Scientific Events in Cuba.

2. Design of environmental knowledge socialization system (Master thesis FCOM)

3. Elements for the design of the integrated knowledge management system that incorporates the EBA in each territory.

4. Two Provinces (Mayabeque and Artemisa) and 6 municipalities with knowledge management systems report by the team. It could not confirm its existence, but it was clarified that the reference was to the database project outputs.

5. Training in mangrove management and health issues for 33 workers, 15 forest technicians and 17 students.

4.2.2.3.- Number of community members (men and women) addressing environmental and adaptation issues (local volunteer groups).

The project implementation team or Project Management Unit (UMP), presented as its main results the following list of products related to this indicator;

1. 19 settlements and 9 Popular Councils promote the formation of volunteer groups and community leaders that deal with topics related to the mangrove forest or the management of swamp forests.
2. 4 groups of volunteers
    - Surgidero de Batabanó (with 16 members, 9 women)
    - Cajío (with 10 members, 2 women)
    - Mayabeque Beach
    - Fisheries Federation (Playa Majana) with 6 participants.
3. Training and prevention actions by coastal communities. The following events have taken place:
    - Climate Change Course and my community.
    - Preparation for volunteer activists.
    - Exchange with the members of the Local Development Groups.
    - Follow-up to the South Dock and the mangrove areas.
    - Preparation about the ”Tarea Vida”.

The number of activities presented allows concluding that the indicator would be fulfilled; however, it is recommended in light of the future final evaluation to take the following actions:

- Have a file with verifiers of these activities, including lists or memories of the actions taken by these groups or of the reports and materials presented during the trainings with the respective participant lists.
- It is recommended in the next two years to monitor the number of actions that these working groups, popular councils or settlements have carried out as a consequence of project management in favor of the application of the concept of Ecosystems base adaptation (EBA).
- Conduct a survey and compare with the survey originally made at the beginning of the project to assess the level of knowledge and public awareness through the ex-ante, ex-post evaluation method to measure the impact of the project.

Separately, the EE-EMT assessed the degree of understanding of the communities in the two provinces through participatory workshops in which representatives of various institutions, ages, with the inclusion of children of secondary education and primary and sectors in each province, related to the project. Details of the methodology, participants and results are detailed in Appendix 4.

Based on the level of interest of the participants in the workshop, their answers and the conversations that occurred when presenting the results, we concluded that there is a very good level of ownership of the project, a good level of knowledge about the benefits that would result from rehabilitation of mangroves as a measure to combat climate change. At the same time, there is awareness that there is still much to do, and their expectations and proposals are in line with the direction of this project. In such a way that fully completed the project, it is likely that communities feel empowered and receptive to continue incorporating EBA in their environmental management strategies.

4.3.2.4.- Number of local schools with study programs that incorporate the topics of adaptation to climate change.

It was not possible for the evaluation team to see all the education materials reported, although most of them, and the communication sources of the project that the PMU reported, therefore the information presented below was not verified in its entirety. According to the members of the PMU, progress in this component corresponds to:

1. 34 schools that include CC and ABE subjects in the curricula, namely:
   - 5 mix centers
   - 18 elementary schools
   - 4 secondary
   - 1 pre-university basic science
   - 6 municipal university centers
2. 62 teachers trained in schools in the provinces of Artemisa and Mayabeque, through methodological training on adaptation of CC and ABE subjects for the study program.

3. Plan of activities and methodological work in 11 elementary schools with "Circles of Interest" (promote vocational interests) in mangrove theme (5 in Artemisa and 6 in Mayabeque).
4. Environmental education workshop in Batabanó primary school, as a generalization pilot to other schools, to generate best practices and develop skills

During the assessment mission could visit and talk with at least two professors benefiting from school activities. In addition, one of the teachers that keeps circles of interest and several of her students participated in a workshop organized in communities. Regarding the participation of schools it must be said that the area has a range of schools organized by the Ministry of Education and coverage developed by the project includes 16 elementary schools, 15 secondary schools, 3 universities and municipal pedagogical institute. However, for reasons of time it was not possible to verify their work in all cases. The case of the Pedagogical Institute was analyzed and accepted by the evaluation team as an example of a higher education center.

It was considered that the work seems complete, but requires instruments to formalize the achievements to the present. For example, the project should have letters of commitment from schools that formalize the receipt of educational instruments or training, as well as the formalization of changes in the curricula of schools that should be formalized before the Ministry of Education or its provincial representative to ensure the sustainability of efforts.

4.3.2.5.- Number of materials for dissemination and awareness on issues of climate change adaptation, produced by the local media.

In terms of specific products were verify the existence and use of at least the following elements;

1. 6 audiovisual materials, which included:
    - "Cambio de Tiempo", 2015. This is rather a documentary for television about the project, its purpose and the expected benefits.
    - "Bosque Perdido", 2016, a television program focused on the social and environmental impact of the degradation of the mangrove forest and justifies the existence of the project itself.
    - "Creciendo", 2016 (diag. Social sensitivity, environmental education, mangrove planting, institutional strengthening). This television documentary shows the techniques of mangrove planting that the project does and the general importance of the ecosystem.
    - "A Leda", 2016 (Life and Work of Dr. Leda Menéndez), this television documentary focuses on life and work in the mangroves of the renowned Cuban scientist Dr. Menéndez and who has become a national inspiration about the importance of this ecosystem.

- Video Clip "Manglar Vivo". This is a “reggaeton” video clip of a Cuban artist that seeks to reach the community of young adults and adolescents about the mangrove, its importance and the effect of climate change, highlighting the protective role of the mangrove swamp.
- Audiovisual material on mangroves and their protection, which is being incorporated by the Producer Mundo Latino into other initiatives and audiovisual projects in Cuba, for example, they are working on communication material on the "Life Task" and part of the "Footage" is being used "Raised with the Live Mangrove Project.

2. 4 local TV programs and 5 national broadcast programs produced.
3. 13 local radio programs production, 2 of them in provincial stations, and 11 in local radios (6 in Mayabeque and 5 in Artemisa).
4. 3 articles, 2 in the provincial press and one in the national press.

The evaluation team interviewed Mr. Omelio Borroto, Director of Mundo Latino, a Cuban television production house that already has more than 500 documentaries in various areas of knowledge. The interview was conducted in the classroom set up by the “Manglar Vivo” project at the headquarters of Mundo Latino, to promote these videos. The interview allowed knowing the perception of the producer about the project.

According to Mr. Borroto, the partnership with the Living Mangrove project has brought two important advantages. First, the project has provided a lot of information in an organized way to build good scripts. In addition, it is a project that integrates environmental and social issues. Finally, it is a project with resources and little bureaucracy so facilitate the rapid production of materials and create synergies with other projects for mutual benefit (for example, by joining resources to visit areas and make recordings).

During the interview some of the materials generated by “Manglar Vivo” , in particular two short documentaries and a video clip were shown. The materials seem very good quality and were suggested generally use more colloquial language to facilitate compression to all education levels. However, they are considered excellent communication tools.

If these results are compared with those expected life of the Project:

1. 17 audiovisual products (TV series, documentaries, multimedia)
2. 3 local TV programs.
3. 5 local radio programs.
4. 2 articles in the local press on adaptation issues

It is clear that in terms of specific results have been achieved almost entirely and resources originally programmed most of the results to the life of the project. If we consider the total of audiovisual and TV programs as audiovisual products, all the results would have been covered in the life of the project.

The only recommendation on this indicator is:

- To conduct a hearing audiences evaluation and make measurements via surveys of the impact by specific audiences that should be identified.

General comments on the evaluation process in component 2

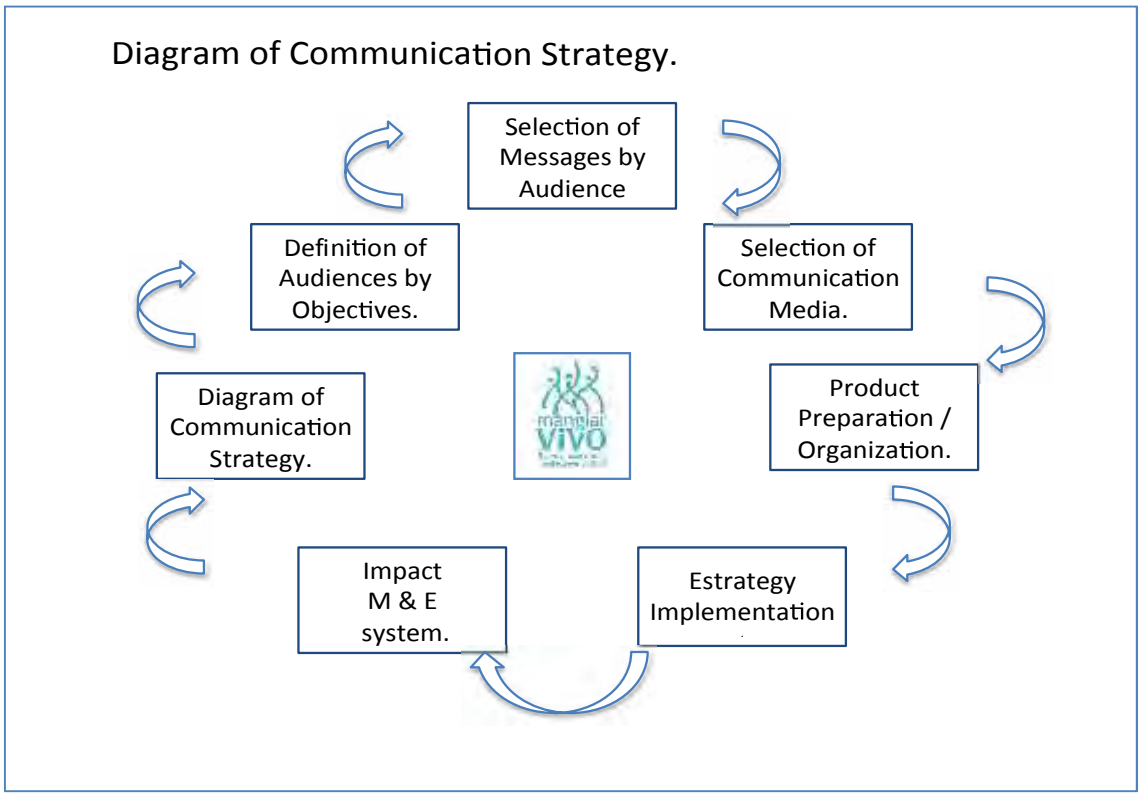
There is no doubt that the project team has done a very effective effort in producing communication materials and stimulation of stakeholders to achieve the goals set by the project. However, it was evident during the mid-term evaluation process that an additional effort is required in the next few years before the completion of the project to have a successful final evaluation of the project. The MTR Evaluation Team set out therefore take the following measures follow:

1. Make a strategic analysis for the communication and impacts of the project.

It requires retake existing information and document management process to identify project in the following order (Figure below):

1. Definition of communication objectives and training.
2. Establishment of the main audiences.
3. Establishment of messages by audience in particular.
4. Select the most appropriate means of communication per audience.
5. Selection of existing products or possible development of new products if deemed necessary.
6. Establish a monitoring and evaluation system to measure the results and their impacts

Figure 7. Scheme that illustrates the steps to follow in a suggested communication strategy for the Living Mangrove Project



A notable advantage to implement this recommendation is that the project already has a large number of mechanisms and products that can be used directly, as well as enough time to prepare new ones if identified as necessary. The ordering and use of these mechanisms will allow a greater efficiency and effectiveness of the communication and training process.

The existence of indications of unforeseen impacts was evidenced during the evaluation, for example the development of educational and training activities in the absence of the project team or without resources provided by the project. At the same time, it was mentioned during visits continued use of educational infrastructure, communication materials and preparations education offered by the project in activities that were not promoted or financed by the "Manglar Vivo" project. These are positive evidences of the impact of the project, however, they are not properly documented and systematized, possibly because the PRODOC indicators are exclusively performance indicators.

2.- Collect tangible evidences that show the achievements obtained by the project.

During the assessment mission verifiers commitments to communities and schools and universities they were requested to validate the results mentioned by team members or by

interviewees or workshop participants. In some cases, for example, universities mentioned that there are two cooperation agreements; however, in some cases appear to be missing specific verifiers.

The evaluation team interpreted this as a reflection of the enthusiasm of the team to progress with work and not consider each step the need to document the results with verifiers, which can be caused by one more of the following factors: (a) lack of human resources or time, (b) lack of training in project management, and (c) PRODOCs little consideration of this process during project implementation.

Product of this analysis was recommended:

- Design a monitoring system for PRODOC and its implementation that guarantees having verifiers for all indicators.
- To collect verifiers of all achievements to the present.
- To consider complementing the Logical Framework with viable performance indicators to obtain in the rest of the life of the project.
- To consider the possibility of AMA-CITMA collaborating by placing a part-time official (50% of its time), dedicated to ensure the follow-up of the matrix of project indicators.

Currently M & E monitoring is a function of project coordination, but in our opinion there should be additional support given the large number of activities that require operational follow-up to obtain verifiers can easily distract the coordination of the strategic or sacrifice the availability of all documentation that will be required in the final evaluation.

3.- Establish mechanisms to measure the impacts of communication strategies and project ownership.

To accomplish this, as explained above, it is recommended to supplement the ML PRODOCs with impact indicators and gather information to allow verification and measurement. Appendix 9 includes a ML suggestion that includes impact indicators.

4.3.3.- Component 3

This component seeks to ensure the effectiveness and sustainability of adaptation investments by establishing a facilitating environment at the regional level. With the fulfillment of component three, the effectiveness and sustainability of adaptation actions must be ensured by establishing a favorable environment at the regional level. It focuses on two fundamental products: institutional strengthening at the government level (six municipal and two provincial governments), control organizations and governmental supervision bodies (Rangers and Coastguard corps) and the productive sector (Fisheries Inspection Office and forestry sector mainly) and the estimation of the cost - benefit ratio of the application of the Ecosystem - Based Adaptation (EBA) approach by governments as

the main measure of adaptation. If the economic valuation is adequately achieved, this will be a fundamental component for the long-term sustainability of the project and its extension to other areas.

3.1 - Consolidated information about the costs and benefits of ABE available to decision-makers and planners

The economic valuation will be carried out to establish the costs and benefits of the EBA at the landscape level. There is a great gap in the knowledge of the economic value of ecosystem services of coastal ecosystems in Cuba, which makes it difficult to identify the potential economic cost of the impact of CC and human activities that degrade these ecosystem services and reduce the resilience of these systems, and its value is underestimated by decision makers and controlling entities.

The aim is then to carry out studies to fill these information gaps and thus to know the possible economic impact that the CC may have on local communities (by gender and age) and how this can be mitigated with an EBA approach. In addition, the study aims to establish a comparison between the costs and benefits of possible interventions to be developed in the coastal zone, including 1) EBA approach (current project) 2) Construction of retaining walls or other structures 3) Relocation of human settlements and associated infrastructure to the interior of the coast. This result will allow decision makers to be able to establish the ecological, social and economic costs of different management decisions, so that the EBA approach can be applied knowing its impact in the short and long term.

The information presented in these studies and the ability to conduct similar studies in the future will equip decision makers with tools to make decisions about the EBA approach to address the CC based on economic arguments and increase local support for these decisions.

3.2 - Strengthened institutions (municipal and provincial governments, Ranger Corps, Coastguards and Fisheries Department) that support ABE actions, within the structure of updated and actively implemented action plans.

Currently in Cuba provincial and municipal governments must include in their development plans measures to adapt to the effects of climate change. The project contributes effectively to the fulfillment of this governmental directive, contributing to the adequate support of the EBA approach in the coastal areas under its administration.

The development of knowledge management systems will also contribute to its effective implementation; this includes monitoring the progress and impacts and systematizing the lessons learned.

According to the logical framework, the project provides logistical support for the ror knowledge management by institutions in the academic sector (IES, INAF) to the productive sector (forestry companies) as well as the elements to determine the state of legal protection of the mangrove at national level and which will have strict protection at the local level.

The success of this component was established through three indicators:

1) The frequency of training activities and technical support to coastal communities carried out by the provincial and municipal governments to incorporate the EBA.
2) The frequency of the inspection activities to the coastal areas carried out by the provincial and municipal governments to incorporate the EBA.
3) Number of studies and methodologies carried out to estimate the cost - benefit ratio of the application of the ABE approach, available to planners and decision makers.

The first indicator takes into account the frequency with which the training and technical support activities to coastal communities are carried out by local governments in order to incorporate the EBA approach. The second is related to government control activities and refers to the inspection activities carried out by the municipal and provincial governments to incorporate the EBA approach.

All the institutions involved in the project actions and the EBA approach (Provincial and municipal governments, Ranger Corps, Coastguard and Fisheries Inspection Office) must come out strengthened and with case studies, new regulations and methodologies.

The third indicator of success will measure, because it has not yet been established, the acquisition of a new working tool, through the economic valuation that will allow them to estimate the costs and benefits of the EBA approach, to make it available to decision makers. There are no baseline precedents in any of the indicators.

Progress of results

Among the most relevant results are the following:

<u>Indicator 1.-</u>

- Elaborated guide for the inspections with EBA approach, which is in validation as a work instrument for the provincial and municipal governments.
- Concluded the legislative compendium related to the protection and sustainable management of coastal ecosystems.
- Three trainings related to the current regulatory framework, and 3 others in prevention and confrontation of forest fires were done.
- 113 prevention actions developed in coordination with local governments to prepare communities for the critical period of fires.

Indicator 2.-

- 3 comprehensive inspections were carried out, involving the regulatory authorities of the territory; as well as, 83 maritime and 180 terrestrial tours in function of supervision, all of them have been favorable to the ecosystem restoration process and the sustainability of the ABE with the alliance of the Ranger Corps, Coastguards, State Forestry Service and the Fisheries Departments.

Indicator 3.-

- Completion of the information survey for the baseline of the economic valuation studies of the entire coastal strip and a map with the information required to carry out the economic valuation studies.
- 4 trainings were carried out 2 in provincial governments and 2 in municipal governments for specialists from different institutions, increasing the number of people trained at the provincial and municipal levels.
- No studies and methodologies have been made available to planners and decision makers to estimate the cost-benefit of applying the EBA approach, reflecting some delay in the scope of this indicator. It is recommended that in the planning of the third year of implementation, special attention should be paid to the progress of this aspect.

Adaptive Management

With the objective of encouraging the accomplishment of the 3 component in the second PPR (2016), a new indicator is added: "Number of studies and methodologies carried out to estimate the costs and benefits of implementing the EBA approach available to decision makers, already identified as a result of PRODOC.

The activities for the consolidation of the information on cost benefits, despite the fact that the country has identified it as a priority, are behind schedule. It is necessary to build capacities at all levels, with greater emphasis on territories, which will be the future users and beneficiaries of this important tool to make decisions in the territories they administer.

The process of gathering information is complex, which requires time, which is why the training of personnel has been given a higher priority, the accompaniment by national institutions, strengthening the integration with the academy and stability of the work team.

4.4.- FINANCIAL AND ADMINISTRATIVE MANAGEMENT.

Execution of the Budget;

According to PRODOCs budget it is programmed component with a high level of intervention in Component 1 (72%), component 2 (12%), component 3 (9%) and management component approximately 6%, as shown in Table 4.

Table 4 .- General Budget Summary PRODOCs.

COMPONENT	PRODOC	PERCENTAGE (%)
Component 1	4,020,000.00	71.89
Component 2	700,000.00	12.52
Component 3	500,000.00	8.94
Management 4	372,000.00	6.65
TOTAL	**5,592,000.00**	**100.00**

The review of budget execution by component based on the data provided by the implementation team (Table 5) shows that;

- Component 1 is the most under-executed.
- Components 2 and 3 are executed above the PRODOC programming.
- To carry out the aforementioned points, it is recommended to make a strategic reprogramming process as a result of this EMT.

Table 5. Progress of the financial execution of the "Manglar Vivo" Project.

COMPONENT	Spent 2014	%	Spent 2015	%	Spent 2016	%	Cumulative 2014-2016	%	AOP 2017	%	Balance PRODOC	%
Component 1	0.00	0.00	334,890.33	50.40	417,722.61	54.31	752,663.34	51.78	1,218,100.00	73.76	2,049,236.66	82.40
Component 2	7,039.95	35.29	143,836.58	21.65	147,254.07	19.15	298,187.54	20.51	163,600.00	9.91	238,212.46	9.58
Component 3	6,577.27	32.97	101,931.04	15.34	166,350.04	21.63	274,906.66	18.91	202,500.00	12.26	22,593.34	0.91
Management 4	6,332.24	31.74	83,745.77	12.60	37,771.53	4.91	127,893.89	8.80	67,200.00	4.07	176,906.11	7.11
TOTAL	**19,949.46**	**100.00**	**664,403.72**	**100.00**	**769,098.25**	**100.00**	**1,453,651.43**	**100.00**	**1,651,400.00**	**100.00**	**2,486,948.57**	**100.00**

The project, in spite of its delays in financial execution, due to the evaluation team's opinion to external factors, has successfully managed to adapt and progress in the performance of its activities; therefore it is not considered that this compromises the results to the life of the project, rather represents a good opportunity to exceed the expectations of implementation in the remaining years.

It is worth considering the fact that even though the counterpart has not been valued for each component separately, according to the data of the counterpart contributions discriminated by their sources, it can be concluded that these are more focused on Component 1 . in contrast components where the counterparty is presumably lower have higher levels of performance.

The information reported by the Implementing Team on the counterpart is not discriminated by component. However, because it mainly salaries of forestry companies and the State Forestry Service and inputs for planting mangrove, we assume that this contribution corresponds mainly to component 1.

This means that by 2018 the implementation by component will have to be reviewed and the necessary arrangements made to guarantee the authorization of UNDP to have sufficient resources for the normal execution of the project in all its components from now until the end of the project. For which a strategic reprogramming exercise would be very useful.

The administrative management of the project in general is good but not escape limitations and administrative challenges mentioned in section 4.1. Two issues in particular draw attention during the mid-term evaluation, the first related to budget sub-execution at the time of the evaluation and the second related to over-execution of the counterpart budget.

Budget sub-execution;

There is a high budget sub-execution. In May 2017, latest data log on ATLAS system, show execution of US $ 1,453,451 was recorded, this represents a sub-foreclosing on programming and disbursements for the year 3 approximately 2,491,278. 2017 execution of US $ 1,300,000 was estimated. If the PMU manages to run the entire budget for this year, according to contracts and acquisitions in progress, the underspend would be reduced to approximately US $ 1,171,329 in accordance with the contract and procurement records displayed by the PMU. By September 2017, they were executed approximately US $ 727,834.00 according to ATLAS (information provided by UNDP) and approximately 840,000 US dollars according to contracts and procurement process, reviewed the implementation team. If these data are confirmed and recorded in ATLAS execution for 2017 to approximately 21% of the total budget will be reduced.

They have justified the delays in implementation in several facts that could be checked, for example:

1. The start of the project outside the fiscal year created difficulties for the initial implementation.

2. The agreements with the institutions responsible for the implementation of the project in the field took more time than expected.
3. The adjustments for the revision of the mangrove technical worksheets, nonexistent before the project, took time to be formulated and formalized.
4. Some particular equipment costs were overestimated during the design PRODOCs and resulted in significantly lower costs for the project, for example, tractors, boats, engines or vehicles.
5. There was a change in the importing agency during the course of the project, which required an initial period of training and learning both in the new importing agency that had no experience with the equipment and supplies for this project, as well as in the administrative personnel of the project, which generated arrears. In addition, the agency that initially handled acquisitions had both workload inevitably delayed procurement for this and other projects in the country. This greatly affected the purchase of inputs in 2014 and 2015.

In the year 2015-2016 there was a change in procurement policies. This change established that each government organization, including AMA-CITMA would be responsible for having their own import agency. The import agency of the AMA-CITMA, (EMIDICT) had no experience in the procurement of products and supplies that the project needed, for example, agricultural and forestry products and equipment, boats or other high-cost inputs that were not cataloged All this process of transition and learning has directly impacted the possibility of implementation in the years 2015 to 2017. For example, with the PMU, the documentation of purchase of a boat, water quality measurement equipment, as well as various materials for firefighting and the challenges involved were verified.

Even though specific recommendations have been made to overcome these challenges and speed up execution, it is clear that a delay of this magnitude is difficult to overcome by the end of the project date, so it is recommended to explore the possibilities of a free extension for the project from 6 months to a year. However, the PMU in recent conversations, after the evaluation and before the delivery of this report, has insisted that with the proposed purchases and accelerating implementation can achieve the full execution of the budget at the scheduled time. This recommendation is consistent with the possibilities of extending the time or financial effort to implement technical recommendations, especially in component 1 and 2, through a proposed strategic reprogramming.

Co-financing Implementation.

The first fact that drew attention was that the counterpart was not established in detail in the PRODOC. Throughout the document, especially the budget disaggregated with narrative was mentioned in multiple lines that the funds would be supplemented with sources such as; (a) human resources, (b) partially fueled, (c) office facilities and equipment, as the main

elements. However, the PRODOCs not establish a concise summary table and the amounts for institution counterparts.

To the date of mid-term evaluation it was identified that all of the funds offered in return, were already implemented and exceeded. Based on the documentation, a counterpart of US $ 5,044,400 was established for which no specific source was established. The PMU reported contributions for a total amount of US $ 7,184,567.93 (Table 6).

Table 6. Detail of the value and types of counterpart contributed by Cuba, discriminated by institution

Co-financed Entity Name	Type of co-financing	Amount co-financed at the date of authorization CEO (US $)	Amount actually contributed to the Mid-Term Review Date (US $)	Actual percentage (%) of the expected amount
Institute of Agroforestry Research (INAF)	90% salaries and 10% goods		$ 93,872.00	1.31
State Forest Service Artemisa (SFS ART)	90% salaries and 10% goods		$ 1,920,482.23	26.73
State Forest Service Mayabeque (SFS MAY)	90% salaries and 10% goods		$ 4,623,200.00	64.35
Environment Agency (AMA)	90% operations and 10% Wages and goods		$ 196,313.70	2.73
	TOTAL	**$ 5,044,400.00**	**$ 7,184,567.93**	**142.43**

The counterpart was contributed in different proportions by the following agencies: (a) Institute of Ecology and Systematics (IES) approximately 4.88%, (b) Institute of Agroforestry Research (INAF) approximately 1.31%, (c) Artemisa Forest State Service approximately 26.73 %, (d) State Forestry Service Mayabeque approximately 64.35%, (e) Environmental Agency (AMA) approximately 2.73%.

The data shows that forestry companies and the Ministry of Agriculture were the main contributors of co-financing. Additionally, due to the distribution of costs in these cases, forestry companies and their supervisors spend the most time on project implementation.

The main justifications for the advance execution of the counterpart were:

- State companies, faced with delays in acquiring equipment at the beginning of the Project, frequently provided support in equipment, machinery and labor.
- Salary reclassification prepared by the Forest Technical Service for workers in the mangrove. During the formulation of the project, the personnel working in the agricultural and forestry sector earned average of between 250 and 300 CUP per month. The reclassification of the work in mangroves, which obeys to the demands

of the work and to the difficulty of access to the mangrove, reviewed the technical data of work reaching a value of up to 1200 pesos per month. By quadrupling the salary for field labor, cofinancing was increased in particular for the positions that work in the field, for example of forestry companies, which represent a high proportion of the co-financing of most institutions except the AMA, this mainly in salaries

It is recommended that the support provided by the organizations involved continue to be provided during the second phase of the project in order to continue with the achievements so far reached and multiply them. Therefore, even though the counterparty has been exceeded, resources and inputs provided are as important to the successful implementation that will require by the end of project implementation.

4.5.- STEPS TO FOLLOW FOR THE IMPLEMENTATION.

This project presents a seemingly paradoxical situation has achieved a satisfactory compliance despite significant budget underspend. The following describes the factors that have contributed to creating these conditions, as well as the proposed measures to ensure the total execution of the committed budget within the established period.

The answer is complex and long because it has multiple factors. Although throughout the evaluation process evidence is given as to the reasons and follow-up measures are recommended, it is pertinent to summarize below the considerations discussed with the PMU in this particular regard.

In the first instance, budgetary under-execution is primarily due to the delay in the importation of equipment, which is coupled with over-execution of co-financing. It is correct to expect a higher level of field achievements if some equipment had been available for work, as an example, the chainsaws have not yet been acquired and had done so when the elimination of invasive alien species and rehabilitation of the forest were planned. of swamp would have gone faster. However, the active participation of government organizations, forest companies and local actors have compensated for this lack of equipment and justify the goals achieved to date are well justified. Moreover, some Cuban entities have lent their stocks teams to advance some of the activities.

The initial planning was made taking into account the major costs are incurred in years 2, 3 and 4, to face possible delays in procurement systems. To date, the project has had significant changes in expenses, for 2016 there was an execution of 769 thousand US $ and for 2017, base on PMU Information, it rose between 1,258 and 1,300 thousand US $, for more than 160% increase, readjustments of the plans for the following years ensure the expenditure of the remaining budget.

Recently, the project implementation unit informed the evaluation team leader at the end of December 2017 that most of the equipment has already been acquired and only delivery is pending to record the expense. It is very important that UNDP verify these levels of execution to formalize these progresses.

Considering, all the described aspects, as well as the additional considerations made by the evaluation team, which will represent additional expenses, it is expected that the changes produce the necessary acceleration to improve the budgetary execution and, if possible, increase the expected results in key indicators of some components, for example those related to the rehabilitation of swamp forests and communication issues. This is an urgent strategy for the implementation of a strategic re-planning to incorporate the recommendations proposed during MTE.

The Midterm Evaluation team has not had access to the specific details of the readjustments proposed by the PMU for the year 2018, because they are in the process of being approved. The interpretation of the PMU answers to questions related to project performance once acquired the equipment described above is to achieve at least;

- Have a communication strategy with better materials and better-established audiences, therefore with a greater impact than originally expected.
- An increase in the number of hectares under management of the Swamp Forest.
- Development of an intervention protocol for the rehabilitation of mangroves.
- Establish which interventions are most effective for the rehabilitation of mangroves.
- An increase in the number of rehabilitated hectares of mangroves.
- A better integration of the concept of EBA in the municipal and provincial development plans with specific actions.
- Have a record of impacts of different project outputs.

To confirm these expectations and to define more clearly the expected achievements, it will be necessary to develop the strategic re-planning process.

4.6.- EXECUTION OF THE PROJECT AND ADAPTIVE MANAGEMENT.

4.6.1.- Management Mechanisms

The Project has taken place in a highly variable environment. For example:

- The “Manglar Vivo” Project is immersed in a novel process called “experiment of public administration of the Artemisa and Mayabeque provinces”, which is pioneer in the country. At the same time, it must coordinate with the central administrations due to its funding nature (UNDP/AF).
- The project has gone through decisions and institutional changes that include changes in administrative and importing procedures. The latter is quite important

because most of the project's inputs are imported due the lack of suppliers in the country.

- The project team itself has undergone changes such as the change of director, the incorporation of a consultant and the entry of new technical personnel. Some of these changes happened only 6 months or less ago.
- Due to administration and project management mechanisms in Cuba, the project´s technical staff is assigned a job and responsibilities in the project, but they also maintain work responsibilities in the agencies where they belong to. Therefore they must continually balance the demands of the project needs and those of their own institutions.

In this context, it should be noted that the response and adaptation capacity of the project team is impressive and positive. The team´s adaptive capacity in the field, to address the challenges associated with the restoration of the mangrove, has also been evident. However, the recommendation to make a more formal process in component 1 is reiterated. This formalization will allow a better quantification of the individual effects of each of the field treatments that are being progressively incorporated.

In a similar way, work with the communities and with the organizations and forest companies has shown the team´s capacity to organize along the way the plantation technical specifications, and other administrative and technical processes necessary for the performance of the project tasks.

The adaptive and learning capacity shown by the project and its actors must be widely recognized and stimulated, as well as guided by close technical support from the participating agencies, particularly the AMA, CITMA and MINAGRI. This condition is a notorious advantage during the monitoring of these MTR recommendations.

4.6.2.- Project Planning.

According to the PMU and some of the project´s beneficiaries, the planning of project activities stems from each project component manager´s leadership. Component managers are responsible for engaging stakeholder representatives, with whom they coordinate directly.

The approach currently used is important but not sufficient and it is recommended that, to create sustainable conditions for the project´s management, an annual workshop with stakeholders be conducted. Such workshop would have two phases:

- A first phase for presenting and showing the previous years´ results and validating the scope of the results,
- A second phase for sharing, adjusting and validating the proposed work plan for the following year that has been prepared by the component leaders with their respective field partners.

The purpose of doing these exercises is to achieve full ownership of the process, create conditions for long-term sustainability and set commitments for the execution of the project and for the participation of stakeholders in monitoring and evaluation.

4.6.3.- M & E systems or project management.

The Project Management Unit indicated that the project has a database that compiles most of the documents and products completed or produced thus far. The database also grants team members access to work instruments and tools. However, there is no formal system for project monitoring, evaluation or adaptive management. Nor was it possible to access the database.

Importantly, despite the lack of a formally established M&E system, it is notorious that the project team prepared very well for the mid-term evaluation mission, framing its management and results in the PRODOC´s terms and indicators. This was achieved in spite of the short time that several of the PMU members have in their current roles.

It is recommended in the MTE that a project M&E system be established. Such system should be based on the PRODOC´s indicators, with the collection and organization of result verifiers being summarized by project objective as established in the PRODOC. But it should also expand to include and measure its impacts, as recommended in the proposed extension of the Logic Framework. Furthermore, it is recommended that a Knowledge Management System (KMS) is put in place and that bot the M&E and the KMS are used in the project´s adaptive management.

4.6.4.- Involvement of the interested parties.

It was observed and verified during the MTE that there is a broad understanding of the stakeholders of the issues promoted by the project and the relationship of the same with the national policies and with their own management.

Particularly in component 2 emphasis is placed on efforts to promote materials, classrooms and other communication mechanisms to achieve an important understanding of the parties. However, beyond the communication instruments, the level of participation and understanding of the project was evident during the consultation workshops held in the two provinces (Appendix 9).

The responses and proposals of the participants of these workshops demonstrate an important level of involvement of the actors. It will be important to deepen in this process. For example, that local actor becomes more actively involved in the formulation of work

plans in the future and in the monitoring of their implementation and results, as well as in monitoring and evaluation tasks.

The UNDP is an active and constructive actor in the development of the project, it was evident during the meetings and interviews, in addition to the observations of the evaluation team, that the administrative team in particular the person in charge of budget and procurement, has a very close relationship with the UNDP team.

The representatives of UNDP showed a clear management of the project, its terminology and the importance of institutional relations and their functioning mechanisms.

4.6.5.- Information and Communication.

It is evident that there are numerous communication tools and activities to promote the work of the project, both from the point of view of providing information in different formats, such as the provision of facilities for education and communication.

With the purpose of improving the efforts of using each of these available tools, through the design of a communication strategy process that allows to identify the following elements:

1. Definition of communication objectives and training.
2. Establishment of the main audiences.
3. Establishment of messages by audience in particular.
4. Select the most appropriate means of communication for each audience.
5. Selection of existing products or possible development of new products if considered necessary.
6. Establish a monitoring and evaluation system to measure the results and their impacts

Based on this process, it is recommended that in the years to complete the project, the use of the products that need to be developed to complete the work will be designed as well as the most effective use of the existing products

4.7.- SUSTAINABILITY

4.7.1.- Environmental Sustainability (component 1)

In the long-term national scale, it is anticipated that the activities of this project will mesh with those of the implementation of the Tarea Vida. Should this synergism come to fruition, the project would have the enabling conditions and the necessary support to give continuity to the restoration activities. In fact, the project has already worked on the implementation of mangrove restoration practices in Havana and in the province of Guantánamo. On the

other hand, this project should be more formally coordinated with the BASAL project and in the near future with other projects designed to restore the mangroves aquatic component, since these are fundamental for the balance and sustainability of the region's fishing resources.

At the local level, project components have been transforming the mindset of the region's inhabitants and the authorities to continue to rehabilitate the red mangrove and swamp forests. For example, according to Engineer Fernández Moreno, EAF Artemisa Technical Specialist, strategies for sustainability in your province are to (a) continue the work contained within the project by the EAF, (b) maintain within the Economic Technical Plan restoration activities; and (c) maintain the institutional support that guarantees the continuity of the financing for all the restoration work.

It is important to note that there is a greater awareness of the importance of the mangrove and IAS than of the coastal forests. Therefore, unless efforts are increased in the project, to raise awareness on the importance of coastal forests, actions on the latter are unlikely to be sustainable. These efforts should be included as part of the fulfillment of indicator 1.4 for the restoration of coastal forests, which is the indicator with less progress towards its goal in component 1. In particular, it is worrisome that the project is currently looking to generate income from the IAS harvest but there is no exit plan for when both Tropical Almond and casuarina wood is exhausted and villagers choose to harvest the saplings of those species of interest that have been planted and are under development in the coastal forests.

Another important aspect for sustainability is the incorporation of the dimension of adaptation to climate change in combination with mitigation strategies. An important product marketed by forestry companies is coal (especially from wood harvested during this project), which produces carbon emissions during both production and consumption. Therefore, it is very important to explore the possibility of quantifying the carbon balance of environmental restoration and the impact of emissions of its by-products as a first step towards producing and marketing carbon-neutral products.

4.7.2.- Social (component 2)

Component two is aimed at creating enabling conditions based on information on the development of ABE concepts for the effect of climate change in the southern area of the provinces of Mayabeque and Artemisa, as well as on local knowledge by both interested social groups, and by the authorities responsible for resource management in the two provinces and their six coastal municipalities.

It was clear from the review of the material and documentation provided by the project team that has largely fulfilled the purpose of developing tools for information dissemination.

There are means of work, classrooms established and / or equipped and in addition to audiovisual media, such as print materials. PPR reports and information provided by the project team said it has met and even exceeded the number of training events in the project area. They were a good knowledge and understanding of the authorities interviewed, technical institutions and interviewed enterprises and participants of the workshops and during field trips on the importance of mangroves, their functions and value to protect further evidenced of climate change.

