



**GREEN
CLIMATE
FUND**

Meeting of the Board
16 – 19 March 2021
Virtual meeting
Provisional agenda item 14

GCF/B.28/02/Add.04

23 February 2021

Consideration of funding proposals - Addendum IV

Funding proposal package for FP157

Summary

This addendum contains the following seven parts:

- a) A funding proposal titled "Coastal Resilience to Climate Change in Cuba through Ecosystem Based Adaptation – "MI COSTA"";
- b) No-objection letter issued by the national designated authority(ies) or focal point(s);
- c) Environmental and social report(s) disclosure;
- d) Secretariat's assessment;
- e) Independent Technical Advisory Panel's assessment;
- f) Response from the accredited entity to the independent Technical Advisory Panel's assessment; and
- g) Gender documentation.

Table of Contents

Funding proposal submitted by the accredited entity	3
No-objection letter issued by the national designated authority(ies) or focal point(s)	72
Environmental and social report(s) disclosure	74
Secretariat's assessment	77
Independent Technical Advisory Panel's assessment	93
Response from the accredited entity to the independent Technical Advisory Panel's assessment	103
Gender documentation	105

Funding Proposal

Project/Programme title: *Coastal Resilience to Climate Change in Cuba through Ecosystem Based Adaptation – “MI COSTA”*

Country(ies): *Republic of Cuba.*

Accredited Entity: *United Nations Development Programme*

Date of first submission: *2019/07/04*

Date of current submission: *2021/02/17*

Version number: *[V.7]*



Contents

Section A	PROJECT / PROGRAMME SUMMARY
Section B	PROJECT / PROGRAMME INFORMATION
Section C	FINANCING INFORMATION
Section D	EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA
Section E	LOGICAL FRAMEWORK
Section F	RISK ASSESSMENT AND MANAGEMENT
Section G	GCF POLICIES AND STANDARDS
Section H	ANNEXES

Note to Accredited Entities on the use of the funding proposal template

- Accredited Entities should provide summary information in the proposal with cross-reference to annexes such as feasibility studies, gender action plan, term sheet, etc.
- Accredited Entities should ensure that annexes provided are consistent with the details provided in the funding proposal. Updates to the funding proposal and/or annexes must be reflected in all relevant documents.
- The total number of pages for the funding proposal (excluding annexes) **should not exceed 60**. Proposals exceeding the prescribed length will not be assessed within the usual service standard time.
- The recommended font is Arial, size 11.
- Under the [GCF Information Disclosure Policy](#), project and programme funding proposals will be disclosed on the GCF website, simultaneous with the submission to the Board, subject to the redaction of any information that may not be disclosed pursuant to the IDP. Accredited Entities are asked to fill out information on disclosure in section G.4.

Please submit the completed proposal to:

fundingproposal@gcfund.org

Please use the following name convention for the file name:

“FP-[UNDP]-[Cuba]-[2020/03/20]”

A. PROJECT/PROGRAMME SUMMARY			
A.1. Project or programme	Project	A.2. Public or private sector	Public
A.3. Request for Proposals (RFP)	Not applicable		
A.4. Result area(s)	<p>Check the applicable GCF result area(s) that the <u>overall</u> proposed project/programme targets. For each checked result area(s), indicate the estimated percentage of <u>GCF budget</u> devoted to it. The total of the percentages when summed should be 100%.</p>		
	<p>Mitigation: Reduced emissions from:</p> <p><input type="checkbox"/> Energy access and power generation:</p> <p><input type="checkbox"/> Low-emission transport:</p> <p><input type="checkbox"/> Buildings, cities, industries and appliances:</p> <p><input type="checkbox"/> Forestry and land use:</p> <p>Adaptation: Increased resilience of:</p> <p><input checked="" type="checkbox"/> Most vulnerable people, communities and regions:</p> <p><input type="checkbox"/> Health and well-being, and food and water security:</p> <p><input type="checkbox"/> Infrastructure and built environment:</p> <p><input checked="" type="checkbox"/> Ecosystem and ecosystem services:</p>	<p>GCF contribution:</p> <p><u>Enter number</u>%</p> <p><u>Enter number</u>%</p> <p><u>Enter number</u>%</p> <p><u>Enter number</u>%</p> <p>11%</p> <p><u>Enter number</u>%</p> <p><u>Enter number</u>%</p> <p>89%</p>	
A.5. Expected mitigation impact	N/A	A.6. Expected adaptation impact	444,793 direct and 879,321 indirect 11.7% of population
A.7. Total financing (GCF + co-finance)	\$ 44,299,229 USD	A.9. Project size	Small (Upto USD 50 million)
A.8. Total GCF funding requested	23,927,294 USD		
A.10. Financial instrument(s) requested for the GCF funding	<p>Mark all that apply and provide total amounts. The sum of all total amounts should be consistent with A.8.</p> <p><input checked="" type="checkbox"/> Grant <u>23,927,294</u> <input type="checkbox"/> Equity <u>Enter number</u></p> <p><input type="checkbox"/> Loan <u>Enter number</u> <input type="checkbox"/> Results-based payment <u>Enter number</u></p> <p><input type="checkbox"/> Guarantee <u>Enter number</u> <input type="checkbox"/> <u>Enter number</u></p>		
A.11. Implementation period	8 years	A.12. Total lifespan	30 years
A.13. Expected date of AE internal approval	7/3/2019	A.14. ESS category	B
A.15. Has this FP been submitted as a CN before?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.16. Has Readiness or PPF support been used to prepare this FP?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
A.17. Is this FP included in the entity work programme?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.18. Is this FP included in the country programme?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.19. Complementarity and coherence	<p>Does the project/programme complement other climate finance funding (e.g. GEF, AF, CIF, etc.)? If yes, please elaborate in section B.1.</p> <p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>		
A.20. Executing Entity information	<p>The Executing Entity is the Environmental Agency (AMA) of the Ministry of Science, Technology and Environment (CITMA) of Cuba. The Deputy Minister of CITMA is appointed as the National Designated Authority of Cuba to the GCF</p>		

A.21. Executive summary (max. 750 words, approximately 1.5 pages)

1. The Project responds to the coastal adaptation needs of Cuba due to slow onset events, including relative sea level rise and the associated flooding arising from extreme weather events (hurricanes and extra-tropical storms). Impacts from these climate drivers are a matter of national security for a small-island state and pose an existential threat to coastal settlements and communities. Projections show that if no intervention is made by 2100, up to 21 coastal communities will disappear with a further 98 being severely affected by climate related threats (flooding, coastal erosion and saline intrusion).
2. Cuba's Southern Coast has been selected due its high vulnerability to climate change particularly in the form of coastal flooding and saline intrusion. 1,300 km of coastline, 24 communities, and 1,324,114 people will directly benefit from the project implementation through activities and measures designed to increase resilience to these identified climate impacts.
3. Cuba's geographical characteristics and its marine and coastal ecosystems conservation status represent an optimal opportunity for wide scale ecosystem-based adaptation (EBA), an approach that has been favoured through Cuba's State Plan to Manage Climate Change "Tarea Vida". EBA can adaptively withstand a range of increasing water levels and wave heights, which help achieve more cost-effective and flexible adaptation solutions, thus making it particularly appropriate to Cuba's southern coastline. Healthy ecosystems can be a natural defence barrier against sea level rise, and moderate winds and waves by reducing coastal erosion, flooding and salt intrusion risks, as well as serving a protective role during more extreme events.
4. Geomorphological processes in Cuba have led to an interconnected and diverse landscape in which different ecosystems have flourished. The coastline is very irregular and diverse, including steep cliffs, sandy beaches, extensive low lying and swampy coastal plains fringed by mangroves with coastal lagoons and estuaries adjacent to a wide and shallow shelf area with abundant seagrasses and fringed by coral reefs. Connections between mountains and marine environments, between fresh and saltwater sources, and between karstic processes and deep aquifers are well known¹.
5. The proposed project will enhance adaptive capacity by holistically rehabilitating coastal land-seascapes, their interlinked ecosystems and hydrology. This will be achieved by rehabilitating ecosystem functions and connections within mangroves and swamp forests and reducing anthropic pressures to marine coastal ecosystems, thus enhancing the services supplied by integrated coastal ecosystems (particularly protection from saline flooding and erosion, and channelling freshwater to coastal areas and aquifers). It will also strengthen the adaptive capabilities of coastal governments and communities' by building their capacity to utilise and understand the benefits of EBA, enhancing information flow between stakeholders and strengthening the regulatory framework for territorial management in coastal areas.
6. 11,427 ha of mangroves, 3,088 ha of swamp forest and 928 ha of grass swamp will be restored, which in turn will improve the health of 9,287 ha of seagrass beds and 134 km coral reefs crests. Together these ecosystems will provide protection and regulation services along the targeted coastline (See Figure 2). Climate Change Adaptation (CCA) and EBA *training of trainers* will target national and local decision makers, teachers, economic sector leaders and local communities aiming to provide training to 60% of the population within the targeted municipalities. Environmental information will be provided and integrated into existing information products to provide a fuller picture of coastal vulnerability and resilience and will be distributed through a knowledge platform, to ensure the strengthening of regulatory frameworks and continuous feedback to and from the communities to technical organizations and government.
7. Project interventions will enable a new paradigm by positioning EBA directly into development strategies and actions as a means for integrated coastal zone management in a changing climate, thereby enabling flexible risk management solutions for coastal populations and reducing their flooding risks. To enable such a paradigm, an integrated approach to EBA needs to be implemented including a focus on the full coastal marine landscape and ensuring that information and capacities are available to communities and the government. This requires i) information to be available and accessible, ii) ecosystems to be rehabilitated and iii) communities and institutions' awareness of ecosystems role in adaptation to be strengthened along with their capacities to sustain it.
8. Ecosystem protection and rehabilitation, capacity building (in both governing institutions and communities) and regulation strengthening are the pillars of this project. The former aims to recover the ecosystem's functionality to provide protection and regulation services and the latter ensure its sustainability and continuity.
9. The project provides direct support to and will provide a baseline for the implementation of the Government of Cuba (GoC)'s "Tarea Vida"; its implementation in targeted areas during the project will provide GoC with practical methods and approaches which can be implemented elsewhere. Through its interventions, the project proposes direct solutions to national priorities outlined in "Tarea Vida" and in Cuba's Nationally Determined Contributions (NDCs), enabling a transformation in how the GoC will manage climate change impacts on its coast and generate information used to implement similar approaches in the Caribbean region.

¹ Silvestri, S., Kershaw, F. (eds.). Framing the flow: Innovative Approaches to Understand, Protect and Value Ecosystem Services across Linked Habitats. UNEP World Conservation Monitoring Centre, Cambridge, UK

B. PROJECT/PROGRAMME INFORMATION

B.1. Climate rationale and context (max. 1000 words, approximately 2 pages)

Climate change impacts and threats

10. The Cuban archipelago's location in the Caribbean, places it in the path of frequent tropical storms², and the long, narrow configuration of the country is such that no part of the country is very far from the sea (over 57% of the population lives in coastal municipalities).
11. Coastal municipalities and their respective settlements are also extremely vulnerable to climate change (CC) due to increased storms and rising sea levels, resulting in increased coastal flooding caused by extreme meteorological phenomena such as tropical cyclones, extratropical lows, and strong winds from *sures*³. From 2001 to 2017, the country has been affected by 12 hurricanes 10 which have been intense (category 4 or 5, FS Figure 7), the highest rate in a single decade since 1791. In the past 10 years the percentage of intense hurricanes affecting the country has risen from a historical average of 26% to 78% with accompanying acute losses (FS Table 6). These intense hurricanes impacting Cuba since 2001 coincide with very high sea surface temperatures (SSTs) in the tropical Atlantic recorded since 1998.
12. The coasts of Cuba in the past three decades have also seen an increase in the occurrence of moderate and strong floods as a result of tropical cyclones and of extratropical systems; with extratropical cyclones being associated with the highest rates of flooding in the country. Furthermore, warm Pacific El Niño events lead to an increase in extra-tropical storms which increase the risks of flooding along the coastline⁴.
13. CC induced Sea Level Rise (SLR) will aggravate coastal flooding affecting in particular low lying coastal areas. It is expected that through SLR, mean sea level will increase by 0.29 m by the year 2050 and between 0.22m and 0.95m by the year 2100⁵ impacting 119 coastal settlements in Cuba (FS Section Table 2 Figure 35). Combining increased storm surge and projected SLR, flooding of up to 19,935 km² (CC + Category 5 hurricane) and 2,445 km² (CC + normal conditions) can be expected by the year 2050⁶ (Feasibility Study Section 2.4.2).
14. These estimates could be higher when compounded by the impact of surface water warming on the speed of storms, and new research that links it to increased wave heights in the Caribbean⁷. Under this scenario, storms could be more frequent and move at a slower pace thus increasing the impact on island states such as Cuba^{8,9}.
15. CMIP5¹⁰ projections indicate that by 2050, mean annual temperature in Cuba will rise by a median estimate of 1.6°C; total annual extremely hot days (temperature >35°C) will rise by a median estimate of 20 days (RCP 4.5) and 20.8 days (RCP 8.5). Associated increases in potential evapotranspiration will further lead to more frequent severe droughts¹¹, as already observable in eastern Cuba (FS, Figure 34).
16. Cuban coastal seascapes and landscapes are a succession of ecosystems that have coevolved under current climatic conditions, including current distributions of extreme events. The progression of coral reefs, seagrass meadows, beaches, coastal mangroves and forest or grassland swamps represents an equilibrium that confers resilience to each ecosystem separately but also to the coast as a whole (Figure 2). The current resilience of Cuban coastal ecosystems to extreme events and SLR, is being undermined by both climate change effects (increased extreme events) and other anthropogenic pressures, tempering their capacity to provide their protective services. Mangroves have further suffered high levels of degradation affecting their ability to colonize new areas, reduce wave impacts, accrete sediments and stabilize shorelines. Additionally, coral reefs have shown signs of bleaching and degradation that have been attributed to mangrove and sea grass degradation (including the alteration of hydrological natural flows, presence of invasive species, water contamination, and habitat destruction, see Figure 2), climate-related increases in surface water temperature and to increased impacts of hurricanes¹².

² Acosta, Jorge (2016). Catalog of tropical cyclones in the Caribbean region

³ Strong southerly winds

⁴ Cárdenas, P. y M. Pérez (1991): Eventos ENOS y anomalías de lluvia en Cuba. Instituto de Meteorología. 24 pp. And Meulenert, A. R. (1991): Efecto del evento El Niño-Oscilación del Sur sobre el estado del tiempo en Cuba. Instituto de Meteorología.

⁵ IPCC-AR5-WGL. Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment report (AR5) of the intergovernmental Panel on Climate Change. 2013. The Cuban tide gauge monitoring system values are closed to the global mean sea-level rise from the IPCC's models (AR5, 2013) where four possible trajectories (Representative Concentration Pathways or RCPs) are described on global sea-level rise

⁶ Iturralde y Serrano (2015) Macroproyecto. Peligros y vulnerabilidades de la zona marino-costera de Cuba: estado actual y perspectivas ante el cambio climático 2100. Editorial Academia, La Habana

⁷ Reguero, B.G., et al. (2019). A recent increase in global wave power as a consequence of oceanic warming. *Nat Commun* 10, 205 doi:10.1038/s41467-018-08066-0

⁸ Planos E., Rivero R., Guevara V (eds), 2012. Impactos del Cambio Climático y medidas de Adaptación en Cuba

⁹ Kossin et al. (2018). A global slowdown of tropical-cyclone translation speed, *Nature*, <https://www.nature.com/articles/s41586-018-0158-3>.

¹⁰ Program for Climate Model Diagnosis & Intercomparison. CMIP5- Coupled Model Intercomparison Project Phase 5- Overview.

<https://pcmdi.llnl.gov/mips/cmip5/>

¹¹ The World Bank Group. Climate Change Knowledge Portal. Climate data. Projections.

<https://climateknowledgeportal.worldbank.org/cuba/climate-data-projections?variable=pr>

¹² Alcolado et al., 2009. *Trend of change of live stony coral cover in Cuban coral reefs*. Serie Oceanológica No. 5. La Habana, Cuba.

SLR will further increase current vulnerabilities and stresses on ecosystems due to increases in water depth and wave energy which will increase coastal erosion, coastal flooding and saline intrusion risks^{13,14}.

Coastal erosion

17. Current coastal erosion rates are attributed to a combination of natural dynamics (waves, currents, extreme events, hurricanes, etc.) and human interventions (natural resources extraction, wetlands filling, coastal infrastructure construction excluding natural dynamics, habitat loss, water diversion, etc). An increase in the magnitude of extreme events and increasing SLR will accelerate erosion related to natural processes, which currently averages 1.2 m/year (calculated between 1956-2002)¹⁵. This erosion rate poses a danger to communities, infrastructure and natural habitats that are not tolerant to saline intrusion and provide services to landward communities.

Flooding

18. Coastal flooding as a combination of high rainfall, high sea levels and storm surges has been identified as one of the primary climate change related threats to Cuba. Trends in the frequency of coastal floods during the period 1901-2011 have been observed in Cuba with the past three decades seeing an increase in the occurrence of moderate and strong floods, regardless of the meteorological events that generate them (FS Section 1.3.3). Specific impacts and the extent of resulting damages depend on local bathymetry and topography, seabed roughness and coastal vegetation coverage and conditions, with the coastal regions of La Coloma- Surgidero de Batabano and Jucaro-Manzanillo being particularly vulnerable (See FS Figures 38 and 40).

19. Hurricanes have also extensively damaged infrastructure. Hurricane Matthew, which crossed the eastern end of Cuba in October 2016, caused USD 97.2 million of damages (approximately 2.66% of GDP), making it the third most devastating hurricane to hit the island in the last decade, only behind Ike (2008) and Sandy (2012), with equivalent costs of USD 293 million (12.05% of GDP) and USD 278 million (9.53 % of GDP) respectively¹⁶.

Saline intrusion

20. Saline intrusion into aquifers is the most common and extensive cause of freshwater degradation in Cuba's coastal zones. Most of these aquifers, located near and beneath the northern and southern coasts, are open to the sea, making them very susceptible and exposed to saline intrusion as a result of SLR, and potentially leading to water that is too saline for human consumption and increasing the salinization of agricultural fields¹⁷. It is estimated (FS Section 3 and Annex 1) that approximately 544,300 ha in the area of proposed interventions are already affected by saline intrusion.

Drought

21. Drought has been identified among the most important climate risks for all Caribbean islands, including Cuba. There has been an increase in drought events in the period 1961-1990 when compared to 1931-1960¹⁸. Severe droughts have been increasing in eastern Cuba and are projected to increase in the future (Figures 33-36, FS). Future projections indicate a general reduction in rainfall by 2070 (particularly along the Eastern Coastline), along with an average reduction in relative humidity between 2% and 6% between 2030 and 2070, respectively (FS Figure 20). Reduced rainfall occurring mostly during the summer rainy season, with relatively smaller increases in winter and dry season rainfall. This situation adds an increase pressure on the aquifers, which cannot be filled by just one tropical storm, or during the rainy season.

Vulnerability Southern Coast of Cuba, project target site

22. Cuba's coastal ecosystems have been extensively studied through extensive research led by The Ministry of Science, Technology and Environment (CITMA), the Environmental Agency (AMA) and the Scientific Institute for the Sea (ICIMAR). ICIMAR's research on coastal dynamics and vulnerability is the foundation for Cuba's National Environmental Strategy (NES) and its State Plan for Facing Climate Change ("Tarea Vida", 2017) which outlined coastal areas in eminent danger as national priority.

23. A research-based CC vulnerability ranking (high, medium, and low) was designed considering a combination of factors: geological, geomorphological and ecosystem degradation (Feasibility study Section 2.2), highlighting that vulnerability to sea-level rise and associated events is higher in the country's low-lying coasts¹⁹. Settlements in these areas are more vulnerable to SLR and more likely to be affected by extreme weather events (hurricanes,

¹³ NU. CEPAL(Ed), 2018. Efectos del cambio climático en la costa de América Latina y el Caribe. Reconstrucción histórica y proyecciones del efecto del cambio climático sobre el oleaje en la costa de Cuba, 63pp.

¹⁴ Reguero, B.G., et al. (2019). A recent increase in global wave power as a consequence of oceanic warming. *Nat Commun* 10, 205 doi:10.1038/s41467-018-08066-0

¹⁵ Hernández-Zanuy, A.C., E. Tristán, M. Guerra, R.T. Capote, M. Martínez, M. Hernández, P.M. Alcolado Menéndez, S. Lorenzo, L. Peña-Fuente, M. Esquivel y M. Sosa. 2006. Rehabilitación ecológica del tramo de costa comprendido entre Surgidero de Batabanó y Mayabeque, costa sur de la Provincia de La Habana. Informe Final de Proyecto de Programa Ramal de Protección de Medio Ambiente y Desarrollo Sostenible.

¹⁶ As cited in Cuba's National Determined Contributions, p6

¹⁷ Iturralde y Serrano (2015) Macroproyecto. Peligros y vulnerabilidades de la zona marino-costera de Cuba: estado actual y perspectivas ante el cambio climático 2100. Editorial Academia, La Habana

¹⁸ Lapinel, B., Rivero, R.E., Cutié, V., Rivero, R.R., Varela, N., 1993. Sistema Nacional de Vigilancia de la Sequía: Análisis del Periodo 1931-1990 (Informe Técnico). Instituto de Meteorología, La Habana, CUBA.

¹⁹ Iturralde y Serrano (2015) Macroproyecto. Peligros y vulnerabilidades de la zona marino-costera de Cuba: estado actual y perspectivas ante el cambio climático 2100. Editorial Academia, La Habana

tropical storms) because of their low elevation, largely flat topography, extensive coastal plains and the highly permeable karstic geology that underlies it; hence more exposed and susceptible to flooding and saline intrusion (FS, Section 3). These areas have been targeted as the project's area of intervention, prioritized within "Tarea Vida," with attention being paid to two coastal "stretches" totaling approximately 1,300 km of coastline and 24 municipalities covering 27,320 km² (Figure 1 FS, Section 3).

24. Main localities for direct intervention (FS, Annex 1) of EBA include settlements with high vulnerability to coastal flooding, facing saline intrusion and with a contribution to economic life including those with major fishing ports for shrimp and lobster. Settlements with coastal wetlands that represent a protective barrier for important agricultural production areas to reduce the effects of saline intrusion on the underground aquifers and agricultural soils where also considered (FS, Figures 56-62, Section 3).



Figure 1. Targeted Coastal Stretches. 'Tramo 1' is Stretch 1 and 'Tramo 2' is Stretch 2

Southern Coastal Ecosystems

25. Coastal ecosystems in the targeted coastal stretches are characterized mainly by low, swampy and mangrove-lined shores surrounded by an extensive, shallow submarine platform, bordered by numerous keys and coral reefs. In these areas mangroves and marshes could potentially act as protective **barriers against storm surges, winds and waves** and therefore **reduce coastal erosion, flooding and salt intrusion associated risks**. These ecosystems can keep pace with rising seas depending on sediment budgets, frequency of disturbances, colonization space, and ecosystem health^{20,21,22}.
26. There are numerous reported functional relationships between coastal and marine ecosystems, including sediment binding and nutrient absorption, which combined with water retention, create equilibrium dynamics and coastal stability. Freshwater infiltration is favored by swamp forests reducing saline intrusion risk and organic matter exchange facilitates favorable conditions for healthy seagrass beds and coral reefs. Restoration of these fluxes and connections is required to increase these ecosystems resilience to a changing climate and strengthening their protective role²³.
27. Coastal ecosystems and their complex interconnections provide a variety of services to communities²⁴ (Figure 2), including coastal protection and disaster risk reduction²⁵. These services can be enhanced with healthy ecosystems, functional connections and when adequately integrated into land/marine planning policies^{26,27}.

²⁰ Morris et al. 2002. *Responses of coastal wetlands to rising sea level*. Ecology 83(10):2869–2877

²¹ McIvor et al. 2013. *The response of mangrove soil surface elevation to sea level rise*. Natural Coastal Protection Series: Report 3. Cambridge Coastal Research Unit Working Paper 42. Published by The Nature Conservancy and Wetlands International, pp 59

²² Van Wesenbeeck et al. 2016. *Coastal and riverine ecosystems as adaptive flood defences under a changing climate*. Mitigation and Adaptation Strategies for Global Change, 22(7), 1087–1094. DOI: 10.1007/s11027-016-9714-z

²³ Silvestri, S., Kershaw, F. (eds.), 2010. *Framing the flow: Innovative Approaches to Understand, Protect and Value Ecosystem Services across Linked Habitats*. UNEP World Conservation Monitoring Centre, Cambridge, UK

²⁴ Silvestri, S., Kershaw, F. (eds.), 2010. *Framing the flow: Innovative Approaches to Understand, Protect and Value Ecosystem Services across Linked Habitats*. UNEP World Conservation Monitoring Centre, Cambridge, UK

²⁵ Sudmeir et al 2018. *Global literature review on ecosystem-based disaster risk reduction*. New Dimensions for natural hazards in Asia. Tagaytay, Philippines Feb 2018.

²⁶ Spalding M. et al 2014. The role of ecosystems in coastal protection: Adapting to climate change and coastal hazards. *Ocean & Coastal Management* 90:50-57

Wells S. et al 2006. *The role of ecosystems in coastal protection: Adapting to climate change and coastal hazards*. UNEP-WCMC Biodiversity Series 24. Cambridge. UK

²⁷ Lacambra et al. 2019. *Ecosystem Based Disasters Risk Reduction and Climate Change Adaptation*. Eco-DRR & EbA Regional Workshop Report. UN Environment Bogota.

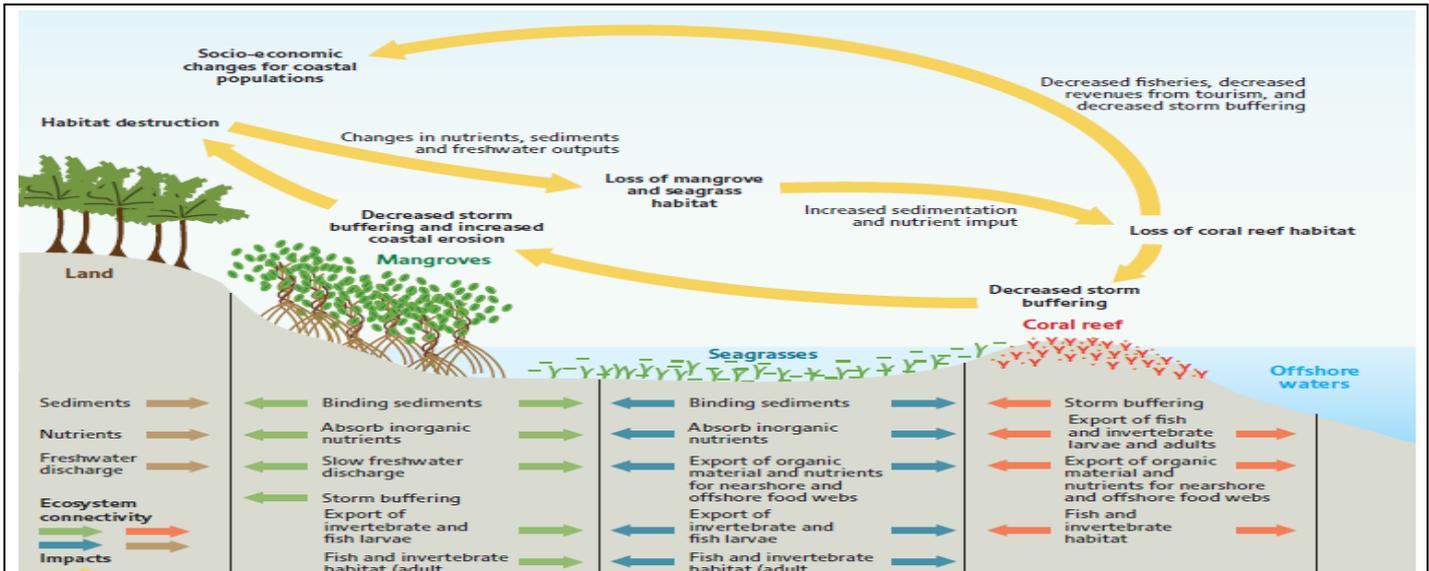


Figure 2. Integrated Coastal Ecosystems (Functional Coastal Landscape) Source UNEP-WCMC, 2010

28. Figure 3 summarizes the climate change rationale for the project, demonstrating how both observed historical and projected changes in climate lead to impacts on erosion, flooding and freshwater flows, which increase the risks of saline intrusion and losses and damages to infrastructure and livelihoods. It further demonstrates how the proposed EbA solutions (mangrove regeneration and improved freshwater flows) will lead to outcomes (coastal stability, protection and reduced saline intrusion) which reduce environmental and social vulnerabilities to climate change impacts.

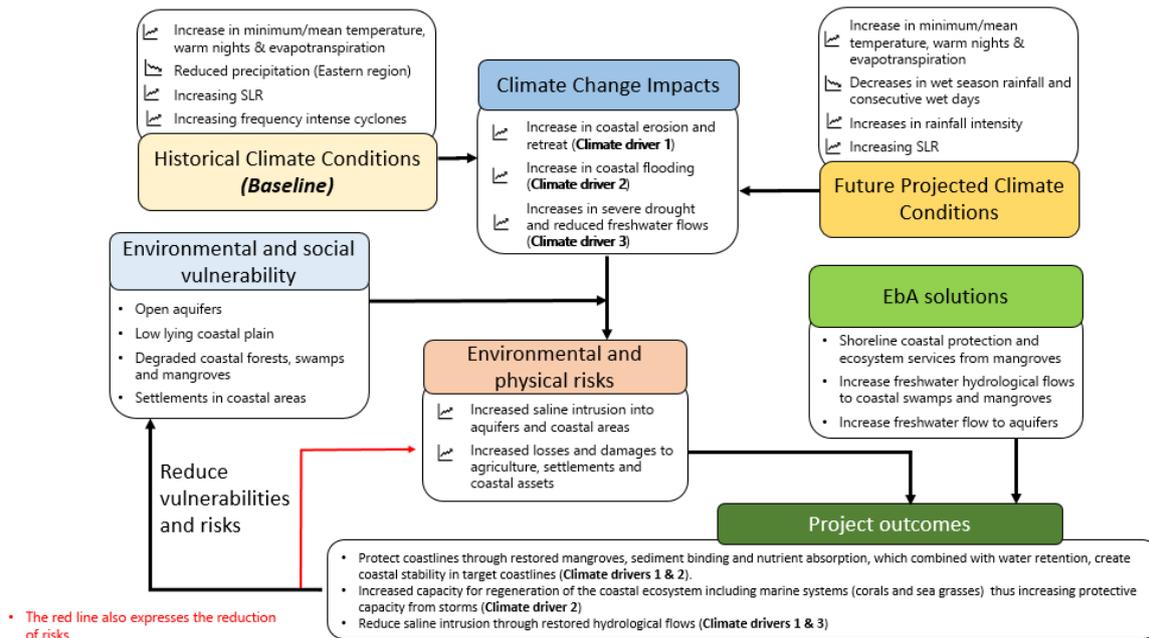


Figure 3 – Climate impacts, vulnerabilities, risks and reduction through EbA solutions and project outcomes

29. The project will focus on actions along Cuba's Southern Coast that has been selected due its high vulnerability to climate change (open aquifers, low lying coastal plain, degraded ecosystems and concentration of settlements), particularly to storms, drought and sea level rise, which result in coastal flooding and saline intrusion.

30. Targeted shores cover approximately 89,520 hectares of mangroves (representing 16.81% of the country's mangroves) followed by 60,101 hectares of swamp grasslands and 28,146 hectares of swamp forests²⁸. These in turn will contribute to improving 9,287 ha of seagrass and 134 km of coral reefs and their respective protective services.

²⁸ Menéndez, L. y A. Priego (1994): Los manglares de Cuba: Ecología. En: El ecosistema de manglar en América Latinay la cuenca del Caribe: su manejo y conservación. (D. O. Suman, ed.), Rosenstiel School of Marine and Atmospheric Science, Universidad de Miami.

31. There is evidence of reef crests degradation^{29,30} which in turn could cause significant wave damage in both mangroves and sea grasses reducing further their ability to offer protection against the effects of CC on the coast of Cuba³¹.
32. Restoration of degraded red mangrove (*Rhizophora mangle*) strips along the coastal edges, in stretches 1 and 2, is crucial. During wind, storms and hurricane seasons, the sea has penetrated more than 150 meters inland in these areas, exposing areas dominated by black or white mangroves, which are less tolerant to hyper-saline conditions, potentially becoming more degraded. During stakeholder consultations, communities highlighted the consequent loss of infrastructure and reduced livelihood opportunities (both fisheries and agriculture).

Coastal Stretch 1: La Coloma – Surgidero de Batabanó (271 km – 13,220 km²)

33. This stretch is made up of 3 provinces (Pinar del Rio, Artemisa and MAYabeque) and 13 municipalities (San Juan y Martinez, San Luis, Pinar del Rio, Consolacion del Sur, Los Palacios, San Cristobal, Candelaria, Artemisa, Alquizar, Guira de Melena, Batabano, Melena del Sur and Guines). The main localities along this stretch are: (1) La Coloma in Pinar del Rio Province; (2) Beach Cajío in Artemisa province; and, (3) Surgidero Batabanó in Mayabeque Province (Figure 1).
34. The vulnerability assessment concluded that, by 2100, 5 communities in this stretch could disappear due to SLR. Extreme events, waves' strength and salinity have also been identified in this area; hence appropriate adaptation measures need to be in place to reduce the impact.
35. These risks are being exacerbated by the impacts of ecosystem degradation related to changes in land use, pollution past logging, grey infrastructure and inappropriate measures of coastal protection in the past, urbanization, and the reduction of water and sediments flows (FS section 3.1.1).
36. The impact of saline intrusion into the karstic aquifer is particularly troubling along this coastal stretch with important implications at a national level, as the main aquifer, in the southern basin which supplies water to the targeted coastal communities and agriculture, is also an important source of fresh water to the capital, Havana. To address the issue of saline intrusion in this area, the GoC has experimented with grey infrastructure (The Southern Dike), a 51.7 km levee built in 1991 aiming to accumulate runoff fresh water to halt the infiltration of saline water in the interior of the southern aquifer. The USD 51.3 million investment, with maintenance costs of USD 1.5 million every 3 years and a once-off USD 15 million (20 years after it was built), had a positive effect in partially containing the progress of the saline wedge. However, the impact of the dike resulted in the degradation of mangroves in its northern shore reducing the mangroves function to protect the coastline³².

Coastal Stretch 2: Jucaro- Manzanillo (1029 km – 14,660 km²)

37. This stretch is comprised by 4 provinces (Ciego de Avila, Camaguey, Las Tunas and Granma) and 11 municipalities (Venezuela, Baragua, Florida, Vertientes, Santa Cruz del Sur, Amancio Rodriguez, Colombia, Jobabo, Rio Cauto, Yara and Manzanillo). The main localities to intervene along this stretch include (1) Júcaro in Ciego de Avila Province; (2) Santa Cruz del Sur in Camagüey Province; (3) Manzanillo in Gramma Province (4) Playa Florida (Figure 1).
38. The communities in this coastal area are located within extensive coastal wetlands dominated by mangroves, swamp grasslands and swamp forest.
39. Water reservoirs for irrigation have reduced the water flow towards natural ecosystems, it has also been directed towards agricultural lands altering the natural flow indispensable for ecosystems.
40. Mangroves have been highly impacted by degradation and fragmentation, which has undermined their role in protecting the beach and human populations from extreme hydro-meteorological events, saline intrusion and coastal erosion. Only 6% of mangroves are in good condition, while 91% are in a fair state, and 3% are highly degraded. Wetlands in the prairie marshes have begun to dry due to a combination of climate drivers and land use management with a direct impact in reducing their water retention and infiltration capacity.
41. Coral crests of the area's broad insular platform, have been classified as very deteriorated or extremely deteriorated and it is predicted that if no intervention on the sources of degradation from the island, is made, they will disappear by 2100²⁴. Reef elimination will increase communities' flood risk to potentially settlements disappearing.²⁹
42. Saline intrusion is becoming increasingly significant in this area due to a combination of CC-related SLR and the overexploitation of aquifers.
43. Climate change vulnerability is exacerbated by construction practices (such as people building small shops and walkways) along the shoreline where fully exposed infrastructure can be found within flood zones, between the

²⁹ Iturralde and Serrano, 2015 and Alcolado et al., 2013

³⁰ Resiliencia en crestas de arrecifes coralinos del este del golfo de Batabanó, Cuba y factores determinantes probables. Serie Oceanológica 13: 49-75

³¹ Rosada Rodríguez, I. (2018): Efectos del cambio climático en la costa de América Latina y el Caribe: Evaluación de los sistemas de protección de los corales y manglares de Cuba. CEPAL. pp15-16.

³² Menéndez, L., J. M. Guzmán y N. Ricardo (2006): Los manglares de la franja costera del sur de La Habana: Principales afectaciones debido a la construcción de un dique. 210-218 pp.

coast and the coastal marsh. This situation is aggravated by the limited knowledge of local actors and a false sense of security that was perceived during community consultations.

Baseline investment projects

44. Traditionally, Cuba's tropical storms response and management strategies have focused on emergency preparation and attendance rather than on planning for disaster risk reduction. The GoC has successfully introduced early warning mechanisms and clear emergency protocols to reduce the impact of storms in the loss of lives. The development of Centres for Risk Reduction Management (CGRR) has also been successful in mobilizing local actors when storms are predicted to hit ensuring that emergency resources are available to address storms' immediate impacts. While these are important steps in the face of an immediate emergency, they are insufficient to manage multiple ongoing threats (some of slow consequence of climate change).
45. In 2017, GoC approved its State Plan to Face Climate Change ("Tarea Vida") in which identified and prioritized the impacts of saline intrusion, flooding and extreme events to the country coastal zones, focusing strategic actions for the protection of vulnerable populations and of key resources including protective ecosystems such as mangroves and coral reefs (FS Table 10). The GoC has begun to look into various strategies to mainstream local adaptation initiatives using existing successful national mechanisms for capacity building and knowledge transfer (FS Section 7.8) and international cooperation best practices.
46. Initial investments made by the GoC have identified the country's climate vulnerability, including drought and SLR vulnerability and hazard risk assessment maps. The development of the "Macro-project on Coastal Hazards and Vulnerability (2050-2100)", focused on these areas' adaptation challenges including oceanographic, geophysical, ecological and infrastructure features, together with potential risks such as floods, saline intrusion and ocean acidification. Cross-sectoral information integration was a key tool to identify climate risks and potential resources (existing instruments, institutions, knowledge, etc) to manage it. While this is an important foundation it has yet to be translated into concrete actions often as a result of lack of technical equipment.
47. International cooperation has financed projects that have further allowed the GoC to innovate on various institutional mechanisms such as the Capacity Building Centres (CBCs) and Integrated Coastline Management Zones through active capacity building incorporating municipal and sectoral needs. Table 1 summarizes the most relevant baseline projects and highlights key results, lessons learned, and gaps identified. The proposed project aims to address such gaps, and incremental GCF financing is required to efficiently achieve efficient climate resilience in the target coastal sites.

Table 1. Baseline investment projects

Key results	Lessons learns / Scaling up in this project	Key gaps / Addressed in this project
Sabana Camagüey/GEF/UNDP (1999-2007)		
The project focused on tourism development in harmony with biodiversity protection and sustainable development Sabana Camagüey archipelago Total investment of US\$ 4,119,448		
Integrated Coastal Management	ICM approach facilitates addressing specific situations identified in the coastal zones of each intervention area of the project The relevance of an integrated approach with local governments empowered and aware of environmental risk management and natural resources management	This practice has been validated widely in Cuba, and at least 60% of the coastal territories of the country have ICM plans prioritizing areas in the Northern part of the Country. 40% (among those the most vulnerable to CC) have yet to adopt this tool. The approach to ICM failed to take into account EBA within its coastal management thus excluding a key issue for coastal management and vulnerability assessments particularly as it relates to zones at risk of disappearing under coastal flooding.
Coastal and marine ecosystems monitoring protocols	Developing and implementing monitoring protocols for coral reefs These protocols will be applied in this project.	Exclusion of indicators of specific relevance to the challenges of CC adaptation, including ecosystem responses to pressures from CC, and the effectiveness of EBA measures in terms of ecosystem health and the buffering of coastal communities were not incorporated.
Capacity Building Centres: Joint instruments of ICM & capacity building. At CBC occurs the integration, conciliation and analysis of problems and opportunities in the decision-making process going beyond training, education and awareness-raising activities in communities.	Central points for the identification of hazards and climate change risks and vulnerabilities. This experience will be scaled up from an adaptation perspective in this project.	Training did not include <i>CC-adaptation</i> . The use of climate data, when available, is limited to extreme events responses, rather than a proactive approach to risk management to slow onset events. Curricula and KM material need to be enhanced to integrate EBA with trainings to local populations.
Awareness raising and training of key stakeholders as the basis for behavioral change: UNDP Project "Capacity 21" (1999-2006) Implemented as one of the components of the Sabana Camagüey project. Total investment of US\$ 483,900		

<p>Identification of the existing knowledge gaps related to environmental issues and sustainable natural resource management in the established target groups. Training and support materials.</p>	<p>Ecosystems restoration guidelines for stakeholders' awareness creation and training. Capacity building guidelines at a community level</p>	<p>The capacity development did not include communities awareness creation or training on CC-impacts, threats and adaptation options.</p>
<p>Application of a regional approach to coastal and marine protected areas management in the Southern Archipelagos region /GEF/ UNDP (2009-2014) Conservation and sustainable use of marine biodiversity of global importance through an expanded, strengthened and integrated network of marine and coastal protected areas (AMP) in the Southern Archipelagos region. Total investment of US\$ 5,710,000</p>		
<p>Monitoring programs were applied to Marine Protected Areas (MPAs). A publication on the status of the Southern Archipelagos coastal and marine biodiversity was produced.</p>	<p>Use of the protected areas monitoring and management tools produced will be of much relevance to the proposed project. Integration of lessons learned in protected areas the management applied to EBA.</p>	<p>The interaction of terrestrial and Marine systems and the influence of CC-threats were not considered. This is a key input required to measure EBA capacity for coastal resilience.</p>
<p>Prevention, control and management of Invasive Exotic Species (IES) in vulnerable ecosystems in Cuba /GEF/UNDP (2011-2016) The project had nationwide coverage. Total investment US\$ 5,018,182</p>		
<p>Design and implementation of a national program document for the prevention, control and management of IES. Guideline for the observation of anomalous behavior and indications of environmental changes in species and ecosystems such as invasive behavior of species, coral bleaching and algal blooms.</p>	<p>The methodological bases (on risk analysis, environmental impact evaluation and protective areas management programs) could be applied in the proposed project, together with the use of corresponding monitoring protocols and Information System for the management and eradication of IES. Monitoring activities aimed at assessing climate variability influence on species (invasive and native) behavior.</p>	<p>It mainly focused on biodiversity objectives, climate adaptation or coastal zones resilience were not an objective.</p>
<p>Reduction of environmental vulnerability to coastal floods due to sea penetration through Ecosystem-Based Adaptation in the south of the provinces of Artemisa and Mayabeque (Manglar Vivo)/Kyoto Adaptation Fund-UNDP (2014-2019) Reducing coastal floods along 84 km of coastline along the provinces of Artemisa and Mayabeque through mangrove restoration Total investment US\$ 6,067,320</p>		
<p>Restored mangrove and swamp forest ecosystem to improve the resilience of the coastal belt and reduce the impacts of the coastal floods</p>	<p>This experience will be scaled up directly in particular for rehabilitation of mangroves ecosystem and swamp forests, as well as for the coordination and processes involved with forestry sectors. Numbers of hectares recovered by this project serve as baseline estimated in the proposed project log frame. The recognition of the relevance of IWRM role for coastal resilience, given the importance to provide and manage the required water flow to the wetlands specially during extreme climate change events (droughts and floods).</p>	<p>Limitations on in its EBA approach are mainly related to focusing only in inland actions and not on monitoring its impact on integrated ecosystems connectivity and functionalities restoration as it relates to marine areas and coastal resilience. The project did not consider developing more general capacities and user based information for adaptation and as such missed the opportunity to allow for the integration of adaptation measures within general local contexts. The development of methodological bases for CBA was considered by the project but at a late stage. More experience needs to be developed in incorporating this analysis within an EBA framework to value its results in terms that are more understandable to decision makers.</p>
<p>The Country Partnership Program (CPP) on Sustainable Land Management (OP 15 GEF/UNDP/UNEP) (2008-2023) Developing capacities for addressing land degradation threats in Cuba Total investment US\$ 10,000,000</p>		
<p>Development of systems and capacities for the management of environmental information. Guidelines for climate related disasters prevention Increased capacities for water management.</p>	<p>Guidelines and approaches for information management and capacity building have the potential to contribute to CC resilience and are therefore relevant for this project. Strengthen meteorological stations network to improve an understanding of current climate variability and support decision making. In this particular case for droughts</p>	<p>It does not have a specific focus on adaptation, or on the specific threats facing coastal zones.</p>
<p>48. Considering the nationwide risk, the implementation of "Tarea Vida" has promoted and developed actions focused on the protection of soils, water resources, marine-coastal ecosystems and on reducing the vulnerability of its coastal settlements through multiple initiatives contributing to the differentiated attention of the vulnerabilities identified in each coastal zone. These include the following ongoing projects:</p> <ul style="list-style-type: none"> • FAO/MINAG/GCF: 'Increased climate resilience of rural households and communities through the rehabilitation of production landscapes in selected localities of the Republic of Cuba (IRES)' which has been approved for implementation to address the impact of drought in agricultural production in Las Tunas, Villa Clara and Matanza provinces in line with actions 3 and 4 of "Tarea Vida." The project is focused on agricultural and livelihood production while incorporating ecosystem based solutions as a source of livelihood protection to increase the climate resilience of agricultural production and ensure food security through improved ecosystem services from landscape management. 		

- **UNDP/AMA/EU:** 'Building coastal resilience in Cuba through natural solutions' being implemented in 4 northern central coastal municipalities (Villa Clara, Sancti Spiritus, Ciego de Ávila y Camagüey) focusing on Strategic Actions 1 and 2 of "Tarea Vida" and tasks 1,5,7,9, to provide support to the Risk Management Group. The project works to enhance local Disaster Risk Management Centers in an effort to integrate disaster risk management and adaptation into the vulnerability assessment and planning tools of these territories and experimenting with limited nature based solutions for local populations.
49. These projects prioritize ecosystem and nature based solutions in accordance to the GoC's NDCs and will complement each other through lessons learned in the implementation of EBA as a source of coastal defense (current project), livelihood protection, and integrating DRR within a wider adaptation framework thus providing strategic support to the GoC in managing CC principle impacts. This includes upscaling and integrating best practices, innovating new approaches on natural based solutions and providing support to key economic sectors.

Barrier Analysis

50. Considering the impact of CC, actions are required so the protective role of ecosystems is mainstreamed as a stronghold for climate resilience, while integrating local communities and enabling inter-sector coastal planning to reduce the high vulnerability of Cuba's coast to climate change. An EBA approach for managing climate impacts along vulnerable coastlines provides an adaptation solution that can better adapt to the changing external conditions demanded by climate change helping achieve more cost-effective resilience to a range of climate impacts in a manner that ingrates local conditions and needs for coastal protection and services.
51. For EBA measures to be effective these initiatives need to be based in sound knowledge and measures to ensure their functionalities through time thus requiring the participation and enhanced capacities of communities and governments to maintain these systems. Knowledge, tools and capacities have been lacking to enable the development and implementation of actions with a longer-term vision focused on adapting to the full scale of challenges posed by CC through an integrated approach to coastal management that takes an enhanced view of the protective role of ecosystems. Thus allowing local communities to incorporate adaptation solutions to a wide scale of impacts (saline intrusion, coastal flooding) rather than solely predicting and reacting to individual events.
52. This project will shift the paradigm in climate resilience in coastal areas in Cuba, resulting in the full-scale, integrated and sustained application of an EBA approach together with building capacity and awareness among direct beneficiaries and government institutions at all levels for increased sustainability. Key Barriers are:

Barrier 1: Limited knowledge in vulnerable communities of CC drivers/threats and adaptation options

53. Though Cuban scientific and technical institutions have generated large amounts of information on the characteristics of coastal and marine ecosystems, trends in climatic conditions, and the magnitude and nature of CC drivers/threats affecting the ecosystems and local populations^{33,34,35}, there is limited information and general understanding on *CC adaptation*. Climate information, has mostly been used for disasters preparedness quite successfully, however mobilization in the face of permanent vulnerability to climate change requires continued and sustained action. Currently highly scientific material that would be useful for adaptation is not accessible to key decision makers at the local level, nor presented in the required manner for its effective application. Hence, knowledge has not yet evolved into actions that bridge sector gaps particularly locally. Technical information on CC adaptation needs to be translated for communication and streamlined into development planning to reduce communities' vulnerability to climate change. This is particularly relevant considering the recent changes to Cuba's constitution that have conferred local actors with greater responsibility in local development (FS Section 4.2.2).
54. Community consultations indicate that communities perceive climate change as a future issue instead of an ongoing process that already poses immediate threats to lives and livelihoods, thus limiting their buy-in to adaptation strategies and planning. While the socialization of Tarea Vida has begun to change this perception, information has not flowed equally to all community members and remains highly technical, failing to generate local understanding of how climate change impacts them in the short term nor how current practices can have a direct impact on coastal vulnerability. This is particularly salient in rural coastal communities.
55. Actions at community level have focused on preparation, attendance and reconstruction to individual impact events and not to continuous changes as a result of CC including increased coastal flooding and saline intrusion. Hence communities feel adaptation is a reactive strategy to temporal extreme events during which information flows top down making them reactive actors to threats. To achieve climate resilience, communities ought to become active participants. Adaptation solutions require enabling community knowledge and ownership which in turn generates positive action in how communities interact with coastal ecosystems.
56. Besides, a limited number of local communities have first-hand practical knowledge of the range of adaptation options that exist for achieving sustainable resilience to CC, a situation which, if unaddressed, will result in an

³³ Iturralde y Serrano (2015) *Macroyecto. Peligros y vulnerabilidades de la zona marino-costera de Cuba: estado actual y perspectivas ante el cambio climático 2100*. Editorial Academia, La Habana

³⁴ Planos E., Rivero R., Guevara V (eds), 2012. *Impactos del Cambio Climático y medidas de Adaptación en Cuba*.

³⁵ Alcolado et al., 2009. *Trend of change of live stony coral cover in Cuban coral reefs*. Serie Oceanológica No. 5. La Habana, Cuba.

overreliance on cost-ineffective forms of adaptation such as hard infrastructure that are difficult to maintain and do not fully address the range of impacts these communities will be facing. This was made particularly evident during national consultations to municipal governments that looked to implement hard infrastructure solutions to manage saline intrusion without considering that these would generate further stress to vulnerable ecosystems currently providing protection.

Barrier 2: Limited experience with effective and sustainable implementation of EBAs

57. A solid base of knowledge and expertise has been developed on natural resource management, sustainable land management, biodiversity and conservation, but there is a generalised lack of knowledge and practical understanding within government and productive sectors on how to integrate this diverse portfolio into a coastal adaptation strategy that favors a functional coastal landscape as is required for EBA.

58. This is due to the limited experience that many institutions have in allocating key resources required for effective EBA including the monitoring of interrelated ecosystems services and the impact of coastal management on these. For example, while water monitoring in key aquifer and reservoirs is performed by water monitoring institutions (INRH) it currently fails to capture and value the hydrologic requirements needed for coastal ecosystems to deliver ecosystem services in favor of the overall water balance. Restoration projects often fail to capture the impact that actions inland are having on coastal marine systems and integrating them within a wider scope of coastal resilience. This lack of information and experience trickles down to economic sectors as it relates to local planning that often fails to make room for key inputs to EBA. EBA approaches and interventions are more successful when landscapes and systems are integrated, and their nexus and functionalities understood (Figure 2).

Barrier 3: Physical barriers that reduce natural ecosystems response capacities

59. Through time, infrastructure has been built within, neighboring or near mangroves and wetlands changing the natural dynamics, particularly those related with sediment trapping and water flow. There are infrastructure barriers -roads, dikes, walls, embankments etc.- upstream reducing sediment and water flow, there is also infrastructure within the ecosystems altering the natural dynamics and flows as well as infrastructure along the shoreline and offshore. Often times these have been built as a temporary and ineffective measure to manage coastal flooding (Figure 65, FS). Land conversion, deforestation, increased sedimentation, pollution, changes on freshwater discharges can have cascade effects in mangroves, seagrasses and coral reefs³⁶. This has an impact not only the ecosystems but also their connectivity and functionalities including those related with coastal protection. Cuba is not different and actions along the shoreline have affected ecosystem's capacity particularly as it relates to mangroves and coastal marine systems (Feasibility Study section 2.3). Upon field visits the construction of hard infrastructure along vulnerable coastlines was evident demonstrating the need for informed physical planning (FS Section 6.2).

Barrier 4: Inadequate cross-sector mechanisms for Coastal Community Adaptation (CCA) mainstreaming in policy and regulations

60. Although inter-governmental coordination has been progressively strengthened in recent years, there is still an entrenched tendency for institutional actors –environment, social, production- to work in silos, and for taking decisions at national level with a limited involvement from local authorities. This is particularly evident at a local level, where there is an expectation to follow national sectoral directives adopted at the national level. In addition, there is insufficient information and data from national to local stakeholders. This top down approach translates into a limited capacity to take decisions locally, and such decisions are often decided by one sector alone (e.i. deciding on hard solutions vs nature-based solution). This has resulted in limited capacities to incorporate adaptation and natural resources management in decision-making at the territorial level. While a legal framework has been established at constitutional level- to promote territorial decentralization, it has yet to be made effective. This is also aggravated as locally relevant information on ecosystems management (ecological flow of water for example) is insufficient to allow for more coordinated action across various sectors.

Barrier 5: Limited access to and availability of finance for technical equipment to mobilize large scale adaptation investments, and insufficient mainstreaming of projects' outputs into public policies

61. Climate change adaptation has been hindered by limited availability of funds for investment. Though baseline investments exist (Table 1), more investments are needed to overcome the barriers in the target areas, particularly in the case of access to technical and monitoring equipment that would allow for a successful implementation of EBA. The current international economic context faced by Cuba limits the government's capacity to access hard currency from the international capital markets. This results in higher costs and difficulties in acquiring and importing equipment (machinery and technology) that could support adaptation to the evolving impacts of CC. While its technical capacities for natural environmental management are high, its ability to transform these actions and knowledge for an effective EBA strategy for coastal resilience is obstructed by the lack of the necessary machinery and technology that will allow for correct modeling, measuring and evaluation of coastal resilience and solutions.

³⁶ UNEP-WCMC (2010)

62. Hence, the identification of sustainable solutions that favor national capacity is crucial, particularly as hard infrastructure solutions have demonstrated to provide partial results and demand extensive amount of investment in imported equipment which can become financially unsustainable. Furthermore, the GoC is struggling to balance the budget and is resorting to domestic bond issuance to finance the budget deficit that has arisen as a result of the current economic blockade (sovereign bonds are sold primarily to domestic state-owned banks, as Cuba does not have a private banking sector) and manage the fall-out from the implementation of COVID 19 management measures. EBA, once implemented, will prove to be particularly effective as it enhances natural infrastructure that already exists and has shown (See Economic Analysis and FS 5.6.1) overtime to require reduced operation and maintenance costs as systems become self-sustaining.
63. While international cooperation projects in the past have been successful in achieving results, these have often failed to incorporate themselves into formal national or local structures for economic development. Among the several causes for the above failure includes limited appropriation at the sectoral level, because of the wrong perception of projects and their outcomes being independent entities with no influence on public policies. This is a key barrier that needs to be addressed through this project to ensure that interventions are not isolated investments but are embedded within budget planning processes/mechanisms and formal legal frameworks.

B.2. Theory of change (max. 1000 words, approximately 2 pages plus diagram)

64. Climate change is expected to impact Cuban coastal areas due to sea-level rising coupled with the increase of intensity and frequency of storms. These changes will exacerbate erosion and flooding of coastal areas. Coastal municipalities, particularly along the southern coastlines, and their respective settlements are extremely vulnerable to CC and more likely to be affected by extreme weather events because of their, low elevation, largely flat topography and highly permeable karstic geology as well as their relative location to storm occurrence.
65. The diverse coastal ecosystems in these areas and their complex interconnections if restored can provide a variety of services to these settlement including coastal protection and disaster risk reduction that will enable these ecosystems to act as protective barriers against storm surges reducing coastal erosion, flooding and salt intrusion associated risks and keep pace with rising seas (through sediment binding and nutrient absorption, which combined with water retention, create equilibrium dynamics and coastal stability in target coastlines).
66. While the GoC has looked to prioritize through “Tarea Vida” a resilience model for coastal communities based on EBA, knowledge, tools and capacities as identified in the barrier section have been lacking to enable its development and implementation. This has resulted in communities and local governments with limited capacity to both implement and manage EBA measures through actionable measures to enhance coastal resilience beyond traditional risk management measures or through business as usual solutions including infrastructure based solutions that have proven to be ineffective in these areas.
67. The project’s goal statement is hence summarized in the following manner: IF coastal ecosystems along Cuba’s southern coastline and their complex interconnections are rehabilitated and adaptive capacity in stakeholders is increased THEN coastal ecosystems will provide valuable coastal protection services that will result in an increased climate resilience of coastal communities in low lying coastal settlements BECAUSE coastal ecosystem services to manage climate impacts will be restored and sustained through increased stake holder capacity and awareness as well as in the integration (mainstreaming) of EBA into development planning mechanisms, processes and budgets. The project’s goal will be achieved through the delivery of its two outputs: Rehabilitated coastal ecosystems for enhanced coping capacity to manage climate impacts and Increased CC Adaptation Capacity in Vulnerable Coastal Communities, Governments and Economic Sectors. Project results will be measured by populations and economic assets protected as a result of EBA actions, the value of information products and trainings to local populations and their uptake and the integration of EBA measures within national regulations, local development and financial plans.
68. Output 1 will be focused on working with local and national actors to rehabilitate ecosystems along 1,300 km of Cuba’s vulnerable southern coastline, through an integrated coastal ecosystem approach that will result in the increased protective capacity of vulnerable communities and populations along project target areas, as a result of EBA actions focused on restoring local hydrology and reducing local pressures. Restoration will be managed based on best practices and innovations developed through baseline experiences (Table 1) that will be integrated through a wider marine-coastal landscape approach to account for effective EBA. The impact of the EBA actions will be monitored and evaluated to provide crucial quantitative data and knowledge to support the use of nature-based solution as flood defenses, mainstreamed in territorial planning and disasters reduction strategies. The knowledge from restoration activities will be ready for application, systematized and formatted in user-friendly products (output 2) thus, making possible for EBA to be up scaled and providing knowledge base support for EBA approaches at various levels, thus addressing knowledge and capacity barriers that have limited the capacity to implement EBA in a full scale and in an integrated manner. These actions will be complemented by a community based monitoring system that will be developed through the project that will be unique to Cuba.
69. Output 2 will be focused on working with communities and local governments and economic sectors to increase local climate change adaptation capacity by providing technical trainings, systemizing information through a knowledge management platform and delivering information products that will allow communities to better identify

and prioritize adaptation options including streamlining EBA within local governance planning frameworks budgets as foreseen in the GoC 2019 Constitution, which bestows greater responsibility to local actors in development and financial planning. This will allow the project to address barriers 2,3,4 and 5.

70. This project, through both outputs, will allow communities to adapt proactively and enhance coastal resilience by including them as active participants in monitoring and in generating coastal resilience that will be communicated through information products that will be enhanced and developed through the project making use of existing successful climate and environmental information systems. The proposed community-based monitoring system and the data analysis that will be developed through the project is considered unique for Cuba and will work at providing increased awareness of local populations to their ecosystems in their general every day management. Data provided will be used to adjust the prognoses of the local CC-impacts/coastal drivers and to determine more accurately the role of EBAs in reducing CC related vulnerabilities.
71. The project's approach follows the recommendation by IPCC to integrate the multiple coastal zones uses in planning for climate change³⁷. Approaches to increasing ecosystem capacity for resilience by reducing local stresses are considered feasible, cost-effective and highly scalable. Combined with the advantages of using local knowledge to guide transitions, solutions will become more effective and sustainable as they are undertaken in partnership with local communities, cultures, and knowledge. The project will provide the support needed to shift the paradigm in climate resilience in coastal areas in Cuba resulting in the implementation of a full-scale, integrated and sustained application of EBA while integrating local communities and enabling inter-sector coastal planning.
72. Figure 3 summarizes the activities of the proposed project and explains how the activities will contribute to overcome the barriers leading to paradigm change.

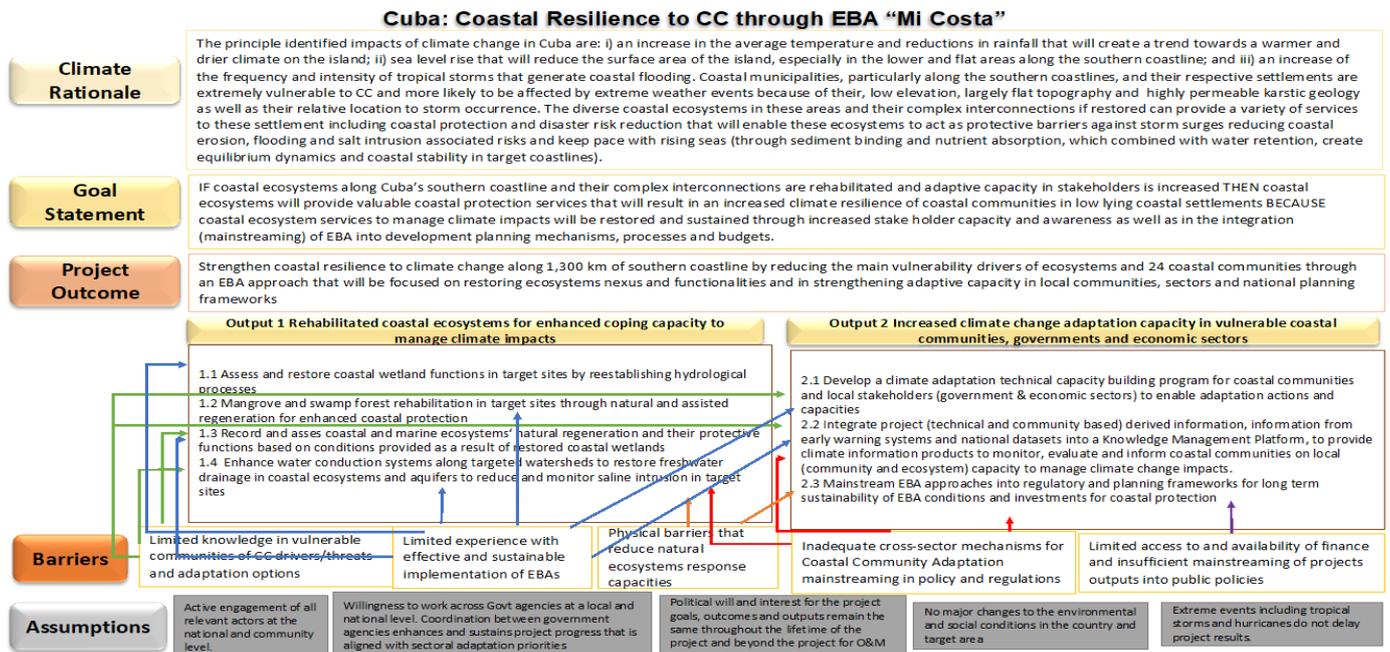


Figure 3. Theory of Change and its baseline assumptions

B.3. Project/programme description (max. 2000 words, approximately 4 pages)

73. The proposed project's objective (outcome) is to strengthen coastal resilience to climate change along 1,300 km of Southern Coastline by reducing the main vulnerability drivers of ecosystems and 24 coastal communities. It will do so through an EBA approach, restoring ecosystems nexus and functionalities, and by strengthening adaptive capacity in local communities, sectors and national planning frameworks. The latter includes enhancing a greater understanding of climate change, its consequences and adaptation options together with mainstreaming ecosystems management within territorial and coastal planning instruments and frameworks. The long-term 30-year objective will be calibrated with information originated by two monitoring mechanisms: i) environmental indicators derived from the interventions improving ecosystems functioning and ii) community assessments. The project in its entirety will be managed and coordinated by AMA with the support of national actors that will be hired or enlisted by AMA in its role as EE to the project.

Output 1: Rehabilitated coastal ecosystems for enhanced coping capacity to manage climate impacts

³⁷ IPCC Special Report on Global Warming of 1.5°C, October 2018 & Kelleway et al., 2017. Review of the ecosystem service implications of mangrove encroachment into salt marshes. Volume23, Issue10 October 2017

74. Output 1 will focus on rehabilitating coastal wetlands structure and functionalities along the wider marine-coastal landscape as presented in Figure 2 to address projected impacts along coastal zones consequence of relative sea level rise (coastal flooding and saline intrusion) and extreme events (increased erosion and coastal flooding) derived from climate change. Through the interactions of the four activities in this output, the project will effectively implement an EBA strategy for strengthening coastal resilience by increasing coastal ecosystems capacity to reduce such impacts. The proposed activities are thus aimed at strengthening coastal wetlands and marine ecosystems' coastal protection and water regulation services as well as co-benefits that will increase the overall system resilience (including communities') to the identified climate change impacts. This project follows the recommendation by IPCC that states that planning for climate change should be integrated with the use of coastlines by humans.³⁸
75. The ecosystem rehabilitation methods to be applied have been chosen based on the sound understanding and relevance of ecosystems' functions connectivity and environmental continuum "river basin-coastal zone-continental shelf" or "top mountain-dep ocean" highlighted by UNESCO and the Convention of Biological Diversity among many others^{39,40,41,42,43}. Approaches to reducing local stresses are considered feasible, cost-effective and highly scalable making use of the existing strongholds in target areas such as diverse and interconnected coastal seascapes as well as national best practices in natural resource management.
76. Monitoring activities within this output will focus on assessing ecosystems' responses (including their health, connectivity and reduced pressures) to rehabilitated conditions as indicators of increased coastal resilience⁴⁴ and will in turn provide evidence based information and guidance for EBA approaches in areas where physical infrastructure measures are not feasible (Feasibility Study Section 5.6 and 5.6.2).
77. Actions will be implemented in 7 specific sites in the areas of La Coloma; El Cajío; Surgidero de Batabanó; Júcaro; Santa Cruz del Sur; Manzanillo and Playa Florida (Figure 1).
78. GCF will provide funding that will be directed for the purchase of equipment and technology (See FS Section 6.3.1) required for the improvements (additionality to overcome the barriers) to restore and quantify the capacity of ecosystems to reduce climate change threats (erosion, flooding and salt intrusion). GoC co-financing will be provided by CITMA, MINAG and INRH for the implementation of restoration and monitoring.

Activity 1.1. Assess and restore coastal wetland functions in target sites by reestablishing hydrological processes

79. This activity focuses on initial actions for the rehabilitation of coastal wetland functions by reestablishing the hydrological processes within coastal ecosystems. This will include the clearing of existing water channels and favoring actions to restore the ecological flow of water including the removal of invasive species. These actions will improve the ecosystems' coping capacity to coastal flooding, climate extremes, and to saline intrusion by restoring water flows and water ways and -along with actions in Activity 1.2- rehabilitate the fluxes between ecosystems. GoC funds through Activity 1.4 will complement these actions. Rehabilitation actions will be implemented by 6 Forest Enterprises (MINAG co financing) that will be hired by the AMA through GoC co-financing and will make use of the equipment purchased through GCF funds (See FS Section 6.3.1).
80. This activity will also invest in the monitoring of coastal wetland functions to verify baseline conditions and monitor the effectivity of the restoration actions (rehabilitating water flows, new plantings, increased in foliage etc.), which in turn will allow for steering accordingly to ensure the ecosystem's flows, nexus and functionalities for coastal protection are rehabilitated. Experts from the Institute of Ecology and Systematics (IES/) and yhr Institute of Tropical Geography (ITG) will be hired by AMA to perform monitoring and develop the products that will be continually used to evaluate ecosystem health.
81. Actions will be focused on degraded coastal wetlands in 7 key sites along the Southern Coastline (see FS Annex 1 and Section 6), targeting mangroves, swamp forests and swamp grasslands however having a larger implication in the overall ecosystem maintenance by reestablishing natural hydrological processes. Site selection for interventions was identified through a process that included community and municipal consultation and vulnerability-based mapping (Macro project report).

Sub activity 1.1.1 Validate local conditions in intervention sites and verify ecosystem coping capacities to CC impacts through in situ and spatial temporal analyses

³⁸ IPCC Special Report on Global Warming of 1.5°C, October 2018

³⁹ Silvestri, S., Kershaw, F. (eds.). Framing the flow: Innovative Approaches to Understand, Protect and Value Ecosystem Services across Linked Habitats. UNEP World Conservation Monitoring Centre, Cambridge, UK

⁴⁰ Tabor, G. (2019) Ecological connectivity: a bridge to preserving biodiversity. In UNEP Frontiers 2018/19 Emerging Issues of Environmental Concern. UNEP. Nairobi

⁴¹ UNESCO 2017 Management of coastal aquifers and Groundwater. MedPartnership. International Hydrological Program.

⁴² Secretariat of the Convention on Biological Diversity (2019). Voluntary guidelines for the design and effective implementation of ecosystem-based approaches to climate change adaptation and disaster risk reduction and supplementary information. Technical Series No. 93. Montreal.

⁴³ Krosby M. et al 2010. Ecological connectivity for a changing climate. *Conservation Biology*. Vol: 24, No. 6, 1686–1689

⁴⁴ Lacambra, C. 2010. Ecosystem-Inclusive Coastal Vulnerability Assessment in Tropical Latin America. PhD Thesis. Cambridge Coastal Research Unit. University of Cambridge. United Kingdom.

82. Coastal wetlands conditions' baseline validation and rehabilitation progress will be assessed in situ through transects and permanent plots and complemented with drone image and remote sensing analyses to better gauge impact to the ecosystem's general functionality and structure including hydrology, forest cover and reducing levels and sources of degradation. This will allow the project to determine if the conditions that were assessed during project design remain and select the best method for rehabilitation focusing on their functionalities to manage CC related risks.
83. Sampling and permanent plots will further allow comparison with initial data and assess survival conditions, species dominance and distribution, soil conditions and microbiota, and major zoological groups. Water salinity, quality, and flow into the ecosystems will also be monitored. These indicators are directly related to coastal ecosystems health and functionalities for resilience^{45,46} and will provide information to assess the effectivity of the restoration actions in strengthening coastal resilience and overall ecosystem sustainability. These conditions will be monitored during the project's lifetime.
84. Actions from this sub activity will result in an updated forest profile and basic structure as well as an updated forest landscape map that will include indicators on hydrology within and across the ecosystems, health and functionalities related to protection and resilience capacity. Experts from IES/CITMA and ITG/CITMA will be hired by AMA to develop these products.
85. GCF funds will be invested in monitoring equipment that will be shared amongst the various actors in charge of projects monitoring (FS Sections 6.3.1 and Table 21). These include a digital photo camera; software for GIS; annual satellite image of the project areas; optical salinity meters; materials to make soil profiles; metric tapes and material to establish quadrants. Co-financing from the GoC will include all costs related to performing the monitoring and field verifications, developing information analysis including an updated forest landscape map and forest profile. This information will be integrated into Knowledge Management Platform created for this project and that will be managed by ICIMAR.

Sub activity 1.1.2 Restore the ecological flow of freshwater towards targeted mangrove ecosystems through cleaning of existing water channels and building small scale low impact infrastructure to facilitate the laminar flow of water during rainy seasons

86. Forestry enterprises will perform the rehabilitation of the coastal wetland hydrology in each target site to ensure the ecological flow of freshwater towards the mangrove ecosystems (target of this activity) and favor the recovery and stability of coastal ecosystems including:
- Restoring the natural water flow through the cleaning of existing water channels;
 - The establishment of small drainage channels (less than 50 cm wide) to allow the ecological water flow in the case of dams, or where natural drainage is obstructed. In these cases, the small drainage channels will pass through the natural meandering and water flow areas to allow the laminar flow of water.
 - The construction of small- scale speed bumps (small earth mounts) to direct runoff storm water during rainy periods to mangrove areas will further facilitate the flow of water to wetlands.
87. GCF funds will be invested in agricultural equipment that will be provided to the forestry enterprises for the cleaning and establishment of water channels. (mattractors with front blade and amphibious equipment for cleaning ditches and canals, FS Section 6.3.1) Co-financing from the GoC will be used for the implementation of these actions through the hiring of the 6 forestry enterprises that will develop the restoration actions in accordance with national legislation and based on the successful protocols developed through the AF funded Manglar Vivo project. GoC financing (parallel and co-financing) will further be used in removing infrastructure barriers along the coastline and the cleaning of draining ditches and other drainage systems (p.125). The project has developed an ESAR to ensure that all interventions are carefully monitored per GCF and UNDP safeguard standards.

Sub activity 1.1.3 Invasive species management in target sites to reduce pressures on the coastal wetland and enhance ecosystem's coping capacity and resilience

88. Management of Invasive species (IES) has been identified, through national research and baseline projects, to be important for the rehabilitation of swamp grasslands and mangroves. IES in target sites compete for the use of water resources, obstruct natural water courses and contribute to swamp drying.
89. IES management actions within the coastal wetlands include:
- Mangroves and swamp forests: IES include Casuarina and Terminalia catappa. Other species occasionally found in mangroves include Majagua Florida (Thespesia populnea), gray Guacalote (Caesalpineia bonduc) and the Asian colubrine. Interventions here will include the felling of individual trees followed by covering the base of the trunks to avoid regeneration or regrowth at stumps is suggested.

⁴⁵ Lacambra, C. 2010. Ecosystem-Inclusive Coastal Vulnerability Assessment in Tropical Latin America. PhD Thesis. Cambridge Coastal Research Unit. University of Cambridge. United Kingdom.

⁴⁶ Spalding M. et al 2014. The role of ecosystems in coastal protection: Adapting to climate change and coastal hazards. *Ocean & Coastal Management* 90:50-57

- In the case of Swamp forest: disposal and management of these species by logging race, girdling, removal of sprouts, removing natural regeneration and immediate planting of several pioneer native species and/ or management native natural regeneration.
 - Swamp grasslands: IES include the vine (*Ipomea alba*), water lettuce (*Pistia stratiotes*), water hyacinth (*Eichhornia crassipes*), miriofilum (*Myriophyllum pinnatum*), Australian pine (*Casuarina* spp.), *Leucaena* (*Leucaena leucocephala*) and melaleuca (*Melaleuca quinquenervia*). The disposal and management of these species suggested is by logging, girdling, removal of sprouts, removing natural regeneration for trees and shrubs, and extraction of aquatic herbaceous species.
90. The AF funded Manglar Vivo and the GEF funded "Prevention, control and management of IES in vulnerable ecosystems in Cuba" projects developed key protocols for the sustainable management and control of IES for long-term impact that will be followed in the development of this sub-activity, with the additionality of incorporating a changing climate in the resulting information products. All interventions will be managed following the project's ESMP and national legislation.
91. GCF Funds will be used for the purchase of equipment required to perform these actions (chainsaws, backhoes, boats, etc., FS Section 6.3.1) while GoC co financing will be used for the implementation of management actions through forest enterprises that will be hired by the AMA

Activity 1.2 Mangrove and swamp forest rehabilitation in target sites through natural and assisted regeneration for enhanced coastal protection

92. This activity will result in the rehabilitation of ecosystem functionalities in 15,443ha of degraded coastal wetlands through natural and assisted regeneration in target sites focusing on mangroves, swamp forests and grasslands. This activity along with actions through Activity 1.1. will directly improve the coping capacity of coastal wetlands to flooding (by increasing sediment trapping, increasing ecosystems health and reestablishing seaward species that have been lost *R. mangle*), climate extremes (by strengthening the coastal system green structure and reconstructing its protective role with red mangrove) and saline intrusion (by restoring water /infiltration capacity).
93. Interventions for rehabilitation across ecosystems will be developed through local forest enterprises hired by AMA through co financing funds and will follow protocols which have proven to be effective through baseline projects⁴⁷ and national research (Section B.2). These include targeted ecosystems rehabilitation, reestablishing key species, restoring conditions for the sustainability of interventions (FS Table 4) including protective measures.
94. This activity takes into account the integrated nature of GCF and co-financing resources as critical inputs for action as GCF funds will provide the necessary equipment (sub activity 1.2.1) required due to incremental costs of adaptation while co-financing funds will implement sub activities 1.2.2 and 1.2.3 with the provided equipment. Rehabilitation activities will be coordinated by AMA and implemented by 6 national forestry enterprises with *in situ* expertise in forest management.
95. GCF funds for this activity will be specifically used for the acquisition of required equipment and software/hardware (Sub activity 1.2.1) that will be used in the restoration actions (Sub activity 1.2.2-1.2.3) by forest enterprises and its protective measures (Sub activity 1.2.4) by local forestry services and rangers (FS Table 22). Co-financing from the GoC includes the implementation of restoration actions as well as purchase of national insurance for the investment in mangroves rehabilitation during the initial 8 years of project implementation against climatic or accidental eventualities

Sub activity 1.2.1 Acquire forestry and evaluation equipment for restoration in target sites

96. GCF funds will be used to acquire forestry equipment for restoration actions in target sites (sub activities 1.2.2-1.2.3, FS Section 6.3.1.2). This includes the purchase of agricultural equipment difficult to access in Cuba (Barrier 2 and Feasibility Study Section 4.5) that will be provided to each local forest enterprise (6) and is required for the implementation of restoration investments (Sub activity 1.2.2-1.2.4), this includes the establishment of nurseries along each project site as well as mobilization equipment for access to difficult areas of access along the wetlands.
97. Equipment will be acquired through GCF funds during the project's first and second year and will follow UNDP's procurement process. Equipment will be provided to local forest enterprises and will provide the capital means for the maintenance of coastal ecosystem interventions throughout the project's full life time (30 years) while directly enhancing national capacities for EBA. It should be noted that lack of this equipment has been listed as an important barrier in implementing ambitious EBA actions. Equipment to be acquired includes: tractors, chainsaws, infrastructure and materials for establishing forest nurseries, collectors for propagules; vehicles and equipment for the mobilization of workers and for surveillance measures; sprinklers, water pumps, tools for restoration and surveillance, measuring and communication equipment.

Sub activity 1.2.2 Implementation of natural regeneration management measures in target sites

98. Forests rehabilitation of targeted mangroves and swamp forests will be based on their current degradation conditions as verified in the analysis provided in Activity 1.1. FS Annex 1 provides initial information on targeted areas for mangrove and swamp forest restoration per project site. Actions for natural regeneration include the thinning of the canopy and removing branches or trees that impede the penetration of light for young mangrove trees to grow. In the case of swamp forests and grasslands, actions include the clearing of weeds as well as the management of natural regeneration of native species including controlled clearing of vegetation cover to stimulate the natural growth rate and the implementation of controlled extraction measures to reduce the concentration of dominant of pioneer species.
99. Rehabilitation will be funded by GoC co financing (MINAG and CITMA) through the hiring of forest enterprises that will be that will make use of the equipment acquired in Sub activity 1.2.1 for rehabilitation actions in target sites and their maintenance. This includes the cost of labor, oversight, technical expertise. All interventions will be managed following the project's ESAR, national legislation and protocols for forest management

Sub activity 1.2.3 Red mangrove and native species planting in target sites for forest rehabilitation along the shoreline boundary of targeted coastal wetlands

100. Actions within this sub-activity include the building of 7 forest nurseries (1 per project site) as well as planting along the shoreline border of wetlands. Use of established protocols and best practices will be implemented for these actions (FS Section 6.3.1.1). Actions under this sub activity will follow interventions directly linked to restoring protective services across the coastal wetlands.
101. Mangrove restoration efforts will rehabilitate the protection strip that used to be dominated by red mangrove along the coastlines (FS Annex 1). Planting will be done in sections with very low mangrove density and with no evidence of sufficient presence of propagules. Planting will be done through the spreading of mangrove propagules / seedlings and will follow a best practice developed by the Manglar Vivo project for the protection of mangrove seedlings through a process of *estanquillo* (placing wooden sticks in the mud along the coastline to protect against wave impact).
102. Swamp forest rehabilitation actions will enhance native species diversity (often affected by illegal logging), with the objective of enhancing the ecological functionalities and connectivity for resilience and ecosystem services maintenance along the swamp forests that will in turn be monitored through Activity 1.1. Actions include increasing the rate of seed germination in native species located along the intervention areas. Seeds will be placed in nurseries for propagation and planting once grown. Actions to stimulate growth along the wetlands will also be implemented including the use of arbuscular mycorrhiza fungi that is native to the coastal wetlands and has shown to be effective.
103. These actions will be implemented by forest enterprises that will make use of the equipment acquired in Sub activity 1.2.1 exclusively for these actions in target sites and their maintenance. Red mangrove and native species planting will be funded by the GoC that will be financing this sub activity through the hiring of forestry enterprises, experts from IES and oversight support from state run forestry services. All interventions will be managed following the project's ESAR national legislation and protocols for forest management

Sub activity 1.2.4 Implementing external risk management measures in target sites to ensure perdurance of target restoration investments including fire control management, illegal logging surveillance and climate insurance

104. Actions under this sub activity will protect restoration investments from external risks (fires, illegal logging and loss from extreme storms) as they gain maturity and have enhanced capacity to self- manage. This will incorporate mitigation measures within the project to ensure that coastal ecosystems have the opportunity to develop during their initial years to provide long term services to coastal landscapes. Actions under this sub-activity will be implemented in areas specifically targeted for restoration with the support of the equipment acquired in Sub activity 1.2.1. Cost of implementation and surveillance (labor, monitoring, technical expertise, purchase of insurance) will be covered by the GoC as dedicated co financing for this project and includes the work of forestry enterprises and forest ranger corps
105. Protective measures to the sustainability of restoration actions include:
- The establishment of fire control systems (including firebreaks and fire trails) along swamp grass lands and active training of fire rangers in forest areas. Protocol for these systems will build upon best practices generated through the Manglar Vivo project that incorporated and innovated on cost effective firebreak measures through the restored hydrology network of existing water channels.
 - The surveillance and protection from illegal logging and extraction (native species in swamp forests), increased support to forest rangers for general monitoring.
 - Purchase of national insurance for the rehabilitated mangroves in project sites during the initial 8 years of project implementation against climatic eventualities (extreme weather).

Activity 1.3 Record and asses coastal and marine ecosystems' natural regeneration and their protective functions based on conditions provided as a result of restored coastal wetlands

106. This activity follows a functional landscape approach in which interventions across and along the watersheds and coastal wetlands (as described in Activity 1.1 and 1.2) will have a positive effect on the health and coping capacities of seagrass and coral reefs providing an opportunity for natural regeneration.
107. Hence this activity will assess and record the restored functional relationships between coastal and marine ecosystems to reduce key degradation drivers such as sediment loads, nutrients and domestic and industrial contamination (fisheries, food and pesticides industries), providing an opportunity for natural regeneration and enhancing ecosystems protective capacity against coastal threats particularly to extreme weather. A volunteer community network for the surveillance of sea grass and corals will also be created to provide support in the repair of corals during extreme weather events.
108. This activity follows recognized best practices for effective recovery of marine ecosystems that have shown to recover once degradation drivers are managed. The results from this activity will provide practical and scientific information that will allow its replication at national and regional scales and strengthen the global argument for EBA in coastal systems. It will also involve communities to create participatory awareness in the protective role of marine ecosystems through monitoring.
109. This activity will be led by AMA's ICIMAR with the support of 4 local Environmental Study Centers (CEAs) and on communities that will be trained through Activity 2.1.3 to support in the monitoring of seagrasses and coral reefs and their role in coastal protection. Monitoring agencies (INSMET, GeoCuba) will also provide monitoring support and will have access to the monitoring equipment (FS Table 23). Information will be collected in the Knowledge Management Platform that will be created through the project (Activity 2.2).

Sub activity 1.3.1 Acquire and install monitoring equipment to evaluate enhanced water quality and environmental conditions for seagrass and coral reef natural regeneration

110. This sub- activity considers the integrated nature of GCF and co-financing resources as critical inputs for action with GCF funds providing the necessary equipment (required due to incremental costs of adaptation, FS Section 6.3.1) while co-financing funds will implement sea water quality monitoring and evaluation activities (including the installation of the acquired equipment). Together these actions will assess coastal and marine environmental conditions (measured through water quality) as a consequence of the actions implemented in the wetlands for enhanced marine ecosystem's responsive capacity.
111. Monitoring capacity will be provided through the enhancing of 5 labs which will be dedicated to sea water monitoring within the target sites and will provide information on the conditions for ecosystem recovery. Four of these laboratories will be set up at a provincial level within local CEAs (Ecovida, University of Granma, CIEC and CIMAC) as well as one at a national level within ICIMAR that will be established as a central node. Physical, chemical and biological indicators will be monitored (Sub activity 1.3.3) through these labs in by marine expeditions coordinated by ICIMAR within the target sites to allow the assessment on improved conditions for coastal and marine ecosystems responsive capacity.
112. Actions will also include the installation of 36 monitoring stations (16 marine and oceanographic surveys, 10 weather stations, 4 wave stations and 6 sea level and terrain movement stations) to measure the marine ecosystem capacity for resilience and regeneration as measured through changes in water parameters (FS, Section 6.3.1.3). Equipment will be installed by experts (INSMET) hired by AMA based on best practices and international standards.
113. Installation of the monitoring station will be done under two approaches to ensure sufficient coverage and parameters to monitoring including: (1) the placement of stationary ocean stations to be located on the coast and along the keys "callerías" and (2) in the placement of stations within boats that operate under existing routes covering Batabanó-Isla de la Juventud and Júcaro-Cayo Ancilitas (in the Jardines de la Reina). This will allow the use of measurements through transects located between the coast and the cays or islands (section 6.3.1.3 FS for locations and criteria). Placement of these stations and their operation will be done through committed GoC co-financing provided by CITMA. AMA will be responsible for their use through ICIMAR, INSMET and local CEAs.
114. The GoC through co financing funds provided by CITMA will install the monitoring system including establishing the connectivity that will be required to connect them to the Knowledge Management Platform (Action 2.2).
115. Equipment will be acquired through GCF funds during the project's first and second year and will follow UNDP's procurement process. Equipment to be acquired through GCF funds will provide equipment that will enable the monitoring of marine water quality including laboratory monitoring equipment (vortex shakers, magnetic stirrers, laser sediment analyzers, water pumps, centrifuges, electrophoresis chambers, spectrophotometers, incubators, water distillers, water dionizers, microscopes), continuous segment flow analyzers, atomic absorption spectrometer, HPLC equipment to determinate organic pollutants, a mobile laboratory for in situ monitoring; material for collection and maintenance of samples including chemicals; and ICT equipment to process information. Equipment to be acquired for the installation of the marine stations includes: echo sounder; tide gauge, CTD sensors (conductivity, temperature and depth) coupled with sensors for physical and chemical data and current profilers; automatic weather stations, and tools and supplies for their installation.
116. Assessments (Sub activity 1.3.3) provided through the monitoring will include the following:
 - Coastal & marine waters' monitoring & assessment. Physical, chemical and biological indicators will be monitored at specified areas and periods of time to assess if coastal and marine ecosystems

environmental conditions have improved due to the actions implemented in the wetlands (Activity 1.1), and hence improve marine ecosystem's responsive capacity.

- Environmental conditions will be assessed, monitored and analyzed to evaluate the change due to the interventions. Baseline conditions are expected to improve, and degradation causes to diminish, hence will be monitored to assess the changes occasioned by the project activities. This will be done through the integration of information from the monitoring stations on physical-chemical water parameters.

Sub-activity 1.3.2 Acquire and install monitoring equipment to develop a monitoring system to measure marine ecosystem capacity for resilience and regeneration

117. As in sub activity 1.3.1, this sub activity considers the integrated nature of GCF and co-financing resources to meet adaptation needs, with GCF funds providing the necessary equipment (required due to incremental costs of adaptation, FS Section 6.3.1.3) while co-financing funds will install this equipment through the hiring and use of national experts (INSMET, ICIMAR, GeoCuba) by AMA to implement a monitoring system to measure the marine ecosystem's capacity for resilience and regeneration in relation to seagrass and coral reefs' recovery and increased resilience in targeted areas considering their role in wave energy dissipation
118. Actions under this sub-activity include enhancing capacity of ICIMAR through GCF funds for the collection and processing of data samples through marine expeditions including a boat to support coastal and marine sampling operation and submarine data collection, autonomous diving equipment; safety consoles with gauge, compass and depth gauge; submarine data collection materials.
119. Monitoring systems for both coral and sea grasses will be established and coordinated by ICIMAR and fully funded through GoC co financing (making use of GCF acquired equipment specifically for these actions).
120. Coral reefs monitoring will be developed for all reef variables according to the standard AGRRA method that establishes three monitoring modules, (1) coral monitoring, (2) fish monitoring and (3) algae monitoring to establish the conditions of the reefs and their health status. Seagrass monitoring will be carried out through three transects parallel to the coast, 50 meters long each, which have been previously geo-referenced. The transects will be located at different distances from the coast on a perpendicular line. The transects will be located at different distances from the coast on a perpendicular line. In each transect 12 square frames of 25 x 25 cm will be used. The transects will be repeated at different distances from the coast to verify through them if the changes in the coastal wetlands are having the expected effect of reduction in suspended sediments, nutrients and turbidity are modified over time as a result of the application of the EBA methods. Additionally, the monitoring of the physicochemical variables (Activity 1.2.1) is intended to explain possible alteration to the seagrass beds.

Sub-activity 1.3.3 Implement a monitoring and surveillance system for coastal and marine ecosystem regeneration capacity and ecological resilience to extreme events, including a network for coral recovery

121. The monitoring and surveillance system will include the implementation of sea water quality monitoring that will provide information on the improvement of seawater conditions as result of actions on coastal wetlands to assess the impact of these actions within the coastal seascape as well as record the environmental conditions (paragraph 43) that allow the natural recovery and regeneration of coral and sea grass to enhance ecosystem resilience and capacity. This will have a direct impact in enhancing the ecosystem's capacity for wave energy dissipation providing protection from extreme weather. The environmental conditions will be monitored through the monitoring stations installed in Sub activity 1.3.1 that will include the use of oceanographic and marine meteorological measurements from coastal stations, ships, and satellites.
122. Monitoring and surveillance of marine ecosystem regeneration and capacity for resilience will be done through coral and sea grass monitoring through equipment provided and installed in Sub activity 1.3.2. Coral monitoring analysis and assessment will include the processing of criteria for resilience, developed through the TNC ground based research in Cuba (FS p153) relying on variables that include: Percentage of live coral with respect to the total and dead coral; Abundance of fleshy algae, versus abundance of goblet algae; Abundance of herbivorous species (parrot fish, and surgeon fish) both in relative and absolute terms, abundance of the Caribbean spiny hedgehog (*Diadema antillarum*); Structural profile of reef against depth; Presence or absence and frequency of whitening and other diseases; Frequency of whitening (to be identified by voluntary monitoring) and weekly monitoring of their condition and establish the speed of color recovery in the case of bleached coral.
123. Sea grass monitoring will rely on the use of transects as detailed in Sub activity 1.3.2. Variables to be monitored include: species of marine plants present; relative abundance (in percentage of the framework covered by each species); density (by counting the number of stems); average height of the vegetation; type of substrate (coarse sand, sand, mud-sandy, muddy); abundance of the associated fauna (mainly marine invertebrates); biomass and presence of threats (erosion, turbidity, contamination, solid waste). Additionally, through the use of remote sensing systems, marine grazing distribution will be estimated if the distribution is compact and homogeneous or if patches and fragmentation of the ecosystem occur over time. The distribution in non-homogeneous patches is typically an indication of stress by limits in the penetration of light or by mechanical effects of waves and currents.
124. A volunteer network for the surveillance and the recovery of corals damaged after extreme events will also be mobilized as part of the monitoring and surveillance system. Their composition and methods of interventions will

be based on a methodology proven to be successful in Cuba (Sabana Camaguey/GEF/UNDP (1999-2007))⁴⁸. This network would be made up of professional divers in tourism, marine protected areas technical staff, specialists from the environmental studies centers, and communities' rangers and volunteers involved in the project.

125. The implementation of the marine monitoring and surveillance systems will be funded by the GoC that will develop this activity through the mobilization of experts and research institutions (ICIMAR) and that will collect this information through the Knowledge Management Platform (Activity 2.2) created through this project. As stated in p.118-20, GCF funds will contribute to the monitoring equipment (See Section E.6) that will be employed for the monitoring itself.

Activity 1.4. Enhance water conduction systems along targeted watersheds to restore freshwater drainage in coastal ecosystems and aquifers to reduce and monitor saline intrusion in target sites

126. Considering the climate change risk projections (drought and SLR) and vulnerability to saline intrusion within the area's aquifers, this activity will work to restore the natural hydrological process along the watersheds and aquifers in the project's area of influence. Ensuring enough freshwater drainage into these ecosystems will reduce saline intrusion by enhancing filtration to soils and aquifers. Currently, there is not a possibility to assess an ecological flow to coastal ecosystems due to the lack of measuring stations to manage upstream water distribution towards these areas.

127. During the 8 years of GCF intervention, this project will result in the reduction of saline intrusion in 16,329 ha. From year 9 to year 30, Cuba will continue with actions to ensure aquifers recharging and to guarantee a sustainable reduction of the salt wedge to improve freshwater availability in 561,500 ha by reducing saline intrusion and improving freshwater recharge. The monitoring program that will be enabled through this system will contribute to the identification of catchment areas, rainwater catchment and salt-wedge advancement/receding that will improve guidance to local adaptation actions hence providing an important backbone in linking EBA actions with water management for adaptation in coastal ecosystems and communities. In strengthening the present hydro-meteorological network and stations (sub activity 1.4.2) the project will thus enable the holistic management of fresh-water resources considering these to be key adaptation needs to coastal communities and that will guide local development processes.

128. GCF funds to be used in the purchase of monitoring systems will ensure that the required quantity and quality of water drains into coastal ecosystems, particularly to swamp forest, during long drought periods, which are key instruments for aquifer recharge. GoC financing (parallel and co-financing) will be used to eliminate manmade barriers that have degraded/changed the hydrological process including clearing of physical waste from channels and eliminating polluted discharges into the coastal ecosystems. GCF will be solely funding climate risk reduction additionalities required to overcome climate change related threats and specifically salt intrusion; nonetheless, the monitoring system will also be key during droughts and floods both projected to be aggravated due to climate change.

Sub-activity 1.4.1 Remove obstacles along water channels and enable water conduction systems in target sites to increase water flow into coastal wetlands and aquifer recharge in drought affected aquifers

129. GoC will implement this sub-activity through financing provided by the INRH that will include building wells and hydraulic restoration actions for recharging selected aquifers affected by long periods of drought including 19 wells established in Jucaro and another 38 that will be built in Camaguey (FS section 6.3.1.4). The infiltration of fresh water through these wells will use the following measures:

- Channels that collect rainwater locally and transport water by gravity through the existing natural topography towards the infiltration wells. GoC co-financing will be used to eliminate manmade barriers (abandoned roads and infrastructure) that have degraded/changed the hydrological process and improve the natural recharge of aquifers along the coastal wetlands.
- Water conduction systems from reservoirs/dams built for other purposes which transfer surplus water and infiltrate them directly into the wells. These will be enabled to flow into the aquifers along the target sites using secondary canals provided for irrigation of agricultural areas.

Sub-activity 1.4.2 Invest in monitoring equipment to develop a real time water flow control system in target areas for the monitoring of groundwater with a basin management approach to assess the evolution of saline intrusion and response capacity to climate impacts and EBA interventions.

130. The restoration of coastal wetlands including the rehabilitation of freshwater hydraulic flow (sub-activity 1.1.2), will allow a water surplus increasing the natural floodplain, which will also reduce the risk of flooding in settlements downstream. The infiltration processes in these areas will contribute to reduce saline intrusion through increasing the water table. To evaluate the effect of the project interventions and monitor saline intrusion, GCF funds and GoC

⁴⁸ Alcolado, P.M. 2004. Manual de capacitación para monitoreo voluntario de alerta temprana en arrecifes coralinos. La Habana. 80 p. ISBN 959-270-040-0

co financing funds provided by the INRH will be used for the establishment of a real time water flow control system for the monitoring of ground water with a basin management approach.

131. Measuring stations will be acquired through GCF funding to allow an accurate estimate of the water balance (including the salt wedge) and provide relevant data on the quantity and quality of water reaching the coastal area. These will be installed by specialists provided through GoC co-financing funds along the basin, close to the boundaries of the basins and along coastal zones, upstream and downstream of the reservoirs (see FS section 6.3.1.4 for locations). This will enable the measurement of the following conditions:
- Hydrological variables cycle will be measured based on the World Meteorological Organization and quality standards, including: fresh water quality, water quantity and temporal and spatial distribution within basins, ability to meet current and future demand, hydrologic and hydraulic flood simulation in real time, flood and drought forecasting through automated real time hydrologic and hydraulic simulation.
 - Monitoring will include the following basic elements: i) wells measurements, water levels and quality (salinity, dissolved oxygen, hardness, heavy metals); ii) water discharged from the reservoirs to the rivers to ensure the ecological flow; iii) analysis and evaluation of the impact of the interventions.
132. The monitoring system will be integrated to the INRH's monitoring system who will be responsible for monitoring and maintaining this system. Equipment to be acquired through GCF funds that will enable real time water flow monitoring includes: bathometers; radar automatic water level recorders; conventional gauges with semiautomatic transmission via mobile phone; automatic hydro-meteorological stations with rain gauges, for measuring flow rates in surface currents and levels in reservoirs and wells; conventional evaporimeters to balance water reservoirs; water quality probes amongst other. Given the current economic blockage to Cuba, accessing instruments is an immense challenge.

Sub activity 1.4.3 Develop hydrological models to support hydrological processes and water management (identification of catchment areas, salt-wedge advancement/receding and saline intrusion) to better assess the impacts of SLR and change on precipitation patterns on coastal conditions.

133. This sub-activity will result in the production of hydrological models (real time and prognoses) to support water management and monitor saline intrusion, both during climate extremes (drought, floods) as well as in normal conditions to assess the impacts of SLR and change on precipitation patterns. Superficial and underwater runoff will be modelled to predict the evolution of saline intrusion through time and identify flood risk areas. This information will be provided locally for enhanced planning and decision making (Activities 2.2, 2.3).
134. Investments provided through GoC co-financing provided by the INRH includes the processing of the data provided real time water flow control system (Sub activity 1.4.2) and that will result in the hydrological models. GCF funds will be directed in the training of INRH hydrological specialists in data management and in the enhanced ICT capacity that has proven a barrier for real time monitoring and climate modelling due to current limited information processing capacity for these actions.

Output 2: Increased technical and institutional capacity to climate change adaptation in Coastal Communities, Governments and Economic Sectors

135. Output 2 is focused on working with coastal communities located along climate vulnerable coastlines, local governments and economic sectors to mainstream EBA actions and information into community-based adaptation measures while working to enhance local and national governance mechanisms within the framework of Tarea Vida. Through this output the project will address key barriers related to information access and lack of capacity for adaptation and will create opportunities for inter sector coordination to ensure that EBA investments are appropriated by communities and become institutionalized through a legal framework and mechanisms to allow for their long term sustainability.
136. A key outcome of this output will be sectoral and municipal regulatory frameworks strengthening specifically on EBA mainstreaming and approaches based on results derived (such as ecological flow calculation) from Output 1 and their inclusion into local development, land use planning, disasters risks reduction and CZM plans. Output 2 will allow for the contextualization and the correct packaging of information derived from Output 1 to foster the appropriation of EBAs at the local level, promoting a "bottom up approach" for EBA initiatives and mainstream it into national planning processes and information systems for on the ground decision making. This novel approach to national planning and adaptation is in tune with the current constitutional reform process undergoing in Cuba.
137. Through enhanced understanding, awareness and capacity to identify and monitor coastal vulnerabilities to climate change, coastal communities and local governments in targeted areas will become active agents for adaptation favoring solutions that take advantage of national best practices, ecosystems (as demonstrated in Output 1), and consolidated information systems. Information and training provided by the project will be based on continuous consultation from communities themselves to ensure that its material is relevant and useful.
138. AMA will oversee the implementation of this output through its various specialized agencies and local representatives. It will rely on the active involvement and support of municipal government and structures

Activity 2.1. Develop a climate adaptation technical capacity building program for coastal communities and local stakeholders (government & economic sectors) to enable adaptation actions and capacities

139. This activity will develop and implement a capacity building program to be delivered to targeted coastal communities (24 municipalities)⁴⁹ to build understanding of CC impacts and vulnerabilities such as coastal flooding (from extreme weather and SLR) and saline intrusion (from droughts and SLR). The program will increase awareness and knowledge for adaptation actions and skills to strengthen the resilience of key stakeholders in these communities, prioritizing EBA over other management strategies. This will include providing results and techniques derived from the project as seen in Output 1 to ensure their maintenance and replication. It will also allow information from the Knowledge Management Platform (Activity 2.2) to be included and contextualized through a locally relevant learning program.
140. Design of the training content will allow for the coordination of key actors in municipalities (economic, learning and government sectors) thus integrating valuable technical information (derived through project monitoring and other information systems) from each sector/institution and allowing for active coordination of local priorities for adaptation (water management, physical planning, adapted livelihoods). This will allow the curricula to be relevant to key sectors within each area and to focus on a multidisciplinary and local approach for EBA and adaptation.
141. Training under this activity will be targeted to 24 municipalities located within 7 provinces⁵⁰ in the project's targeted coastlines, these have been selected based on vulnerability assessments to coastal threats from CC and directly in areas where rehabilitation interventions (Output 1) are taking place.
142. Training will be delivered through Capacity Building Centres (CBCs) (FS, Section 4.2.3.1) located in each municipality that will be enhanced as well as through 7 classrooms that will be created in each of the restoration intervention areas (Output 1). This will allow training programs to be included within existing learning and coordination structures that have proven to be a local expression of coordination on issues such as disaster risk planning, and integrated coastal management training thus allowing these issues to be integrated within an adaptation framework (considering they will be informed by local climate information products (Activity 2.2)). The training program will be sustained by existing local structures (provinces and municipalities) as they will be integrated them into municipal and provincial daily life.

Sub activity 2.1.1 Identification, design and packaging of the training content to be provided to coastal communities and stakeholders to increase coastal adaptation capacity for local adaptation actions including EBA

143. Actions include the establishment of institutional agreements by AMA with key institutions such (INRH, MINAG, MINAL, productive centers, and national and international learning centers) for the development of specific training content. Content will be informed by existing scientific information (vulnerability assessments, climate projections) and consultation with communities and relevant local structures. Community consultation will include information derived project development that resulted in stakeholder mapping and in consultations developed during the first years of project implementation with the support of FLACSO-Cuba that will be hired through GoC co-financing.
144. The content will be transformed and packaged into a training curriculum designed to address key local concerns. Experts from the Municipal University Centers (CUM) and universities will be hired to guide this process in collaboration with specialists from local CEAs and international and national specialists from water resources, physical planning, fishing, agriculture and forestry sectors. This will result in the printing of training materials (through GCF funds) for specific topics (climate change, ecosystem services to manage climate impacts, water resource management, causes of ecosystem degradation, ecological rehabilitation and nature based solutions). Content creation will be led by AMA and its specialized agencies. GCF funds will finance the production of the training material (publication and printing costs) and the hiring of international experts (with UNDP support see p.335 and 194) for content creation and mobility costs.

Sub activity 2.1.2 Enhance physical and operational capacity in 24 Capacity Building Centers in targeted coastal municipalities, and establish 7 Annexed classrooms in the intervention areas to provide an adequate space for community and stakeholder capacity building, community monitoring and for the coordination of local adaptation activities

145. This activity will enhance infrastructure at the territorial level through existing Capacity Building Centres (CBCs) which already serve an important role as local brokers for environmental knowledge, enhancing their capacity to train on coastal zones adaptation in the 24 targeted municipalities. Investments will be focused on⁵¹ enabling the

⁴⁹ Municipalities also as listed in p32 and 36: 1) San Juan y Martinez, 2) San Luis, 3) Pinar del Rio, 4) Consolidacion del Sur, 5) Los Palacios, 6) San Cristobal, 7) Candelaria, 8) Artemisa, 9) Alquizar, 10) Guira de Melena, 11) Batabano, 12) Melena del Sur, 13) Guines, 14) Venezuela, 15) Baragua, 16) Florida, 17) Vertientes, 18) Santa Cruz del Sur, 19) Amancio Rodriguez, 20) Colombia, 21) Jobabo, 22) Rio Cauto, 23) Yara and 24) Manzanillo. Refer to FS Sections 3.1 and 3.2 for full map.

⁵⁰ Provinces as listed in p.32 and 36: 1) Pinar del Rio, Artemisa, 2) Mayabeque, 3) Ciego de Avila, 4) Camaguey, 5) Las Tunas and 7) Granma. Refer to FS Sections 3.1 and 3.2 for full map.

existing CBC premises (expanding their physical and material capacity for training) and in developing 7 classrooms that will be established through GoC co-financing (municipal donation of the space) in the seven ecosystem intervention sites identified in Output 1. These classrooms will serve as training spaces in the 7 settlements where ecosystem intervention will occur (Output 1), ensuring that targeted communities appropriate and acquire the technical capacity to maintain the EBA investments (See FS Table 18 for locations)

146. Premises will be designed to meet the following: increased capacity for training (25 people in CBCs and 15 in annexed classrooms), accessibility of different users, connectivity (audio, data, video, internet) and physical security. GoC funds will be used to enhance physical/infrastructure capacity within these Centres and class rooms (expanding training space) while GCF funds will be used to expand their material capacity (ICT equipment, media tools, office furniture) and to guarantee their adequate operation (internet services).
147. Staff from local governments, through the Council of Municipal Administration, will be responsible for the administration of enhanced CBCs and classrooms, payment of current accounts (energy, water, cleaning, security etc), maintenance and repair to guarantee its operation and sustainability.