An important aspect for sustainability, however, is the verification of overall achievement, for which a series of surveys is required to compare the results of the initial surveys, carried out by the project to determine the change in knowledge as a direct effect of project interventions.

On the other hand, it is very important that the municipal and provincial plans mention, the EBA and the importance of the mangrove, as confirmed in the documentation reviewed after the evaluation mission. However, it is necessary to verify that the actions and decision making of the authorities, as well as the activities and management practices of the different stakeholders in the project implementation area have changed. It is necessary to ensure that the project team monitors these changes and has verifiers prior to the final evaluation of the project.

4.7.3.- Institutional (component 3).

The social and institutional sustainability of the EBA approach to mitigate the effects of the CC is based firstly on the integration of this approach into the government development plans at the municipal and provincial levels, which promotes that the government is the first responsible for achievement among the agencies involved. This should contribute to the creation of a knowledge management system supported by the research centers linked to the project which guarantees an adequate flow of information for decision making from the government headquarters until the community.

Sustainability is based on the fact that they will be carried out by well-established permanent institutions in Cuba, which include the provincial and municipal governments, the Ranger Corps, the Coastguards and the Fisheries Inspection Office, while the existing community organizations will be the channels through which the information should flow.

An important premise for the sustainability of the project is the demonstration that the EBA approach has a better cost / effectiveness ratio, which is mentioned in components 2 and

3. Once the economic valuation has been carried out and its results have been duly widespread, it must be an extremely valuable tool for decision-making both in the intervention area and in other areas of the country with a similar situation.

4.8.- RISKS FOR THE SUSTAINABILITY OF THE PROJECT.

4.8.1.- Financial.

The main financial risks that were found were:

- Local organizations do not have the financial or technical possibility to maintain equipment purchased with project resources.
- Local governments or the organizations involved in the implementation do not have the necessary resources to maintain the equipment and replace it when necessary.
- Given that labor cost increase as result of the technical data sheets for mangrove workings, there is a risk that they will later be changed for different reasons, which could generate discontent among forest workers. This should be established with the relevant authority.
- The disproportion in the levels of financial execution by component found in the PMU could cause disproportion in the achievement of results in the rest of the life of the same.

4.8.2.- Economic Partners.

- There is a risk that a fall in the prices of export products such as coal discourages sustainable management and encourages the unsustainable use of the forest resources of the swamp forest or mangrove forests.
- It seems that the technical data sheet for work in mangroves has a fairly high remuneration compared to other fieldwork and even to professionals of higher academic level in Cuba. This has been one of the success factors in stimulating work on these issues and in these areas, but also poses risks to the sustainability of the project and its interventions if these conditions are not maintained.

4.8.3.- Risks faced with the legal institutional framework.

- As indicated in the corresponding section, mangrove management through EBA is a very long-term process, which must be adopted through an explicit institutional agreement that is currently non-existent at the national and provincial levels.
- In municipal or provincial development plans for mangrove conservation through EBA, we do not have evidence that there is a requirement for an operational work plan that clearly defines the activities, its associated budget and its verification and monitoring program.
- Continuous use of the knowledge management tool is required, which at this time is not available for decision making. Their absence jeopardizes the work in the mangrove forest by decisions taken without considering these criteria.

4.8.4.- Environmental.

- There are potential catastrophic climate change-related events such as storms or hurricanes that are becoming increasingly intense, and which could jeopardize the investments made by the project.
- Methods used to-date to rehabilitate or restore the mangrove has not been tested under current conditions. Therefore, there is a possibility that their effectiveness is not as expected.
- Due to the slow growth and natural stabilization of the mangrove forest, there is the risk that, after the project ends (i.e., 5, 10 or 15 years later), the essential conditions for their establishment cannot be ensured, thus there is uncertainty about the recovery of their resilience and fulfillment of their expected function of stabilizing the coast and reducing floods and other negative effects of CC.

4.9. RATINGS FOR PROGRESS TOWARDS SUCCESS.

Ratings were made based on the criteria established in the Guide for the Preparation of the Mid-Term Review in Projects Supported by UNDP and financed by the Adaptation Fund (AF). This table complements the table of performance indicators according to PRODOCs and the ML located in Appendix 9.

Criteria:			
1. 1. Monitoring and Evaluation	Ratings	2. Execution of the IA and EA	Ratings
Design of M & E at the beginning	MS	Quality of UNDP implementation	S
Implementation of the M & E Plan	S	Quality of execution of the Executing Agency	S
General quality of M & E	S	Overall quality of implementation / execution	S
3.Evaluation of Results (Outcomes)	Ratings	4. Sustainability	Ratings
Relevance	HS	Financial resources:	P
Effectiveness	S	Socio-political:	HP
Efficiency	S	Institutional framework and governance:	HP
Overall Results Rating (Outcomes)	S	Environmental	P
		Overall probability of sustainability:	P

Note: Ratings are based on 6-points scales as follows: Highly Unsatisfactory (HU), Unsatisfactory (U), Moderately Unsatisfactory (MU), Moderately Satisfactory (MS), Satisfactory (S), and Highly Satisfactory (HS). In terms of project sustainability, ratings are based on a 6-points scale that ranges from Highly Unlikely (HU) to Highly Probable (HP).

Overall, the design of M & E project is satisfactory and the performance of project implementation is satisfactory to highly satisfactory, while in terms of results is satisfactory (Table 7), based on the criteria of the evaluation team. Specific details on the performance of the activities can be seen in Appendix 9. On the other hand, sustainability is considered

highly probable or probable in all cases. Of course this does not mean that no lessons learned or specific recommendations to improve performance to ensure that all results are met by the date of the final evaluation.

V.- RECOMMENDATIONS AND LESSONS LEARNED.

Following is a synthesis of the project´s level of progress towards results and recommendations for corrective measures (if any) in the design, implementation, and monitoring and evaluation in the project´s final phase.

5.1.- RECOMMENDATIONS

Below are the main actions proposed by the MTE evaluation team and aimed at reinforcing the project´s benefits, along with guidelines for achieving the main objectives and an analysis of best practices to address the issues of relevance, performance and success. These recommendations have not been built by project components but rather by the most important processes for achieving the project's goals for the final evaluation with a criterion of excellence.

5.1.1 Measures to improve project design

- Complement the logical framework by adding broader assumptions, linking SMART objectives with threats and incorporating impact indicators.
- Carefully map all intervened areas in each stand and individually mark all planted or sowed propagules to improve monitoring and evaluation of plant survivorship and establishment and quantification of the effectiveness of the interventions, and to guarantee transparency at the time of the final evaluation.
- Hire an expert in experimental design to assist in the formulation of activities (project interventions), to allow:
    - Evaluating the most effective and efficient treatments and practices.
    - Determining criteria for each intervention.
    - Discriminating the success factors of each strategy.
    - Establishing mechanisms for replication.
    - Identifying mechanisms for long-term sustainability (see Appendix 8).
- Keep a quantitative and spatially explicit record of all other tasks performed in the mangroves, such as clearing channels and crown thinning and seedling removal of black mangrove, in order to incorporate this information into the management, monitoring and control protocols and in the cost-benefit analyses of the interventions.

5.1.2.- Measures to improve financial performance through;

- Make an effort to achieve acquisitions in the next two years to accelerate execution during 2018.
- Determine, in the fastest and most expeditious manner, the convenience of strategic re-planning based on the PMU and with a view to finalizing it.
- Ensure the review and adjustments of budget execution by components (strategic replanning), which allows achieving without limitation;
    - Accelerate the execution of Component 1, particularly indicators 1 and 3 without neglecting the scope of the rest of the indicators.

- Excel the development of the execution of Indicator 3 of Component 2 without neglecting the monitoring of compliance of all the indicators to the life of the project.
- To Speed up the agreement with the Agrarian University of Havana, to achieve the execution of indicator 3 of Component 3, without neglecting the monitoring of compliance of all the indicators to the life of the project.

- Look for mechanisms to accelerate results with external technical assistance in specific areas such as:
  - Establish a working protocol for interventions in the mangrove.
  - Design of the communication strategy,
  - Economic alternatives to increase social resilience
  - Mangroves Economic valuation and its application.
- Explore by the end of 2018 the possible need of a no-cost extension of the project.

5.1.3.- Measures to ensure compliance with the goals of the project life:

- Maintain the pace of work of all the components, but make sure to promote the following goals:
  - Harmonize and update the compliance data of indicators 1, 2 and 4 of Component 1, to determine in which it is necessary to accelerate the interventions.
  - Accelerate the development of the execution of indicator 3 of Component 2.
  - Accelerate the agreement with the Agrarian University of Havana, to achieve the execution of indicator 3 of Component 3.
- It is proposed to hold at least an annual meeting between the project team and the groups of interest or participants in order to:
  - Analyze the performance of the previous year
  - Formulate the POA for the following year.
  - Promote the commitment of the participating actors to the implementation of the POA and the monitoring of their actions.

5.1.4.- Measures to improve performance and verification.

- Obtain an expert in the formulation, administration and evaluation of projects that trains personnel on M & E systems, but that collects, at least, the following documents:
  - Files of all the documentation produced by the project.
  - Files of verifiers of the scope of all the results achieved by the project.
  - Files that document those results and impacts of the project interventions, which were not anticipated by the project nor were they produced by direct project investments.
- Ensure that each PPR report has verifiers for each indicator in a physical and digital manner.

- Appoint a member of the implementing team as responsible for maintaining an updated file of all the verifiers of each project indicator with a view to the final evaluation.
- Keep copies of all your files, products and verifiers in printed and digital format in at least two separate sites or servers, to guarantee the integrity of the information and make updates of the minimum information every two months.

5.1.5.- Measures to improve the impact and its verification.

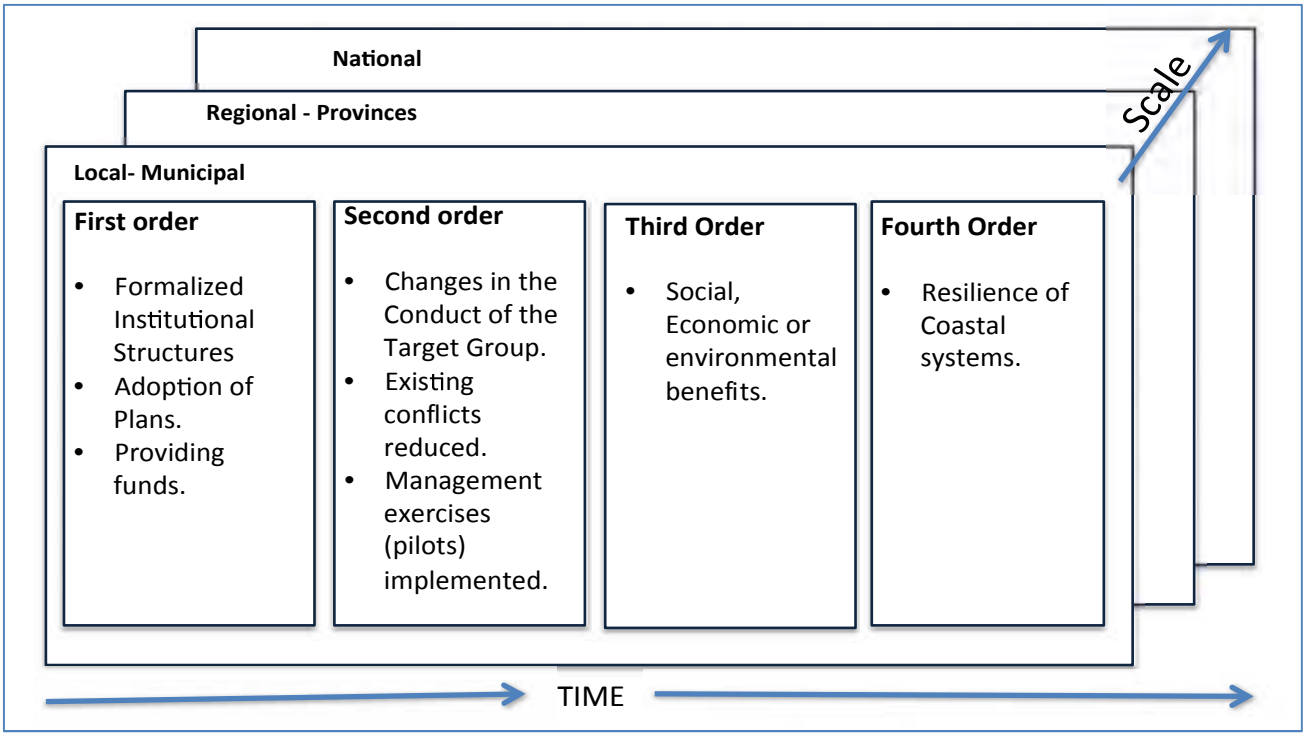
- Formulate a communication strategy, based on the recommendations of this MTE and reorient the use of existing means and materials, as well as the development of new products and means to communicate the scope and results of the Project.
- Measures to improve the understanding of the value of the ABE approach in the mangrove and its adjacent ecosystems through:
    - Relationship of the project works with the goods obtained from the mangrove or its adjacent ecosystems, particularly fishing, coal, forest and non-forest resources of the ecosystem.
    - It is necessary to develop a greater awareness of the value of swamp forests to achieve mangrove conservation objectives as part of the ABE approach, reinforcing associated products such as the production of honey, charcoal and other forest and non-forest forest products.
    - It is recommended to use economic valuation as an instrument of communication to impact the decision-making sector and local communities.
    - Use the results of the economic assessment to compare the ABE method with other coastal protection methodologies in Cuba.
- It is recommended that the team maintain copies of all its files, products and verifiers in printed and digital format in at least two separate sites or servers, to guarantee the integrity of the information and make updates of the minimum information every two months.

5.1.6.- Measures for the sustainability of the project impacts.

- It is required to formalize the intervention protocols to ensure the possibilities of replication and increase in the scale of implementation:
- Find that the “Manglar Vivo” Project is established as an useful experience for the implementation of the TASK LIFE and streamline its management.
    - It is recommended that economic alternative activities contribute to the carbon neutral balance. For example:
- Develop alternative productive activities in swamp forest with a neutral carbon footprint, which can be compensated with the recovery of the basal forest area.
    - Increase the efficiency of coal production to reduce its carbon footprint, and planting the mangrove until there is carbon produced with a carbon neutral footprint will mitigate the residual footprint. This carbon neutral footprint

could be certified and exported with an over-price that pays for mangrove planting or enrichment of the swamp forest.

- Incorporate the social resilience concept, which involves the economic alternatives that the project is currently working almost imperceptibly.
- It is recommended to make a classification of results according to the MCI methodology.



5.2.- LESSONS LEARNED

The main lessons learned and their value to reinforce the adaptive management actions that were identified as part of the project's mid-term are summarized below.

5.2.1.- About the project design.

- It is very important that the project formulation considers the upstream and downstream management effects of the intervention area; regardless of whether they are considered in the design of the interventions.
- Project indicators should include impact indicators to improve understanding of long-term sustainability potential.

5.2.2.- On the management and administration processes.

- The project must align the years of execution with calendar years from the beginning of its implementation.
- Procurement processes and their scope must be considered in planning.
- Communication materials and actions should be part of a strategy guided by the messages that you want to send and the audience that will receive them.
- Maintaining a physical and digital file with at least two copies minimizes the risks of information loss.
- It is important to maintain and update the data periodically, at least every 2 months.

5.2.3 On the implementation of the project.

- Revision of labor technical files (salaries) was a success factor to achieve the interest of the productive groups.
- Social resilience is not limited to the protective nature of ecosystems against climate change; it also incorporates attention to aspects related to the adaptation of the livelihoods of local people.
- The mangrove has shown a great adaptive capacity and has shown to respond positively to interventions for restoration.

5.2.4.- On aspects of coordination and ownership.

- Consulting with the organizations responsible for the management of resources such as (MINAGRI,) provincial and municipal (EAFs) during the design phase of the project results in a better understanding of the reality and more realistic and successful intervention proposals.
- Management problems must be addressed immediately, to avoid delays in technical execution.
- Having liaison with official appointment of specific representatives of the project in institutions and territories results in a better follow-up and appropriation.
- Regular meetings between UNDP, MINCEX, CITMA and the Project Management Unit have resulted in better management.
- Close financial monitoring by AMA and UNDP allows mitigation measures to be taken before the project ends.
- On-site monitoring and exchange with participating agencies (MINAGRI) by the PMU to ensure the achievement of the Project's objectives and control of the resources delivered
- The delivery of economic incentives by relevant government institutions to their workers to restore mangrove ecosystems and swamp forests has resulted in more effective fieldwork.

VI.- .GENERAL CONCLUSIONS

The Mangrove Vivo project has great relevance, given the significant threats posed by climate change, sea level rise, saline intrusion and hurricanes, whose consequences are accentuated in coastal areas with high deterioration of coastal ecosystems, such as the case of the coasts of the provinces of Artemisa and Mayabeque. That is why greater efforts are focused on rehabilitating mangrove ecosystems and swamp forests and thus the recovery of the environmental services they provide, as protectors of the coastline, which should involve many actors ranging from the productive sector and regulatory bodies, even governments and local communities. The results obtained so far have strong social, political, economic and environmental implications.

Country ownership is high, and is expected to increase in the future with the implementation of "Tarea Vida", there is broad participation of key stakeholders in the two provinces in the project and has achieved a strong interagency collaboration between industry productive, regulatory agencies, universities, local governments and community. The high level of involvement and commitment of stakeholders is one of the reasons for the project's effectiveness, sustainability and broad impact to date.

The Environment Agency (AMA) has fulfilled its role as Executing Agency in a satisfactory manner. Despite the changes of direction and youth of the team, the Project Management Unit (PMU) has maintained its focus on the expected results of the project, has carried out monitoring and evaluation activities diligently, has faced and managed the risks of effectively and have provided timely support and advice to the actors involved. UNDP has also fulfilled its functions as implementing agency effectively and continuously working with the PMU to face the challenges represented change import agency and the enormous difficulties in obtaining project inputs abroad.

It should be noted that the financial execution of the project at the half of its execution period is approximately 21% behind schedule due to the previous causes, it is expected that project execution can be completed in the life of the project, but the possibility of a Temporary extension without cost. Moreover, the need for financial re-planning is a need to establish the budget by components in the light of the recommendations of this MTE. By the other hand, it was identified that all of the funds offered in return, were already executed and exceeded (142, 34%), however the continuity and success of the project required as part of strategic re-planning to continue the co-funding commitment

The evidence shows that the project has mostly achieved the results committed according to the PRODOC. With an unspecified progress of impacts, in spite of the delays suffered in the budget execution that can be overcome with the follow-up of the recommended measures. However, there are still some important challenges: (a) complementing the logical framework, (b) modifying the experimental design in the formulation of project

interventions to evaluate the most effective and efficient treatments and practices, (c) discriminating the factors success of each strategy and establish the intervention protocols, (d) improve the communication strategy, (e) organize the information in a systematic way to ensure that the compliance verifiers of each component have greater visibility and (f) complete the studies of economic valuation of the services offered by the mangrove among other recommendations.

As detailed in the report, there are already many elements established to promote institutional, socio-political, financial and environmental sustainability, since Cuba has the appropriate social structure to carry out rehabilitation tasks in a sustainable manner, involve local communities and institutionalize and extend the lessons learned to other coastal communities.

The results of the Mid Term Evaluation, therefore, indicate that the project is well on track to achieve its strategic products and generate significant environmental benefits that should be extended to the country level.

VII.- APPENDIXES.

Appendix 1.- TDR without annexes

Electronic Version Attached.

Appendix 2.- Evaluation matrix.

Project Strategy	Indicator	Initial reference level	Goal to project life	Level in the 1st and 2nd PPR (self-reported)	Level in the 2nd and second PPR (self-reported)	Progress from the third period to the evaluation date.	Mid-Term Goal Level	Mid-Project Evaluation	Evaluation of the achievements obtained	Justification of the evaluation
COMPONENT 1	Mangrove area (ha) established along the coast between Batabanó and Punta Mora.	533	1290.6	85	418.5		645.3	503.5		It is very close to compliance with the goal to the EMT, it is very likely that when documenting the progress of the third year is fulfilled, it is required to maintain this level of activity to complete the goal of the Project life.
	Total restored area of mangrove ecosystems between Majana and Surgidero de Batabanó	144	1711.9	143.8	726.5		855.95	870.3		It is very close to compliance with the goal to the EMT, it is very likely that when documenting the progress of the third year is fulfilled, it is required to maintain this level of activity to complete the goal to the Project life.
	Total area of inland forests that borders the wetland with cropland	939	4,315.50	99.9	1401.2		2157.75	1501.1		It requires a greater effort to reach the goal but it is possible to accelerate and increase the actions already begun.
	Number of IAS management plans developed.	0	1	0	0		0.5	0		There is a proposal document for a management plan for 20 invasive species and control measures have been taken. However, the management plan committed as a result has not yet been completed, it is reported that it is 80% upfront.
COMPONENT 2	Number of development plans, provincial and municipal that effectively incorporate the EBA	8	8	0	8		4	8		It was possible to integrate into the strategies of two provincial plans and the 6 municipal development plans that include measures to adapt to climate change and specifically EBA measures. Specific activities need to be incorporates from MTE to the end of the project
	Number of municipal and provincial governments with knowledge management systems implemented that incorporate the EBA.	0	8	4	0		4	4		We have actively worked on the development of training and training materials and a monitoring system to monitor the activities. It is required to have a system that provides data on the management of the ecosystem for decision making, and how the information is transmitted to the inhabitants and decision-makers of the province or municipalities.
	Number of community members (men and women) belonging to local volunteer groups that address environmental and adaptation issues.	0	60		26		30	26		There are 4 groups with 26 groups (the proposed gender ratio is not yet reached) and it is necessary to build two more groups, it is considered very close to half of the project's duration. There is more data that has not been provided but was requested.
	Number of local schools with study programs that incorporate the topics of adaptation to climate change.	0	Elementary 16, secondary 1, University 3 and 1 pedagogical institute	0	34 Elementary Schools (22), Secondary (9), Local Universities (6), Training Institute (1)		Elementary 8, secondary 1, University 1 and 1 educational institute	34 Elementary Schools (22), Secondary (9), Local Universities (6), Training Institute (1)		The goal to the life of the project has almost been completely concluded, the challenge will be to continue at this level with its implementation and increase it if possible and where possible.
	Number of materials for dissemination and awareness on issues of adaptation to climate change, produced by local media.	0	27	7	33		13.5	40		The goal was reached average and exceeded is entirely feasible to achieve the project's life.
COMPONENT 3	The frequency of training activities and technical support to coastal communities carried out by the provincial and municipal governments to incorporate the EBA.	0	15	3	9		7.5	12		The goal of training in the different components of the Project has been exceeded, mainly in Regulatory Framework, forest management and rehabilitation of mangroves and in natural resource management or eradication of invasive exotic species (ISS) and fire control..
	The frequency of inspection activities to coastal areas carried out by the provincial and municipal governments to incorporate the EBA.	0	15	6	3		7.5	9		The Medium Term goal has been exceeded. It is very difficult to reach the life of the project.
	Number of studies and methodologies carried out to estimate the cost - benefit ratio of the application of the ABE approach, available to planners and decision makers.	0	3	0	0		1.5	0		No methodology was presented for the valuation of this indicator, a draft methodology has been developed to establish the cost benefit analysis of the application of the ABE methodology, a study and methodology is being completed, not available at the time of the evaluation. , but used in two exercises in third countries. Meetings and workshops were initiated to begin the collection of

Color Code for the evaluation of indicators

Green = Achieved	Yellow = Way to be Achieve		Red = Not on track to be achieved

Appendix 3.- Interview guiding questions

The MTE technical team of Manglar Vivo selected the following guiding questions for the evaluation:

- How relevant is the project and its objectives to Cuba's national priorities?
  Were the project´s objectives and the components clear, feasible and realistic given the scheduled time?
- Do the indicators meet the expected values according to the work plan and the schedule?
- To what extent did interested parties participate in the project design process? For example, local communities, local authorities, project implementers and affected groups or project beneficiaries.
- Were the capacities of the executing institution and the counterparts properly taken into account when the project was designed? Were they taken into account for the training and institutional strengthening plans of the participants in the implementation?
- Were the relevant lessons learned from other projects duly incorporated in the project design? What lessons and how are they reflected in the design? Could you indicate which other projects served to improve it?
- Were the association agreements duly identified and the roles and responsibilities negotiated before the approval of the project?
- Were the counterpart resources (financing, personnel, and facilities) and the project management mechanisms agreed upon at the beginning of the project? Was there legislation and regulation of support and support?
- Were the assumptions and risks of the project correctly articulated within the Project Document?

These questions had the purpose of framing an analysis of the feasibility of implementing the intervention model and its hypotheses or premises, between 2015, 2016 and the first half of 2017. It is proposed that the questions evaluate the following general aspects:

1. The project´s progress extent and its potential fulfillment during its final phase.
2. External and internal limiting factors and their impact on implementation.
3. Possible gaps in its initial design.
4. Emerging strengths and potential synergies with other processes that can magnify the impact of the project
5. Effects and impacts generated in the time elapsed from its inception to half of its execution (in 2017).

The questions were posed according to the interlocutor and their role in the Project in order to have an adjusted view of the added value of the current phase of the project, as part of the intervention strategy of the Government of Cuba to achieve processes to reduce the environmental vulnerability to coastal flooding through Ecosystem Based Adaptation (ABE) in the southern provinces of Artemisa and Mayabeque.

Appendix 4.- Purpose, methods and results of local stakeholder consultation workshops

Given the evaluation´s limited time and the large number of stakeholders in the project, we chose a collective work methodology that optimizes time and encourages the contributions of the participants in an organized and horizontal manner. This methodology consisted of grouping the local actors in two workshops, one for each province, and through a facilitation process, the perceptions of the participants about the project were extracted and prioritized. The methodology used is called Nominal Group Technique[7]. The workshop facilitation format ensures that all participants in the process have the same opportunity to speak and maximizes the number of people that can be consulted in a given period. In addition, it is a dynamic process that yields a concrete product in a short time and that benefits all participants by fostering a true exchange of information, unlike the unidirectional nature of individual interviews.

The workshops objective was to identify, from the perspective of the local stakeholders, what were the main achievements and challenges of the Manglar Vivo project. This allowed us to validate the perceptions about the impact of the project on institutions, actors and ecosystems to date. In each workshop, three questions were asked: (a) what do you think has been the greatest achievement of the project to date? (b) what do you think has been or remains the greatest challenge in the implementation of the project?, and (c) what is the most important action to tackle the most important challenge identified by the group?

Each question was solved separately using a dynamic which the participants worked individually and prepared between 1 and three answers to the question. Next, each individual presented their main response, which was recorded on a board with a consecutive numbering. The presentations were made in order and without allowing discussion or opinions of third parties about the contributions, to guarantee participation in a horizontal environment free of trials. Once a first round of contributions was completed, the process was reiterated as long as there were new contributions. The second part of the process consisted of a silent vote, in which each participant individually chose the 4 or 5 ideas that seemed most important to him/her and registered his/her vote, not knowing how the others voted. In the end the ideas with the highest votes were read out identified.

The workshops, held in Güira de Batabanó (Mayabeque) and in Cajío (Artemisa), were attended by 33 and 30 people respectively, representing 38 institutions. It should be noted that the Artemisa workshop was attended by five children from grades 10 and 11 of the "Circle of Interest on Mangroves"), who participated in some of the activities with the rest of the group or separately from the adults. The full list of attendees and their respective

[7] https://en.wikipedia.org/wiki/Nominal_group_technique

institutions can be found in Appendix 6. Both workshops lasted 4 and 5 hours (1.5-2 hours more than scheduled), reflecting the high level of interest of the participants.

For the exercise on the main achievements, 56 different answers were obtained (24 in Mayabeque and 36 in Artemisa), of which 16 stand out, which collectively obtained 50% of the votes in each site (Table 1).

Table 1, List of the main achievements identified in the workshops at the two provinces.

Province Main achievements	% votes
MAYABEQUE	
Mangrove ecosystem conservation	8.3%
Integration with the institutional and territorial framework	8.3%
Building of the classroom	6.6%
Fusion among different perspectives for wetland restoration	5.0%
Guarantee of life for coastal ecosystems	5.0%
Knowledge exchange between scientists and workers	5.0%
New projects	5.0%
Change of mentality from exploitation to conservation	4.1%
Reduction of vulnerability to coastal flooding	4.1%
ARTEMISA	
Access to the means for doing the job	8.7%
Favored mangrove and coastal forest ecosystems.	7.8%
Coastal protection strengthening	6.8%
Integration among all sectors and the community	6.8%
Including youth in the importance of coastal and mangrove management	6.8%
Reforestation and restoration of the coast outermost zone	6.8%
Strengthening of the forestry sector with government´s presence	5.8%

In order to make a comparative analysis between the two provinces, the 56 responses were categorized into six groups and the number of responses corresponding to each group in each province was quantified. The two provinces differ in their perception of achievements (Table 2).

Table 2. Percent of the answers on main achievements that were identified by the workshop participants and that correspond to each category. Bold indicates the most noticeable differences between the two provinces.

Category	Mayabeque	Artemisa
Change in mentality and learning	**38.8%**	19.4%
Institutional strengthening		**14.6%**
Governance	17.4%	14.6%
Infrastructure and quality of life improvement	**14.9%**	5.8%
Ecosystem recovery and conservation	**24.0%**	17.5%
Risk reduction	5.0%	**28.2%**
Grand Total	100%	100%

Among the actors of Mayabeque's workshop, the main achievement has been the change in the mentality of the actors and what they have learned about the value of ecosystems to protect them from climate change and biodiversity. In addition, there is a perception that their living standards have improved and that ecosystems are recovering. In contrast, for the local actors of Artemisa the greatest achievement has been the reduction of fire and flood risks, which affect them and ecosystems. They also consider the change of mentality and learning important, but at the same time they observe the institutional strengthening, especially of the ranger corps, as an important achievement. It should be noted that several members of the Forest Ranger Corps participated in the Artemisa workshop, while in Mayabeque more workers from agroforestry companies participated.

Regarding the past and future challenges of project implementation, the Mayabeque and Artemisa stakeholders identified 50 challenges (26 and 24 respectively). Of these, 6 and 9 challenges stand out respectively with a collective voting of approximately 50% (Table 3). It is highlighted that in Mayabeque, the group of attendees selected as their main challenge the construction in record time of the ecological classroom in which the workshop was held. However, it was not considered in the subsequent analyses, since it was a very specific matter and it had already been overcome.

Table 3. List of the main challenges identified in the workshops of the two provinces.

Province	Main challenges	% votes
MAYABEQUE		
	Building of the ecology classroom in record time (21 votes)	
	Resistance to change in ways of thinking in the coastal region	11.4%
	Lack of knowledge of novel restoration techniques	10.6%
	Producing comprehensive technical projects	6.5%

Province	Main challenges	% votes
	Rising awareness among decision-makers in the territory	6.5%
	Mangrove forests are trash dumps	5.7%
	Difficult access to restoration areas	5.7%
	Hard working conditions in the restoration areas	5.7%
ARTEMISA		
	Control of invasive alien species	9.6%
	That ecosystems may not get back what humans took from them	8.7%
	Lack of bibliographic resources on the mangrove project for the use of Circles of Interest groups	8.7%
	Educating people to avoid forest fires	7.7%
	Achieving recovery and conservation of native species in the area	6.7%
	Delivering [working]supplies on time	6.7%

A comparative analysis of the answers shows different points of view expressed between the two provinces (Table 4). For the Mayabeque stakeholders, the biggest challenge represents the change of mentality of different sectors of society; this includes decision makers, groups and individuals. For Artemisa stakeholders, this is also the most important challenge, but almost as important is the long-term sustainability of actions and ecosystems. In Artemisa, they are also aware of the challenge represented by the current state of the ecosystems for their recovery. The weakness in governance structures, on the other hand, seems to be a greater concern in Mayabeque than in Artemisa.

Table 4. Percent of the answers on main challenges that were identified by the workshop participants and that correspond to each category. Bold indicates the most noticeable differences between the two provinces.

Answer category	Mayabeque	Artemisa
Climate change and risk	4.1%	1.0%
Current ecosystem conditions	0%	**9.6%**
Work conditions	11.4%	6.7%
Governance weakness	**15.4%**	4.8%
Institutional weakness	5.7%	2.9%
Lack of information	16.3%	20.2%
Stakeholder way of thinking	**40.7%**	29.8%
Long-term sustainability	6.5%	**25.0%**

Participants proposed actions to face the most important challenge of their province were varied. In Mayabeque, the most important challenge is the resistance of the actors to change their way of thinking about the coast and participants proposed 14 different

activities to face it (Table 5). Four of these proposals received 50% of the votes. A fifth of the votes focused on a long-term vision, framed within the government plan called Tarea Vida. The other three proposals focused on the transfer of knowledge in different modalities and to different sectors of the population.

Table 5. List of actions proposed by Mayabeque workshop participants that would serve to tackle the challenge of changing the way of thinking of coastal inhabitants. Bold indicates those that add about 50% of the votes.

LIST OF PROPOSED ACTIONS	% votes
Implementing the TAREA VIDA	**21.1%**
Strengthening environmental education, outreach and community work	**15.6%**
Teaching everyone on the need to recover the mangrove	**11.1%**
Knowledge management for incorporating EBA (ecosystem based adaptation)	**6.7%**
Convincing stakeholders by showing concrete results	6.7%
Strengthening strategic alliances among decision-makers and communities to care for ecosystems	5.6%
Creation of audiovisual programs on the project´s accomplishments to incentivize community participation	5.6%
Integrate restoration and monitoring activities	5.6%
Teach decision-makers about the tasks underway	5.6%
Find and disseminate multidisciplinary evidence on how the coastal zone works	4.4%
Give higher visibility to studies on risk and vulnerability and of the benefits of the mangrove	4.4%
Demonstrate the mangrove´s recovery	2.2%
Create new ways for personal and family income that are nature-friendly	2.2%
House-to-house or family-to-family introduction of the ´project's benefits	1.1%
MOU with the 10 to fine contraveners	1.1%
Improve sources of employment	1.1%

For the challenge of controlling invasive alien species, Artemisa actors proposed twelve different types of actions. However, those that received the most votes focus on the felling and use of IAS (Table 6).

Table 6. List of activities proposed by Artemisa´s workshop participants to tackle the challenge of controlling Invasive Exotic Species (IAS). Bold indicates those that add about 50% of the votes.

LIST OF PROPOSED ACTIONS	% votes
Increase educational methods on sustainable management (that includes economic use) of IAS among Circles of Interest	**14.3%**
Log EIS and plant native species	**12.5%**
Incentivize use of IAS to satisfy population needs	**12.5%**
Create brigades and outfit them for exploiting IAS	**10.7%**
Clean Access channels	8.9%
Provide resources (tools, chainsaws)	8.9%
Carry out better management and eliminate EIS from forests	8.9%
Minimize IAS regeneration	7.1%
Eliminate Tropical Almond tree to give room to Cuban species	7.1%
Manual or mechanical control	5.4%
Ring trunks	1.8%
Manual Tropical Almond tree control (Vincent´s method)	1.8%

Based on the level of interest of the participants in the workshop, their responses and the conversations that were given when presenting the results, we conclude that there is a very good level of ownership of the project, a good level of knowledge about the benefits that would be derived of mangrove rehabilitation as a measure to combat climate change. At the same time, there is awareness that there is still much to be done, and their expectations and proposals are in line with the direction of this project. Thus, should the project is completed in earnest, it is very likely that the communities will feel strengthened.

Appendix 5.- Itinerary of the Evaluation Mission.