Sub activity 2.1.3 Implement in 24 targeted municipalities and 7 intervention sites a capacity building program through local structures (CBCs and annexed classed rooms)

148. Implementation of the capacity building program in the 24 municipalities and 7 intervention sites will take a two pronged approach: 1) implement a “trainer of trainer” methodology to allow training curriculum to flow into communities and 2) using the CBCs and annexed classrooms to provide adaptation training with a strong EBA focus to key community stakeholders leveraging their role as knowledge brokers on natural resources and integrated coastal planning at a local level. It should be noted that prior to this activity adaptation and EBA training had been absent within these structures.
149. Specialists from FLACSO-Cuba and international specialists will be hired (see p.335 and 194) to provide training to community leaders focusing on key stakeholders identified through a stakeholder mapping process (Feasibility Study Section 6.3.2.1) transforming them into key community trainers on specific topics such as nature based solutions. Training of community trainers will be done through workshops organized at a territorial and national level. Through community trainers the project aims to reach 60% of the population within the targeted municipalities. GCF will finance the logistic costs of the trainings and workshops (mobility and transport at a territorial level) as well as international experts. GoC co-financing will be used for the hiring of national experts (FLACSO-Cuba) and national trainers that will be hired to provide training workshops.
150. In the case of enhanced CBCs (Sub activity 2.1.2), these will be operated by two specialists (environmental and information technology specialist) to be selected by the provincial delegations of the CITMA. In the case of the newly created classrooms these will be operated by one specialist. CITMA will be responsible for their salaries throughout the project and after its conclusion. The specialists hired in operating CBCs and classrooms will program community training and awareness (based on identified local needs) by enlisting community trainers on set topics to provide capacity building locally under the designed curricula (Sub activity 2.1.1).
151. Enhanced CBCs will be key for providing EBA awareness and training to communities; these Centers will provide training directly to community actors and will support inter-sector climate change adaptation in coastal activities leveraging their role as knowledge brokers transforming them into crucial actors at a territorial level to coordinate Tarea Vida.

Activity 2.2. Integrate project (technical and community based) derived information, information from early warning systems and national datasets into a Knowledge Management Platform, to provide climate information products to monitor, evaluate and inform coastal communities on local (community and ecosystem) capacity to manage climate change impacts.

152. This activity will collect information derived from the local ecosystems rehabilitation actions and hydrological dynamics restauration (Output 1) to integrate it into national databases through a Knowledge Management Platform, which in turn will feed the development of national and information products, including: i) A Protocol for Coastal Resilience Assessment (PERC) ii) enhancing successful existing early warning systems (disasters and emergency attention, EWS for drought in agriculture, forest fires, health, etc.); and, iii) coastal vulnerability and resilience assessments for coastal adaptation that will integrate information on ecosystem monitoring (Output 1) with indicators derived from community monitoring of local conditions. This work will be led by AMA through ICIMAR and will work locally with CBCs and local governments through interterritorial networks (See FS Table 29 for list of stakeholders and use of GCF funds)
153. Community derived information will result in an important paradigm shift in the way that information is managed in Cuba by enabling a two-way information flow, flowing not only down from national governments to settlements but also up from settlements to national government. This will allow for the development of useful climate information products that are built upon transparent and clearly identified data that will serve as important instruments to measure community capacity for resilience. It will also allow information to adapt to local conditions and serve as an early warning for coastal capacity to adaptation responding to the various hazards particular to coastal communities (coastal flooding, saline intrusion, extreme weather).

154. Through the involvement of key actors the project will favor the delivery of the core elements of a people centered end to end MHEWs that already exists in Cuba. Through its environmental monitoring the project will provide contextual information to enhance EWS on climate impact through an assessment of coastal resilience to enhance disaster risk knowledge by incorporating ecosystem capacity to manage climate threats and better assess vulnerability. This information will in turn be consolidated through the project's knowledge management system that will be accessible to all key decision makers within the EWS SOP chain facilitating information throughout institutions to better monitor the impact of possible hazards and consequences and guide decision making. This will further be enhanced through the delivery of informational products to communities.
155. Capacities developed through Activity 2.1 and the interrelation with scientific data will result in communities becoming active and informed drivers of adaptation and local agents for climate adaptation action.

Sub activity 2.2.1 Integrate project and national databases and monitoring systems into a Knowledge Management Platform for Coastal Adaptation (KMPCA)

156. This activity will create a Knowledge Management Platform for Coastal Adaptation to integrate and manage national and local information to contribute to the National Environmental Information System currently being developed. The KMPCA will also integrate community monitoring with environmental conditions monitored via Meteorological Stations by INSMET, Environmental Health Units, Hydraulic Resources, Forestry Companies, Protected Areas and Volunteer Groups. The information collected in, and generated by, the KMPCA will allow governments, sectors and society to monitor the project's objectives and progress over time; as well as to identify priorities and weaknesses that may arise during implementation. More importantly it will provide continuous information on coastal resilience in targeted coastlines.
157. The KMPCA will be coordinated by AMA through an operative node within ICIMAR that will house and integrate all investigation and projects on coastal adaptation. The node will receive and integrate: i) Indicators of climate change (including the PERC) and ii) Project information (such as interventions evolution & monitoring). Additionally, the KMPCA will support the incorporation of EBA indicators into the National Statistical System (SEN)⁵², to be used by the Government and to facilitate its use within all sectors, which in turn, will promote inter-sectoral coordination and the incorporation of EBA measures in sectoral planning instruments. Through the platform the project will address the coordination and information barriers that have not allowed effective communication between local and inter-sector actors as it will allow all stakeholders to speak the same language through an integrated and transparent mechanism.
158. The inter-territorial networks (at community, municipal, provincial level and national levels) created through the KMPCA will ensure that the information flows back to the territories through monitoring reports and recommendations developed in close cooperation with the territories (popular councils and municipal councils) so that the monitoring results can be integrated into the local planning mechanisms. The information will not only flow from the territories (to gauge impact of interventions and EBA as a general strategy) but back to them and between them. The exchange of information from the local to the national will favor the continuous flow of information and knowledge generated by the Project leveraging national and locally relevant knowledge management tools and databases to ensure communication and facilitate upscale.
159. GCF funds will be used for the purchase of information technology equipment including software to facilitate communications between institutions and sectoral databases and national information systems, international expertise and technical support services as detailed in the project's log frame to enable the integration of information systems and databases. The implementation of the system (labor, national programming support and expertise) will be financed by the GoC under dedicated co financing provided by CITMA (FS Table 29).

Sub activity 2.2.2 Train communities to provide community monitoring of coastal ecosystems and local conditions (indicators for socio economic, environmental, climate health, and drinking water quality) as part of a community monitoring system to complement information derived from EBA monitoring systems and better assess coastal vulnerability and resilience.

160. Actions include investing in training to communities that will form part of a community monitoring system for adaptation to CC building. Community monitoring volunteers will be identified through local education centers and schools (a best practice learned through the Manglar Vivo project) and relevant associations, prioritizing the participation of women and communities located within the most vulnerable areas. Hence, harnessing AMA and CITMA's experience in the creation of multidisciplinary groups to produce hazards, vulnerability and disaster risk studies and using this capacity to incorporate long term climate projections for targeted areas and layering these with information on local conditions that will be directly affected as a result of climate change (health, drinking water quality, livelihoods, ecosystem capacity).

⁵² The SEN coherently integrates the statistical information systems of the country, which interact to meet the information needs of the State, the Government and society, in order to know the behaviour of geographic, economic, demographic, social and environmental processes for the monitoring of economic and social development, as well as responding to international statistical commitments (Resolution 70 / GOC-2016-473-EX26).

161. The implementation of the community monitoring system will complement existing EWS Systems and will serve as a mechanism to increase ownership and empowerment of communities to incorporate adaptation alternatives and solutions to local climate impacts. As the communities take part in environmental monitoring (measuring shoreline receding rates, maximum floods benchmarks, mangroves survival rates, among others) it will help generate an understanding of climate change and related impacts as continuous environmental change to which they can gradually adapt and adjust their own actions based on their risk perception.
162. The community monitoring system will complement the technical monitoring system of the coastal zone (Output 1) with the involvement of the community in the generation of information and knowledge of local conditions to develop a more complete picture of coastal vulnerabilities and capacity for adaptation. Information from the communities' monitoring system will partly feed the KMPCA (Activity 2.2.1) and will be shared with, CBCs (Activity 2.1.3) who will consolidate this information with community concerns and will advise on the information products to be developed locally.
163. GCF Funds will be used for community monitoring workshops -to train communities on EBA monitoring- and for the procurement of basic equipment (cameras, recording equipment, etc.) which will remain within the communities under the custody of local CBCs. AMA's ICIMAR will coordinate this activity and ensure its integration with site specific EBA monitoring (FS Table 29). Data from the monitoring will be transformed into locally information products (Activity 2.2.3). Use of information and uptake will be measured throughout the project.
164. The implementation of the community monitoring system will allow communities to take an active part in the information process to monitor coastal capacity at an ecosystem and community for managing climate impacts derived from climate change projections, which in the case of the targeted communities will result in significant changes as a result of coastal flooding, saline intrusion and increased extreme weather events. They will become active participants in the information products that will be developed thus promoting a real change from a traditional reactive approach that considers communities as passive stakeholders, to a planning and prevention approach where they are active and informed agents on climate risk and participate in its management, hence addressing a key project barrier.

Sub-activity 2.2.3 Create user driven climate and environmental information products as tools for EBA implementation, appropriation and maintenance

165. Through this activity the project will generate climate and environmental information products as tools for EBA implementation and maintenance. Information will be derived from the environmental monitoring systems put in place through Output 1 and community monitoring (integrated within the KMPSCA) and existing national climate information systems. Information will be packaged within existing information products and new locally relevant climate information products. These include: A Protocol for Coastal Resilience Assessment (PERC), environmental information for coastal adaptation (environmental modules on EBA) and community-based early warnings. See Feasibility Study Table 17 for a list of possible information products. GCF funds under this sub activity will be used to cover printing costs and logistic costs of technical meetings (FS Table 29).
166. Information products will be based on local climate and oceanographic data and will be prepared locally, supported by national entities such as INSMET with the aim of improving disaster risk reduction, natural resources management, EWS and thus enhancing adaptation to CC. Centres for Environmental Studies (CEAs) will be responsible for improving existing local-scale early warning information products through the inclusion of relevant local information, such as the coastal erosion index, the saline intrusion line, coastal flooding characteristics, the state of the ecosystems, and others. Climate products (bulletins, weather reports, meteorological networks, etc.) will be updated annually based on the results of the monitoring and complemented with the existing monitoring networks, with particular focus on the integration of ecosystems related information and their functionality.
167. A Protocol for Coastal Resilience Assessment (PERC), following the conceptualization of the recently developed Drought Index, will result from this activity. This protocol will be designed with local stakeholders and will be integrated into the Territorial Statistical Information System (SIET), which in turn will ensure the inclusion of the main vulnerabilities to CC in municipal and national development plans considering the use of SIET for development planning and metrics. The PERC will take into account 5 outputs: vulnerability, sensitivity, adaptability, resistance and transformability (See Feasibility p166-168). The PERC will be monitored and updated through the KMPCA (Activity 2.2.1) and made available at a territorial level through CITMA provincial delegation. This will allow coastal communities to better identify and assess their resilience to incoming climate impacts.

Activity 2.3. Mainstream EBA approaches into regulatory and planning frameworks at the territorial and national levels for long term sustainability of EBA conditions and investments for coastal protection

168. Activity 2.3 will provide inputs for generating the legal frameworks and financial mechanisms required for the streamlining of adaptation, and in particular EBA, in coastal zones management (See FS Table 30 for inputs to be funded with GCF funds). This will be done through various mechanisms for addressing the capacity and information barriers that had made this approach impossible, including creating a network for legal and technical support to municipalities and standardizing technical information for the development of national guidelines. The results of this activity will be even more relevant considering the recent constitutional changes that will empower municipal governments in financial and natural resource management.

169. By generating tools and methodologies including that can be easily applied and locally relevant, municipal authorities will be able to incorporate an EBA approaches in their own economic and planning instruments generating a development pathway for local governments whose own development is being directly threatened as a result of climate change impacts. More importantly, the legal framework under the project (included as a project development indicator) will be essential in the consolidation of an enabling regulatory environment for EBA initiatives, with their respective national legal support hence creating conditions for long terms sustainability of the EBA investments, approach and facilitating its upscale.

Sub activity 2.3.1 Create a network of legal advisor to develop a detailed analysis of the regulatory, legal and institutional framework and solutions (costing tools, legislation, regulations) to integrate EBA investments and management in 24 municipal and 7 provincial economic plans through concrete actions and investments.

170. Actions include creating and funding the support that will be provided under a network of legal advisors (3 per province) representing economic and planning sectors relevant to coastal management and government levels to provide support at municipal, national and provincial government authorities to integrate EBA approaches into development plans and budget allocation mechanisms for coastal areas. This includes financing directed at the hiring of legal experts that will provide support and developing a legal capacity gap assessment (GoC co-financing), providing them the space (GoC funds) and the equipment required to operate (GCF funds), as well as covering the logistic costs of providing support and training (GCF funds).

171. Through the network of advisers, the project will directly address existing capacity gaps identified during the project's barriers. The network of advisors will produce a detailed analysis of the regulatory, legal and institutional framework for integrating EBA as an adaptation and sustainable development strategy, identifying implementation gaps and possible solutions to address these by introducing regulations, legal recommendations, costing tools. These tools and recommendations will be provided as direct support of the legal network to the 24 municipalities involved in the project to contribute in the preparation of regulatory documents (as identified in the analysis). The network of legal advisors will work closely with these municipal governments to frame new regulations and plans for their discussion in popular councils and legislation bodies.

172. A key result under this sub activity will be the development of environmental management plans in to include the sustainability of EBA in the 7 project districts and 24 municipalities.

Sub activity 2.3.2 Production of technical standards for the inclusion of EBA in national and sectoral regulations.

173. Actions will be centered around developing a Cuban Technical Standard (Norm) of "Terms and Definitions for the EBA in Cuba" and "Technical Guidelines for the Establishment of the Ecological Flow". This will be achieved during the first half of the project implementation and will be based on early project results that will be used to inform these standards. Packaging of this information will be funded through this activity with support from the network of legal advisors that will guide input and advice to AMA and CITMA, hence addressing specific information gaps that had been missing for this action in the past (i.e. lack of standardized information such as on calculating ecological flows to ecosystems). Support to CITMA is provided considering its mandate to produce technical standards at a national level for natural resource management.

174. The technical standards and guidelines will constitute a base for EBA approaches integration into municipal and national actions and budgets and will also be key instruments for governments in water management planning. Standards, which are regulatory in nature, will provide the criteria for restoring coastal ecosystem's functionality for coastal protection and instructions on how to maintain such functionalities and nexus within ecosystems. Information to integrate these standards will be derived from Output 1 activities which will feed the KMPCA and the inputs it provides to national databases. These will provide criteria for restoring ecosystem's functionality and resilience and also instructions on how to maintain such nexus and functionalities including ensuring proper water allocation for ecosystems in water management instruments.

175. Support will be provided in the form of communication and socialization products such as manuals and guidelines that will be produced for replication and incorporation on the technical standards and ecological flows at various sectors (GCF funds), information processing (GoC cofinancing), and the logistic costs of providing technical support and training such workshops for socialization of the technical standards and incorporation into regulations(GCF funds).

Sub activity 2.3.3 Incorporate EBA into municipal territorial and natural resource planning instruments including territorial land use plans and local environmental ordinances for long term sustainability of conditions required for EBA results.

176. This activity will incorporate EBA into municipal territorial and natural resource planning instruments, including in local plans for "Tarea Vida", Risk Reduction Management Strategies territorial land use plans (Planes de Ordenamiento Territorial- POT) and local environmental ordinances on resource management (Modelos de Ordenamiento Ambiental- MOA). Through this activity, actions for coastal resilience will be included in land use ordinances to reduce climate vulnerability and look to reduce pressure on ecosystems services of coastal landscapes.

177. Technical support and advice will be provided to key sectors (water, agriculture, fisheries and environmental) and key stakeholders (local governments, productive organizations, local scientific/technical research centers, community leaders, representatives of civil society), to achieve successful inter-sectoral coordination of EBA in their sectoral planning instruments. The project will explore best practices for integrating financial mechanisms and financial planning strategies such as forecast based financing. Information products derived from Activity 2.2. will be key instruments for this work as will the statistical data provided through the KMPCA, that will serve to ensure that all sectors understand the impact of their actions in enhancing coastal resilience.
178. Technical support will be provided in the form of trainings (such as in using cost benefit analysis, CMZ adaptive planning, physical planning in marine zones, use of climate impact modelling, participatory planning mechanisms, ecosystem and economic valuations), that will be provided through workshops and *insitu* support to municipalities that will require the hiring of national and international experts. GCF funds will be used for the recruitment of international experts (see p. 335 and 194) to provide training to national and local governments, logistic cost of workshops, transportation costs (including purchase of a Microbus to reduce travel expenses), as well as printing costs related to the production and design of guidelines on EBA methodologies and standards.

B.4. Implementation arrangements (max. 1500 words, approximately 3 pages plus diagrams)

179. This project will be executed in the Republic of Cuba under Article 1 of the Standard Basic Assistance Agreement (SBAA) between the Government of Cuba and the United Nations Development Programme, signed by the parties on May 17, 1975. The objectives and expected results of the project correspond to the priorities defined in the Country Program Document (CPD) 2020-2024 agreed between the GoC and the UNDP.
180. The project implementation will be regulated by the provisions of Resolution 15/2006 of the former Ministry of Foreign Investment and Economic Cooperation (MINVEC), currently the Ministry of Foreign Trade and Foreign Investment (MINCEX), dated May 26, 2006, which states that the Rules for Economic Cooperation that Cuba receives are mandatory for all stakeholders and will be applicable in the project implementation.
181. The project will be implemented following UNDP's national implementation modality (NIM) - according to the SBAA, the Country Program Document (CPD) 2020-2024 and as per policies and procedures outlined in the UNDP (POPP) (see: <https://popp.undp.org/SitePages/POPPSubject.aspx?SBJID=245&Menu=BusinessUnit>). A subsidiary agreement (project document) will be established between UNDP and AMA as per Article 3 of the SBAA. All references in the SBAA to "Executing Agency" shall be deemed to refer to "Implementing Partner".
182. The national executing entity - also referred to as the national 'Implementing Partner' in UNDP terminology - is required to implement the project in compliance with UNDP rules and regulations, policies and procedures (POPP), including the NIM Guidelines. These include relevant requirements on fiduciary, procurement, environmental and social safeguards, and other performance standards. **The (national) Implementing Partner** for this project is the Environmental Agency (AMA) ascribed to the Ministry of Science, Technology and Environment (CITMA) of Cuba.
183. AMA will be accountable to UNDP for managing the project, including monitoring and evaluation of project interventions achieving project outcomes, and for the effective use of UNDP resources. AMA will designate a National Project Director to carry out the strategic direction of the project and oversee its operational and technical execution. AMA will act with the support of its ascribed research and environmental management centers amongst these ICIMAR and CITMA's specialists based in the project involved provinces and municipalities. AMA will establish through GoC resources inter-institutional agreements with MINAG, INRH and local governments for the delivery of project activities as described in Section B.3. UNDP, at the request of the GoC, will provide support in project implementation through the project's Operation Coordination.
184. In addition, the Government of Cuba has requested UNDP to provide direct project services for this project. The UNDP and Government of Cuba acknowledge and agree that those services are not mandatory and will be provided only upon Government request and specified in the Letter of Agreement (LoA). When requested, as is the case for this project, the direct project services follow UNDP policies on the recovery of direct project costs relating to GCF funded projects.
185. The management arrangements for this project are summarized in Figure 4.

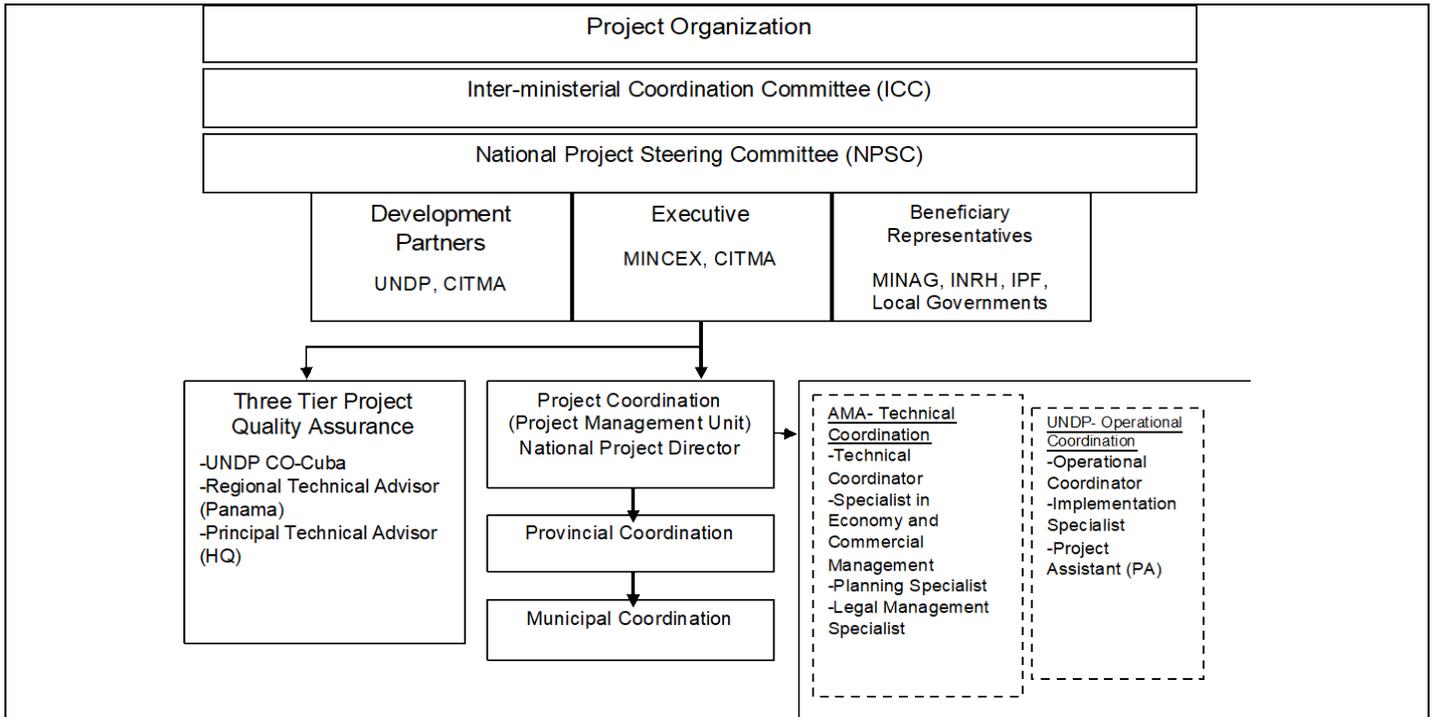


Figure 4. Organization Structure

186. The Inter-Ministerial Coordination Committee (ICC) for the GCF in Cuba: The First Deputy Minister of CITMA was appointed as the National Designated Authority (NDA) of Cuba to the GCF. He is also responsible for all scientific, technological and environmental activities, among others, in specialized management offices of the ministry. Given the importance of the GCF, the ICC was established by the National Government in 2018, to promote, approve, and oversee GCF projects at national level. This Committee is formed by the Central Bank of Cuba (BCC), which presides it; the Ministry of Science, Technology and Environment (CITMA), which acts as its Secretariat; the Ministry of Foreign Trade and Investment (MINCEX); the Ministry of Economy and Planning (MEP); the Ministry of Finance and Prices (MFP); the Ministry of Energy and Mines (MINEM); the Ministry of Agriculture (MINAG) and the National Institute of Hydraulic Resources (INRH). The ICC will provide oversight to the National Project Steering Committee (NPSC) and will require periodic reporting from the NPSC, for this project.
187. The NPSC is responsible for making management decisions by consensus when guidance is required by the National Project Director, including recommendations for UNDP/Implementing Partner approval of project plans and revisions, and to address any complain at the project level. To ensure UNDP's ultimately accountability, the decisions of the National Project Steering Committee should be taken in accordance with standards that ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition. In case of not being able to reach a consensus within the National Project Steering Committee, the final decision will rest with the UNDP Resident Representative in Cuba. This information will be reflected in the project document that will be signed between UNDP and AMA.
188. The NPSC will be jointly chaired by the Ministry of Foreign Trade and Investment (MINCEX) and CITMA. The NPSC will meet at least once a year or more as necessary.
189. The NPSC has the following roles:
- An Executive that holds the project ownership and chairs the NPSC. This role will be exercised jointly by MINCEX, as rector of international cooperation in Cuba, and CITMA.
 - A Development Partner representing the interests of the parties concerned that provide funding and/or technical expertise to the project. This role will be fulfilled by CITMA and UNDP;
 - Beneficiary representatives who ensures the realisation of project benefits from the perspective of project beneficiaries. Comprised of: Ministry of Agriculture (MINAG), National Institute of Hydraulic Resources (INRH), Institute of Physical Planning (IPF), and local governments at the provincial level of Pinar del Río, Artemisa, Mayabeque, Ciego de Ávila, Camagüey, Las Tunas and Granma.
190. Project Quality Assurance: UNDP provides a three – tier oversight and quality assurance role involving UNDP staff in Country Offices and at regional and headquarters levels. The quality assurance role supports the Project Board by carrying out objective and independent project oversight and monitoring functions. This role ensures appropriate project management milestones are managed and completed. Project Assurance must be independent of the Project Management function; the Project Board cannot delegate any of its quality assurance responsibilities to the Project Manager. The project assurance role is covered by the accredited entity fee provided by the GCF.

As an Accredited Entity to the GCF, UNDP is required to deliver GCF-specific oversight and quality assurance services including: (i) Day-to-day oversight supervision, (ii) Oversight of project completion, (iii) Oversight of project reporting.

191. National Project Director: The National Project Director has the authority to execute the project daily activities on behalf of the NPSC within the constraints laid down by the NPSC. The National Project Director oversees managing and making project decisions daily. His/Her main responsibility is to ensure that the project generates the results specified in the project document, with the required level of quality and within the specified time and cost limitations. The Implementing Partner (AMA) appoints the National Project Director, who must be a different person from the Implementing Partner representative in the NPSC. The National Director will have the support of two separate Coordinations (Technical Coordination and an Operational Coordination) each headed by a Coordinator. The Technical Coordination Team will be located at AMA and will be financed through GoC co-financing. The Operational Coordination Team will be comprised of local staff that will be contracted by UNDP through GCF funds (see section G3).
192. The Technical Coordination will be headed by a Technical Coordinator for the support of the project's technical components and will be integrated by: i) 1 Specialist in Economy and Commercial Management that will work with the economic sectors and local government to integrate EBA strategies and find financial mechanisms ii) 1 Planning Specialist that will provide support to Output 1 and integration of the ecosystem restoration within territorial planning processes; iii) 1 Legal Management Specialist that will work with local and national governments to integrate EBA mechanisms within development plans. The Operational Coordination will be based in UNDP and will be headed by an Operational Coordinator who will be in charge the project' reporting mechanisms and oversight including the project's ME. She/he will be supported by 1 implementation specialist that will be in charge of providing support to the technical coordination in establishing and integrating long term OM strategies for the project outputs (as foreseen in the OM plan) and integrating them within national structures. A Project Assistant will be hired the Operational Coordination and will be in charge of the project's administrative and financial management.
193. The Project Management Unit will also be supported through Provincial and Municipal Coordination Teams comprised of provincial and municipal representatives from CITMA, MINAG and INRH at each provincial/municipal level. The provincial and municipal coordination teams will be responsible for the proper running of the execution plans and schedules developed by National Project Director and will ensure a successful sectoral interaction at these levels. Provincial and Municipal Coordination Teams will provide monthly reports on local project actions to the National Project Director.

Flow of funds

194. As the AE, UNDP Cuba will disburse funding (received from the GCF according to the FAA disbursement schedule), through direct payments as per the requests received from AMA as the EE according to the project workplan. Also, AMA will conclude agreements with its ascribed institutes and centers, and with entities belonging to MINAG, and INRH, for the services to be provided to the project, which will be covered by the national co-financing. A Letter of Agreement (LOA) shall be signed between UNDP Cuba and AMA since UNDP will provide direct support to implementation to develop the process of procurement of goods and services necessary to achieve the expected results. Considering the restrictions of the blockade that limit the capacity of Cuba's importing institutions, the GoC has requested UNDP to be responsible for all procurement that requires importing goods. In this project the implementing partner coincides with the responsible party since AMA through its National Project Director, carries out the strategic direction of the project and oversees its operational and technical execution.
195. The following diagram outlines the flow of funds and services to the project.

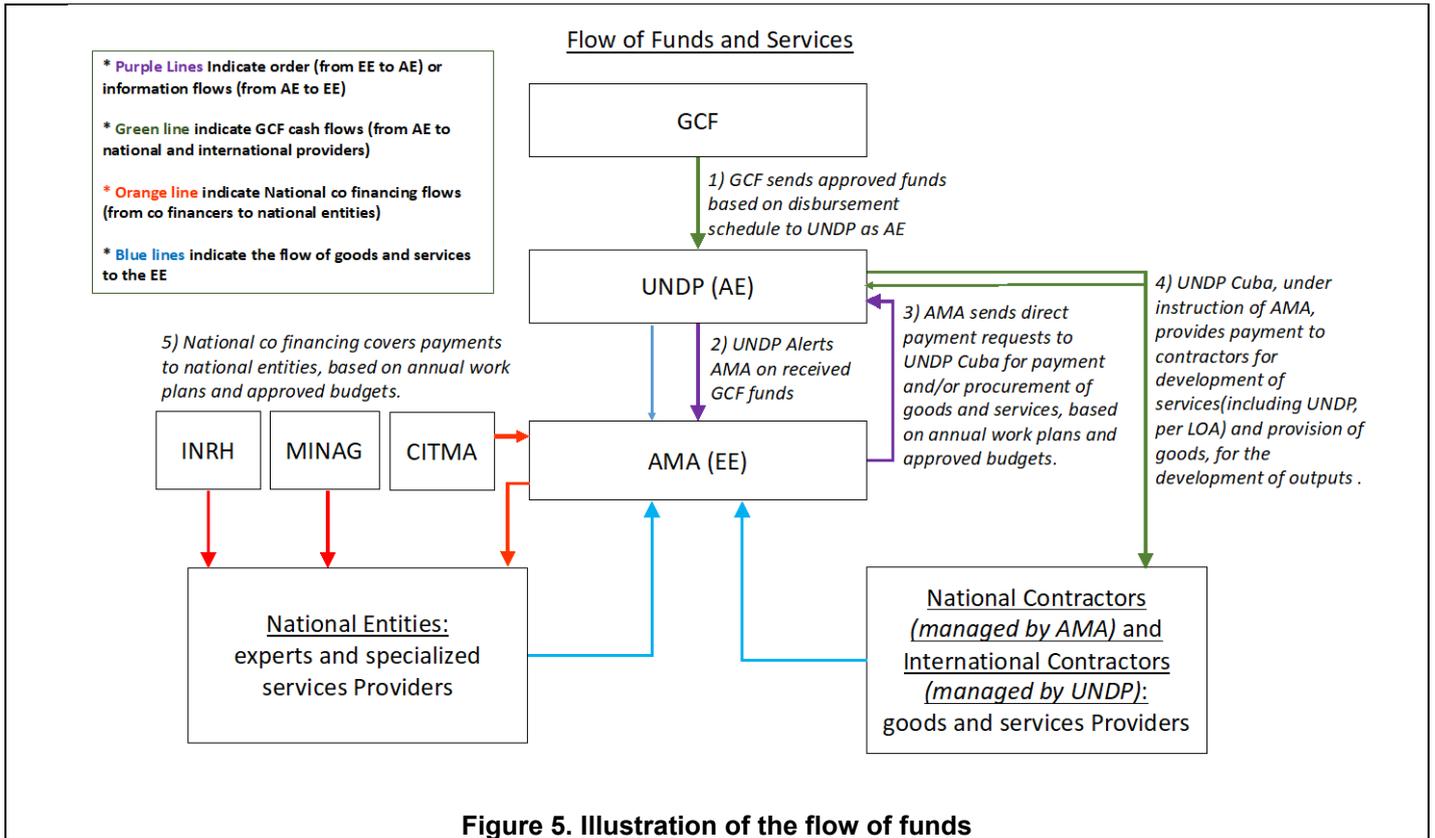


Figure 5. Illustration of the flow of funds

B.5. Justification for GCF funding request (max. 1000 words, approximately 2 pages)

196. Rising sea levels and increased storms will have a considerable impact to coastal communities through coastal flooding and saline intrusion. GCF resources, will be key in strengthening climate resilience to extreme events in Cuba's most vulnerable populations. By the year 2050, it is estimated that 2,445 km² (CC + normal conditions) of land will have been temporarily or permanently affected by SLR, if combined with a Category V hurricane impact would increase to 19,935 km². Projections also show that if no intervention is made, by 2050 up to 14 coastal communities will be affected by SLR and by 2100 up to 21 coastal communities will disappear with a further 98 being severely affected by climate related threats, and there will be a 37% reduction of freshwater availability.
197. The GoC has taken the initial steps to implement a general adaptation strategy through "Tarea Vida". This has allowed the correct identification of climate impacts and has provided guidance in terms of assessing national vulnerability and priorities, however additional support is required to address key barriers to facilitate its implementation. Cuba's ecosystem are an existing stronghold that provide an important source of coastal protection proving to be both effective and cost-efficient to managing coastal threats. As stated in B.1 a lack of initial financial resources required to implement EBA along with a lack of capacities and information have proven to be important barriers for the implementation of an integrated EBA strategy that could results in increased resiliency to over 1,300km of coastline.
198. The nature, magnitude and urgency of climate related threats faced by Cuban coastal communities, coupled with the scale of investment required for this project are beyond GoC capacity particularly as they require access to technical and informational equipment that is hard to access by the majority of Cuban institutions particularly locally.
199. In addition to Cuba's limited capacity to access hard currency and banned access to funding from most international development agencies, the GoC is facing a tough fiscal and macroeconomic situation as a result of the trade blockade. GoC estimates at USD12 million the daily cost of the blockade to the Cuban economy,⁵³ or approximately USD4.4 billion on an annual basis. This equates to 7.8% of the estimated 2018 GDP⁵⁴. As a result of the macroeconomic duress, GoC will incur a budget deficit in 2019, estimated at approximately CUP6 billion or over 10% of GDP.⁵⁵ GoC plans to fund the deficit from the issuance of domestic bonds to state-owned domestic banks, more than doubling sovereign debt from approx. CUP 4 billion at the end of 2018 to CUP10 billion at the end of 2019. GoC's capacity to borrow is limited by the lack of a significant domestic saving pool and complete lack

⁵³ Source: <http://www.cubadebate.cu/especiales/2018/12/21/cual-es-el-presupuesto-del-estado-cubano-para-2019-infografias/#.XG7mfC2ZP-b>

⁵⁴ GDP estimate provided by GoC's statistical department, Oficina Nacional de Estadística e Información (ONEI).

⁵⁵ GoC's 2019 budget published on 4 January 2019.

- of access to the international capital markets. Balancing the budget from further cuts in expenditure would impair GoC's ability to provide essential services such as health and education.
200. GCF funds will be used specifically to address climate change additionality as follows: The project will develop key instruments and information products, as well as ensure EBA inclusion on policy and regulation frameworks critical to ensure the paradigm shift and mainstream EBA approaches in local and regional planning. These instruments will support the national upscale of ecosystem based territorial planning and will provide the national capacities to enable effective EBA strategies for increasing coastal resilience in those areas in which are the best alternatives. This includes information creation related not only with the implementation of ecosystem-based interventions but also with their evaluation as adaptation strategies (data measurements, data analysis and prognoses). The Protocol for Coastal Resilience Assessment and its integration into national statistics is a key step in enabling long term adaptation at local and national scales, by providing a baseline benchmark to assess the country's adaptive capacity to climate realities and steer actions according to short, medium and long term goals. This steering is considered continuous as current challenges will be addressed while others climate related challenges might appear, in fact is considered key to address the uncertainty related with climate change. GCF resources will support in shifting the country's paradigm from a top-down and reactive approach in managing climate risks to one that looks to empower coastal communities to the ongoing impact produced by climate change and to identify locally appropriate solutions.
201. GCF financing is leveraging GoC funds to increase the scope and scale of CC resilience investments in Cuba. This project also builds on lessons learned from past and ongoing projects, such as Adaptation Fund project 'Manglar Vivo' and the GEF funded "Sabana Camaguey" project, Table 1.
202. GCF funds will allow the GoC to cover initial investments in equipment, expertise and information products that need to be purchased abroad in hard currency, overcoming an important barrier in national technical capacity for climate adaptation. GCF funding, will also enable access to international EBA practitioners to help refine national approaches, providing trouble shooting support, advising on EBA training and implementation, and interacting with local experts to maximize national capacities. The GoC will mobilize its own resources and efforts in co-financing valued above USD 20 million for the project's success and committing over USD16.5 million in OM support throughout the project's full lifetime.
203. Total beneficiary population (direct and indirect) will consist of 1,324,114 inhabitants (over 11% of the national population) located along 24 coastal municipalities along a 1,300km coastline. Within this overall beneficiary population, the project will directly benefit 444,793 inhabitants and indirectly 879,321 inhabitants also affected by CC-related impacts (coastal erosion, flooding and salt intrusion) and that will benefit through the EBA project's actions along the target coastline. Benefits will include increased protection through EBA actions to climate impacts as well as increased capacity to manage these through improved information products and capacity building. Over 57% of the Cuban population resides along the coastline thus indicating a potential for high impact not only in providing support to a clearly identified vulnerable population, but also due to its high potential for national upscale.
204. Rehabilitating coastal ecosystems will not only increase their protective role and water regulation services but will also allow for increased co-benefits related with ecosystem services improvement provided by healthy mangroves and coastal wetlands (aprox 30)⁵⁶, including fisheries, carbon sequestration, increased water quality, tourism, etc. This in turn will translate into increased communities' resilience with greater income resulting from tourism, fisheries catch and sustainable use of the natural resources. Baseline project Manglar Vivo demonstrated net benefits to community populations valued at USD 107million derived from mangrove restoration.⁵⁷
205. This project has been designed to facilitate the implementation of "Tarea Vida" which will mobilize all sectors and stakeholders to effectively manage CC impacts and prioritizing the adaption approach presented within this project: ecosystem's functionalities restoration, awareness creation and evidence-based EBA mainstreaming into planning instruments. Hence GCF, funds will be of crucial importance in generating the enabling mechanisms required at a technical and institutional level for the correct implementation of "Tarea Vida" (see Table 2), including upscaling of EBA experiences, hard data collection and analysis (though monitoring, the knowledge management platform, and information products) ensuring information flow (both top down, bottom up and transversal) and the revised national and local legal frameworks derived from the project.
206. Without this project, the target coastal communities will be unable to cope with the identified climate risks. Unaddressed CC threats (considering the prognoses of increasing frequency and intensity of hurricanes in combination with SLR and shifting precipitation patterns) in combination with ecosystem degradation will result in further deterioration of their resilience capacity and further impacts to neighboring communities (floods, erosion and salt intrusion) potentially leading to resettlement. Without the GCF-funds to support the access of key specialized equipment for the implementation of EBA and to develop the information monitoring products, the expected sustainable development benefit derived from "Tarea de vida" will not be possible in Cuba.

⁵⁶ Lacambra, C., Friess D., Spencer, T. Moeller, I. (2013). Bioshields: mangrove ecosystems as resilient natural coastal defences in Renaud F. et al (eds). *The role of ecosystems in disaster risk reduction: From science to practice*. UNU-Press

⁵⁷ <https://undp-climate.exposure.co/splendor-of-the-living-mangrove>

207. Furthermore, results from the project will enable municipal governments to take full advantage of the recently bestowed autonomy as a result of the current constitutional reform process. The information products foreseen by the project will provide the required tools to help municipal governments to incorporate EBA practices into policies and territorial planning, as well as in their direct implementation. As these constitutional changes are recent, effective coordination amongst sectors at local and national levels is still evolving and hence capacity building is required to enable effective climate related risks reduction and integration into policies and development actions. GCF funds will provide strategic resources towards this direction. Enhanced capacity of local learning and mobilization structures such as CEA's and CBCs for EBA will allow for enhanced local capacities to better address climate impacts. An estimated 66% of the total project budget will be directed to local structures and interventions.
208. Finally, the information collected through this project represents an important opportunity for alternative solutions for SIDS to address the many climate change challenges that are looking for sustainable, flexible and cost effective adaptation solutions. GCF will hence provide a valuable platform to promote South-South cooperation, expertise exchanges and knowledge management for an alternative approach to coastal resilience, one that favors an EBA approach and is more accessible and in tuned with developing island nations and their national contexts.

B.6. Exit strategy and sustainability (max. 500 words, approximately 1 page)

209. The project has been designed in close consultation and involvement of relevant government agencies at the national and local levels, as well as with local economic sectors. It also builds from successful ecosystem-based interventions, ongoing capacity building programs and information management approaches, all of which provide a baseline for sound results. Building on these foundation as well as in leveraging within national and local frameworks, the project ensures that the investments as well as the results of the interventions are sustained beyond the project period and in the longer-term. Amongst these includes framing the project in line with the GoC's "Tarea Vida" and with the constitutional reform process that has taken place and elevates the role of municipal governments in development and economic planning.
210. **Operation & Maintenance (O&M)** arrangements are in place with national and local governments and communities committed to the arrangements for sustaining and maintaining the project interventions in the long-term as detailed in the project's OM Plan (Annex 13). These include the commitment of CUP 396.78 million⁵⁸ by the GoC (through 3 national institutions) for OM actions including working with Provincial Base Business Units and specialized national technical institutions such as the Institute of Cybernetics, Mathematics and Physics to provide support and develop service plans for acquired equipment during the project's full lifetime.
211. Equipment to be acquired through the project has been selected with the support of national experts identifying project needs, cost efficiency and national capacities for its maintenance. This has included selecting equipment with few spare parts and considered within the project budget. The purchase of the required replacement parts for the equipment will allow for the maintenance services that will be provided by specialized workshops in the country to prolong the lifespan of the acquired equipment in function of the project activities. The political realities that facing Cuba in the past 60 years have provided an opportunity for the country to develop national technical capacity to prolong the lifespan of sophisticated technical equipment (often past 50-60 years). This has been the case in biomedical, transport, science, industrial and climate monitoring equipment that continues to function well past their normal lifespan as a result of national innovations and careful maintenance plans in specialized centers throughout the country (i.e. an operating radar network dating from 1970s).
212. As established by the GoC, projects implemented derived from international collaboration are implemented by national institutions. Once these projects are completed, institutions involved (INHR, MINAG and CITMA) oversee these investments ensuring that all equipment designed for its functioning is maintained. Through Activity 2.3, work will be done with municipalities to ensure their financial support in the maintenance of community monitoring systems and capacity building systems, these will complement actions and investments foreseen by CITMA to maintain these (See Annex 13). The inclusion of budgets for EBA in provincial development plans is project indicator included within the project.
213. A procurement plan and an operation and maintenance plan has been developed as part of project development with maintenance costs being foreseen by national counterparts to ensure that these are included within national budgets and that all equipment parts are made available. UNDP will provide support in the procurement of equipment and guaranteeing that in the case of technical equipment service contracts are included to provide OM and O&M training for their maintenance as well as warranties during the project's initial 8 years,. A specialist will be hired by the project to provide support to national institutions in the design of OM plans of the project investments
214. Adaptation strategies with known technical complexity, built with national technical and scientific capacity and with relatively limited requirements for ongoing maintenance will ensure the project's **Technical sustainability**. For example, the mangrove planting and management techniques have been previously demonstrated in the Adaptation Fund project in Artemisa and Mayabeque. The strategies will also be based on, and backstopped by, highly qualified technical and scientific individuals from the participating Cuban institutions. The integrated

⁵⁸ Valued at 16.5million USD considering USD 1=24 CUP Exchange Rate.

- approaches of EBA and community's and governments involvement (including capacity building and mainstreaming in land planning frameworks) guarantees the project success. GCF funding will further enable fostering the overall approach as international best practices, thus helping refine models, provide trouble shooting support and enhance national training on EBA implementation.
215. **Environmental sustainability** is a cornerstone of the project design, with a sound understanding of the main drivers of ecosystems functions' optimization (as natural infrastructure) or degradation and investing on those functions that enhance ecosystem structural capacity and in reducing conditions that impact such service. Of particular importance is the integrated ecosystems functionalities approach, which applied to coastal zones recognizes that natural ecosystems (mangroves, wetlands, seagrass beds and coral reefs) function as an integrated system with vital ecological interdependencies connecting them and are also highly dependent on adequate watershed management. Following the initial investment, coastal ecosystems will have restored their natural ability to cope and respond to natural dynamics, including climate related events.
216. Training will enhance community capacities and disseminate climate adaptation knowledge in targeted coastal municipalities through CBCs while leveraging national training models. These CBCs will become permanent ensuring that coastal ecosystems are valued by local populations and mainstreamed in local planning approaches to address CC impacts in the long term including the lack of informed physical planning in coastal areas. The KMPCA will provide key inputs to complement training by documenting both the impact and long-term cost efficiency of the EBA approach to decision makers thus enabling the preference of this approach rather than the traditional grey infrastructure investments seen in the past.
217. **Institutional sustainability** will be ensured by fully involving and strengthening national and local institutions (National, provinces, municipal and community-based) from project design to implementation. As explained, in the stakeholder analysis and implementation arrangements, institutions at all these levels will be directly involved in the activities and on planning and providing technical and governance support for the successful implementation of adaptation strategies. National and local institutions will also participate in the monitoring of the project's impacts and in the management and dissemination of information and lessons learned. Of importance is the project's focus on inter-institutional and inter-sector collaboration. Project design has also leveraged from existing national and local structures to ensure the its long-term sustainability and that of information derived from it. The resulting information will inform the mainstreaming of EBA into the local municipality's development plans and upscaled to national legislation, and advice *Tarea de Vida's* goals.
218. **Social sustainability** will be ensured through the active and direct involvement of the populations affected by, or at risk from the impacts of climate change, in the planning, implementation, management and monitoring of adaptation strategies, as active participants rather than solely as stakeholders. A core of the project is the investment on awareness raising and education among the vulnerable population and the planning and sectorial authorities on the short- and long-term nature and implications of climate change, as well as on the adaptation options available. This will help to ensure continuous support from local communities, buy-in to long term the adaptation measures and to reduce ecosystems degradation (so they can provide the protective service) as well as maximizing design and compliance of planning and governance instruments intended to increase communities and livelihoods resilience to climate risks. The inter-sector mechanisms in Output 2 will maximize adaptation mainstreaming among planning instruments and sectors' policies.
219. **Financial Sustainability:** Following the necessary GCF's initial funding investment, required to rehabilitate the adaptation functions of key ecosystems, build the capacities and create the planning instruments to mainstream ecosystem-based planning to adapt to climate change, the financial sustainability of the ongoing maintenance and management of the adaptation strategies will be ensured through financial and economic instruments managed by the Government, including actions foreseen through the long-term implementation of *Tarea Vida* and the development of municipal economic planning. Activity 2.3 will work at all levels to ensure that these and future EBA investments are included within local and national budgets and has been included as a project indicator. Operations and maintenance costs will be executed after the expiry of the GCF project have been foreseen by national institutions and are manageable under the GoC fiscal budget.
220. Infrastructure CBCs resource management and additional technical staff dedicated to the project and funded by GoC also ensure that project objectives will be maintained once it is finished, and will be integrated into national (case of KMPCA and information products) and local structures (CBCs, information products, community monitoring teams). Commitment letters have been secured from municipalities and national ministries for long term maintenance of investments, an important commitment from municipalities being the identification of a space to house CCC-GCAs and annexed classrooms and CITMA's commitment to cover the cost of staffing during and after the project's close. The project's focus on leveraging and enhancing existing environmental local and national structures to manage EBA, ensures efficiency and favor long term sustainability.
221. Natural infrastructure sustainability will be ensured by reducing/eliminating anthropic pressures upon the systems (GoC co-financing). In the event of an extreme event impacting the restoration efforts a national insurance will be triggered which will cover all expenses already invested in the rehabilitation efforts.

C. FINANCING INFORMATION							
C.1. Total financing							
(a) Requested GCF funding (i + ii + iii + iv + v + vi + vii)		Total amount			Currency⁵⁹		
		23,927,294			million USD (\$)		
GCF financial instrument		Amount	Tenor	Grace period	Pricing		
(i)	Senior loans	0	Enter years	Enter years	Enter %		
(ii)	Subordinated loans	0	Enter years	Enter years	Enter %		
(iii)	Equity	0	Enter years		Enter % equity return		
(iv)	Guarantees	0					
(v)	Reimbursable grants	0					
(vi)	Grants	23,927,294					
(vii)	Result-based payments	0					
(b) Co-financing information		Total amount			Currency⁵⁹		
		20,371,935			million USD (\$)		
Name of institution		Financial instrument	Amount	Currency⁵⁵	Tenor & grace	Pricing	Seniority
MINAG		Grant	16,242,488	million USD (\$)	Enter years Enter years	Enter%	Options
CITMA		Grant	2,696,376		Enter years Enter years	Enter%	Options
INRH		In kind	1,435,071		Enter years Enter years	Enter%	Options
(c) Total financing (c) = (a)+(b)		Amount			Currency⁵⁹		
		44,299,229			million USD (\$)		
(d) Other financing arrangements and contributions (max. 250 words, approximately 0.5 page)		<p>Municipal authorities will provide the space required to house the CBC's and the annexed class rooms. In kind co finance from the INRH will be provided through the expanded monitoring programme that will be funded by the Institute to incorporate the project's target areas (see Activity 1.3 section B2). Co finance provided Finance by CITMA includes dedicated staff assigned specifically to the project and its management, managing of the CBCs and annexed class rooms (salaries), as well as in monitoring through its various ascribed institutions. MINAG, through the National Forest Development Fund (FONDAEF), will provide 15.3 million in co-financing over an 8 year period. Co-financing provided through FONADEF will include among others the hiring of Forest Enterprises to develop restoration actions within coastal wetlands. Baseline finance includes actions provided by INRH in managing saline intrusion through aquifer recharge as detailed in section B2 as well as actions related to enhancing water flow access to ecosystems and sanitation measures.</p>					
C.2. Financing by component							

⁵⁹ Co-financing by co-financiers will be provided and is committed in Cuban Peso (CUP), the reference calculation in USD responds to the current exchange rate 1 USD = 24 CUP based on UN Operational Rates of Exchange published on Jan 14, 2021 and available at <https://treasury.un.org/operationalrates/OperationalRates.php>

Output	Activity	Indicative cost million USD (\$)	GCF financing		Co-financing		
			Amount million USD (\$)	Financial Instrument	Amount ⁶⁰ million USD (\$)	Financial Instrument	Name of Institutions
1. Rehabilitated coastal ecosystems for enhanced coping capacity to manage climate impacts	1.1 Assess and restore coastal wetland functions in target sites by reestablishing hydrological processes	6,663,216	824,684	Grants	5,838,532	Grants	MINAG and CITMA
	1.2 Mangrove and swamp forest rehabilitation through natural and assisted regeneration for enhanced coastal protection	15,540,075	5,913,298	Grants	9,626,777	Grants	MINAG
	1.3 Record and assess coastal and marine ecosystems' natural regeneration and protective functions based on conditions provided through restored coastal wetlands	6,695,259	5,702,286	Grants	992,973	Grants	CITMA
	1.4 Enhance water conduction systems along targeted watersheds to restore freshwater drainage in coastal ecosystems and aquifers to reduce and monitor saline intrusion in target sites	3,604,215	2,428,144	Grants	1,176,071	Grants	INRH
2. Increased technical and institutional capacity to climate change adaptation in coastal communities, governments and economic sectors	2.1 Develop a climate adaptation technical capacity building program for coastal communities and local stakeholders to enable adaptation actions and capacities	4,234,945	3,318,301	Grants	916,644	Grants	CITMA
	2.2 Integrate project derived information, from EWS and national datasets into a Knowledge Management Platform, to provide climate information products to monitor, evaluate and inform coastal communities on local capacity to manage climate change impacts.	3,923,386	3,606,086	Grants	317,300	Grants	CITMA
	2.3 Mainstream EBA approaches into regulatory and planning frameworks at the territorial and national levels for long term sustainability of EBA conditions and investments for coastal protection	1,277,896	995,175	Grants	282,721	Grants	MINAG, CITMA, INRH
3. Project Management	3.1 Project Management	2,360,237	1,139,320	Grants	1,220,917	Grants	CITMA, MINAG, INRH
Indicative total cost (USD)		44,299,229	23,927,294		20,371,935		
C.3 Capacity building and technology development/transfer (max. 250 words, approximately 0.5 page)							
C.3.1 Does GCF funding finance capacity building activities?					Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

⁶⁰ Co-financing by co-financiers will be provided and is committed in Cuban Peso (CUP), the reference calculation in USD responds to the current exchange rate 1 USD = 24 CUP based on UN Operational Rates of Exchange published on January 14, 2021 and available at <https://treasury.un.org/operationalrates/OperationalRates.php>

C.3.2. Does GCF funding finance technology development/transfer?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<p>The project,almost in its entirety (95%), is based on innovation and knowledge transfer and management. GCF funds for Output 1 are destined for the purchase of restoration, monitoring and information technology equipment for coastal ecosystems rehabilitation within the targeted areas. Without this equipment, the required rehabilitation efforts would be nearly impossible. Access to adequate equipment for adaptation efforts was identified as an important barrier for the GoC to project implementation. The equipment will also facilitate knowledge systematization, from this project and other knowledge generated through other Cuban experiences, such as mangroves, swamps and wetlands restoration, and measuring the reduction of impacts on underwater ecosystems as well as their respective responses to climate change drivers (Table 1). Information technology aimed at monitoring will provide an important input to enhance national capacities to upscale the project to all coastal areas and integrate existing knowledge. Output 2 is mainly focused on generating government and community capacities to sustain and upscale EBA actions as a main strategy to manage local climate impacts. This includes, the development of capacity building program to be embedded within local governments, a knowledge management platform and information products that will be available for vulnerable coastal populations.</p>	

D. EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA

This section refers to the performance of the project/programme against the investment criteria as set out in the GCF's [Initial Investment Framework](#).