Date: 15 - 22 October 2017

1st Stage from 15 to 16

Detailed Work Program for the Mid Term Review Mission of the ¨Manglar Vivo¨ Project					
Day	**time**	**Activity**	**Place**	**Content and details of the activity**	**Participants**
15	Nestor (13:15), Marcia (Y)	Pick up evaluators at the airport and transfer to the Hotel.	Internacional Airport José Martí (terminal 3)	Lodging in hotel, exchanges on Program, delivery of folder with materials made by the Project, map with location of the proposed areas to visit and complementary information.	Luis David, Reinier, Representative from MINCEX José (driver)
16	9:00 – 10:00 am	Initial meeting of the evaluation team (EE) with officials of the UNDP Office.	UNDP Office	Pick up at the hotel at agreed time and accompaniment to UNDP	Goverment employees, Oficinas UNDP office, EE
	10:00 – 12:00 am	Meeting of the EE with officials counterparts of the project. .	UNDP Office	Presentation of the national entities where they explain the role they play in relation to the Project	PMU, MINCEX, CITMA (DRI, AMA), UNDP, local governments, CNGB, GAF, EPFF, IPF, UNAH
				General explanation of the project: Project conditions in its implementation, operation of the project, spatial scope of the impacts of the project and the beneficiaries, impacts so far, relevance with respect to national priorities	PMU, MINCEX, CITMA (DRI, AMA, UMP), UNDP, local governments CNGB, GAF, EPFF, IPF, UNAH
	12:00 – 2:00 pm	Lunch		After the meeting, the evaluators are accompanied to the bank branch to get cash. Time for lunch	Reinier, José (driver)
	2:00 - 5:00 pm	Meeting of EE with the Project Management Unit (PMU)	Meeting room AMA	Welcome by the director of AMA	Dra. Maritza García
				Intervention of scientific institution that is inserted in the tasks of the NP: Training staff and advice on forestry activities	INAF

				Role played by the CGB in the Project. (Impacts of the Project in the territory, actions carried out, sustainability of the Project).	Forest rangers
				Presentation of Mayabeque province results (Impacts of the Project in the territory, actions executed, sustainability of the Project)	Provincial Government Mayabeque
				Results presentation province Artemisa (Impacts of the Project in the territory, actions carried out, sustainability of the Project)	Provincial Government Artemisa
				Presentation of the work of the Mayabeque Agroforestry Company	EFI Mayabeque
				Presentation of the work of the Artemisa Agroforestry Company	EFI South Coast
				Presentation of the work of SEF Artemisa	
				Presentation of the work of SEF Artemisa	
				Presentation of the work of the Artemisa Agroforestry Company	EFI South Coast
	5:00 PM				

2nd Stage from 17 to 18

Day	Time	Activity	Place	Content and details of the activity	Participants
17	5:30	Pick up evaluators	Hotel		Javier (driver)
	7:00 am	Arrival of EE to Mayabeque Province	Municipal Government	Wellcome at Government Municipality Melena del Sur Welcome at Mayabeque Beach (Melena del Sur)	EFI, PMU, Representatives of the project in the territories
	8:30 -1:00 am	Visit to the intervention areas	Melena del Sur, Güines and Batabanó	Mangrove: areas in the process of restoration, areas certified by SEF (west and east of Mayabeque beach) Elimination of exotic species: Areas of elimination and control of EE (Embarcadero) Swamp forest: Areas under enrichment work with native species (Embarcadero, Los patos)	Ivan (Coordinator of the project in the territory), Cárdenas (EFI), Gualberto (EFI), members of the brigade (EFI), SEF, CITMA, PMU, CNGB, IES, INAF
	1:00 -2:00 pm	Lunch			
	2:00– 2:30 pm	Presentation of the protected Area ¨Golfo de Batabanó¨	Classroom for training in Batabanó	General characteristics of the area, general activities of the protected area (Impacts of the Project in the territory, actions carried out, sustainability of the Project).	Actors of the productive sector, the community, the protected area and the municipal and local government
	2:30 – 5:00 pm	Interviews with local actors according to the method suggested by the evaluators	Classroom for training in Batabanó	Activity proposed by the EE, where a group work workshop will be held with actors and beneficiaries in the territory so that everyone will have the opportunity to express themselves.	Members of the communities, students of schools, workers of the Company, CITMA of the 3 municipalities, popular council, PCC, groups of volunteers, forest rangers, teachers, nursery brigade, fishermen and ICRT
	5:00 pm	Back to Havana			
18	5: 30 am	Pick up evaluators	Hotel		PMU

7:00 am	Arrival of EE to Artemisa province	Municipal Government Forest Unit Cajio	Welcome at Government Municipality Güira de Melena Welcome in Playa Cajio (Güira de Melena)	EFI, PMU, Representatives of the project in the territories
8:30 -1:00 am	Visit to the intervention areas	Güira de Melena, Alquizar, Artemisa	Mangrove: areas in the process of restoration, areas certified by the SEF (west of Cajio, Cajio Viejo, east of Guanimar) Elimination of exotic species: Areas of elimination and control of EE (Cajio Viejo, alboretum, plan carpa) Swamp forest: Areas under enrichment work with native species (San Miguel, alboretum, plan carp)	Argudin (Coordinator of the project in the territory), Cárdenas (EFI), Gualberto (EFI),), members of the brigades (EFI), SEF, CITMA, PMU, CNGB, IES, INAF
1:00 -2:00 pm	Lunch (CNGB Cajio)			
2:00 – 5:00 pm	Interviews with local actors according to the method suggested by the evaluators	Training classroom in Cajio	Activity proposed by the EE, where the second group work workshop will be held with actors and beneficiaries in the territory so that everyone will have the opportunity to express themselves.	Members of the communities, students of schools, workers of the Company, CITMA of the 3 municipalities, popular council, PCC, groups of volunteers, forest rangers, teachers, nursery brigade, fishermen and ICRT

3rd stage from 19 to 22

Day	Time	Activity	Place	Content and details of the activity	Participants
19	8:00 am – 12:00 pm	Interchange between the EE and the PMU	Classroom Mundo Latino	Welcome by Omelio and presentation of several audiovisuals related to the project	Omelio Borroto, PMU
				Presentation of each component. Financial management. Point out of aspects that remained pending .. Clarify doubts and discussion of what was seen by the EE	PMU
	12:00 pm	Lunch			
	2:00 pm 6:00 pm	Exchange of the evaluation team with the PMU Preparation of the report of main findings	Classroom Mundo Latino Hotel	Presentation of each component. (cont) The EE works based on the preliminary findings report	PMU EE
20	10:00 am	Mission Wrap-up meeting	PNUD offices	Presentation of the EE	Staff members of PNUD, CITMA DRI, AMA and PUM
21	All day	Analysis of the information necessary for the preparation of the final report	Hotel	The EE Works for the final report	EE, PUM
22	All day	Organization of work for the preparation of the final report Evaluators return to their respective countries (pick up at 3:00 PM)	Pick up at hotel	The EE Works for the final report	EE (driver to pick upevaluators)

Appendix 6.- Listas de personas participantes de la Evaluación.

List of people interviewed during the EMT mission of the Mangrove Vivo project

Sitio	Fecha	No participantes	Comentarios
PNUD	16 de octubre de 2017. Hora 9:00	4	
AMA	16 de octubre de 2017. Hora 11:00	21	
AMA	16 de octubre de 2017. Hora 3:30	22	
Grupo acompañante durante la visita a provincia Mayabeque	17 de octubre de 2017	8	Todo el dia
Gobierno Municipal Mayabeque	17 de octubre de 2017	3	
Obreros de la forestal entrevistados	17 de octubre de 2017	8	En el camino mientras trabajaban
Area Protegida Golfo de Batabanó	17 de octubre de 2017	33	Participantes del Primer taller
Grupo acompañante durante la visita provincia Artemisa	18 de octubre de 2017	7	Todo el día
Gobierno Municipal Guira de Melena	18 de octubre de 2017	4	
Brigada forestal Cajío	18 de octubre de 2017	19	
Niños escuela primaria	18 de octubre de 2017	5	Participantes del taller
Cuerpo de Guardabosques y actores de la provincia	18 de octubre de 2017	27	Participantes del taller

Mundo Latino	19 de octubre de 2017	7	Documentales y presentacion de los componentes del proyecto
PNUD	20 de octubre de 2017	7	Presentación de las conclusiones preliminares

A complete list of all the information with specific by participants was reported in the excel file delivered separately by 13-11-2017.

PNUD 9:00 am

NOMBRE	ORGANISMO
1. Grisel Acosta	PNUD
2. Tomas Escobar	PNUD
3. Pedro L. Ruiz	DRI CITMA
4. María R. Moreno	PNUD

AMA 11:00 AM

1. Maritza Gonzalez	DPP-AMA
2. Mercedes Arellano	DPP-AMA
3. Maritza García	DPP-AMA (Presidenta)
4. José Manuel Guzmán	Coordinador Técnico de proyecto OIN
5. Gricel Acosta	PNUD
6. Yaiser Ávila	Coordinador Componente 1 OIN
7. Juliette Diaz	Coordinador Componente 2 OIN
8. Iván Martinez	CITMA AP Mayabeque
9. Alexis Argudín	CITMA Artemisa
10. Marta María Fleitas	Dirección CITMA Artemisa
11. Juan C. Perez	Coordinador EAF Costa Sur
12. Salvador Fortge	Empresa Forestal Mayabeque (Director)
13. Fara S. Carreras	Instituto de Planificación Física
14. Edel Elías Hernández	Cuerpo de Guardabosques
15. Wilfredo Muevi	Grupo Empresarial Agroforestal
16. Pedro Ruiz	DRI-CITMA
17. Tomás Escobar	PNUD

18. Reinier Samón Administrador de proyecto
19. Pablo Bachiller CITM Artemisa
20. Luis David Director de proyecto
21. Felipe Cárdenas Empresa Forestal

AMA 3:40 PM

1. Juliette Diaz Coordinador Componente 2 OIN
2. Yaiser Ávila Coordinador Componente 1 OIN
3. Aralis Ramos SEF Componente 3
4. Iván Martinez CITMA AP Mayabeque
5. Elio Lázaro Amador UNAH Mayabeque
6. Rodrigo Fernández EAF Costa Sur Componente 1
7. Juan C. Pive EAF Costa Sur Componente 1
8. Dialys Borroto CITMA Alquizar (Jefa de sección)
9. Juana Teresa Suarez INAF Coordinador en INF de componente 1
10. Edel Elías Hernández Cuerpo de Guardabosques
11. Fernando Jimenez DFFFS Coordinador DFFfS
12. Fara S. Carreras Instituto de Planificación Física
13. Gilberto Gonzalez EAFM
14. Julio C. Alvarez HAC, IES, Componente 1
15. Maritza Gonzalez DPP-AMA
16. Pablo Bachiller CITM Artemisa
17. Reinier Samón Administrador de proyecto
18. Gloria Porma SEF Mayabeque (Jefe)
19. Mercedes Arellano DPP-AMA
20. Luis David Director de Proyecto
21. Teresa Suarez Coordinador INAF
22. Felipe Cárdenas Empresa Forestal

Field trip to intervention sites. Date October 17 Time 7:30 - 7:00 PM

Field Trip participants

1. José Manuel Guzmán Coordinador Técnico de proyecto OIN
2. Luis David Almeida Director de proyecto
3. Marta Prado DRI-AMA
4. Teresa Suarez Coordinador INAF
5. Juliette Diaz Coordinador Componente 2 OIN
6. Felipe Cárdenas Empresa Forestal
7. Julio C. Alvarez HAC, IES, Componente 1
8. Yaiser Ávila Coordinador Componente 1 OIN

Municipal Government Melena del Sur

Taima Jimenez Vicepresidenta Admon Municipal

1. Carlos A. Ofarrill Funcionario Comité Municipal del PCC
2. Grace Gil Especialista CITMA Melena

Laborers of the forester interviewed on the road

1. Yamil Bello Director UEB
2. Gualberto Gonzaléz obrero
3. 6 obreros (se desconocen los nombres)

Gulf of Batabanó Protected Area (First workshop)

1. Yamila Alfonso Activista
2. Raul Gómez Cine Batabanó
3. Lázaro Suarez Activista
4. Idania Pavines SEF Mayabeque
5. Teresa Suarez Coordinador INAF
6. Lázaro Lliteras Flota marina
7. Saray Rodriguez Técnica de mangle
8. Elena Leyva Flora y Fauna
9. Pedro Vines Punto de Control
10. Yaneisy Febles Técnico Recursos Humanos
11. Zuleimis Marín Técnico Jutía
12. Jorge Luis Perez Técnico Ecosistemas Marinos
13. Felipe Cárdenas Empresa Agroforestal Mayabeque
14. Rosabelis Angotes Operario de Reptiles
15. Elaine Relona Económica
16. Maricela Pascual Dtra UGB Guines
17. Gualberto Gonzalez Especialista EAF
18. Madelyn Pau Técnico Areas Protegidas
19. Juliette Diaz OIN-AMA
20. Paulino Columbí TT CGB Melena
21. Zenaida Vazquez Tt CGB Batabanó
22. Bárbara Leyva Técnica avifauna
23. José Batista Especialista Flora y fauna Mayabeque
24. Martha prado Especialista Relaciones Internacionales AMA
25. Grace Gil Especialista CITMA Melena
26. José M. Gonzalez CT Mayabeque
27. Yaiser Ávila Coordinador componente 1
28. Rosalidia Aro Flora y Fauna

29. Julio Álvarez HAC IES
30. Marcia E. Rodriguez Flora y fauna
31. Oneisy Aguilar Pescahabana
32. José Manuel Guzmán Coordinador Técnico de proyecto OIN
33. Luis David Almeida Director de proyecto

Field trip to intervention sites. Date October 18, 2017

Field Trip participants

1. José Manuel Guzmán Coordinador Técnico de proyecto OIN
2. Luis David Almeida Director de proyecto
3. Mercedes Arellano DRI-AMA
4. Teresa Suárez Coordinador INAF
5. Juliette Diaz Coordinador Componente 2 OIN
6. Julio C. Alvarez HAC, IES, Componente 1
7. Yaiser Ávila Coordinador Componente 1 OIN

Municipal Government Guira de Melena

1. Alexis Argudin Esp. Medio Ambiente Gov. Prov. Artemisa
2. Caridad Rodriguez Jefa de Colaboración Gov. Municipio Guira de Melena
3. Jorge L. Barrios Defensa Civil. Gob. Municipio Guira de Melena
4. Alain Duque Director Agricultura Municipio Guira de Melena

Cajío forest brigada

1. Ana Chavez Especialista
2. Ester Quintana Jefe Brigada no 4
3. Odelys Sanchez Especialista Agroforestal
4. Jesús Rodriguez Jefe Brigada
5. Hiosvany Marin Obrero
6. Fabiola Perez Especialista SEF municipal
7. Juan Ortega Especialista Silvicultura
8. Leandro Lázaro Circulo de Interes de manglar
9. Dialys Borroto CITMA Alquizar
10. Alain Duque Director Agricultura Guira de Melena
11. Vicente Nuñez Jefe de Brigada Forestal Guira de Melena
12. Juan Perez Coordinador EAF Costa Sur
13. Yeliannis Pereira Auxiliar de limpieza
14. Daymi Piedro Vivero Forestal
15. Caridad perez Vivero Forestal
16. Kenisleidi Alonso Vivero Forestal

17. José E. Alba Obrero
18. Reinier Godoy Obrero Agropecuaria
19. Ricardo Pozas Chofer Proyecto Manglar

Ranger Corps Cajío (second workshop)

Niños escuela primaria

1. Stephanie Rodriguez Circulo de interés
2. Marlon Gonzalez Circulo de interés
3. Victoria de la C Rodriguez Circulo de interés
4. Dianet Almenares Circulo de interés
5. Cinthia García Circulo de interés

Adultos

6. Mercedes Arellano AMA
7. Ana Ibis Chavez EAF
8. Mercedes Ramirez Maestra escuela primaria
9. Jesús Abrante Obrero
10. Fidel Obrero
11. Fabiola Perez SEF Municiio
12. Rodrigo Fernandez EAF Costa Sur
13. Osmany Marin JD Cajío
14. Kenisbidy Alonso Vivero Forestal
15. Esther Quintana Jefe brigada
16. Dainy Piedra Vivero Forestal
17. Leandro L. Marin Círculo de Interés
18. Teresa Suarez Coordinador INAF
19. Edel E. Hernandez Coordinador CGB
20. Juan C. reyes Coordinador EAF Costa Sur
21. Alaxis Rosales EAF Costa sur
22. Odelys Sanches EAF Costa Sur
23. Mayelmo Perez Técnico CGB
24. Lázaro García Técnico CGB
25. Odalmis Mujica Técnico CGB
26. Alexis Argudin CITMA provincial
27. Alain Duque Dtor Agricultura Guira
28. Juan A. Ortega Esp Silvicultura
29. Jesús Rodriguez Jefe Brigada Alquizar
30. Sandro Álvarez CGB
31. Carlos Rodriguez CGB
32. Roger Peña CGB

Date October 19, 2017

Mundo Latino audiovisual producer (all day)

1. José Manuel Guzmán Coordinador Técnico de proyecto OIN
2. Luis David Almeida Director de proyecto
3. Mercedes Arellano DRI-AMA
4. Juliette Diaz Coordinador Componente 2 OIN
5. Julio C. Alvarez HAC, IES, Componente 1
6. Yaiser Ávila Coordinador Componente 1 OIN
7. Omelio Borroto Director Mundo Latino

Date October 20, 2017

UNDP Debriefing (Presentation of the preliminary findings)

1. Grisel Acosta PNUD
2. Tomas Escobar PNUD
3. José Manuel Guzmán Coordinador Técnico de proyecto OIN
4. Luis David Almeida Director de proyecto
5. Maritza Gonzalez DPP-AMA
6. Maritza García DPP-AMA (Presidenta)
7. Pedro J. Ruiz DRI CITMA

Annex 7.- Lists of Revised Documents.

Main documents requested by the Midterm Evaluation Team.

A. National context documents

- National Biodiversity Strategy and Action Plan 2014-2020, Cuba. Document of CITMA / UNDP (2016)
- V National report to the CBD. 2016
- Second National Communication to the United Nations Framework Convention on Climate Change
- Working document prepared and published by the Directorate of Programs and Projects of the AMA, January, 2017
- Iturralde, M. & H. Serrano (2015): "Dangers and vulnerabilities of the marine and coastal zone of Cuba: current state and perspectives for climate change up to 2100"
- MACROPROJECT: Evaluation of the impact of sea level rise on the coastal zone, for the years 2050 and 2100
- Project 2 of the UNEP/UNDP Country Pilot Program (CPP) on Sustainable Land Management ("Creation of capacities for the coordination of information and monitoring systems / sustainable land management in areas with water resource management problems") and its most recent report, if it is already running.
- BASAL Project (Environmental Bases for Local Food Security) and its most recent report, if it is already in execution.
- Project "Project for the Prevention of Saline Intrusion in Aquifers of the Southern Catchment Mayabeque and Artemisa provinces", and its most recent report, if it is already in execution.
- Project "Activities in support of the preparation of the Second National Communication by the Republic of Cuba to the UNFCCC", and its most recent report, if it is already in execution.

B. Project context documents (ecological, social and political)

- Results of the UNDP Environmental and Social Diagnosis. Documents reviewing the institutional framework and legal framework during the formulation if they exist.
- Documents of the ¨TAREA VIDA¨ and publication of the corresponding baseline study.
- National Goals for Biological Diversity, 2016-2020.

C. Project design documents

- Logical framework and theory of change of the project intervention.
- PRODOC Project Document. Logical Framework
- Proyect beginning meeting report

D. Documents related to the project technical implementation

- Annual Operating Plans (POAs)
- Progress reports (quarterly, semi-annual, or annual) with project work plans and corresponding financial reports
    a. Project Performance Reports (PPR) by year of project execution
    b. Quarterly progress reports and work plans of the various task forces responsible for the execution
- Summary list of formal meetings, workshops, etc. that have been made, indicating date, place, subject treated and number of participants
- Individual reports of workshops and visits
- Maps of the places of execution of the project were requested but were not presented during the field trip.
- Electronic copies of project products: bulletins, brochures, manuals, technical reports, articles, etc.
- Any available information on the monitoring data of the restoration component, beyond what is available on indicators in the logical framework of the PPRs:
    a. Vegetation surveys prior to the intervention (lists of species), extension of the ecosystems in their different degrees of conservation, or their historical changes, etc.)
    b. Sources of plant material (provenance and quantities)
    c. Activities of propagation and collection of material for planting
    d. Schemes and sowing campaigns: Planting places, quantities, densities, local participation.
    e. Survival and evaluation activities and monitoring of other variables
    f. Activities of evaluation and monitoring of the change of the coastal vegetation outside the zones of intervention
    g. Activities of evaluation and monitoring of extreme hydrological events
- Any relevant monitoring data in socio-economic matters, such as average income / employment levels of interested parties in the area of activity, changes in income related to project activities.
- Data on economic valuation of protected or restored ecosystems, as well as data on goods and services and their assessment, if they exist in the project area or in Cuba or in other reference areas. Reference data from any country in the Greater Antilles or the Central / South American Caribbean coast could also be considered, if available. A methodology was developed that was indicated by the team but it was not possible to have the document because the specific agreement with the University that developed the methodology was not complete.
- List of related projects / initiatives that contribute to the objectives approved / initiated after the approval of the project.
- List of Project Beneficiaries in the criteria of the implementing team, a list of specific beneficiaries was not reviewed, but general data and interviews with actors representing the direct beneficiaries were presented.

- Information on the relevant users of the project's website over a certain period of time, if available: number of unique visitors per month, number of visits, periods for updating the information, responsible for the handling of the web page, etc.

E. Project management and finance documents

- UNDP Initiation Plan
- Project Initiation Report.
- UNDP Final Project Document and final approval documents (request for authorization from the CEO, etc.).
- List of project personnel, their position and functions and the summary description of their areas of expertise or experience.
- Audit reports (electronic copies if possible
- Electronic copies of the finalized and relevant Tracking Tools of including the authorization of the CEO in the middle of the cycle (indicate the specific TTs for this area of action of the project)
- Project supervision reports
- Minutes of the Project Board meetings (name of the project and any other related bodies (eg meetings of the Project Preliminary Evaluation Committee)
- Project financial reports, reconciled with UNDP.
- Budget execution reports and adjustments presented by the PT to the finance area of the UNDP.
- Other related management documents: adaptive management reports and management memoranda's from the direction , etc.
- Actual expenses by project result, including management costs, as well as the documentation of any significant budget revision.
- Establishment of the programmed budget by Project Objective.
- Establishment of annual expenses, or other temporary unit of reporting, by Project Objective
- List of contracts and items purchased for a value greater than $ 5,000 US $ (Specific examples of purchases were reviewed, for example, tractors, boats, fire attack equipments, computers and office equipments, among others).
- Second. Co-financing table with a breakdown of expected and actual totals in cash and in kind, as well as by origin.
- Confirmation of the list of names and titles of the interested parties related to the project and in their opinion the EMT Mission must meet (there were specific meetings with personnel of all institutions directly involved in the project, and participation lists of each meeting were maintained).

Appendix 8.- Proposed experimental design for mangrove interventions

Currently the EET is using several methods to rehabilitate the red mangrove strip. These consist of:

1. Improving the hydrology of the ecological system in an effort to recreate the original conditions of flood pulses. This is accomplished by cleaning and dredging the channels to allow more fresh water to enter the mangrove and from there to the sea.
2. Given that, regardless of the current level of forest degradation, there is still a mixed natural regeneration that enables natural recovery; additional conditions are created to improve the reestablishment of the mangrove. That is accomplished by eliminating black mangrove trees (*Avicennia germinans*) and thus thinning the black mangrove canopy to favor the growth of the naturally established red mangrove propagules and seedlings in the understory
3. Creating conditions to promote the accelerated regeneration of the red mangrove through sowing with the following techniques:
    a. Planting red mangrove propagules in groups of three individually (triads) to promote growth accelerated by the effect of competition between seedlings.
    b. Planting red mangrove propagules in groups of three, but in "islands" that contain a variable and non-predetermined number of triads that can vary between 10 and 25 triads - a process that allows the accumulation of organic material and leaf litter in the mangrove in areas where the soil is predominantly clay,- Island size is not consistent
    c. Building a small dike around the islands to increase water retention in the soil during the dry season.
    d. Establishing small basins or trenches in the sandy coastal bank areas, where the tide has established a sandy and dry strip, these trenches allow retaining water and forming areas for the regeneration of red mangrove on the coastline where it is currently dominated by black mangrove.

These different techniques seem to be effective in the generation of seedlings, however, a systematic methodology is required to prove its success of implementation and to be able to evaluate it in the light of effort and cost in the future. Currently, the application of the different techniques does not follow systematic criteria and they are used jointly or in isolation according to the recommendation of the head of the brigade.

This absence of explicit criteria to define the use of different techniques has two limitations. The first is that there is no way to discriminate the effectiveness of each technique or combination of techniques to produce a protocol that guarantees the effectiveness of the intervention in other sites; a precondition for replication. Secondly, there is no way to

establish the cost/benefit ratio for each technique or combination of techniques, a precondition for up scaling.

Therefore, it is recommended that, for the rest of the life of the project, interventions should involve the following:

1. Establishing control plots in similar conditions and without any intervention to allow comparing results with the intervened plots,
2. Adopting a pilot study strategy with an experimental design in which the techniques are applied and evaluated separately and in pre-agreed combinations and thus measure their effectiveness and cost-benefit ratio independently for each treatment or in combination.
3. Engage the institutional commitment to this approach of the AMA and CITMA together with the MINAGRI (forestry sector organizations).

Below is a proposal for a basic experimental design that could be useful, just to illustrate in a simplified manner what is required. The final design must be done with the support of an expert who can analyze the location and conditions of the stands in a specific way.

The experimental design could be done in the following way:

Plots of 25x25 m are established and the recommended treatments are applied in the central plot of 20x20 located 5 m from the edge of each plot. This design seeks to eliminate the edge effects that may influence the results. In each plot a single planting technique is applied; for example: (a) planting of red mangrove in simple propagules regularly spaced every 50 cm in parallel rows separated by 50 cm (this gives a density of 4.14 individuals per m^2) [8], (b) planting of red mangrove in islands of a standard diameter of 2 meters and with 25 propagules per islands, (c) only natural regeneration- This is the control.

It is recommended to use only two methods of sowing plus control, at least at this scale, as the design becomes very complex if additional methods are added. In the plots in which propagules are sown, all should be marked, so that when evaluating the survival it is done only on the basis of the marked material and it does not mix with the propagules that have been dispersed and established naturally. Finally, half of the plots are subjected to clearing of *A. germinans* (black mangrove) and the other half are left without thinning. Figure 1 illustrates a suggested spatial design for the experimental units. Each unit is repeated at least once or twice in each stand and in each repetition the order of the two sowing treatments and their control is changed, as well as the location of the plots with or without thinning.

It should be noted that this design is only an example of how to make the experimental design and is only for illustrative purposes. The final design must be carried out with the

[8] Ferreira, A.C., Ganade, G. and de Attayde, J.L., 2015. Restoration versus natural regeneration in a neotropical mangrove: effects on plant biomass and crab communities. *Ocean & Coastal Management*, *110*: 38-45.

support of an expert who can analyze the location and conditions of the stands, so as to verify if this design is appropriate or if it requires modifications. A design like the one presented here, allows statistically separating the effect of each treatment (clearing vs. no clearing, regular sowing versus sowing on islands and sowing versus natural regeneration) and their combinations an interactions. In this way it will be possible to determine the cost-benefit ratio of each treatment in order to prepare a replication proposal in other parts of the country.

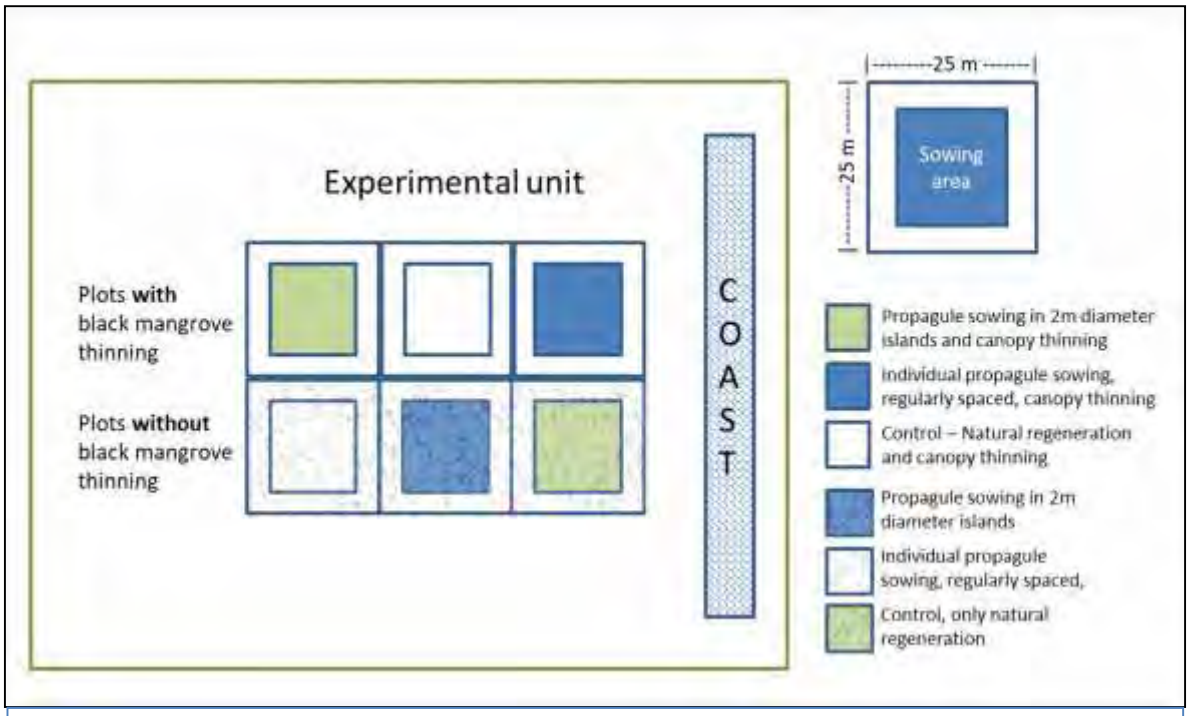


Figure 1. Suggested experimental design for different mangrove sowing and management treatments. Own creation.

TERMINAL EVALUATION OF THE UNDP / ADAPTATION FUND PROJECT

Reducing vulnerability to coastal flooding through ecosystem-based adaptation in the South of Artemisa and Mayabeque provinces of Cuba

UNDP ID PNUD: 69416

AF ID: 84007

Evaluation report

Evaluation period: June – August 2020

Prepared by

Jon García, Joanna Acosta-Velázquez y Daysi Vilamajó

31 August 2020

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ACRONYMS

AF	Adaptation Fund
AMA	Environmental Agency (by its initials in Spanish)
AWP	Annual Work Plan
BASAL	Environmental Bases for Local Food Security
CDB	Convention on Biological Diversity
CGB	Forest Ranger Corps (by its initials in Spanish)
CITMA	Ministry of Science, Technology and Environment (by its initials in Spanish)
EbA	Ecosystem based Adaptation
EMIDICT	Specialized Import, Export and Distribution Company for Science and Technology (by its initials in Spanish)
FAO	Food and Agriculture Organization of the United Nations
FLACSO	Latin American Faculty of Social Sciences (by its initials in Spanish)
FONADEF	National Forestry Development Fund (by its initials in Spanish)
GCF	Green Climate Fund
GEF	Global Environment Facility
HVR	Hazard, Vulnerability and Risk
IAS	Invasive Alien Species
ICIMAR	Institute of Marine Sciences (by its initials in Spanish)
IES	Institute of Ecology and Systematics
INAF	National Institute of Agroforestry Research (by its initials in Spanish)
INRH	National Water Resources Institute (by its initials in Spanish)
M&E	Monitoring and Evaluation
Mi Costa	Adaptation to climate change in Cuba's coastal areas through an ecosystem-based approach
MINAG	Ministry of Agriculture
MINCEX	Ministry of Foreign Trade and Investment (by its initials in Spanish)
MTR	Mid-term review
OP-15	Capacity Building for Coordination of Information and Monitoring/Sustainable Land Management Systems in Areas with Water Resources Management Problems
PADIT	Articulated Platform for Integral Territorial Development (by its initials in Spanish)
PMC	Project Management Costs
PMU	Project Management Unit
PPR	Project Performance Report
SDGs	Sustainable Development Goals
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNFCCC	United Nations Convention on Climate Change

UNEG	United Nations Evaluation Group

EXECUTIVE SUMMARY

Brief description of the project

The project entitled "Reducing vulnerability to coastal flooding through Ecosystem-based Adaptation (EBA) in the south of Artemisa and Mayabeque provinces", better known as Manglar Vivo (Living Mangrove), aimed to increase the resilience of coastal communities of six municipalities in the south of these two provinces to coastal erosion, flooding and marine intrusion caused by climate change primarily through the recovery and restoration of mangroves. The project was financed by the Adaptation Fund (AF), with an AF budget of USD 6,067,320. It was implemented by UNDP Cuba and executed by the country's Ministry of Science, Technology and Environment (CITMA by its initials in Spanish) and Ministry of Agriculture (MINAG by its initials in Spanish) for a period of 6 years, from 1 October 2014 to 30 September 2020 (the project, initially lasting 5 years, was extended by one year).

Objectives and scope of the evaluation

The objective of this consultancy is to carry out the final evaluation of Manglar Vivo. This evaluation analyses the relevance, design, effectiveness, efficiency, sustainability and impact of the project. It also identifies lessons learned and provides recommendations. The conclusions of the document are based on the review of relevant documentation and interviews with key stakeholders. The evaluation team consists of three evaluators. Only one of them was able to make field visits, and these were limited due to the pandemic caused by COVID-19. The evaluation team has triangulated the data collected to answer the evaluation questions.

Overall Project Rating

The evaluation concludes that Manglar Vivo was relevant, very effective and efficient. Monitoring and evaluation was moderately satisfactory. Implementation by the implementing agency was very satisfactory, while the performance of the executing agency was satisfactory. Sustainability is likely in financial, socio-political, institutional and political terms, and moderately likely from an environmental point of view.

Table 1. Evaluation results[1]

Evaluation Ratings:			
1. Monitoring and Evaluation	***rating***	**2. IA& EA Execution**	***rating***
M&E design at entry	MS	Quality of UNDP Implementation	HS
M&E Plan Implementation	S	Quality of Execution - Executing Agency	S
Overall quality of M&E	MS	Overall quality of Implementation / Execution	S
3. Assessment of Outcomes	**rating**	**4. Sustainability**	**rating**
Relevance	R	Financial resources:	L
Effectiveness	HS	Socio-political:	L
Efficiency	S	Institutional framework and governance:	L
Overall Project Outcome Rating	HS	Environmental:	ML
		Overall likelihood of sustainability:	L

Main findings

In terms of **relevance**[2], Manglar Vivo is consistent with the United Nations conventions on climate change, wetlands, and biodiversity, the international guidelines on EbA, and the objective, results, and outputs of the AF. The project is also in line with UNDP priorities at global, regional and national levels and Cuba's United Nations Development Assistance Framework 2014-2018. Furthermore, the project is in tune with national strategies and priorities in the areas of economic and social development, climate change and environment, and responds to the problems and needs of the provinces and municipalities where it focuses. All stakeholders were actively involved in the design and implementation of the project.

The **project design**[3] formulated a fairly clear and well-integrated structure, with a few exceptions. However, there are important gaps in relation to climate information; the connectivity of coastal ecosystems with terrestrial and marine ecosystems; the built environment; and the promotion of alternative livelihoods and the modification of practices of productive sectors other than forestry. These limitations are relatively understandable, given the relatively limited financial resources available, the time frame and the pilot nature of this project.

The targets are feasible and realistic within the budget, but not within the timeframe of the project. The results framework included in the project document does not allow the achievement of the goal or the key intermediate result to be measured. Overall, 80% of the indicators in the results framework are not specific and/or consistent. The identification of risks is moderately adequate, but their analysis is inappropriate.

The project document does not clearly integrate lessons learned from other projects. The project document does a good job at identifying and analysing complementary international projects and identifying synergies. During its implementation, the project had a high level of coordination with other international cooperation interventions and with work and research initiatives carried out by Cuban institutions.

[1] Following the rating scales provided in Annex D of the ToR and page 25 of the UNDP/GEF guidelines for final evaluations.
[2] For details, see section 3.1
[3] For details, see section 3.2

In terms of **effectiveness**[4], at the end of the project, all the final targets of the results framework in the project document have been met, and 8 or 50% have been exceeded. All the FA targets have also been met, and 5 or 25% have been exceeded. This analysis is based on important assumptions. Section 3.6 examines impacts in terms of vulnerability and ecosystem health based on available information.

To achieve these results, Manglar Vivo had to overcome some significant challenges. The risk mitigation strategies identified in the project document were adequate, although the strategy with regard to the import of goods was insufficient. During the implementation of the project, the actions to mitigate the risks that arose were appropriate. The project showed a high capacity for adaptive management.

From the point of view of **efficiency**[5], the project has spent the budget foreseen in the project document. Financial performance improved over time. There are important differences in the financial implementation by component, as the cost of goods and services was not accurate in the design. Project management costs are and are expected to be slightly lower than planned. Manglar Vivo was able to mobilize 382 percent of the co-financing committed in the project document. The co-financing, all in kind, helped mitigate the impact of the delay in importing some goods and exceed some of the targets. The project produced financial reports and audits with the required regularity, with room for improvement in terms of their quality.

The cost-effectiveness of Manglar Vivo was probably intermediate. Its management costs (6.5% of total costs) are below the FA ceiling (9.5%), but above the GEF and GCF ceilings for projects of this size (5%). Available information indicates that ecosystem restoration was cost-effective and that EbA is more cost-effective than adaptation through the construction of grey infrastructure.

An appropriate M&E plan is included in the project document. As indicated, the results framework has major shortcomings. During implementation, especially from the mid-term evaluation, the project strengthened the M&E system. Reporting has been appropriate in terms of quantity, but its quality is average: often reporting does not respond completely, directly or clearly to the system of indicators.

The project established effective partnerships with relevant actors. The Steering Committee, the Project Management Unit (PMU), the Environmental Agency (AMA by its initials in Spanish) and UNDP played their roles well and had a fluid dialogue. Despite all this, the project was extended by one year, at no cost.

The **sustainability**[6] strategy is sound, although more attention should have been paid to other connected ecosystems, the integration of sustainability into productive sectors other than forestry, and the promotion of alternative livelihoods.

From the point of view of the policy, regulatory and institutional framework, the necessary conditions have been established to make the project's results sustainable in the short, medium

[4] For details, see section 3.3.
[5] For details, see section 3.4.
[6] For details, see section 3.5.

and long term. From the financial point of view, the provinces of Artemisa and Mayabeque and the project's municipalities have already secured substantial resources to give continuity to the results of Manglar Vivo, especially those related to ecosystem restoration. In addition, the forests are insured. Furthermore, there is progress in mobilizing international resources. The project has provided equipment that will facilitate the continuity of the project's results. From a socio-cultural perspective, the project has strengthened the awareness and technical capacity of almost all relevant actors. There is also a strong political will to give continuity to the project's results and technical capacities and knowledge transfer mechanisms to do so. From an environmental perspective, the project results are subject to significant risks, including the occurrence of major extreme climate events; the expansion of Invasive Alien Species (IAS); and the degradation of connected ecosystems.

In terms of **impact**[7], in the short term, pressures on ecosystems have been considerably reduced, but are not negligible. These pressures are likely to be limited in the medium to long term. The economic blockade of the country and the COVID-19 do not help to reduce these pressures.

There is no comprehensive information on the health of coastal ecosystems. Available information suggests an improvement. In addition, available information indicates an improvement in the health of marine and terrestrial ecosystems. The health of these ecosystems is expected to improve over time.

There is little scientific evidence on the impact of the project in reducing vulnerability to coastal flooding. It is reasonable to think that the restoration of coastal ecosystems, the cleaning of ditches and channels, and the strengthening of planning, management and response capacities have reduced the vulnerability of target populations to these aspects. There is anecdotal evidence in this regard. Those who have benefited most are the populations immediately on the coast. A AMA study will assess vulnerability reduction more rigorously in 2021.