D.1. Impact potential (max. 500 words, approximately 1 page)

222. Tools and capacity building platforms developed through this project will directly assist the GoC in providing national scale mechanisms for adaptation actions in coastal areas while leveraging on existing national assets. This will enable the implementation of the GoC's "Tarea Vida" while prioritizing the adaptation model presented in this proposal. Hence project results will have an important impact at a national and institutional level.
223. The coasts in Cuba will be greatly affected by coastal flooding from SLR and increased storm intensity, as well as changing precipitation patterns, reducing the availability and quality of fresh water as well as causing damage to coastal infrastructure (FS Section 4.6 and 6). Over 57% of the Cuban population resides along the coastline, hence the project has a potential for extremely high impact not only in providing support to clearly identified vulnerable populations, but also for its high potential for national upscale.
224. The project will foster adaptation to CC amongst coastal communities by: i) Increasing resilience of ecosystems and ecosystem services, specifically those related to coastal protection; and, ii) increasing resilience of most vulnerable people, communities and regions, including mainstreaming ecosystem approaches into planning and regulations. The project has targeted two of the most climate vulnerable coastal stretches in Cuba as identified by national research, with various settlements at risk of disappearing if no action is taken.
225. Project outputs have been designed to directly contribute in reducing climate risks along highly vulnerable coastal areas by rehabilitating and enhancing the ecosystem services of coastal wetlands to better manage saline intrusion, reduce coastal erosion and provide a buffer to increased storm intensity and changing precipitation patterns. Together with strengthening community, government and sector adaptive capacity through capacity building, access to tailored climate information for enhanced decision making at municipal scale, and mainstreaming evidence-based ecosystem planning approaches to address climate change impacts. These outputs will generate a true shift, by the GoC, on climate risk management, from a reactive approach to a preventive.
226. 1,324,114 inhabitants (over 11% of the national population) located along 24 coastal municipalities along a 1,300km coastline are the direct and indirect beneficiaries of this intervention. The economic importance and size of human settlements in these stretches is also significant with four national main fishing and agricultural zones. Furthermore, the current constitutional reforms provide an important opportunity to engage local communities and develop capacities at a local level to promote integrated coastal management in planning and governance frameworks and ensure climate change risks are considered and addressed.
227. There project will directly benefit 444,793 inhabitants and indirectly 879,321 inhabitants. The latter also affected by CC-related impacts (coastal erosion, flooding and salt intrusion) and that will benefit through the project's actions along the target coastline (Table 3 and text below present the methodology and definitions applied to estimate the number of beneficiaries).
228. Monitoring, data collection and knowledge management from project implementation is a strong asset included within the project, by which it looks to generate lessons learned, including information products, to enhance national and international replication to SIDS and in shorelines with similar ecosystems, providing an alternative coastal adaptation model to exclusively hard infrastructure approaches.
229. A climate change mitigation co-benefit is emissions reduction and blue carbon sequestration. The project will rely on a combination of natural regeneration and artificial regeneration (planting) of mangroves to achieve the rehabilitation of the desired structure (output 1) to restore systems functionalities and adaptation-related services in mangroves and other associated coastal ecosystems. Improved management of forest will contribute to emission reduction and blue carbon sequestration (far more carbon per hectare than tropical rainforests or marshes). Mangroves are unique carbon storehouse in their ability to lock carbon up in anaerobic soils. Globally, blue carbon ecosystems are known to be significant CO₂ sinks with average carbon sequestration rates of 8.3 t CO₂ per hectare, per year for Mangroves. For a total extent of 11,427 ha, the total annual sequestration is 94,844 t CO₂/year, thus the expected lifetime (22 years) emission reductions is 2,086,568 tCO₂. Rehabilitation of swamp forest and swamp grasslands will also have an important sequestration effect, however as national formulas are still being developed, a numeric estimate cannot yet be calculated. However, it should be noted that while the project will have cross cutting results, it is classified as a purely adaptation project in accordance to the GoC's preference.

Table 2. Scope of Project Interventions (Ecosystems and Beneficiaries)

Geographic Areas	Coastal Line (Km)	Area Km2	Land Area Km2	Marine Area Km2	Direct Beneficiaries	In-Direct Beneficiaries	Total Beneficiaries
Stretch 1	271.00	12,660	6,500.00	6,682.00	222,737.00	527,285.00	750,021.00
Stretch 2	1,029.00	14,660	11,007.00	3,623.00	222,056.00	352,036.00	574,092.00
Total	1,300.00	27 320.00	17,507.00	10,305.00	444,793.00	879,321.00	1,324,114.00

Methodology to calculate the number of beneficiaries

230. The number of direct and indirect beneficiaries were established by outputs, considering the expected benefits derived from each and adjusting to avoid double counting. For example, output 1 activities are ecosystem rehabilitation in specific coastal sites. In this case beneficiaries were estimated as the number of people that will benefit from enhanced coastal protection services. Other services restored and that would also enhance communities’ resilience to climate change and extreme events have not been considered in this estimation.
231. The number of beneficiaries were determined by Geographic Information Systems (GIS) data identifying the settlements affected by category 5 hurricanes and saline intrusion, located in areas within the influence of mangrove forest, tropical swamp forests, and located below mean sea level (according to SLR scenarios up to 85 cm) for each of the municipalities of the target areas (24 municipalities).

Output 1

232. Direct Beneficiaries (BD) were established in the 7 settlements where direct interventions will be made in the ecosystems (AI) and in nearby settlements that are expected to be directly affected by SLR and category 5 hurricanes.

Output 2

233. In this Output, Direct Beneficiaries (BD) are expected in the 24 municipalities covered by the project, since they will benefit from the capacity building in this component. Hence, Direct Beneficiaries (BD2) are calculated based on the sites of the CBCs and their areas of influence (the remaining rural settlements within the municipalities as a whole). 60% of its population will be targeted for training⁶¹.
234. Indirect beneficiaries for the project include residents of the 24 municipalities that will benefit from the results of the capacity building but will not receive direct training.

D.2. Paradigm shift potential (max. 500 words, approximately 1 page)

235. The project will provide the support needed to shift the paradigm in climate resilience in coastal areas in Cuba resulting in the implementation of a full-scale, integrated and sustained application of EBA while integrating local communities and enabling inter-sector coastal planning. The project takes into account new mechanisms being introduced at local level and will leverage and enhance them to create a new paradigm of localized adaptation action to be achieved by increasing the capacity of local ecosystems and creating community awareness, and ownership through scientific knowledge linked to concrete adaptation actions through EBA management.
236. Through the complementarity and synergies of its interrelated outputs, the project will ensure that the necessary conditions are created for nationwide application by addressing the baseline actions required for effective EBA (fully functional ecosystems, communities as active agents of adaptation and planning frameworks).
237. While Output 1 will enhance coastal ecosystems services to better manage climate impacts facing vulnerable coastal zones, Output 2 will promote a shift from a traditional reactive approach that considers communities as passive stakeholders into a preventive/proactive approach where they are informed active agents in natural resources and risk management. Working with local authorities the project allows for this capacity to be established within local planning frameworks for long-term EBA sustainability. Through this output, the project provides an important opportunity in the country to enable information flow back to communities so that it can be integrated into local coastal planning mechanisms, moving beyond the implementation of top down directives, furthermore current EWS will also be strengthened by the data gathered. This will make the project a unique experience in the country which will be scaled-up within the framework of the long-term program “Tarea de Vida”.

Potential for scaling up and replication

238. The EBA approach favored by the project allows for a cost-effective strategy to coastal adaptation that builds on Cuban’s strongholds –sound understanding of its coastal ecosystems’ functionalities and services, strong scientific capacities of national institutions, educated communities, and existence of political will. It does this by enhancing national institutions to work in an integrated manner on adaptation, to enhance the protective role of coastal ecosystems, while leveraging in-country research and proven experiences that have yet to be implemented at a large territorial scale. This will be further enhanced by involving local stakeholders as key figures in monitoring and ensuring the permanent and sustainable functionality of adaptation measures.
239. The project will generate valuable lessons and best practices, which will be systematized and shared with other stakeholders, projects and institutions. The monitoring systems will provide data to better adjust the prognoses of the local CC-effects/coastal drivers and to determine more accurately the effect of EBA in reducing CC

⁶¹ A 60% proportion was established considering similar results faced in projects using similar capacity building measures. Also taking into account the vocation of the population in the municipal capitals (AC).

vulnerabilities. The monitoring system that will integrate both community monitoring and data analysis, will not only be unique in Cuba but will also be relevant worldwide to quantify both impacts and responses more accurately.

240. The adoption of a legal framework for EBA will favor an evidence-based replication and scaling of the project through removal of barriers that currently limit EBA implementation. Information to develop and integrate EBA regulations will be derived from the KMPCA and its inputs to national databases.

Potential for knowledge sharing and learning

241. An important result from the project will be the development of crucial quantitative data supporting the EBA and nature-based flood defences as alternatives for coastal flooding risk reduction, potentially transferring this knowledge to other countries in the Caribbean or with similar ecosystems, and supporting the design of more cost-efficient CCA interventions. Thus, making possible the upscale of science-based and evidence-based EBA strategy in Cuba and other countries.

242. Information derived from the project and the monitoring system will include measures to better quantify the coping capacity of an integrated ecosystems landscape such as: i) coral reefs and seagrass recovery time estimation once hydrological rehabilitation in associated ecosystems has taken place; ii) the estimation of mangroves resistance to extreme events, shifting precipitation patterns and their recovery time; iii) the estimation of the morphological effects of the integrated recovered ecosystem to withstand SLR; iv) combined effects for reducing coastal risks of rehabilitating the natural infrastructure and flows and functionalities between ecosystems. This last point will be critical in creating shifting mindsets from traditional engineering approaches that have failed to incorporate the role of physical planning in reducing coastal resilience as well as in incorporating nature based solutions as adaptation alternatives (paragraphs 56 and 58-60).

243. The Capacity Building Program and resulting information products will promote good practices derived from the project implementation, and these will be disseminated beyond its intervention radius. In general, the Project will: i) develop tools and technologies based on national and local experiences, with potential to be used in different conditions throughout the country and other tropical coastal zones with similar environmental and geographical settings; ii) Regularly compile data, evaluations, management practices and knowledge, and ensure their wider dissemination; iii) Consolidate results in the form of toolkits and guidelines, designed for different stakeholders and decision-makers; iv) Include the participation of the communities in coastal based adaptation and integral planning and therefore bringing knowledge down-up complementing the up-down knowledge transfer; v) influence land planning regulatory frameworks to be more in tune with natural dynamics and mainstream ecosystem-based territorial planning approaches and vi) promote international data & knowledge exchange generated through the project implementation and monitoring system.

244. The project will provide advice on regulatory topics to municipalities, sectors and national actors to support the inclusion of technical standards for EBA within planning and budgets. A network of regulatory advisors representing all sectors relevant in coastal management and government levels will contribute in this support. Community proposals and concerns will be incorporated to ensure that all solutions consider their interest.

Contribution to the creation of an enabling environment

245. The project has been designed to address key barriers in the development of a new approach to address climate impacts (Figure 3. **Theory of Change and its baseline assumptions**).

246. An important barrier is the lack of awareness, at a local and inter sectoral levels, of climate change impacts and potential adaptation solutions. Output 2 will address these barriers by strengthening capacities, communication and awareness in key stakeholders and sectors in a manner that is locally relevant and innovative for Cuba in its top down and bottom up approach. Furthermore, via capacity building of local governments the project will directly influence on local planning instruments and traditional approaches used in the past by coastal engineers. Mainstreaming EBA on local planning instruments has been selected as key indicator of the project implementation. Community capacity building will be enhanced by the enhanced CBCs and the provision of relevant information on climate risks and natural resources management as adaptation strategies. The monitoring systems established in Output 1 and Output 2 will be essential instruments to enable inter-sectoral coordination- another important barrier- while providing consistent information on the effectiveness of investments on coastal natural infrastructure, which will be valuable not only for national upscale but to other tropical countries in their efforts to implement EBA initiatives in coastal zones.

247. Activity 2.3 will provide key inputs for generating the legal frameworks required for the streamlining of adaptation, in particular EBA, in coastal zones management. The results of this activity will be even more relevant considering the recent constitutional changes that will empower municipal governments in financial and natural resource management. By generating tools and methodologies that can be easily applied and locally relevant, municipal authorities will be able to incorporate an EBA approaches in their own economic and planning instruments.

248. The legal framework generated under the project will be essential in the consolidation of an enabling regulatory environment for EBA initiatives.

Contributions to the regulatory framework and policies

249. The innovations and investments proposed through this project will occur within a structure of policies and institutional frameworks, all of which consistently prioritize addressing the challenges posed by climate change,

especially in coastal communities, and the development of resilience and capacities for adaptation. With this in mind, the project has been developed to propose direct solutions for all priorities outlined in “Tarea Vida”, supporting the GoC’s plans to address climate change impacts, promoting adaptive actions in prioritized sectors and supporting enabling planning mechanisms for nationwide scaling up. Mainstreaming EBA into the local planning and regulatory frameworks will be a direct result this project.

250. A bottom up approach for the enhancement of regulatory and institutional frameworks is foreseen through the project. This enhancement will be supported by national mechanisms that will be developed with project funding, and that are regulatory in nature, including “Technical Standards” and “Legal Guidelines”. There has been a lack of specific scientific information required for their formulation (as identified in Barriers 1, 3 and 4) and with will be provided by the integration of information derived from Output 1, into an accessible knowledge management platform and contextualized through information products (Activity 2.2) and then translated into specific normative frameworks that will allow for local action in the targeted municipalities and provinces.
251. Activity 2.3 will specifically address gaps in the legal and regulatory frameworks, identified as barriers for EBA approaches, and look for inter-sector coordination at all levels to ensure that ecosystem-based integrated coastal management is embedded within planning frameworks as a to strengthen resilience to climate change. The project will strengthen the legal national framework by:
- Leveraging on “Tarea de Vida”, its existing framework and its prioritization of climate adaptation.
 - Compiling and systematization of field experiences and good practices under existing frameworks, regulations and institutions (Technical Norms and Legal Guidelines).
 - Building up, through enhanced capacity and tools (Activity 2.1), current political reforms to strengthen the role of communities, municipalities and provinces to lead in coastal planning and development.
 - Updating local ordinances and development plans to mainstream EBA and ensure initiatives sustainability through updated provincial and municipal management plans.
252. Beyond the specific EBA standards, which will be a crucial contribution of the project, this will contribute more broadly to the strengthening of public policies and regulations. During the period of development and implementation of the project, changes will be occurring in the strategies and policies of various activities (forestry, agriculture, water resources, land use, among others), in addition to the consolidation of the development of a new local management model much more decentralized than the current one. This project will provide the EBA methodological and normative framework for all these developments in sectorial and local policies and regulation. The participation of the key organizations and sectors in the project will ensure the appropriation of the EBA as a tool, and its consideration in their respective sector frameworks.

Contribution to climate resilient development pathways

253. The GoC has prioritized climate change impacts as a national prerogative as stated in Cuba’s NDCs. The NDC has prioritized adaptation, with threats to its coasts being highlighted as the most important challenge arising from climate change with an important toll to its national economy and territorial integrity⁶². This is also expressed in main policy documents⁶³. The project has been developed to fully align itself with these priorities by addressing those coastal areas most vulnerable to CC and in favoring a solution grounded in national capacities for scaling up while looking to address main barriers.
254. The project builds on seven of the Cairo principles for coastal zone management recommended as a route for resilient coastal zones in the Americas, including maintaining the functioning of healthy ecosystems and strengthening governance mechanisms for coastal adaptation.
255. Through the project’s planning instruments, data collection, capacity building structures and practical experience, the project has been designed to address climate resilience while enabling the GoC in the implementation of the framework developed through “Tarea Vida” for a climate resilient development pathway.

D.3. Sustainable development (max. 500 words, approximately 1 page)

256. The project is fully aligned to assist Cuba’s in meeting SDG’s, particularly in relation to maintaining the availability of clean water to coastal populations, achieving climate action, reducing disasters risk, contributing to managing and protecting marine and coastal ecosystems and in reducing the loss of natural habitats and biodiversity. These will be achieved directly through EBA investments and sustained through the monitoring systems, tools and inter sector mechanisms developed through the project.

Environmental Co-Benefits:

257. The reduction of coastal landscape and ecosystem degradation (Sustainable Land Management benefit) and strengthening of green infrastructure will restore natural protection against coastal erosion, salt water intrusion and flooding that have serious impacts on the habitats of both marine and terrestrial fauna and flora, as well as on local livelihoods, threatening the health and well-being of coastal communities. These much-needed rehabilitation

⁶² As cited in NDC: Losses from 16 hurricanes dating from 1998-2008 have been calculated to be at USD 20.564 billion without taking into account impacts due to drought.

⁶³ in particular the “Guidelines of the Economic and Social Policy of the Party and the Revolution” and in the “National Plan for Social Development to 2030: Proposal of the Vision of the Nation, Axes and Strategic Sectors

activities will help regulate the movement of water, sediments and nutrients in coastal watersheds, to mitigate future flooding and rebalance aquatic process such as water flow, pollutant assimilation and remineralization. Co-benefits derived from this include carbon storage of approximately 94,844 t/year, improved water flows, water and soil quality as well groundwater recharge, all of which are key for both human livelihoods and ecosystems.

258. These activities will also benefit aquatic and terrestrial biodiversity by restoring reproduction and feeding sites of keystone and vulnerable species. Marine biodiversity in Cuba is among the highest in the Caribbean, and coastal ecosystem rehabilitation will not only, contribute to increase coastal communities resilience, but will also mitigate future loss of native flora and fauna, and also support the continued flourishing of both local and migratory species. This will benefit both Cuba the wider Caribbean region, by supporting living organisms, improving biomass along the coast, strengthening biodiversity corridors, improving air quality and enabling blue carbon sequestration – a critical global environmental benefit- as well as ensuring such carbon remains stored. Healthy coastal wetlands (including seagrasses) have the capacity to permanently store carbon, unhealthy and weak ones are potentially great carbon emitters contributors; with a long-term vision of restoring ecosystems functionalities and fluxes, the project is ensuring the maintenance of healthy ecosystems.
259. Building capacity at community and local government levels to improve an understanding of climate change impacts and solutions, including the integration of ecosystem management in coastal planning and disasters risk reduction, will also generate important and transformative national benefits. Working closely with local communities, as well as public sector and research organizations, it will be ensured that activities are tailored to the local ecosystem climate adaptation and resilience services' rehabilitation needed, while integrating the needs and priorities of stakeholders. Moreover, community awareness and sensitization campaigns that promote environmental and climate change literacy will empower local communities and share ecological knowledge that is key to supporting local, sustainable management of coastal ecosystems. Intersectoral coordination and continuous environmental monitoring will ensure that past environmental pressures to the ecosystem are managed through improved coastal planning and adjusted economic planning instruments.

Social and Gender co-benefits:

260. Co-benefits derived from improving reliability and access to ecosystem goods and services include fisheries restoration, greater availability of non-timber products, increased carbon storage, and sustained agriculture production. Co-benefits for health and well-being include improved air and water quality, increased coastal recreational spaces, restoration of ecological cultural heritage, and higher availability of medicinal products.
261. Despite generally high levels of gender equity in the country, there is still an important level of gendered differentiation of roles in rural households, such that women are predominantly responsible for family health and living conditions. Access to clean water, both in terms of quantity and quality, is the greatest challenge in which women play a key role. Saline intrusion and change on precipitation regimes being the main climate change drivers. A Gender Action Plan (Annex X) has been designed by considering both a comprehensive gender assessment, as well as the results of the stakeholder consultations. Fresh water availability is being addressed by restoring coastal wetlands water filtering capacity and water quality through waste management and sanitation activities (GoC financing). As such, reductions in time burdens and livelihood stress linked to climate change is expected as a gender-specific co-benefit. Moreover, training and capacity-building will further support Cuba in its continued promotion of women's empowerment and economic inclusion, providing both men and women with equal opportunities to benefit from project activities. The increased participation of women in the forestry sector within the project's Gender Action Plan. Experience from Manglar Vivo demonstrated the project's positive impact in the hiring of women in forest brigades (particularly in the support of forest nurseries).
262. Capacity building activities, developed in participation with stakeholders, will help improve understanding and management of climate change risks and ecosystem functionalities and conservation for multiple stakeholders, including local communities and women. 66% of the total project budget has will be dedicated to enhancing local capacities at both a community and institutional level (through existing local institutions). Key co-benefits of these activities are complementing and valuing local ecological knowledge and enhancing management capacities, which will continue to support all participating coastal community members, especially women, adapt to climate change.
263. Similarly, creating community-based monitoring systems and including women and other key stakeholders in monitoring and planning of climate change impacts and vulnerability, will promote gender-equitable ownership over the process and ensure that the voices of women are included.

Economic benefits:

264. The lines of actions of this project will generate important economic benefits to both the GoC and communities. Persistent pressures, such as coastal flooding from extreme events, such as storms and hurricanes, SLR, saline intrusion and changes in precipitation patterns can have serious impacts on natural capital, productive activities, infrastructure and transportation services that are necessary to maintain a thriving economy and a safe and healthy population. A CBA analysis developed through the baseline project "Manglar Vivo" calculated net benefits to communities derived from mangrove restoration at USD 107 million⁶⁴. The Government's financial costs associated

⁶⁴ <https://undp-climate.exposure.co/splendor-of-the-living-mangrove>

to emergency attendance and recovery when responding to climate related extreme events will also be reduced, potentially saving USD97-278 million per disaster.⁶⁵ The introduction of capacity building on forecast based financing could provide an important opportunity for Cuba.

265. The rehabilitated green infrastructure will contribute to reducing costs associated to maintenance and repair of Cuba's hard (grey) infrastructure in and near coastal zones, including gabions, piers, roads and dams.
266. Rehabilitation of coastal ecosystems services will help secure opportunities for sustainable activities such as fishing and tourism, that will benefit the national economy and broader Caribbean region (e.g., offshore fisheries).
267. Experiences from the Manglar Vivo project resulted in salary raises by 400% of forest brigade workers (local forest workers hired by Forest Enterprises) involved in complex restoration work. These salaries will be translated to forest brigade workers working on this project.

D.4. Needs of recipient (max. 500 words, approximately 1 page)

268. Cuba, a small island developing state, is located within an active tropical cyclone area, thus among the most vulnerable countries to Climate Change. Projections show that if no intervention is made by 2100, up to 21 coastal communities will disappear with a further 98 being severely affected by climate related threats (flooding, coastal erosion and saline intrusion). The zones prioritized by the project are and the most vulnerable areas to climate change impacts in the country. Without intervention, the projected inundation by hurricanes (storm surges could reach 192,990 ha, 310,950 ha, and 440,540 ha for hurricanes categories 1,3 and 5 respectively, with an estimated range of cost of USD 97- 278 million per single event⁶⁶.

269. Public Consultations within the targeted areas reaffirmed the high level of climate change vulnerability among project beneficiaries and the general lack of awareness on the benefits provided by coastal and marine ecosystems in reducing climate related risks and in strengthening community's resilience. The population of the targeted areas has strong linkages to the marine environment, being heavily dependent on fishing, goods and national tourism; many are also involved in agriculture and livestock to diversify livelihoods opportunities. These dependence on the natural ecosystems goods and services makes evident the need to incorporate an ecosystem approach to adapt their lifestyles, cultural practices and work dynamics to climate change. Employment opportunities have further been affected by the degradation of productive infrastructure by climatic factors. During consultations, the beneficiaries expressed the need and urgency to take action, identifying the following climate change threats: i) coastal flooding by sea penetration and extreme weather events, ii) soils salinization and, iii) mangrove's damage (1st line of defense *R. mangle* has already disappear in some areas by a combination of coastal erosion, extreme events and anthropic factors). During consultations, the urgent need to restore that lost 1st line of defense was evident. Actions through this project have been designed to specifically overcome the barriers (see Table 2) to address the needs of the targeted communities by restoring ecosystems functionalities, increasing communities awareness about their own resilience and how to strengthening and directly involving local socio-economic sectors and local governments ensuring resources uses, land planning and coastal management policies integrate climate adaptation (through ecosystem management).

Economic and social development level of the country and the affected population

270. Climate change adaptation cannot be separated from Cuba's future economic and social development; in fact, it is central to the Nation's vision of its future. The National Environmental Strategy of Cuba (NES) and "Tarea Vida" have identified climate change impacts and adaptation as national priorities, being coastal threats highlighted as the most important challenge. The Guidelines for the Economic and Social Policy have stated the importance of accelerating the introduction of directives and programs aimed at tackling climate change and integrating them in territorial and sector policies.

271. While investments in hard infrastructure have sought to mitigate climate impacts on the nation's natural capital and public services, have also unintentionally contributed to further degrading coastal landscapes. Alternative approaches are needed to address the vulnerability of coastal communities, support the on-going development of strong local economies, and secure food, water and land access for local populations threatened by climate change.

272. EBA represents an innovative and promising alternative to achieving environmental outcomes that enable climate change adaptation and socio-economic development. Cuba's expertise can allow to further expand this approach as a main strategy to address climate change impacts. The challenge in generating the tools and information required to upscale this experience has demonstrated to be a key barrier in Cuba's achievement of its development goals as these will be affected directly by CCC.

273. The project will combine GCF and GoC resources to address the barriers to adaptation with funds being invested to cover the gaps in technological capacity, information and monitoring equipment that are beyond the reach of the GoC and that are required to correctly and sustainably implement EBA as a main strategy for adaptation.

274. The project as designed, provides a key opportunity for capacities and knowledge to be strengthened across diverse stakeholders and institutional platforms, to plan for and manage coastal ecosystem rehabilitation, and to

⁶⁵ Oficina Nacional Estadística e Información (ONEI) 2016.

⁶⁶ Considering the cost of damages caused by extreme weather, taking into account Hurricane Matthew, Ike and Sandy. For breakdown cost see Section 3.2 in Feasibility Study p49-50.

promote key stakeholder resilience through capacity building, regulatory framework modification and community resilient interventions. This will give Cuba the much-needed support to effectively adapt to a changing climate, while continuing to make inclusive economic and social advancements for the sustained resilience of coastal communities and national institutions.

275. Combined with a commitment to cross-sectoral integration as facilitated through the KMPCA and constant monitoring, the project ensures that planning and future coastal interventions recognize the interrelation of climate change impacts with social and economic development. This represents a shift in coastal management, towards a holistic, preventive approach based on an understanding of the strong dependence of the natural infrastructure of Cuban coastal zones and thus strengthening coastal zones planning mechanisms and local community resilience. Such shift will benefit local, national and regional Caribbean economies.

Absence of Alternative Sources of Financing

276. International socio-political circumstances have resulted with the GoC having to face limited access to commercial, financial and economic services that have resulted in difficulties related to the implementation of environmental and natural resource management projects and policies. This is mainly due to lack of access to hard currency required for purchasing the equipment and inputs required for environmental monitoring and for emplacing technical solutions required to address climate change impacts⁶⁷.
277. The GoC has no other hard currency alternative sources to invest in this project. While GoC co-financing has been dedicated to enhancing project results, this co-financing is possible by the Government Directives which indicate that the preparation of the National Economy Plan must take into account the financing needs in support of the implementation of the State Plan to Combat Climate Change (“Tarea de Vida”).

Need for Strengthening Institutions and Implementation Capacity

278. Cuba has a complex institutional system. There are many institutions, all of which, directly or indirectly, adhere to multiple scales, national, provincial and municipal; in some cases, even reaching specific communities. Despite this solid institutional network, there is a tendency to work in silos looking to meet directives that follow a top down approach. Cubans have acknowledged the need to work in a more integrated and less sectorial manner to achieve greater efficiency and productivity. Lack of communication equipment and infrastructure capacity that facilitates communication among technicians and data sharing makes information integration an almost impossible challenge despite the existing capacity and will among researchers.
279. Adaptation to climate changes, poses both specific challenges and opportunities, in that a comprehensive solution requires integrated actions and local specific solutions. Hence the project looks to invest in these capacities at a territorial level to generate the ability for coastal communities to recognize how climate impact will affect them and generate specific tools to strengthen resiliency. 66% of the total project budget will flow to local communities, favoring local structures to ensure that capacity is enhanced for local adaptation action. Furthermore, the project will enhance data and information sharing transversally, between institutions, which in turn will favor the integration of sectors across the territory,

D.5. Country ownership (max. 500 words, approximately 1 page)

280. The GoC has actively participated in the project design to respond to the priorities identified in the country’s overarching policy and planning documents, including a sound scientific baseline of the impacts; among the instruments: National Environmental Strategy 2016-2020, Directives for Tackling Climate Change (2016), NDCs and country program to the GCF. The project complements and in some cases, sets the baseline for the implementation of the GoC’s *Tarea Vida*, its implementation in target areas will serve as strategic co-financing during the project. Local communities and stakeholders’ outreach are a crucial component of the project, both during design and implementation stages, which are being and will continue to be implemented through consultations and the development of monitoring systems.
281. The project has been designed so that project actions and investments are integrated into the government structures, increasing the participation of local actors throughout planning and implementation activities, creating adaptation initiatives ownership to guarantee their long-term sustainability. The design process also recognises that local bodies of People’s Power (OLPP) are key for project implementation and their involvement contributes to the ownership of interventions. The project design has been developed in close cooperation with the GoC and aims to strengthen national capacity being this project of National Implementation Modality (NIM) with the support of UNDP seeking to empower local actors in implementation. Country ownership will further be ensured through the leadership role of the AMA as executing agency.
282. CITMA, the national designated authority of the GoC to the GCF, is the ministry responsible for directing, executing and controlling State’ policies in relation to science, technology, environment and their coherent integration into national sustainable development. It coordinates the National CC Group. CITMA delegates its various functions to numerous agencies and institutions related to its management area, among these is the Environmental Agency (AMA) which acts as the lead environmental agency in Cuba.

⁶⁷ Rodriguez Mega, E (2019). “Cuba acknowledges climate change threats in its constitution.” Nature. March 8, 2019. <https://www.nature.com/articles/d41586-019-00760-3>.

283. AMA/CITMA, is in charge promoting government strategies for environmental management through research and the active implementation of strategic projects and in putting into practice environmental policy and providing key recommendations for the legislation on environmental issues. As a public agency, it receives an estimated USD 44million annual funding from the GoC's national budget. It has expertise in implementing the baseline projects in natural ecosystem management (Table 1) and has demonstrated its strength, capacity and transparency in the execution of international projects, including an extensive portfolio of GEF projects, totaling nearly USD50 million.
284. AMA has access to capacity from its various affiliated institutions (Feasibility Study p78) and territorial representations. Amongst these is the Institute of Marine Sciences (ICIMAR) with a key role in monitoring project interventions. At a territorial level, it has access to a network of Centres for Environmental Studies at a provincial level as well as to municipal environmental specialists at a municipal level. This makes AMA a strategic actor in bridging the gaps in EBA and adaptation expertise at a local level and in coordinating actors at a municipal level as required through Output 2. AMA will invest in the integration of a specific project management team at a national and local level for this project and in the hiring local teams to implement capacity building through the enhanced CCC-GCAs.
285. The project is also aligned with UNDP's comparative advantage in the areas of capacity building, providing technical and policy support, reducing barriers and creating enabling conditions for adaptation planning and investments. It also builds on UNDP's current portfolio of 56 Ecosystem-based Adaptation projects globally, undertaking work in protecting, restoring and managing natural ecosystems to help vulnerable communities adapt to climate change. UNDP Cuba has been involved on several projects in Cuba working together with the GoC such as detailed in Table 1 and the project's Feasibility study. The technical and policy support provided by UNDP through these projects is focused on institutional strengthening and building capacities to utilize natural resources in a sustainable way, while increasing resilience to climate variability and associated risks and impacts.
286. A wide range of stakeholders at the national, provincial and local levels were consulted to develop this proposal, including: government actors involved in climate change and disaster risk management, different population groups from locally affected communities, Institutional actors, including the presidents of the "Popular Councils" that represent the interests of citizens in the Municipal Assembly of People's Power, as well as those in the health and education sector, and actors from sectors related to the project such as tourism, fishing, forests, hydraulic resources and physical planning. At the national level, the Economy and Planning, Finance and Banking sectors were also consulted as part of a larger institutional consultation within the framework of Cuba's Inter-Ministerial Coordination Committee (ICC) of the Green Climate Fund.
287. The public consultations, occurring in five stages, aimed to: i) understand and identify their perceptions of climate change and the possible social and environmental risks/impacts on their communities, ii) integrate their views and suggestions on the project activities to the project design; iii) confirm/identify their roles in the implementation of the project, and iv) identify other barriers and opportunities. These processes were informed by a gender approach, ensuring that gender-sensitive questions and modalities were implemented, allowing the voices and ideas of both women and men to be included. Overall, these activities were successful and had a high level of active participation, attesting to the involvement and interest of stakeholders in the continuation of the Project.
288. The active consultation process was a unique experience for the GoC and included participatory mapping, site visits, formal meetings/focus groups, email communication and a wider national consultation workshop took place to validate the approach and territorial ownership. Additionally, surveys were administered to two communities in a piloting exercise aimed at further developing the survey tool to be used and to obtain preliminary information regarding stakeholder views and interests concerning the Project. The tools and information derived from the five stages of public consultations were used to develop an integrated stakeholder consultation plan for the implementation of the project (Annex IX).

D.6. Efficiency and effectiveness (max. 500 words, approximately 1 page)

289. The GoC is seeking a grant to undertake the proposed adaptation actions. For the project, the GoC has set aside over USD 20 million additional resources as co-financing. Total value of the project is estimated at USD 44.3 million, for a 30-year investment, with GCF funds being specifically targeted to address required investments needed to manage climate impacts.
290. A GCF grant is deemed at the most appropriate level of concessionally in light of: (i) the public good nature of the project's activities and lack of financial reflows; (ii) GoC's inability to access hard currency for the international procurement of goods and services required for the implementation of the project's activities and inability to access funding from most international development agencies (UNDP being one of the few exceptions); (iii) the tough macroeconomic and fiscal circumstances currently affecting Cuba as a result of the trade blockade; and (iv) GoC's significant contribution to co-finance the project. The absence of financial resources required to carry out the necessary adaptation investments to implement an integral adaptation approach in Cuba has in fact been identified as an important barrier.

Cost Effectiveness and Efficiency

291. The economic analysis developed through the project proposal estimated the net present value (NPV) of the proposed intervention to be \$72 million with an economic internal rate of return (EIRR) of 21.8%, hence demonstrating the overall economic efficiency of the proposed investment project. This rate of return will probably increase as the analysis solely took in consideration investment in mangroves and not the project's innovative functional ecosystem approach which foresees important benefits from investments in swamp forests and grass lands.
292. To gauge the impact of the interventions, the project relied initially on a study from the University of Cantabria that assessed the quantity of land flooded, the number of people flooded, and the total stock of assets lost for extreme weather events in Cuba, both with and without mangroves. The difference between the scenario with and without mangroves provides an estimate of the benefits of mangroves. Given a total of 409,090 hectares (ha) of mangroves included in the study, benefits of mangroves per ha are also presented in Table 4.

Table 3. Damages and Losses with and without Mangroves in Cuba⁶⁸

	Annual expected value	1-in-10 year return	1-in-25 year return	1-in-50 year return	1-in-100 year return
Land flooded (km2)					
With mangroves	523	796	1,173	1,898	3,313
Without mangroves	745	1,121	2,120	3,878	7,865
Benefits of mangroves	222	324	946	1,980	4,552
People flooded					
With mangroves	41,270	63,021	88,468	139,212	247,443
Without mangroves	63,745	93,003	169,950	294,685	569,449
Benefits of mangroves	22,476	29,982	81,481	155,473	322,006
Total assets lost (USD million)					
With mangroves	301	453	639	1,019	1,890
Without mangroves	455	679	1,222	2,154	4,449
Benefits of mangroves	154	226	583	1,136	2,559
Benefits of mangroves per ha	377	554	1,426	2,776	6,256

293. This study was complemented with an economic analysis adjusted for the project for which, we examine solely the benefits of mangrove in terms of losses of assets along the coast lines of the targeted areas. This assumption under-estimates the true economic value of the proposed rehabilitation activities in Output1 that provide benefits to communities beyond immediate protection services as well as the full benefits derived to the project beneficiaries that will be attained through the increased awareness of climate threats and capacity to manage these that include enhanced governance mechanisms.
294. The economic analysis also considers a scenario without the project that results in no benefits being attained by the project, resulting in continued coastal erosion rates and ecosystem degradation resulting in the potential loss of 4,680 ha of mangrove that would cost and estimated USD 52 million. If these calculations are included within the economic analysis, the project's base line NPV stands at an estimated USD 100 million with an EIRR of 25%
295. A financial analysis is not applicable to this project as all the impacts to be addressed are exclusively public in nature and do not generate financial reflows. Private sector activity has very limited presence in the target areas – primarily independent private workers who contribute part of their income to the state through tax payments.
296. The project included within its economic analysis an alternative scenario considering the targeted construction of seawalls for coastal protection totaling an estimated 61km of construction, or just over 10% of the 580km of coastline where mangrove restoration directly takes place – a very conservative estimate. (Economic Analysis and Feasibility Study Section 5.6). Cost comparisons for the engineering solutions took into accounts costs based on literature reviews relevant for the Caribbean for the coastal protection including Simpson, M.C et al (2010) that calculated coastal protection costs of 19 major cities in the Caribbean and included a range of costs for seawalls between USD 4 million/km to USD 14 million/km. Based on this range, total construction costs for the 61km of sea walls in the targeted areas would stand between USD 243 million and USD 851 million. Operation and maintenance costs were taken from Simpson and are estimated at annual costs within the ranges of USD 370,000 and USD 420,000 per km. The economic model assumes as base case the lowest end of the range for both construction and O&M costs. Costs also considered investments for managing saline intrusion and providing general capacity building at a local level. Benefits were assumed to be the same as those provided by the restored mangroves in terms of coastal protection, however accruing earlier on considering the percentage of sea walls operating per year. While grey infrastructure creates negative externalities, for instance at ecosystem level, these were not quantified and, therefore, the benefits of grey infrastructure utilized in the economic model are implicitly optimistic.
297. The base case economic model, based on the conservative assumptions above, results in an NPV of -38.6million and an EIRR of 7.1%, below the 10% return threshold conventionally used in economic analyses. The NPV at a 10% discount rate is -USD 66.8 million. The sensitivity analysis shows that a 20% increase in costs (for instance as a result of the increase in seawall extension) and a 10% decrease in benefits (for instance as a result of negative

⁶⁸* IH Cantabria, 2018. Valoración de los sistemas de protección de los corales y manglares de Cuba. En Evaluación de impactos y vulnerabilidad en la zona costera Norte Occidental de Cuba 24pp.

externalities on the eco-system) would push the EIRR to to 0.7%. Any further increase in costs and decrease in benefits would push the EIRR clearly into negative territory. The NPV is negative in all scenarios. The comparison proves the sound approach being sought by the project (rehabilitation of the existing ecosystem), also while considering the reduced maintenance cost of EBA interventions which require capacities easily found within Cuba versus a reliance on infrastructure and equipment heavy investments.

298. Interventions proposed through this project hence favor cost-effective interventions, which while may require high implementation investments are then followed by reduced maintenance costs in the long term and ability to leverage national strengths (strong scientific and monitoring capacity) while providing additional positive externalities to coastal communities. In addition, once ecosystems have reached the desired protective functionality derived from rehabilitating and strengthening specific ecological processes, ongoing maintenance costs are much lower compared to hard infrastructure. The project has also taken into account national and local frameworks and infrastructure to reduce costs and maximize cost efficiency. Hence the project looks to leverage on CBCs, statistical data systems and monitoring networks looking to only enhance these by providing an adaptation approach to measure and ensure coastal climate resilience.

Application of best practices

299. EBA approach of this project is based on a thorough understanding of the physical system, local stresses of the target areas and the integrated working of their ecosystem as a natural, resilient barrier to protect the coastal communities. System knowledge is the base to provide a resilient solution to the CC derived coastal threats.
300. A large body of knowledge and information has been generated and accumulated through the national and international projects that have been developed in Cuba over more than 30 years. This experience will feed into the project directly by informing the adaptation and EBA techniques that will be included within the project. Of particular importance as the basis for the actions of this project is the “Macroproject on Coastal Hazards and Vulnerability (2050-2100)”, which as stated above consists of 12 research projects focused on issues of specific relevance to the challenges of adaptation in coastal zones (see FS Section 2), namely mangroves, geomorphology and coastal dynamics, sea levels, marine currents, beaches, reef ridges, floods, coastal settlements, saline intrusion, bathymetric services, ocean acidification and information integration. The best practices developed, and lessons learned with the Macroproject, including the targeting of the most vulnerable coastal areas, have been applied to the proposed project approach.
301. The GoC, with international cooperation support, has invested and developed in best practices and actions both on the ground and to strengthen the legislation related to the sustainable management of marine-coastal ecosystems. While these have not focused on adaptation measures themselves as a primary objective, their impact on adaptation objectives has been identified and measured through various monitoring tools and systems that have been created alongside these projects and have monitored their effectiveness. As a result, these experiences establish the basis and provide valuable inputs for the proposed project (see Table 1).
302. The best practice of the Adaptation Fund financed project Manglar Vivo contributes to the proposed project. The project re-established the coastal belt of red mangrove (*Rhizophora mangrove*) in two geographic sectors (Surgidero de Batabanó and Punta Mora) together with important actions such as the evaluation and monitoring of the mangroves and swamp forests, the identification of 20 invasive exotic species per site, with proposals for control and management; the spatial delimitation of the types of coverage in the initial stage of the project (mangrove, swamp grasslands, swamp forests); realization of space-temporal analyses of the types of coverage (scrubland, crops, mangroves, forestry plantations, swamp forests, swamp grasslands, artificial areas, water); the monitoring of vegetation indices and the evaluation of the functioning of freshwater currents. This experience will be scaled up directly through Output 1.

E. LOGICAL FRAMEWORK

This section refers to the project/programme's logical framework in accordance with the GCF's [Performance Measurement Frameworks](#) under the [Results Management Framework](#) to which the project/programme contributes as a whole, including in respect of any co-financing.

E.1. Paradigm shift objectives

Please select the appropriated expected result. For cross-cutting proposals, tick both.

- Shift to low-emission sustainable development pathways
- Increased climate resilient sustainable development

E.2. Core indicator targets

Provide specific numerical values for the GCF core indicators to be achieved by the project/programme. Methodologies for the calculations should be provided. This should be consistent with the information provided in section A.

E.2.1. Expected tonnes of carbon dioxide equivalent (t CO ₂ eq) to be reduced or avoided (mitigation and cross-cutting only)	Annual	Click here to enter text. t CO ₂ eq
	Lifetime	Click here to enter text. t CO ₂ eq
E.2.2. Estimated cost per t CO ₂ eq, defined as total investment cost / expected lifetime emission reductions (mitigation and cross-cutting only)	(a) Total project financing	___ USD
	(b) Requested GCF amount	___ USD
	(c) Expected lifetime emission reductions	_ t CO ₂ eq
	(d) Estimated cost per t CO₂eq (d = a / c)	Choose an item. / t CO ₂ eq
	(e) Estimated GCF cost per t CO₂eq removed (e = b / c)	___ Choose an item. / t CO ₂ eq
E.2.3. Expected volume of finance to be leveraged by the proposed project/programme as a result of the Fund's financing, disaggregated by public and private sources (mitigation and cross-cutting only)	(f) Total finance leveraged	___ Choose an item.
	(g) Public source co-financed	___ Choose an item.
	(h) Private source finance leveraged	___ Choose an item.
	(i) Total Leverage ratio (i = f / b)	___
	(j) Public source co-financing ratio (j = g / b)	___
	(k) Private source leverage ratio (k = h / b)	___
E.2.4. Expected total number of direct and indirect beneficiaries, (disaggregated by sex)	Direct	444,793 total - 225,421 male and 219,372 female 49.32% female
	Indirect	879,321 total - 445,640 male and 433,681 female 49.32% female
E.2.5. Number of beneficiaries relative to total population (disaggregated by sex)	Direct	4% of total population ⁶⁹ (2.0% male and 1.9% female of the total population)
	Indirect	7.8% of total population (3.9% male and 3.8% female of the total population)

⁶⁹ Total population stands at 11,239,114 based on information from the 2917 ONEI

E.3. Fund-level impacts						
Expected Results	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
	Number of direct and indirect beneficiaries	Annual technical report of the project / surveys, group techniques and interviews (baseline, mid-term and final), coastal vulnerability assessments	<i>Direct</i> ⁷⁰ 0 males 0 females 0 total <i>Indirect</i> 0 males 0 females 0 total	Direct 67,626 male 65,811 female 133,437 total Indirect 66,846 male 65,052 female 131,898 total	<i>Direct</i> 225,421 male 219,372 female 444,793 total <i>Indirect</i> 445,640 male 433,681 female 879,321 total	Active participation of all relevant stakeholders Local actors are actively involved and interested in participating in capacity building activities Environmental and social circumstances in the target sites do not materially change throughout project implementation
	Number of beneficiaries relative to total population	Surveys will be produced for the project and will be delivered by an independent institution	0% of total population	2.7% of total population (direct and indirect)	11.7% of total population (direct and indirect)	
A4.0 Improved resilience of ecosystems and ecosystem services	A4.1 Coverage/scale of ecosystems protected and strengthened in response to climate variability and change	Project reports with assessment, data from monitoring systems (marine, environmental, coastal wetland): annual reports; mid-term and final evaluation Independent monitoring reports by national environmental experts	3002.5 ha of strengthened mangroves 3415 ha rehabilitated swamp forest 0 swamp grassland Coral reefs & seagrasses 0 ha	+2,856 ha of the degraded mangroves in the target coastlines have been rehabilitated (total 5,858.5 ha) +772 ha of degraded swamp forest in the target coastlines have been rehabilitated (total 4,187 ha) +232 ha of degraded swamp grasslands in the target coastlines have been rehabilitated	+11,427 ha degraded mangroves rehabilitated (total 14,429.5 ha) +3,088 ha of degraded swamp forest have been rehabilitated (total 6,503 ha) 928 ha of degraded swamp grasslands have been rehabilitated 9,287ha of seagrass and 134 km coral reefs crest improved	Extreme hydro-meteorological events do not damage, destroy or delay the EBA measures Active participation of all relevant stakeholders
A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions	A1.1 Change in expected losses of lives and economic assets (US\$) due to the impact of extreme climate-related disasters	Project reports with the assessment of the impact of extreme climate-related disasters on economic assets (estimated based on data collection,	4 307 979 \$ USD ⁷¹	USD 0, Rehabilitated mangroves will provide no benefits for the first 5 years following rehabilitation,	Potential reduced accumulated losses of USD 17.8 Million ⁷²	Environmental and social circumstances in the target sites do not materially change throughout project implementation

⁷⁰ For methodology on calculating direct and indirect beneficiaries please refer to Annex 2 (Feasibility Study) Section 7.2 p163-165

⁷¹ CELAC & Universidad de Cantabria estimate that current mangrove conditions in target areas provide service of USD4.3 million in coastal protection (avoided loss)

⁷² For methodology and dedicated funds on measuring impact refer to Annex 11 Section "Methodology to determine the protected area against an extreme flood". Funds allocated are those included in processing the results of the environmental monitoring systems to assess ecosystem capacity (Activities 1.1, 1.3, 2.2).

		<p>data analyze and prognoses by modelling and statistical analysis).</p> <p>Community incomes independently monitored through official annual reporting at a territorial level (target sites) produced by fishing cooperatives, tourism ministry and agents, and INRH on drinking water quality and access).</p>		<p>as they will not have sufficient structural stability to offer significant coastal protection. Rehabilitated mangroves will start to offer benefits in Year 7 onwards</p>	<p>Extreme hydro-meteorological events do not damage, destroy or delay the EBA measures</p> <p>Active participation of all relevant stakeholders</p>
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E.4. Fund-level outcomes

Expected Outcomes	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	<i>A7.2 Number of males and females reached by [or total geographic coverage of] climate-related early warning systems and other risk reduction measures established/strengthened</i>	<p>Coastal vulnerability assessment to be taken during project's Year 1 and at project's Terminal Evaluation Report</p> <p>Ecosystem health monitoring (CIS)</p> <p>Surveys will be produced for the project and will be delivered by an independent institution</p>	Estimated 5,000-20,000 people protected from coastal flooding in Artemisa Mayabeque and Playa Cajío as a result of mangroves in current state ⁷³ .	Mangroves will provide no benefits for the first 5 years following rehabilitation, as they will not have sufficient structural stability to offer significant coastal protection. Rehabilitated mangroves will start to offer benefits in Year 7 onwards	At least 135,507 ⁷⁴ people (66,873 women and 68,234 men) directly benefitted through increased coastal protection services from restored ecosystems as a result of EBA investments in intervention areas	<p>Environmental and social circumstances in the target sites do not materially change throughout project implementation</p> <p>Extreme hydro-meteorological events do not damage, destroy or delay the EBA measures</p>
A5.0 Strengthened institutional and regulatory systems for climate-responsive planning and development	<i>A5.1 Institutional and regulatory systems that improve incentives for climate resilience and their effective implementation</i>	Mid-term report and final evaluation with the numbers of plans (document-based evidence of	0	4 Proposals for the inclusion of EBA in national and sectoral regulations	4 National instruments and sectoral regulations have mainstreamed EBA	Social, political and economic circumstances in the target municipalities and provinces do not materially

⁷³ CELAC & Universidad de Cantabria estimate that current mangrove conditions target areas reduce potential flooding benefitting between 5,000-20,000 people in Artemisa Mayabeque and Playa Cajío that would be affected had mangroves not been present

⁷⁴ See Section 7.2 on Feasibility Study (Annex 2) for methodologies and calculation of project beneficiaries at an Output Level. Number for indicator are direct beneficiaries of Output 1. Calculations to measure this indicator will include estimated on the distance of sea penetration during coastal flooding that will be compared to historic records to calculate area that is no longer being flooded, in addition the numeric models and mapping (including FS Figures 56-62) will be used to calculate flooding in various scenarios taking into account mangrove and ecosystem health and extreme hydrological events (see footnote 70) and taking into account population of affected settlements, finally through surveys perception of vulnerability of the targeted population to flooding and saline intrusion as EBA actions progress and ecosystem services are rehabilitated.

		<p>approved plans) which have included EBA approaches</p> <p>Legal and regulatory gap assessment (Activity 2.3.1) developed in year 1 and 7 evaluating progress of regulatory framework (technical standards, etc.) as result of project implementation.</p> <p>Certified copies of approved legislation and regulations (technical standards)</p>	0	<p>⁷⁵ 7 municipalities have mainstreamed EBA into their Development Plans</p> <p>7 municipalities have mainstreamed EBA within the Territorial Management Plans reflected within annual workplans</p> <p>7 instruments designed and under implementation regulating the elimination of man-made barriers in coastal ecosystems (aiming to restore water flow dynamics and ecosystems functionalities)</p>	<p>1st National Technical EBA</p> <p>24 municipalities have mainstreamed EBA into their Development Plans (including economic and environmental plans)</p> <p>24 municipalities have mainstreamed EBA within the Territorial Management Plans reflected within annual workplans</p> <p>24 regulatory instruments for elimination of man-made barriers within coastal ecosystems reflected within annual workplans</p>	<p>change throughout project implementation</p> <p>Governments and sectors remain committed to the inclusion of EBA measures in regulatory instruments</p> <p>Governments and sectors remain committed to the implementation of regulations for the elimination of anthropic barriers in coastal ecosystems</p>
A8.0 Strengthened awareness of climate threats and risk-reduction processes	A8.1 Number of males and females made aware of climate threats and related appropriate responses	<p>Annual reports; mid-term and final evaluation</p> <p>Surveys will be produced for the project and will be delivered by an independent institution</p>	0 men and 0 women	67,626 men and 65,811 women (total 133,437 people with knowledge on EBA solutions to manage local impact of CC)	225,421 men and 219,372 women (total 444,793 people with knowledge on EBA solutions to manage local impact of CC)	<p>Active participation of stakeholders</p> <p>Being aware translates into action</p>

E.5. Project/programme performance indicators

Expected Results	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
Output 1: Rehabilitated coastal ecosystems for enhanced coping capacity to manage climate impacts	Number of hectares of rehabilitated coastal wetland in target areas providing protective services to targeted services	Annual environmental monitoring reports; reports from MINAG's Forestry Service	7317.5 ha of mangroves	3,860 ha of degraded coastal wetland has been rehabilitated	15,443 ha of degraded coastal wetland has been rehabilitated and providing protective services to targeted coastlines	The required equipment for rehabilitation is available to use within the time planned Local actors are actively involved in the design, implementation, monitoring and

⁷⁵ In Cuba all plans mentioned in this box are regulatory binding in nature.

	Number of hectares of seagrasses being lost per year ⁷⁶ in target areas as a result of the restoration of natural hydraulic processes and coastal wetlands functionalities and connections	Annual environmental monitoring reports by AMA's environmental institutions	9287 ha at a reduction loss of 65ha/year	9,026 ha at a reduction loss of 65ha/year	8,954 ha at a reduction loss of 18 ha/year	correction of coastal rehabilitation activities Appropriate measures have been implemented so in case of extreme events ecosystem restoration process is efficient 0.2-0.5% coral and seagrass annual reduction rates are sufficient for these ecosystems to restore their protective service against storms and coastal erosion
	Number of Km of Reef crest degraded per year in target areas as a result of the restoration of natural hydraulic processes and coastal wetlands functionalities and connections	Annual environmental monitoring reports by AMA's environmental institutions	2,2 km/year Annual rate of loss of reefs and frontal ridges 1.7%	2.2 km/year	0.25 km/year	
	Number of Hectares with salinity >1g/l in the intervention area ⁷⁷	Annual reports based on INRH monitoring systems including that being developed for the project	544,300ha with salinity >1g/l	Saline intrusion reduction in 5,443 ha 538,857ha with salinity >1g/l	Saline intrusion Reduction in 16,329 ha 527,971ha with salinity >1g/l	
Output 2: Increased climate change adaptation capacity in vulnerable coastal communities, governments and economic sectors	Number of people with knowledge and skills to adapt to CC, broken down by communities, governments and sectors, taking into account gender and age groups.	Annual technical report of the project. Community consultations based on interviews, focus groups and surveys to assess local capacity ⁷⁸ . These will be assessed independently by FLACSO at project base line, mid-term and final year. Community vulnerability assessments	0	133,437 (65,811 women and 67,626 men, 30% of project beneficiaries) with high level of capacity (assessed by FLACSO)	444,793 people (219,372 women and 225,421 men, total project beneficiaries) with high level of capacity (assessed by FLACSO)	The agreements signed between the project team, local and national entities are fulfilled Local actors are actively involved and interested in participating in capacity building activities Social, political and economic circumstances in the target municipalities and provinces do not materially change throughout project implementation
	Number of Climate information products developed responding to local needs linked to monitoring the capacity of ecosystem to provide services in managing	Annual report of the project-level monitoring Community consultations	0	At least 2 per municipality rated as relevant by users (at least one of the products	At least 10 per municipality rated as relevant by users (at least 3 of the products will	

⁷⁶ Under current conditions coral reefs and sea grasses are degraded at a rate of 0.7 and 1.7% per year respectively because of different drivers (see paragraphs 21-35 pg6). By restoring natural hydraulic processes and coastal wetlands functionalities and connections, the project will reduce such degradation rates, particularly addressing terrestrial sediment sources, and will increase these ecosystems coping capacity and functionalities and provide protective services. Hence this indicator is considered to be a direct result of the wetland conditions and restored functionalities under an integrated coastal approach.

⁷⁷ This indicator is included as the approach in Output 1 will result in reducing saline intrusion in coastal communities, identified as a key CC impact to water sources.

⁷⁸ Following project's stakeholder engagement plan and consultation methodology

	climate impacts (water quality, protective capacity, community vulnerability, etc.)	on information relevance perceived by users based on interviews, focus groups and surveys ⁷⁹ . These will be assessed independently by FLACSO at project mid-term and final year		will respond women's climate information needs per user based consultation)	respond to women's climate information needs per user based consultations)	
	Number of municipalities that have incorporated ecosystem management within their development, territorial, and coastal zone management and disaster risk prevention plans/strategies	Annual technical report of the project. Meeting minutes of the local government Mid-term report and final evaluation with the numbers of plans (document based evidence of approved plans) Legal and regulatory gap assessment developed evaluating progress of regulatory framework	0	7 municipalities have mainstreamed EBA into their Development Plans (including financing mechanisms) 7 municipalities have mainstreamed EBA within the Territorial Management Plans reflected within annual workplans 7 regulatory instruments for elimination of man-made barriers within coastal ecosystems reflected within annual workplans	24 municipalities have mainstreamed EBA into their Development Plans (including financing mechanisms) 24 municipalities have mainstreamed EBA within the Territorial Management Plans reflected within annual workplans 24 regulatory instruments for elimination of man-made barriers within coastal ecosystems reflected within annual workplans	

E.6. Activities

Activity	Description	Sub-activities	Deliverables
Output 1			
Activity 1.1. Assess and restore coastal wetland functions by reestablishing hydrological processes	<p>Actions for the rehabilitation of coastal wetland functions specifically related to strengthening coastal resilience and overall ecosystem sustainability along the wider marine-coastal landscape to improve ecosystems' coping capacity to coastal flooding (by restoring water flows), climate extremes (by strengthening the coastal system green structure, rehabilitating fluxes between ecosystem and restoring waterways) and to saline intrusion (by restoring water flow into coastal ecosystems).</p> <p>Inputs: - Labour and expertise of 6 local forestry enterprises to implement and monitor the</p>	<p>1.1.1 Validate local conditions in intervention sites and verify ecosystem capacities for coastal resilience to CC impacts through in situ and spatial temporal analyses 1.1.2 Restore the ecological flow of freshwater towards targeted mangrove ecosystems through cleaning of existing water channels and building small scale low impact infrastructure to facilitate the laminar flow of water to coastal wetlands during rainy seasons 1.1.3 Invasive species management in target sites to reduce</p>	<p>Updated forest profile with basic structure and landscape map in each target area to guide ecosystem capacity and conditions as the project progresses. Restored conditions in targeted areas of the coastal wetlands to allow for coastal ecosystems' key functionalities and interactions to be rehabilitated .</p>

⁷⁹ Following project's stakeholder engagement plan and consultation methodology

	<p>hydrological restoration processes in 7 target sites (hired by GoC)</p> <ul style="list-style-type: none"> -Agricultural equipment (including fuel and spare parts) provided to local forestry enterprises to clear water channels and restore natural hydrology. - Equipment provided to each local forestry enterprises for the evaluation and monitoring of forest conditions - Plastic boats (one per coastal stretch) provided to AMA for wetland monitoring works (in channels and sea) - Equipment provided to forest enterprises for invasive species management. - International (technical capacity building) and national expertise (AMA) in developing forest analysis and profiles and processing monitoring information 	<p>pressures on the coastal wetland and enhance ecosystem coping capacity and resilience</p>	
<p>Activity 1.2 Mangrove and swamp forest rehabilitation through natural and assisted regeneration for enhanced coastal protection</p>	<p>Restoration of 15,443 ha of degraded coastal wetlands through natural and assisted regeneration in target sites focusing on mangroves, swamp forests and grasslands. This activity along with Activity 1.1. will directly improve the coping capacity of coastal wetlands to flooding (by increasing sediment trapping, increasing ecosystems health and re-establishing seaward species that have been lost R. mangle), climate extremes (by reconstructing its protective role with red mangrove) and saline intrusion (by restoring water /infiltration capacity)</p> <p>Inputs:</p> <ul style="list-style-type: none"> - Labour and expertise of 6 local forestry enterprises to implement restoration measures in 7 target sites (hired by GoC) -Supervision and monitoring work of forest guards and forest certification officers in each target site. - Restoration equipment provided per target site to local forest enterprises to implement restoration measures - Agricultural machinery (tractors) per target site provided to forest enterprises for restoration in irregular ground areas - Tools and supplies per target sites for forestry works provided to local cooperatives - Internal transportation equipment for forestry enterprises and local environmental supervision staff (forest guards) to implement and monitor restoration works including protective measures in each target site -Communication services for forest enterprises developing restoration works -ICT equipment for local forestry services to process restoration monitoring information -Forest insurance 	<ul style="list-style-type: none"> 1.2.1 Acquire forestry and evaluation equipment for restoration in target sites 1.2.2 Implementation of natural regeneration management measures in target sites 1.2.3 Red mangrove and native species planting in target sites for forest rehabilitation along the shoreline boundary of coastal wetlands 1.2.4 Implementing fire control management and illegal logging and extraction surveillance measures as well as the purchasing of insurance for mangrove forests within restoration sites to ensure their long term sustainability and protection 	<p>The restoration of 15,443 ha of degraded coastal wetlands through natural and assisted regeneration in target sites focusing on mangroves, swamp forests and grasslands.</p> <p>Restoration of coastal wetlands along with restored conditions (1.1) will result in coastal ecosystem's restored functionalities and interactions to be rehabilitated in targeted areas</p>
<p>Activity 1.3. Record and assess coastal and marine ecosystems' natural regeneration and protective functions based on conditions provided through restored coastal wetlands</p>	<p>This activity will assess and record the restored functional relationships between coastal and marine ecosystems to reduce key degradation drivers such as sediment loads, nutrients and domestic and industrial contamination (fisheries, food and pesticides industries), providing an opportunity for natural regeneration and enhancing ecosystems protective capacity against coastal threats particularly to extreme weather</p> <p>Inputs:</p>	<ul style="list-style-type: none"> 1.3.1 Acquire and install a sea water quality monitoring system to evaluate enhanced environmental conditions for seagrass and coral reef natural regeneration 1.3.2 Acquire and install a monitoring system to measure marine ecosystem capacity for resilience and regeneration 1.3.3 Implement a monitoring and surveillance system of coastal seascapes and marine ecosystem regeneration and capacity for resilience to extreme events, 	<p>Monitoring and surveillance system of coastal seascapes and marine ecosystem regeneration will be created. A network for coral recovery will be implemented. Sea grasses and coral reefs anthropic inland degradation drivers will be reduced, and ecosystems resilience restored in target areas. Monitoring system of the marine ecosystems created will show the effectivity of the interventions.</p>

	<ul style="list-style-type: none"> - Logistical services for marine expeditions (transportation, meals) led by ICIMAR and community volunteers - Lab ,office and ICT equipment for enhancing capacity of 4 local environmental centres and one central node to process sea water quality samples and environmental data - Seawater monitoring equipment to enhance ICIMAR's capacity to monitor conditions as a result of restoration and compliment information provided by local environmental centers. -Transportation equipment for sampling expeditions led by ICIMAR and community volunteers -Marine stations (equipped and installed) for environmental monitoring led by ICIMAR -Supplies for local sea water laboratories that will provide environmental monitoring under the guidance of ICIMAR -Diving equipment for community coral monitoring and recovery volunteers - 50 marine specialists located in local environmental centres and ICIMAR for environmental monitoring and processing of information from target sites -Community volunteers for coral monitoring and recovery -Trainings to community volunteers for marine monitoring 	<p>including a network for coral recovery</p>	
<p>Activity 1.4. Enhance water conduction systems along targeted watersheds to restore freshwater drainage in coastal ecosystems and aquifers to reduce and monitor saline intrusion in target sites</p>	<p>This activity will work to enhance local water conduction systems in target sites for recharging and well monitoring of selected aquifers affected by long periods of drought, GoC financing (parallel and co -financing) will be used to eliminate manmade barriers that have degraded/changed the hydrological process into the coastal ecosystems and enhance local water conduction systems for recharging of selected aquifers.</p> <p>GCF funds will be directed for ground water salt intrusion monitoring that will be implemented under a basin management approach. This in turn will allow to take adequate actions to reduce it and manage water flow during droughts.</p> <p>Measuring stations will be located along the catchment basins including coastal areas, and upstream and downstream of the reservoirs. Estimations of the water balance and of quantity and quality of water reaching the coastal area will allow a better management of the resource, particularly during droughts, and in turn a reduction of salt intrusion.</p> <p>Real time hydrologic and hydraulic simulations, floods and droughts forecasting will support decisions for managing saline intrusion. Water quality monitoring in bathometric wells distributed along the course of the main streams and in some tributaries. Aquifer levels measured by automatic level recorders distributed within the areas affected by the saline intrusion. For flow measurement, hydrometric points will be located at the mouths or nearby, and near reservoirs, upstream and downstream.</p> <p>Inputs:</p>	<p>1.4.1 Enhance local water conduction systems in target sites for recharging and well monitoring of selected aquifers affected by long periods of drought</p> <p>1.4.2 Invest in monitoring equipment to develop a real time water flow control system in target areas for the monitoring of ground water with a basin management approach to assess the evolution of saline intrusion in target areas and evaluate their capacity for resilience to climate impacts</p> <p>1.4.3 Develop hydrological models to support water management identification of catchment areas, salt-wedge advancement/receding and saline intrusion) to better assess the impacts of SLR and change on precipitation patterns on coastal conditions.</p>	<p>Salt intrusion management:</p> <p>Real time data from monitoring will result in the generation of hydrological simulations and models to support the management of the water flows and salt intrusion during CC extreme events (long drought periods).</p> <p>Modelling of liquid and solid runoff to predict saline intrusion evolution in time.</p> <p>Reduction of saline intrusion in 16,329 ha during the project's initial 8 years.</p>

	<ul style="list-style-type: none"> - Monitoring equipment (and installation equipment) in target sites to be integrated into INRH monitoring systems to sample the quality and availability of terrestrial waters and its contribution of ecological flow and develop hydrological model. -Expertise of INRH (locally and nationally) in developing hydrological models for ground water monitoring -Labour, equipment and expertise of local INRH in target sites in enhancing water conduction systems Capacity building to local INRH monitors in target sites on OM of hydrological equipment -Communication equipment and services for data transfer of water quality information -ICT equipment and material for processing of monitoring information to be provided to INRH staff (local and national) for processing information and developing hydrological models -1 Transportation equipment to local INRH staff for well monitoring in target areas 		
Output 2			
<p>Activity 2.1. Develop a climate adaptation technical capacity building program for coastal communities and local stakeholders (government & economic sectors) to enable adaptation actions and capacities</p>	<p>This activity will develop and implement a capacity building program to be delivered to targeted coastal communities (24 municipalities) to build understanding of CC impacts and vulnerabilities such as coastal flooding (from extreme weather and SLR) and saline intrusion (from droughts and SLR). The program will increase awareness and knowledge for adaptation actions and skills to strengthen the resilience of key stakeholders in these communities, prioritizing EBA over other management strategies.</p> <p>Inputs:</p> <ul style="list-style-type: none"> - Physical space to host the 24 CBCs and 7 annexed classrooms (1 CBCs in each municipality of targeted coastlines and 1 classroom in each of the 7 target sites) - Audiovisual, media and office equipment for each of the CBCs and class rooms to deliver capacity building and trainings - Internet connectivity nodes in each of the CBCs and annexed class rooms to facilitate communication for knowledge sharing and deliver online trainings to communities - Local staff (team responsible for the trainings, personnel for the CBCs, local CITMA experts) -Expertise (national and international) for the design of training material and curricula -Surveys and evaluations on local capacity - Transportation equipment (microbus) for staff in CBCS's and annexed classroom to travel to project sites and within communities - Trainings to local trainers (workshops, by international and national experts) - Consultation, awareness-raising and other workshops (logistics and delivery) - Audio-visual products (documentary, KM media products) 	<p>2.1.1 Identification, design and packaging of the training content to be provided to coastal communities and stakeholders for coastal adaptation capacity for local adaptation actions including EBA</p> <p>2.1.2 Enhance physical and operational capacity in 24 Capacity Building Centers in targeted coastal municipalities, and establish 7 Annexed classrooms in the intervention areas to provide an adequate space for community and stakeholder capacity building, community monitoring and to develop local coordination activities</p> <p>2.1.3 Implement in 24 targeted municipalities and 7 intervention sites a capacity building program through local structures (CBCs and annexed classed rooms)</p>	<p>Coastal adaptation capacity building program designed and implemented in 24 municipalities along the coastal stretch. The resulting program and respective training material will be used for national replication.</p> <p>24 Capacity Building Centres operating in which CCA training to communities and relevant stakeholders will occur, and information relevant to support inter-sector adaptation will be produced</p>
<p>Activity 2.2 Integrate project (technical and community based) derived information, information from</p>	<p>This activity will collect information derived from the local ecosystems rehabilitation actions and hydrological dynamics restauration to integrate it into national databases through a Knowledge Management Platform, which in turn will feed</p>	<p>2.2.1 Integrate project and national databases and monitoring systems into a Knowledge Management Platform for Coastal Adaptation (KMPCA)</p>	<p>A Knowledge Management Platform for Coastal Adaptation to integrate and manage information created both nationally and locally</p>

<p>early warning systems and national datasets into a Knowledge Management Platform, to provide climate information products to monitor, evaluate and inform coastal communities on local (community and ecosystem) capacity to manage climate change impacts</p>	<p>the development of national and local climate information products, including: i) A Protocol for Coastal Resilience Assessment (PERC) ii) enhancing successful existing early warning systems (disasters and emergency attention, EWS for drought in agriculture, forest fires, health, etc.); and, iii) coastal vulnerability and resilience assessments for coastal adaptation that will integrate information on ecosystem monitoring (Output 1) with indicators derived from community monitoring of local conditions</p> <p>Inputs:</p> <ul style="list-style-type: none"> - Software and hardware (ICT equipment) to develop the information node in ICIMAR add ensure connectivity from local environmental education centres throughout target municipalities to operate KMPCA including for spatial management and data processing -Connectivity services, server support and technological trouble shooting to host the KMPCA and to enable delivery of information products to local populations across targeted coastlines - ICT equipment to support data processing capacity of databases integration the information nodes at 5 ministries with relevant databases -Monitoring and training equipment for local community monitors at target sites - Transportation for community monitors -Information, maps and audio-visual products -Logistics for local workshops and trainings on use and management of KMPCA and development of information products -Data processing expertise and capacity of experts at ICIMAR and of local environmental centers to develop information products - National experts to develop information products -Surveys and evaluations on local information needs and relevance of information products 	<p>2.2.2 Train communities to provide community monitoring of coastal ecosystems and local conditions (indicators for socio economic, environmental, climate health, and drinking water quality) as part of a community monitoring system to complement information derived from EBA monitoring systems and better assess coastal vulnerability and resilience)</p> <p>2.2.3 Create user driven climate and environmental information products as tools for EBA implementation, appropriation and maintenance</p>	<p>(provided through a community monitoring system) to contribute to the national information system (SEN).</p> <p>Climate and environmental information products used as tools for EBA, including a Protocol for assessing coastal resilience (PERC), coastal vulnerability assessments, environmental information for coastal adaptation (environmental modules on EBA) and community early warning systems.</p>
<p>Activity 2.3 Mainstream EBA approaches into regulatory and planning frameworks at the territorial and national levels for long term sustainability of EBA conditions and investments for coastal protection</p>	<p>This activity will address a key barrier identified in ensuring the sustainability of EBA investments and integrated coastal management through their integration into national and local norms. This activity will enhance "Tarea Vida's " framework of by incorporating the principles and mechanisms for the implementation of the EBA and adaptation actions.</p> <p>Inputs:</p> <ul style="list-style-type: none"> -Legal and regulatory planning specialists to provide support to municipal and provincial governments in target coastlines -Capacity building and technical support from national and international experts to local authorities in territorial planning, financial mechanisms and valuations, integrated coastal management, production of technical standards. -Software for online meetings and connectivity services for legal advisors and local authorities in target municipalities -Work of CITMA, ONAI, MINAG, INRH and physical planning experts locally and nationally to develop technical standards and integrate them into national and local regulations -ICT and office equipment and supplies for legal advisors - Workshops, meetings, conferences 	<p>2.3.1 Create a network of legal advisor to develop a detailed analysis of the regulatory, legal and institutional framework and solutions (costing tools, legislation, regulations) to integrate EBA investments and management in 24 municipal and 7 provincial economic plans through concrete actions and investments.</p> <p>2.3.2 Production of technical standards for the inclusion of EBA in national and sectoral regulations</p> <p>2.3.3 Incorporate EBA into municipal territorial and natural resource planning instruments including territorial land use plans and local environmental ordinances for long term sustainability of conditions required for EBA results</p>	<p>Development of a Technical Standard of "Terms and Definitions for the EBA in Cuba" as baseline criteria for integrating ecosystem management approaches into municipal and national actions, norms, policies and budgets. This includes the inclusion of EBA into the POTs and the municipal development strategies. The creation of a network of legal advisors from different sectors to address gaps in the current legal frameworks to be addressed through proposals for national and local legislation and regulations.</p>

	<p>- Transportation equipment for CITMA authorities in charge of integrating national standards to facilitate movement to target sites and meeting with local authorities</p>		
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E.7. Monitoring, reporting and evaluation arrangements (max. 500 words, approximately 1 page)

303. GCF funding will be used to ensure that monitoring and evaluation systems are put in place to track progress over the 8 years of project implementation towards the planned project outcomes and fund level impacts. A monitoring and evaluation annex has been developed for this project. Monitoring plans will be achieved through the means of verification outlined in Section E above, where progress on each indicator, from the current baseline to the mid-point and end-point targets, will be tracked. This includes making use of national information sources as detailed in the ME Annex. The National Director through the support of its Coordination's will consolidate all project reporting as informed by the various project actors through its Municipal and Provincial Coordination's and form project monitoring systems, the KMPCA developed through Activity 2.2. and that will be managed by ICIMAR/CITMA will serve as the central consolidating mechanism for project information.
304. Output 1 involves establishing a long-term monitoring platform in the target areas which will allow supporting the long-term sustainability of the project interventions on ecosystem restoration. This monitoring will be led by CITMA with support of community monitoring and will be integrated within the Operative Node developed within ICIMAR (Activity 2.2). Monitoring products developed through the Activity 1.1 will be used to validate baselines and guide project monitoring through forest landscape maps and indicators. In the case of marine ecosystems monitoring will be consolidated by ICIMAR/AMA that will act as a central node to the locally based labs. Monitoring systems will provide information that will directly flow to the Operative Node and will be consolidated by ICIMAR/CITMA. ICIMAR/CITMA will provide this information to the National Director.
305. Site-specific restoration protocols for Activity 1.1. will be developed as detailed within the FS Section 9.2.1. The protocols will be revisited frequently and adjusted based on the data collected from the restored ecosystems, enabling an adaptive management approach. Site-specific restoration protocols will each include a detailed M&E plan that describes how rigorous, frequent, long-term monitoring of the following variables will take place: plant survival rates plant vigor & rate of growth (all three for all species); soil/sediment chemistry (where applicable) and water chemistry (where applicable). Long-term monitoring datasets, including all EBA investments, will be managed and archived within CITMA. Formal plans will be signed off by government and appropriate institutions in each of the two target areas, covering continued long-term monitoring over at least three decades of the project's EBA investments.
306. As a result of Activity 2.2.3, within 24 targeted municipalities will be trained in monitoring coastal threats, ecology and ecosystem health to track the restoration and conservation of targeted coastal ecosystems. Information derived through this monitoring will be integrated by ICIMAR/CITMA into the Knowledge Management Platform and the technical monitoring that will be developed by forest services, cooperatives, ICIMAR and INRH. The project monitoring will engage beneficiaries and mechanisms will be in place for data collection data through communities participation to ensure long term monitoring. Capacity building monitoring and relevance of information products will be accomplished with the support of FLACSO to assess the improvement of understanding at community level and communities evolution from low to high coping/adaptation capacities. This will be done through surveys that will be develop by FLACSO and will be monitored through constant community consultations including user uptakes and relevance of training and information provided.
307. Project-level monitoring and evaluation will be undertaken in compliance with the [UNDP POPP](#) and the [UNDP Evaluation Policy](#).
308. The primary responsibility for day-to-day project monitoring and implementation rests with the Project National Director that will develop annual work plans to ensure the efficient implementation of the project. The Project Manager will inform the Project Board and the UNDP Country Office of any delays or difficulties during implementation, including the implementation of the M&E plan, so that the appropriate support and corrective measures can be adopted. The Project Manager will also ensure that all project staff maintain a high level of transparency, responsibility and accountability in monitoring and reporting project results.
309. The UNDP Country Office will support the Project National Director as needed, including through annual supervision missions. The UNDP Country Office is responsible for complying with UNDP project-level M&E requirements as outlined in the [UNDP POPP](#). Additional M&E and implementation quality assurance and troubleshooting support will be provided by the UNDP Regional Technical Advisor as needed. The project target groups and stakeholders including the NDA Focal Point will be involved as much as possible in project-level M&E.
310. A project inception workshop will be held after the UNDP project document has been signed by all relevant parties to: a) inform project stakeholders to the project strategy and discuss any changes in the overall context that influence project implementation; b) discuss the roles and responsibilities of the project team, including reporting and communication lines and conflict resolution mechanisms; c) review the results framework and discuss reporting, monitoring and evaluation roles and responsibilities and finalize the M&E plan; d) review financial reporting procedures and mandatory requirements, and agree on the arrangements for the annual audit; e) plan

- and schedule Project Board meetings and finalize the first year annual work plan. The final inception report will be cleared by the UNDP Country Office and the UNDP Regional Technical Adviser and approved by the Project Board and submitted to the GCF within 6 months after the Funded Activity Agreements effectiveness date.
311. A project implementation report will be prepared for each year during the project implementation. The Project National Director, the UNDP Country Office, and the UNDP Regional Technical Adviser will provide objective input to the annual GCF APR. The Project Manager will ensure that the indicators included in the project results framework are monitored annually well in advance of the GCF APR submission deadline. Progress against the gender action plan, stakeholder engagement, social and environmental safeguards updates, challenges and delays must also be monitored by the Project Manager and reported in the GCF APR. The GCF APR will be shared with the Project Board and other stakeholders.
 312. An independent mid-term evaluation will be undertaken, and the findings and responses outlined in the management response will be incorporated as recommendations for enhanced implementation during the final half of the project's duration. The terms of reference, the review process and the final evaluation report will follow the standard templates and guidance available on the UNDP Evaluation Resource Center. The final evaluation report will be cleared by the UNDP Country Office and the UNDP Regional Technical Adviser and will be approved by the Project Board. The final evaluation report will be available in English.
 313. An independent terminal evaluation (TE) will take place when project activities have concluded. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance available on the UNDP Evaluation Resource Center. The final TE report will be cleared by the UNDP Country Office and the UNDP Regional Technical Adviser and approved by the Project Board. The TE report will be available in English.
 314. The UNDP Country Office will include the planned project evaluations in the UNDP Country Office evaluation plan, and will upload the evaluation report in English and the management response to the public UNDP Evaluation Resource Centre (ERC) (www.erc.undp.org).
 315. The UNDP Country Office will retain all M&E records for this project for up to seven years after project financial closure in order to support ex-post evaluations.
 316. A detailed M&E budget, monitoring plan and evaluation plan will be included in the UNDP project document.
 317. Monitoring, reporting and evaluation arrangements will comply with the relevant GCF policies and Accreditation Master Agreement signed between GCF and UNDP.

F. RISK ASSESSMENT AND MANAGEMENT

F.1. Risk factors and mitigations measures (max. 3 pages)

For probability: High has significant probability, Medium has moderate probability, Low has negligible probability. For impact: High has significant impact, Medium has moderate impact, Low has negligible impact. Prohibited practices include abuse, conflict of interest, corruption, retaliation against whistleblowers or witnesses, as well as fraudulent, coercive, collusive, and obstructive practices

Selected Risk Factor 1

Category	Probability	Impact
Technical and operational	Low	Medium

Description

Limited engagement of local actors in the implementation of the project activities which leads to a lack of appropriation of the adaptation initiatives affecting their sustainability in the long term

Mitigation Measure(s)

The project has been designed in very close collaboration with national and local actors to address their vulnerability and needs, as well as in alignment with an existing comprehensive national strategy for Climate Change Adaptation, which has strong stakeholder support of both government officials and communities. A comprehensive Stakeholder Engagement Plan (SEP) has been developed along with consultations that are included in Annex XIII. Consultations have been included in the proposal phase to disseminate information about the project activities in the targeted communities that will also support building capacity on adaptation and the benefits of EBA, safeguards and climate change in general. The Stakeholder Engagement Plan, and consultations carried out during the preparation of this proposal included culturally appropriate methodologies tailored to the actors where consultations programs were implemented. Best practices for community engagement from baseline projects are incorporated. Output 2 of this project will also mitigate this risk as it looks to engage communities in a manner that is relevant existing institutions and mechanisms such as Capacity Building Centres and Multidisciplinary groups also favors engagement. Furthermore, the local actors will have a representative who will be member of the Project Steering Committee (see also C.7) what will increase their influence on the project and their engagement. In this way, the local actors will follow the project and be able to influence the results of the project towards a product of high value to the communities. The engagement will also be part of the evaluation of the project. Actions will be taken if deemed necessary. The probability of occurring the risk with these measures is low.

Selected Risk Factor 2

Category	Probability	Impact
Technical and operational	Medium	Medium

Description

Extreme weather events could affect the restoration activities during the first half of project implementation. The outputs of the project, particularly output 1, might be affected by extreme weather events which could cause damages, loss or delays during the implementation. It is considered that even if extreme weather-related events occur during the 2nd half of the project the actions taken during the former 4 years will have increased ecosystems resistance to these events. This impact however is largely dependent on the magnitude, intensity and frequency of extreme events, and given the uncertainty posed by climate change, the team has precautionary considered a risk with medium probability.

Mitigation Measure(s)

Restoration interventions will be implemented based on site-specific protocols derived from evidence-based practices deployed during previous projects (in particular from "Manglar Vivo"). These protocols, that are currently on editorial revision and will be publicly available in 2020^{80,81}, consider local environmental conditions – including frequency, severity and type of climate-induced hazards – and explicitly identify lowest risk options for implementation. Local knowledge on the impacts of historical climate-induced events will be used to detailed better the types of interventions at the local level. Extreme events during the implementation phase, particularly in the former years when trees cannot yet withstand extreme conditions, could delay restoration processes. Restoration methods that consider small plants vulnerability to certain extreme weather events will be applied, these include: i) short wood or other soft materials fences to protect the ecosystems (reduce/eliminate the impact); ii) planting from nursery (when mangrove trees have a certain height) and thus reducing as well the window of exposure to extreme events; iii) combination of above measures. The project activities also include evaluating survival rates and growth of ecosystem rehabilitation through a comprehensive monitoring program, which includes magnitude, frequency and intensity of extreme conditions (wave height, wind speed, water flow, etc) to feedback

⁸⁰ Manglar Vivo (2020). Protocolo de restauración de ecosistema de manglar

⁸¹ Manglar Vivo (2020). Plegables de ecotecnologías para la restauración ecológica

on the required structure of ecosystems. Once functionalities have been restored, these protocols and others created during the project will be used for rehabilitating the ecosystems if/when impacted by an extreme event. The resulting landscape and EBA approach is intended to protect the coast from category 3-4 storms with a probability of occurrence of less than 100 years (which is the one applied to 'hard constructions' such as longitudinal dikes), however climate change related and unknown uncertainties could increase or decrease this probability. If these conditions are exceeded, EBA measures might be partially damaged. In the case of an extreme event during project implementation and project lifespan, insurance policies and reconstruction plans are applicable in Cuba and will be invested in. This mitigation measure to ensure for funds for ecosystems reconstruction, is expected to adjust the risk level to "Low impact".

Selected Risk Factor 3

Category	Probability	Impact
Technical and operational	Low	Medium

Description

Reduced effectiveness because activities are not undertaken to tackle the causes driving ecosystem degradation.

Mitigation Measure(s)

The project will develop actions to restore ecosystem functions focusing on their coastal protective role, while the GoC will use national funds and initiatives to address the causes of degradation by: implementing measures to tackle the cause of system degradation and restoring coastal ecosystem; Strengthening the Environmental Regulatory System (Feasibility Study), including elaborating and implementing regulations specific to each territory; Supporting the capacity building at the national and local levels. The GoC considers this project as part of its integral national project with investments to reduce pressure on ecosystems which is already being carried out and budgeted for. Furthermore, output 2 addressing training of local communities will minimize the risk. The above measures minimize the probability of the risk.

Selected Risk Factor 4

Category	Probability	Impact
Technical and operational	Low	Low

Description

Rehabilitation of ecosystems may introduce non-native organisms/invasive species. The project will rely on a combination of natural regeneration and artificial regeneration (planting) to achieve the recovery of structure, function and EBA services. These activities will involve enrichment planting and reintroducing local species. Invasive species (either planted or already existent in the ecosystem) may proliferate and colonize areas more quickly than native species, especially during the initial stages of rehabilitation activities or in frequently disturbed areas.

Mitigation Measure(s)

Natural regeneration will be the preferred option wherever possible. When enrichment planting and vegetation restoration is carried, only native species that are adapted to the hydrological and soil conditions of these systems will be used. Species will also be selected in accordance with their ability to successfully thrive in degraded conditions (with the exception of invasive species), resist the forces of extreme climate related events, and restore connections and functionalities between ecosystems. These could include pioneering species, flood resistant species, and/or species with deep root networks to restore soils, all of which occurring naturally in similar environments in Cuba. The monitoring program will be complemented by management plans to monitor and control invasive species, such as *Casuarina equisetifolia*, *Dichrostachys cinerea* and *Leucaena leucocephala*. The selected control mechanisms (primarily manual) will be designed to mitigate adverse effects on the ecosystem or human health. Pesticide use will be prohibited, in order to protect sensitive environments and human settlements from any possible exposure. For manual or mechanical control, measures will be taken to avoid damage to sites that are critical for the thriving of native biodiversity (e.g., breeding sites, nesting sites, etc.). Sub-activity 1.1.5 and experience from previous project, the project ensures to create the adequate protocols and actions to reduce further the probability and its impact.

Selected Risk Factor 5

Category	Probability	Impact
Technical and operational	Low	Low

Description

Project activities, including restoring hydrological flows to mangroves and coastal wetlands may cause adverse impacts to already degraded natural habitats. Risks related to sediment movement, water contamination and equipment and

personnel movement during rehabilitation activities (associated with replanting, natural regeneration management activities, and the restoration of drainage channels) are minimum. The rehabilitation of ecosystems' functionalities will require dredging existing canals and removing existing hard infrastructure to restore natural hydrology (i.e. freshwater flows to these areas) and natural sediment movement dynamics. This may generate waste and speed localized erosion but only in the short-term and the adequate protocols will be in place to ensure there is no damaging sediments reach seagrasses or coral reefs.

Mitigation Measure(s)

Protocols and management measures will be put in place to ensure that all activities mitigate any possible harm to ecosystems (and sensitive receptors). This will include guidelines for the use of machines to transport materials and remove any grey infrastructure as per the ESAR, including adherence to the "Regulation of Environmental Impact Assessment" (Resolution 120/2009). Emergency procedures for dealing with possible spills or accidents that could impact soils, waters, and native species will be included. Additionally, management plans for all revegetation activities will be developed, (included limited use of fertilizers, and prohibition on the use of pesticides) as will procedures for managing the impact of replanting activities on natural habitats. The methodologies and measures will be tailored to each ecosystem component and for each of the intervention sites. Consideration will be given to the topographic, hydrogeological, climate and oceanographic conditions for each site, as well as existing infrastructure (state of degradation, types of materials), so as to avoid contamination and disturbance that could harm sensitive aquatic biota. This will be carried out with the participation of relevant state actors (e.g., Forestry Agency) and/or with projects and organizations already working with these issues (e.g. Sabana Camagüey Project). Any, construction and clearing activities will avoid environmentally sensitive areas and will proceed as per the ESAR, to manage impacts on flora and fauna.

Selected Risk Factor 6

Category	Probability	Impact
Technical and operational	Low	Low

Description

Project activities, including mangrove and wetland rehabilitation, infrastructure removal activities, as well as coral reefs and seagrasses monitoring may have an adverse effect on community or worker's health and safety. Working in mangroves and swamps implies increased exposure to vector borne diseases prevalent in Cuba. Finally, monitoring of coral reefs and sea grasses involves diving, which is an inherently risky activity.

Mitigation Measure(s)

Protocols and management measures will be emplaced to ensure workers safety and mitigate damages and disruptions due to noise, vibration and air quality impacts associated with infrastructure removal (both green and grey). These will include safety equipment and guidelines for the use of machines and transportation that ensure worker and community safety. Emergency procedures for dealing with possible spills or accidents will be emplaced. In instances where fertilizers are used, the methodologies will include proper equipment, management and limited application. Health and safety training instructions will be given to all employees of the project (including subcontractors) and will include avoidance measures for vector borne disease exposure such as protective appropriate clothing. Likewise, only certified divers with ample expertise in this activity will monitor coral reefs and seagrasses.

Selected Risk Factor 7

Category	Probability	Impact
Credit	High	Medium

Description

Increase on prices and limited access to international markets, due to the US Embargo restrictions and to potential price increases related to the economic ordinance approved in January 1, 2021 with direct impact in implementation costs, diminishing the financial capacity of the project to undertake the planned activities.

Mitigation Measure(s)

A procurement plan will be developed in the short and medium term with the support of UNDP to mitigate financial risks, considering UNDP's vast experience in the negotiation of contracts (fixed pricing, block purchasing, diversified vendors, etc.). UNDP will facilitate access to LTAs and procurement advisory from the Global and Regional Support Units to minimize as far as possible the impact of costs in the project budget and resources. Considering the impacts from the embargo on financial transactions, the payment to the international suppliers may be done in a currency other than USD. The costs of financial transactions (including the transportation of goods and equipment) may be subject to the fluctuation of exchange rates. To minimize the impact of the fluctuation of exchange rates, UNDP will support with access to LTAs which are already

negotiated contracts with favorable conditions and will support the project with the procurement plan. Further UNDP's accounting system allows for the monitoring and financial management of expenditures across multiple currencies. In the system, expenditures are converted to the rate of USD using the UN Official Rate of Exchange of the accounting date of transaction. The project has adjusted its budget in consultation with national authorities and developed an initial analysis to identify and incorporate within its budget estimated prices increases as they relate to national purchases. The probability and impact of the risk are reduced to low.

Selected Risk Factor 8

Category	Probability	Impact
Credit	Low	Medium
Description		
The pool of potential contractors is a risk for this project. Due to the international political situation of Cuba, providers/vendors of the measurement instruments might be reduced leading to higher costs		
Mitigation Measure(s)		

The project has access to UNDP Long Term Agreements (LTAs) a description of these can be found in: https://popp.undp.org/UNDP_POPP_DOCUMENT_LIBRARY/Public. Work during project design has been made with the regional procurement support unit to identify a pool of potential vendors and contractors, in the case of equipment and material needs. A procurement plan has been developed with timelines. National expertise is high and can be relied for implementation of activities in output 1. In the case of international expertise required for support in output 2, the project will leverage access to use established international cooperation channels. UNDP will also provide support to this end.

Selected Risk Factor 9

Category	Probability	Impact
Technical and operational	Low	Low
Description		
The ecosystem and their functionalities rehabilitation are not quick enough for ecosystems to keep pace with sea level rise as a consequence of climate change.		
Mitigation Measure(s)		

Elimination of degradation drivers and infrastructure that could increase ecosystem's coastal squeeze and their capability to keep pace with a rising sea will be assured with activities in output 1. The monitoring system will allow for maneuvering and prioritizing activities in the medium term. Their sustainability will be ensured with activities in output 2, awareness creation and mainstreaming the role of ecosystems in planning instruments. Best practices as detailed in Table 4 of the FS have been considered within restoration actions to ensure the resiliency of the ecosystems.

Selected Risk Factor 10

Category	Probability	Impact
Technical and operational	Medium	Medium
Description		
The effects caused by COVID 19 and the measures implemented at the national level, to confront the virus and protect the population may imply delays in the execution of the project.		
Mitigation Measure(s)		

Since March 2020, Cuba has applied epidemiological hygienic measures in order to control and prevent the spread of COVID 19. Considering that this scenario can extend over time, mitigation measures have been incorporated, which are reflected in the adjustments made to the budget. Among the measures are: Avoid unnecessary staff gatherings. For this, the number of face-to-face activities in years 1 and 2 (workshops, technical meetings, etc.) have been reduced; Also, the number of tours and visits to the project areas have been adjusted to the necessary minimum.

- Enhance the remote work modality to guarantee the execution of the project in social isolation conditions. In this sense, it is planned to guarantee the connectivity and ICT access to key personnel at all levels.
- Permanent monitoring of the behavior of this epidemiological situation and of the measures implemented in the country will be conducted, to apply the necessary adaptive management measures.

Selected Risk Factor 11

Category	Probability	Impact
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Credit	High	Low
Description		
Cuba has approved a recent economic reorganization ordinance that includes an adjusted international exchange rate to be made effective on January 2021, hence potential affecting the capacity to report on co financing values.		
Mitigation Measure(s)		
<p>Co-financing values have been adjusted to consider the impact of the ordinance in the value of co-financing actions and have been converted to USD using January 2021 exchange rate values. Project budget and budget notes include details on co financing actions that will be delivered per co financing source at an output level, as indicated in co-financing letters that make a direct reference to the project's Funding Proposal. Co-financing will be reported by UNDP and ascertained per internal Standards of Operation and in alignment with FAA obligations through verified means in the form of co-financing letters indicating the co-financing source, amount mobilized per output as well as in actions per project budget. A commitment has been provided by the GoC through its NDA on the delivery of project actions per Funding Proposal thus indicating that while the calculated value may be adjusted per new exchange rates, project delivery per co financing outcomes will not be affected. UNDP through its reporting process will report on any changes or failure to materialize co financing in accordance to FAA rules.</p>		

G. GCF POLICIES AND STANDARDS

G.1. Environmental and social risk assessment (max. 750 words, approximately 1.5 pages)

318. This project has completed the UNDP social and environmental screening procedure (see SESP attached as Annex). This screening was undertaken to ensure this project complies with UNDP's Social and Environmental Standards. The overall social and environmental risk category for this project is: **Moderate**.
319. CITMA/AMA will be responsible for the supervision of the ESMF. The UNDP will gain the endorsement of CITMA/AMA and will ensure the ESMF is adequate and followed. The PMU will ensure timely remediation actions are taken by the contractor, as necessary. The CITMA/AMA will be responsible for the revision or updates of this document during work. It is the responsibility of the person to whom the document is issued to ensure it is updated.
320. While a selection of the most significant Social and Environmental risks is presented in section F, the detailed risk assessment undertaken for the project a comprehensive Social and Environmental Risk Procedure (SESP) report, as well as the Environmental and Social Management Framework (ESMF), which can be found in Annex VI.
321. The project has mainstreamed environmental sustainability, social equity and gender considerations into the design of the project, the structuring of individual project activities, as well as in the implementation structure, monitoring plan, and budget. The activities have been chosen and designed to provide integrated benefits, not only for climate resilience, but also to enhance environmental sustainability and social equity benefits.
322. Potential environmental risks were identified for coastal ecosystem rehabilitation activities, which could introduce invasive species or cause impacts to critical habitats. The project will rely on a combination of natural regeneration and artificial regeneration (planting) to achieve the recovery of structure, function and ecosystem services. Restoring mangroves and wetlands will involve enrichment planting and the re-introducing of key mangrove species, as well as hydrological management to ensure adequate water availability. These activities may have limited adverse impacts on flora and fauna in the area, locally affecting water turbidity and altering sediment compositions, which may affect sensitive biodiversity and habitats. Likewise, non-native or invasive species (either already existent in the ecosystem) may proliferate and colonize areas more quickly than native species, especially during the initial stages of restoration activities or in frequently disturbed areas. Management measures will be taken, and plans will be developed with protocols and methodologies for each of the sites and the different landscape ecosystem components to ensure that the techniques mitigate any harm to the ecosystem and biodiversity, while monitoring activities will be put in place to follow any potential impacts.
323. The possibility of minor social impacts may occur during rehabilitation activities restricting the availability, quality of and access to natural resources in the restoration areas. That is, areas targeted for rehabilitation and protection may result in enforcing existing restricted access to extraction of non-timber forest products, animals and wood from mangroves, although it is important to note that this is already legislated, and that the project does not introduce new legislation but rather supports existing legislation for maintaining the sustainability of the investment. Specifically, management measures will be put in place to ensure that the restoration of ecosystems (in particular mangroves and swamps) is sustainable. Environmental regulations are already in place to protect sensitive environments that will support the effective rehabilitation of mangroves, including laws that prevent deforestation of mangroves in protected areas and other laws that ensure the sustainable use of resources. This risk is mitigated by the fact that Cuban Forest Law however recognizes the right of forest habitants and neighbouring areas to use the forest resources, including among others, the collection of fruits, fodder, and firewood.
324. To mitigate these risks, current use of coastal ecosystems has been assessed with the needs of local communities, and as required alternatives use options will be identified. This will allow trade-offs and synergies between sustainable use and coastal protection to be identified so that management measures are taken to protect the most vulnerable areas, in alignment with Cuban environmental laws, while ensuring community benefits and resource access in sustainable use areas. This process will be gender-sensitive.

G.2. Gender assessment and action plan (max. 500 words, approximately 1 page)

325. A gender assessment was carried out in the design of the project, as an entry point for the incorporation of gender responsive actions throughout its design and implementation of the project, and as the basis of the gender action plan. The gender action plan for the project was designed by taking into account both a comprehensive gender assessment, as well as the results of stakeholder consultations. The stakeholder consultations, which explicitly covered gender issues, inquired of both institutional and community participants what specific problems and difficulties may be faced by women and girls in adapting to climate change in the coastal zone of Cuba. The full results of the community level consultations can be found in the Stakeholder Consultation and Engagement Plan.
326. Cuban society demonstrates exceptional gender equality, according to the UNDP Annual Human Development Report (2015), Cuba had a Gender Inequality Index (GII) value of 0.304 (below the average of LAC), which has positioned Cuba as the 62nd in the world ranking. Cuba's GDI value, in the report, was listed as 0.946, placing them in "Group 3" (out of 5 groups), which is defined as "countries with medium equality in HDI achievements between women and men". The World Economic Forum's Global Gender Gap Index, which analyses the division of resources and opportunities between men and women pace, Cuba's overall score at 0.745, ranking it 25th in the world.

327. Overall, indicators show that Cuba has an exceptionally high level of education attainment (there is no gendered difference), as well as a strong score in regard to political empowerment and that the level of gender equality is high.
328. Nonetheless, despite the high level of gender equality in Cuba, Cuban culture remains broadly patriarchal, with certain manifestations of gender inequality mainly affecting women and girls, specifically in rural areas.
329. It has been recognized that women play an important role as heads of families and have an active participation in community work; hence this proposal seeks to strengthen their role in these spaces, considering them key subjects in climate change adaptation actions.
330. Women are disproportionately impacted by the lack of water at the household level, informed the decision to include waste management and sanitation activities as a part of the project (through GoC baseline financing).
331. Overall, the design and implementation of the project took into consideration the following gender implications: Specific strategies to include/address female-headed households; Different conservation incentives faced by women; A more nuanced and data-based identification of gaps in gender equality through the use of sex-disaggregated data in the monitoring of implementation results and hold individuals and institutions accountable for results that promote gender equality. Ensuring that sensitization and awareness are adjusted to more effectively reflect gender-specific differences that may exist. Gender-responsive strategies in the Stakeholder Engagement Plan have been adopted and have been budgeted.
332. The project has included support from specialists in Environmental and Social Safeguards Specialist and gender, to provide advice and support within the project to implement gender-related activities.
333. During project implementation, qualitative assessments will be made of gender-specific benefits that may be directly associated with the project. This will be incorporated into the APR, the Mid-Term Evaluation and the Final Evaluation. Indicators to quantify the achievement of project objectives in relation to gender equality include: number of men and women who benefitted from EBA solutions, number of men and women employed in jobs created by the project, training opportunities, knowledge management and information dissemination.
334. The gender action plan outlines entry points for gender-sensitive actions to be taken in each of the project's activity areas. In addition, specific indicators to measure and track the progress of these actions at the activity level, will be incorporated into the detailed M&E plan to be developed at the start of implementation of the project, (including gender-disaggregated data) to be collected and measured throughout implementation.

G.3. Financial management and procurement (max. 500 words, approximately 1 page)

335. The financial management and procurement of this project will be guided by UNDP financial rules and regulations available [here](#)⁸². Further guidance is outlined in the financial resources management section of the UNDP Program and Operations Policies and Procedures (POPP) available [here](#). UNDP has comprehensive procurement policies in place as outlined in the 'Contracts and Procurement' section of UNDP's POPP. See [here](#).
336. The project will be implemented following the National Implementation Modality (NIM) following the UNDP's POPP guidelines available [here](#)⁸³. UNDP will ascertain the national capacities of the implementing partner by undertaking an evaluation of capacity following the Framework for Cash Transfers to Implementing Partners (part of the Harmonized Approach to Cash Transfers - Harmonized Approach to Cash Transfer ([HACT](#))). All projects will be audited following the UNDP financial rules and regulations noted above and applicable audit guidelines and policies.
337. The NIM guidelines are a formal part of UNDP's policies and procedures, as set out in the UNDP POPP. The NIM guidelines were corporately developed and adopted by UNDP and are fully compliant with UNDP's procurement and financial management rules and regulations.
338. The national executing entity AMA/CITMA (also referred to as the national 'Implementing Partner' in UNDP terminology), is required to implement the project in compliance with UNDP rules and regulations, policies and procedures (including the NIM guidelines). In legal terms, this is ensured through the national Government's signature of the UNDP Standard Basic Assistance Agreement (SBAA), together with a UNDP project document which will be signed by the Implementing Partner to govern the use of the funds. Both of these documents require compliance. During implementation, UNDP will provide oversight and quality assurance in accordance with its policies and procedures, and any specific requirements in the Accreditation Master Agreement (AMA) and project confirmation to be agreed with the GCF. This may include, but is not limited to, monitoring missions, spot

⁸² In line with UNDP National Implementation (NIM) Guidelines, the Government is responsible for the management and procurement of the Project to achieve project outputs. Government regulations, rules and procedures apply to project implementation to the extent that they do not contravene the principles of the Financial Regulations and Rules of UNDP. UNDP Financial Regulations section 16.05 state:

- "The administration by executing entities or, under the harmonized operational modalities, implementing partners, of resources obtained from or through UNDP shall be carried out under their respective financial regulations, rules, practices and procedures only to the extent that they do not contravene the principles of the Financial Regulations and Rules of UNDP.

- Where the financial governance of an executing entity or, under the harmonized operational modalities, implementing partner, does not provide the required guidance to ensure best value for money, fairness, integrity, transparency, and effective international competition that of UNDP shall apply."

⁸³ In line with UNDP NIM Guidelines, the Project will be implemented following Government regulations, rules and procedures. The Government will ensure that their respective procedures do not contravene the principles of UNDP Financial Rules and Regulations.

checks, facilitation and participation in project board meetings, quarterly progress and annual implementation reviews, and audits at project level or at implementing partner level on the resources received from UNDP.

339. The AMA has undergone a HACT assessment by UNDP to assess its capacities for project implementation. Results derived from the HACT assessment concluded a general low risk level of AMA with questions regarding funds flow, organizational structure internal and financial audit, reporting and monitoring and information systems all being positively rated. In the case of procurement 24 out of 37 questions were rated positively mainly due to the complicated nature of international procurement for Cuba. Hence, UNDP at the GoC's request will provide support in the procurement of goods per project's procurement plan. The HACT framework consists of four processes : i) macro assessments; ii) micro assessments; iii) cash transfers and disbursements; and iv) assurance activities. Assurance activities include planning, periodic on-site reviews (spot checks), programmatic monitoring, scheduled audits and special audits. During micro-assessment, there can weaknesses identified for which actions are required to addresses the gaps. When a spot check finds that the gaps are not addressed it will mean that the level of assurance activities will have to remain higher and modalities of engaging with that implementing partner will have to be reviewed if necessary. All details are available [here](#).
340. The project will be audited in accordance with UNDP policies and procedures on audits, informed by and together with any specific requirements agreed in the AMA. According to the current audit policies, UNDP will be appointing the auditors. In UNDP scheduled audits are performed during the program cycle as per UNDP assurance/audit plans, on the basis of the implementing partner's risk rating and UNDP's guidelines. A scheduled audit is used to determine whether the funds transferred to the implementing partner were used for the appropriate purpose and in accordance with the work plan. A scheduled audit can consist of a financial audit or an internal control audit.
341. All GCF resources will be provided to the executing entity, less any agreed cost recovery amount. Per GoC request, under UNDP's national implementation modality, UNDP will be responsible for direct payments of required foods and services as required by the executing entity for the implementation of agreed and approved program activities.

G.4. Disclosure of funding proposal

No confidential information: The accredited entity confirms that the funding proposal, including its annexes, may be disclosed in full by the GCF, as no information is being provided in confidence.

With confidential information: The accredited entity declares that the funding proposal, including its annexes, may not be disclosed in full by the GCF, as certain information is being provided in confidence. Accordingly, the accredited entity is providing to the Secretariat the following two copies of the funding proposal, including all annexes:

- full copy for internal use of the GCF in which the confidential portions are marked accordingly, together with an explanatory note regarding the said portions and the corresponding reason for confidentiality under the accredited entity's disclosure policy, and
- redacted copy for disclosure on the GCF website.

The funding proposal can only be processed upon receipt of the two copies above, if containing confidential information.