Manglar Vivo contributed to the Sustainable Development Goals (SDGs), had socio-economic benefits, respected environmental and social safeguards, and promoted gender equity and the inclusion of youth. The evaluation team has identified only positive unexpected outcomes.

The project provided public goods in the form of new knowledge, approaches and technologies and took steps to disseminate these public goods. There are excellent prospects in terms of replication and/or scaling up. The results of the project have informed the development of policies and strategies. During the project, the project approach was applied in other areas of the country. There are prospects for replication in the municipalities and, to a greater extent, the project provinces, and other provinces of the country. In addition, the lessons learned during the implementation of this project are being used in the design of other projects to be financed with international resources, of different scales. At the international level, there has been no concrete progress in replicating the lessons learned during the implementation of the project.

Recommendations

Based on the findings above, this evaluation has the following recommendations.

[7] For details see section 3.6.

Table 2. Summary of recommendations and responsible parties

No.	Recommendation	Responsible Party
1	Prepare a document describing the aspects to be taken into account in the preparation of an integrated management plan for the coastal basins that drain into the mangroves of southern Artemisa and Mayabeque (AMA) and submit it to the National Watershed Council	PMU, AMA
2	Organise a workshop to identify and characterise the lessons learned during the implementation of the project, and consolidate them, integrate them into a document and disseminate them	PMU, AMA, UNDP
3	Use these lessons in the development and implementation of new projects	AMA, PMU, AF
4	Promote that the vulnerability assessment planned for the project are is actually conducted and takes into account Manglar Vivo, and ensure that lessons learned are factored in in the design of new projects	AMA

1. INTRODUCTION

1.1. Objective of the evaluation

As indicated in the ToR, the objectives of this final evaluation are

- To evaluate the achievement of the results of the project "Reducing vulnerability to coastal flooding through Ecosystem-based Adaptation in the south of Artemisa and Mayabeque provinces"; and
- To develop recommendations and identify lessons learned that can improve both the sustainability of the benefits of this project and the overall programming of the activities of UNDP in Cuba.

1.2. Scope and methodology of the evaluation

1.2.1 Scope

The evaluation analyses the different phases and aspects of the project, namely

- The project formulation phase: project design, logical/results framework, assumptions and risks, management arrangements, complementarity with other projects and initiatives in the same field, expected involvement of stakeholders.
- The project implementation phase: management and coordination system, financing and co-financing, monitoring and evaluation (M&E) system, stakeholder participation, adaptive management.
- The project results: impact, country ownership, catalytic or replication effect, integration of other UNDP priorities, and sustainability (political and institutional, financial, socio-economic and environmental) of the project benefits

1.2.2 Methodology

The evaluation team is composed of two international evaluators (Jon Garcia, as team leader, and Joanna Velázquez-Acosta) and one national evaluator (Daysi Vilamajo). The evaluation has been carried out following a structured process that integrates data collection and analysis and is based on the evaluation matrix (see Annex 5.1). This was developed at the inception phase and forms the backbone of the evaluation. This matrix includes the evaluation questions considered for each criterion and details the most relevant qualitative and quantitative indicators that inform the evaluation questions, the information sources and the data collection methods.

The evaluation examines the relevance, effectiveness, efficiency, sustainability and impact of the project results. It provides conclusions, recommendations and lessons learned and qualifies the project results using the various matrix models and evaluation criteria recommended by UNDP. The project results are assessed against the expectations set out in the project's logical framework.

The evaluation process takes into consideration the guidelines and procedures set out in the UNDP Guide to Conducting Final Evaluations of UNDP-implemented AF-funded projects, as well as those

for UNDP/Global Environment Facility (GEF) projects. In addition, the evaluation has been conducted in accordance with the Code of Conduct for Consultants in Evaluation established by the United Nations Evaluation Group (UNEG). In this regard, the evaluation has adopted a participatory, consultative and gender-sensitive approach.

It is important to mention, however, that this evaluation has been implemented in a special context: the global health crisis related to the COVID 19. This crisis compromises the full application of the UNDP/AF guidance for conducting final evaluations, particularly as it relates to face-to-face meetings and field visits. The evaluation team, in coordination with UNDP, AMA and the PMU, has adjusted the methodology according to a changing context, as the health situation and the Cuban Government's actions evolved. While the evaluation team believes that it has had access to adequate information, in terms of both quantity and quality, to produce a robust, evidence-based evaluation report that is credible, reliable and useful, the inability of the international evaluators to travel to Cuba and the difficulties of the national consultant to travel to the field are limitations that are important to bear in mind. For example, the evaluation team has not been able to measure robustly and independently the health, at the end of the project, of the ecosystems where restoration activities have been carried out. This would be possible in a final evaluation with extensive field visits and the necessary technical capacity and equipment. In this assessment this has not been possible, as the international team has not been able to go to the field due to the pandemic. In that sense, at this point the team of evaluators has depended on the information provided by the project. As explained in section 3.3 on effectiveness, there is little information available on the health of ecosystems at the end of the project.

Data collection

Primary and secondary data have been collected. Secondary data has been obtained from project management staff (project team and UNDP offices in Cuba and at the regional level) and partners, as well as through review of project documents, general policy documents and others. Annex 5.2 provides the list of the documents that have been reviewed as part of this evaluation, comprising all the documents listed in Annex B of the ToR. Primary data have been collected mainly through semi-structured interviews conducted remotely (with donors, implementing and executing agencies, national, provincial and municipal partners, and beneficiary communities). As part of the evaluation, the national evaluator visited the field for two days, observing the project sites and talking to some key stakeholders. Annex 5.3 provides the list of the people who were interviewed.

Data analysis

The evaluators have compiled and analysed all the data collected. The quantitative data have been analysed with the appropriate instruments (e.g. percentages, average scores and perception indices). In order to ensure the consistency of information collected by various sources, triangulation of data has been an essential tool to verify and confirm the information collected. Conclusions have been drawn from the relevant information through interpretative analysis. This systematic approach ensures that all findings, conclusions and recommendations are supported by evidence.

1.3 Structure of the evaluation report

This evaluation report begins with an executive summary. Section 1 provides a brief introduction. Section 2 briefly describes the project and the development context. Section 3 presents the findings with regard to the project's relevance, design, effectiveness, efficiency, sustainability and

impact. Section 4 provides conclusions, lessons learned and recommendations. The annexes include the evaluation matrix, lists of documents and persons consulted, statements by the evaluators, detailed comments on the project results framework, and maps of the health of the mangrove in 2015 and 2020

2 DESCRIPTION OF THE PROJECT AND THE DEVELOPMENT CONTEX

2.2 Context of the evaluation

Cuba is one of the ten countries with the largest extension of mangroves in the world. In 2014, mangroves covered a total area of 5647 km^2 in the country, equivalent to 5.1% of its total area. However, the country's mangroves are suffering from high levels of degradation in many areas.

This is the case of the coastal and sub-coastal forests in the south of the provinces of Artemisa and Mayabeque. Since the beginning of the development of the shipbuilding industry in Cuba, more than 400 years ago, they provided timber to the shipyards in the then San Cristobal de la Habana. The development of this activity caused the gradual settlement of this territory, stimulating the development of other activities such as food production in areas close to the wetlands, and port activity and fishing on the coastline. Over time and up to the present day, the wetlands of this region have been severely affected by loss of extension, diversity and structural modification. For example, the protective strip of red mangrove on the coastline has disappeared in many places. Anthropogenic impacts that have affected the structure and functioning of coastal wetlands include the modification of hydrological flows through the construction of dikes, canals, and roads, the drying out of wetlands for agricultural activities, and the discharge of pollutants.

These modifications significantly degraded the health of the region's mangroves, reducing the quality of the ecosystem services they provide, particularly in terms of protecting the coast from erosion, sea level rise, and extreme weather and sea events. Mangrove deterioration has resulted in increased saline intrusion into underground aquifers. These are essential for the irrigation of the coastal plains, one of the most productive in the country, and as a source of drinking water for the city of Havana, which, with over 2 million people, is home to approximately 20% of the country's population. The degradation of the mangroves has also led to the retreat of the coast and severe flooding during tropical storms, putting human lives, productive systems and biodiversity at risk. These impacts will continue to be exacerbated by the effects of climate change, such as sea level rise and the increased intensity and frequency of extreme weather and maritime events, in one of the areas of the country most vulnerable to tropical storms and hurricanes.

Despite their protection since 1998, through the adoption of the 1998 Forestry Law, the health of mangroves in these two provinces was a concern in early 2010. An assessment of the health of the mangrove ecosystem in the entire northern and southern coastal strip of the large island of Cuba (Menéndez, 2013, University of Alicante) identified the strip comprised in these two provinces as one of the least healthy in the country. Restoration activities to improve the health of these mangroves, increase ecosystem services and increase the resilience to climate change of their direct and indirect beneficiaries were a priority.

2.2 Brief description of the project

The project entitled "Reducing vulnerability to coastal flooding through Ecosystem-based Adaptation in the south of Artemisa and Mayabeque provinces" aimed to increase the resilience of coastal communities in six municipalities in the south of these two provinces to coastal erosion, flooding and marine intrusion caused by climate change primarily through the recovery and restoration of mangroves. The project was financed by the AF, with a budget of US$ 6,067,320 from AF and co-financing from Cuba. It was implemented by the UNDP in Cuba and executed by the country's CITMA and MINAG for a period of 6 years, from 1 October 2014 to 30 September 2020 (the project, initially lasting 5 years, was extended by one year).

To achieve its objective, the project focused on mitigating and partially reversing the physical impacts of climate change in the coastal areas of these two provinces through the implementation of three components:

- Component 1: the recovery and ecological restoration of coastal ecosystems, especially the red mangrove and swamp forests, in order to strengthen their buffer function against extreme events and reduce saltwater intrusion.
- Component 2: the integration of the principle of EbA into territorial management plans for coastal areas and agricultural production zones, through training and awareness campaigns for communities and decision-makers.
- Component 3: the creation of an enabling environment at the regional level for the effective and sustainable implementation of these plans, based on the production of information on the costs and benefits of EbA accessible to decision-makers and planners and the strengthening of institutions.

3 FINDINGS

3.1 Relevance[8]

3.1.1 Is the project coherent with the objectives of international environmental and climate change conventions and EbA?

To what extent is the project aligned with the objectives of the international environmental (United Nations Convention on Biological Diversity (CBD)) and climate change (United Nations Framework Convention on Climate Change (UNFCCC)) conventions?

The project is consistent with the United Nations environmental conventions. It responds to the CBD and the Aichi targets for the restoration of degraded ecosystems that provide essential ecosystem services, as well as to the UNFCCC, which promotes the reduction of socio-environmental vulnerability to the impacts of climate change through the development of integrated

[8] To what extent was the project consistent with international environmental and climate change conventions, the strategic objectives of the Adaptation Fund and the UNDP and with local, regional and national priorities in terms of development and environmental protection and adaptation to climate change?

coastal zone management plans and the conservation and sustainable use of coastal, terrestrial and marine ecosystems. The project is also aligned with the Convention on Wetlands of International Importance (Ramsar), whose mission is to promote the conservation and rational use of these.

Cuba's international commitments on climate change, biodiversity, and wetlands were taken into account in the project's development phase. It is also planned to present the activities carried out in Cajio, a project intervention area, as a case study in Cuba's third national communication to the UNFCCC.

Does the project follow the international guidelines on EbA?

An EbA initiative must meet two requirements: i) the use of natural resources to provide a climate solution, and ii) the existence of an economic and/or social benefit for the vulnerable population. From this point of view, it can be claimed that, as argued in the project document, Manglar Vivo applies an EbA approach, although with some margin for improvement. Indeed, on the one hand, the project is committed to the rehabilitation of ecosystems to increase resilience to climate change. At the same time, the project provides economic and/or social benefits. As discussed in more detail in section 3.2.1, the promotion of economic benefits is, however, mostly indirect. In the medium term, the project provides benefits in terms of increased productivity of agriculture and fisheries, the key livelihoods in the area. In the short term there were positive impacts in terms of employment in the forestry and beekeeping sectors, but more work could have been done to promote alternative livelihoods, both in terms of the number of sectors and the depth of work in each sector, for example by identifying, analysing and promoting value chains.

It is important to mention that EbA is becoming increasingly important in the context of climate change and biodiversity conservation policies and it is promoted by both the UNFCCC and the CBD. When Manglar Vivo was designed in early 2010, guidelines on what constitutes an EbA solution and its differences with conservation or biodiversity protection solutions were just being standardized at the international level. The project played a pioneering role in this regard in the country and the region.

3.1.2 Is the project consistent with FA’s strategic priorities?

The FA funds projects and programmes that help vulnerable communities in developing countries, parties to the Kyoto Protocol and the Paris Agreement, to adapt to climate change. To be eligible for resources from the Fund, any project or programme must comply with the Fund's results framework and contribute directly to its overall objective and results.

The objective of Manglar Vivo is clearly in line with the overall objective of the AF, in terms of reducing vulnerability to climate change. The project also contributes to three of the eight outcomes identified in the Fund's strategic framework, namely outcomes 2, 5 and 6. In addition, component 1 contributes to FA’s output 5, component 2 to FA’s output 6 and component 3 to FA’s output 2.1. Annex VIII of the project document clearly indicates these links. The project also met the FA's requirements for community ownership and involvement at both the design and implementation levels (see Section 3.1.4). The project also meets the Fund's requirements for social and environmental safeguards. The project benefited from strong scientific support (in terms of species

to be eliminated, restored, replanted...). No negative social or environmental impacts were reported.

3.1.3 Are the objectives of the project in tune with UNDP priorities in the country and the region?

The objectives of the project are in line with UNDP priorities at global, regional and national levels. Although the project was designed and approved earlier, at the global level, it is aligned with UNDP's Strategic Plan 2018-2021, whose overall objective is "to assist countries in achieving sustainable development by eradicating poverty in all its forms and dimensions, accelerating structural transformation for sustainable development and building capacities for recovery from crises and shocks". Interviews suggest that the project is also consistent with UNDP priorities for the Caribbean sub-region, with UNDP focusing its action on the protection of coastal areas from the risks of sea level rise and intensifying hurricanes, prioritising EbA.

The project is also fully in line with UNDP priorities in Cuba. Specifically, the project contributes to results 4 and 31 of UNDP's Country Programme 2014-2018. Furthermore, the project is in line with the Cuban United Nations Development Assistance Framework 2014-2018. In particular, the project contributes to axis 4, environmental sustainability and disaster risk management, outcomes 7 and 8 and indicators 7.1, 7.2, 8.2 and 8.3[9].

3.1.4 Is the project in harmony with national environmental, climate change and sustainable development strategies and priorities?

As an island country, adaptation to climate change, ecosystem restoration and coastal zone management are key issues for Cuba, which are highlighted in many of the country's policy documents and strategies. To begin with, the project is consistent with the National Programme for Economic and Social Development to 2030, which seeks to reduce vulnerability to climate change and has a strategic focus on the protection and rational use of natural resources and the environment.

In addition, the project is in harmony with the country's climate change policies and strategies. Manglar Vivo is in line with the first two national communications to the UNFCCC, completed in 2001 and 2015 respectively, and the third national communication currently in preparation. More fundamentally, the project is in tune with the 2007 Cuban Civil Society Programme to Address Climate Change, which aimed to integrate the effects of climate change into development plans, involving the different levels of government, and even more fundamentally with the State Plan to Address Climate Change adopted in 2017, better known as Tarea Vida. This plan identifies 5 strategic actions and 11 tasks in the area of adaptation and mitigation. The project contributes

[9] Direct effect 7: Production and service sectors strengthen the integration of environmental considerations, including energy and climate change adaptation, into their development plans. Indicator 7.1 refers to investment in environmental protection; 7.2, to investment in climate change adaptation and mitigation. Direct effect 8: Governments and key sectors improve disaster risk management capacity at the territorial level. Indicator 8.2 refers to the implementation of studies; 8.3 refers to training in risk management.

directly to Task 5, which focuses on the recovery of the most affected mangroves in the country. It should also be noted that the project areas were explicitly prioritized in Tarea Vida.

In addition, Manglar Vivo is aligned with environmental laws and policies. In particular, the project is in line with the National Environmental Strategy established for the periods 2011-2015 and 2016-2020, which defines strategic objectives in terms of "rational management of natural resources" and "confronting climate change". Among the priority lines of action are the rehabilitation of mangroves to improve the provision of climate regulation services, as well as environmental education and communication. On this last point, the project is also consistent with the national education policy (2010-2015), which gives great importance to environmental education and issues related to climate change. In addition, the project responds to the National Biodiversity Programme 2016-2020, whose goal 10 seeks to reduce anthropogenic pressures on coastal and marine ecosystems, including mangroves. The activities carried out in the framework of the project were also consistent with the country's legal and regulatory environmental framework (Environment Law n°81 of 1997, Forestry Law n°85 of 1998, and Decree/Law 212 on coastal zone management of 2000).

3.1.5 Is the project consistent with provincial and municipal needs and plans in the intervention area of the project?

The project operated in an area that was both very strategic and fragile. According to the interviews and the review of documents, the provinces of Artemisa and Mayabeque are of great importance for the national economy. On the one hand, they represent 25% of the country's food production area, mainly for food, vegetables and grains. The plains which stretch from coast to coast include some of the most productive agricultural land in the country. In addition, their underlying aquifers are the main source of water for the capital, Havana. In addition, one of the project's intervention municipalities, Batabanó, includes a strategic port, as the main exchange point between the island of Cuba and the country's second largest island, the Isle of Youth, which is heavily dependent on imports from the former.

The southern provinces of Artemisa and Mayabeque are however highly vulnerable to tropical cyclone surges and sea level rise, exacerbated by climate change. Cuba is in one of the most active parts of the Atlantic/Caribbean hurricane region, and the two provinces under consideration are a critical point for extreme weather events (hurricanes, anticyclones). Therefore, the project intervention area faces the risk of coastal flooding, which regularly affects communities and settlements. In fact, before the project, the possibility of relocating a large part of the population in the intervention area, especially the inhabitants of Batabanó, was considered, with major social costs and economic costs that are difficult to bear for an economy burdened by an economic, financial and commercial blockade. The project's area of intervention is also faced with the penetration of the salt wedge, which threatens food production and the supply of drinking water to both the area and Havana.

The environmental fragility of this area is accentuated by natural causes such as coastal erosion and strong anthropogenic changes. The mangrove ecosystem has been heavily modified in recent decades by the cut of the red mangrove and by infrastructure works such as the construction of drainage channels, a retention wall (the "Dique Sur", built at the end of the 1980s) and a coastal road. According to the impact summary document, these different investments were also the result

of the lack of vision and integrated management of the coastal zone and of the awareness of the value of the ecosystem services provided by the mangroves by the productive enterprises and local communities that used the mangrove for its medicinal properties and for obtaining charcoal. These pressures have led to the degradation of mangroves, negatively affecting their function of protection against extreme events and saltwater intrusion, as well as their ecological value in terms diversity of flora and fauna, which was significant in the past (the area includes a protected area).

In this context, the objectives and activities of Manglar Vivo fully respond to the problems and needs identified in the two provinces. According to the interviews, the project design was also based on Hazard, Vulnerability and Risk (HVR) studies, which had been carried out in this area in 2007. The six municipalities considered in the project were identified as the most vulnerable to sea level rise and extreme events in these studies. It should be noted that the start of the project coincided with the process of updating the HVRs of the two provinces, which allowed the introduction and training of government leaders in the concept of EbA, as a new approach to addressing environmental problems, with a more holistic vision. The interviews confirm the relevance of the project in addressing socio-environmental issues in the area.

Manglar Vivo was also very relevant from an institutional and political-administrative angle. In fact, the project accompanied and strengthened an experimental phase of decentralization, which took these two provinces, previously attached to Havana, as a spearhead for greater territorial autonomy. In turn, the transfer of competencies led to a more direct dialogue with the provincial governments, favouring the consideration of their needs.

3.1.6 Have all relevant stakeholders been involved in the design and implementation of the project?

The project document details the consultative process followed throughout the project design (organisation of workshops, working sessions, field visits). The interviews confirm that almost all stakeholders were involved in this process, both national and local (central government ministries and entities, research centres, provincial and local governments, civil society organisations). Consultations with community-based organisations and local communities were also carried out during the project preparation phase.

This high level of participation and involvement of the various stakeholders was maintained during the implementation of the project. Many of the interviewees highlighted the active participation of governments and communities in activities not only to raise awareness but also to restore and monitor mangrove ecosystems through the formation of five volunteer groups, training classrooms and interest groups in schools. Actors from the productive sector, particularly agroforestry companies, were the main implementers of the mangrove rehabilitation activities (component 1). Within the framework of components 2 and 3 of the project, 2,916 training activities were carried out for different types of actors and key members of the communities (community leaders, teachers and children, leaders of productive enterprises and journalists). One of the strengths of the project was the linkage of the country's scientific and academic sectors.

The project appears to have maintained an approach to integrate relevant stakeholders throughout implementation. The interviews indicate that some key institutions, which were not involved in the

design or the early implementation phases, were incorporated during implementation once they were identified as relevant, such as the Batabanó Gulf protected area, some research institutes, such as the Institute of Marine Sciences (ICIMAR by its initials in Spanish), and ApiCuba, a beekeeping company that belongs to MINAG, both from 2017.

The interviews conducted with a very broad representation of actors highlighted the collaborative and interactive nature of the process, in which different actors worked together. In this sense, the communities indicate that their opinions were heard and taken into account in the workshops, and that there was always a dialogue between people's experience and scientific knowledge, integrating different knowledge. This confirms the analysis of the mid-term evaluation, which highlights the high level of public involvement.

3.2 Project design[10]

3.2.1 Assessment of the logical/results

¿How clear and integrated were the objectives, outcomes, outputs and activities of the project?

The objective, outcomes, outputs and activities of the project are quite clear and well-integrated. The outputs contribute to achieving the objective. The promotion of ecosystem restoration to reduce vulnerability is, as mentioned above, very relevant and, as will be discussed later, probably effective. Also positive is the integration of restoration activities on the ground, including different ecosystems and linking the planting of native species with the removal of IAS. It is also important to highlight the integration of these on-the-ground activities with awareness-raising and training activities for community and government actors, institutional strengthening and knowledge management. The integration of a cost-benefit analysis, which actually contributes to components 2 and 3, is interesting. In general, the sequence is also appropriate in terms of conducting diagnostics before intervening in the field.

That said, the structure of outcomes and outputs is not very common. Typically, AF and/or GEF-funded projects have fewer outcomes than outputs, with the latter contributing to the former. In contrast, in the logical framework of this project there are 16 outcomes and 9 outputs. This creates confusion, although it is probably because the outcomes were actually formulated as targets.

In addition, it is not very clear where and how the integration of EbA into provincial and municipal planning is included. The project document is confusing. In the summary presentation of the logical framework (pp. 20-21) there are two references, the clearest reference being in component 3. In the detailed presentation of the logical framework (pp. 62-64) there is only one reference, and it is located in component 2. The interviews suggest that the location of this aspect was not very clear during implementation. However, as detailed in section 3.3.1 on effectiveness, this shortcoming

[10] Was the project internally coherent and robust in its design?

did not prevent the project from achieving its expected goal in terms of integration of EBA into provincial and municipal planning.

On the other hand, there are some important gaps. Firstly, insufficient attention is paid to climate information. This is important because without climate projections it is difficult to know whether the EbA measures will be sustainable in the long term and whether they will actually increase climate resilience. Although the project builds on the projections previously made in the macro-project, in particular the HVR studies that resulted in the prioritisation of this area, it would have been appropriate to include some specific actions in this regard, for example in terms of early warning systems. In Cuba the Institute of Meteorology and Civil Defence centralises the information, integrating all the entities and projects.

Secondly, although, as mentioned, it considers the coastal ecosystem in an integral manner, considering the mangrove forest, the swamp forest and the bordering forest, Manglar Vivo does not directly consider the relationship of this ecosystem with the terrestrial ecosystems, particularly the corresponding hydrographic basin, nor the marine ecosystem, especially the sea grasses and corals. Manglar Vivo worked with other projects that sought to improve watershed and water management (see Section 3.2.4), with room for strengthening this aspect. Manglar Vivo did not clearly address the marine aspect. This is important in a project that focuses on ecosystems and must address their connectivity. Indeed, the health of coastal ecosystems is partly dependent on the quantity and quality of freshwater provided by rivers, and this is vulnerable to climate change. Similarly, the health of coastal ecosystems depends partly on the ability of corals and seagrasses to dissipate wave energy, among other contributions. From another perspective, the rehabilitation of coastal ecosystems contributes to the restoration of terrestrial and marine ecosystems. This is in any case a complex issue and one of the big questions in EbA projects, where a balance has to be found between the connectivity of ecosystems and the availability of funds and efficiency in implementation.

Thirdly, the project does not comprehensively address aspects linked to the built environment / human settlements. The project includes the cleaning of ditches and canals, which is very relevant. It has also worked on waste management a few times. However, the project has not addressed aspects of grey infrastructure that are important for reducing the vulnerability of the target populations. This is particularly important in Surgidero de Batabanó, where urban resilience actions are required, including the redesign of the canal system. Although UNDP does not have a comparative advantage in this regard, and AF projects cannot cover all vulnerability drivers, it would have been important to consider this dimension at least indirectly, for example by supporting the development of plans to be implemented later by the government.

Fourth, the project does not sufficiently address the promotion of alternative livelihoods that can reduce pressure on ecosystems. The project document refers to economic benefits derived from the sustainable use of ecosystems, but there is no sufficiently clear and robust strategy in this regard, beyond the indirect benefits in agriculture and fisheries and the direct benefits in the forestry sector and, on a very limited scale, in the use of removed IAS and beekeeping. Furthermore, despite some efforts in this regard in conjunction with complementary projects, Manglar Vivo has not worked sufficiently with productive sectors other than forestry, such as farmers and fishermen.

It is important to mention that these limitations are relatively understandable, given the relatively limited financial resources available, the implementation time and the pilot nature of this project. The formulation of Manglar Vivo began in 2011 and culminated in 2013, although implementation began in 2014. Almost a decade ago, knowledge about EbA in the country and the region and even globally was much more limited. In ten years, the science has evolved. In fact, this project helped significantly to enrich that knowledge. It should also be noted that both UNDP and AMA are aware of these deficits and have sought to address them, especially with regard to the integration of terrestrial, coastal and marine ecosystems, in the formulation of new projects, particularly the project Adaptation to Climate Change in the Coastal Zone of Cuba with an Ecosystem-based Approach, better known as Mi Costa, which has a much larger Budget. In this sense, Mi Costa builds on the lessons learned in the implementation of Manglar Vivo.

How feasible and realistic were the project objectives, outcomes and outputs within the available budget and time frame?

All targets are feasible and realistic within the budget. However, the targets are not feasible and realistic within the 5 years. In general, the project is exposed to significant challenges in terms of implementation, particularly because of the need in Cuba to import inputs and the difficulty of doing so due to the economic and commercial blockade, which implies uncertain and lengthy contracting and procurement processes (see section 3.3.1 for details).

Within this general framework, three targets in particular were neither feasible nor realistic in terms of time. This is the case for targets relating to the number of hectares (ha) of forest restored with 85% survival three years after planting. As the target is formulated, at the end of the project the hectares planted in the previous two years cannot be considered, simply because the required three years have not passed. This makes it impossible to meet the target set by then in the final year, as a full assessment must be made within three years of the end of the project. This points to the debate between performance and outcome targets, and what outcome targets to consider for living systems such as ecosystems, given that in principle the positive results of restoration actions become more apparent over time. It makes sense to consider the outcome of restoration activities, but it is unrealistic for a project to measure them three years after it has closed.

It is important to emphasize that, while realistic, all three targets for restoration of the coastal ecosystem were ambitious. On the one hand, the level of degradation of the ecosystem was high, with a significant presence of IAS. On the other hand, it was a complex social environment, with significant anthropic pressures. The use of the surrounding communities was a challenge, which the project was going to address. However, there were also anthropic and climatic pressures on connected ecosystems, in terms of the watershed and marine areas, where the project would not substantially intervene. In addition, the institutional context was complex, with many actors not fully coordinated.

The very high level of achievement of the targets after one year's extension (see section 3.3.1) attests to the fact that the targets were feasible and realistic with the budget but required more time.

How effective was the M&E system (indicators, baselines, targets, methods and sources of verification) in measuring the progress/results of the project? Were they SMART and consistent with the project objectives, outcomes and outputs?

The results framework included in the project document has major shortcomings. Some of these were identified in the mid-term evaluation. To begin with, although the project's objective is to reduce vulnerability to coastal flooding, the results framework does not include any indicators to measure this. It is simply assumed that people living in the areas of direct and indirect influence of coastal ecosystems will see their vulnerability to coastal flooding reduced if the health of these ecosystems improves. This is a reasonable assumption. However, such a project should measure its results more concretely and robustly, with specific indicators of vulnerability to specific coastal flood risks. This is particularly important for indirect beneficiaries who are not very close to the coastal ecosystems in which the project intervenes. This analysis should also consider climate projections in the medium and long term. This is not easy to measure, but methodologies could have been defined with the participation of Cuban research institutes and AMA's HVR studies unit, as well as international good practices with the support of UNDP (e.g. experimental and control groups).

In addition, the results framework does not provide a robust measure of whether the health of coastal ecosystems has improved as a result of the project. Indicator I refers to the health of mangroves, but does not clearly indicate which indicators are considered, does not provide a concrete baseline, and does not indicate which values are expected (it says high level of health, but not which values would be high (50% or 90%?)). Furthermore, the indicator refers only to mangroves, and not in an integrated manner to coastal ecosystems, leaving aside swamp forests and bordering forests. The indicators in component 1 attempt to address this partially by considering the number of hectares restored with high survival rates and the existence of an IAS elimination plan. This is an improvement over indicator I, but it is still insufficient as a system for measuring the health of coastal ecosystems. As indicated in the previous section, indicators 1.1, 1.2 and 1.3 have a serious deficiency in terms of temporality. In addition, the health of water resources and, more importantly in terms of reducing vulnerability to marine flooding, the health of marine ecosystems, particularly corals and seagrasses, are not considered.

Indicator systems (indicator, baseline, target, method and source of verification) are more appropriate in components 2 and 3, although there are notable limitations. On the one hand, there is no correspondence between the results mentioned in the summary logical framework (pp. 20-21) and the detailed logical framework (pp. 61-63). Some results mentioned in the former disappear in the latter, and not only in those where there is overlap (such as in the integration of EbA into plans). The summary logical framework includes as a result "21,502 people from 6 popular councils (men and women) receiving economic benefits resulting from sustainable use and conservation of coastal ecosystems (e.g. mangrove honey)". This disappears in the detailed results framework. This is not a minor omission, as it seems to address one of the most important gaps, that of promoting alternative livelihoods. In this regard, it should also be noted that the results framework includes a reference to the impacts of climate change on economic activities, but in an imprecise manner. The summary logical framework also includes a target on implementation of adaptation measures by 28 communities that is not included in the detailed results framework. In both the detailed and summary results frameworks, the creation of a community level knowledge system is not well covered by the M&E system. Indicators for schools and dissemination materials are not sufficient. In addition, many of these indicators, particularly those for training, are

performance indicators (how many dissemination materials) rather than outcome indicators (how awareness, technical knowledge and behaviours have changed as a result of those materials). The project has made efforts to measure this through a survey, but this is not captured in the results framework.

Generally speaking, a good percentage of the indicators for the objective and the 3 components (80% or 12 out of 16) are not specific and/or consistent. There are also other shortcomings, such as having two sub-indicators, which suggests that the indicator is not specific enough. Annex 5.5 provides detailed comments for each indicator.

3.2.2 Assumptions and risks

The project document does not present assumptions but includes a section (pp. 55-56) on risks to project implementation. Seven risks were included, two of an environmental nature, four of an institutional nature and one of a social nature. The impact and likelihood of these risks are low or medium in the project document. The risks of greatest impact and likelihood in the project document are extreme weather events and fires affecting the survival of seedlings, and changes in the ownership of EbA by decision-makers. The other risks included in the project document are changes in climate affecting the phenology of the trees, negatively impacting the nursery; slow processes of equipment acquisition by local governments; limited availability of inputs and equipment on the national market; and short-term needs outweighing medium- and long-term considerations associated with EbA at both local government and community levels.

The project document identified almost all relevant risks but did not give due weight to all of them. The probability and risk of three of the seven risks should have been higher than considered in the project document. Extreme weather events, particularly hurricanes, many of them category 3 and 4, are highly probable in the intervention area and their impact would have been severe, not only on the ecosystems (it could have wiped out everything planted), but also on the ditches and canals cleared and, more generally, the infrastructure needed to reach the work sites. The risk of affecting communities' housing and livelihoods was also high and could have compromised the ownership of EbA or at least the availability of time to participate in project activities. These hurricanes are often devastating. It was very likely that the international market would have to be tapped and that procurement processes (by the national government or UNDP, not local governments) would be slow and difficult, with significant impact. On the other hand, the project document did not consider three major risks: national challenges in the supply of essential goods, such as fuel, needed to go to the field; lack of manpower to carry out project tasks, especially ecosystem restoration and canal cleaning; and institutional change in terms of the innovative process of decentralisation that the two provinces were undergoing. The project document also failed to consider the risk of global health pandemics, such as COVID-19, but this was largely unsuspected by all, not only in 2013, but even in early 2020, even though there had been smaller-scale multi-country epidemics previously. Furthermore, the project document did not explicitly consider sea intrusion in certain months of the year, due to the predominance of the so-called "south winds" which cause a rise in sea level due to wind drag, although in this case it can be considered implicit in the risk of extreme weather events.

Of the risks that were considered, those that took place were those of having to go to the international market and facing long, difficult and uncertain procurement processes (beyond the

change of importer - for a more detailed discussion on this point, see section 3.3.1). This had a large impact, larger than anticipated in the project document. The impact was partially mitigated by national co-financing. The other expected risks did not materialise or did not have a significant impact. The non-occurrence of an extreme weather event in the intervention area is rather exceptional. Forest fires were few and of limited extent, largely due to community surveillance and training in firefighting. No phenological impacts on seedlings were evident during the project. The risks in terms of ownership of EbA by decision-makers, local governments and communities did not took place due in part to the accumulated awareness between the design and the start of the project and in part as a result of the project's efforts in this area. The formulation process and the approval in 2017 of Tarea Vida also contributed to the project's articulation with the other sectors.

Of the risks not considered in the project document, institutional change did not have an impact, but the lack of manpower did, especially at the beginning. It could be managed by increasing the salaries of the forestry workers. The lack of fuel also occurred, affecting the project in an important way, especially with regard to inspections. Finally, project implementation was also affected by COVID 19, which did not allow field visits and reduced face-to-face meetings.

3.2.3 Lessons from other relevant projects integrated in project design

The project document mentions relevant previous or ongoing initiatives, both national and international (for analysis of complementarity and coordination see section 2.3.4). It is generally indicated that lessons learned from some of these initiatives will be used in the implementation of Manglar Vivo, but it is not detailed what these lessons are or how they are specifically integrated. That said, the interviews suggest that external lessons learned, particularly at the national level, were taken into account during the implementation of the project, especially when closely involving the research institutes. The main project mentioned is a UNDP/GEF project which worked in two systems in the Sabana de Camagüey in the north-east of the Cuban archipelago.

3.2.4 Complementarity with other interventions

Were other relevant interventions clearly identified in the project document?

The project document identifies in Annex VII the other projects carried out in the intervention provinces of Manglar Vivo, or adjacent areas, in the areas of climate change adaptation, ecosystem preservation and sustainable management of natural resources (soil and water) (8 in total), as well as potential areas of synergy. The document describes five of them in more detail and explains through a map and an outline the relations and complementarity between the existing initiatives and Manglar Vivo. This section does not identify nationally funded and developed initiatives and interventions, although these are mentioned more generally in other sections of the project document.

To what extent does the project support (and not duplicate) activities and objectives not addressed by other donors?

The project had a high level of complementarity with other initiatives developed in the area in the same field. The interviews conducted highlighted two in particular: i) The "Environmental Bases for Local Food Security" (BASAL) project, financed by the European Union and the Swiss Agency for Development and Cooperation (SDC), which focused on strengthening local capacities for incorporating the environmental component into socio-economic development plans (with particular attention to the issue of food security), in the agriculturally important municipalities of Los Palacios (Pinar del Rio), Güira de Melena (Artemisa) and Jimaguayú (Camagüey); and (ii) the project "Capacity Building for Coordination of Information and Monitoring/Sustainable Land Management Systems in Areas with Water Resources Management Problems", better known as OP-15, financed by the GEF and implemented by UNDP, which aimed to introduce the sustainable land management approach into actions to prevent degradation, recover and rehabilitate degraded land, and mitigate the effects of drought. It was developed in the provinces of Artemisa and Mayabeque, but inland, in agricultural production areas.

Available information indicates that Manglar Vivo, BASAL and OP15 worked in a complementary manner towards the common purpose of increasing the resilience of the area's populations to climate change, natural disasters and environmental degradation, through ecosystem rehabilitation actions and support to territorial planning and local capacity building. These three projects were complementary because of their different but connected geographical areas of intervention (the lower part of the coast in Manglar Vivo and the upper part of the agricultural plains of Havana-Matanzas in BASAL and OP-15) and because of the type of ecosystem targeted (mangrove for the Manglar Vivo and land and water resources for the two other projects). Manglar Vivo was also a pioneer in adopting an EbA approach, which the other projects did not promote (they focused rather on promoting alternative agricultural practices, improving water resource management and knowledge about climate change).

It is also worth highlighting the complementarity with the project "Application of a regional approach to the management of marine and coastal protected areas in the southern archipelagos of Cuba", funded by GEF/UNDP (2009-2014), which focused on the preservation of marine and coastal protected areas in southern Cuba, concentrating its activities on the restoration of coral reefs and sea grasses, as the first line of protection against extreme events, although this ended (in September 2014) almost when Manglar Vivo began. The interviews also noted that the project built on lessons learned and results from other projects, such as the GEF/UNDP-funded project "Improving the prevention, control and management of Invasive Alien Species in vulnerable ecosystems in Cuba," whose inputs led to improved identification and management of IAS under component 1.