H. ANNEXES

H.1. Mandatory annexes

- Annex 1 NDA no-objection letter(s) [\(template provided\)](#)
- Annex 2 Feasibility study - and a market study, if applicable
- Annex 3 Economic and/or financial analyses in spreadsheet format
- Annex 4 Detailed budget plan [\(template provided\)](#)
- Annex 5 Implementation timetable including key project/programme milestones [\(template provided\)](#)
- Annex 6 E&S document corresponding to the E&S category (A, B or C; or I1, I2 or I3):
[\(ESS disclosure form provided\)](#)
 - Environmental and Social Impact Assessment (ESIA) or
 - Environmental and Social Management Plan (ESMP) or
 - Environmental and Social Management System (ESMS)
 - Others (please specify – e.g. Resettlement Action Plan, Resettlement Policy Framework, Indigenous People’s Plan, Land Acquisition Plan, etc.)
- Annex 7 Summary of consultations and stakeholder engagement plan
- Annex 8 Gender assessment and project/programme-level action plan [\(template provided\)](#)
- Annex 9 Legal due diligence (regulation, taxation and insurance)
- Annex 10 Procurement plan [\(template provided\)](#)
- Annex 11 Monitoring and evaluation plan [\(template provided\)](#)
- Annex 12 AE fee request [\(template provided\)](#)
- Annex 13 Co-financing commitment letter, if applicable [\(template provided\)](#)
- Annex 14 Term sheet including a detailed disbursement schedule and, if applicable, repayment schedule

H.2. Other annexes as applicable

- Annex 15 Evidence of internal approval [\(template provided\)](#)
- Annex 16 Map(s) indicating the location of proposed interventions
- Annex 17 Multi-country project/programme information [\(template provided\)](#)
- Annex 18 Appraisal, due diligence or evaluation report for proposals based on up-scaling or replicating a pilot project
- Annex 19 Procedures for controlling procurement by third parties or executing entities undertaking projects financed by the entity
- Annex 20 First level AML/CFT (KYC) assessment
- Annex 21 Operations manual (Operations and maintenance)
- Annex x Other references

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*



Deputy Minister

Havana, June 11, 2019

Yannick Glemarec,
Executive Director, The Green Climate Fund ("GCF")

Re: Funding proposal for the GCF by UNDP regarding "Coastal Adaptation to Climate Change in Cuba through Ecosystem Based Adaptation – MI COSTA"

Dear Sir:

We refer to the project "Coastal Adaptation to Climate Change in Cuba through Ecosystem Based Adaptation – MI COSTA" in Cuba as included in the funding proposal submitted by UNDP to us on June 10, 2019.

The undersigned is the duly authorized representative of the National Designated Authority of Cuba.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no-objection to the project "Coastal Adaptation to Climate Change in Cuba through Ecosystem Based Adaptation – MI COSTA" as included in the funding proposal.

By communicating our no-objection, it is implied that:

- (a) The government of Cuba has no-objection to the project "Coastal Adaptation to Climate Change in Cuba through Ecosystem Based Adaptation – MI COSTA" as included in the funding proposal;

- (b) The project "Coastal Adaptation to Climate Change in Cuba through Ecosystem Based Adaptation – MI COSTA" as included in the funding proposal is in conformity with Cuba's national priorities, strategies and plans;
- (c) In accordance with the GCF's environmental and social safeguards, the project "Coastal Adaptation to Climate Change in Cuba through Ecosystem Based Adaptation – MI COSTA" as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process for ascertaining no-objection to the project "Coastal Adaptation to Climate Change in Cuba through Ecosystem Based Adaptation – MI COSTA" as included in the funding proposal has been duly followed.

We also confirm that our no-objection applies to all projects or activities to be implemented within the scope of the project.

We acknowledge that this letter will be made publicly available on the GCF website.

Kind regards,



Jose Fidel Santana Nuñez

Environmental and social safeguards report form pursuant to para. 17 of the IDP

Basic project or programme information	
Project or programme title	Coastal Resilience to Climate Change in Cuba through Ecosystem Based Adaptation – “MI COSTA”
Existence of subproject(s) to be identified after GCF Board approval	No
Sector (public or private)	Public
Accredited entity	United Nations Development Programme (UNDP)
Environmental and social safeguards (ESS) category	Category B
Location – specific location(s) of project or target country or location(s) of programme	<p>Republic of Cuba: The Activities under Output 1 will be implemented in seven specific sites in the areas of 1) La Coloma; 2) El Cajío; 3) Surgidero de Batabanó; 4) Júcaro; 5) Santa Cruz del Sur; 6) Manzanillo and 7) Playa Florida.</p> <p>The Activities under Output 2 will be targeted at 24 municipalities 1) San Juan y Martinez, 2) San Luis, 3) Pinar del Rio, 4) Consolidacion del Sur, 5) Los Palacios, 6) San Cristobal, 7) Candelaria, 8) Artemisa, 9) Alquizar, 10) Guira de Melena, 11) Batabano, 12) Melena del Sur, 13) Guines, 14) Venezuela, 15) Baragua, 16) Florida, 17) Vertientes, 18) Santa Cruz del Sur, 19) Amancio Rodriguez, 20) Colombia, 21) Jobabo, 22) Rio Cauto, 23) Yara and 24) Manzanillo.</p>
Environmental and Social Impact Assessment (ESIA) (if applicable)	
Date of disclosure on accredited entity’s website	Tuesday, February 4, 2021
Language(s) of disclosure	English and Spanish
Explanation on language	Spanish is the official language of Cuba and is the language spoken at the project’s target sites.
Link to disclosure	https://www.cu.undp.org/content/cuba/es/home/presscenter/articles/2019/micosyaInformeGestAmbientaSocialIGAS.html
Other link(s)	Government of Cuba “Financiamiento Climatico” Portal: http://financiamientoclimatico.cubaenergia.cu/index.php/descargas
Remarks	An ESIA consistent with the requirements for a Category B project is contained in the project’s “Environmental and Social Assessment Report (ESAR)”.
Environmental and Social Management Plan (ESMP) (if applicable)	
Date of disclosure on accredited entity’s website	Thursday, February 4, 2021
Language(s) of disclosure	English and Spanish
Explanation on language	Spanish is the official language of Cuba and is the language spoken at the project’s target sites.

Link to disclosure	https://www.cu.undp.org/content/cuba/es/home/presscenter/articles/2019/micosyaInformeGestAmbientaSocialIGAS.html
Other link(s)	Government of Cuba "Financiamiento Climatico" Portal: http://financiamientoclimatico.cubaenergia.cu/index.php/descargas
Remarks	An ESMP consistent with the requirements for a Category B project is contained in the "Environmental and Social Assessment Report (ESAR)".
Environmental and Social Management (ESMS) (if applicable)	
Date of disclosure on accredited entity's website	N/A
Language(s) of disclosure	N/A
Explanation on language	N/A
Link to disclosure	N/A
Other link(s)	N/A
Remarks	N/A
Any other relevant ESS reports, e.g. Resettlement Action Plan (RAP), Resettlement Policy Framework (RPF), Indigenous Peoples Plan (IPP), IPP Framework (if applicable)	
Description of report/disclosure on accredited entity's website	Stakeholder Engagement Plan and Gender Action Analysis were disclosed on Monday, February 8, 2021
Language(s) of disclosure	English (February 8, 2021) and Spanish (February 15, 2021)
Explanation on language	The Stakeholder Engagement Plan and Gender Action Analysis have been drafted in English and have been disclosed. Translation of both documents in Spanish is in process and will be completed by February 15. They will be posted in Spanish as well.
Link to disclosure	UNDP Cuba Country Office Website: https://www.cu.undp.org/content/cuba/es/home/presscenter/articles/2019/micosyaInformeGestAmbientaSocialIGAS.html
Other link(s)	Government of Cuba "Financiamiento Climatico" Portal: http://financiamientoclimatico.cubaenergia.cu/index.php/descargas
Remarks	N/A
Disclosure in locations convenient to affected peoples (stakeholders)	
Date	Monday, February 15, 2021
Place	The Ministry of Science, Technology and Environment (CITMA) has prepared a letter that to be sent on February 10, 2021 to the project's Territorial Delegations alerting them of the project documents included within the websites with the instruction to make these accessible (ESAR, Stakeholder Engagement Plan, Gender Action Plan and Analysis) via relevant channels to local communities and stakeholders, including through the popular councils. Physical copies of the documents in Spanish will be provided to the Territorial Delegations on February 15, 2021.

	UNDP has also disclosed the location of the project's ESAR, Stakeholder Engagement Plan and Gender Action Plan via its Facebook page: https://m.facebook.com/story.php?story_fbid=3215568675210158&id=740315822735468
Date of Board meeting in which the FP is intended to be considered	
Date of accredited entity's Board meeting	N/A
Date of GCF's Board meeting	Tuesday, March 16, 2021

Note: This form was prepared by the accredited entity stated above.

Secretariat's assessment of FP157

Proposal name:	Coastal Resilience to Climate Change in Cuba through Ecosystem Based Adaptation - "MI COSTA"
Accredited entity:	United Nations Development Programme (UNDP)
Country/(ies):	Republic of Cuba
Project/programme size:	Small

I. Overall assessment of the Secretariat

- The funding proposal is presented to the Board for consideration with the following remarks.

Strengths	Points of caution
<p>The funding proposal's comprehensive set of ecosystem-based adaptation (EbA) interventions to increase resilience of coastal wetlands and nearshore marine ecosystems draws on the lessons learned through the Adaptation Fund project "Manglar Vivo". It includes the restoration of freshwater flows to areas of mangrove restoration. The proposed project also uses the technical capacities of Cuban specialists and local communities to build a participatory monitoring process that measures the impact of the interventions on freshwater and marine ecosystem functions and adapts management practices according to measured results.</p>	<p>The integrated set of EbA interventions is based on scientifically supported best practices. Ecosystem science, however, is unable to independently quantify the marginal benefit of each intervention. Considering the climate impact facing the targeted coastal communities from coastal flooding, saline intrusion and storms, the project's EbA approach is superior to the existing grey infrastructure and is the most appropriate alternative to ensure coastal resilience. However, evidence of the additional climate resilience delivered in practice to coastal communities from the scale of ecosystem restoration to be undertaken in this project is limited.</p>
<p>In the base case, the net present value of the proposed intervention is estimated to be USD 72 million with an internal rate of return of 21.1%, demonstrating the overall economic efficiency of the proposed investment project.</p>	<p>Cuba's limited foreign exchange earnings is one of the principal barriers preventing the Government of Cuba from acquiring the equipment that is essential for coastal EbA. Private insurance instruments are also not available in Cuba. GCF involvement will make it possible for Cuba to purchase equipment and gain access to international expertise in this area. Whether this is appropriate justification for this approach, absent potentially more efficient private sector instruments for achieving the same objectives, is outside the scope of this technical review.</p>

	Changes in monetary policy may affect the cost of goods and services in Cuba, which are difficult to predict. Contingencies have been included for the cost of goods and services procured in Cuba (38% of the GCF budget), which would only be released if the rise in prices for items listed in the GCF budget for GCF proceeds exceeds a predetermined threshold.
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2. The Board may wish to consider approving this funding proposal with the terms and conditions listed in the respective term sheet and addendum XVII, titled “List of proposed conditions and recommendations”.

II. Summary of the Secretariat’s assessment

2.1 Project background and climate rationale

3. The proposed project will enhance the adaptive capacity of Cuba’s southern coastline to the increasing frequency and intensity of hurricanes caused by climate change by holistically rehabilitating coastal land and seascapes and their interlinked ecosystems and hydrology. This will be achieved by rehabilitating ecosystem functions and connections within mangroves and swamp forests and reducing anthropic pressures on marine coastal ecosystems, thus enhancing the services supplied by integrated coastal ecosystems (in particular protection from saline flooding and erosion, and channelling freshwater to coastal areas and aquifers). It will also strengthen the adaptive capabilities of coastal governments and communities by building their capacity to utilize and understand the benefits of ecosystem-based adaptation (EbA), enhancing information flow between stakeholders and strengthening the regulatory framework for territorial management in coastal areas.

4. The project will restore 11,427 ha of mangroves, 3,088 ha of swamp forest and 928 ha of grass swamp, which in turn will improve the ecosystem health of 9,287 ha of seagrass beds and 134 km of coral reef crests. Together, these ecosystems will provide protection and regulation services along the targeted coastline. Climate change adaptation and EbA training of trainers will target national and local decision-makers, teachers, economic sector leaders and local communities, with the aim of providing training to 60 per cent of the population within the targeted municipalities. A knowledge dissemination platform building community understanding and participation will strengthen regulatory frameworks and allow for continuous feedback to and from the communities to technical organizations and national and local governments.

5. The table below provides a breakdown of the project financing streams and uses of funding.

Table: Project financing

Source	Amount (USD)	Use	Amount (USD)
GCF	23 927 294	Rehabilitation of coastal ecosystems	32 502 765
MINAG^a	16 242 488	Mainstreaming of ecosystem-based adaptation, and capacity-building of communities and institutions	9 436 227

CITMA^b	2 696 376	Project management costs	2 360 237
INRH^c	1 435 071		
Total	44 299 229		

^a Ministry of Agriculture.

^b Ministry of Science, Technology and Environment.

^c National Water Resources Institute.

2.2 Component-by-component analysis

Component 1: Rehabilitated coastal ecosystems for enhanced coping capacity to manage climate impacts (total cost: USD 32.5 million; GCF cost: USD 14.9 million, or 45.7 per cent).

6. Component 1 will focus on rehabilitating the structure and functionalities of coastal wetlands along the wider marine coastal landscape to address projected impacts along coastal zones as a consequence of relative sea level rise (coastal flooding and saline intrusion) and extreme events (increased erosion and coastal flooding) caused by climate change. The interactions of the four activities in this component will enable the project to effectively implement an EbA strategy.
7. Activity 1.1 will monitor the baseline functions of coastal wetlands and allow continuous changes in function to be tracked during project implementation. It will re-establish the hydrological processes within coastal ecosystems by using GCF-funded agricultural equipment provided to forestry agencies to clean water channels and restore the ecological flow of freshwater towards the mangrove ecosystems. Invasive species in mangroves, swamp forests and grassland will be removed and managed. These actions will improve the coping capacity of the ecosystems to coastal flooding, climate extremes and saline intrusion.
8. Activity 1.2 will rehabilitate ecosystem functions in 15,443 ha of degraded coastal wetlands through natural and assisted regeneration of mangroves, swamp forests and grassland at targeted sites. This activity, together with the actions included in activity 1.1, will directly improve the coping capacity of coastal wetlands to flooding (by increasing sediment trapping, increasing the health of the ecosystems and re-establishing seaward species that have been lost), climate extremes (by strengthening the coastal system green structure and reconstructing its protective role with red mangroves) and saline intrusion (by restoring water and infiltration capacity).
9. Activity 1.3 will assess and record the restored functional relationships between coastal and marine ecosystems affected by sediment loads, nutrients, and domestic and industrial contamination from fisheries, food and pesticides industries. This activity follows recognized best practices for effective recovery of marine ecosystems that have shown to recover once degradation drivers are managed. The results from this activity will provide practical and scientific information that will allow its replication at the national and regional levels and strengthen the global argument for EbA in coastal systems. It will also involve communities to create participatory awareness of the protective role of marine ecosystems through monitoring.
10. Activity 1.4 will enable the implementation of a monitoring programme for the identification of catchment areas, rainwater catchments, and salt-wedge advance and retreat processes that will improve guidance linking local adaptation actions to control saline intrusion. GCF funds will be used to purchase and deploy monitoring systems that will allow the development of hydrological models enabling project managers to ensure that the required

quantity and quality of water drains into coastal ecosystems. This is particularly important because swamp forests are key instruments for aquifer recharge during long periods of drought.

Component 2: Increased technical and institutional capacity for climate change adaptation in coastal communities, governments and economic sectors (total cost: USD 9.4 million; GCF cost: USD 7.9 million, or 83.9 per cent).

11. This component will focus on working with vulnerable coastal communities and economic sectors to mainstream EbA actions and information into community-based adaptation measures, while working to enhance local and national governance mechanisms within the framework of the Tarea Vida national plan to manage climate change. It will address key barriers related to information access and lack of capacity for adaptation, and will create opportunities for intersectoral coordination to ensure that EbA investments are appropriated by communities and become institutionalized through a legal framework and mechanisms to allow for their long-term sustainability.

12. This component will strengthen sectoral and municipal regulatory frameworks for the mainstreaming of EbA approaches based on ecosystem data derived from component 1, which will be included in local development, land-use planning, and disaster risk reduction and zoning plans, ensuring appropriate EbA actions at the local level, and promoting a bottom-up approach for EbA initiatives. It comprises the following three activities.

13. Activity 2.1 will focus on training communities as active agents by designing appropriate training content, enhancing the capacity of existing capacity-building centres in each municipality which will act as training centres, and will implement the capacity-building programme for 60 per cent of the population of the target municipalities.

14. Activity 2.2 will integrate project-derived information, as well as information from early warning systems (EWS) and national data sets, into the Knowledge Management Platform for Climate Adaptation (KMPCA), generating climate information products to monitor, evaluate and inform coastal communities on the local capacity of communities and ecosystems to manage climate change impacts. Through its environmental monitoring at the community level, the project will provide contextual information to enhance EWS on climate impacts through an assessment of coastal resilience to enhance disaster risk knowledge. This will be done by incorporating ecosystem capacity to manage climate threats and better assess vulnerability, thus relying on a two-directional flow of information between communities and the KMPCA. This activity will require technical assistance to integrate several databases, train communities on environmental monitoring and create user-driven information products, including a protocol for the assessment of coastal resilience, environmental information for coastal adaptation (environmental modules on EbA) and community-based EWS. These information products will be prepared locally, supported by national entities such as the Cuban Meteorological Institute (INSMET), with the aim of improving disaster risk reduction, natural resources management and EWS and thus enhancing adaptation to climate change.

15. Lastly, activity 2.3 will support the mainstreaming of EbA approaches into regulatory and land-planning frameworks at the territorial and national levels, as well as the introduction of financial mechanisms for the long-term sustainability of EbA conditions and investments for coastal protection. It will address the critical barrier of inter-agency coordination that is typical among EbA projects. Technical standards and guidelines, which are necessary criteria for restoring the functionality of coastal ecosystems for coastal protection, and instructions on how to maintain such functionality will be created as a basis for the integration of EbA approaches into municipal and national actions and budgets and as key instruments for governments in water management planning. As the project's exit strategy relies on financing from the public sector, it is essential that the project pays close attention to the implementation of best practices for integrating financial mechanisms and financial planning strategies, such as forecast-based financing.

III. Assessment of performance against investment criteria

3.1 Impact potential

Scale: High

16. The core objective of the proposed project is to protect and restore coastal ecosystems in Cuba, providing critical ecosystem services for vulnerable people on Cuba's hurricane-prone south coast. The funding proposal estimates that the project will be able to restore 11,427 ha of mangroves, 3,088 ha of swamp forest and 928 ha of grass swamp, which in turn will improve the ecosystem health of 9,287 ha of seagrass beds and 134 km of coral reef crests. This will provide protection and regulation services that will directly increase the resilience of 1,324,114 total beneficiaries (11 per cent of the population) in the 24 target municipalities against coastal erosion, flooding and saline intrusion. The 444,793 direct beneficiaries will gain knowledge of EbA solutions to manage local impacts of climate change. These beneficiaries will be active agents in the community-based implementation, monitoring and maintenance of the proposed intervention. Economic losses are expected to be reduced by USD 17.8 million by the end of the project and by USD 44.5 million in the long term (over 15 years from the start of project implementation). The significant impacts expected in relation to both livelihoods and ecosystems justify the "high" rating for the programme's impact potential. In addition, research suggests that the protection of coastal and marine ecosystems such as mangroves, marshes, seagrass beds and seaweed may have a significant effect on reducing emissions from land use, although this impact has not been quantified.

3.2 Paradigm shift potential

Scale: Medium-High

17. The project will enable two key changes to the way in which coastal resilience is conceived. The first is a change from traditional disaster risk management to a holistic approach maximizing the value of ecosystems, in line with national adaptation planning. The second is a change from a traditional reactive approach with communities as passive stakeholders to a preventive approach where communities are informed active agents of coastal and disaster risk management.

18. The project has been designed taking into account the characteristics of Cuba's economy, which places limitations on private sector engagement, and the country's capacity to procure technology from abroad. As a result, the profile of the project has some differences from that of a typical GCF project.

19. First, a substantial portion of the GCF budget is dedicated towards highly specialized scientific equipment, vehicles and spare parts that Cuba has otherwise few opportunities to acquire. These tools, combined with Cuba's significant expertise in operating and maintaining the equipment, provide confidence that results can be maintained long after project completion.

20. Secondly, the project's exit strategy does not contemplate the private sector taking a significant role in the maintenance of the restored ecosystems. Rather, the project will leverage Cuba's strong community-level engagement and the capacity of its public institutions, including local governments and research centres.

21. Replication of the project will be facilitated by the adoption of a legal framework for EbA that will favour an evidence-based replication and scaling of the project through the removal of barriers that currently limit the implementation of EbA. The project will generate valuable evidence to guide the implementation of EbA in the country, including measures to better quantify the coping capacity of an integrated landscape of ecosystems, such as: (i) the estimation of coral reef and seagrass recovery time once hydrological rehabilitation in the associated ecosystems has taken place; (ii) the estimation of mangrove resistance to extreme events and shifting precipitation patterns and their recovery time; (iii) the estimation of the

morphological effects of the integrated recovered ecosystems to withstand sea level rise; and (iv) the estimation of their combined effects in reducing the coastal risks of rehabilitating the natural infrastructure.

22. The combination of a solid community-based approach with the involvement of public institutions and the focus on learning and evidence-based decision-making, supported by the development of an overall legal framework for EbA, justify the “medium–high” rating in terms of paradigm shift potential.

3.3 Sustainable development potential

Scale: High

23. The proposed project will promote the conservation and restoration of over 15,000 ha of valuable and biodiverse coastal ecosystems, as well as the preservation of 9,287 ha of seagrass beds and 134 km of coral reef crests. In addition to protection against climate change impacts, it is expected that the project will deliver major benefits in terms of the preservation of ecosystems and the associated biodiversity and will preserve water flows, and water and soil quality from climate change and other impacts and increase groundwater recharge. It will also deliver significant mitigation co-benefits, capturing approximately 94,844 tonnes of carbon dioxide equivalent per year.

24. The preservation of ecosystem services has wide benefits across the multiple dimensions of sustainable development. The project will deliver positive impacts on fisheries restoration, increase the availability of non-timber products and result in sustained agricultural production. Co-benefits for health and well-being include improved air and water quality, increased coastal recreational spaces, restoration of ecological cultural heritage and greater availability of traditional medicinal products. In addition to ecosystem services, savings from disaster recovery (estimated at USD 97–278 million per disaster) should be increasingly relevant for communities and the Government of Cuba in the context of the increasing frequency and intensity of hurricanes in the Caribbean region. Although these benefits have not been quantified owing to the fact that specific interventions are yet to be defined, there is high confidence that they should be very relevant.

3.4 Needs of the recipient

Scale: Medium–High

25. The programme targets a small island developing State with high vulnerability to climate change and which ranks relatively high on the Notre Dame Global Adaptation Initiative (ND-GAIN) index that measures country readiness and vulnerability, with a particularly high score in relation to vulnerability to sea level rise.

26. The capacity of Cuba to adapt to climate change is mainly limited by two factors as a result of international socioeconomic circumstances, namely lack of finance and lack of access to technology. The project will provide much-needed transfer of technologies and best practices to a country with strong skills in the areas of communities and institutions, including spare parts to guarantee the maintenance of equipment after project completion, and will contribute to covering the financing gap.

27. Cuban institutions, while generally solid in terms of technical capacity and community-level reach, frequently work in siloes, whereas the implementation of EbA approaches fundamentally requires the coordination of administration among different sectors. The GCF intervention will provide assistance to bridge that gap.

3.5 Country ownership

Scale: High

28. Country ownership by the Government of Cuba, national institutions and, most importantly, communities, is at the core of the project design, which perceives beneficiaries as active agents for the conservation and restoration of coastal ecosystems.

29. The Government of Cuba has actively participated in the project design, ensuring alignment with relevant policies and plans, including the National Environmental Strategy 2016–2020, directives for tackling climate change (2016), nationally determined contributions and the GCF country programme. The project complements and, in some cases, sets the baseline for the implementation of the Government’s Tarea Vida national plan to manage climate change adopted in 2017, which highlights coastal areas in imminent danger as a national priority and favours EbA approaches to tackle climate change.

30. The Government of Cuba’s commitment to the project is further highlighted by its substantial contribution in grant and in-kind resources (over USD 20 million) to the project.

3.6 Efficiency and effectiveness

Scale: Medium–High

31. Existing studies agree that EbA interventions are highly cost-effective solutions in increasing the resilience of populations while delivering significant social and environmental co-benefits. The programme expects to deliver high value for money, improving the resilience of over 1.3 million people while preserving and restoring over 15,000 ha of highly biodiverse coastal ecosystems through the GCF grant of USD 23.9 million.

32. The use of grants and funding is considered adequate in this case considering Cuba’s unique socioeconomic situation and limitations. The project interventions will generally not be able to generate substantial reflows and are aimed at increasing the resilience of the most vulnerable communities. Likewise, Cuba’s barriers to accessing technology make it necessary to procure a large amount of equipment and spare parts. GCF has engaged extensively with the United Nations Development Programme (UNDP) to ensure that efficiencies are sought where possible and all inputs contribute to the project’s outcome through a robust theory of change.

33. Cuban institutions, including the Ministry of Agriculture (MINAG), will contribute substantial co-financing, largely in the form of grants, with a value of USD 20.37 million, approximately USD 0.85 for each United States dollar provided by GCF. Upcoming changes in Cuba’s monetary policy have been taken into account in the preparation of the funding proposal and adequately budgeted for, but may result in changes in the value of goods and services. In order to mitigate the risks associated with the purchasing power of GCF proceeds, the GCF Secretariat and UNDP have agreed on including a total of USD 0.63 million in contingencies, which would be released only if the rise in prices for items in the budget for GCF proceeds exceeds a predetermined threshold.

34. The project has a high economic internal rate of return (EIRR) of 21.1 per cent, with long-term benefits far exceeding the initial investment, thereby providing confidence that the intervention will be sustained.

IV. Assessment of consistency with GCF safeguards and policies

4.1 Environmental and social safeguards

35. The project will involve the rehabilitation of coastal ecosystems and the capacity-building of the beneficiaries and government institutions to improve coping capacities in relation to coastal flooding, climate extremes and saline intrusion. The activities will include: (i) re-establishing/restoring the hydrological processes of wetlands through waterways restoration/clearing; (ii) rehabilitating mangrove and swamp forest/grassland; (iii) improving

freshwater aquifer recharge through dams, channels and infiltration wells; and (iv) effectively managing coastal ecosystems through scientific monitoring of key ecosystem indicators. These ground-based interventions will be undertaken in seven target sites within two coastal stretches, namely: (i) from La Coloma to Surgidero de Batabanó; and (ii) from Júcaro to Manzanillo, encompassing 2.8 million ha of land and marine areas. The project will be implemented by the Environmental Agency (AMA) of the Ministry of Science, Technology and Environment (CITMA) and the Cuban branch of the Latin American Faculty of Social Sciences (FLACSO Cuba). The accredited entity (AE) has assessed the project to be of moderate risk, which is equivalent to category B¹ under the GCF risk categorization system. The Secretariat agrees with this categorization since although the project would be located in natural habitat areas, the interventions are aimed at rehabilitating and enhancing the functions of the ecosystem services. The potential adverse environmental and social risks and/or impacts of the project interventions are therefore of low probability, highly localized and can be readily addressed by standard mitigation and management measures. The Secretariat confirms that the project is within the environmental and social risk level to which the AE is accredited.

36. **Environmental and social safeguards (ESS) instruments.** The project underwent the social and environmental screening procedure and environmental and social assessment (ESA) of the AE. The ESA report includes an environmental and social management plan (ESMP) and a multi-tiered grievance redress mechanism. A separate stakeholder consultation report and engagement plan have also been prepared.

37. **Compliance with GCF ESS standards.** Paragraphs 37–47 below summarize the key risks and impacts in relation to the GCF ESS standards and how they have been addressed in the proposal.

38. **ESS 1: Assessment and management of environmental and social risks and impacts.** The project proposal underwent the social and environmental screening procedure and ESA process of the AE. An ESA report has been submitted. The ESA report has identified the seven target sites and the interventions that would be undertaken on each of those sites and has assessed the risks and potential impacts associated with those interventions. The ESA report includes an ESMP, which provides generic management and mitigation measures for the risks and potential impacts of the various ground-based interventions at the project sites. More specific mitigation and management measures will be identified during project implementation. The site-specific interventions will be subject to at least six key steps/processes, namely: (i) contracts of works shall include clauses on environmental and social requirements, including preparation of an ESMP; (ii) preparation/issuance of environmental procedures, instructions and plans for construction works; (iii) environmental incident reporting; (iv) daily and weekly environmental inspection checklists; (v) corrective actions for any non-conformance with the above procedures; and (vi) review and auditing of the above procedures.

39. **ESS 2: Labour and working conditions.** The project implementing units are likely to engage a few staff, researchers, aides and labourers, while small-scale civil works at the project sites would potentially involve a few workers and labourers. The ESA report includes an analysis of the national legislation related to labour conditions and the prevailing labour practices in the country, which found that these are sufficient to address potential occupational health and safety concerns, as well as to guarantee appropriate labour and working conditions. The standard environmental clauses for contracts of works will also include provisions for workers' occupational health and safety.

40. **ESS 3: Resource efficiency and pollution prevention.** There is a potential for temporary and localized contamination of water channels in the form of increased turbidity,

¹ As per annex I to decision B.07/02 (annex I to document GCF/B.07/11), category B is defined as “Activities with potential mild adverse environmental and/or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures”.

sedimentation and silting from minor civil works. This will be addressed by developing and implementing an erosion drainage and sediment control plan for any surface works, excavation work, water crossings and storm water pathways. The plan would include minimizing cleared areas, installing erosion and sediment control devices, properly disposing or using topsoil, and stockpiling excavated materials away from waterways. The use of infiltration wells, which is intended to prevent saline intrusion into the aquifer, may also have inadvertent effects or changes on the groundwater and coastal aquifer. Management measures for addressing surface and groundwater quality concerns have been identified in the ESMP. The groundwater quality will be monitored and assessed every two months as part of the operation of boreholes.

41. **ESS 4: Community health, safety and security.** The restoration of the ecosystem functions of coastal areas will provide health and safety benefits to the local communities. However, there is a small possibility of adverse impacts on the health and safety of local communities due to possible short-term contamination of waterways during construction works. There is also a risk of an increase in waterborne diseases due to changes in the wetlands ecosystem. The ESA report provides baseline information on the prevalence of waterborne diseases. The existing community health systems available in the project area are deemed sufficient to address any health and safety issues arising from the project. The Ministry of Health has in place programmes for the prevention of diseases caused by water pollution wherein water quality is monitored through the network of water quality and hydrogeological monitoring stations that include the project sites. The project will also conduct awareness-raising and education campaigns on the risk of waterborne diseases and will require contractors to strictly control the formation of standing water and accumulation of construction wastes so as not to cause breeding and propagation of pests and disease vectors.

42. **ESS 5: Land acquisition and involuntary resettlement.** The ESA report has determined that there will be no economic displacement, either temporary or permanent, during the implementation of the project as the interventions will all be undertaken in government-owned lands, including protected areas. The activities related to the project interventions will be carried out in forest areas which are administered by the agroforestry companies of the respective provinces and are under a socialist State property regime. The presence of informal occupants or invasions of the public space where the wetlands and mangrove areas are located was not identified during the consultations carried out as part of the formulation of the project.

43. **ESS 6: Biodiversity conservation and sustainable management of living natural resources.** There is a possibility of an inadvertent introduction of invasive species in the rehabilitation of wetlands and mangrove areas. During construction activities, invasive species (either planted or already existing in the ecosystem) may proliferate and colonize areas more quickly than the native species. There is also a risk that the rehabilitation and restoration of ecosystem functions may instead adversely affect critical natural habitats or compromise existing protected areas. These risks have been adequately addressed in the ESMP. For protected areas, activities will be developed under an approved management plan. The ESMP will take into consideration the potential spread of weeds through erosion and sediment entering any waterways. The project will also revegetate disturbed areas using only native species.

44. **GCF Indigenous Peoples Policy and ESS 7: indigenous peoples.** The AE provides for the screening of indigenous peoples in the ESA report and has determined that there are no indigenous peoples in Cuba. In any case, the project scope and activities pose minimal risks in relation to indigenous peoples issues.

45. **ESS 8: Cultural heritage.** The screening conducted indicates that the project will not adversely affect any cultural heritage structures or sites. The ESA report has identified potential sensitive areas located in cultural heritage sites within the project influence areas but none of those sites will be directly affected by the project. In the case of the discovery of archaeological

sites and other objects of cultural and historical interests that may become apparent during project implementation, contractors are required to follow certain procedures, as set out in the environmental clauses of the contract agreements, including immediate cessation of work in the area, notification of the contracting officer and securing of the site and/or objects.

46. **Implementation arrangements.** As the implementing agency, AMA, which is part of CITMA, will be responsible for the implementation of the ESMP via the delivery organizations (e.g. contractors). Both the AE and AMA will provide overall oversight of environmental and social issues and environmental and social monitoring and reporting. A safeguards manager will also be nominated at the respective national- and State-level project management units. A field officer will be responsible for day-to-day inspections at the project sites and will provide technical expertise on environmental management. As required, an independent review of the project's compliance with environmental and social parameters may also be undertaken.

47. **Stakeholder engagement and grievance redress mechanism.** The project design has undergone extensive stakeholder consultations and a stakeholder consultation report and stakeholder engagement plan have been prepared. National and local consultations have been held involving representatives from institutions from the following sectors, among others: farming, forestry, food (fisheries), water resources management, urban planning, education, public health, science, technology, conservation management, civil defence, finance, economy and planning, construction, tourism, environmental management, civil society organizations, and regulatory and enforcement authorities (e.g. the Forest Rangers Corps). Various government officials have also been consulted at the provincial and municipal levels, including through meetings with the communities located in the project intervention areas.

48. The ESA report contains a sufficiently detailed description of a multi-tiered grievance redress mechanism at the project level (first tier), within the grievance committee at the provincial level (second tier), and within the accountability mechanism of the AE and existing nationally legislated frameworks (third tier). The safeguards manager in the respective programme management unit will be designated as the key officer in charge of the grievance redress mechanism.

4.2 Gender policy

49. The AE has provided a gender assessment and gender action plan and therefore complies with the requirements of the GCF Gender Policy.

50. The gender assessment provided by the AE describes the enabling environment and legal and institutional framework that provide the context for the promotion of gender equality and women's empowerment in Cuba. Cuba is a signatory to the Convention on the Elimination of All Forms of Discrimination Against Women and other international agreements strengthening women's rights and gender equality. The Constitution of Cuba recognizes and guarantees that all persons receive the same protection and treatment from the authorities and enjoy the same rights, freedoms and opportunities, without any discrimination on grounds of sex, gender, sexual orientation or gender identity. Cuba's Economic and Social Development Plan 2030 is based on "human development, equity and social justice" and guarantees the rights and duties of all citizens with equality, inclusion and social justice. In spite of the policies, laws and development plans in place, in practice there remain cultural and social biases and institutional barriers to women's equality. Overall, the population that faces the most vulnerability is single-parent families with women at the head; the percentage of households headed by women stood at 44.9 per cent in 2012.

51. The gender assessment undertaken by the AE based on desk reviews and stakeholder consultations demonstrates that Cuba is performing well in terms of female representation in legislative work, despite gaps in the productive sectors. In certain sectors, the employment rate

for women is above or near equal to that for men. However, generally, Cuban women are not equally represented in decision-making in the private sector and remain underemployed and constrained by sociocultural barriers, reduced access to training and the burden of domestic and childcare responsibilities, which affect their employability and income. Further, many more men own land than women, and more men than women are members of and hold managerial positions in cooperatives. The lower level of participation of women is due to patriarchal norms and beliefs that recognize and value men's work, while undervaluing the role of women. Although the promotion of women in the agriculture sector has been encouraged and the national agricultural development plan includes a gender strategy, in practice women constitute a minority in productive agricultural work as well as in management positions, in addition to not being considered for certain activities such as the management of farms or the operation of agricultural machinery. This further limits access to and representation of women among more "technical" opportunities. Similarly, in the fisheries sector, while women represent 25 per cent of the workforce, they are engaged in the less well remunerated activities, contrary to men, the majority of whom participate in better remunerated activities (fishing and diving) and with better access to more valuable fisheries resources.

52. Women's participation in the fisheries sector is primarily related to the processing of catch, as well as to the activities of selling and exchanging of catch. Time poverty is another barrier for women that limits their ability to self-care, recreation and development initiatives. Women depend on mangroves in many ways, including for the collection of resources for traditional medicine and crafts, as a result of which they are more vulnerable to mangrove loss and saline intrusion. The latter affects their household and family care roles, which depend on access to a reliable source of clean water. In the forestry sector, women account for approximately 20 per cent of the workforce and while the number of women in decision-making positions is growing, they are still less represented than men. Although there are services and support for women who have been victims of gender-based violence, there are no specific laws regarding gender-based violence in Cuba. Interestingly however, evidence suggests that the number of deaths among women due to increased frequency and intensity of hurricanes and flooding is less than that among men in Cuba. However, women are still vulnerable to the longer-term impacts of climate change because of their more direct and limited access to and control of resources, economic vulnerability, and domestic and reproductive roles.

53. The AE has provided a gender action plan which complies with the requirements of the GCF Gender Policy. The gender action plan includes activities that address the challenges identified in the gender assessment, as well as baseline information, indicators, targets, timelines and budgets. The AE will hire an ESS specialist with expertise in gender mainstreaming to support and guide the activities within the gender action plan and mainstream them throughout the project. Although the AE has already carried out consultations with women and women's groups, it will undertake additional consultations and will collect baseline data to strengthen project activities and measure impact. The project has identified women-headed households, the elderly, young people and disabled persons as also being vulnerable. Activities within the gender action plan are designed to build the capacity of women through awareness-raising and training on climate change impacts and mitigation measures. The gender action plan includes targets to increase women's employment and livelihood opportunities and build capacity, as well as actions to support women's inclusion in decision-making both within the project itself and the institutions implementing the project. More specifically, the project will generate employment in the forestry and water resources sector, as well as in the organizational structures associated with the implementation of the project. It will also conduct training and education activities related to climate change, agriculture, fisheries, leadership and decision-making (including marine and coastal wetlands monitoring, EbA activities, and mangrove and forest rehabilitation). Women will also be included in the design of such EbA approaches and will be the target group for awareness-raising on climate-based information products, while being equally represented in the development of proposals for the

refinement and integration of gender into regulatory and planning frameworks for EbA approaches. These actions will ensure increased skills and roles for women, and will contribute towards their improved engagement in decision-making.

54. Although the AE has developed various mechanisms to respond to the challenges identified in the gender assessment, it is recommended that the AE strengthen the human resources available to implement the gender action plan, as well as to integrate sufficiently robust mechanisms to address gender-based violence within the grievance redress mechanism and other related actions.

4.3 Risks

4.3.1. Overall programme assessment (medium risk)

55. GCF is requested to provide a grant of USD 23.9 million, which will be invested in the rehabilitation of the coastal land and seascapes and their interlinked ecosystems and hydrology. Through the National Forest Development Fund (FONDAEF), MINAG will provide USD 16.2 million of co-financing. CITMA will provide USD 2.7 million of co-financing and the National Water Resources Institute (INRH) will provide USD 1.4 million as an in-kind contribution. The AE supports the full grant request owing to the nature of the project as a public good and the inability of the Government of Cuba to access hard currency for the international procurement of goods and services required for project implementation.

56. The role of the government is particularly crucial to the project. MINAG is committed to providing co-financing for a previously approved GCF project (FP126: Increased climate resilience of rural households and communities through the rehabilitation of production landscapes in selected localities of the Republic of Cuba (IRES)) and USD 16.2 million for this project during the overlapping implementation period. Given the sizeable amount of co-financing from the Government, the timely disbursement of co-financing is critical. In addition, the Government's capacity to integrate the data generated from the project for decision-making processes in water management and its willingness to incorporate the EbA approach are also critical to the sustainability of the project. Approximately 66 per cent of the total project budget will finance local costs, which may escalate owing to the recent exchange rate revision adopted by the Government.

4.3.2. Accredited entity/executing entity capability to execute the current programme (medium risk)

57. UNDP is the AE for the project. UNDP Cuba has been working in the country since 1975 and has gained experience in the area of coastal adaptation to climate change over 25 years with the Government of Cuba.

58. AMA, which is part of CITMA, is the executing entity (EE) for the project. The Deputy Minister of CITMA is appointed as a national designated authority of Cuba to GCF. The EE has a track record of implementing projects financed by a number of development partner agencies such as the Global Environment Facility, the European Union and the Commission on Sustainable Development. The AE has conducted a capacity assessment of the EE and concluded that the EE has a low level of risk in terms of its capacity.

4.3.3. Project-specific execution risks (medium risk)

59. As regards procurement and price risk, the AE has identified the potential increase in costs due to the embargo restriction and political situation as a risk. This could affect the procurement plan for the equipment for which GCF resources will be largely used. To minimize

the impact of fluctuating costs, the AE will provide support through access to long-term agreements, which include negotiated conditions for procurement with a pool of vendors and contractors. In addition, payment to international suppliers may be made in a currency other than United States dollars.

60. With respect to operation and maintenance (O&M), the GCF resources will be largely used to purchase equipment which is not currently accessible in Cuba and the co-financing from the Government of Cuba will be invested in the implementation, monitoring and O&M. There is a risk that the necessary spare parts or capacity might not be easily available beyond the project implementation period. According to the response provided by the AE, the Government will take into consideration the accessibility of O&M resources in the procurement process, so that the selection of equipment will require minimal replacement of spare parts and maintenance efforts.

61. In relation to co-financing and the potential increase in local prices, given the sizeable amount of co-financing from the Government, the GCF disbursement should be tied up with the commitment of the Government's co-financing. In addition, owing to the recent exchange rate revision by the Government, the local costs may escalate. The AE has identified this as a high probability risk. The project has readjusted its budget and co-financing amount in consultation with relevant ministries and converted to United States dollars using the January 2021 exchange rate. Approximately 66 per cent of the total project budget is for local expenditure and will be financed by co-financing from the Government and partly by GCF. To minimize the impact of price fluctuations, the AE will facilitate access to long-term agreements and procurement advisory services from the global and regional support units to minimize the impact of cost escalation in the project budget and resources. The project has undertaken an analysis to identify and incorporate within its budget estimated price increases related to national purchases. Based on these measures, the AE expects the impact of the risk to be reduced to low. In case of an unexpected additional increase in local prices, the co-financing based on the current exchange rate may be inadequate to support the project activities and the shortfall may affect the project's intended climate impact. Hence, the continued willingness of the Government to provide the necessary co-financing is critical to the success of the project.

62. With regard to project viability, the AE carried out an economic analysis, resulting in an EIRR of 21.1 per cent. The analysis considered the benefits of mangroves in terms of loss of assets along the coastlines of the targeted areas under a "with project" and "without project" scenario. The analysis includes an alternative scenario that considers the construction of seawalls for coastal protection instead of the EbA approach. The alternative scenario results in an EIRR of 6.4 per cent, which is below the 10 per cent threshold of the AE and close to an EIRR of 0 per cent in the sensitivity analysis that considered a 20 per cent increase in costs and a 20 per cent reduction in benefits. The comparison proves that EbA interventions are more efficient. As noted above, the viability of the project will also depend on the capacity of the Government for O&M.

4.3.4. Compliance risk (medium risk)

63. The recipient country, Cuba, is not subject to United Nations Security Council resolutions.

64. The AE will implement the project through AMA/CITMA acting as the EE. The AE determines that the EE represents a low risk with respect to risks of money-laundering, financing of terrorism, and prohibited practices.

65. The AE will manage the procurement of all imported products. The disbursement of cash and/or vouchers to the beneficiaries is not envisaged. Accordingly, the AE determines that the overall project poses a negligible risk for money-laundering, financing of terrorism, and prohibited practices.

66. The AE has established and implemented procedures for reporting allegations of misconduct. In addition, the AE implements a three-tier oversight and quality assurance procedure involving personnel at the country, regional and headquarters levels.

67. The Office of Risk Management and Compliance (ORMC)/Compliance Team has conducted a review of the project in accordance with relevant GCF Board approved policies and does not find any material issue or deviation with respect to compliance issues. Based on the available information for this funding proposal, the ORMC/Compliance Team has determined a risk rating of “medium” and has no objection to this request proceeding to the next steps for processing.

4.3.5. GCF portfolio concentration risk (low risk)

68. In the case of approval, the impact of this proposal on the GCF portfolio concentration in terms of results area and single proposal is not material.

4.3.6. Recommendation

69. It is recommended that the Board consider the above-mentioned factors in its decision on the funding proposal.

Summary risk assessment		Rationale
Overall programme	Medium	Cuba has recently adopted new exchange rules. The new rules may affect local prices. Approximately 66% of the project cost is spent in local currency. The accredited entity has proposed some measures to mitigate the potential impact on prices. However, an unexpected increase in local prices may render the co-financing based on the current exchange rate inadequate to cover the project activities. Consequently, the shortfall may affect the project’s intended climate impact. Hence, the continued willingness of the Government of Cuba to provide the necessary co-financing is critical to the success of the project.
Accredited entity/executing entity capability to implement the programme	Medium	
Project-specific execution	Medium	
GCF portfolio concentration	Low	
Compliance	Medium	

4.4 Fiduciary

70. UNDP, as an AE, will provide oversight and quality assurance in accordance with its policies and procedures and any specific requirements in the accreditation master agreement and project confirmation to be agreed with GCF. This may include, but is not limited to, monitoring missions, spot checks, facilitation and participation in project board meetings, quarterly progress and annual implementation reviews, and audits at the project level or at the implementing partner level on the resources received from UNDP.

71. The EE is AMA, which is part of CITMA. The Deputy Minister of CITMA is appointed as the national designated authority of Cuba to GCF. The national EE – also referred to as the national “implementing partner” in UNDP terminology – is required to implement the project in

compliance with UNDP rules and regulations, as well as UNDP Programme and Operations Policies and Procedures (POPP), including the National Implementation Modality guidelines.

72. In addition, the Government of Cuba has requested UNDP to provide direct project services for this project. UNDP and the Government of Cuba acknowledge and agree that those services are not mandatory and will be provided only upon the Government's request and as specified in the letter of agreement. When requested, as is the case for this project, the direct project services follow UNDP policies on the recovery of direct project costs relating to GCF-funded projects.

73. The project will be implemented following the National Implementation Modality in line with the UNDP POPP guidelines.

74. AMA has undergone a harmonized approach to cash transfer assessment by UNDP to assess its capacities for project implementation. The results derived from the assessment demonstrate that AMA has a general low level of risk, with criteria regarding flow of funds, organizational structure, internal and financial audits, reporting, and monitoring and information systems all being positively rated.

75. The financial management and procurement of the project will be guided by UNDP financial rules and regulations. Further guidance is outlined in the financial resources management section of the UNDP POPP web page, including the procurement policies in the "Contracts and Procurement" section.

76. All projects will be audited following the UNDP financial rules and regulations noted above and applicable audit guidelines and policies.

77. The project will be audited in accordance with UNDP policies and procedures on audits, informed by and together with any specific requirements agreed in the accreditation master agreement. According to its current audit policies, UNDP will appoint the auditors. In line with UNDP policies, scheduled audits are performed during the project cycle as per UNDP assurance/audit plans, based on the implementing partner's risk rating and UNDP guidelines.

78. A scheduled audit is used to determine whether the funds transferred to the implementing partner have been used for the appropriate purpose and in accordance with the workplan. A scheduled audit can consist of a financial audit or an internal control audit.

79. This assessment by the Secretariat is a draft assessment. A revised budget incorporating the reduced unit costs, information on how much of the GCF proceeds will be spent in local currency, and what the impacts are in real terms regarding possible currency fluctuations are still pending. The draft assessment will be revised once the required information has been submitted to the satisfaction of GCF.

4.5 Results monitoring and reporting

80. The project is an adaptation project aimed at improving costal resilience through EbA. It is expected to reach a total of 444,793 direct and 879,321 indirect beneficiaries. The AE has worked extensively with the Secretariat and has managed to develop a logical framework for the project in line with the GCF results management framework/performance measurement framework and the correct indicators to measure the project outcome and impact have been selected. Additionally, the project has designed adequate project performance indicators that allow the project results to be tracked.

81. The implementation timetable provided in annex 5 to the funding proposal is in line with the GCF requirements and contains the relevant milestones and deliverables.

4.6 Legal assessment

82. The accreditation master agreement was signed with the AE on 5 August 2016 and became effective on 23 November 2016.

83. The AE has provided a certificate confirming that it has obtained all internal approvals and has the capacity and authority to implement the project.

84. The proposed project will be implemented in Cuba, a country in which GCF is not provided with privileges and immunities. This means, among other things, that GCF is not protected against litigation or expropriation in this country, which risks need to be further assessed. The Secretariat sent a draft of the bilateral agreement on privileges and immunities to the national designated authority of Cuba on 12 December 2018. Discussions are still in progress, with the last communication from the national designated authority received in January 2019 and a follow-up email sent by the Secretariat in January 2019.

85. The Heads of the Independent Redress Mechanism and Independent Integrity Unit have both indicated that it would not be legally feasible to undertake their redress activities and/or investigations, as appropriate, in countries where GCF is not provided with relevant privileges and immunities. Therefore, it is recommended that disbursements by GCF are made only after GCF has obtained satisfactory protection against litigation and expropriation in the country, or has been provided with appropriate privileges and immunities.

86. In order to mitigate risk, it is recommended that any approval by the Board be made subject to the following conditions:

- (a) Signature of the funded activity agreement in a form and substance satisfactory to the Secretariat within 180 days from the date of Board approval; and
- (b) Completion of legal due diligence to the satisfaction of the Secretariat.

Independent Technical Advisory Panel's assessment of FP157

Proposal name:	Coastal Resilience to Climate Change in Cuba through Ecosystem Based Adaptation – "MI COSTA"
Accredited entity:	United Nations Development Programme (UNDP)
Country/(ies):	Republic of Cuba
Project/programme size:	Small

I. Assessment of the independent Technical Advisory Panel

1.1 Impact potential

Scale: High

1. Cuba is located in the Caribbean, which is a global hotspot for hurricane formation and subsequent landfall. The country is one of the small island developing States (SIDS). The island is elongated from east to west, and many of the important population hubs, including the capital city, are located on the southern coasts. An estimated 57 per cent of the population of the country live in coastal municipalities. The island, as in the case of other Caribbean islands, is subject to meteorological hazards such as hurricanes and associated storm surges and flooding. Moreover, it faces occasional droughts.

2. Due to a rise in sea surface temperature in recent decades, hurricane activity in the region has increased. There has also been a rise in the sea level along the coastal zones of Cuba, resulting in the salinization of aquifer systems and a decline in the availability of potable water. Moreover, gradual salinization has been adversely affecting crop agriculture. The worst effect of rising sea levels in an island State is found in the form of inland inundation of beachfronts, which erodes the remaining beachfronts and limits recreational and tourism activities in the beach areas affected.

3. In recent decades, hurricanes have struck Cuba's coasts with much increased intensity and frequency. Cuba was affected by 12 hurricanes between 2001 and 2017, 10 of which were category 4 or 5 (i.e. intense). In the past 10 years, the percentage of "intense hurricanes" affecting the country has risen from a historical average of 26 per cent to a staggering 78 per cent. This has caused a significant rise in the loss burden. The projection on beachfront inundation for category 1, 3 and 5 hurricanes is estimated at 192,990 ha, 310,950 ha and 440,540 ha, respectively. The rate of loss of beach due to inundation induced by sea level rise has been alarming.

4. The Government of Cuba has been keen on providing necessary support during post-hazard emergency periods and for rehabilitation of communities. The need for mobilization of hard currency, despite the country facing an economic embargo and isolation from global economies, has been increasing. Unless a solution is found, people will continue to struggle under climate change.

5. In addition to the increased hurricane activity induced by climate change, Cuba's coasts have experienced an increase in the occurrence of moderate to strong floods. These floods are associated with storm surges triggered by the combination of high wind speed and change in sea level. To add to this, warm Pacific El Niño events have led to an increase in extra-tropical storms, with associated risk of inundation of coastline, including the coastal municipalities of

Cuba. Although the 2050 scenario may appear far away today, a combination of sea level rise of about 30 cm and a category 5 hurricane could potentially wreak havoc in Cuba, with the flooding of an area of 19,935 km². Considering the frequency of occurrence of category 5 hurricanes and rising sea levels, one cannot rule out such possibilities.

6. Therefore, the population of Cuba needs support to build an effective hurricane defence so that municipalities will feel safer. Nature has offered protection services to Cuba's coastal population. Many municipalities are located behind mangrove belts. Such plants, by virtue of their physiology and vegetative properties, absorb the wind and dampen its speed at landfall, thereby offering vegetative protection along the coast. Moreover, healthy mangroves stand between sea surges and the hinterland, thereby significantly reducing the loss burden, and even reducing the death toll among the coastal population and livestock.

7. However, despite legal provisions against mangrove destruction, Cuba's mangroves have been experiencing continued destruction in recent decades due to anthropogenic activities. Institutional oversight and control have largely failed to reduce the rate of human-induced destruction of mangroves, in particular, red mangroves. With the degradation of mangrove protection along the coastal municipalities, the protective green belts are no longer capable of offering ecosystem-based services, which is why the loss burden from hurricane activities is increasing over time.