Has the intervention been coordinated with other donors to seek complementarity and synergies?

The project also had a high level of coordination with other international cooperation interventions, both in its design and implementation phases. There is generally good coordination at an institutional level, as AMA coordinates an International Projects Desk where the activities of the different projects are discussed to avoid duplication and ensure efficiency in funding. Many of the international projects identified in this area of the country, with a fairly similar objective, were financed and/or managed by the UNDP, which facilitates coordination and the exchange of information and good practices. Similarly, the limited staff rotation in Cuban institutions and the high ownership and involvement of these institutions favour inter-institutional and inter-sectoral

coordination, as well as the integration of the results of different projects. Likewise, CITMA was involved in both Manglar Vivo, BASAL and OP15.

In more operational terms, Manglar Vivo and BASAL jointly developed training activities on environmental issues. A classroom was created, where training courses and workshops were provided for the beneficiaries of both projects, allowing them to share an integral vision of the environmental problems of the agricultural and coastal zones. The interviews indicate that the promotion of honey production by Manglar Vivo was incorporated by some producers who were beneficiaries of BASAL and who followed the training given by Manglar Vivo. In the same way, joint water management and monitoring activities were developed with the OP-15 project, which contributed to the objectives of both projects. This included the cleaning of water channels in Artemisa, and common hydraulic analysis in Mayabeque. To this end, three water quality monitoring stations were established, managed by specialists from the National Institute of Water Resources (INRH by its initials in Spanish).

Finally, it should be noted that the project activities were carried out in coordination with different research initiatives carried out by Cuban institutions in the agricultural, water and forestry fields. According to the interviews, the project was linked in Artemisa to a national project carried out by the Grain Research Institute on the production of grains more resilient to the new climate, which are better adapted to the salinisation of soils and warmer temperatures. In Mayabeque, the project was coordinated with the Agrifood Innovation Programme led by the National Institute of Agricultural Sciences. There was also synergy with projects of the National Forestry Institute and the National Botanical Garden in the categorization of plant species.

3.3 Effectiveness

3.3.1 Has the project been effective in achieving its expected objectives, outcomes and outputs?

The results framework of Manglar Vivo includes three indicators at the objective level and 13 indicators at the outcome level. Manglar Vivo has been very successful in meeting the targets set out in this results framework. At the end of the project, all final targets have been met, and 8 or 50% have been exceeded. The fulfilment of the targets at the objective level has been satisfactory: the three targets at this level have been met satisfactorily. The fulfilment of the targets at the outcome level has been very satisfactory: in eight of the 13 targets at this level the fulfilment has been very satisfactory; in the remaining five, satisfactory. Table 3 provides details, including the rationale for the ratings.

Performance is also very satisfactory using the FA Result Tracker. From the Fund's results framework, 9 targets were set at the impact level and 11 targets at the outcome level. All impact targets have been met, and 2 have been exceeded. All outcome targets have been met, and 3 exceeded. Annex 5.6 provides details.

This analysis is based on important assumptions. As detailed in section 3.2.1, the project results framework has significant limitations at both the objective and outcome levels. In that sense, the

above analysis does not imply that the project has clearly achieved the objective of reducing the vulnerability of its direct and indirect beneficiaries, or even that its intermediate outcome of improving the health of coastal ecosystems has been unequivocally achieved. The information available to analyse these aspects is insufficient. Section 3.6 examines these impacts based on available information.

Table 3. Progress Towards Results Matrix (Achievement of Outcomes against End-of-Project Targets)

Type of Indicator	Indicator	Baseline	Progress as June 30, 2020	Target for Project End (Sept 2020)	Rating	
					Justification	Rating
Objective: To increase the resilience of populations living in the coastal zone of the provinces to Mayabeque Artemisa and the effects of climate change.	I. Areas with high rates of health and the conditions of the mangroves (soil and salinity of the water, the density of the canopy, the existence of local regimes of protection).	Coastal ecosystems that cover 7 318 ha are degraded, have excessive levels of salinity due to seawater intrusion and the obstruction of channels and have a limited protection regime.	Rehabilitation actions have been developed in 7770.2 ha (in mangrove forests - 3402.2 ha and wetland forests - 4368 ha). For details on health, kindly see the last column and the impact section.	7 318 Ha (total area where reforestation of mangrove, restoration of the mangrove ecosystems, and the enrichment of the forested areas inland was carried out) Note: the rates of coastal mangroves and wetlands must be nominated in the methodological documents to be developed at the start of the project.	As mentioned, the indicator, baseline and target system is not consistent. The target refers to hectares where restoration actions have been carried out; the indicator, to the result of these actions, in terms of high health indexes. The target in terms of number of hectares has been slightly exceeded (by 6%). There is not enough robust information to assess the health component of the indicator, as the results framework does not indicate what level should be considered high, does not provide a clear baseline, and there is no results information for most of the variables mentioned in the indicator. Existing information suggests that good health has been achieved in terms of water salinity (interstitial water was found to average 36 g/l in 2019) [11]. The existing information also suggests a decrease in soil salinity[12], and an improvement in the growth rate	S

[11] This figure is an average of the measurements taken at 244 monitoring points: 210 in the mangrove ecosystem and 34 in the southern dyke speed bumps. These 244 monitoring points include the plots inherited from the Southern Archipelago project and the macro project from 2013 and the plots and stations set up by Manglar Vivo from 2015 to 2019. In the monitoring points of the southern dyke, the monitoring was carried out in cooperation with project 2 of the OP15 programme, and from 2019 it was carried out with the INRH Artemisa.

[12] The project has 17 soil salinity monitoring points. The data show a downward trend: from 39 ppm in the areas surrounding the canals and 47 ppm in the other areas in 2015 to an average of 34 ppm in 2019 (in the dry period).

Type of Indicator	Indicator	Baseline	Progress as June 30, 2020	Target for Project End (Sept 2020)	Rating	
					Justification	Rating
					of forest cover. The normalized vegetation index did not change during the project's duration[13]. Other health indexes not considered in the indicator suggest an improvement in the health of the mangrove ecosystems, such as the return and/or appearance of certain endemic and threatened species of flora and fauna. There are also improvements in the health of adjacent marine and terrestrial ecosystems, although this is not considered in the indicator. For details see section 3.6.1 on impact.	
	II. Numbers of people (men and women) with reduced vulnerability due to proximity of functioning mangrove forest and wetland ecosystems.	17,524 People in 47 communities are directly affected by coastal flooding.	Vulnerability of 21,502 inhabitants of the communities (46% women) directly benefited from the work of the project was reduced. The increase in the health of ecosystems together with their ability to reduce waves is a fact verified by research institutions. This capacity will continue to increase as the actions consolidate and the first strip of red mangrove reaches the desired structure	21 502 People (of which at least 45% are women) directly affected by the reduction of coastal flooding.	The target in terms of people has been achieved. This statement assumes that restoration actions have improved the functioning of ecosystems and that they protect the people mentioned.	S
		270,705 People are indirectly affected by the impacts of the phenomena	Vulnerability of the 270 705 inhabitants of the communities (50% women) was reduced. The increase in the health of ecosystems indirectly benefits the entire population of the	270,705 People (at least 45% are women) benefit indirectly by the reduction of the impact	The target in terms of people has been achieved. This statement assumes that restoration actions have improved the functioning of ecosystems and that they protect the people mentioned.	S

[13] This analysis was carried out at 235 points throughout the mangrove, where NDVI values were monitored from 2000 to 2019. In 2014 the average NDVI was 0.80, while in 2019 it was 0.81. Values between 0.6 and 1 are considered in the literature as indicators of healthy vegetation.

Type of Indicator	Indicator	Baseline	Progress as June 30, 2020	Target for Project End (Sept 2020)	Rating	
					Justification	Rating
		associated with the CC on economic activities.	municipalities. In addition to this, the strengthening of knowledge (material and knowledge) of the institutions of the territory has increased their resilience to natural phenomena such as hurricanes and fires.	of the phenomena associated with the CC on economic activities.		
	1.1 Area (ha) of red mangrove is established along shore between Batabanó and Punta Mora.	533 ha	Rehabilitation actions have been conducted in 1527.9 ha of red mangrove forest (includes restoration of ditches and canals, management of natural regeneration and sowing of propagules). Of these, the State Forest Service certified 895.7 ha with more than 90% survival. It is anticipated due to the evolution it has had to date and the effectiveness shown by the actions that are certified with more than 85%.	1290,6 ha of which 85% survived* (1097 ha) *Survival can only be measured 3 years after planting	The target has been exceeded by 18%, if the number of hectares where restoration actions have been carried out is taken into account. As mentioned in section 3.2.1, this indicator is deficient. If one considers the number of hectares where 85% of the seedlings have survived three years after planting, the target has not been met (70% have been achieved), given that what was planted at the end of 2018 and in 2019 and 2020 cannot be added up, as three years have not passed. It is reasonable to expect that at least 85% survival of planted seedlings will be achieved in that period, following the past example.	HS
	1.2 Cumulative area of mangrove ecosystem restored between Majana and Surgidero de Batabanó.	144 ha	Rehabilitation actions have been conducted in 1874, 3 ha of the mangrove ecosystem (includes restoration of ditches and channels, management of natural regeneration and sowing of propagules). Of these, the State Forest Service certified 1152.2 ha with more than 90% survival. It is expected due to the evolution it has had to date and the effectiveness shown by the actions that are certified with more than 85%.	1711,9 ha of which 85% survived* (1455,1 ha) *Survival can only be measured 3 years after planting	The target has been exceeded by 9%, if the number of hectares where restoration actions have been carried out is taken into account. As mentioned in section 3.2.1, this indicator is deficient. If one considers the number of hectares where 85% of the seedlings have survived three years after planting, the target has not been met (67% have been achieved), given that what was planted at the end of 2018 and in 2019 and 2020 cannot be added up, as three years have not passed. It is reasonable to expect that at least 85% of the planted seedlings will survive in that period, following the past example.	HS

Type of Indicator	Indicator	Baseline	Progress as June 30, 2020	Target for Project End (Sept 2020)	Rating	
					Justification	Rating
	1.3 Cumulative area of landward edge woodlands restored and enriched.	939 ha	4,368 ha of landward edge woodlands were enriched by planting native species and encouraging natural regeneration. Of these 2727 ha were certified with more than 90% survival by the State Forest Service. It is expected due to the evolution it has had to date and the effectiveness shown by the actions that are certified with more than 85%.	4315,5 ha of which 85% survived* (3668,2 ha) *Survival can only be measured 3 years after planting	The target has been achieved, if we take into account the number of hectares where restoration actions have been carried out. As mentioned in section 3.2.1, this indicator is weak. Considering the number of hectares where 85% of the seedlings have survived three years after planting, the target has not been met (63% have been achieved), given that what was planted at the end of 2018 and in 2019 and 2020 cannot be added up, as three years have not passed. It is reasonable to expect that at least 85% of the planted seedlings will survive in that period, following the past example.	S
	1.4 Numbers of IAS management plans developed.	0	The Invasive Exotic Species Management Plan (EEI) by the Institute of Ecology and Systematics (IES) and the Agroforestry Research Institute (INAF) was completed, published and disseminated. This plan has been applied in the 7318 ha where the Project has intervened.	1, covering 7,318 ha	The target has been achieved.	S

Type of Indicator	Indicator	Baseline	Progress as June 30, 2020	Target for Project End (Sept 2020)	Rating	
					Justification	Rating
Outcome Indicator	2.1 Numbers of provincial and municipal development plans that make specific provision for EBA.	2 provincial and 6 municipal governments are preparing development plans that do not include EBA.	In total, EbA has been integrated into 26 plans, as follows: - 2 provincial development plans 2020/2025 - 2 provincial environment strategies - 2 provincial economic plans - 2 provincial adaptation plans - 6 municipal development plans 2020/2025. - 6 municipal economic plans - 6 municipal adaptation plans In this sense, under the policy of the "Life Task" within the plan of the economy of the two provinces for a period of 2020-2025 (5 years), a budget of 20,000.0 MP was approved only for the recovery of coastal forests considering actions with an EbA focus. This budget includes not only the project areas but other areas in the north of the province.	2 provincial plans and 6 municipal plans	The target has been significantly exceeded.	HS
Outcome Indicator	2.2 Numbers of provincial and municipal governments with EBA-related knowledge management systems in place.	0	Knowledge Management was consolidated into a system made up of: research institutes and universities, as generators of knowledge and information regarding EBA; and decision-makers at the territorial level (local governments, media, actors from different branches and ministries) as users and propagators of this knowledge to communities (children, youth, state, private workers, and housewives). The main tangible elements of the system are the training classrooms (5) created by the project and a digital information system (documentary and geographic)	2 provincial and 6 municipal governments	The target has been achieved. This statement considers that the systems created in terms of information flow and tools can be considered as sufficient elements of a knowledge management system.	S

Type of Indicator	Indicator	Baseline	Progress as June 30, 2020	Target for Project End (Sept 2020)	Rating	
					Justification	Rating
			available to local governments and the classrooms themselves.			
Outcome Indicator	2.3 Numbers of community members (men and women) belonging to local voluntary groups addressing environmental and adaptation issues.	0	5 working volunteer groups with a total of 94 members, of them 44 women (47%) and 50 men (53%) have been created, distributed as follows: - One in Guanímar (with 18 members, 10 are women), - One in Surgidero de Batabano (with 16 members, including 9 women), - One in Cajio (with 20 members, including 12 women), - One in Playa Mayabeque (with 35 members, of them 13 women), and - One at Majana beach (with 5 members, all fishermen). These groups support: the inspections and controls carried out on the project, the transfer of the trunks to make the palisades, the dissemination of the work of the project in the area.	1 group with at least 15 members (of which at least 45% are women) in four municipalities	The target has been exceeded in terms of number of groups, persons and percentage of women.	HS
Outcome Indicator	2.4 Numbers of local schools with study programmes incorporating adaptation issues.	0	35 schools in the two provinces include CC and EBA in their study programs, of which: 16 primary schools, 15 secondary schools and 4 municipal university centres, including one teacher training institute, which is part of the Agrarian University of Havana (UNAH).	16 primary schools 15 secondary schools 3 municipal universities 1 teacher training institute	The target has been achieved.	S

Type of Indicator	Indicator	Baseline	Progress as June 30, 2020	Target for Project End (Sept 2020)	Rating	
					Justification	Rating
Outcome Indicator	2.5 Numbers of dissemination and awareness raising materials on adaptation issues, produced by local media	0	19 audio-visuals were produced and broadcasted on several occasions by national and local television stations, related to the objectives and advances of the project, the mangroves and the importance of their protection. 47 reports were broadcasted by local (26), national (17) and international (4) television stations about the project, its actions, progress and perspectives as well as the importance of mangroves and other coastal wetlands. 39 reports and interviews were disseminated on national (7) and local (32) radio. 18 articles were published in national (4), local (9), web (4) media, and international (1). Many with access via internet.	17 audio-visuals 3 local television 5 local radio 2 articles	The target has been significantly exceeded.	HS
Outcome Indicator	3.1 Frequency of training and technical support visits carried out by provincial and municipal governments to coastal communities in support of EBA	0	2916 training and technical support actions were carried out with the coastal communities. These activities were led by the local government (153), the forest ranger (2729) and research institutes and universities (34). 2014: 3: Gob:1 CGB:2 2015: 144: Gob: 13 CGB: 127 Ins+Uni: 4 2016: 134: Gob 16 CGB: 115 Ins+Uni: 3 2017: 177: Gob: 14 CGB: 150 Ins+Uni: 13	3 training and technical assistant activities undertaken per year by technical authorities to coastal areas.	The target has been significantly exceeded.	HS

Type of Indicator	Indicator	Baseline	Progress as June 30, 2020	Target for Project End (Sept 2020)	Rating	
					Justification	Rating
			2018: 1265: Gob: 4 CGB: 1247 Ins+Uni: 14 2019: 1193: Gob: 105 CGB: 1088			
Outcome Indicator	3.2 Frequency of inspection visits to coastal areas by provincial and municipal governments in support of EBA	0	The Council of the Provincial Administration of Artemis and Mayabeque CAP led 25 Comprehensive Inspections to the coastal area of the Project. Integral inspection year 1 2014 2 2015 4 2016 5 2017 7 2018 6 2019 0 2020 In these inspections were participating representatives of all the regulatory institutions of each municipality: the CAP and CAM, SEF, CGB, TGF, PNR, and implementation office.	3 inspection activities undertaken per year by provincial municipal government and other regulatory authorities	The target can be considered to have been exceeded, except when major causal factors external to the project have not allowed it (in 2014, 2015 and 2020).	S
			In the 6 years, 2319 sea and land tours were carried out, led by the CGB and cooperated with PNR, SEF, TGF and the OIN. CGB / coop tours year 10 2014 70 2015 180 2016* 566 2017*		The target can be considered to have been exceeded, except when major causal factors external to the project have not allowed it (in 2014, 2015 and 2020).	HS

Type of Indicator	Indicator	Baseline	Progress as June 30, 2020	Target for Project End (Sept 2020)	Rating	
					Justification	Rating
			987 2018* 357 2019** 149 2020*** 2319 * Repair of the southern dike road, improving traffic and surveillance capacity ** Recurrence of the Blockade and reduction of fuel, from September to December, in 2020 also affected by shortages of fuel in all provinces *** Only the first quarter of the year with COVID 19 is reported.			
Outcome Indicator	3.3 Number of studies and methodologies carried out to estimate the cost - benefit from the implementation of the approach ABE, available for planners and policy makers.	0	A Methodology for Monetary Assessment of Wetland ecosystem services was developed, which served as the basis for: • The realization of 4 studies of economic valuation (3 in the mangrove ecosystem and 1 in the swamp forest at municipal levels of the two provinces) carried out by students of the Agrarian University of Havana. • Two economic valuation studies were also carried out: One in the Mangrove ecosystem in the Project intervention area with the corresponding Cost Benefit analysis and using two different discount rates. The other economic valuation study was conducted in the Cienaga Forest in the project work area. In total, a methodology for Monetary Valuation in Wetlands and 6 studies on economic valuation were completed.	3	The target has been exceeded.	HS

To meet the targets set out in the project document, and to exceed some of them, Manglar Vivo had to overcome some important challenges. One of the most substantial challenges was the need to import many inputs, from fuel to heavy equipment via light equipment, and the difficulties of doing so given the trade blockade to which Cuba is subject. Indeed, many of the inputs needed for the project do not exist on the national market, so they have to be imported. This is difficult because of the economic, financial and commercial blockade, which makes very few suppliers available and involves long, complex and uncertain import processes with these suppliers. The whole chain is complex: identification of goods and suppliers, procurement, shipping and payment, even for UNDP, which assists in this matter. Cuban actors try to anticipate and are creative, but there are often negative surprises. In addition to these general difficulties, which apply to all international projects implemented in Cuba, there were exceptional challenges relating to imports during the implementation of Manglar Vivo. In Cuba there is no free import market - import companies are assigned to certain institutions. In 2017, CITMA and the Ministry of Foreign Trade and Investment (MINCEX by its initials in Spanish) changed the institution in charge of importing to the executing agency of Manglar Vivo (AMA). EMIDICT, the newly appointed importing company, was not technically prepared to assume the rigours of this type of acquisition. Among other things, it did not know the technical specifications of the goods to be imported for Manglar Vivo. These factors resulted in significant delays in the acquisition of basic goods, including fuel. The impact of not having these goods was partially mitigated by the commitment of the agroforestry companies in Artemisa and Mayabeque, who made some of the missing equipment available to the project as this arrived. In any case, these companies lacked some of them, as they generally did not exist in the country. This contributed to the delay in the implementation of the project, and the consequent one-year extension of its duration.

The limited environmental awareness of the communities close to the intervened ecosystems was another important challenge. Before the project, these communities were not aware of the importance of these ecosystems and their illegal use, partly due to their own vulnerability, contributed to their degradation, in a vicious circle. The conservation and restoration of these mangroves was disruptive and there was some resistance to change. In this sense, there was a certain mistrust at the beginning, having to convince communities not only that it was a project for them, but also that it was with them. Awareness raising, training and communication activities, including work with children, participatory processes and the very positive results of ecosystem restoration changed this awareness. In this respect it was very important to develop an identity manual and to undertake communication in a professional manner, with the help of experts. Indeed, the project involved the Design Institute in the participatory development of a visual identity and the Faculty of Communication of the University of Havana in communication tasks, including visits to schools, the development and dissemination of life stories, the regular production of newsletters, and the development and dissemination of perception studies (for more details on communication, see section 3.5.2).

The mindset of agroforestry enterprises was also a challenge. These enterprises were economic actors used to timber extraction who were unaware of the medium- and long-term benefits of protecting, conserving, and/or restoring wetland forests. In this sense, the companies were unaware of the ecology of mangroves and did not recognize them as ecosystems, but rather as productive forest cover. One of the two agroforestry companies was newly created, so its capacities were even more limited.

In addition, Manglar Vivo had to deal with limited knowledge, given the innovative nature of the project. Although the project was rooted in many years of experience, the approach was novel, so some details were unknown and had to be learned on the fly, with a significant learning curve in different areas. Before the project, agroforestry companies and communities were unaware of how the coastal ecosystem worked and what it was made up of. For example, the differences between mangroves, swamp forest and neighbouring forests were not well understood. The rehabilitation and restoration of coastal ecosystems was also a challenge. It was necessary to identify the species to be repopulated and to characterize and propose a site-specific germination strategy, of which neither the project team nor the specialists from the research institutes nor the forest workers were entirely sure. In addition, once the species had been identified, the seedlings had to be procured. It was necessary to search all over the country to find the species that make up parts of the bordering forests and were no longer south of Artemis and Mayabeque. In the training rooms, the trainers themselves had to be trained and awareness materials produced. The economic valuation studies were also very innovative. The country had little experience in this area, although another UNDP initiative, BioFin, had started environmental accounting at national level. In this context, it was difficult to set up a working team and find relevant information on environmental economics, as evaluations had not been carried out with the required depth and specificity. Also, when some of the equipment that was scarce or non-existent in the country, such as GPS, arrived, many people did not know how to use it. Another key point was the institutional one. The country lacked references of such multidisciplinary teams in coastal ecosystem restoration for climate change mitigation and adaptation.

Another of the challenges was the state of degradation of the ecosystems where work was being done, which had been greatly reduced not only by the cutting of trees and the inadequate functioning of the canal system, but also by the massive presence of IAS. Eliminating these was a difficult task. In addition, the coast had been affected by a recent hurricane, so the restoration work was made difficult in many areas by the presence of many objects of all kinds. Many of the roads were also blocked, making access to the work areas difficult.

Related to the above, as mentioned, it was not easy to secure the labour needed to carry out the restoration activities of the project. At the beginning of the project, the agroforestry companies did not have enough staff, and existing staff was unmotivated and lacked the necessary equipment (shoes, chainsaws, transport) for field work. The project solved this difficulty by increasing the salary of those working in rehabilitation from 300 to 1300 CUP/month, through the improvement of the technical work sheets, getting the workers to do more tasks and each of them being better paid.

Finally, COVID-19 stopped the project's activities. Its impact was relatively limited because the restrictions took place at the end of the project, when many of the targets had already been met, but they were not negligible, even for this final evaluation, whose modality was re-evaluated because of the pandemic and because the two international evaluators could not travel to the country.

3.3.2 How were risks managed and mitigated?

In general, the risk mitigation strategies identified in the project document were adequate. However, the sequence of activities was not fully taken into account in two respects. On the one hand, the survival of seedlings can in many cases only be analysed after a certain period of time, so there is a risk that areas where there is no survival in the last two years cannot be replanted. On the other hand, in the project document, awareness raising relies decisively on the dissemination of the results of economic assessment, but since this is produced rather late in the project, this strategy contributes more to the sustainability of the project once it is completed than to its appropriation during implementation. In addition, the strategy with regard to the acquisition of goods is insufficient. The project document focuses on the development, approval and early implementation of procurement plans. Although this is a desirable strategy, it does not address structural problems, such as reducing imports to the essentials and training importing companies on the technical specificities of the goods to be imported.

During project implementation, actions to mitigate the risks that were presented, whether or not identified in the project document (see section 3.2.2 for details), were appropriate. The multidisciplinary composition of the steering committee and work teams helped to identify risks and define and implement strategies to mitigate them. For example, this included updating provincial and municipal disaster risk reduction plans in light of new AMA studies, conducting very frequent inspections, or taking a more active, though insufficient, approach to promoting alternative livelihoods. Similarly, in early 2016, the risk of ineffective mangrove restoration was identified, and the design changed. It was also felt that more time was needed to see the results and a one-year extension was requested. The project was also able to adapt to the new and unsuspected situation generated by COVID-19. Perhaps, if anything, more could have been done with respect to the transition of the importing company, although the project team, AMA, CITMA, MINCEX and UNDP supported and held permanent exchanges and meetings with the new importing company to facilitate the process. The Progress Reports to the Donor (PPR) indicate precisely how the risks were managed.

3.4 Efficiency

3.4.1 Adaptive management

As mentioned above, the project was able to identify obstacles and risks and design and implement strategies to overcome those obstacles and mitigate those risks. In this sense, the project was able to adapt and respond to different needs as it was implemented, showing a great capacity for adaptive management. To this end, collaborative work was very important, in terms of the participation of many actors, valuing the information and ideas of all of them.

The most important recommendations of the mid-term evaluation focused on information gathering, including documentation of coastal ecosystem restoration. To this end, it was suggested that an expert be hired. Following this recommendation, the project hired an international expert with this profile and refined, in the light of her recommendations, both the restoration techniques (use of staking, planting in garden style...) and their documentation, applying methodologies for experimental work in mangroves. Based on the recommendations of the Steering Committee, the project included new actors, such as the protected area, the flora and fauna institution, hydraulic

resources, or ICIMAR, to monitor the maritime zone. The adaptive management was documented in the PPRs and shared with all relevant partners.

3.4.2 Financing and co-financing

Is there a difference between planned and actual expenditure and why?

As of May 2020, the project had spent US$5,367,258, or 96% of the total budget foreseen in the project document. Financial information provided by the UMP and interviews suggest that the rest is committed. For details, see Table 4.

By year, the project had an extremely low financial implementation in 2014 (3% of what was foreseen in the project document and 19% of what was foreseen in the budget revision), and low in 2015 and 2016 (50% of what was foreseen in the project document each year, although in 2016 74% of what was foreseen in the budget revision). Financial performance was good in 2017 (76% of what was planned in the project document and 97% of what was planned in the budget revision), but was again low in 2018 (57% of what was planned in the project document and the budget revision). Financial implementation was relatively good in 2019 (87% of what was planned in the project document and the budget revision) and good in the first five months of 2020 (43% of what was planned in the project document and the budget revision). It should be noted that this analysis uses the data provided by the PMU, but that the totals provided for this part are higher than those included in the project document for the whole implementation period. This point is discussed in more detail later in this section.

Several factors explain this evolution. The start of the project outside the Cuban fiscal year created difficulties for implementation in 2014. In 2015, institutional arrangements were negotiated with the institutions responsible for project implementation in the field and this took longer than expected. The revision of the mangrove work sheets, which did not exist before the project, also took time to be formulated and formalized. In addition, the agency that initially handled international procurement had such a large workload that procurement was delayed for this and other projects in the country. This greatly affected the procurement of inputs in the years 2014 and 2015. Subsequently, as mentioned, there was a change in procurement policies from 2015 to 2016. This change established that each government organization, including AMA-CITMA, would be responsible for having its own import agency. The AMA-CITMA import agency (EMIDICT) was not technically prepared. This process of transition and learning directly impacted the possibility of implementation in the years 2015 to 2017.

As of May 2020, there were significant differences in financial implementation by component: in component 1, around 10% of the total budget foreseen in the project document for this component was still to be implemented, while approximately 20% more than the total budget foreseen had been spent in components 2 and 3.

The main reason for the financial underperformance in component 1 is that the prices of several machines were lower than expected. For example, the tractors had a planned cost of 35,000 CUP, and had an actual cost of 17,000 CUP; the crawler tractor, a planned cost of 150,000 CUP and an actual cost of 65,000 CUP; and the backhoe loaders, a planned cost of 250,000 CUP, and an actual cost of 78,000 CUP. The reason for this was the agreement with a brand that supplies this

machinery, which is represented in Cuba and is not significantly affected by the economic blockade on imports. In light of this, a budget revision was made in 2018 and 2019, directing the surplus to printing guides, brochures and other documents. It is estimated that by the end of the project, implementation of this component will be 5% lower than foreseen in the project document.

The main reason for the financial over-execution in components 2 and 3 was the increase in the price of services for workshops and printing. These were done with national providers. Although this is quicker and more strategic from an impact point of view in the country, prices in Cuba are much higher than in other countries due to the increase in the price of raw materials abroad as a result of the US economic blockade. Table 6 provides details of the financial execution by component.

With regard to project management costs, as of May 2020, actual cumulative expenditure amounted to USD 304,889, which is equivalent to 82% of the total planned costs. It is estimated that at the end of the project the management costs will be 3% lower than foreseen in the project document. Actual cumulative implementation costs as of May were 5.7% of total cumulative project costs, a slightly lower percentage than foreseen in the project document (6.7%). At the end of the project they are estimated to represent 6.5% of total project expenditure. These expenditures are analysed in detail below in this section.

Table 4. Cumulative finance of the project

	Cumulative Actual (June 2014-May 2020)	Total (June 2014 - Sept 2020) planned in the prodoc		Cumulative (June 2014 - May 2020) based on UMP data			
				Planned		Percentage	
		Total	% over total	Prodoc	Revision	Over prodoc	Over revision
Outcome 1	3,647,582	4,020,000	91%	6,683,469	5,645,669	54.6	64.6
Outcome 2	819,552	700,000	117%	1,126,584	867,461	72.7	94.5
Outcome 3	595,234	500,000	119%	797,868	742,023	74.6	80.2
PMC	304,889	372,000	82%	559,868	479,368	54.5	63.6
Total	**5,367,258**	**5,592,000**	**96%**	**9,167,789**	**7,734,521**	**58.5**	**69.4**

Table 5. Finance per year

	2014					2015					2016					2017				
	Previsto			Porcentaje		Previsto			Porcentaje		Previsto			Porcentaje		Previsto			Porcentaje	
	Prodoc	Revisión	Actual	Sobre el prodoc	Sobre la revisión	Prodoc	Revisión	Actual	Sobre el prodoc	Sobre la revisión	Prodoc	Revisión	Actual	Sobre el prodoc	Sobre la revisión	Prodoc	Revisión	Actual	Sobre el prodoc	Sobre la revisión
Outcome 1	228,300	29,500		0%	0%	752,200	752,200	334,890	45%	45%	1,147,400	647,400	417,723	36%	65%	1,218,100	879,100	877,363	72%	100%
Outcome 2	211,200	40,500	7,233	3%	18%	237,300	237,300	143,837	61%	61%	197,500	121,477	147,254	75%	121%	163,600	151,200	138,630	85%	92%
Outcome 3	146,600	15,000	6,577	4%	44%	158,400	158,400	101,931	64%	64%	162,300	238,323	166,350	102%	70%	202,500	202,500	175,122	86%	86%
PMC	99,000	18,500	6,139	6%	33%	127,100	127,100	83,746	66%	66%	38,500	38,500	37,772	98%	98%	67,200	67,200	67,321	100%	100%
Total	**685,100**	**103,500**	**19,949**	**3%**	**19%**	**1,275,000**	**1,275,000**	**664,404**	**52%**	**52%**	1,545,700	1,045,700	769,098	**50%**	**74%**	1,651,400	1,300,000	1,258,436	76%	97%

	2018					2019					2020 (31 de Mayo)				
	Previsto			Porcentaje		Previsto			Porcentaje		Previsto			Porcentaje	
	Prodoc	Revisión	Actual	Sobre el prodoc	Sobre la revisión	Prodoc	Revisión	Actual	Sobre el prodoc	Sobre la revisión	Prodoc	Revisión	Actual	Sobre el prodoc	Sobre la revisión
Outcome 1	1,829,663	1,829,663	938,139	51%	51%	1,204,306	1,204,306	943,517	78%	78%	303,500	303,500	135,951	44.8	44.8
Outcome 2	210,290	210,290	168,493	80%	80%	106,694	106,694	214,107	201%	201%	-	-	-	-	-
Outcome 3	114,068	113,800	112,266	98%	99%	14,000	14,000	32,987	236%	236%	-	-		-	-
PMC	48,600	48,600	41,953	86%	86%	90,900	90,900	36,587	40%	40%	88,568	88,568	31,372	35.4	35.4
Total	**2,202,621**	**2,202,353**	**1,260,850**	**57%**	**57%**	**1,415,900**	**1,415,900**	**1,227,198**	**87%**	**87%**	**392,068**	**392,068**	**167,323**	**42.7**	**42.7**

Table 6. Project finance per component

	Cumulative Actual (June 2014- May 2020)	Planned for the whole duration of the project *	Total (June 2014 - Sept 2020) planed in the prodoc	Percentage	
				Mayo 2020	Final project
Outcome 1	3,647,582	3,815,131	4,020,000	**91%**	**95%**
Outcome 2	819,552	819,552	700,000	**117%**	**117%**
Outcome 3	595,234	595,234	500,000	**119%**	**119%**
PMC	304,889	362,085	372,000	**82%**	**97%**
Total	**5,367,258**	**5,592,002**	**5,592,000**	**96%**	**100%**

* This corresponds to the addition of actual expenditure in the period 2014-2019 and the expenditure planned for 2020.

Did the leverage of funds (co-financing) occur as planned?

According to the data provided by the UMP, Manglar Vivo managed to mobilize CUP 19,238,611 in co-financing. This represents 382% of what was committed in the project document, which, as highlighted by the EMT, does not provide a concise and clear table in this regard.

The main source of co-financing is the National Fund for Forestry Development (FONADEF by its initials in Spanish), with resources from the Ministry of Agriculture. In addition, co-financing was provided by AMA, the National Institute of Agro-Forestry Research (INAF by its initials in Spanish), the Institute of Ecology and Systematics (IES), ICIMAR, Mundo Latino and the Forest Rangers Corps (CGB by its initials in Spanish) attached to the Ministry of the Interior, among other institutions. The co-financing was in kind and consisted specifically of the salaries of the specialists, technicians and workers involved in the project, as well as expenses related to fixed telephone services, electricity, premises and other expenses associated with the operation of offices, work areas and laboratories.

An important factor in increasing FONADEF's co-financing was the refinement of the technical specifications. The project improved their wording, thus being able to mobilize more resources by engaging more workers and quadrupling their salaries. As noted above, the co-financing helped to mitigate the impact of the delay in importing some goods. As noted in the MTR, it can be concluded that co-financing concentrated on component 1.

Were the accounting and financial systems established for the management of the project and the production of accurate and timely financial information adequate?

The project produced financial reports with the required regularity. This included combined expenditure reports and the financial sections of the PPRs. In terms of audit, financial controls exceeded the requirements of the AF. In fact, audit reports were made by up to four institutions. Financial management followed the donor's budget lines and complied with their rules. The deviations mentioned above in terms of allocation to the various components were authorized. Nevertheless, the quality of the financial reports can be improved. In the financial information provided by the UMP to the evaluation team, the subtotals (as of May 2020) were higher than the planned budget for the whole project (as of September 2020). This is partly explained by differences in the fiscal year between the project document (September - September) and Cuba (January - December) and by delays in procurement due to the US blockade. In this regard, the financial year budgets include the outstanding purchases from the previous year, the planned purchases for that fiscal year and part of the purchases for the following year. Although relevant, this explanation is insufficient. In order to plan finances properly, the total in project finances should consider the project document. On the other hand, there are also deficiencies in the monitoring and reporting of co-financing, which is either not disaggregated or, as in PPRs, is provided incompletely or inconsistently[14].

Have financial resources been used efficiently?

[14] The evaluation team prepared a co-financing table along the lines of the TOR, but the PMU did not complete it.

It is very difficult to compare the cost-effectiveness of Manglar Vivo with other projects working on EbA in terms of cost versus results achieved. For example, it is not clear which indicator to use (cost per hectare where restoration work has been carried out? cost per hectare restored? cost per person with reduced vulnerability as a direct result of the project?) It seems more appropriate to make a qualitative analysis, considering the important factors in that aspect. The distance between the capital city and the intervention areas, the distance between human settlements and workplaces, the distance between the workplaces themselves (degree of concentration), the salary of the labour force, the cost of inputs/equipment/machinery and the level of consolidated knowledge can be highlighted. Considering these factors, compared to other international projects, the cost-effectiveness of Manglar Vivo was probably intermediate. The proximity of the intervention areas to the capital, to the human settlements and to each other favoured the cost-effectiveness. However, labour wages were probably higher than in other countries, particularly the least developed countries, where per capita income is lower and where there are likely more wage disparities, resulting in lower wages for jobs performed by communities. Similarly, the US economic, financial and trade blockade resulted in higher input prices than in other countries. On the other hand, as explained, the EbA was very new in Cuba, so there was a learning curve. Projects that are not pilot and build on those are more efficient. In Cuba, Manglar Vivo worked on 84 km in 6 years; in a project that extends it and gives it continuity (Mi Costa) they are looking to work on 1,300 km in 8 years. Not only is there a difference in scale, but also in capacity and effectiveness thanks to the lessons learned from the implementation of Manglar Vivo.

In terms of management costs, Manglar Vivo is not particularly efficient. As mentioned, in Manglar Vivo these costs represented 5.7% of the total project expenditure as of May 2020 and are expected to represent 6.5% by the end of the project. This is below the ceiling set in the AF policy (9.5%)[15] and the percentage indicated in the project document (6.7%) and approved by the AF. However, it is above the ceiling set for this type of project by the GEF and the GCF[16], in both cases 5%. A comparison with some other projects at the international level suggests that the management costs of Manglar Vivo are reasonable, with projects with both higher and lower management costs than Manglar Vivo.

Manglar Vivo developed a cost-benefit analysis of coastal ecosystem restoration interventions. In terms of costs, the study considered restoration and maintenance activities, expendable assets, equipment and fuel. In terms of benefits, five provision services were considered (agricultural production, beekeeping, livestock, fishing and water purification) and seven regulation and support services (disaster damage reduction, air quality and gas regulation, water regime regulation, pollution control/waste regulation, erosion regulation, nutrient cycling and biodiversity). Note that there is no explicit, direct or comprehensive consideration of reducing the vulnerability of the populations of the area to coastal flooding as a result of climate change (not all relevant aspects

[15]The AF management cost policy does not distinguish between projects by their size. https://www.adaptation-fund.org/generic/costs-and-fees/#:~:text=The%20project%20execution%20cost%20(B,to%20day%20activities%20of%20projects.

[16] The GEF and GCF management cost policies distinguish projects by their size, with different ceilings: the GEF differentiates between projects less than or equal to and more than USD 2 m, while the GCF differentiates between projects less than or equal to or more than USD 3 m. For the GEF, in projects over USD 2 m, management costs should not exceed 5%; in medium-size projects, of less than or equal to USD 2 m, management costs may be higher than 5% but should not exceed 10%. For GCF, in projects of more than USD 3 m, management costs should not exceed 5%; in projects of less than or equal to USD 3 m, these costs should not exceed 7.5%. GEF Guidelines on the project and program cycle policy. GEF/C.52/Inf.06/Rev.01 (2017) and Policies on fees for accredited entities and delivery partners GCF/B.19/29 (2018).

are considered), although implicitly and partially the above-mentioned regulating services contribute to reducing vulnerability (some of those included are relevant). At the same time, the study considers aspects which, although they do not directly contribute to adaptation, are important, such as biodiversity and, in a more complex manner, the regulation of greenhouse gases. The analysis concluded that the cost-benefit ratio was greater than 6.8; in other words, for every CUP invested in the restoration of coastal ecosystems, a gain of more than 6 CUP was obtained[17]. This study does not demonstrate, as argued in some project communications, the cost-effectiveness of applying the EbA approach, but rather the cost-effectiveness of restoring coastal ecosystems in general. The part of reducing vulnerability to climate change is not fully integrated into this analysis.

Furthermore, the project document provides concrete indications on the cost-effectiveness of EbA against hard or grey infrastructure investments. The project document estimates that the cost of hard or grey infrastructure in the intervention area would be USD 141/m. In contrast, the cost of EbA is just over 62 USD/m, which is only 44% of the cost of a grey infrastructure approach. In total, the savings would be more than USD 6.5 m over 84 km of coastline[18].

3.4.3 Monitoring and Evaluation (M&E) System

Did the project have a robust M&E system to measure the achievement of results? Did it have sufficient financial resources? Was the logical framework used during implementation as a management and monitoring tool?

The project document includes an M&E plan in line with UNDP and AF procedures. The plan clearly defines roles and responsibilities and specifies the tasks to be undertaken. These tasks include an inception report; bi-annual monitoring to inform the Steering Committee; and annual monitoring and reporting, using the AF templates. The M&E plan also includes annual field visits. The M&E plan in the project document also includes an MTR and a final evaluation. A final project report would also be prepared during the last three months of the project. The monitoring and evaluation plan also includes audits, which would be conducted annually or at other frequencies according to UNDP audit policies. The monitoring and evaluation plan is comprehensive and robust. Sufficient financial resources are allocated to implement the plan.

As noted in section 3.2.1, the results framework has significant weaknesses at both the objective and outcome levels. During implementation, especially since the MTR, which recommended strengthening scientific monitoring, the project put in place a much more comprehensive and robust M&E system than suggested in the results framework in the project document. This is particularly true regarding the health of the mangrove, marine ecosystem and water resources - no progress was made in monitoring the swamp forest and the bordering forest. This was mainly done through co-financing of the country's research institutes and other international projects, but also relied on the support of volunteer groups. With INAF and IES, M&E methodologies were

[17] According to the study, the total monetary value of the ecosystem services in the mangrove areas of the project intervention zone reached a value of more than 120 million CUP per hectare per year. The reference to 6.8 is the low range. The cost-benefit ratio ranged from 6.81 to 15.25.
[18]The project document provides a more detailed analysis by taking data from the Caribbean. The costs offered here are based on data from the South Dike for related coastal infrastructure investments, but not identical to those that would be required to address flood risk.

established to assess the conditions of the mangrove and its response to restoration activities. To this end, salinity meters were acquired and used and permanent monitoring plots and photo points or quick visits (no more than 5 minutes at each point) were established in a larger number of areas. These visits were combined with satellite images. Together with the IES, forest workers and technicians from the protected area monitored the flora and fauna, particularly birds (resident and migratory), butterflies and dragonflies. They had a baseline from previous studies, which were completed with new zoological studies. In addition, with ICIMAR, the health of marine ecosystems began to be monitored. Additionally, Manglar Vivo worked with OP15 and the National Institute of Hydraulic Resources to monitor water quality, establishing 3 monitoring stations. On the other hand, the project made efforts to monitor the communities' perception, as an indicator of the results of the awareness and training activities. In collaboration with the Latin American Faculty of Social Sciences (FLACSO by its initials in Spanish), the project designed a survey. This was implemented in 2014, 2017 and 2019. Although the same people were not surveyed, the available information suggests that the same questions were asked to the same population groups, allowing for commensurability. All this implied a substantial increase in the number and frequency of field visits by not only the PMU but also other relevant actors. This was helped by the provision of transport by Manglar Vivo.

What was the frequency and quality of reporting?

Reporting has been carried out in accordance with the monitoring and evaluation plan included in the project document. In fact, more types of reports have been produced and a greater number of reports than foreseen in the project document. In fact, in addition to five PPRs, covering the entire implementation period, the PMU has produced several types of quarterly and annual reports, for different national institutions. The MTR was completed in November 2017. This document constitutes the final evaluation.

The quality of project reports, in particular the PPRs, is however medium: it improves what is required in the project document, but additional information is not always relevant (e.g. survey) or clear (e.g. inspections), while relevant information that should exist (e.g. water) is not provided. Indeed, the report often does not respond completely, directly or clearly to the indicator system. For example, the number of hectares where restoration activities have been carried out is reported, but not their impact in terms of ecosystem health (indicator I) or seedling survival (indicators 1.1, 1.2 and 1.3). In addition, the results of the survey are reported as an indicator of vulnerability (indicator II), when such a perception indicator only indicates the impact in terms of awareness and training. Indeed, these anecdotal perceptions can be influenced by several factors, making accurate measurement and analysis difficult. The progress report is also not clear regarding the knowledge management system, the surveys (it is not the total number that counts, but their distribution), or the cost-benefit analysis (it matters how many methodologies and studies, but not how many ecosystem services were considered). The lessons learned section could also be expanded and deepened. On the other hand, the document summarizing the impact of the project is undated and the progress document as of May does not provide consolidated information. Despite these important areas of improvement, the PPRs followed the general guidelines of the AF.

3.4.4 Institutional arrangements and stakeholder involvement

To what extent were effective partnerships established for project implementation with relevant stakeholders at different levels?

This section draws on previous sections. Section 3.1.6 explains the involvement of stakeholders during project design and implementation. Section 3.2.4 assesses the complementarity and coordination with other national and international initiatives, reporting on synergies with them. In this section it is therefore only appropriate to point out that effective partnerships were established with relevant actors, particularly with some ministerial portfolios (environment, foreign affairs, agriculture, education, interior), research institutes, academia, provincial and municipal governments, communities, schools, agroforestry companies, the forest ranger corps and some international projects, especially BASAL and OP15. As noted, partnerships expanded over time, with new institutions being added as their relevance was identified. From this perspective, the Steering Committee had a wide and diverse representation and worked well in terms of dialogue and exchange, and strategic leadership. As indicated above, these partnerships also helped to minimise project challenges, particularly in terms of the delay in inputs for component 1, mitigated by the contribution of agroforestry enterprises. These interactions not only strengthened the design and implementation of the project, but also constitute a positive impact of the project which is likely to continue when the project closes.

In addition to strengthening links with stakeholders, Manglar Vivo contributed to two key national processes. The project established a strategic alliance with the Third National Communication to the UNFCCC, materializing the theoretical concepts and political approach of this communication. Manglar Vivo also contributed to Tarea Vida.

3.4.5 Management system

Quality of execution and implementation

The implementation and execution of the project has been adequate. The PMU experienced a change of personnel in 2017. Information available as of August 2020 suggests that the internal information management deficiencies highlighted in the MTR were resolved. The PMU is a young, but technically robust, responsible and committed team. Monthly and quarterly meetings were held to follow up on technical and administrative aspects. Interaction with stakeholders was also appropriate. However, there have been some gaps in reporting and perhaps in the integration of the EbA into planning, an area where the team could perhaps have been stronger.

AMA has played its role well as the executing entity. It is an institution with a lot of experience in the execution of multilateral cooperation projects (it currently executes 10 m USD per year with seven international projects), with strong technical and administrative capacities, capable of mobilising the expertise required, and a solid administrative structure. However, as explained, its importing agency was not prepared to assume such a role for this project. AMA also has proven experience in collaborating with other institutions in the country, at the sectoral and territorial levels, which, on the other hand, can at times slow down decision-making processes. AMA committed sufficient human resources to the project and provided close and daily support to the PMU. The interaction with UNDP was also continuous.

For its part, UNDP fully complied with its role as implementing agency. At the regional level, there was a change in technical supervision, but this does not seem to have affected the implementation of the project. UNDP Cuba provided the required technical and administrative assistance, despite being a team with a high workload, given that much of the multilateral cooperation to the country flows through UNDP. Its technical soundness is well recognized. Administrative and financial support has also been important, since UNDP makes all the payments. In 2015, UNDP took over importing to address the lack of capacity of the new importing company, giving it time to settle in. The UNDP team has played an active role, participating in workshops, making field visits and overseeing consultancies and publications. Their contribution in the latter aspect is highly valued, not only from a technical point of view, but also to avoid typographical errors and to ensure that it is accessible to different audiences and that all institutions are well represented. UNDP appears to have fulfilled its supervisory role, in terms of lobbying and demanding compliance with donor guidelines, but providing assistance and showing a practical, constructive and collaborative attitude to achieving this. The dialogue between PNDU, AMA and UMP was fluid.

Have the tasks scheduled in the project's Annual Work Plans (AWP) been completed and has the project experienced any delays in implementation? If so, why?

As noted, the project has experienced delays. An extension of one year was requested. The delay is due to delays in imports and slow institutional start-up. In the first two years there was little progress. The delay is also explained by the introduction of new methodologies following the MTR. Once these methodologies were in place, they improved implementation, which, as detailed in section 3.4.1, accelerated from the third year onwards, but it took some time to understand and refine these methodologies. The arrival of specialized equipment and the cumulative results of training also gave a boost to implementation. The extension is also justified by the times involved in mangrove restoration. The impact of the pandemic has been relatively minor, as significant progress had already been made on almost all fronts.

3.5 Sustainability

3.5.1 Are there political, regulatory, institutional, financial, socio-cultural and environmental risks to the sustainability of the results of the project?

Did the project devise a sound sustainability or exit strategy, and did it implement it?

Components 2 and 3 can be understood as the exit or sustainability strategy of Manglar Vivo. In particular, this strategy is based on the integration of EbA into the policy framework and planning of governments and productive sectors (output 2.1); raising the awareness and training of stakeholders (output 2.2) based on sound knowledge management (output 2.3), including a cost-benefit analysis of EBA (output 3.1); and strengthening coordination (output 3.2). The project document adequately highlights this orientation of the two components, although it perhaps places too much emphasis on component 3 as an exit strategy. The sustainability strategy is sound, although more attention should have been paid to other connected ecosystems, with interventions that ensure ecological flow; the integration of sustainability into productive sectors other than

forestry (particularly agriculture and fisheries); and the promotion of alternative livelihoods. As the exit strategy is fully integrated into the project, it is well represented in the results framework. In this regard, section 3.3.1 on effectiveness assessed the extent to which the project exit strategy was implemented. The consequences of progress on these indicators in terms of risks to the sustainability of project results are discussed below.

Sustainability risks from the point of view of the political, regulatory and institutional framework

The available information suggests that from the point of view of the political, regulatory and institutional framework, the necessary conditions have been established to give sustainability to the project results in the short, medium and long term.

To begin with, Cuba is a signatory to international conventions that oblige it to give continuity to the processes and results of Manglar Vivo. Indeed, as noted in section 3.1.4, Cuba is a party to the UNFCCC, the CBD and Ramsar, among others.

Some national policies, strategies and laws, many of them in harmony with the country's international commitments, will also contribute to the sustainability of the results of Manglar Vivo. Among these, the National Economic and Social Development Programme to 2030 stands out as the country's main roadmap for the medium term (one of its five axes is environment and natural resources and the third general objective is adaptation to climate change). It also highlights Tarea Vida, with a horizon up to 2050, which, as indicated, gives EbA a key role in the coastal areas, stressing the need to protect and restore mangroves (this is one of the 11 tasks considered, in particular Task 5), and prioritizes the area of intervention in this respect. The environmental laws, policies and strategies mentioned in Section 3.1.4 (particularly the national environmental strategy and the national programme for the conservation of biological diversity) will also facilitate the continuity of the processes and outcomes of Manglar Vivo.

At the provincial level, as a result of the project's efforts, EbA has been included in eight plans. In particular, the provinces of Artemisa and Mayabeque have integrated EbA and, more specifically, the protection and restoration of their mangroves and the cleaning of ditches and canals, into their development plans, their economic plans, their environmental strategies and their adaptation plans. At municipal level, the six municipalities in the intervention area have included EbA in their development plans, their economic plans and their adaptation plans. The time frame for these plans is 2020/2025. Interviews suggest that EbA is also being inserted into the land use plans, which are currently under review. The insertion of EbA in the aforementioned provincial and municipal plans will contribute considerably to the sustainability of the processes and results of Manglar Vivo, although the absence of a comprehensive management plan for the coastal basins that drain the intervened mangroves compromises sustainability.

In addition, the institutional networks formed as a result of Manglar Vivo are likely to continue, given the importance attached to it by stakeholders and the collaborative attitude prevailing in Cuba.

Sustainability risks from the financial angle

From a financial point of view, Cuban institutions have already secured substantial resources to give continuity to the results of Manglar Vivo. In particular, in their economic plans, the provinces of Artemisa and Mayabeque have jointly allocated 20 m CUP to the protection and restoration of their coastal forests for the period 2020/2025 (10 m CUP each province), with resources from Tarea Vida. Although this heading also includes the forests on the north coast, a high percentage will go to the forests in the south where the project has intervened. Additionally, as mentioned above, the six municipalities involved in the project have allocated resources to give continuity to Manglar Vivo in their economic plans.

In addition, the agro-forestry companies in Artemisa and Mayabeque will mobilize resources from FONADEF. Thanks to the project, these companies have improved their capacity to develop data sheets and thus make use of the resources of this fund. Under the aegis of MINAG, this fund gives high priority to mangroves and their restoration. In fact, the economic plans of these two companies have already incorporated actions to sustain the results of Manglar Vivo. In general, these budgets also include the cleaning of ditches and canals for which these companies are responsible for maintenance.

The state forest services of these two provinces have approved a budget for 3 years (2021-2023) to train forest workers in restoration, through theoretical/practical actions, and to follow up and maintain the results of Manglar Vivo. The Mayabeque Forest Service has committed 500,000 CUP per year for 3 municipalities in the mangrove zone.

The National Company for the Protection of Flora and Fauna (ENPPFF by its initials in Spanish) will also mobilize resources not only from FONADEF, but also from the Fund for Other Budget Transfers, which allows for the leverage of resources for the conservation of flora and fauna. Its work will focus on the "Golfo de Batabanó" Protected Area of Fauna Refuge, which has had a historic budget of half a million CUP a year.

The forests in the area of intervention also have insurance, contracted with banks, to cover possible impacts such as hurricanes, fires or pest attacks. Although it has never been claimed to date, it can be an important financial resource. For its part, the Dique Sur has financial resources for engineering works to improve water flow.

Additionally, there are advances in the mobilization of international resources. This aspect is detailed in section 3.6.5. Here it is important to note that the resources are substantial. The most advanced and ambitious project is known as Mi Costa and seeks to mobilize 24 m USD, a part of which would be allocated to the intervention zone of Manglar Vivo. The PMU is also working on a proposal for the Caribbean Biodiversity Fund to monitor and slightly expand the coverage of the results of Manglar Vivo, building on its lessons and those of BASAL. Although not directly targeting the Manglar Vivo intervention area, the Food and Agriculture Organization of the United Nations (FAO) is attempting to mobilize resources for ecosystem restoration actions on the northern coast of Artemisa and Mayabeque. There would be positive indirect effects on the Manglar Vivo intervention area.

Resources for dimensions of Manglar Vivo other than coastal ecosystem restoration appear less secure. However, there are good prospects in some areas. The national strategy to strengthen local governments and communications includes financial mechanisms to support decentralization and community media.

On the other hand, from a material point of view, it is important to note that the project has provided equipment that will facilitate the continuity of the project results both in the forest and in the canals. This includes heavy machinery, such as backhoes, and light machinery, from chainsaws to computers, as well as means of transport. The interviews suggest that Cuban institutions have the technical capacity and financial resources to maintain this equipment. The risk in this regard may be the supply of parts or pieces when repairs need to be made, if they have to be imported.

From a financial point of view, the prospects are not so promising in terms of livelihoods. Although there has certainly been progress in the forestry sector and the project has made some efforts in some other areas, such as beekeeping and ecotourism, the impact in this area has been rather limited. Section 3.6.1 on anthropic pressures elaborates on this point.

Risks to sustainability from a socio-cultural perspective (country ownership / institutional and community capacity building)

The project has strengthened the awareness and training of almost all relevant actors, especially at local and community level, including adults, youth and children, male and female, and different productive occupations, on the importance of protecting and restoring ecosystems, particularly coastal ones, and their benefits, including reducing vulnerability to climate change. The interviews confirm the results of the 2019 survey, which reflected considerable awareness of the project's benefits and the need for their continuity. Indeed, 98% of the 689 people interviewed considered the protection of coastal ecosystems to be positive. This empowerment is fundamental to the sustainability of the project's results.

There is no indication that there can be any reversal in this regard. The conservation of natural resources and the EbA has been included in the education system. The work with schools and their circles of interest also continues on its own. They organise activities, such as the Mangrove Day. In addition, the training classrooms are well placed to continue, as they have physical spaces, methodologies and outreach materials, and trained, committed staff who are paid by the Artemis library, the forest ranger corps and the Batabanó Gulf protected area. In Artemisa, a project is being developed in coordination with CITMA to obtain resources for an environmental chair at the information centre. The universities were also strengthened with tools and materials. The project has made an important effort to document processes and lessons, which can be used as reference material.

The interviews also suggested political will on the part of representatives of national, provincial and municipal institutions. The results of the cost-benefit analysis, only recently published, will contribute to this.

Beyond awareness, sufficient technical capacities seem to exist to give continuity to the processes and results of Manglar Vivo. In this regard, it is essential not only the capacities built in local actors, including forest companies and workers, but also the links created between them and research institutes, which will be able to solve doubts as they arise and allow the updating of the knowledge needed to sustain the results of Manglar Vivo. From a monitoring point of view, the good relationship between communities and foresters will also contribute to sustainability.

The health of the ecosystems is expected to improve over time, increasing the ecosystem benefits. This is expected to further strengthen the environmental awareness of the relevant actors, contributing to the sustainability of the processes and results of Manglar Vivo.

From a social point of view, alternative livelihoods to those related to mangrove degradation have been promoted, although there is room for improvement in this regard (see Section 3.6.1 for an in-depth analysis).

Risks to sustainability from the environmental point of view

The results of the project are subject to significant risks from an environmental perspective. On the one hand, although the restoration dynamic is positive, and the health of the ecosystems appears to have improved considerably (see Section 3.6.1), it should not be lost sight of the fact that the coastal ecosystems were seriously degraded and the presence of IAS was very widespread before the project. In this sense, despite the fact that the project developed and disseminated an IAS Management Plan, in coordination with the IES and INAF, there is a non-negligible risk, especially under conditions of climate change, that these species will once again gain ground at the expense of native species, degrading the coastal ecosystems where work was carried out.

On the other hand, it is important to consider the connectivity with other ecosystems, particularly with inland water resources and marine ecosystems. There is a significant risk that the recovery process of coastal ecosystems will be reversed if the ecological flow to the region's mangroves is not improved, and/or if the marine ecosystems continue to be degraded, among other aspects by climate change. Implemented by UNDP, the Mi Costa project integrates these aspects. On the other hand, the FAO project incorporates the water dimension, thus contributing to the sustainability of Manglar Vivo. Having said this, it would be advisable to guarantee a better management of these two adjacent ecosystems beyond these possible international resources. In this regard, although there have been efforts to change the mindset of farmers, in collaboration with BASAL, and fishermen, progress in integrating environmental sustainability in general and adaptation to climate change and EbA in particular into the plans of these productive sectors has been limited. The results of the project have been included in the country's Strategic Plan for the Agricultural and Forestry Sector, but not in the plans or strategies of the agricultural and fisheries sectors at the sub-national level. Nor has a plan been developed for the integrated management of the coastal basins that drain into the mangroves of the provinces of intervention, which promotes good management of the ecological flow in the short, medium and long term, helping to ensure that restoration actions remain in place over time. Although this was not among the expected results of the project, it is important from the point of view of sustainability.

Perhaps the most significant environmental risk is that of an extreme event, particularly a hurricane, of very high magnitude. As discussed in section 3.2.2, this did not occur during the implementation of the project in the intervention area, but is very likely and could be devastating. Manglar Vivo has improved the response capacity, but the project areas remain highly exposed. The vulnerability of the inhabitants of the intervention area is analysed in more detail in section 3.6.1.

Another important environmental risk is fires, whose frequency and magnitude could increase with climate change. The work of Manglar Vivo in this aspect has been considerable in terms of physical actions, particularly the opening and maintenance of fire trails, technical capacity, equipment and

community surveillance, reducing the probability that fires will significantly affect the results of the project. Nevertheless, the risk is not negligeable. The May 2020 progress report notes that in the first five months of 2020 there was one less fire than in the same period in 2019, but the impact was greater, due not only to more favourable environmental conditions, but also to the fact that the preventive work with poachers and the use of fire has not been effective. Forest insurance would help to mitigate the impact of these external risks.

3.5.2 Communication

How effective are communications in ensuring stakeholder awareness of the project and of EbA?
Are there effective external communication mechanisms in place?

The project has undertaken numerous communications efforts, particularly as part of component 2 activities to raise awareness and train stakeholders on EbA and the importance of mangroves and other coastal wetlands in adapting to climate change. Over 123 materials were produced. Specifically, a total of 19 audio-visual materials were produced, 47 reports broadcast on local and national television, 39 reports and interviews broadcast on local and national radio, and 18 articles published in local and national media. This exceeds the targets defined in the logical framework during the project design.

In addition to being copious, the communication of the project has been effective. This was helped by the development in 2018 of a comprehensive communication strategy based on lessons learned in 2016 and 2017 in response to a recommendation from the MTR. This strategy identified the main lines of action and principles of the communication activities, as well as the communicative purposes and spaces and tools that could be used for each of the target public groups. Following the new strategy, which could have been more concrete, Manglar Vivo carried out communication adapted for different types of publics (communities, children, journalists, national and provincial governments...) with different objectives, using various media and diffusion channels (television, radio and press at local and national level, as well as social networks). These actions allowed the communication and dissemination of the project results at local, provincial, national and to a lesser extent at the international level, including the presence at some international events, such as NAP Expo.

The information available indicates that the work with the media has been one of the pillars of success and acceptance of the project at local and national level. The 2019 survey of a sample of 10% of the target population demonstrates the effectiveness of the communication actions. 91% of the respondents considered that the training and advocacy activities carried out by Manglar Vivo had increased their knowledge about climate change adaptation, the environment, and the importance of mangrove care and protection. In addition, it is reported that 76% know or use some of the materials developed by the project, including communication materials (audio-visuals, radio notes, brochures...). The MTR report already highlighted at the end of 2017 the very good quality of the communication tools produced and their contribution to the high level of public participation in the project and the good understanding by local stakeholders of the causes of the deterioration of the mangrove and its benefits in terms of EbA.

3.6 Impact

3.6.1 Are there signs that the project has contributed to, or enabled progress towards, the expected impacts (reduced vulnerability to climate change and pressure on ecosystems)?

To what extent has the project reduced pressure on the wetland ecosystems in the intervention area?

At the beginning of the project, the main factor of pressure on the wetland ecosystems in the intervention area was illegal activities by the population, mainly for the extraction of wood for charcoal production, sand mining, and poaching. The project has contributed significantly to reducing this pressure. Essentially, this has been done through three mechanisms: increased social awareness of the importance of protecting coastal ecosystems; more frequent and effective monitoring; and promotion of alternative livelihoods.

As mentioned, progress in raising awareness has been very significant. Populations have become defenders of coastal ecosystems. Monitoring and control has also made significant progress (see indicator 3.2), thanks to the strengthening of institutional coordination and the provision of equipment and transport. Increased awareness has also led to greater surveillance and social control. Progress in alternative livelihoods has been limited. The project has directly generated more jobs in the forestry sector (e.g. in Mayabeque the agroforestry company increased the number of workers from 20 to 55), with higher pay (quadrupling), and has generated alternative sources of income through beekeeping and the use of the invasive alien species removed to make charcoal and export pallets and beehive boxes. In the latter two areas, project support has not yet translated into full-time employment. In addition, the project has made some other efforts, such as exploring the use of a sludge with medicinal properties or the exploitation of ecotourism, with the development of a trail. These efforts have not yet borne concrete fruit. Manglar Vivo has also organised a course in the management of local development projects with the Articulated Platform for Integrated Territorial Development (PADIT by its initials in Spanish) in the province of Artemisa. Although only the bee initiative has been implemented, the conditions for other alternatives have been improved. Indirectly, through the improvement of ecosystem services, the project promotes greater productivity of key economic activities in the intervention area, namely agriculture and fisheries (see text below for more details). Although some positive impacts on agriculture and fisheries are already seen, these impacts will in principle be more evident in the medium and long term.

In addition to the economic exploitation activities, an element of pressure on the ecosystems was the malfunctioning of the canal system. Manglar Vivo helped to clean up trenches and canals and helped INRH to identify points that needed engineering adjustments to improve water flow. Drainage of water for agriculture is another pressure factor for coastal ecosystems. Manglar Vivo strengthened the awareness of farmers, mainly through BASAL and OP15, which focus on this, although there is probably room for improvement in this area.

In sum, in the short term, pressures on ecosystems have been reduced considerably, although they remain important. These pressures are likely to be reduced in the medium and long term, however, to the extent that the restoration of coastal ecosystems is strengthened and their benefits in marine (fishing) and terrestrial (agriculture) areas are more evident, and farmers and INRH implement good practices in the use of water resources and the maintenance and improvement of the canal system, respectively.

It is important to stress, however, that there are structural and circumstantial factors that do not help to reduce economic pressure on ecosystems. We refer in particular to the economic blockade of the country, which is compromises its prosperity, and the pandemic caused by COVID-19. In this sense, there is always a risk of unsustainable use of natural resources, given that communities live in the area.

To what extent has the project improved the health of the wetland ecosystems in the intervention area?

As mentioned (see sections on M&E and effectiveness), there is no complete information on this point. A baseline and robust end-situation analysis is lacking.

With regard to coastal ecosystems, as mentioned in section 3.3.1, the project carried out restoration interventions on 7,770 hectares. Of these, 4,368 hectares have been certified as restored in wetland forests and 3,402 hectares of mangroves. Regarding the results in terms of the health of coastal ecosystems, the available information suggests the following positive impacts[19]:

- Water: interviews indicate that there has been a reduction in water salinity, by improving the exchange between fresh and saltwater, as a result of cleaning ditches and canals and the purifying and barrier action of the strengthened mangrove. Available studies indicate a salinity level of 36 g/l [20], which can be considered an indicator of good health.

- Tree density/vegetation cover: Aerial pre and post images show positive results in terms of mangrove restoration. Existing information suggests an improvement in the growth rate of the forest cover of this ecosystem. According to the project data, the mangrove cover grew at a rate of 2.8% in the period 2006-2011 and a rate of 4.2% in the period 2011-2015. In contrast, mangrove coverage grew at a rate of 7.9% in the period 2015-2020, when the project was implemented. Interviews suggest that there are already red mangroves up to 10 metres long and with propagules or embryos, i.e. at full reproductive capacity. In the swamp forest, while the previous trend was towards degradation, the cover grew at a rate of 8.5% during the implementation of the project.

[19]The project has generated maps that show a clear improvement in the health of the mangroves between 2015 and 2020. These maps are included in Annex 7. The methodology is not entirely clear, so this final assessment summarizes the available information.
[20]This figure is an average of the measurements taken at 244 monitoring points: 210 in the mangrove ecosystem and 34 in the southern dyke speed bumps. These 244 monitoring points include the plots inherited from the Southern Archipelago project and the macro project from 2013 and the plots and stations set up by Manglar Vivo from 2015 to 2019. In the monitoring points of the southern dyke, the monitoring was carried out in cooperation with project 2 of the CPP OP15 programme, and from 2019 it was carried out with the INRH Artemisa..

- Normalized Vegetation Index: available information indicates that this index hardly changed during the project's duration[21]. In 2014 the average NDVI was 0.80, while in 2019 it was 0.81. In any case, the index suggests good health[22].

- Soil: The existing information also suggests a decrease in soil salinity. The data show a downward trend: from 39 ppm in the area around the canals and 47 ppm in the other areas in 2015 to an average of 34 ppm in 2019 (in the dry period) [23]. The effect and duration of this change is substantial. The project has 17 soil salinity monitoring points. In some points (7), analyses of functional groups of microorganisms were carried out. A slight increase in biodiversity was noted in areas where the change in salinity was permanent, mostly in areas favoured by microchannels or planting niches. The interviews mention a recovery of the soil/sedimentation and that metres of coast have been recovered.

- Floristic and Faunistic Composition / Biodiversity
    - Flora: available information points to a reduction in the presence of IAS (mainly casuarina (C. equisetifolia) and the Indian almond (Terminalia catappa)) and an increase in the presence of native species (especially the red mangrove, but also others) [24]. There are no concrete figures on the number or percentage of these before and after the project.
    - Fauna: Interviews suggest that species such as the manatee, bullfrog and crocodile have returned to the area. Migratory birds have also been seen, especially waders, coots and others, which had ceased to frequent the area[25]. The presence of molluscs (oysters) and crustaceans (shrimps) has also been detected.

In addition to improvements in the health of coastal ecosystems, available information indicates an improvement in the health of marine and terrestrial ecosystems. In marine ecosystems, an improvement in water quality in terms of micro-organism and hydrogen composition has been detected. There has also been an increase in the volume and diversity of marine flora and fauna (e.g. different types of molluscs, 4 species of fish, sponges), especially in the areas of Playa Majana and Punta Cayamas. The Gulf of Batabanó is strategic for fishing in the region, as it is the breeding ground for lobster and crayfish fry, which are caught as far as in Florida, USA. However, there is no solid scientific analysis of the project's impact on fishing. Interviews suggest that the project has helped to improve the aquifers in the provinces of Artemisa and Mayabeque on which

[21]This analysis was carried out at 235 points throughout the mangrove, where NDVI values were monitored from 2000 to 2019.
[22] Values between 0.6 and 1 are considered in the literature as indicators of healthy vegetation.
[23]It should be stressed that the data are not absolutely comparable: in 2015 there is no average and no indication of the season; in 2019 there is an average and an indication of the season.
[24]In particular, Haemathoxylon campechianum (Campeche wood, Brazil), Calophyllum antillanum (ocuje), Taliparíti elatum (majagua), Sabal japa (toti tail, cana japa), Tabebuia angustata and T. shaferi (white oak), Bursera simaruba (almacigo), Swietenia mahagoni (mahogany, c. antillana), Cojoba arborea (red palm), Abarema glauca (Algerian palm) and Coccoloba praecox (uverillo, uvilla), Thrinax radiata (guano de costa), Cupania glabra (guara de costa), Erythroxylum confusum (arabo colorado) and Trichilia havanensis (siguaraya). These native species tend to offer multiple benefits. For example, the bagá species, in addition to providing protection against erosion of riverbanks, offers food services to wildlife.
[25] Birds: Buteogallus gundlachii (Batwing sparrowhawk), Patagioenas leucocephala (white-headed torcaza), Agelaius assimilis (marsh mayito), Melopyrrha nigra (negrito); Butterflies: Phoebis avellaneda; fish: Nandopsis tetracanthus (Biajaca criolla) and Limia vittata (Cuban limia). In the protected area, a greater presence of mammals such as Capromys pilorides (jutia conga) and Mysateles prehensiles (jutia carabalí) has been detected.

food production for the capital depends, as well as drinking water, although there are no specific data on this.

The health of coastal ecosystems, and associated marine and terrestrial ecosystems, is expected to improve over time as planted species grow, although as mentioned in section 3.5.1 these ecosystems are exposed to significant environmental risks. Mangrove planting began in late 2014 or the first half of 2015. In 5 years, the trees reach an average height of between 1.5 and 2 meters. In this sense, the intervention areas have been declared areas in the process of restoration and/or rehabilitation, and not restored or rehabilitated, because restoration is a process that takes time, especially given the degree of degradation at the beginning of the project.

Has the project reduced the vulnerability of the populations of the six municipalities in the project's direct intervention area (direct beneficiaries) and that of the populations of the provinces of Artemisa and Mayabeque beyond the six municipalities in the project's direct intervention area and other provinces of the country (particularly Havana) (indirect beneficiaries)?

Vulnerability is a complex concept, with many facets. It is not easy to measure. There are many debates in the international literature about the definition of vulnerability and/or resilience indicators.

As noted, the project has helped to restore coastal ecosystems. One of the services provided by these ecosystems is protection from sea-level rise and extreme weather events. In particular, mangroves dissipate wind and sea energy. In principle, in this sense, mangrove restoration reduces vulnerability to coastal flooding. The mangrove, especially the red mangrove, is a good barrier to sea penetration.

Scientific evidence on the impact of the project in this regard is scarce. However, there is anecdotal evidence. Before the project, coastal flooding reached 11 kilometres. During the project, coastal flooding reached a maximum of 8 kilometres. In recent events, waves invaded where there were no mangroves, while they did not invade where there were mangroves, because they provided protection.

The attribution is in any case complex, as it partly responds to the absence of very high intensity hurricanes during the implementation of the project. In fact, in order to measure the change in the level of vulnerability, one would have to see the effect of a hurricane of the same level. This information does not exist. However, it seems logical to think, and there are indications, that the recovery of coastal ecosystems has reduced vulnerability to coastal flooding. As mentioned, mangrove restoration takes time, so it is early to analyse the impact of restoration actions on the health of coastal ecosystems and, in turn, the impact of healthier coastal ecosystems on reducing the effect of sea level rise and extreme weather events. From the point of view of attribution, it should also be borne in mind that the rehabilitation of the southern dyke has also contributed to reducing vulnerability.

Beyond the restoration of ecosystems, other interventions have contributed to reducing vulnerability. The cleaning of ditches and canals has helped to improve the channelling and circulation of water, so that it flows more where it should, reducing the occurrence and extent of damage, and it flows faster, reducing the duration of damage.

In addition, the project has helped reduce vulnerability by strengthening planning, management and response capacities, providing more and better information, improving institutional and technical capacities, and providing equipment, including computers, vehicles and heavy (e.g. backhoe) and light (e.g. chainsaws) machinery.

Within this general framework, it is important to distinguish between several scales: municipalities on the first strip of coast, municipalities slightly further inland, municipalities slightly further inland in the provinces of Artemisa and Mayabeque, and Havana. Indeed, within the project the situation of the six municipalities is dissimilar: Batabanó and in particular Surgidero are very close to the coast; the other five municipalities are close but more distant from the coast.

In this sense, it is in Batabanó and especially in Surgidero that vulnerability has been reduced the most (5,000 inhabitants). In the other five municipalities (Artemisa, Alquízar, Güira de Melena, Melena del Sur and Güines) vulnerability to marine flooding has also been reduced. Interviews suggest that in some other municipalities in the two provinces, especially those most adjacent to the project area, vulnerability to marine flooding has also been reduced (sub-costal municipalities are no longer flooded). In these areas, as well as in Havana, the impact on surface and groundwater resources (saline intrusion) has been reduced, improving agriculture and the availability of drinking water. Interviews suggest that farmers are now able to grow crops that they could not grow before. In this sense, more than 2.5 million people have theoretically benefited from the project. These areas have also benefited from advances in the institutional, technical and material factors mentioned above. This zone of influence must include the population of the Isle of Youth, approximately 85,000 people, given its dependence on imports using the port of Surgidero de Batabanó, whose resilience to coastal flooding has been strengthened as a result of Manglar Vivo.

In its communications, the project uses a perception survey as an indicator of vulnerability reduction. Specifically, it highlights that in 2019, 80% of the more than 900 people interviewed in these six municipalities considered that their vulnerability had been reduced. In reality, this data indicates the ownership of the project by these people, but it is not a robust indicator of changes in the level of vulnerability.

AMA's Hazard, Vulnerability and Risk Studies Department plans to conduct one such study on the intervention area in 2021. This study will provide scientific data on the reduction of vulnerability to marine flooding of the direct and indirect beneficiaries of the project, taking into account future projections. In addition to its rigour, with extensive and detailed field work, this study will have the advantage of giving more time to settle the coastal ecosystems where Manglar Vivo has intervened.

To what extent have there been unexpected results (positive or negative) and what were they?

The evaluation team has not identified any negative unexpected results. The identified unexpected results are all positive. These include:

- the integration of EbA into the national education system;
- the direct promotion of some alternative livelihoods, such as ecotourism and medicinal muds;

- the creation of nurseries for the neighbouring forest[26];
- improving physical planning. Thanks to information generated by the project, the government will relocate the most vulnerable population;
- improving water planning by identifying the water passages that INRH need to improve to ensure water flow in coastal wetlands and aquifer recharge.
- There were also unexpected advances in scientific research. In particular, a fern species thought to be in danger of extinction was identified.