8. In the context of high-intensity hurricanes induced by climate change and the potential adverse effects due to storm surges and flooding, there is a need for immediate mangrove restoration and an alternate land-use plan around affected municipalities so that mangrove protection is integrated with other necessary planned approaches to resilience-building. However, central to such planned approaches should be ecosystem-based adaptation (EbA). This should be complemented by: adequate institutional strengthening; capacity-building at both institutional and community levels; a participatory mangrove protection and co-management scheme involving local communities; and a revision of policy and regulatory frameworks that would embrace EbA in future management programmes. Responding to such a holistic need, the proponents have identified the barriers to implementation of an EbA programme, and considered measures to address such barriers. This proposed project is a culmination of such information and analyses, which have been duly discussed in numerous participatory consultations and undergone vetting by the relevant authorities.

9. The proposal is for the EbA-focused project to be implemented over eight years, with a total estimated budget of USD 44.3 million. The accredited entity requests GCF support of USD 23.9 million in the form of grants. The project will directly benefit a total of 444,793 people involving 29 target coastal municipalities, clustered around two hotspot areas. A total of 11,427 ha of mangroves, 3,088 ha of swamp forest and 928 ha of grass swamp will be restored, which, in turn, will improve the health of 9,287 ha of seagrass beds and 134 km of coral reef crests. Together, these ecosystems will provide protection and regulation services along the targeted coastal stretches. The population likely to benefit from the project constitute some 11.7 per cent of the total population of the country. Such a share of potential beneficiaries makes the project quite interesting. In addition to the direct beneficiaries, the project will also indirectly benefit 879,321 people by offering a multitude of co-benefits.

10. The discussions above clearly indicate that the project's impact potential is high.

1.2 Paradigm shift potential

Scale: Medium to High

11. The funding proposal anticipates two major outputs: (i) enhanced coastal ecosystem services to better manage climate impacts; and (ii) promotion of a shift from a traditional reactive (disaster risk reduction) approach to a proactive planned approach. The latter approach is to be complemented by planning, institutional strengthening, and capacity-building.

While past pilots have confirmed that EbA has multifaceted beneficial impacts in terms of reducing adverse impacts of climate-induced effects, the second output highlights the potential for causing a shift from the current paradigm to embrace the new resilient paradigm by promoting ecosystem-centric holistic planning, people's participation, and institutional oversight and guidance.

12. The evidence from local pilots, including the recently completed Manglar Vivo project (financed by the Adaptation Fund), indicates that EbA is a cost-effective alternative to structural approaches for coastal protection against storm surge. Moreover, additional benefits likely to accrue from mangrove restoration are attractive enough to justify replication of coastal resilience-building efforts through mangrove restoration. Such restoration, along with institutional protection, offers low-cost, ecosystem-based measures to learn from and replicate within Cuba, and perhaps throughout the Caribbean islands where possible. Instead of locking in large amounts of financing, the replication will continue to lock in carbon through mangrove restoration, with a multitude of auxiliary beneficial effects, such as salinity control and enhancement of biodiversity in symbiotic relationships with mangroves.

13. The project activities will provide plenty of monitoring and calibration opportunities, which in turn will generate EbA-related data to inform replication along other parts of Cuba's coastline, and for regional and global communities to learn and emulate in their circumstances. The learning opportunities should not only be concentrated for the scientists and practitioners of Cuba; rather, the project should also focus on sharing such knowledge with other stakeholders, including those in the Caribbean region and beyond. The independent Technical Advisory Panel (TAP) welcomes the clarification from the accredited entity, in response to a question, that although GCF funds are not to be set aside for this purpose, the United Nations Development Programme (UNDP) will mobilize its network of experts, and use its participation in various regional forums and discussion, to highlight the knowledge that has been developed in Cuba through the GCF-supported project. Moreover, the evidence collected by the project will be packaged through and made available via UNDP communication and knowledge management channels, and disseminated at relevant events, for example, through the Caribbean Community Climate Change Centre.

14. The potential for knowledge-sharing and learning will be further realized through the implementation of the capacity-building programme. The latter will entail: (i) development of tools and technologies based on national and local experiences; (ii) routine compilation of data, evaluations, management practices and knowledge, and their wider dissemination; (iii) consolidation of results in the form of toolkits and guidelines that will be designed for various stakeholder groups and decision makers; (iv) inclusion of coastal communities in participatory planning and adaptation, where local-level knowledge will be matched and complemented with institutionally driven information on best practices in similar situations; (v) regulatory frameworks to take note of natural dynamics and mainstream ecosystem-based territorial planning approaches; and (vi) promotion of international data and knowledge exchange generated through the implementation of the project and the monitoring mechanisms within it.

15. Based on the above-mentioned capacity-building activities, the project will create opportunities for learning and for sharing fresh understanding on EbA approaches. There is provision for advice on regulatory aspects for the local municipalities, which is expected to strengthen their efforts towards mangrove restoration and also create local-level incentives to avoid further degradation of red mangroves. As envisaged, the project will contribute to the creation of an enabling environment where local-level institutions involved at the target municipality level will benefit from participatory resilience-planning. Simultaneously, their trained personnel will engage with local stakeholders to execute such planning by focusing on EbA approaches. The theory of change explains the intent and presents how the creation of the enabling environment will be achieved under output 2. It is expected that the likelihood of adoption of a legal provision for EbA will favour evidence-based learning and subsequent

replication, which will enable the institutions to remove barriers and promote the nationwide implementation of EbA.

16. The project is expected to strengthen the national legal framework by: (i) leveraging on the existing climate change policy framework (Tarea Vida) and its prioritization of climate adaptation; (ii) compilation and systematization of field experiences and good practices under existing frameworks, regulations and institutions in the form of technical standards and legal guidelines; (iii) building up current political reforms to strengthen the role of communities, municipalities and provinces to lead in coastal planning and development; and (iv) updating local ordinances and development plans to mainstream EbA, and ensure the sustainability of initiatives through updated provincial and municipal management plans. A key aspect of sustaining mangroves revolves around effective measures to discourage communities from harmful activities (including the felling of mangroves for fuelwood, overextraction of groundwater, pollution, and diversion of rivers for irrigation) in complete disregard of legal provisions. Although the legal provisions will be strengthened through the project, if the communities continue to degrade or destroy the mangroves, the ultimate objective will not be achieved. To ensure sustainability of the mangroves, the project will rely more on legal provisions, which will need to be complemented by relentless engagement with communities to cause gradual behavioural change. If the communities fail to understand the value of mangroves and continue to damage mangrove ecosystems, the project's objective will not be achieved. For a complete paradigm shift, behavioural change regarding the standing mangroves is critically important, where equal focus with respect to legal provisions should have been placed.

17. In view of above considerations, the independent TAP finds the paradigm shift potential of the project as moderately high.

1.3 Sustainable development potential

Scale: High

18. The proposed project is expected to directly contribute some of the Sustainable Development Goals (SDG):

(a) SDG 5 (gender equity) – by addressing gender concerns in an effort to build resilience, giving women better opportunities to protect lives and ensuring well-being in the event of a hurricane;

(b) SDG 13 (enhanced climate action) – by taking proactive measures to reduce vulnerabilities of coastal populations of Cuba; and

(c) SDG 15 (life on land) – by protecting (coastal) wetlands and creating opportunities for mangroves to thrive.

19. In addition to the above-mentioned direct contributions to SDGs, the project will indirectly contribute to SDG 3 on good health and well-being by creating greater access to safe water, and also to SDG 6 by offering water cleansing co-benefits along the coastal aquifer systems through the mangrove restoration activities. Moreover, the project is aligned with the Sendai Framework for Disaster Risk Reduction 2015–2030, where the EbA approach will address people's vulnerability to hurricanes and associated issues of storm surges and floods.

20. **Economic co-benefits:** Coastal mangrove protection and restoration, and planned coastal development informed by climate risk will enable the communities in the target municipalities to avoid the damage and losses that generally result from hurricanes, storm surges, flooding, saline intrusion and other phenomena. Based on the experiences from the baseline project Manglar Vivo, it is estimated that mangrove restoration alone in that case helped accrue net benefits to communities worth USD 107 million. The reduction in vulnerability of the affected communities is expected to reduce the need for mobilization of finance by the Government of Cuba for emergency assistance and post-disaster recovery. This

saving is estimated in the range of from USD 97 million to USD 278 million per disaster. Therefore, one may expect that the project will provide significant economic benefits for both the communities as well as the Government of Cuba.

21. There can be other auxiliary but important economic co-benefits. For example, the regenerated mangroves, if allowed to thrive by the communities, will reduce the financing requirements for the maintenance and repair of hard infrastructure maintained by government institutions. Simultaneously, the co-benefits of water quality improvement would reduce the need for health-care services and thereby save costs. Indirect benefits may also accrue in the fisheries and tourism sectors, with enhanced ecosystem services. The potential enhancement of resilience is likely to instil confidence among entrepreneurs in the target municipalities to invest more and create local-level employment through business expansion. From previous project experience, it has been found that forest brigade workers enjoyed a 400 per cent rise in income from managing the forests, which is also anticipated under the current project. Overall, the project presents a significant economic co-benefit potential.

22. **Social co-benefits:** Coastal fisheries, availability of non-timber products, reduction in salinity – all offer excellent social co-benefit potential. While direct health benefits are anticipated from the reduction in salinity, the improvement in water quality will also add to the same health objective. The regeneration of mangroves close to municipalities will enhance possibilities for the expansion of local tourism and recreational facilities, which will offer additional well-being amenities to the inhabitants. Mangrove restoration will reduce the current rate of loss of foreshores and beaches, which in turn will help maintain the remaining beaches in the intervention areas and allow continuation of recreational services for the communities.

23. However, the greatest social co-benefit may accrue by providing the protection service from the regenerated mangroves, especially during hurricanes and storm surges. The potential reduction in flooding will significantly enhance well-being. The improvements in drainage infrastructure are likely to contribute to allowing flood waters to recede quickly, which will enable the inhabitants to return to normal life following storm-induced flooding.

24. **Environmental co-benefits:** Ecosystem restoration is the central theme for the project approach and, therefore, the project should ideally have much greater emphasis on environmental aspects. The project aims to reduce mangrove degradation, which in itself will deliver environmental objectives such as carbon sequestration (about 94,844 t/year) and enhancement of both terrestrial and aquatic biodiversity. It is expected that, due to project-related mangrove restoration, fragmented biodiversity corridors will be re-established. Seagrass restoration will contribute towards improving the health of coastal wetlands.

25. The strengthening of institutional aspects through capacity-building and regulatory measures will contribute to systemic approaches to manage the coastal environmental conditions of Cuba. If the project engages with local communities and can convince them not to cut down or otherwise harm red mangroves, and thereby induce a behavioural change regarding the destruction of mangroves, it will have a long-term benefit for the sustainability of the coastal ecosystem. However, the project needs to place due importance on community engagement, equal to the importance given to strengthening regulatory measures.

26. **Gender equality:** Resilience-building by means of enhanced physical protection against extreme weather events has been regarded as a step towards greater gender equity, as such measures reduce pre- and post-hazard stresses of women and significantly reduce mortality rates. Similar co-benefits are expected from the proposed project. Moreover, the positive effects of salinity reduction, increased freshwater infiltration into groundwater aquifers, greater biodiversity, and increased availability of non-timber forest products from regenerated mangroves will contribute towards households' access to ecosystem services. Women are likely to experience these benefits directly, given the gender-differentiated roles of men and women at the household and community levels. The potential health and well-being benefits will facilitate

the achieving of gender equity. The project presents a gender action plan, with due emphasis on actions that will contribute to gender equity.

27. Based on the available information presented, it appears that the project's sustainable development potential is high.

1.4 Needs of the recipient

Scale: High

28. Cuba is one of the SIDS. Its location in the Caribbean makes it subject to hurricanes, as the South Atlantic region is one of the most active hurricane regions in the world. In recent decades, there has been a significant increase in the occurrence of high-intensity hurricanes. Both the south-west and south-east coastal zones of the country are known hotspots for hurricane-related hazards. Such hazards not only affect human lives, they also destroy physical infrastructure, and disrupt critical services such as drinking water supply and electricity in the aftermath of a hurricane. The Government of Cuba has been generously mobilizing finance for emergency assistance and restoration of livelihoods in the order of from USD 97 million to USD 278 million per event. Investments have also been made in hard infrastructure, seeking to mitigate climate impacts on the nation's natural capital and public services. However, many of these have unintentionally contributed to further degrading coastal landscapes. EbA represents an innovative and promising alternative to achieving environmental outcomes that enable climate change adaptation and socioeconomic development. Cuba's expertise can allow this approach to be expanded further as a main strategy to address climate change impacts. However, there are gaps in technological capacity, information and monitoring equipment that are beyond the reach of the Government of Cuba, especially given its limited buying power as a result of the decades-long trade embargo. As a result, it has become extremely difficult to ensure that people's lives and livelihoods are safeguarded in the hazard-prone coastal zone of Cuba. Therefore, the needs of the recipient in the wake of hurricanes, storm surges and flooding driven by climate change is paramount.

29. Cuba has a population of 11.24 million, distributed in 15 provinces and 168 municipalities. The per capita gross domestic product of Cuba was USD 8,822 in 2018, with a growth rate of about 3 per cent per annum. About 15 per cent of the population live in extreme poverty. The country's human development index stands at 0.815, ranking Cuba seventieth out of 189 countries in 2019. As at 2012, Cuba's public debt was 35.3 per cent of gross domestic product, and inflation was 5.5 per cent. Non-state activities and employment opportunities are limited, accounting for only about 30 per cent of total employment. Therefore, the major economic activities are generally linked to state-owned activities and institutions.

30. Recently, Cuba has embarked upon ecosystem-based approaches, and piloted EbA in a recently concluded project titled Manglar Vivo, aligned with Tarea Vida. This has given a first opportunity to compare EbA approaches to coastal protection with respect to hard protection – the latter having adverse environmental externalities. From this pilot project, it appears evident that EbA approaches are both economically and environmentally better options than hard engineering-driven options. The recently collected data have been cross-checked with communities and coastal managers at municipality level, through consultative processes, which have formed the basis of the project.

31. Because of the long-term political embargo, Cuba has been forced to accept economic isolation. As a consequence, it has not been able to take advantage of the worldwide free trade opportunities, despite having comparative advantages in producing specific commodities for global trading. This has resulted in severely restricting Cuba from accessing technologies from the rest of the world, which has given rise to artificial barriers to taking active measures to reduce people's vulnerability. Only in December 2020 did Cuba integrate its monetary system with the globally operated free-exchange system, which triggered a sudden 24-fold decline in the value of the Cuban peso with respect to the United States dollar. Under such economic and

monetary uncertainties, Cuba cannot finance the proposed activities alone. However, the measures and the activities are public in nature, where these are expected to deliver public goods, and there is hardly any private interest in such activities that might have drawn private financing. As a result, apart from the Government of Cuba, there is no other local financing source for the project. This is why GCF has been requested to finance the project with grant support, with Cuba committing significant co-financing.

32. As indicated above, Cuba has tested the EbA approach through a pilot, and the lessons learned need to be emulated at scale so that the institutions can gear up their machineries to replicate EbA as the “new normal.” In order for Cuban coastal institutions to assume full responsibility, it is necessary to generate tools, guidelines and legal provisions before they can propagate EbA activities and planned coastal adaptation. The institutions have to gather more information and calibrate such tools, and they need to engage communities in shaping their policies and legal mandates for effective implementation of a participatory ecosystem restoration mechanism. In order for the institutions to do so, their capacities need significant strengthening. Moreover, the general stakeholders also need awareness-raising and capacity-building support so that they can attach increased emphasis to restoring mangroves, water flow and drainage systems. In doing so, they will stop being the cause of degradation of such systems, and rather become beneficiaries by addressing their vulnerability. Without capacity-building and hand-holding, it will be difficult to deliver such objectives. There is a need for support in such areas of action.

33. The project builds on an appropriate barrier analysis, which provides justification for strengthening institutions and revisiting available legal and policy regimes. The proposed project not only emphasizes building the capacity of both institutions and communities, it also creates provisions for revising the policy and legal frameworks. These will interplay and contribute towards strengthening institutions dealing with coastal zone management.

34. Based on the above analysis using various criteria, the independent TAP is of the opinion that the needs of the recipient are high.

1.5 Country ownership

Scale: High

35. Cuba acknowledges the importance of coastal protection and protection of mangroves as measures to protect its communities affected by climate change. Cuba’s National Environmental Strategy 2016–2020 has correctly identified climate change adaptation as a national priority. The country has developed guidelines for economic and social policy, where the importance of accelerating the introduction of directives and programmes aimed at tackling climate change through sectoral policies is highlighted. The policies are aligned well in terms of coastal protection, while ecosystem restoration and augmentation receive due importance in relevant sectoral policies. The building blocks for the proposed project are aligned with the Directives for Tackling Climate Change (2016), the nationally determined contribution for Cuba, and also the country programme submitted to GCF. Overall, the project’s policy alignment is well established.

36. The project is well grounded within the governance structure of the country. The actions and investments proposed are integrated into the government structures, where local actors and institutions participate throughout planning and implementation of activities, so that maximum ownership can be ensured. The importance of local bodies of people’s power is recognized in the project design, and their involvement is given due priority towards implementation. The institutions representing the Government of Cuba are involved in the project design, which will facilitate a coordinated effort in the project’s implementation. Cuba’s Agencia de Medio Ambiente (Environment Agency) has been chosen as the executing entity in a bid to ensure country ownership.

37. The nationally designated authority for Cuba to coordinate with GCF is the Ministry of Science, Technology and Environment (CITMA) – the ministry in charge of affairs on policy, coordination, control and executing activities relating to science, technology and environment. The Environment Agency is the national agency responsible for managing environmental issues on behalf of CITMA, which is the appropriate body mandated to promote EbA in Cuba. Under the directives of CITMA, the Environment Agency promotes government strategies for environmental management through research and implementation of strategic projects and by putting the environment policy into practice. It receives adequate finance from the Government of Cuba to run its affairs, which will be used to cover the annual operation and maintenance costs¹ for the equipment. The Environment Agency will engage one of its affiliated national bodies, the Institute of Marine Science, to monitor the impacts of project interventions on the marine environment.

38. UNDP is the implementing entity for the project. UNDP has a strong presence in Cuba. It leverages expertise in capacity-building, provides technical and policy support, addresses barriers, and creates enabling conditions for adaptation planning and investments. The UNDP local office in Cuba will leverage the expertise available in a portfolio of 56 EbA projects implemented globally. Moreover, UNDP Cuba has been involved in the implementation of several projects, where particular emphasis has been placed on institutional capacity-building, sustainable natural resources management, and increasing resilience at various levels. The expertise of UNDP in rolling out an EbA project will be a good fit for the proposed project.

39. As indicated above, the project design has benefited from numerous consultations involving local affected communities, institutional actors, municipalities, citizen groups, and representatives of sectors such as health, fisheries, forestry, hydraulic resources and tourism. There were also consultations at the subnational and national levels involving institutions representing economy and planning, finance, banking and other allied sectors. The Interministerial Coordination Committee of Cuba was duly appraised of the project design before the project was submitted to GCF. The entire consultative process of project design gives confidence as to ownership of the project by the stakeholders.

40. Although there is no specific mention of the involvement of women's groups in the consultative processes, the gender-related aspects presented in the project and highlighted in the gender action plan provide assurance that gender-related concerns are considered in the design of the project.

41. From the above analysis, the independent TAP is of opinion that the project's country ownership is high.

1.6 Efficiency and effectiveness

Scale: Medium to High

42. The 30-year, small investment project will be implemented in eight years with a proposed budget of USD 44.3 million, where GCF is requested to finance USD 23.9 million with the highest concessionality (as grants). The Government of Cuba is offering co-financing of USD 20.3 million, a co-financing ratio of 1:0.85 against GCF financing, representing a significant commitment given the context.

43. A GCF grant seems justified as the proponents have provided evidence that the EbA activities are economically more cost-effective than the other alternative engineering-based option – hard protection (involving sea walls, etc.). Moreover, the goods and services generated through the proposed financing are public in nature, where a revenue stream will not be generated and private financing will not tend to come in the foreseeable future. Moreover, the

¹ The Government of Cuba has sent a letter highlighting the need for investments in operation and maintenance, and its intention to provide adequate financing by mobilizing budgeted amounts of operation and maintenance costs.

Government of Cuba has been struggling to secure hard currency for the procurement of international goods and services including equipment, for which the proposed GCF financing appears to be the only viable option.

44. The project will not lock in large finance in infrastructure. Rather, it will allow both the communities and the Government to save hard cash by reducing the loss burden from repeated high-intensity hazards. In addition, it will allow the regeneration and restoration of mangrove protection belts close to the target municipalities, which will lock in carbon. Although such a sequestration potential has not been considered as the key benefit, it will certainly be effective in the accrual of economic co-benefits.

45. The proponents have checked the economic efficiency of the project. The predicted annualized cost savings of having protective infrastructure in place have been compared against project costs. However, in a system where hurricanes with varied intensities generally ravage the coast, the higher the intensity of the event, the greater the loss burden precipitated. Very high-intensity events generally occur rarely and, therefore, the costs saved are generally higher for events that occur either once in 50 years, or even once in 100 years. Based on frequency analyses of hurricanes and storm surges along Cuba's coasts, the annualized expected costs avoided due to (mangrove) protection were estimated² and used for the economic efficiency analyses. A discount rate of 10 per cent was considered for the economic analyses. Outputs from the economic analysis provided the following results. In the base case, and only considering the benefits of coastal protection, the net present value (NPV) of the proposed intervention is estimated to be USD 49.85 million, with an economic internal rate of return (EIRR) of 18.6 per cent. Taking into account the potential for carbon capture, the NPV for a 30-year period is estimated at USD 72 million, with an EIRR of 21.1 per cent. Considering the benefits gained from a "no intervention" analysis, the project's baseline NPV stands at USD 100 million, with an EIRR of 25.0 per cent. The estimated numbers indicate that the project's economic efficiency is high.

46. The economic performance of the project should ideally take into cognizance a scenario without the project, so that a rational comparison may be examined. The "without the project" scenario would result in continued coastal erosion and ecosystem degradation – the latter would result in a loss of 4,680 ha of mangrove areas and an additional loss burden of USD 52 million. The project also analysed the sensitivity of increased project costs and a simultaneous decrease in project benefits. The base case economic model results in a negative NPV of -USD 38.6million and an EIRR of 7.1 per cent, below the 10 per cent return threshold conventionally used in economic analyses. The NPV at a 10 per cent discount rate is negative at -USD 66.8 million. The sensitivity analysis shows that a 20 per cent increase in costs (for instance, as a result of the increase in sea-wall extension) and a 10 per cent decrease in benefits (for instance, as a result of negative externalities on the ecosystem) would push the EIRR to 0.7 per cent. Any further increase in costs and decrease in benefits would push the EIRR clearly into negative territory. The NPV is negative in all scenarios. The comparison proves the sound approach being sought by the project (rehabilitation of the existing ecosystem), while also considering the reduced maintenance cost of EbA interventions (which require capacities easily found within Cuba) compared with a reliance on infrastructure and equipment heavy investments.

47. In an 8-year project implementation period, one may anticipate that one or more moderate to high-intensity hurricanes could occur. In that event, part of the mangrove restoration programme would face a setback and might require reinvestment in mangrove plantations. In most cases, the reinvestment requirements cannot be made through an ongoing project. In the proposed project, the mangrove regeneration efforts will be brought under an insurance service, where government will pay an estimated USD 5 million in premiums in the

² The benefits of investments for output 2, which are aimed at enhancing institutional capacity, are not included in the benefit stream for the project. Many such benefits are not always tangible and, therefore, were not included in the estimation of benefits.

initial years of the project. In the event that a hurricane event destroys the nurtured mangrove areas, the payout from the insurance will cover the cost of replanting, and thereby help achieve the long-term sustainability of the mangroves. The independent TAP finds the considerable payment necessary to ensure that, even if the hurricane-prone region is affected during implementation, there will be ensured protection that would cover the damage to the mangroves.

48. Cuba has much experience in managing its coastal resources, including mangroves. Its institutions are eager to emulate global best practices, a few of which have been integrated into the project design. However, one must not forget that, in addition to policy and legal regimes, the institutions need to engage strongly with the local communities to discourage any anthropogenic degradation or destruction of mangroves, which have resulted from a range of unsustainable practices carried out to date. If human-led destruction cannot be checked, the effectiveness of mangrove restoration and coastal protection will only be theoretical. Therefore, the said people-centric approach to embark upon forest co-management involving local communities must receive high priority along with the policy and legal frameworks. Otherwise, the ultimate effectiveness of the project will remain questionable.

49. In view of the above considerations, the independent TAP finds the efficiency and effectiveness of the project to be medium to high.

II. Overall remarks from the independent Technical Advisory Panel

50. The independent TAP recommends that the Board approve the project.

51. The independent TAP also recommends the following:

(a) The project management unit, guided by the national project steering committee, should engage more with local people by strengthening its participatory processes, including through the project's planned provincial coordination and municipal coordination structures, so that the communities realize the value of mangroves and eventually cease unsustainable practices that damage them. The project must pay additional attention to social engagement so that business-as-usual degradation or destruction of mangroves is reversed, with active involvement of community peers and a behavioural change orchestrated through greater community engagement.

Response from the accredited entity to the independent Technical Advisory Panel's assessment (FP 157)

Proposal name:	Coastal Resilience to Climate Change in Cuba through Ecosystem Based Adaptation – “MI COSTA”
Accredited entity:	United Nations Development Programme (UNDP)
Country/(ies):	Republic of Cuba
Project/programme size:	Small

Impact potential
UNDP appreciates ITAP's rating of HIGH impact potential.
Paradigm shift potential
UNDP concurs in the importance of working and engaging with communities to fully meet the project's paradigm shift potential. Hence, the project through Output 2.1 will work with communities via capacity building including resilient livelihoods and productive practices that are sustainable with EBA. The training material will be provided to economic and productive sectors as well as key stakeholders and implemented via Capacity Building Centers that have proven to be effective in the past in community engagement. Further, Output 2.2 will develop and disseminate climate and environmental information that will relate the value and health of ecosystems to capacity for climate resilience from climate impacts as felt by communities (flooding, access to water quality, etc.). Finally, the project will also engage with communities as environmental monitors making them active participants in the project by measuring local ecosystem health and relate it to their protective benefits (Output 2.2). Together, these actions will work to shift the mind set in communities and they relate to their ecosystems.
Sustainable development potential
UNDP appreciates ITAP's HIGH rating for sustainable development potential.
Needs of the recipient
UNDP agrees with ITAP's appreciation of HIGH country need.
Country ownership
UNDP appreciates ITAP's consideration regarding the High level of country ownership and confirms that women's groups were involved in the consultation process.

Efficiency and effectiveness

UNDP agrees on the importance of community engagement as an important part of project sustainability. The project will work, as stated above, to shift communities' relationship with their ecosystems by identifying the benefits in resilience that are provided by them (through information products) and gaining the capacities for their sustainable management (through capacity building) and relating these to ecosystem health (through their roles in environmental monitoring). Thus creating a real value in ecosystem sustainability.

Overall remarks from the independent Technical Advisory Panel:

UNDP acknowledges the recommendation made by ITAP and will work to actively engage with communities to ensure their active participation and involvement. This will include adhering to the project's stakeholder engagement plan, including workshops, trainings and consultations with target communities. The project will monitor through surveys and community outreach perception of communities as they relate to their ecosystems and capacities and information gained through project activities to ensure the project fully meets its paradigm shift potential.



**"Coastal Adaptation to Climate Change in Cuba
through Ecosystem Based Adaptation – MI
COSTA project"**

Annex 8 Gender Analysis and Action Plan

December 16, 2020

Table of Contents

Introduction	3
Section I: Gender Analysis/Assessment: Guide (Project/Program Level).....	4
a) Methodology.....	4
b) The Need for a Gender Perspective in Communities.....	4
c) Existing Gender Inequality and Social Inclusion in Cuba	5
• Gender Inequality Indicators	5
• Poverty	7
• Health.....	8
• Employment and Labour-Force	9
• Education	11
• Political Participation and Decision Making.....	13
• Access to Resources	Error! Bookmark not defined.
• Role of Women in Relevant supply chain in Rural Areas.....	18
• Gender Based Violence	23
d) Legal and administrative framework for the protection of women and the protection of gender equality	25
e) Results from Stakeholder Consultations.....	28
f) Project design and implementation.....	29
g) Gender consideration in design of Grievance Response Mechanism	31
h) Monitoring and evaluation	33
Section 2: Gender Action Plan	35

Introduction

The Green Climate Fund recognizes the central importance of gender considerations in terms of both impact and access to climate funding and requires a Gender Assessment and Gender Action Plan to be submitted as part of the project-funding proposals that it assesses. The main objective of the Gender Assessment is to screen the gender aspects of the GCF project, and to subsequently strengthen the gender responsive actions within the project.

In particular, this gender assessment aims to provide an overview of the issue of gender in Cuba, with a specific focus on the gender differentiated impacts of climate change and how this information can be used to design an adaptation intervention that is gender-sensitive. By identifying gender issues relevant to the Project interventions and situated in the Cuban context, across elements such as use and access to resources, gender-differentiated roles in employment and livelihoods, and roles in political decision making, the Gender Assessment and Action Plan (GAAP) identifies opportunities for gender mainstreaming in the design of the "Coastal Adaptation to Climate Change in Cuba through Ecosystem Based Adaptation – MI COSTA project". Furthermore, the project aims to address gendered climate resilience across the household, community and institutional levels

The information in the present assessment is based on an analysis of Cuban social policies, programmatic documents, and statistics as well as academic and scientific papers and results, as well as stakeholder consultations with both institutional actors (national and local), and Cuban beneficiaries living in the project interventions areas. The GAAP was also carried out with the support of the “Facultad Latinoamérica de Ciencias Sociales” (FLACSO) - Cuba program, benefitting from the extensive knowledge and experience of the national FLACSO team, comprised on experts specialized in socio-economic research, vulnerability, and gender equality, as well as community engagement. The principle objectives the GAAP are as follows:

1. To align the project proposal with Cuba's national priorities on gender.
2. To incorporate information and lessons learned from previous national gender studies and evaluations in Cuba to both understand the context and ensure that project activities are gender-responsive.
3. To present results from stakeholder consultations and involving women, men, girls and boys residing in the areas where the project will be developed from an early stage in project design.
4. To integrate gender considerations into project indicators, goals and activities, and identify ways in which women can act as leaders and decision-makers in community-based adaptation interventions.

Part I: Gender Analysis/Assessment: Guide (Project/Program Level).

a) Methodology

The present gender assessment, carried out at the beginning of the design of this project, acts as an entry point for the incorporation of the gender perspective throughout the design and implementation of the project, and is the basis of the gender action plan. Stakeholder consultations, led by FLACSO, took place in July and August 2018 in La Coloma (Pinar del Río), Playa Cajío (Artemisa) and Júcaro (Ciego de Ávila). The results of the consultations are detailed in the Stakeholder Consultation and Engagement Plan. Accordingly, the Gender Action Plan presented in Section 2 of the present report has been designed by taking into account both the comprehensive gender assessment presented in the current section 1 as well as the results of the consultations.

To summarize, the gender analysis and stakeholder participation and consultation, enabled the following:

- A strong participative process and accordingly, a commitment by both local government officials and community members in fulfilling the objectives of the "Adaptation to climate change in Cuba through Ecosystem Based Adaptation – MI COSTA project";
- Demonstration of the need for gender-disaggregated data and indicators to establish a baseline in which to measure improvements and identify areas of interest; and
- Establishment of recommendations to be incorporated into the Gender Action Plan.

b) The Need for a Gender Perspective in Communities

Extensive literature and global experience has shown that women and men are often affected differently by the same socio-environmental conditions, and that depending on cultural norms and beliefs, power imbalances and differentiated roles in the household and public spheres, their responses to everyday situations is also different. Furthermore, it is also widely documented that women experience the effects of climate change differently than men, both in terms of adjusting livelihood strategies, in their changing relationships to scarce resources and in regard to disasters. Overall, socio-cultural factors may limit women's access to assets and decision-making power, which generally position women in more vulnerable situations. It is therefore necessary to introduce a gender equity approach to project design, in order to implement project activities in a manner that reduces equity gaps. Finally, it is also important to understand that although women may be more vulnerable to the impacts of changing environmental conditions, the GAAP aims to understand the gendered differences in impacts between both men, women, girls and boys. For example, in the Cuban context, men can also

face greater risks in disaster situations, due to the socially mandated roles they are expected to assume (embodying characteristics such as strong, courageous, and decisive), which frequently leads to increased incidence of injuries and higher mortality rates.

c) Existing Gender Inequality and Social Inclusion in Cuba

Cuban society demonstrates exceptional gender equality, despite the fact, that Cuban culture remains broadly patriarchal, with certain manifestations of gender inequality mainly affecting women and girls. Although the Cuban Revolution of 1959 set out to eliminate all forms of discrimination and inequality based on a profound socio-economic and political transformation that created a unique situation of equity among its citizens, the cultural stigmas and stereotypes, placing women in sometimes disadvantaged positions have tended to prevail in popular culture. Although very significant achievements have been made in regard to the participation of women in the economic and social development spheres of Cuba, more work remains to be done, signalled in a recent speech by Raul Castro himself, the former president of Cuba. On September 27, 2015, Raul Castro, then acting as President of Cuba, addressed the UN at the “Global Leaders’ Meeting on Gender Equality and Women’s Empowerment: A Commitment to Action”. He ended his speech by saying that: “... political will is much needed to avoid turning the results obtained so far into our goals instead of making them a starting point and a pledge to achieve true equality for women”.¹

• Gender Inequality Indicators

Several indices have been developed to quantify the concept of gender inequality, whereby the United Nations Development Programme (UNDP) uses the Gender Inequality Index (GII) and the Gender Development Index (GDI). The GII measures gender inequalities in three important aspects of human development—reproductive health, empowerment and labour market participation. The GDI accounts for disparities between women and men in three basic dimensions of human development—health, education and living standards.

According to the UNDP Annual Human Development Report (2015), Cuba had a GII value of 0.304 (below the value of Latin America), which has positioned Cuba as the 62nd in the world ranking. Cuba’s GDI value, in the report, was listed as 0.946, placing them in “Group 3” (out of five groups), which is defined as “countries with medium equality in HDI achievements between women and men”.

Another useful indicator is the World Economic Forum’s (WEF) Global Gender Gap Index, which analyses the division of resources and opportunities between men and women in 144 countries. It measures the size of the gender inequality gap in four key areas: health and survival, educational attainment, economic participation and opportunity and political

¹ Castro Ruz, Raúl (2015) Speech delivered at the Global Leaders’ Conference on Gender Equality and Women’s Empowerment, held in New York. See: <http://www.unwomen.org/-/media/headquarters/attachments/initiatives/stepitup/commitments-speeches/cuba-stepitup-commitmentspeech-201509-en.pdf?la=en&vs=4258>

empowerment. In the 2017 WEF Global Gender Gap Report, Cuba’s overall score was 0.745, which ranked it 25th in the world. The breakdown of Cuba’s sub-scores were as follows:

Area measured	Index Score	Global Ranking
Health and Survival	0.970	103
Educational Attainment	1.000	1
Economic Participation/Opportunity	0.629	99
Political Empowerment	0.382	19

Overall, the above statistics show that Cuba, in contrast to many of its neighbouring nations in the LAC region, as well as in terms of global rankings shows an exceptionally high level of educational attainment (there is no gender difference), as well as a strong score in regards to political empowerment and that the level of gender equality in Cuba is high.

Summarized below are national statistics and references to the political and legal framework of Cuba, which evidence favourable gender equity conditions nationally, specifically in relation to the issues identified by GCF as causes of discrimination against women, making them more vulnerable to climate change.

1) Division of labour, lower incomes and lesser livelihood opportunities for women:

- 49% of the labour force in the civil state sector is female
- 48.6 % of managers in Cuba are women

Law 116 "Labour Code" Article 2, establishes as one of the fundamental principles governing labour law Equality in Salary: "work is remunerated without discrimination of any kind in correspondence with the products and services it generates, its quality and the real time worked, where the principle of socialist distribution of each one according to his capacity to each one according to his work must govern.

2) Fewer legal rights:

Law 116 "Labour Code", article 2, establishes Equality at Work as one of the fundamental principles governing labour law: "Every citizen in a position to work has the right to obtain employment in accordance with the demands of the economy and at his or her choice, whether in the state or non-state sector; without discrimination on the basis of skin colour, gender, religious beliefs, sexual orientation, territorial origin, disability and any other distinction prejudicial to human dignity".

The Bases of the Economic and Social Development Plan to 2030, in the Strategic Axis "Human Development, Equity and Social Justice", establishes the specific objective 19: "To guarantee the exercise of the rights and duties of all citizens, with equality, inclusion and social justice,

expressed in the access to opportunities, the achievements or results, the distribution of the benefits of development and the confrontation with all forms of discrimination by skin colour, gender, gender identity, sexual orientation, disability, territorial origin, religious belief, age and any other distinction injurious to human dignity".

3) Lesser political and professional representation:

In Cuba, women represent:

- 53.22% of the seats held in the National Assembly of People's Power (ANPP), the highest legislative body in the country.
- 48.4% of the members of the Council of State
- 60.5% of higher education graduates
- 67.2% of technicians and professionals nationwide
- 53.5 of the workforce associated with the Science, Innovation and Technology system.

These factors are further elaborated in the following sections.

- **Poverty**

One of the priorities of the government, since the Cuban Revolution of 1959 was the eradication of poverty in Cuba. To a large extent, the post-revolution socio-economic transformation and social policies were able to reverse many of the structural issues responsible for poverty. As one researcher has noted:

"It should be noted that during the sixties, seventies and first half of the eighties important advances were made, fundamentally in health, education and social security, and the trend towards a more equitable redistribution of wealth was consolidated, as evidenced by the sustained increase in the income received by the poorest population".²

One of the indicators of this process has been the decrease in the Gini coefficient from 1953 to the end of the 1980s, demonstrating the reduction of inequality in Cuban society. However, the tightening of the economic and financial embargo imposed by the United States as well as the end of the Soviet era, led to a deep economic crisis in the 1990s resulting in a significant deterioration of the living conditions of the Cuban population. The equity gaps widened, and the phenomenon of poverty re-emerged in Cuban society, while for others, for whom poverty had not been totally eradicated, it was a deterioration of the mechanisms for its relief.³

Since then the situation has considerably improved and it is important to note that in Cuba, poverty has a distinct character, given that all citizens are guaranteed access to basic social

² Zabala Argüelles, María del Carmen (2009) Female head of household, urban poverty and social exclusion: a subjective perspective in the Cuban context. - 1st ed. - Buenos Aires: Latin American Social Sciences Council - CLACSO. Page 71.

³ Alonso, Aurelio 2002 "Poverty seen in three scales. Reflections on the Hispanic Caribbean", Paper presented at the International Workshop on Poverty Reduction Strategies in the Caribbean. The external actors and their impact on poverty reduction in the area, CLACSO/CROP/CIPS/CIEI, Havana, 4-6 November.

services such as health, education and employment. That is, unlike elsewhere, the poverty in Cuba is poverty with protection, with comprehensive social security services provided by the State based on a universal access approach. That is why extreme situations of poverty, such as hunger, or high mortality rates are not present⁴. Accordingly, in Cuban academic literature and discourse, terminology such as vulnerable groups, socially disadvantaged groups or at-risk populations are used. These groups include the following:

- Female-headed households.
- Low-income households.
- Households with people with disabilities.
- Households with older adults living alone.
- Households exposed to environmental risks (e.g. close to the sea/coastal areas).

That is, despite the relatively high level of gender equality, the socio-demographic profile of the most vulnerable families in Cuba, has a higher frequency of female-headed households headed by women who are solely responsible to provide for children's needs, dependent or are in a precarious situation in the labour market due to their low income. Furthermore, studies such as those by Pérez (1998) and Zabala (2010) show important differences between men and women within poor households, which place women at a greater disadvantage than men.⁵

Overall, the segment of the population that faces the most vulnerable socioeconomic conditions is single-parent families with women at the head.⁶ According to census data, this segment is significant, with households headed by women having increased from 28.2 per cent in 1981 to 44.9 percent in 2012.

- **Health**

Since the Cuban Revolution, health has been a key sector prioritized by the State, putting Cuba in an exceptional position among other countries in the region, obtaining health outcomes comparable to those countries with relatively much higher levels of social economic development. In the development of the health sector, women have played an important role, representing 71.0% of the 492,366 workers in the National Public Health System. Furthermore, Cuba ranks as a nation with one of the highest concentrations of doctors, with 81.9 doctors per 10,000 inhabitants.⁷ There are 150 hospitals, 450 polyclinics, 131 maternity homes, 13 research institutes and comprehensive rehabilitation services at all

⁴ Fleitas Ruiz, Reina (2013) Poor families and gender inequalities in health: the case of San Isidro. - 1st ed. - Autonomous City of Buenos Aires: CLACSO, E-Book (CLACSO-CROP) Page 110-111.

⁵ Fleitas Ruiz, Reina (2013) Familias pobres y desigualdades de género en salud: el caso del barrio de San Isidro. - 1st ed. - Autonomous City of Buenos Aires: CLACSO, E-Book (CLACSO-CROP) Page 112)

⁶ Zabala, María del Carmen (2010) Female head of household, urban poverty and social exclusion: a subjective perspective in the Cuban context. Buenos Aires, CLACSO.

⁷ Annual Health Statistics, 2017; p. 11 and 12. Digital Version.

levels of care.⁸ The following three programmes are prioritized in the country: Maternal and Child Health, Comprehensive Care for the Elderly, and Immunization.

Several gender-focused prevention and health-care programmes have been implemented and developed. Women's sexual and reproductive health is guaranteed, and the maternal mortality rate is 22 per 100,000 live births. The health system is integrated into the family and massive and systematic tests are carried out to detect cervical cancer, breast cancer and other diseases at an early stage, as well as the Maternal and Child Care Programme (PAMI), which gives special attention to early pregnancy, the Maternity and Conscious Parenthood Programme (Programa de Maternidad y Paternidad Consciente), prevention programmes for HIV, STIs, AIDS and care for the elderly.

Cuba has a demographic context of low population growth, with a birth rate of 10.2 live births per 1000 inhabitants, a general fertility rate of 43.0 live births per 1000 women aged 15 to 49, and low fertility levels of 1.61 children per 1000 women.⁹ The overall mortality rate is 9.5 deaths per 1000 inhabitants with chronic non-communicable diseases (primarily heart disease) as the main cause of death. Male mortality is higher than female mortality except for in the case of diabetes mellitus.¹⁰ Cuba is also distinct from many other countries in the region in regards to its population curved being significant skewed towards the elderly, rather than youth, with 20.1 percent of its population over 60 years of age¹¹, making the ageing population one of the main challenges facing Cuban society. Life expectancy is generally high at over 78 years (76.5 years for men and 80.4 years for women)¹².

The Infant Mortality Rate has for ten consecutive years remained below five deaths under one year of age per 1000 live births; and in 2017 it was 4.0, the lowest in history.¹³ The Maternal Mortality Rate was 41.6 per 100,000 live births, of which 24.8 were due to direct causes (mainly due to complications related to the puerperium and others). In 2017, 29.4 induced abortions were performed for every 1000 women between 12 and 49 years of age and 72.4 for every 100 births.¹⁴ Finally, Cuba's comprehensive immunization programme protects against 13 diseases, with 100 percent vaccination coverage, in all population groups, with no gendered differences. The impact indicators showing the elimination of mother-to-child transmission of HIV and congenital syphilis, certified by PAHO/WHO in June 2015, are also still met.

- **Employment and Labour-Force**

⁸ Ibid; p. 9.

⁹ Ibid; p. 9.

¹⁰ Ibid; p. 9.

¹¹ National Bureau of Statistics and Information, 2018.

¹² Ibid; p. 20.

¹³ Ibid; p. 9.

¹⁴ Ibid; p. 154.

Cuba's employment policy since 1959 has been based on the principles of guaranteed employment, which translates into full employment for all citizens, the principle of equality and non-discrimination on the grounds of skin colour, sex or religious belief; and the principle of harmony between communal and individual interests. The legal framework relating to employment is based on the Constitution of the Republic. Although the gender equality policy is strong, in practice, Cuban women remain overloaded with domestic and childcare responsibilities, and this coupled with insufficient technical training, reduces women's chances of gaining access to more complex leadership positions and pay.¹⁵ That is, as elsewhere, Cuban women face high work burdens including managing the demands of domestic work in addition to other employment and are also often relegated in rural to roles that are considered 'women's work' such as the making of handicrafts, canning and raising small livestock. This indicates the dominance of hegemonic masculinities that limit participation in activities outside those traditionally carried out by women, with emphasis on reproductive work and unremunerated work. Regardless, there have been significant changes over the last several decades. In 1958, only 20% of the female population between 25 and 44 years of age was employed, mainly in domestic work. While by 1983, 59% of the total female population of the same age was employed, including occupation in work requiring high professional and technical specialization¹⁶.

Although the promotion of women in agriculture has been encouraged, national statistics reveal the masculinization of the agricultural sector leading to the minority presence of women in productive work as well as in management positions. The presence of the traditional social division of labour in the agricultural context means that women are not considered for certain activities, for example such as the management of farms or the operation of agricultural machinery, which has led to less access and representation among these types of more 'technical' opportunities.¹⁷ The 2002 Population and Housing Census recorded that women employed in rural areas accounted for 13.7% of the total number of Cuban women engaged in paid work and 22.8% of the total number of rural women. They accounted for 67 per cent of the non-economically active population in those areas¹⁸. Furthermore, it is estimated that for every 100 men employed in rural areas, there are only 30 women employed.¹⁹ The women participation in the Cuban agricultural sector has been between 15% since 2015 up to 18% in 2020. In 2015 were employed 898,500 total workers in this sector, 140,900 of them were women; in 2020 there are 792,000 employed, 137,900 of

¹⁵ (Estrategia de Género del Sistema de la Agricultura de Cuba 2015-2020. MINAG, Havana, 2016. 34pp.)

¹⁶ FLEITES-LEAR, Marisela (1996). Paradoxes of the Cuban woman. In *New Society Magazine*. No. 143. May-June 1996. Buenos Aires: Friedrich Ebert Foundation; p. 42.

¹⁷ (Romero, MI, Benítez, B, Miranda, S. *Pensar y actuar en clave de género: desafío para el desarrollo agropecuario local*. MES Award to the result of the greatest contribution to local development, INCA- PIAL, 2015.)

¹⁸ ONE, 2002.

¹⁹ Echevarría, Dayma, Teresa Lara, Miriam García (2010) "Empleo femenino en zonas rurales: logros y retos de los proyectos de cooperación para el desarrollo". In: CEEC. Annual Seminar on Economics and Business Management. Hotel Nacional de Cuba, 24-25 June 2010. CD.)

then are women²⁰. In the cooperatives, the female representation is 15-20%, depending on the type of entity, and the female users reach 11%. The greatest increase in the number of women has been in the occupational category of workers, with 3.2 per cent, 3.0 per cent in higher-level cooperatives and 6.7 per cent in middle-level technicians.

Most managers have limited awareness of the need to employ women and the ways to offer them jobs (that is to create new jobs and create appropriate conditions for existing ones). There are a lower percentage of women leaders among those in managerial positions and many women tend to have responsibilities related more to the administrative tasks rather than those associated with decision making. Some trades are considered "mixed" (cooking, caring for large or small livestock, growing vegetables) and others only "for men" such as acting as head of livestock or as an administrator. This has led to recent initiatives by the Ministry of Agriculture and the Federation of Cuban Women to promote gender equality in their management models.²¹

Outside of the agricultural sector, women in Cuba show strong representation in the labour force, out-representing men in several. The following figures reflect this:

- 48% of the total number of people employed in the civil state sector
- 32% of the non-state sector
- 46% of senior management
- 78.5% of health personnel
- 48% of scientific researchers
- 66.8% of the force of highest technical and professional qualification
- 65.2% of higher education graduates.²²

● Education

Cuba is considered to have the best education system in Latin America, and one of the best in the world, particularly in regard to access and attainment of higher degrees. Education in Cuba is universal, free, and public. This democratization of education following the Cuban Revolution²³ included the expansion of the number of schools, the nationalization of private schools, a literacy campaign in 1961, which reached the most remote areas of the country, and the implementation of sixth and ninth grade programs for the newly literate. In 1976, a new constitution was approved, outlawing discrimination in all its forms, including gender discrimination, and established that in all state institutions the principle of equality would be

²⁰ ^[1] Indicator "Workers employed in each economic activity". Agriculture, livestock, forestry sector. Statistical Yearbook of Cuba, 2015 and 2020. ONEI; 2015 and 2020.

²¹ Collection of authors (2014) Gender equality for quality management of food security. Demonstrative experience of a gender equality management system for the agricultural sector in Cuba. Havana, Cuba.

²² Castro Ruz, Raúl (2015) Speech delivered at the Global Leaders' Conference on Gender Equality and Women's Empowerment, held in New York.

²³ «Education in Cuba». EcuRed.

promoted and that all citizens should "enjoy education in all the country's educational institutions, from primary school to universities, which are the same for all".²⁴

The Cuban education system is organized into three tiers namely, primary (preschool, primary school), secondary (basic secondary, pre-university, professional technician) and tertiary (doctoral level study). Primary and basic secondary education is compulsory nationwide and most of Cuba's population has obtained secondary education²⁵. In the 2016-2017 school year, 2,030,432 students were enrolled at all levels of education, 1,016,358 of which were women, accounting for 50 per cent of total enrolment.²⁶ Cuba has a net enrolment rate in primary education of 99.5 per cent, with a gender parity index of 1;²⁷ and a retention rate at the primary level of 99.2 per cent, while at the lower secondary level it is 93.5 per cent²⁸. The highest level of education attainment, the tertiary level, had an enrolment of 218,643 persons in the 2016-2017 school year. The subjects with the highest enrolment were the medical sciences (76,329), pedagogy (45,442), and technical sciences (30,870). An impressive sixty-two per cent of those enrolled in higher education in those fields were women.²⁹ There are however gendered differences apparent in the fields of study chosen, with women studying and graduating from careers that have traditionally been recognized as "feminine", such as areas of health, education, social sciences (economics) and the arts and a lower representation in certain technical and professional fields.

Not only does Cuba's educational system demonstrate exceptional gender parity, it also addresses possible issues of intersectional marginalization with a special education programme for persons with disabilities. This program has the same curriculum as the General Education curriculum, but with schooling alternatives adapted to the needs of the learners.³⁰ There is also a range of programs for Adult Education through adapted programs such as the Facultades Obrero Campesinas (Rural Workers' Colleges) and the Cursos para Trabajadores (Courses for Workers).³¹

Figure 1. Enrolment and Graduates by Regime of Study and Sex. Academic year 2017-2018.

²⁴ Constitution of the Republic of Cuba (1976); Articles 42 and 43.

²⁵ ONEI (2008). Education in the Revolution; p. 6. Digital Version.

²⁶ ONEI (2017). Annual Statistics of Education; p. 10. Digital Version.

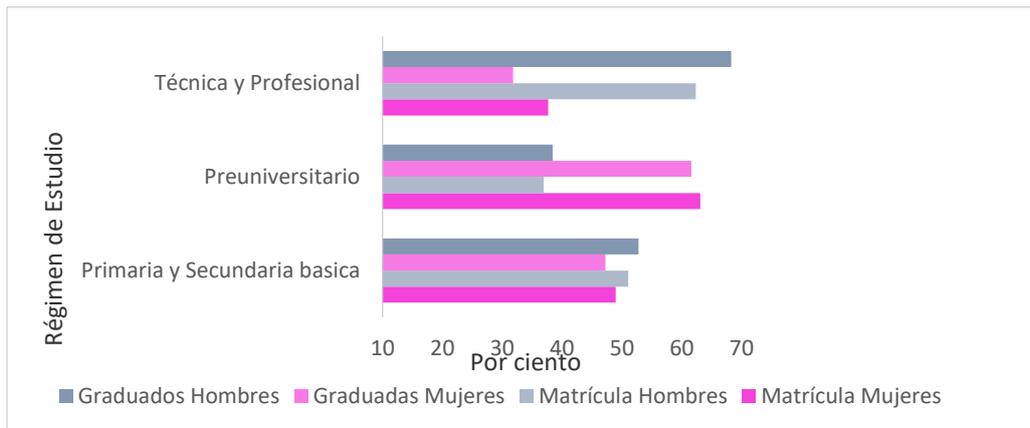
²⁷ Ibid; p. 28.

²⁸ Ibid; p. 18.

²⁹ Ibid; p. 25.

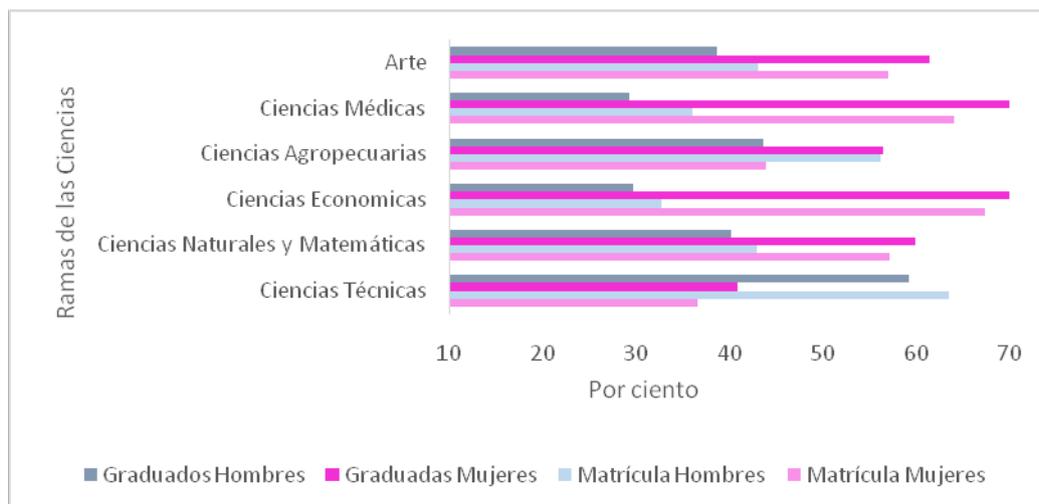
³⁰ ONEI (2008). Education in the Revolution; p. 10. Digital Version.