3.6.2 Cross-cutting elements

Did the project successfully integrate other UNDP priorities, such as the achievement of the Sustainable Development Goals (SDOs), poverty alleviation and generation of socio-economic benefits, prevention and recovery from natural disasters, respect for social and environmental safeguards and empowerment of women?

The contribution to SDGs was not integrated into the project design, as they were defined after the project was designed (SDGs were formulated in 2015, while the project was designed in 2011). However, the purpose and activities of the project contribute to the fulfilment of several SDGs, namely those on climate change (no. 13), preservation of marine and terrestrial diversity (no. 14 and 15), clean water (no. 6), decent work (no. 8) and gender equity (no. 5, see below).

On the other hand, although the project's primary vocation was environmental, it generated economic and/or social benefits. As mentioned in section 3.6.1, in the short term there were positive impacts in terms of job creation and improvement of working conditions in the forestry sector and the development of new potential income generating activities, such as beekeeping. In the medium term, the project provides benefits in terms of increased productivity in agriculture and fisheries, the key livelihoods in the area. These socio-economic benefits contribute to poverty reduction in the beneficiary communities, although the lack of data makes it impossible to quantify this contribution[27].

As discussed in more detail in section 3.6.1, it is reasonable to think that the project contributed to reducing the vulnerability of the populations in the south of the provinces of Artemisa and Mayabeque to coastal flooding, although there is no scientific data to confirm this.

Furthermore, although environmental and social safeguards were not defined during project design, given that these requirements were integrated into UNDP procedures in 2015, negative social or environmental impacts have not been reported. The project team considered these aspects during the implementation of the activities, in light of the knowledge gained from training funded by the GFC, ensuring that the activities of Manglar Vivo did not have any negative environmental and social impacts.

[26]The project did not establish mangrove nurseries. It was assessed that they are not economically, ecologically or genetically feasible..
[27]It should be borne in mind that the poverty line is not used in Cuba, as it is considered an inadequate indicator of the socio-economic conditions of the population in a country where health and education are free.

The project has also evolved in terms of gender mainstreaming. Although the Federation of Cuban Women and the MINAG gender group were consulted during the design of the project, the project document does not pay sufficient attention to gender equity. The context analysis is general and not very precise. It points out that women are particularly vulnerable to climate risks and extreme events in the area, since they are the first ones who have to migrate to ensure safe living conditions for their children. However, the project document does not provide an in-depth analysis of this differentiated vulnerability, nor more generally of the living conditions and role of women in the two target provinces. The project document does not include a gender action plan either. Nor does it appear that this was elaborated in the initiation phase, as promised in the project document. Furthermore, the results framework does not systematically integrate the gender perspective. It includes very few gender-disaggregated indicators. Only the indicator on the total number of people benefiting from the project (indicator II) and the indicator on the number of people participating in local volunteer groups established under component 2 (indicator 2.3) detail gender targets (45 per cent women).

During implementation, monitoring and reporting on gender equality has not been systematic. In the last PPR and the June 2020 update on project progress, indicator II is not broken down by gender, although it is detailed for indicator 2.3. The impact summary document does not provide details on gender. Indeed, no information is available on the level of women's participation in many activities, such as the proportion of women in awareness raising and training workshops, the formulation of provincial and municipal development plans, or jobs created in the forestry sector.

However, available information suggests that during its implementation the project did contribute to and did not undermine gender equity, albeit with nuances. The target of having at least 45% of the beneficiaries be women has been exceeded by the end of the project: women represent 48% of the direct beneficiaries and 50% of the indirect beneficiaries. In indicator 2.3, the target is met at the aggregate level, but not for two of the five groups created[28].

Beyond that, the interviews indicate that women have been active participants in the various project activities. In this sense, the interviews indicate that the project has contributed to improving women's representation and participation in the forestry sector. While the workers / labourers remain men, women have had access to technical positions, both in the forestry company brigades and in the nurseries created. For example, women from the communities of Surgidero de Batabanó and Cajio came to hold technical positions within the protected area of the Gulf of Batabanó. It is worth mentioning that the project is part of a socio-cultural context in which women are equal participants in all of the nation's activities[29]. In fact, in Cuba the gender quota in all sectors is 50% and work is paid equally[30].

During its implementation, the project has also made efforts to integrate young people. As mentioned, work was done with primary and secondary schools and universities, from the point of

[28] In Guanímar (10 women out of 18 members), in Surgidero de Batabanó (9 women out of 16 members), in Cajio (12 women out of 20 members), in Playa Mayabeque (13 women out of 35 members), and in Playa Majana (no women out of 5 members).
[29] This does not justify the absence of a detailed gender analysis, gender action plan or systematic monitoring of the project's contribution to gender equality. These aspects are indispensable and mandatory in any international project, regardless of a country's progress in gender equality. Their content changes according to the context, but their need does not.
[30] https://oig.cepal.org/es/paises/11/profile.

view of awareness raising and, in the second case, also of labour enrolment. In addition, young people were trained and involved in forestry work. They worked as forestry technicians or field workers who are responsible for monitoring the flora, planting native species, nurseries and other activities. At the end of the project, 17% of the direct project beneficiaries and 14% of the indirect beneficiaries are young people.

3.6.3 Production of public goods

Were new knowledge, approaches and technologies promoted?

The project pioneered the introduction of the EbA concept in Cuba and Latin America. As explained, EbA is a cost-effective approach compared to structural measures that were used to protect coastal communities from the risk of flooding and submersion (e.g. construction of a retaining wall).

In addition, Manglar Vivo helped to improve knowledge about the restoration of coastal ecosystems. In general, it introduced an ecosystem approach, moving from forest management (planting without hydrological rehabilitation) to the management of wetlands as ecosystems (with hydrological rehabilitation) and promoting a broader territorial approach, considering watersheds and marine ecosystems. It also introduced new techniques. Indeed, although there is long experience of planting mangroves in Cuba, some of the techniques promoted by Manglar Vivo were new. For example, while before it was planted from the sea to the land, now it is planted from the land to the sea. Other new practices include the island method, the niche technique or the staking or palisade, which creates an artificial barrier that helps deposit sediment and reduces the impact of tidal flow and thus coastal erosion. These practices have demonstrated effectiveness and results not previously seen. Likewise, Manglar Vivo generated knowledge in terms of forest species.

Work on the economic or monetary valuation of coastal wetland ecosystem goods and services, the cost-benefit analysis of coastal ecosystem restoration, and the comparison between EbA and adaptation measures based on hard or soft infrastructure works was also very innovative from a knowledge standpoint, although work on the latter aspect was limited. As a result of the project, six theses were produced on this aspect[31].

3.6.4 Demonstration

Have measures been taken successfully to disseminate public goods, for example through training, development of demonstration sites or dissemination of information, among others?

The project has conducted numerous training activities with different types of stakeholders on the concept of EbA. According to the latest version of the project's progress matrix, 173 trainings were

[31]This includes 2 full studies and 4 university graduation papers. One of the full papers focuses on the mangrove ecosystem and the other on the swamp forest. These two studies are ready to be presented as scientific articles in the Ibero-American Journal of Ecological Economics. Three of the graduation papers focused on the mangrove ecosystem and one on the swamp forest.

conducted for governments, local media, and teachers and children, as well as 2916 training actions for communities.

In addition to training, Manglar Vivo has promoted practical learning, with demonstration plots where training has been given to society in general, from the inhabitants to agroforestry workers and agricultural producers, as well as students at different levels. In particular, two classrooms were created, one in Surgidero de Batabanó, within the Golfo de Batabanó protected area, and another in Cajio, within the CGB facilities, established in conjunction with the BASAL project. These reference plots serve as a natural classroom for educational and scientific purposes, in addition to being able to document in situ collections of the area's native species, methods of enriching the mangrove and swamp forest and control of IAS. Forest workers and volunteer groups, both made up of community members, have also learned by doing. The five volunteer groups supported the implementation, control and monitoring of the mangrove restoration activities and participated in raising awareness and disseminating the results of the project in their respective communities.

Additionally, Manglar Vivo developed 10 methodological guides, highlighting those focused on the economic valuation of ecosystem services and the restoration of the mangrove. The systematization products developed allow the consolidation and capitalization of the knowledge generated by the project. Manglar Vivo promoted 60 additional publications.

In addition, the project has taken steps towards the creation of knowledge management systems. In particular, and it is important to be specific about this, Manglar Vivo has strengthened the links between the generators of information and knowledge about EbA (particularly research institutes and universities, more specifically the municipal university centres and the universities of Havana, Artemisa and Agraria in Havana) and the users and propagators of this information to the communities (in particular the national, provincial and municipal governments, the media and the training rooms). In addition, the project has created a digital folder system containing all the project information, including documentary and geographic information, available to local governments and the training classrooms themselves.

In the longer term, the project promoted the integration of the EbA directly into the development strategies and plans of the municipalities and provinces of Artemisa and Mayabeque. The project has succeeded in including EbA in 26 local development plans, significantly exceeding the target set out in the logical framework, with significant financial commitments. In addition, the project promoted the introduction of the EbA concept in the school and university system. In particular, this approach was integrated into the pedagogical guidelines and textbooks of some basic subjects in primary and secondary education (grades 5, 7 and 10) and in optional subjects in different university courses. This will contribute to the dissemination of public goods generated by the project.

The 2019 survey shows that these efforts yielded good results. Ninety-one percent of the respondents that year considered that the training and promotion activities carried out by Manglar Vivo have increased their knowledge about climate change adaptation, the environment and the importance of caring for and protecting the mangrove. Beyond the area of intervention and the short term, these demonstration strategies offer good prospects for replication and scaling up.

3.6.5 Replication / Scaling up

Are activities, demonstrations and/or techniques being repeated within or outside the project, at national or international level? Are some of the approaches developed through the project being adopted at regional/national level, which are being widely accepted, and perhaps legally required?

As mentioned, the results of the project strengthened the development in 2017 of Tarea Vida, which incorporated experiences from the project. The results of the project have also been included in the country's Strategic Plan for the Agriculture and Forestry Sector, with a horizon up to 2030. In addition, the results of the project have been incorporated into the educational system, both in textbooks for grades 5, 7 and 10 and in the contents of subjects for various university courses. As indicated in the section on sustainability, the project results also strengthened the development of development and economic plans at provincial and municipal level, as well as environmental strategies at provincial level.

During the project, the project's approach was applied in other areas of the country. The lessons of Manglar Vivo have been used in the implementation of a project in the Bay of Havana, specifically in the Ensenada de Tisconia. In this area the Bay Group is carrying out actions for the recovery and rehabilitation of a very degraded mangrove area, and with similar characteristics to those of the mangroves where Manglar Vivo is concentrated. Manglar Vivo cooperated actively in the rehabilitation, applying EbA tools and training key actors, from the directors to the farmers of the area, and carrying out communication activities in the Bay and in the interest circles of the adjacent primary schools, transferring the positive experiences obtained in the province of Mayabeque. Thanks to the restoration actions implemented, the health of the mangrove has improved considerably in this area. Interviews suggest that flamingos and other species have returned to the area after many years.

Furthermore, the Manglar Vivo approach was implemented in another ecosystem, in order not only to broaden the application of given knowledge, but above all to enrich and refine it. In particular, Manglar Vivo, focused, as emphasized, on the southern coast of the central part of the large island of Cuba, also developed activities on the south-eastern coast of this island, specifically in Caymanera, in the province of Guantanamo, more than 500 km from the main intervention area. The environmental conditions in this area are different from those in the south of the provinces of Artemisa and Mayabeque. Support included the exchange of knowledge and the use of trained human resources and material acquired by Manglar Vivo in this other area. This activity allowed the enrichment of knowledge on restoration methodologies and will facilitate the expansion to other regions of the country.

Less specifically, there are prospects for expansion in the intervention municipalities. The interviews suggest that in the municipality of Artemisa the lessons of Manglar Vivo have been used in other areas of the municipality. The prospects for scaling-up are more promising in the project's intervention provinces. The governments and agroforestry companies in the provinces of Artemisa and Mayabeque are interested in extending the practices of Manglar Vivo to other municipalities on both the southern and northern coasts. The province of Artemisa will replicate the initiative on the north coast. It has already identified the areas and how to do it. There is also a willingness to apply these methodologies in other municipalities on the south coast of the province. There the mangroves are relatively well conserved, but the province wants to ensure that they are maintained

and/or improved. In the province of Mayabeque two municipalities, Nueva Paz and San Nicolás, have secured FONADEF resources for 2021 to restore wetland areas in their territories in harmony with the Manglar Vivo approach and techniques. Nueva Paz is explicitly mentioned as a priority in Tarea Vida. There is also interest in applying the Manglar Vivo methodology in the other municipalities of the province. The State Forestry Service of the province of Mayabeque, which approves the municipal forestry plans, is providing technical assistance so that the plans of these municipalities include restoration actions in the coastal strip following the Manglar Vivo methodology. This expansion has been promoted by the inter-municipal exchange of experiences at the provincial level. The representatives of the municipalities of Artemisa, Batabanó and Melena Sur indicate that they have exchanged their experience in Manglar Vivo with the other municipalities in their provinces.

At the national level, within the framework of Tarea Vida, there have been efforts to share the results and lessons of Manglar Vivo with other provinces in the country. To this end, as mentioned, books and guides have been prepared and published, and members of the PMU have participated in dissemination events. For example, as a result of the project, more attention is being paid to community involvement and the use of climate change projections as a tool for decision makers is becoming more widespread. The Ministry of Agriculture is also seeking to replicate the Manglar Vivo methodologies with agroforestry companies throughout the country. For its part, the ENPPFF has introduced the EbA approach in its work, not only in Batabanó and Cajio, but also in La Coloma and all the areas it serves, such as Guayabal in Manzanillo, Granma province, in the south east of the country. Theoretical and practical EbA training was also provided in the central region of the island, particularly in the Ciénaga de Zapata in Matanzas province.

In general, the country is very interested in EbA, given its vulnerability and the social and environmental benefits it generates, but also its high effectiveness and relatively low cost compared to alternatives such as resettlement or infrastructure measures in an economic context negatively affected by the economic and commercial blockade.

In addition, the lessons learned during the implementation of this project are being used in the design of other projects to be funded with international resources, of different scales. The most ambitious is the project "Adaptation to climate change in the coastal zone of Cuba with an ecosystem-based approach", better known as Mi Costa. This is a concept note to be financed by the GVF, with UNDP again as the implementing agency. The project considerably extends the geographical coverage of Manglar Vivo. With a budget of 24 m USD for eight years, the project covers seven provinces, 24 municipalities and 1,300 km, directly or indirectly benefiting almost 10% of the Cuban population. As mentioned, Mi Costa includes the intervention areas of Manglar Vivo (84 km of the 1,300 km of Mi Costa correspond to the intervention area of Manglar Vivo). Building on its lessons, Mi Costa fills gaps in Manglar Vivo, particularly by taking a truly holistic approach, integrating actions in terrestrial, coastal and marine ecosystems, with a watershed approach. In addition, Mi Costa promotes a more active participation of communities, particularly with regard to environmental indicators and climate services at the local level and will create a national digital platform for knowledge management. Mi Costa is evidence of the progress made with Manglar Vivo. If Manglar Vivo worked on 84 km in six years, Mi Costa is looking to work on 1,300 km in eight years. Not only is there a difference in scale, but also in capacity and effectiveness thanks to the lessons learned from the implementation of Manglar Vivo. A first proposal has already been sent to the regional GCF.

In addition, the lessons of Manglar Vivo are being taken into account in the formulation of the project "Building coastal resilience in Cuba through natural solutions for climate change adaptation", which involves four municipalities on the northern coast and will be funded by the European Union, and a project promoted by FAO in the same area. Although the interventions will be in different areas than where Manglar Vivo has worked, these projects will benefit the areas of intervention of Manglar Vivo because of their continuity in terms of water resources.

At the international level, there has been no concrete progress in replicating the lessons learned during the implementation of the project. Somehow, however, the lessons learned in terms of EbA have been capitalized on by UNDP's regional office for the region in the development of new projects.

It is important to emphasize that in these expansions, care is being taken to attend to the specificities of each area, and to avoid copy-pasting.

4. CONCLUSIONS, LESSONS AND RECOMMENDATIONS

4.1 Conclusions

Relevance

Manglar Vivo is consistent with the United Nations conventions on climate change, wetlands, and biodiversity. The project follows international guidelines on EbA, with room for improvement in terms of socio-economic benefits and demonstration of reduction of climate vulnerability of the coastal population. The project is in line with the overall objective of the Adaptation Fund and contributes to several of the outcomes and outputs included in its strategic framework. The project is also in line with UNDP priorities at global, regional and national levels. In addition, the project is in line with Cuba's United Nations Development Assistance Framework 2014-2018.

The project is also consistent with national strategies and priorities in the areas of economic and social development (National Programme for Economic and Social Development 2030), climate change (Tarea Vida) and environment (National Environmental Strategy, National Biodiversity Programme). In addition, the objectives and activities of the project respond to the problems and needs of the provinces and municipalities where it focuses. All stakeholders actively participated in the design and implementation of the project. Some key institutions were incorporated during implementation once they were identified as relevant. The collaborative and interactive nature of the project processes, in which different actors worked together and in which the ideas of all of them were valued, is noteworthy.

Project Design

The objective, outcomes, outputs and activities of the project are quite clear and well-integrated. However, some aspects, such as the structure of outcomes and outputs and the location of the integration of the EbA in the provincial and municipal planning, generate confusion. On the other hand, there are important gaps in relation to climate information; the connectivity of coastal ecosystems with terrestrial ecosystems, particularly the corresponding watershed, and the marine ecosystem; the built environment; and the promotion of alternative livelihoods and the adjustment of practices of productive sectors other than forestry, such as farmers and fishermen, in order to reduce pressures on ecosystems. These limitations are relatively understandable, given the relatively limited financial resources available, the time frame and the pilot nature of this project.

All targets are feasible and realistic within the budget. In contrast, the targets are not feasible and realistic within the 5-year timeframe, due to structural difficulties in implementation. The no-cost extension of one year confirms this. Specifically, as defined, the three targets related to the restoration of coastal ecosystems are neither feasible nor realistic in a time perspective.

The results framework included in the project document does not allow measurement of the achievement of the objective (reduction of vulnerability) or the key intermediate outcome (improvement in the health of coastal ecosystems). Indicator systems are more appropriate in components 2 and 3, although there are significant shortcomings. Overall, 80% of the indicators in the results framework are not specific and/or consistent.

The project document does not present assumptions but does identify and analyse risks to project implementation. All the risks identified were relevant, although not all of them were given due weight. The likelihood and risk of three of the seven risks should have been higher than considered in the project document. The project document did not consider five major risks. Five of the seven risks considered were either not present or did not have a significant impact. Two were more likely to occur and have a greater impact than expected (having to go to the international market and facing long, difficult and uncertain procurement processes). Of the risks not considered in the project document, three occurred, with moderate impacts.

The project document does not clearly integrate lessons learned from other projects. The interviews suggest that external lessons learned, especially at the national level, were taken into account during project implementation.

The project document does a good job at identifying and analysing complementary international projects and identifying synergies. The project is very complementary to past and ongoing projects, particularly two, BASAL and OP15, in terms of ecosystem and approach. The project had a high level of coordination with other international cooperation interventions during its implementation, thanks in part to Cuban institutional structures. Manglar Vivo carried out joint activities with BASAL and OP15. Project activities were also coordinated with work and research initiatives carried out by Cuban institutions in the agricultural, water and forestry fields.

Effectiveness

At the end of the project, all the final targets in the result framework have been met, and 8 or 50% have been exceeded. The fulfilment of the targets has been satisfactory at the objective level and very satisfactory at the outcome level. Performance is also satisfactory using the AF Result Tracker. All targets have been met, and 5 or 25% have been exceeded. This analysis is based on

important assumptions. Section 3.6.1 examines impacts in terms of vulnerability and health of ecosystems based on available information.

To meet the targets set out in the project document, Manglar Vivo had to overcome some significant challenges. The most substantial challenge was the need to import key inputs, and the difficulties of doing so given the trade blockade the country is under. In addition to this general difficulty, there were also specific challenges due to the change of importer and the limited preparation of the second. Other important obstacles were the low environmental awareness of the communities; the short-term vision of the agroforestry companies; the existence of limited knowledge, given the innovative nature of the project; the state of degradation of the ecosystems; the insufficient availability of labour; and COVID-19.

The risk mitigation strategies identified in the project document were adequate, although the sequencing of activities was not taken into account in some respects. During project implementation, actions to mitigate risks were appropriate. The project showed a high capacity for adaptive management. The project responded adequately to the recommendations of the mid-term evaluation. The multidisciplinary composition of the steering committee and work teams helped to identify risks and define and implement strategies to mitigate them.

Efficiency

As of May 2020, the project had spent 96% of the total budget foreseen in the project document. Available information suggests that the rest is committed. Financial implementation was low in 2014, 2015 and 2016, mainly due to the issue of imports. Financial implementation improved from 2017, with a fall in 2018. There are important differences in financial execution by component: component 1 has been spent 10% less and will spend 5% less than planned, while components 2 and 3 have been spent and will spend 20% more than planned. The main reason is that input prices have been different from the forecast: lower in component 1, higher in the other two. Project management costs are and are expected to be slightly lower than planned.

Manglar Vivo managed to mobilize 382 percent of the co-financing committed in the project document. The main source is the National Forestry Development Fund (FONADEF by its initials in Spanish), with resources from the Ministry of Agriculture. The co-financing, all in kind, helped to mitigate the impact of the delay in importing some goods and to exceed some of the targets.

The project produced financial reports and audits with the required regularity. Financial management has followed the donor's budget lines and complied with their rules. Nevertheless, the quality of financial reporting can be improved, both for international and national funding.

An analysis of the determinants of the cost-effectiveness of EbA projects suggests that the cost-effectiveness of Manglar Vivo was probably intermediate. In Cuba, projects that take the lessons learned from Manglar Vivo are likely to be more efficient. In terms of management costs, Manglar Vivo is not particularly efficient: its management costs represent 6.5% of its total costs. These are below the AF ceiling (9.5%), but above the GEF and GCF ceiling for projects of this size (5%). The cost-benefit analysis carried out as part of the project indicates that ecosystem restoration was cost-effective: for every CUP invested in coastal ecosystem restoration, there was a gain of more than 6.8 CUP. This analysis does not measure the cost-effectiveness of EbA. The project

document demonstrates the profitability of EbA as opposed to adaptation through the construction of grey infrastructure.

The project document includes an appropriate M&E plan. As indicated, the results framework has major shortcomings. During implementation, especially from the mid-term evaluation, the project strengthened the M&E system. The report has been appropriate in terms of quantity, exceeding requirements. However, although the AF guidelines are met, the quality of monitoring reports is average: it improves on the requirements of the project document, but additional information is not always relevant or clear, while relevant information that should exist is not always provided. Often the report does not respond completely, directly or clearly to the system of indicators.

The project established effective partnerships with relevant actors. The Steering Committee had a broad and diverse representation and worked well in terms of dialogue and exchange and strategic leadership. The PMU is technically robust and provided regular monitoring of the project, with room for improvement in reporting. AMA has performed well in its role as executor, from a technical, administrative and consultation point of view. However, as explained, its recently created import agency was not prepared to assume that role for this project. For its part, UNDP fulfilled its role as implementer, providing the required technical and administrative assistance, and showing a demanding but practical, constructive and collaborative attitude. The dialogue between the PMU, AMA and UNDP was fluid. Despite all this, the project was extended by one year, at no cost.

Sustainability

Components 2 and 3 can be considered as the exit or sustainability strategy of Manglar Vivo. The sustainability strategy is sound, although more attention should have been paid to other connected ecosystems, with interventions that ensure ecological flow; the integration of sustainability into productive sectors other than forestry (particularly agriculture and fisheries); and the promotion of alternative livelihoods.

From the point of view of the political, regulatory and institutional framework, the necessary conditions have been established to give sustainability to the project results in the short, medium and long term. Indeed, Cuba's international commitments and national policies will help give continuity to these results. At provincial and municipal level, the inclusion of the AbE in up to 26 plans will also favour sustainability. The strengthening of institutional structures will also help.

From a financial point of view, the provinces of Artemisa and Mayabeque and the project municipalities have already secured substantial resources to give continuity to the results of Manglar Vivo, especially those related to ecosystem restoration. The agro-forestry companies and forestry services in these two provinces and ENPPFF are also in a position to mobilize financial resources. In addition, the forests are insured. Additionally, there is progress in mobilizing international resources (see below). The project has provided equipment that will facilitate the continuity of the project results both in the forest and in the canals. Although there may be problems with the supply of spare parts, the technical and financial capacity exists to maintain them. The prospects are not so bright for livelihoods (see below).

From a socio-cultural perspective, the project has strengthened the awareness and training of almost all relevant actors. There are no indications that this can be reversed, given its integration into the education system and the dynamism of interest circles and training rooms. There is also a

strong political will to give continuity to the project's results. There also seems to be sufficient technical capacity and knowledge transfer mechanisms to do so. The project's extensive and effective communication activities have contributed decisively to this.

From an environmental perspective, the project results are subject to significant risks, including the occurrence of a major extreme weather event, especially a hurricane, and to a lesser extent fires; the expansion of IAS; and the degradation of connected ecosystems, such as water resources and the marine ecosystem, in part due to the absence of an integrated management plan for the coastal basins that drain the intervened mangroves.

Impact

In the short term, pressures on ecosystems have been significantly reduced through increased awareness, more frequent and effective monitoring, promotion of alternative livelihoods, and improved maintenance and use of water infrastructure and resources. Despite all this, in the short term, pressures on ecosystems are not negligible. These pressures are likely to be reduced in the medium and long term, however, as the restoration of coastal ecosystems is strengthened and its benefits in marine (fisheries) and terrestrial (agriculture) areas become more apparent, and farmers and the INRH implement good practices in the use of water resources and the maintenance and improvement of the canal system, respectively. The economic blockade of the country and the COVID-19 do not help to reduce these pressures.

There is no comprehensive information on the health of coastal ecosystems. Available information suggests an improvement, in terms of lower water and soil salinity, faster growth of forest cover, and recovery of flora and fauna (birds, mammals, reptiles, molluscs and crustaceans). The normalized vegetation index hardly changed. In addition, available information indicates an improvement in the health of marine and terrestrial ecosystems. The health of these ecosystems is expected to improve over time.

Scientific evidence on the impact of the project in reducing vulnerability to coastal flooding is scarce. It is reasonable to think that the restoration of coastal ecosystems, the cleaning of ditches and channels, and the strengthening of planning, management and response capacities have reduced the vulnerability of target populations to these aspects. There is anecdotal evidence in this regard. Those who have benefited most are the populations immediately on the coast. An AMA study will assess vulnerability reduction more rigorously in 2021.

Manglar Vivo contributed to SDGs, had socio-economic benefits, respected environmental and social safeguards, and promoted gender equity and the inclusion of youth. The evaluation team has identified only positive unexpected impacts.

The project provided public goods in the form of new knowledge, approaches and technologies. In particular, Manglar Vivo generated knowledge in terms of EbA, restoration of coastal ecosystems and the economic valuation of the goods and services they offer and the cost-effectiveness of their restoration. The project took measures to disseminate these public goods, including training, demonstration sites, publications of methodological guides, and knowledge management systems that link generators of information and knowledge about EbA and users and propagators of that information. In addition, the integration of EbA into provincial and municipal plans and into the school and university system was promoted, facilitating the circulation of these public goods.

There are excellent prospects in terms of replication and/or scaling up. The results of the project have informed the development of policies and strategies, such as Tarea Vida, agricultural and educational plans, and provincial and municipal plans. During the project, the project's approach was applied in other areas of the country, such as Havana and Guantanamo provinces, with different environmental conditions from those of the project in the second case. There are prospects for replication in the municipalities and, to a greater extent, the provinces of the project. At the national level, within the framework of Tarea Vida, there have been efforts to share the results and lessons of Manglar Vivo with other provinces in the country. Progress is being made in the provinces of Granma and Matanzas. In addition, the lessons learned during the implementation of this project are being used in the design of other projects to be financed with international resources, of different scales. The most ambitious, known as Mi Costa, covers, with a budget of 24 m USD, 1,300 km of coastline. At the international level, there has been no concrete progress in replicating the lessons learned during the implementation of the project**.**

4.2 Lessons

From the above[32], the following lessons can be drawn, which can be organised by distinguishing between effective project actions and areas of opportunity.

Effective actions of Manglar Vivo:

- From the point of view of relevance, sustainability and impact, it is essential that the project is aligned with international, national, provincial and municipal priorities. In this sense, it is key to articulate the project with strategic, long-term national policies and plans, with resources and visibility, such as the economic and social development programme and the national adaptation plan (Tarea Vida).
- From the perspective of relevance, effectiveness, sustainability and impact, it is important to try to identify all relevant actors in the design, but it is fundamental to have an inclusive, open and collaborative approach during implementation, integrating those strategic actors that were not identified in the design.
- From the angle of effectiveness, sustainability and impact, it is essential to promote the connectivity of coastal ecosystems, working simultaneously on mangrove, swamp and bordering forests, and combining the elimination of IAS and the planting of native species with hydrological restoration.
- For relevance, effectiveness and efficiency, it is key to coordinate closely with provincial and municipal governments, as well as with all complementary projects present in the intervention area and the surrounding ecosystems, identifying and exploiting synergies, including joint activities.
- For effectiveness, efficiency, sustainability and impact, it is essential to promote multi- and interdisciplinary teams, with the active presence of research institutes and academia, and favour a collaborative attitude and permanent exchange of knowledge. In this respect, it is

[32]These lessons also take account the lessons set out in the PPR and the MTR.

important to implement an approach that integrates theory with practice, with a high degree of ownership by local governments and communities.

- From the point of view of effectiveness, sustainability and impact, it is important to develop an identity manual and to undertake communication in a professional manner, with the help of experts, for example, the Design Institute and the Faculty of Communication of the University of Havana, respectively.
- From the perspective of effectiveness, it is necessary to adjust the data sheets of the agroforestry companies to ensure efficient forestry work and adequate remuneration, and thus a sufficient and motivated workforce.
- From the perspective of efficiency, a solid technical basis and a fluid dialogue between the PMU, the executing agency (AMA) and the implementing agency (UNDP) are essential for the efficient implementation of an international project.
- From the point of view of relevance, effectiveness and efficiency, it is essential to ensure the commitment of national institutions in order to be able to face difficulties as they arise (such as the provision of equipment or more manpower when the inputs provided with international funding have not arrived).
- From the point of view of sustainability and impact, cost-benefit analyses are an interesting analytical exercise and a useful tool for generating ownership and promoting sustainability, replication and scaling up.
- From the point of view of efficiency, sustainability and impact, the restoration of ecosystems is cost-effective: for every CUP invested in the restoration of coastal ecosystems, a gain of more than 6.8 CUP was obtained. EbA is also more cost-effective than adaptation through the construction of grey infrastructure. That said, EbA and adaptation with grey infrastructure are complementary and sometimes the latter is irreplaceable.
- From the point of view of sustainability, insurance can be important in providing continuity to the results of a project if a disaster occurs.
- From the point of view of effectiveness, sustainability and impact, it is essential to define and adopt measures to disseminate public goods (particularly the knowledge created), including training, demonstration sites, publications of methodological guides, and knowledge management systems that link the generators of information and knowledge and the users and propagators of that information
- For a greater impact, it is strategic to apply during the project its approach in other areas of the country, with similar and different ecosystems to the project, and with information and data on observed and projected climate variability and change, in order to finetune the approach.
- For greater impact, it is important to use the lessons learned during the implementation of one project in the design of other projects, of different scale.

Areas of opportunity:

- It is important to avoid confusion in the project document and to follow international guidelines and good practice (e.g. by defining fewer outcomes than outputs).
- From the point of view of relevance, effectiveness and impact, it is important to have a strong climate information component.
- From the angle of effectiveness, sustainability and impact, it is key to strengthen ecological connectivity, working simultaneously on coastal, terrestrial (inland watershed) and marine

ecosystems, considering the management effects of upstream and downstream areas of the intervention area.

- From the angle of effectiveness, sustainability and impact, it is essential to consider the built environment and human settlements, and to make strategic interventions in hard infrastructure, even when it comes to EbA projects, since they are complementary and not exclusive measures. Significantly reducing the vulnerability to climate change of some populations may require in some cases hard interventions (in some cases EbA may be insufficient to reduce vulnerability to acceptable levels).
- From the perspective of relevance, sustainability and impact, projects that involve protection and/or restoration of ecosystems must directly promote, at a certain scale and strategically (with a value chain vision), alternative livelihoods to those that result in the degradation of these ecosystems. The improvement in the provision of ecosystem goods and services as a result of protection and/or restoration actions is mainly manifested in the medium and long term.
- From the perspective of relevance, sustainability, and impact, it is essential to involve the productive actors that degrade ecosystems in a less direct way. In the case of coastal ecosystems, it is not enough to involve those who deforest, but also those who negatively affect the health of these ecosystems due to excessive water extraction (farmers) or fishing methods that degrade marine ecosystems.
- From the point of view of efficiency, when defining the duration of international projects, both technical and administrative issues must be taken into account, in particular the volume and speed of the contracting and procurement processes. In Cuba, attention must be paid to the need to import a large volume of goods and the long time this requires, due to the US economic, financial and commercial blockade. In this sense, projects in Cuba may require more time than in other countries.
- From an efficiency point of view, it is necessary to strengthen the capacity of importing companies on the specificities of the equipment to be imported and to strengthen the transition processes from the beginning.
- From the management perspective, all targets must be feasible and realistic within the time frame of a project
- From a management point of view, it is essential that the results framework allows the achievement of the objective and the outcomes to be measured. In this regard, it is essential to define SMART indicators of vulnerability. Defining robust indicators of ecosystem health is also essential in EbA projects.
- From a management perspective, risk identification and analysis must be realistic, recognizing the probability and potential impact of each risk.
- From the perspective of effectiveness, it is important to ensure sufficient labour from the outset, promoting adequate wages.
- From the perspective of effectiveness, efficiency, sustainability and impact, in EbA projects it is very important to have a robust M&E system from the beginning to monitor and evaluate the impacts of restoration actions on the ecosystems and the vulnerability of the population in a concrete and holistic way, considering the different ecosystems. The report has to be clear and concise and respond directly to all the elements of the indicator. The M&E system must be an instrument that supports planning and decision making during the course of the project.
- From an impact perspective, at the international level, it is important to establish systems to identify, systematise and disseminate lessons learned during project implementation, for example through South-South forums in the Caribbean.

4.3 Recommendations

Recommendation 1: Based on the results of the project, the PMU and AMA should prepare a document describing the aspects to be taken into account in the development of an integrated management plan for the coastal basins that drain into the mangroves of southern Artemisa and Mayabeque, in order to promote good management of the ecological flow in the short, medium and long term and thus contribute to the permanence of restoration actions. AMA should present this document to the National Watershed Council (CNCH), which in the country is responsible for watershed management and the elaboration of its management plans.

Recommendation 2: The PMU, AMA and UNDP should organize a workshop as soon as the situation of COVID-19 allows to identify and characterize lessons learned during project implementation. This exercise should take into account the lessons learned collected in the PPRs and this final evaluation but should be flexible enough to integrate the lessons identified by all relevant actors. After the workshop, the PMU, AMA and UNDP should consolidate the lessons, integrate them into one document and disseminate them, including their integration into the adopted knowledge management system.

Recommendation 3: AMA, UNDP and AF should use these lessons in the development and implementation of new projects. In this regard, AMA should continue its efforts for national and international initiatives, while UNDP and AF should strengthen them, for example, by organizing webinars that bring together various projects in the Caribbean.

Recommendation 4: AMA should promote that the HVR study planned for the intervention area in 2021 is actually carried out, taking into account future climate projections. AMA should ensure that the study takes into account Manglar Vivo. In this regard, the study should answer questions on ecosystem health and the vulnerability of direct and indirect beneficiaries of Manglar Vivo that this final evaluation has not been able to fully answer due to its scope in terms of equipment and days and the impossibility of conducting field work due to the COVID-19. The results of the HVR should be considered as an evaluation of the results of Manglar Vivo, with more time elapsing since its completion. AMA should ensure that this is explicit, for example with a dedicated annex. This annex should include lessons learned. AMA should ensure that these lessons are taken into account in the design of new projects. AMA should also share the results of the HVR, the conclusions in terms of the results of Manglar Vivo and the lessons learned with UNDP Cuba and Panama, so that they can incorporate the lessons learned into the design and implementation of new projects.

5 ANNEXES

5.1 Evaluation matrix

Table 7. Evaluation matrix

Evaluation criteria	Questions	Indicators	Sources	Methods
1. Relevance: To what extent was the project consistent with international environmental and climate change conventions, the strategic objectives of the Adaptation Fund and UNDP and local, regional and national priorities in terms of development, environmental protection and adaptation to climate change?				
.1.1. Is the project consistent with the objectives of international environmental and climate change conventions and international guidelines on EbA?	• To what extent is the project aligned with the objectives of the international environmental (United Nations Convention on Biological Diversity (CBD)) and climate change (United Nations Framework Convention on Climate Change (UNFCCC)) conventions? • Is the Project in tune with international guidelines on EbA?	• Priorities and areas of work of the international environmental (CBD) and climate change (UNFCCC) conventions incorporated into the design and implementation of the project • Consideration of international EbA guidelines in the design and implementation of the project	• Project document • PPRs • CDB and UNFCCC websites • Interviews with UNDP Cuba and Panama, PMU and AMA	• Document review • Interviews

Evaluation criteria	Questions	Indicators	Sources	Methods
.1.2. Is the project consistent with AF strategic priorities?	• How does the project contribute to the AF's strategic priorities?	• Existence of a clear link between the project objectives and the strategic priorities of the AF	• Project documents • AF strategic documents • Interviews with UNDP Cuba and Panama, PMU and AMA	• Document review • Interviews
.1.3. Is the project align with UNDP priorities?	• How does the project contribute to UNDP priorities at the national and regional level?	• Existence of a clear link between the project objectives and UNDP priorities at the national and regional level	• Project documents • UNDP Cuba country document • Interviews with UNDP Cuba and Panama	• Document review • Interviews
.1.4. To what extent is the project consistent with national environmental, climate change and sustainable development strategies and priorities?	• How does the project contribute to the country's strategies and priorities for the environment, climate change and sustainable development? • Has the project been appropriated by the country? • What was the level of stakeholder participation in the design and implementation of the project?	• Level of alignment between project objectives and national environmental, climate change and sustainable development priorities, policies and strategies • Perception of the level of country ownership of the project • Perception of the level of stakeholder participation in project design and implementation	• Project documents • National policies and strategies (National Development Plan, Tarea Vida…) • Interviews with AMA, MINAG and other national partners	• Document review • Interviews
.1.5. Is the project consistent with the provincial and municipal needs and priorities?	• To what extent does the project respond to provincial and municipal needs? • Have all relevant local actors been involved in project implementation?	• Level of alignment between the project objectives and the needs of the relevant actors at the provincial and municipal levels, in terms of alignment	• Project document • PPRs • Provincial and municipal development plans • Interviews with representatives of	• Document review • Interviews

Evaluation criteria	Questions	Indicators	Sources	Methods
		with the provincial and municipal development plans • Perception of the level of involvement of local actors in project implementation	Artemisa and Mayabeque provinces and the six target municipalities	
2. Project design: Was the project internally coherent and robust in its design?				
2.1. Analysis of the logical / results framework	• How clear and well-integrated were the project's objectives, outcomes, outputs and activities? • How feasible and realistic were the project objectives, outcomes and outputs within the available budget and time frame? • How effective was the monitoring and evaluation system (indicators, baselines, targets, methods and sources of verification) in measuring the progress/outcomes of the project? Were they SMART[33] and consistent with the project objectives, outcomes and outputs?	• Consistency between the objective, outcomes, outputs and activities of the project • Feasibility of objectives, outcomes and outputs within the project's budget and time frame • Quality of the monitoring and evaluation system in the project document • Understanding by the project management unit of the objectives, outcomes and outputs and the timetable • Understanding of objectives, outcomes, outputs and timelines by national, provincial and municipal implementation partners	• Project document • Interviews with UNDP Cuba y Panama, PMU and executing partners (AMA, provincial y municipal governments)	• Document review • Interviews

[33] For specific, measurable, achievable, relevant, time-based.

Evaluation criteria	Questions	Indicators	Sources	Methods
2.2. Assumptions and risks	• Were the project assumptions and risks well identified in the project document? • Did the identified assumptions and risks help to determine the planned activities and outputs? • Have the externalities (such as the effects of climate change, etc.) that are relevant to the results been adequately taken into account?	• Completeness of risk identification and assumptions during project planning and design • Degree and nature of the influence of external factors on the planned activities • Extent to which planning documents anticipated or reflected the risks/externalities already faced by the project during implementation	• Project document and other planning documents • PPRs • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments	• Document review • Interviews
2.3. Lessons from other relevant projects (in the same field) incorporated in the project design	• Were relevant lessons learned from other projects properly incorporated into the project design?	• Examples of consideration of relevant lessons learned/project recommendations in project design	• Project document	• Document review
2.4. Linkage and complementarity of the project with other interventions within the sector	• ¿ Were other interventions within the sector clearly identified in the project document? • To what extent does the project support (and not duplicate) activities and objectives not addressed by others?	• Other interventions in the sector duly described and their possible synergies with the project analysed • Level of coherence and complementarity of the project with projects and programmes of other donors	• Project document • PPRs • Interviews with UNDP Cuba and Panama, PMU and AMA	• Document review • Interviews

Evaluation criteria	Questions	Indicators	Sources	Methods
	• Has the intervention been coordinated with others to seek complementarity and synergies?			
3. Effectiveness: To what extent have the expected results and objectives of the project been achieved?				
3.1. Has the project been effective in achieving the planned objectives, outcomes and outputs?	• To what extent did the project achieve its objectives? • To what extent did the project achieve the expected outcomes? • What was the quality of the outcomes achieved? • To what extent did the project achieve the planned outputs? • What has been the quality of the outputs provided?	• Level of achievement of targets with respect to objectives • Level of achievement of targets with respect to outcomes • Level of achievement of output targets • Quality of outcomes • Quality of outputs •	• Project document • PPR • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments	• Document review • Interviews • Field visits (to the extent possible)
3.2. How were risks managed and mitigated?	• How well were the risks and assumptions managed? • What was the quality of the risk mitigation strategies developed? Were they sufficient?	• Quality of existing information systems to identify new risks and other issues • Quality of risk mitigation strategies developed and followed	• Project document • PPR • Minutes of Steering Committee meetings • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments	• Document review • Interviews
3.3. ¿ What lessons can be drawn in terms of	• What lessons have been learned from the project in terms of achieving objectives and outcomes?	• Reporting of the lessons learned from the analysis	• Project documents • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA,	• Document review • Interviews

Evaluation criteria	Questions	Indicators	Sources	Methods
effectiveness for other similar projects in the future?	• What changes could have been made (if relevant) in the project design to improve the achievement of the project objectives and expected outcomes?		MINAG…), provincial and municipal governments.	
4. Efficiency: Was the project implemented efficiently, in accordance with international and national norms and standards?				
4.1. Adaptive management	• Did the project undergo significant changes as a result of recommendations from workshops, the steering committee or other review procedures? • What follow-up actions (if any) and/or adaptive management measures have been taken in response to the progress reports (PPRs)? • To what extent were the recommendations of the mid-term evaluation taken into account? • How were the lessons from the adaptive management process documented, shared with and internalised by key partners?	• Responsiveness of implementing and executing agencies to recommendations made through the review processes (PPR and mid-term evaluation) • Examples of changes in project strategy/approach as a direct result of recommendations • Proportion of adaptive management processes documented and shared with partners	• PPRs • Minutes of workshops and meetings of the Steering Committee • MTR • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA).	• Document review • Interviews

Evaluation criteria	Questions	Indicators	Sources	Methods
4.2. Financing and co-financing	• Is there a difference between planned and actual expenditure and why? • Did the leverage of funds (co-financing) occur as planned? • Were the accounting and financial systems established for the management of the project and the production of accurate and timely financial information adequate? • Were the financial resources used efficiently? Could the financial resources have been used more efficiently?	• Level of discrepancy between planned and executed budget • Level of discrepancy between planned and leveraged co-financing • Availability and quality of financial reports • Level of project management costs and discrepancy with forecasts • Costs related to the results achieved compared to the costs of similar projects in other organizations • Cost-benefit ratio of applying the EBA approach, and comparison with alternative approaches (particularly infrastructure) to enhance adaptation	• Project document • PPR • Financial reports • Audits • MTR • Cost-benefit analyses of similar projects • Interviews with UNDP Cuba and PMU	• Document review • Interviews
4.3. M&E system	• Did the project have a strong M&E system to measure the achievement of results? • Did it have sufficient financial resources? • Was the logical framework used during implementation as a management and monitoring tool?	• Robustness of the M&E system • Financing the M&E system • Level of use of the M&E system • Timeliness and quality of monitoring and progress reports	• Project document • PPRs • MTR • Interviews with UNDP Cuba and PMU	• Document review • Interviews

Evaluation criteria	Questions	Indicators	Sources	Methods
	• Did the project meet the requirements/timeframe for progress reporting? • Were progress reports fully and adequately completed (in compliance with the guidelines and providing the necessary strategic information)?			
4.4. Institutional arrangements and stakeholder involvement	• To what extent were the capacities of the implementing entities analysed during the design phase? • To what extent were roles and responsibilities discussed and are these clear in the design? • To what extent were effective partnerships for project implementation established with relevant stakeholders at different levels? • To what extent were relevant stakeholders involved in the design, implementation and monitoring of the project? (through information sharing and consultation)	• Number and types of partnerships established between the project and local bodies/organisation • Extent and quality of interaction/interchange between project implementers and local partners • Number, type and quality of mechanisms implemented to promote stakeholder participation at each stage of project design, implementation and monitoring • Number and level of participation in workshops • Perception of the use of local skills, experience and knowledge	• Project documents • Minutes of meetings and workshops • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments. To the extent possible, interviews and focus groups with the direct and indirect beneficiaries •	• Document review • Interviews

Evaluation criteria	Questions	Indicators	Sources	Methods
	• Did national stakeholders have an active role in the project decision-making that guided the implementation? • To what extent did the project use local skills, experience and knowledge in the design, implementation and evaluation of project activities?			
4.5. Management systems	• Have the implementing and executing agencies put sufficient resources in place to achieve the project results? • What is the quality of project execution and implementation by the executing and implementing agencies, respectively? • How effective was the collaboration between the institutions responsible for project implementation? • Have the tasks programmed in the project's Annual Work Plans (AWP) been fulfilled?	• Evidence that clear roles and responsibilities have been established • Level of discrepancy between the actual and planned amount of budget and staff time spent on the project • Difference between the actual and the planned schedule for the implementation of the project • Quality of supervision of implementing and executing agencies, respectively • Number of activities programmed / completed in accordance with the AWPs •	• PPRs • AWPs and budgets • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments.	• Document review • Interviews

Evaluation criteria	Questions	Indicators	Sources	Methods
	• Has the project experienced any delays in implementation? If so, why?			
4.6. What lessons can be drawn in terms of efficiency for other similar projects in the future?	• What lessons can be learned from the project in terms of efficiency? • What changes (if any) could have been made to the project to improve its efficiency?	• Reporting of the lessons learned from the analysis.	• PPRs • MTR • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments	• Document review • Interviews
5. Sustainability: To what extent are there financial, institutional, socio-economic and/or environmental risks to sustain the project results in the long term?				
5.1. To what extent are there financial, institutional, socio-economic and/or environmental risks to sustain the project results in the medium and long term?	• What are the main challenges that could affect the sustainability of the project results? Have they been addressed during the project management? • What factors may enable or hinder the achievement of sustainable results? • Did the project devise a sound sustainability strategy and did it include a specific exit strategy and implement it?	• Extent of obstacles and/or risks to the sustainability of project results • Existence and strength of a sustainability and exit strategy • Number of management plans developed and implemented as a result of the project	• Project documents • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments.	• Document review • Interviews

Evaluation criteria	Questions	Indicators	Sources	Methods
5.2. Country ownership/ strengthening of institutional and community capacities	• To what extent is the level of capacity and stakeholder ownership of the AbE approach sufficient to enable the continuation of project benefits?	• Level of integration of project and EBA objectives into the planning frameworks/documents of institutional and private actors	• Planning documents, strategies of relevant partners • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments	• Document review • Interviews
5.3. Communication	• How effective are communications in ensuring stakeholder awareness of the project and of EBA? • Are there effective external communication mechanisms in place?	• Existence of an internal communication plan, communication protocols and feedback mechanisms • Level of awareness perceived by stakeholders about project results and activities • Number and type of external communication mechanisms or activities implemented • Estimation of the cost-benefit ratio of applying the EbA approach available to planners	• Project documents • Progress reports • Communication materials • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments.	• Document review • Interviews
6. Impact: To what extent has the project contributed to or enabled progress towards reducing pressure on the environment, improving ecological status, adapting to climate change and generally improving the quality of life of direct and indirect beneficiaries?				
6.1. Are there signs that the project has contributed to, or enabled progress towards, the expected impacts (reduced vulnerability to	• To what extent has the project reduced pressure on the wetland ecosystems in the intervention area?	• Number and intensity of pressure factors on ecosystems • Mangrove and wetland areas with increased health indexes	• Monitoring and progress reports • MTR • Interviews with UNDP Cuba and Panama, PMU,	• Document review • Interviews • Field visits (to the extent possible).

Evaluation criteria	Questions	Indicators	Sources	Methods
climate change and pressure on ecosystems)?	• To what extent has the project improved the health of the wetland ecosystems in the intervention area? • Has the project reduced the vulnerability of the populations of the six municipalities in the project's direct intervention zone (direct beneficiaries)? • Has the project reduced the vulnerability of the populations of the provinces of Artemisa and Mayabeque beyond the six municipalities in the project's direct intervention zone (indirect beneficiaries)? • Has the project reduced the vulnerability of the populations in other provinces of the country (particularly Havana) (indirect beneficiaries)? • To what extent have there been unforeseen results (positive or negative) and what were they?	• Number of people (men and women) with reduced vulnerability due to proximity to healthy mangrove and wetland ecosystems (in all six municipalities, in the two provinces, in other provinces) • Examples of unforeseen, positive and negative results	executing partners (AMA, MINAG…), provincial and municipal governments. To the extent possible, interviews and focus groups with the direct and indirect beneficiaries	

Evaluation criteria	Questions	Indicators	Sources	Methods
6.2. Cross-cutting elements	• Did the project successfully integrate other UNDP priorities, such as the achievement of the Sustainable Development Goals (SDGs), poverty alleviation and generation of socio-economic benefits, prevention and recovery from natural disasters, respect for social and environmental safeguards and empowerment of women?	• Contribution to SDGs • Percentage of direct beneficiaries (in the six municipalities) who are poor • Promotion of sustainable livelihoods (e.g. jobs created, income generated) • Evidence that the project results contribute to strengthening the capacity of communities to cope with natural disasters • Evidence that the project complied with social and environmental safeguards • Integration of gender equality in the project design (gender analysis and gender action plan) • Proportion of implementing partners and participants in workshops, training courses or knowledge sharing who are women during implementation • Evidence of activities that incorporate gender into planning or activities at community or national level as a result of the project	• Monitoring and progress reports • MTR • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments. To the extent possible, interviews and focus groups with the direct and indirect beneficiaries	• Document review • Interviews • Field visits (to the extent possible)

Evaluation criteria	Questions	Indicators	Sources	Methods
6.3. Production of public goods	• Did the project promote new technologies and approaches?	• Examples of new technologies and approaches promoted and used during project implementation	• Progress reports • MTR • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments	• Document review • Interviews
6.4. Demonstration	• Have steps been taken successfully to disseminate public goods, for example through the development of demonstration sites, information dissemination and training?	• Number and type of dissemination activities carried out • Number of demonstration sites • Number of trainings organized and number/type of participants in those trainings • Quality of activities for the dissemination of public goods	• Progress reports • Communication materials of the project • Progress reports • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments	• Document review • Interviews
6.5. Replication	• Are activities, demonstrations and/or techniques being replicated within or outside the project, nationally or internationally?	• Examples of activities/techniques used in the project and reproduced in other projects/initiatives (other geographical areas and/or funded by other financial partners)	• Progress reports • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA, MINAG…), provincial and municipal governments	• Document review • Interviews
6.6. Scaling up	• Are some of the approaches developed through the project, which are being widely accepted, and perhaps	• Examples of laws and regulations inspired by the project results	• Progress reports • Interviews with UNDP Cuba and Panama, PMU, executing partners (AMA,	• Document review • Interviews

Evaluation criteria	Questions	Indicators	Sources	Methods
	legally required, being adopted at regional/national level?	• Examples of large-scale initiatives based on project results or methods	MINAG…), provincial and municipal governments	

5.2 List of reviewed documents

The documentation listed in Annex B of the terms of reference, as well as other documents, have been reviewed in detail. In particular, the evaluation team has been reviewed:

- Project document
- Inception report
- PPR for 2015, 2016, 2017, 2018 y 2019
- Progress reports and annual work plans
- Monitoring reports prepared by the project
- Audits
- Mid-term Review
- Annual operation plan for 2015, 2016, 2017, 2018 y 2019
- Minutes of the Steering Committee for 2015, 2016, 2017, 2018 y 2019
- Budget revisions
- Consultancy reports
- Maps
- National Adaptation Plan (Tarea Vida) (CITMA, 2017)
- Cuba UNDP Framework Document 2014-2018
- Guidelines regarding management costs of AF, GEF and GCF
    - https://www.adaptation-fund.org/generic/costs-and-fees/#:~:text=The%20project%20execution%20cost%20(B,to%20day%20activities%20of%20projects
    - GEF Guidelines on the project and program cycle policy. GEF/C.52/Inf.06/Rev.01 (2017)
    - GCF Policies on fees for accredited entities and delivery partners. GCF/B.19/29 (2018).

5.3 List of interviewed persons and institutions

6 July 2020

9:00 am - 10:30 am – UNDP Cuba

- Grisel Acosta. *UNDP Cuba.*
- María Rosa Moreno. *UNDP Cuba.*
- Tomas Escobar. *UNDP Cuba.*

9 July 2020

11:00 am – 12:00 am - Claudia Ortiz. *UNDP Regional Service Centre for Latin America and the Caribbean*

13 July 2020

9:00 am – 11:00 am- CITMA

- Odalys Goicochea Cardoso. Director, Environment Directorate*, CITMA.*
- Maritza García García. President, *AMA, CITMA.*
- Maritza González Cordero. *Director of Programmes and Projects, AMA, CITMA.*
- Pedro Ruiz. International Affairs Directorate, *CITMA (RAMSAR Focal Point)*

11:05 am – 12:00 am - MINAG

- Oscar Labrador Llanes. Directorate for Forest Flora and Fauna*. MINAG*
- Edelmira Castro. *Agroforestry Group. MINAG*

01:00 am –2:00 pm – Research institutes

- Daimar Cánovas González. *Director IES.*
- Roberto Nuñez Moreira. *Director ICIMAR*

2:05 pm – 3:00 pm – Raúl González Rodríguez. *CGB*

3:05 pm – 5:00 pm - PMU

- Luis David Almeida Famada. Project *Director, AMA*
- José M. Guzmán Menéndez. Technical *Coordinator, AMA*
- Reynier Samón Mesa. Project *Administrator, INAF*

14 July 2020

9:00 am – 10:00 am – PMU - Component 1

- Wilmer Toirac Arguelle. *Coordinator Comp 1 - INAF. MINAG*
- Julio César Álvarez Montes de Oca. Coordinator activities *Comp1 - IES. CITMA*
- Teresa Suárez Sarría. *Coordinator activities Comp1 - INAF. MINAG*

10:05 am – 11:00 am – Agroforestry enterprise Artemisa

- Juan Carlos Pérez Mendoza**.** *Coordinator*
- Rodrigo Fernando Moren.

11:05 am – 12:00 pm –State Forestry Service Artemisa.

- Amalia Ramos Mojena. Chief of section
- Leiser Ricardo Mendoza. Specialist
-

1:00 pm – 2:00 pm –State Forestry Service Mayabeque

- Idania Padilla. *Chief of section*
- Osnay. Specialist

2:05 pm – 3:15 pm –Agroforestry Enterprise Mayabeque.

- Adrián Varela Mederos. Director
- Felipe Cárdenas Crespo Coordinator
- Gualberto Gonzales.

<u>15 July 2020</u>

8:00 am – 9:00 am – PMU Component 2

- Juliette Díaz Abreu. *Coordinator Comp 2 AMA*
- Omelio Borroto Leiseca. *Mundo Latino.*

9:05 am – 10:00 am – Provincial governments

- Orlando Días Darías. *Director CITMA. Artemisa Provincial Government*
- Terina García Davis. *Director CITMA. Mayabeque Provincial Government*

10:05 am – 11:00 am – Provincial governments. Specialists

- Alexis Argudín Pereira. *Provincial project coordinator - Artemisa.*
- Iván Efraín Martínez Bordón. *Provincial project coordinator - Mayabeque*

11:05 pm – 12:00 pm – Municipal governments

- Elenne Quiñones Echeverría. Chief of section *CITMA. Batabanó.*
- Graicel Falcón Gil. *Chief of Section CITMA. Melena del Sur.*
- Pablo Bachiller. *Section CITMA. Artemisa.*
- Drialys Borroto. *Section CITMA. Arquizar.*

3:05 pm – 4:30 pm – Community leaders and voluntary groups

- Ricardo Álvarez Doval. *Guanímar Voluntary group.*
- Leandro Lázaro Marín Torres. *Community leader*
- Hiosvany Marín. Community leader *Cajío.*
- Vicente Hdez. Núñez, Community leader *Cajío*
- Yamila Alfonso. *Batabanó Voluntary group*
- Yamir Bello. *Community leader Melena del Sur*

<u>16 July 2020</u>

9:00 am – 10:00 am – PMU Component 3

- Eduardo Cuesta. *Coordinator activities Comp 3*
- Edel Elías Hernández. *Coordinator activities Comp 3*
- Miguel Ángel Vales. *Consultant*

10:05 am – 12:00 am – Capacity building classrooms and firefighters

- Sandro Álvarez Doval. CGB, Güira Melena. *Cajío Capacity Building Classroom*
- Odalmis Mujica Armenteros. *CGB Majana, Artemisa*.
- Yarmila Baltazar González. *Artemisa Capacity Building Classroom*.
- Elvys Leyva Alou. *Batabano Capacity Building Classroom*
- María Teresa Aguiar Añuez. *Director Protected Area Golfo Batabanó*
- Paulino Columbié. CGB *Melena-Batabanó.*

12:30 pm – 2:00 pm - Education

- Elio L. Amador Lorenzo. Coordinator UNAH.
- Josbel Gómez Torres, J Universidad Artemisa.
- Ismael Santos Abreu, MES and MINED.
- Primary school teacher, Cajio.
- Director – pre-graduate level.
- Maikel Cáceres Suárez,

<u>1 and 17 July 2020</u> -International projects

- Eduardo Planos Gutiérrez, Director Project Third National Communication.
- Juan Mario Martínez, Director BASAL.
- Alfredo Martínez, Director OP15.

<u>17 July 2020</u> – Site visits

- Silvia Vilma García Fernández, Director Bahía Habana Working group.
- Nereyda Junco Garzón, Director Center for Environmental Studies Camagüey.
- Ismael Santos Abreu, National Education System.

<u>21 and 22 July 2020</u>- Local stakeholders in Batabanó and Cajio (field visits)

- María Elena y Carlos of the Cajio capacity building classroom
- Andy Montero Díaz, ENPPFF.
- Marcia Elena Rodríguez Quintana, ENPPFF.
- Lianne de la Caridad Echevarría Leiva, student.
- Bárbara Leiva Acosta, Golfo de Batabanó Protected Area, ENPPFF
- Marcos Consi, Golfo de Batabanó Protected Area, ENPPFF
- Idania Padilla Cantillo, State Forestry Service Mayabeque.

5.4 Statement of agreement of the evaluation consultants

Evaluators:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study imitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

Jon García

Evaluation Consultant Agreement Form

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Jon García Bañales

Name of Consultancy Organization (where relevant)**:**

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at *Bilbao, Spain* on *12/08/2020*

d, understood, a

Signature:

Joanna Acosta Velázquez

Evaluation Consultant Agreement Form

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Joanna Acosta Velázquez

Name of Consultancy Organization (where relevant)**:**

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at *Ciudad de México, México* on *12/08/2020*

Signature:

Daysi Vilamajo

Evaluation Consultant Agreement Form

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Daysi Vilamajó Alberdi

Name of Consultancy Organization (where relevant)**:**

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at La Habana, Cuba on *12/08/2020*

Signature:

5.5. Detailed comments to the project's results framework

Table 8. Comments to the system of indicators included in the Project document[34]

Type of Indicator	Indicator	Baseline	Target for Project End	Comments
Objective: To increase the resilience of populations living in the coastal zone of the provinces to Mayabeque Artemisa and the effects of climate change.	I. Areas with high rates of health and the conditions of the mangroves (soil and salinity of the water, the density of the canopy, the existence of local regimes of protection).	Coastal ecosystems that cover 7 318 ha are degraded, have excessive levels of salinity due to seawater intrusion and the obstruction of channels and have a limited protection regime.	7 318 Ha (total area where reforestation of mangrove, restoration of the mangrove ecosystems, and the enrichment of the forested areas inland was carried out) Note: the rates of coastal mangroves and wetlands must be nominated in the methodological documents to be developed at the start of the project.	The indicator is not entirely accurate: it refers to health and conditions, but the latter would be health-related, and the third aspect mentioned refers to management (protection) but not health. In general, the indicator could be considered to refer to ha with high health indices, measured in terms of salinity and sediment in the water and density of forest cover. But here too the indicator is not specific: it does not say what high health indices mean (e.g. what degree of salinity is considered adequate (10%, 30%?). The baseline is not specific: it would need to indicate what specifically was the state in terms of salinity and sediment and density of forest cover, with numbers. It is not enough to say that they are degraded or that they have high levels of salinity (nothing is said about the sediments). The target is not consistent. It refers to the number of hectares where restoration activities have been carried out, but not to their impact (hectares with high health indices), as the indicator.
	II. Numbers of people (men and women) with reduced vulnerability due to proximity of functioning	17,524 People in 47 communities are	21 502 People (of which at least 45% are women) directly	The indicator is not specific: it does not indicate how vulnerability is measured and what that vulnerability is. It is assumed that the improvement

[34] This matrix comments on the detailed results framework included in the project document (pp. 61-63) that is used in the progress reports and not the logical framework summarised in the project document (pp. 20-21). It should be noted that the MTR does not provide a detailed analysis by indicator. It notes in general that indicators are not SMART and that there are no impact indicators and recommends fixing this. It also provides a proposal for an experimental design for the mangrove work (Annex 8), but this covers only some of the indicators in the logical framework and is not specific to the indicators.

Type of Indicator	Indicator	Baseline	Target for Project End	Comments
	mangrove forest and wetland ecosystems.	directly affected by coastal flooding.	affected by the reduction of coastal flooding.	of mangroves reduces vulnerability. This is a reasonable assumption, but the indicator should not assume this, but rather measure vulnerability. The baseline is more precise (vulnerability to coastal flooding), but it does not indicate how to measure it. The target has the same shortcoming. On the other hand, the baseline does not establish the proportion of women to men in the population.
		270,705 People are indirectly affected by the impacts of the phenomena associated with the CC on economic activities.	270,705 People (at least 45% are women) benefit indirectly by the reduction of the impact of the phenomena associated with the CC on economic activities.	The indicator has two baselines and targets, which is not robust and clearly indicates its lack of specificity. This sub-indicator is remarkably imprecise: it is not known which economic activities are referred to, how they are affected and how the impacts on them will be reduced. It seems that the reference here is not to economic activities (in particular agriculture), but to life in general (all social, economic and cultural activities), including infrastructure. The indicator is based on the above assumption. This is reasonable for direct beneficiaries, but less so for indirect ones, so measuring the actual reduction in vulnerability is even more important.
Outcome indicator	1.1 Area (ha) of red mangrove is established along shore between Batabanó and Punta Mora.	533 ha	1290,6 ha of which 85% survived* (1097 ha) *Survival can only be measured 3 years after planting	The indicator is quite precise, although it is not clear whether it refers to action or outcome, when action does not necessarily lead to outcome (many of the planted seedlings may die). The target clarifies this partially but not completely. It is also not clear if the target refers to the consolidated target or only to the new ones, nor if the target includes only those that can be counted in 2020, with reference to those planted in 2017, thus ceasing to count those planted in 2018, 2019 and 2020.

Type of Indicator	Indicator	Baseline	Target for Project End	Comments
Outcome indicator	1.2 Cumulative area of mangrove ecosystem restored between Majana and Surgidero de Batabanó.	144 ha	1711,9 ha of which 85% survived* (1455,1 ha) *Survival can only be measured 3 years after planting	Same as above.
Outcome indicator	1.3 Cumulative area of landward edge woodlands restored and enriched.	939 ha	4315,5 ha of which 85% survived* (3668,2 ha) *Survival can only be measured 3 years after planting	Same as above.
Outcome indicator	1.4 Numbers of IAS management plans developed.	0	1, covering 7,318 ha	The indicator, baseline and target are relatively accurate, relevant and consistent (the target refers to no. de ha, but the indicator does not).
Outcome Indicator	2.1 Numbers of provincial and municipal development plans that make specific provision for EBA.	2 provincial and 6 municipal governments are preparing development plans that do not include EBA.	2 provincial plans and 6 municipal plans	The indicator, baseline and target are fine.

Type of Indicator	Indicator	Baseline	Target for Project End	Comments
Outcome Indicator	2.2 Numbers of provincial and municipal governments with EBA-related knowledge management systems in place.	0	2 provincial and 6 municipal governments	The indicator is not entirely accurate, as it is not known what it refers to with knowledge management systems in place: how to measure whether they have such a system (what it consists of) and how to measure whether it is in place. The baseline and target do not make this clear.
Outcome Indicator	2.3 Numbers of community members (men and women) belonging to local voluntary groups addressing environmental and adaptation issues.	0	1 group with at least 15 members (of which at least 45% are women) in four municipalities	The indicator and the target are not consistent: the indicator refers to no. of people, the second to number of groups with no. of people. The target is not clear: it is not known whether the target is 15 persons or 60 persons (4 groups of 15 persons)
Outcome Indicator	2.4 Numbers of local schools with study programmes incorporating adaptation issues.	0	16 primary schools 15 secondary schools 3 municipal universities 1 teacher training institute	The indicator, baseline and target are fine.
Outcome Indicator	2.5 Numbers of dissemination and awareness raising materials on adaptation issues, produced by local media	0	17 audiovisual 3 local television 5 local radio 2 articles	The indicator, baseline and target are fine.
Outcome Indicator	3.1 Frequency of training and technical support visits carried out by provincial and municipal governments to coastal communities in support of EBA	0	3 training and technical assistant activities undertaken per year by technical authorities to coastal areas.	The target, baseline and target are not entirely consistent, as there is no consistency in the stakeholders: the indicator says provincial and municipal governments, and the target technical authorities, but it is not known whether they are the same.

Type of Indicator	Indicator	Baseline	Target for Project End	Comments
Outcome Indicator	3.2 Frequency of inspection visits to coastal areas by provincial and municipal governments in support of EBA	0	3 inspection activities undertaken per year by provincial municipal government and other regulatory authorities	There is a duplication between indicators 3.1 and 3.2. At the same time there are implicitly two sub-indicators for 3.2 that require one explicit indicator each.
Outcome Indicator	3.3 Number of studies and methodologies carried out to estimate the cost - benefit from the implementation of the approach ABE, available for planners and policy makers.	0	3	The indicator and target could be more precise, distinguishing between studies and methodologies

5.6 Performance according to the Adaptation Fund's results framework

Tabla 9. Desempeño de Manglar Vivo según el marco de resultados del Fondo de Adaptación[35]

		Baseline information				Target performance at completion				Performance at completion				Cumplimiento		
Impact: Increased resiliency at the community, national, and regional levels to climate variability and change	Core Indicator: No. of beneficiaries		Total (direct + indirect beneficiaries)	Direct beneficiaries supported by the project	Indirect beneficiaries supported by the project		Total (direct + indirect beneficiaries)	Direct beneficiaries supported by the project	Indirect beneficiaries supported by the project		Total (direct + indirect beneficiaries)	Direct beneficiaries supported by the project	Indirect beneficiaries supported by the project			
		Total	0	0	0	*Total*	288,224	17,519	270,705	*Total*	288,224	21,502	270,705	100%	123%	100%
		% of female beneficiaries	0%	0%	0%	*% of female beneficiaries*	49%	48%	50%	*% of female beneficiaries*	49%	46%	50%	OK	OK	OK
		% of Youth beneficiaries	0%	0%	0%	*% of Youth beneficiaries*	15%	15%	14%	*% of Youth beneficiaries*	15%	17%	14%	OK	Superado	OK

		Baseline information				Target performance at completion				Performance at completion				Cumplimiento
Outcome 1: Reduced exposure to climate-related hazards and threats	Indicator 1: Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	Number of targeted stakeholders		Hazards information generated and disseminated	Overall effectiveness	Number of targeted stakeholders		Hazards information generated and disseminated	Overall effectiveness	Number of targeted stakeholders		Hazards information generated and disseminated	Overall effectiveness	
		Total		Coastal flooding	2: Partially effective	*Total*		Coastal flooding	4: Effective	*Total*		Coastal flooding	4: Effective	OK, aunque está muy claro cómo lo miden y si la calificación está justificada
		% of female targeted				*% of female targeted*				*% of female targeted*				
Output 1.1 Risk and vulnerability assessments conducted and updated	Indicator 1.1: No. of projects/programmes that conduct and update risk and vulnerability assessments	No. of projects/programmes that conduct and update risk and vulnerability assessments	Sector	Scale	Status	No. of projects/programmes that conduct and update risk and vulnerability assessments	Sector	Scale	Status	No. of projects/programmes that conduct and update risk and vulnerability assessments	Sector	Scale	Status	
		1	Multi-sector	National	2: Undertaking or updating of assessments in progress	1	Multi-sector	Local	3: Risk and vulnerability assessments completed or updated	1.00	Multi-sector	Local	3: Risk and vulnerability assessments completed or updated	OK, aunque está muy claro cómo lo miden y si la calificación está justificada
		No. of projects/progra	Sector	Scale	Status	No. of projects/pro	Sector	Scale	Status	No. of projects/progr	Sector	Scale	Status	
Output 1.2 Targeted population groups covered by adequate risk reduction systems	Core Indicator 1.2: No. of Early Warning Systems	No. of adopted Early Warning Systems	Category targeted	Hazard	Coastal flooding	No. of adopted Early Warning Systems	Category targeted	Hazard	Coastal flooding	No. of adopted Early Warning Systems	Category targeted	Hazard		
		1	3: Dissemination and communication	Geographical coverage	Regional	1	4: Response capability	Geographical coverage	Local	1.00	4: Response capability	Geographical coverage	Local	OK
				Number of municipalities	6			Number of municipalities	6			Number of municipalities	6.00	OK

[35] Only the targets against which Manglar Vivo reports have been included. The AF results framework is much broader.

		Baseline information				Target performance at completion				Performance at completion				Cumplimiento
Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	Indicator 2: Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	**Number of staff targeted**		**Sector**	**Capacity level**	**Number of staff targeted**		**Sector**	**Capacity level**	**Number of staff targeted**		**Sector**	**Capacity level**	
		Total	0	Coastal management	2: Low capacity	***Total***	88	Coastal management	4: High capacity	***Total***	154	Coastal management	4: High capacity	**175%**
		% of female targeted	0			*% of female targeted*	25.0%			*% of female targeted*	45.0%			**Mucho más alto**

		Baseline information				Target performance at completion				Target performance at completion				Cumplimiento
Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress	Indicator 5: Ecosystem services and natural resource assets maintained or improved under climate change and variability-induced stress	**Natural resource improvement level**		**Sector**	**Type**	**Natural resource improvement level**		**Sector**	**Type**	**Natural resource improvement level**		**Sector**	**Type**	
		1: Ineffective		Coastal management	land	4: Effective		Coastal management	land	4: Effective		Coastal management	land	**OK**
Output 5: Vulnerable ecosystem services and natural resource assets strengthned in response to climate change impacts, including variability	Core Indicator 5.1: Natural Assets protected or rehabilitated	**Natural asset or Ecosystem (type)**	**Total number of natural assets or ecosystems protected/rehabilitated**	**Unit**	**Effectiveness of protection/rehabilitation**	**Natural asset or Ecosystem (type)**	**Total number of natural assets or ecosystems protected/rehabilitated**	**Unit**	**Effectiveness of protection/rehabilitation**	**Natural asset or Ecosystem (type)**	**Total number of natural assets or ecosystems protected/rehabilitated**	**Unit**	**Effectiveness of protection/rehabilitation**	
		Mangroves	677.0	ha rehabilitated	1: Ineffective	Mangroves	3,002.0	ha rehabilitated	4: Effective	Mangroves	3402.00	ha rehabilitated		**113%**
		Natural asset or Ecosystem (type)	**Total number of natural assets or ecosystems protected/rehabilitated**	**Unit**	**Effectiveness of protection/rehabilitation**	**Natural asset or Ecosystem (type)**	**Total number of natural assets or ecosystems protected/re**	**Unit**	**Effectiveness of protection/rehabilitation**	**Natural asset or Ecosystem (type)**	**Total number of natural assets or ecosystems protected/rehabilitated**	**Unit**	**Effectiveness of protection/rehabilitation**	
		Forests	939.0	ha rehabilitated	1: Ineffective	Forests	4,315.0	ha rehabilitated	4: Effective	Forests	4368.00	ha rehabilitated		**101%**

		Baseline information				Targeted performance at completion				Performance at completion				Cumplimiento
Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted	Indicator 6.1: Increase in households and communities having more secure access to livelihood assets	**No. of targeted households**	**% of female headed households**	**Improvement level**		**No. of targeted households**	**% of female headed households**	**Improvement level**		**No. of targeted households**	**% of female headed households**	**Improvement level**		
Output 6 Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	Indicator 6.1.1: No. and type of adaptation assets created or strengthened in support of individual or community livelihood strategies	**Number of Assets**	**Type of Assets**	**Sector**	**Adaptation strategy**	**Number of Assets**	**Type of Assets**	**Sector**	**Adaptation strategy**	**Number of Assets**	**Type of Assets**	**Sector**	**Adaptation strategy**	
		0				84	Natural capital	Coastal management	Mangrove reforestation	84	Natural capital	Coastal management	Mangrove reforestation	**100%**

		Baseline information			Target performance at completion			Performance at completion			Cumplimiento
Outcome 7: Improved policies and regulations that promote and enforce resilience measures	Indicator 7: Climate change priorities are integrated into national development strategy	**Integration level**			**Integration level**			**Integration level**			
		3: Some			5: All (Fully integrated)			5: All (Fully integrated)			
	Indicator 7.2: No. of targeted development strategies with incorporated climate change priorities enforced	**No. of Development strategies**	**Regulation**	**Effectiveness**	**No. of Developmen t strategies**	**Regulation**	**Effectiveness**	**No. of Development strategies**	**Regulation**	**Effectiveness**	
		0			8	4: Enforced (Most elements implemented)	4: Effective	8.00	4: Enforced (Most elements implemented)	4: Effective	**OK**

5.7 Maps showing the health of the mangroves in 2015 and 2020

EVALUATION REPORT CLEARANCE FORM

Evaluation Report Reviewed and Cleared by

UNDP County Office

Name: Gricel Acc

Signature: _____ Date: 14/09/2020

UNDP GEF RTA

Name: Claudia Ortiz

Signature:_____ Date:_____