³¹ Ibid; p. 10-11.



Source Based on the Statistical Yearbook of Cuba, 2017. ONEI; 2017.

Figure 2. Enrolment and Graduates, by Branch of Science, in Higher Education by Sex. Course 2017-2018.



Source Based on the Statistical Yearbook of Cuba, 2017. ONEI; 2017

Finally, in Cuba’s most recent Agricultural Gender Strategy, 2015-2020, women’s more integrated and equal involvement in this key sector is recognized: "The promotion of women in the sector is a pillar to promote inclusive policies within it. It is estimated that more than 42% of the personnel dedicated to research, 35% of the people with PhDs in Science, 46.7% of the Master's graduates and 70% of specialized personnel are women".

- **Political Participation and Decision Making**

The equal political participation of women in Cuba has also been one of the goals of the revolutionary government since 1959. With this goal in mind a suite of actions have been implemented to achieve a greater presence of women in public life and to promote their increased contribution to the economic and social development of the country. These include

the Literacy Campaign, the creation of the Federation of Cuban Women and the growing development of higher education.

In the last six decades, the participation of Cuban women in public and parliamentary life has been growing, which is expressed in the current composition of the National Assembly of People's Power (2018) with more than 53% female representation. These statistics place Cuba in second place in the world with the highest proportion of women in legislative work, surpassed only by Rwanda, which has more than 61%.³²

Women's participation in decision-making is increasing in Cuba. Not only has the presence of women in Parliament increased, but in recent years there has also been an increase in their presence in the Council of State and the Council of Ministers. Although they do not represent a majority in this area, several ministries have been presided over by women. In addition, more and more women are occupying leadership positions in Cuba in institutes, economic institutions and service centres. However, their high levels of education often do not correspond to the posts that they occupy, which shows gender inequalities that still persist in today's Cuban society. In Cuba there are 8 women ministers (Ministry of Food Industry; Ministry of Domestic Trade; Ministry of Education; Ministry of Finance and Prices; Ministry of Labour and Social Security; Ministry of Science, Technology and Environment; Central Bank of Cuba and the Comptroller's Office of the Republic) and 44 women deputy ministers. The Political Bureau of the Central Committee of the Party is composed of 17 members, 4 of whom are women (23.52 per cent). Of the 612 members of the National Assembly of People's Power in Cuba, 299 are women (48.86 per cent) and 313 are men (51.14 per cent).

In regard to the design and implementation of the project, it should also be noted that women are well represented nationally in key roles, related to high-level decision-making. That is, the Minister of Science, Technology and Environment of Cuba (CITMA), the body responsible for 'Tarea Vida' (Cuba's climate change strategy), the director of FLACSO (the national body responsible for guiding stakeholder engagement and the gender assessment, and a key partner in capacity building and awareness raising), as well as the project design lead within ICIMAR are all women.

- **Access to Resources**

In Cuba, both men and women have equal rights in access to resources (land, property, goods, etc.). With respect to land, agrarian laws declare the equal right to land for both sexes. Regardless, in practice many more men own land than women, as well as participate in cooperatives and hold managerial positions in cooperatives. This is again due to patriarchal norms and beliefs that recognize and value men's work in agriculture, while undervaluing the role of women.

³² Pérez Betancourt, Roberto (2018) Women more than 53 per cent of candidates nominated to the Cuban Parliament. Published on January 29 at: <http://www.tvyumuri.icrt.cu>

The women participation in the Cuban agricultural sector (*agriculture, livestock and forestry sector included according to the ONEI*) has been between 15% since 2015 up to 18% in 2020. In 2015 were employed 898,500 total workers in this sector, 140,900 of them were women; in 2020 there are 792,000 employed, 137,900 of them are women.

In the cooperatives, the female representation is 15-20%, depending on the type of entity, and the female users reach 11%. The greatest increase in the number of women has been in the occupational category of workers, with 3.2 per cent, 3.0 per cent in higher-level cooperatives and 6.7 per cent in middle-level technicians.

Recognizing this disbalance, promoting gender equality is a goal established by the Ministry of Agriculture, as described in the Cuban Gender Strategy for Agriculture (described further below).

At the institutional level there is evidence of increasing strategic thinking in regard to gender mainstreaming in key resources sectors, whereby the National Association of Small Farmers (ANAP), the Cuban Association of Animal Production (ACPA) and the Association of Agricultural and Forestry Technicians (ACTAF) all have Gender Strategies in place, though in implementation, inequalities persist due to the incremental nature of cultural change. Similarly, development projects, driven by increasing international cooperation, have deployed initiatives in favour of gender equality for food security. Such is the case of IGECSA (Gender Equality for Food Security Quality Management), regional experience that has been applied in Cuba through the UNDP/EU Programme "Agricultural Modernization in Cuba (PALMA)" and the UNDP/EU/COSUDE Project "Environmental Bases for Food Security (BASAL)".

Likewise, after a two-year assessment and with the aim of reducing the gaps that lead to inequalities between rural men and women in Cuba, the Ministry of Agriculture (MINAG) approved its Gender Strategy that includes an action plan to be implemented by business, state, budgetary and cooperative institutions, organizations and entities in the period 2015-2020. The Strategy's mission is: "To guide, encourage and support management for equal rights and opportunities for women and men at all levels of the agricultural system; to focus on: recognizing the disadvantages and capacities of women, as well as the needs, problems and potentialities of each territory; to close gender gaps; and to promote the incorporation, participation and leadership of women in the agricultural, forestry and tobacco sectors"³³ (MINAG, 2016).

The specific of the Cuban Agriculture Gender Strategy objectives are:

- Generate a management culture for gender equality throughout the Agricultural System.

³³ Romero Sarduy, María Isabel; Benítez Fernández, Bárbara; Miranda Lorigados, Sandra. Pensar y actuar en clave de género: desafío para el desarrollo agropecuario local" (In process of publication in the book Cuba Rural).

- To articulate the work for gender equality of the organizations that make up the Agricultural System.
- To strengthen the leadership and economic empowerment of women in the agricultural, forestry and tobacco sectors.

Strategic lines:

1. Creation and/or strengthening of capacities: awareness raising and training to close gender gaps.
2. Communication, knowledge management, and innovation to enhance gender equality.
3. Articulation of organizations, networking and socio-cultural impact on communities for gender equality in the agricultural, forestry and tobacco sectors.
4. Working conditions, occupational health and reconciliation of family and working life with greater gender equality.
5. Impact on institutional management policies to promote gender equality.
6. Follow-up, monitoring, evaluation and recognition of entities working for gender equality.
7. Participation and recognition (social, moral, political and material), leadership and economic empowerment of women.
8. Address masculinities in the agricultural, forestry and tobacco sector, and their impact on gender equality.

Summary of gender gaps in the agricultural, forestry and tobacco sector:

1. Non-parity representation: the predominance of men in the labour force is observed.
2. Sexual division of labour in production systems: jobs and occupations considered for men or women remain.
3. Gender gaps in income: although women and men receive equal pay for equal work, women's income is lower than men's because they carry out the highest paid jobs.
4. Gender gaps in knowledge: women are considered to have less knowledge than men about climate change adaptation.
5. Gender gaps in access to and control of resources: women use resources less than men and men make more decisions about them.
6. Gender gaps linked to health risks: men are more exposed in productive areas, while women are more at risk than men in the home.

Regarding the fisheries sector, the fisheries law is designed to be inclusive and does not have any *de jure* gender limitations. The law establishes the regulations for the adequate organization, administration and control of fishing, in accordance with the conservation and rational use of hydrobiological resources in the maritime, fluvial and lacustrine waters of the Republic of Cuba, in order to contribute to the food sovereignty of the nation.

It defines the principles of management of fishing uses:

- a) Conservation and sustainable use.
- b) The precautionary approach.

- c) The implementation of scientific, technological and innovative criteria; and
- d) Protection of marine, river and lake ecosystems.

It also establishes the regime of fishing authorizations, the fishing modalities, the fishing gear that can be used and the fishing areas. Article 8.1 establishes that no authorization is required for fishing carried out freely by natural persons, whether national or foreign, in maritime, river and lake waters from the coast or natural shores using poles, reels, ropes and hooks, without the aid of floating equipment. However, in fishing areas declared as areas of high environmental and historical-cultural importance and reservoirs of state interest, this practice is not permitted without prior authorization.

Regardless, when it comes to participation in the fisheries sector, there is a gendered division of labour, which is described below in the section regarding Women's roles in supply chains.

At the community level, field observation and interviews with directors of the Marlin Marina in Júcaro (an institution that belongs to the Ministry of Tourism, which offers services of nautical activities, sport fishing and diving for tourism), also demonstrate that there is a traditional sexual division of labour conditions in the community, with the majority participation of men in better-paid activities such as fishing and diving, which involve access to fishing resources and coral reef. Conversely, women work as waitresses, cooks and office workers. Interviews also revealed that for many years there was also the practice of cutting down mangroves to produce charcoal, an activity principally carried out by men. Community interviews indicated that this practice has since subsided, due to better regulation as well as the availability of alternative energy sources.

At the household level, in the communities where the project will be carried out, the sexual division of labour within families is also reproduced. Women are principally responsible for the home and the family and therefore they are the ones who perform the non-remunerated tasks (even if they perform productive tasks and bring in income to the home). Women, as elsewhere in most of the world, are the ones who have the "double shift: productive and domestic and hence a significant time burden of unpaid labour.

Men are primarily economic providers and although they perform some domestic tasks, such as getting water for cooking or washing, they see themselves as helping women rather than undertaking an activity of their responsibility. They are in charge of getting water, buying animals for breeding, agricultural purchases (inputs for production), sales of productions, cutting trees to make charcoal for fuel, collecting wood, house purchases, mowing, building new spaces, etc.

As men mainly perform productive roles, they have more time to satisfy their own needs, for recreation and development. Women, on the other hand, lack time for self-care, recreation and development (management positions, training, participation in events and exchange of experiences, among others), for which reason they are at a disadvantage.

In addition, women - especially housewives - are found to be exposed to greater health risks through systematic exposure to oil and firewood for cooking and through the salination of water.

Some examples found during the field visits are as follows:

- In Playa Cajío, women play an important role as heads of family and a factor that affects the inhabitants greatly, is the water supply problem, which affects the domestic recharge of these women. Approximately 80% of Cajío's population is not native to the area. Many of its inhabitants come from the East of the country and have settled in the small houses that have been abandoned by the inhabitants of Cajío currently living in Güira de Melena.
- In La Coloma, women are considered to be primarily responsible for the household and the family, perform domestic work and are disadvantaged because they are economically dependent on men. Men work in the fishing industry and practice artisanal fishing.

In Júcaro most of the women in the community are housewives, and they are equally disadvantaged because they are economically dependent on men. The houses are in precarious conditions after the passage of cyclones, many cook with oil or firewood

- **Role of Women in Relevant supply chain in Rural Areas**

To further elucidate women's access and control of resources, as well as dynamics around labour and employment, an additional survey was administered to understand women's role in supply chains relevant to the project, including in agriculture, fisheries, use of non-timber forest products and in forestry more broadly.

It was found that in the project areas, women participate in a broad range of agricultural activities, including:

- 1) Soil preparation and Harvest
 - Applying fertilizers / insecticides / or other inputs
 - Harvest
 - Transformation (peeling, washing, grinding)
- 2) Selling and Exchange
- 3) Livestock tending

Some of the activities which were identified as most common among women were:

Planting, applying fertilizers / insecticides / or other inputs, harvesting produce, as well as contributing to administrative tasks and species breeding.

Women in the project focus areas stated that they were interested in learning about other types of agricultural activities, and responded favourably to activities including gender training workshops, and those organized to promote women's employment activities.

Women's participation in the fishing sector was found to be primarily related to the processing of catch, as well in the activities related to the selling and exchange of the catch. They process the catch, clean it, weigh it and pack it, for local sale (themselves in their community) or those working in fishing facilities or companies (EPICOL in La Coloma and in Júcaro).

The role of women in the use of wood for energy is closely linked to the production of charcoal, which is sometimes used as fuel for industrial and domestic use, an activity contracted by forestry companies in the territories. In general, this is an activity that is carried out by men, as a labour-intensive activity that requires significant strength, as well as intense working hours to keep the ovens burning and working. In this coal cycle, women work basically in coal packing or in coal management, control and direction, that is, they direct the group of men who do the work. In the project communities, women hold management positions in many of the forestry units. It is a profitable activity and pays stimulation in foreign currency to its workers (approximately 15.00 CUC per month).

It is worth highlighting the fact that, in Cuba, there is a law which prohibits the felling of mangrove trees (Forestry Law # 85 of 1998), which is reasonably well enforced. Therefore, the wood used for charcoal production does not come from the mangrove, but primarily from invasive exotic species such as casuarina and almond, which are common in the project's intervention areas. It was found however that in the project area, some inhabitants debark the mangrove to make a type of leather or to build simple utensils for rudimentary fishing, however this is done on a very small scale.

In project areas with mangroves, the communities use honeybees, where women are involved in extracting the honey from the hives and taking care of them. Tannin, which is a dye that is extracted from the red mangrove after it is debarked, is also used for medicinal purposes and in the leather industry, although women do not have much involvement in this use.

Regarding the use or collection of products related to seagrasses and/or coral reefs, surveys found that in the case of Batabanó, women participate in the cleaning and packaging of sponges. In the Rincón de Guanabo Protected Area, there is a current project aimed at the exploitation of *Thalassia testudinum*, a species that is part of the sea grasses, where the participation of women in harvesting and processing activities is promoted in order to obtain the primary product from which a pharmaceutical product will be developed.

Marine and Coastal Ecosystem Services

Marine and coastal ecosystem goods and services play a major and vital role in the well-being and way of life of Cuba's coastal communities. These communities generally interact most

with the coastal marine ecosystems, such as coral ridges, reefs and mangroves, which are directly and indirectly exploited.

Among the main economic and environmental uses related to these ecosystems are commercial and self-consumption fisheries; scientific and educational value, coastal protection, erosion control, spiritual, cultural and recreational value, medicinal and conservation value, and biodiversity habitat, among others.

Coral reef ecosystems have use value for subsistence fishing, sport fishing, tourism and recreation. Women make less use than men of the benefits of these ecosystems, especially in subsistence and sport fishing. Some components of these coral ecosystems are used at a community level as natural medicine or for ornamental purposes, mainly by women.

The products of the Costa Arenosa vegetation ecosystems are used to produce charcoal, buds, human and animal food, recreation, seed extraction and beekeeping, coastal protection against the impact of storms and hurricanes or as a source of materials for handicraft production, etc. Oyster farms and capping houses are also work options in these communities in terms of benefits and opportunities for women.

The role of women in national forest enterprises

In Cuba, more than 7,500 women farmers are involved in forest management, representing between 18-19% of the workers in this field (Territorial Delegation of the Ministry of Agriculture, 2014.) The presence and participation of women in forestry is found in all types of occupations, including many that have traditionally been considered as men's, but the figures for these compared to the men are much lower. They are also represented in all forestry structures at the territorial level, whether in forestry enterprises at the provincial level, in forestry units at the municipal level or in forestry brigades in settlements. However, men are more represented than women, although in recent years Cuba has seen an increase in women in forestry, especially in coordination, leadership, management or leadership positions. If before they were less visible, today they occupy positions as directors of companies, forestry units or forestry brigades, which contributes to a greater promotion of women among foresters, based on awareness raising at all levels. In the forestry brigades, women are mainly employed in the nurseries (in the sowing of stumps) or in the packing of charcoal, and men in the work of felling, sowing, etc.

In the case of Cuba, the incorporation of women or not into the forestry sector is not so determined by the access they may have to it, since like men they may work in the sector. There are also other reasons why women are not attracted to forestry activities: lack of motivation, due to the low value or recognition of their work; little knowledge about the sector and insufficient promotion of it so that women can appreciate the potential it offers for individual, social and professional fulfilment; little promotion of employment options that

can be taken up by women, competition from other areas of work with more attractive jobs; distance from work areas and lack of differentiated attention to women's practical needs in terms of working conditions.

Generally speaking, the role of women in forest leadership and management has increased. There is an increasing number of women in leadership positions in forestry who are involved in management, control and decision-making. To a lesser extent, they work in field activities or on the ground, such as in forestry brigades (nurseries). They are more represented in the Forestry Corps, where they certify and control forestry activities, although this body belongs to MININT.

Women have gradually been incorporated into the country's forestry activity, with notable progress in the productive, managerial and organizational spheres. However, there are still gender gaps that require joint action to eliminate them. Some of these are: Greater training and awareness on gender issues for managers of companies, forestry units and workers in the sector, both men and women, who work directly at the base, in nurseries, timber industries, sawmills, coal plans, experimental stations and others; The existence of a greater number of spaces where the topic is included, such as methodological and practical activities, work meetings, management boards, etc.; promoting and strengthening training in the communities from a gender equity perspective, which may contribute to changes in stereotypes related to the activity, thus favouring the incorporation of women into forestry activities.

In Cuba there exist Non-Agricultural Cooperatives (CnA) and Agricultural Cooperatives, which, according to their type, have three names:

- a) Basic Unit of Cooperative Production
- (b) Agricultural Production Cooperative; and
- c) Credit and Service Cooperative.

Again, there are no *de jure* limitations in women's involvement. The requirements for membership in a cooperative are defined according to the contribution of work and goods to the productive functioning of the cooperative, not according to gender or sexual preference.

Cuban legislation on cooperatives:

- Decree-Law No. 366 "On Non-Agricultural Cooperatives"^[2]The organization is an organization with economic and social purposes, which is constituted voluntarily on the basis of the contribution of goods and rights and is supported by the work of its members. The general objective of the cooperative is the production of goods and the provision of services through collective management for the satisfaction of the social interest and that of the members.

- Decree-Law No. 365 "On Agricultural Cooperatives The latter [3] constitute an economic and social organization that is part of the agricultural and forestry production system. Its general objective is the production of goods, fundamentally agricultural and livestock, and their commercialization, as well as the provision of services through collective management for the satisfaction of the social interest and that of the cooperative members.

Women are linked to the forestry sector through the structure of the Base Enterprise Unit (UEB), which is integrated into state-run agroforestry enterprises. It is estimated that there are about 40 thousand workers in the forestry sector, 9 thousand of them women. Forty percent of the technical and professional staff are women.

The advances in women's participation in Cuban forestry are relevant when compared to the situation in other countries in our area and in other regions of the planet. Cuba's National Forestry Programme and forestry sector policy explicitly include the issue of gender and update the strategy to achieve equity.

Traditionally, men have dominated forestry and forest sciences. With very few exceptions such as Cuba, women have not been well represented in the forestry sector and have not had the opportunity to access positions of power and influence as a result of gender discrimination. They have not been motivated or encouraged to choose the forestry profession and as a result are not well represented in the sector as men are. However, in Cuba approximately 40% of the technical and professional staff of the National Forestry Directorate (DNF) of the Ministry of Agriculture and the SEF are women. (Cuba Forestry Sector Development Project, 2008-2013).

In Cuba, more than 7,500 rural women are involved in forest management, representing 19% of the workers in this field^[4]. The presence and participation of women in forestry is found in all types of occupations, including many that have traditionally been considered as men's, but the figures for these compared with men's are much lower and have less recognition.

If before they were less visible, today they hold positions as directors of provincial companies, services and forestry units, which contributes to a greater promotion of women among foresters, based on awareness raising work at all levels. An example of this is the wide representation of women in entities such as the State Forestry Service and the Mountain Agriculture Business Group (GEAM), among others. The incorporation of women has also had a great increase in more practical forestry work, from reforestation actions and work in nurseries, timber industries, sawmills, coal plants, experimental stations, and others; so it becomes a paid job.

Another remunerated activity in which women participate is in the production of the cogollo, a product obtained from prophylactic felling and from wood that falls when hurricanes strike. This vegetable fiber is produced in a family activity, with the participation of women, and is sold to the Forestry Company, which markets it to the Tobacco Company of the territory, which demands the product to tie the bales of tobacco. Women also work in the production

of charcoal, used as fuel for industrial and domestic use, an activity contracted by forestry companies in the territories. In general, this is an activity carried out by men, although women help mainly in keeping the charcoal burning ovens lit and working, it is a profitable activity and pays stimulation in foreign currency to their workers (approximately 15.00 CUC per month).

In Cuba's coastal and mountainous settlements, whose fundamental economic activities are related to forest and coastal and marine ecosystem goods and services. In these communities, the level of unemployment is higher among women than among men, so that a large number of them, given the lack of jobs and other cultural factors, figure as housewives; in many coastal settlements this figure exceeds 50% of the total number of women^[5].

On the other hand, some research reveals^[6] gender inequalities related to the lack of understanding of some male bosses towards the time needs of their subordinates, to attend to domestic tasks that fall on women even after their paid working hours are over.

- **Gender Based Violence**

In recent decades there has been a worldwide movement denouncing gender-based violence, which affects millions of girls and women around the world.³⁴ Gender-based violence is defined as any intentional act or omission, based on gender inequalities, which results in the possible or actual undermining of human integrity (physical, sexual, emotional, economic, professional or psychological)³⁵. Although men are not exempt from gender violence, women are the main victims of a patriarchal culture that legitimizes hegemonic male power. In Cuba, this social problem has also been denounced not only by academia, but also through broader social activism. National campaigns to eliminate all types of violence against women and girls have been fundamental, as well as prevention actions developed at the community level through awareness-raising processes and training with local actors. National campaigns to eliminate all types of violence against women and girls have been fundamental, as well as prevention actions developed at the community level through awareness-raising processes and training with local actors. As part of this process, Cuba joined the Campaign of then UN Secretary General Ban Ki-Moon to end violence against women.

Cuba signed the landmark Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) in 1980. In 1997, the National Plan of Action for Follow-up to the

³⁴ World Report on Violence and Health: Summary. Washington, D.C., Pan American Health Organization, World Health Organization Regional Office for the Americas, 2002.

³⁵ Proveyer Cervantes, Clotilde; Romero Almodóvar, Magela; Hidalgo Gómez, Zulema (2017) Methodological folder. Training of social actors for prevention and attention to gender-based violence in the community setting. ISBN 978-959-242-184-4.

Fourth United Nations Conference on Women was approved by a Decree-Law of the State Council. That same year, it established the National Group for the Prevention and Treatment of Domestic Violence, particularly which perpetrated against women³⁶. This National Group maintains its systematic work and functions as a permanent working group, led by the Federation of Cuban Women (FMC)³⁷ and composed of the Ministry of Education, the Ministry of Public Health, the Ministry of the Interior, the Institute of Legal Medicine, the Office of the Attorney General of the Republic, the National Sex Education Centre, the University of Havana, the Cuban Radio and Television Institute and the People's Supreme Court³⁸.

FMC has re-established a working agreement with other governmental and non-governmental organizations based in the country, expanding its alliances for the benefit of children, young people, women and the family in general³⁸. In 2016, a cooperation agreement was signed between the Federation of Cuban Women and the Office of the Attorney-General of the Republic of Cuba to extend by telephone the possibility of reporting acts of violence against women³⁹. In addition, the National Assembly of People's Power, as part of its working structure, is devising a Parliamentary Committee for the Care of Youth, Children and Equal Rights of Women.

Studies recently developed by the Center for Women's Studies, belonging to FMC, together with the Center for Population Studies (ONEI), belonging to the National Statistics and Information Office, on the conceptions and assessments that the Cuban population has on the subject of gender, indicate that:

- 88.7 % of the Cuban population aged 15-74 (89.2 % of women and 88.1 % of men) consider that laws protecting women are applied in Cuba. 5.3% "agree in part", 1.7% "disagree" and 3.7% "don't know" or "have doubts".
- 88.7% think that in Cuba there are specific policies and actions in favour of women (89.3% of women and 88% of men). 4.6% "agree in part", 1.7% "disagree" and 4.3% "don't know" or "have doubts".

In regard to access to services for victims of GBV, there are several relevant services available. Within the Public Health System: Polyclinics, Day Hospitals, Community Mental Health Centers, Clinical-Surgical Teaching Hospitals, all of which provide psychology and psychiatric

³⁶ FMC is a Non-Governmental Organization (NGO) with a Special Consultative Category in the United Nations Economic and Social Council (ECOSOC). In the local space it is represented by around 74 thousand grassroots organizations. It has affiliates to 86.3% of the population over 14 years of the country. See: "Questionnaire sent to governments on the implementation of the Beijing Platform for Action (1995) and the results of the Twenty-Third Special Session of the General Assembly". <http://www.un.org/womenwatch/daw/Review/responses/CUBA-Spanish.pdf>

³⁷ Organización de Naciones Unidas. Comisión Económica para América Latina y el Caribe. Informe Nacional: Cuba. https://www.cepal.org/mujer/noticias/paginas/3/51823/Informe_Cuba_Beijing_20.pdf

^{38,38,39} Informe de Resultados. Oficina Nacional de Estadística e Información. Editorial de la Mujer. La Habana, 2018. 117 pp.

services that can be accessed by victims of violence. At the community level, the Family Doctor Program provides care to anyone who needs it. All of these services exist throughout the country.

In addition, the following services are identified to establish a claim or request legal or psychological assistance:

- The Women and Family Orientation House (throughout the country);
- The National Revolutionary Police (throughout the country)
- Complaint and suggestion box in different government agencies;
- Letters to relevant agencies and the Government, depending on the nature of the event giving rise to the complaint;
- Services to the population in the municipal governments and the Party;
- Attorney General's Office;
- Centro de Reflexión y Diálogo "Oscar Arnulfo Romero", is based in Havana and has a multidisciplinary team working on gender violence;
- Churches of different religious denominations (throughout the country).

d) Legal and administrative framework for the protection of women and the protection of gender equality

The Constitution of the Republic of Cuba (2019) expresses the political will to guarantee the protection of women. Article 43 of Chapter VI on equality states that: *"The State guarantees that women shall be offered the same opportunities and possibilities as men, in order to achieve their full participation in the development of the country."* The Cuban constitution also states *"Women and men enjoy equal economic, political, cultural, social and family rights. (...) The State strives to create conditions conducive to the realization of the principle of equality."*

Accordingly, Cuban labour legislation does not accept any discrimination in terms of pay, promotions, benefits or equal training. The creation of children's circles in 1961 and the system of semi-boarded schools were also decisive elements in the massive incorporation of women into working and social life. Thus, in the 1970s and 1980s in Cuba, important laws were passed that transformed the legal status of women and aimed to eliminate injustices derived exclusively from gender status. These legal reforms are expressed in the Maternity Act (1974), the Family Code (1975), the Labour Protection and Hygiene Act (1977), the Social Security Act (1979), the Labour Code (1984) and the Criminal Code (1987). Overall, laws in Cuba prohibit discrimination against women and there are currently no restrictions on their civil status.

The following is a summary of the laws currently in force that favour gender equity across spheres:

The Family Code, enacted in 1975 and currently being revised, has supported the strengthening of the family as the fundamental unit of society, together with the growing participation of women in all spheres of life and the equal rights of sons and daughters.

Regarding employment, Act No. 49, of December 28, 1984, established the first Labour Code, with special rules for women's work, such as Chapter VIII, which regulates jobs and their conditions and establishes special protections such as maternity. Therefore, this body of law manifests and recognizes the importance of women's participation in the workplace, their high social function of being mothers and the specific protection for adolescents and pregnant women. The current Labour Code (Act No. 116 of June 17, 2014) reaffirms the protection of working women in Chapter IV and their inclusion in the growing non-state sector of the economy.

The rights to Protection, Safety and Hygiene at Work were established by Law No. 13 of February 27, 1977 (and its regulations and attached legislation), which establishes the duty of administrations to create adequate working conditions that benefit women's participation in the work process. Act No. 116 of the Labour Code currently regulates these conditions.

These principles do not preclude women's right to prove their aptitude and ability to occupy complex jobs. For a time, there was an excess of "protectionism", excluding women from work options that they could perform, which prevented the full exercise of their rights. Concepts and rules were then modified and applied, on the basis that only maternity protection constitutes a labour limit and not the sexist tendency to prohibit women from performing certain tasks. Today in Cuba, these concepts are perfected and enriched through scientific research, experience and the practical results of women's work, in order to avoid masking discriminatory behaviour with false protectionism. In the enacted Social Security and Welfare laws, principles have been enacted that also protect women. The current Social Security Law No. 105 provides guidelines to ensure the maternity of working women and the protection of widows in the event of the death of their spouses.

Maternity laws have assessed the different stages of pregnancy and the protection that the woman and her daughter or child must have in the medical work order. The Working Women's Maternity Act and all the relevant articles of the Labour Code and other labour legislation are examples of the affirmative action measures that have been necessary to establish and that have served over the years to protect the rights that must be guaranteed to women in the labour structure. Under Decree-Law No. 234 of 2003 on the Maternity of Women Workers, parental leave was extended. Article 16 of Chapter VI of this decree, which refers to social benefits, provides that: "Once the postnatal leave is over, as well as the period of breastfeeding that must be guaranteed in order to promote the best development of children, the mother and father may decide which of them will take care of the child, how this

responsibility will be distributed until the first year of life and who will receive the social benefit, communicating the decision in writing to the administration of each parent's workplace". The social custom, however, is that very few men have taken leave.

It is also worth mentioning that one of the strategic axes of Cuba's Economic and Social Development Plan, 2030 is that of "Human Development, Equity and Social Justice." One of the specific objectives of the plan (#19) is focused on "Guaranteeing the exercise of the rights and duties of all citizens, with equality, inclusion and social justice, expressed in access to opportunities, achievements or results, distribution of the benefits of development and confrontation with all forms of discrimination based on skin colour, gender, gender identity, sexual orientation, disability, territorial origin, religious belief, age and any other distinction injurious to human dignity".

Various social mechanisms have also been created to promote policies in favour of women, such as the creation of the Commission for the Care of Children, Youth and Equal Rights of Women in the National Assembly of People's Power, the National Centre for Sex Education, the Commissions for Prevention and Social Care and the Commission for Women's Employment. Cuba's overall health strategy as mentioned above is another policy that has fostered gender equity, since the entire population has free access to these services.

In the process of promoting greater equity and mitigating the contradictions between the private and the public present in Cuban society, three important programs have been implemented and promoted:

- The National Sex Education Program to promote healthy, responsible sexuality with equal rights and opportunities between women and men.
- The Women's and Family Orientation Houses Programme aimed at carrying out individual and group orientation actions in order to ensure that beneficiaries make the necessary changes with respect to the traditional roles assigned and assumed in the families.
- The Women's Chairs Program in Cuban Universities with the aim of introducing and strengthening a gender approach in undergraduate, graduate and research, contributing to the training of future professionals in this perspective and from a multidisciplinary approach.

The FMC, created in 1960, from its inception has assumed the role of transforming the discriminatory mentality towards women, as well as acting as a transforming civil force. Among its most significant actions are: to contribute to the solution of the real needs of women by creating objective conditions for the relief of domestic burdens and responsibilities, the development of a broad educational campaign to confront the social, family and individual conflicts that hindered the presence of women in social life, and the promotion of programmes for cultural improvement, strengthening and promoting women's involvement in increasingly complex tasks, including non-traditional ones, diversifying their roles from the exclusive role of housewife as well as the incorporation of women into

economic life, especially in sectors in which women who until then had been marginalized, such as housewives, domestic workers, and prostitutes.

These actions collectively facilitated women's access to work, promoted women's involvement in decision-making positions, worked towards non-sexist socialization, and encouraged the presence of men and the entire family unit in these changes, while simultaneously supporting the formulation of new legislation that would include and protect women's rights. This led to the revision of discriminatory laws and the enactment of others that affirmed women's right to personal liberty. For example, the Ministry of Labour and Social Security not only removed any restrictions on women's access to traditionally male jobs, but also promoted regulations that broadly favoured the incorporation of women, protected their rights and guaranteed equal opportunities and pay. The FMC has been and continues to be a decisive factor in the drafting, proposal and materialization of laws for the benefit of women and the family and has had a decisive influence during recent years on Cuban legislation contemplating different perspectives of male-female relations in society.

e) Results from Stakeholder Consultations

Global experience has shown that women in most countries experience the effects of climate change differently than men, both in terms of adjusting livelihood strategies, in their changing relationships to scarce resources and regarding disasters. This differentiated impact arises from physical, cultural and social factors that often linked with poverty, and are particularly relevant in contexts where poverty is significantly gendered. In the Cuban context however, although there are gendered differences in various spheres as described above, all men and women are guaranteed the same access to social services, as well as baseline income. This is evident in the fact that although many other nations, there is a startlingly difference in mortality rates during disasters (for example, a study by WEDO found that women and children have been found to be 14 times more likely to die than men during disasters³⁹) in Cuba this situation is inverted, with men's mortality significantly outweighing those of women during disasters⁴⁰.

This observation was strongly supported through the results of the stakeholder consultations carried out to inform the design of the project. The stakeholder consultations, which explicitly covered gender issues, inquired of both institutional and community participants what specific problems and difficulties may be faced by women in adapting to climate change in the coastal zone of Cuba. The full results of the community level consultations can be found in the Stakeholder Consultation and Engagement Plan (Annex 8). Overall, in relation to the

³⁹ Araujo, A. and Quesada-Aguilar, A., (2007), Gender Equality and Adaptation, USA: Women's Environment and Development Organization (WEDO).

⁴⁰ Pichler, A. 2011. Education and adaptive capacity to climate change: a comparative study of social vulnerability patterns to hurricanes in Cuba and Dominican Republic (Mimeo). International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria.

question that consisted of whether climate change affected men and women equally, little perception of differences were evident, neither on the part of the women nor of the men interviewed. All respondents agreed however that people with unfavourable living conditions are the most vulnerable to climate change, with children, the elderly and people with disabilities being identified as the groups most at risk. Furthermore, through a participatory mapping exercise, most community members, as well as representatives of local government validated that the settlements closest to the coast were the most vulnerable, including both the men and women in those communities.

Regardless, the consultations made it possible to identify the following problems that disproportionately affect women:

- Problems in water supply and quality due to saline intrusion. Additionally, sanitation problems in most homes in the project areas. For example, in the Surgidero of Batabanó, the houses are full of black or grey water. Women are the most affected by these problems because they are the most responsible for domestic work in the home.
- Equity gaps in access to employment in Júcaro. In an interview with the Director of the Marlin Branch, Marina Marlin, an institution that belongs to the Ministry of Tourism, and which offers services of nautical activities (sport fishing and diving for tourism). The director pointed out that the base has 150 workers, 23 of whom are women. As mentioned above, these women are mostly involved in work traditionally considered 'women's work' such as the cleaning of boat cabins, and work in the office as secretaries and accountants. From a gender analysis perspective, this indicates a reproduction of the traditional roles of women. In addition, most of the women in the Júcaro community are housewives. In the locality there is no children's circle. Children's circles are state or private institutions, in the latter case self-employed, which provide care for pre-school children (1-5 years).

f) Project design and implementation

Despite the high level of gender equality in Cuba it has been recognized that women play an important role as heads of families and also have an active participation in community work, and hence this proposal seeks to enhance their role in these spaces, considering them key subjects in climate change adaptation actions. Finally, the fact that women are disproportionately impacted by the lack of water at the household level, informed the decision to include waste management and sanitation activities as a part of the project (though co-financing).

The project design also considers lessons learned and successful gender mainstreaming strategies from other projects. In the case of the UNDP/Adaptation Fund Manglar Vlvo Project, there was a very positive change in thinking that led many women to become involved in activities that previously only men took on. The same men saw as a positive example the fact that women entered the forest brigades, the forest ranger corps, or in

management positions at the territorial CITMA. As a result, men were forced to take on household chores for support. And not only do women form part of the kitchen or cleaning staff in the forest brigades, but they also have active roles in these spaces, as forest rangers, which is the regulatory authority for ensuring compliance with forest regulations.

The experiences of other projects in Cuba show that many participate in training and education activities and demonstrate an excellent capacity to coordinate projects that contribute to their empowerment and leadership. On the other hand, in Cuba, it is women who are primarily involved in community activities.

The UNDP/AF project Manglar Vivo worked on accompanying the family in many of the activities, especially the mothers who participated. For example: children's contests, festival for the international day of wetlands, international day for the mangrove ecosystem's defence, national day of mangroves in Cuba, community fairs, educational-communication workshops in schools, and the work of the universities (training of students). In this project, in spite of household responsibilities, a large number of women participated in the training processes and, although some of them ceased to be an official part of the project because of the household's occupations, they found an alternative to be volunteers within the project.

"At the beginning, when I was proposed, I said to myself, 'Foresters?... I am an engineer, but my specialty at the beginning was Medium Technician in Agronomy, but I said to myself: let's try it. I feel good, I don't have any complexes, not even when they sometimes say to me: don't you feel sorry for walking around in boots, with those clothes? The environment in which I work requires this type of clothing (Odalmis, guardian of the forest, UNDP/FA Living Mangrove Project).

"I spend more time in the protected area than I do at home. Sometimes we stay for several days, it's the whole day, we don't have time. Usually we're here, it's our house. My family has supported me a lot in my work, without them I wouldn't be where I am. And my children and grandchildren have been very attached to my work. I even have a granddaughter who is 10 years old and she tells me that she is going to be the future director of Flora and Fauna, because she lives in love with this world in which I work (Tere, UNDP/FA Living Mangrove Project).

"I have always said, once I discussed it with him, that if I ever ceased to exist I would want to be a red mangrove. Because I identify with him: he has all his family on him when he has to let go, when he reaches his maturity level, but he remains firm with his roots in the ground, you as long as there are winds, tides, cyclones and he is still there holding on to the earth. I would like to be a red mangrove" (Yamila, UNDP/FA Living Mangrove Project).

During the visits to the territories and in exchanges with the women, they expressed satisfaction with the implementation of the project in their communities and were eager to participate., considering adequate times and schedules to facilitate their participation in the project activities.

Overall, the design and implementation of the project took take into consideration the following gender implications:

- Specific strategies to include/address female-headed households;
- Different conservation incentives faced by women;
- A more nuanced and data-based identification of gaps in gender equality through the use of sex-disaggregated data in the monitoring of implementation results, and hold individuals and institutions accountable for results that promote gender equality;
- Ensuring that sensitization and awareness are adjusted to more effectively reflect gender-specific differences that may exist. That is the strategies in the Stakeholder Engagement Plan have been adopted, taking these differences into account;
- Inclusion of an Environmental and Social Safeguards Specialist, with expertise in Gender mainstreaming/ provision of advice within the project to implement gender-related activities.

g) Gender consideration in design of Grievance Response Mechanism

As part of the State's political will to achieve gender equality, conditions have been created to support the work of caring for and preventing gender violence through:

- a) signature and commitment to the CEDAW Convention and other international agreements,
- b) the establishment of the Government Platform to implement the agreements of the Beijing Summit,
- c) The creation in 1997 of the National Group for Attention to and Prevention of Domestic Violence, among others, until the recognition of gender violence as an obstacle to achieving equity in Cuba was included in the policy documents of the Party.
- d) The deployment of numerous action initiatives to combat gender-based violence in various institutions, non-governmental organizations and agencies that are contributing to the gender-based violence diaspora, with pioneering initiatives to be taken into account for the improvement of the strategy for addressing the problem of gender-based violence.
- e) The legal protection enjoyed by Cuban women, even if there is not yet a special law on violence, equal opportunities in all spheres of society and, as a result, the sustained increase in their social participation, act as factors of prevention and assume systems of protection against gender violence.
- f) The Constitution of the Republic of Cuba endorsed in 2019, under Title V, relating to "Rights, Duties and Guarantees", recognized that "...all persons receive the same protection and treatment from the authorities and enjoy the same rights, freedoms and opportunities, without any discrimination on grounds of sex, gender, sexual orientation, gender identity.

In Cuba, community prevention work (including violence prevention) is currently governed by Decree-Law 286 of 2011, enacted by the Council of State of the Republic. The Ministry of Labour and Social Security is the agency assigned the function of proposing, directing and controlling the policy approved by the State and the government in terms of prevention, assistance and social work, for which it fulfils the following:

1. To propose, guide and control the procedures for the development of prevention, assistance and social work
2. To design and guide the characterization of family nuclei and communities; and propose actions for the solution of social problems.
3. To promote unity of action for the solution of social problems, to identify their causes and conditions and to make recommendations to the relevant institutions for appropriate action.
4. Control, direct and coordinate with the corresponding bodies, agencies, organizations and institutions the ways and methods for the integral attention of social problems and the prevention of antisocial and criminal behaviours.
5. To promote and coordinate scientific studies and research to identify causes and conditions of antisocial and criminal behaviour, and to use their results in prevention, assistance and social work.
6. Promote the education and training of the personnel linked to these activities.
7. Coordinate, evaluate and propose strategies for dissemination in accordance with the principles of our society and in support of prevention, assistance and social work.
8. Any others that are designated by law.

Local and community grievance mechanisms^{41[1]}

In the Cuban case, a predominant role has been played by the popular organizations, together with other state bodies and institutions with which they have harmoniously developed integral actions at the community level. Complaints to the directorates of the National Revolutionary Police are a frequent complaint mechanism in the localities.

However, there are several agents of community social control to which victims of violence can turn, such as "social and mass organizations", among them: The Committee for the Defense of the Revolution (CDR), the Federation of Cuban Women (FMC), the integral manager of social work and attention, the sector chief of the National Revolutionary Police (PNR), the delegate of the People's Power who represents the inhabitants before the corresponding municipal assembly.

- Greater dissemination and access to existing mechanisms;
- Greater visibility (print media, audio visual) and understanding of gender violence, which often overlaps, in the popular imagination is only perceived as physical and

⁴¹ Barroso, Jorge Luis (2016) El control social comunitario en Cuba y sus implicaciones para la seguridad pública. Revista Policía y Seguridad Pública. January - June 2016. ISSN: 2225-5648. Year 6, Vol 1, p. 127-164.

domestic violence, but can manifest itself in other settings (work, school, among others);

- Training to raise awareness of gender violence and its various expressions
- Participation in groups, networks and campaigns against gender violence that exist in the country;
- To set up a specific "Help Line" for cases of gender violence, similar to that which exists for cases of HIV-AIDS or addictions;
- To have a Law against Gender Violence.

h) Monitoring and evaluation

During project implementation, qualitative assessments will be made of gender-specific benefits that may be directly associated with the project. This will be incorporated into the Annual Project Implementation Report, the Mid-Term Evaluation and the Final Evaluation. Indicators to quantify the achievement of project objectives in relation to gender equality will include: number of men and women who benefitted from Ecosystem-based adaptation solutions, number of men and women employed in jobs created by the project, training opportunities, knowledge management and information dissemination.

More specifically, to monitor and evaluate the progress of the project, the following indicators should be tracked:

Qualitative results:

- The project can generate employment for women from the actions foreseen in the interventions in the forestry and water resources sector, as well as in the organizational structures associated for the implementation of the project.
- Save time for women as a result of shorter working hours required for agricultural and water management practices prior to project implementation and encourage the greater co-participation of men in domestic tasks, through the project's sensitization and capacity building activities.
- Support training and education activities that may include activities related to climate change, agriculture, fisheries, leadership, and decision making, thus enabling greater participation of women to participate with confidence in community meetings.
- Empower women through the project's capacity building and training to facilitate their participation in the project's actions at the community level.



ANNEX VIII – Gender Analysis and Action Plan

GREEN CLIMATE FUND FUNDING PROPOSAL

Section 2: Gender Action Plan

"Coastal Adaptation to Climate Change in Cuba through Ecosystem Based Adaptation – MI COSTA project"

Objectives	Activities	GESI Targets and Indicators	Project Level Measures and Targets	Partner Institutions	Timeline								Budget (US\$)
					Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	
Output 1: Rehabilitated coastal ecosystems for enhanced coastal resilience and capacity to manage climate impacts													
Activity 1.1. Assess and restore coastal wetland functions by re-establishing hydrological processes	<p>1.1.1. Gender equitable training delivered to target community members on coastal wetland monitoring and in the design of monitoring methodologies</p> <p>1.1.2</p>	<p>Baseline: 0 Target: 50% of the training personal Indicator(s):</p> <ul style="list-style-type: none"> Number of women trained <p>Baseline: 0 Target: 50 % of the total personal involved Indicator(s):</p> <p>Number of women involved in the design of the methodological tool</p>	<p>Measure: Number of hectares of coastal wetland rehabilitated for EBA in target areas</p> <p>Targets: 15,443 ha of degraded coastal wetland has been rehabilitated</p>	<p>Responsible: FLACSO-Cuba jointly with AMA</p> <p>Participants: Coastal communities, ICIMAR, FMC, INSMET, INRH, IPF, ENPFF, CES, CGC, DPCITMA, CMP, CIGET, DPFF, CESA, CAM, DMPF, CGRR, EEUP, OM, and ACTAF</p>	X	X	X	X	-	-	-	-	200,541

	Robust participation of women in employment created by the implementation of EBA adaptation protocols	for the monitoring of coastal ecosystems Baseline: 0 Target: 30% of the new employment will be occupied by women ⁴² Indicator(s): • Number of women with employment hydrological restoration process including the removal of invasive species											
Activity 1.2. Mangrove and swamp forest rehabilitation	1.2.1. Robust participation of women in employment created by the implementation	Baseline: 0 Target: 30% of the new employment will be occupied by women ⁴³ Indicator(s):	Measure: Number of hectares of coastal wetland rehabilitated for	Responsible: FLACSO-Cuba jointly with AMA.	-	X	X	X	X	X	X	X	118, 270

⁴² Women have equal access to the employment created by the EBA intervention protocols, as required by Cuban law. However in this case, the target is set at lower than equal participation, as setting a target of 50% may inadvertently increase the work burden of women, as well as impose an employment choice.

⁴³ Women have equal access to the employment created by the EBA intervention protocols, as required by Cuban law. However in this case, the target is set at lower than equal participation, as setting a target of 50% may inadvertently increase the work burden of women, as well as impose an employment choice.

<p>in target sites through natural and assisted regeneration for enhanced coastal protection</p>	<p>of EBA adaptation protocols</p>	<ul style="list-style-type: none"> • Number of women with employment in mangrove, swamp forest and swamp grassland interventions • Number of women headed households with employment in mangrove, swamp forest and swamp grassland interventions 	<p>EBA in target areas</p> <p>Targets: 15,443 ha of degraded coastal wetland has been rehabilitated</p>	<p>Participants: Coastal communities,</p> <p>DMA, AMA, ICIMAR, FLACSO, FMC, INSMET, INRH, IPF, ENPFF, IDICT, CES, CGC, CAP, DPCITMA, CMP, CIGET, DPFF, CESA, CAM, DMPF, ACTAF, and ANAP</p>									
<p>Activity 1.3. Record and assess coastal and marine ecosystems' natural regeneration and their protective functions based on conditions provided as a</p>	<p>1.3.1. Robust participation of women in monitoring of marine ecosystems</p>	<p>Baseline: 0 Target: 30% of the people involved in monitoring activities Indicator(s):</p> <ul style="list-style-type: none"> • Number of women involved in monitoring of marine ecosystems. 	<p>Measure: Change in the annual reduction rate of seagrasses in the intervention sections</p> <p>Targets: Annual reduction rate of 0.2% seagrass</p> <p>Measure:</p>	<p>Responsible: FLACSO-Cuba jointly with AMA.</p> <p>Participants: Coastal communities, ICIMAR, FMC, CNAP, MINAL, INSMET, INRH, IPF, ENPFF, CES,</p>	<p>-</p>	<p>X</p>	<p>218,541</p>						

<p>result of restored coastal wetlands</p>			<p>Change in the annual rate of loss of reef crests and frontal reefs in the intervention sections</p> <p>Targets: Annual loss frontal ridges and reefs is reduced by at least 0.2-0.5%</p>	<p>CGC, DP, CITMA, CMP, CIGET, DPFF, CESA, CAM, DMPF, CGRR, EEUP, OM, and FCPD</p>									
<p>Activity 1.4. Enhance water conduction systems along targeted watersheds to restore freshwater drainage in coastal ecosystems and aquifers to reduce and monitor saline intrusion in target sites</p>	<p>1.4.1. Gender equitable training delivered to INRH experts on hydrological modelling and data management.</p>	<p>Baseline: 0 Target: 50% of the personal trained Indicator(s): • Number of women trained</p>	<p>Measure: Area in target areas affected by saline intrusion.</p> <p>Targets: Reduction of the average area affected by saline intrusion by at least 3%</p>	<p>Responsible: FLACSO-Cuba jointly with AMA</p> <p>Participants: Coastal communities</p> <p>DMA, AMA, ICIMAR, FLACSO, FMC, INSMET, INRH, IPF, ENPFF, IDICT, CES, CGC, CAP, DPCITMA,</p>	-	X	X	X	-	-	-	-	118,270

				CMP, CIGET, DPFF, CESA, CAM, DMPF, ACTAF, and ANAP									
Objectives	Activities	GESI Targets and Indicators	Project Level Measures and Targets	Partner Institutions	Timeline							Budget (US\$)	
Output 2: Increased technical and institutional capacity for adaptation and resilience to climate change impacts in Coastal Communities, Governments and Economic Sectors													

Activity 2.1. Develop a climate adaptation technical capacity building program for coastal communities and local stakeholders (government & economic sectors) to enable adaptation actions	2.1.1. Gender equal participation of women in the design of EBA content and in training delivery.	Baseline: 0 Target: 50% of the total people involved in the training process Indicator(s): <ul style="list-style-type: none"> • Number of women participating in design of training content. • Number of women participating in training delivery. • Number of women trained as decision makers in community level-agricultural cooperatives 	Measure: Number of people with knowledge and skills to adapt to CC, broken down by communities, governments and sectors, considering gender and age groups. Targets: 444,793 people (total project beneficiaries) with high level of capacity (assessed by FLACSO)	Responsible: FLACSO-Cuba jointly with AMA. Participants: DMA, ICIMAR, FMC, IPF, ENPFF, CICA, IDICT, CES, CGC, CAP, DPCITMA, CMP, CIGET, DPFF, CESA, CAM, DMPF, SEF, MMC, and ANAP	X	X	X	X	-	-	-	-	388,875
	2.1.2. Awareness raising and training of local government officials on responding to issues of intersectional	Baseline: 0 Target: 50% of the training personal Indicator(s): <ul style="list-style-type: none"> • Number of women trained in EBA 	Measure: Number of people with knowledge and skills to adapt to CC, broken down by communities,	Responsible: FLACSO-Cuba jointly with AMA. Participants: DMA, ICIMAR,	X	X	X	X	-	-	-	-	

	vulnerability (of women, female-headed households, the elderly, children and disabled persons), including training on environmentally sustainable production practices that reduce or avoid anthropogenic pressure on ecosystems	<p>approaches to coastal adaptation.</p> <p>Baseline: 0 Target: 1 package Indicator(s):</p> <ul style="list-style-type: none"> • Training package developed that addresses issues of intersectional vulnerability (of women, female-headed households, the elderly, children and disabled persons) <p>Baseline: 0 Target: 480 (20 government officials in each of the 24 municipalities) Indicator(s):</p> <ul style="list-style-type: none"> • Number of local government officials trained in EBA approaches to coastal adaptation. 	governments and sectors, considering gender and age groups.	FMC, IPF, ENPFF, CICA, IDICT, CES, CGC, CAP, DPCITMA, CMP, CIGET, DPFF, CESA, CAM, DMPF, SEF, MMC, and ANAP											
Activity 2.2. Integrate	2.2.1. Gender-equitable involvement of	Baseline: 0	Measure: Number of Climate	Responsible: FLACSO-	X	X	X	X	X	X	X	X			350,875

<p>project (technical and community based) derived information, information from early warning systems and national datasets into a Knowledge Management Platform, to provide climate information products to monitor, evaluate and inform coastal communities on local (community and ecosystem) capacity to manage climate</p>	<p>women in the implementation of community monitoring systems.</p>	<ul style="list-style-type: none"> Target: 50% of the total people involved in the monitoring process <p>Indicator(s):</p> <ul style="list-style-type: none"> Number of women involved in implementation of community monitoring systems 	<p>information products developed responding to local needs linked to monitoring the capacity of ecosystem to provide services in managing climate impacts (water quality, protective capacity, community vulnerability, etc.)</p> <p>Targets: At least 10 per municipality</p>	<p>Cuba jointly with AMA.</p> <p>Participants: DMA, ICIMAR, FMC, IPF, ENPFF, CICA, IDICT, CES, CGC, CAP, DPCITMA, CMP, CIGET, DPFF, CESA, CAM, DMPF, SEF, MMC, and ANAP</p>									
	<p>2.2.2. Climate Information products that respond to women's information needs</p>	<p>Baseline: 0 Target: At least 3 climate information products developed responding to women's information needs</p> <p>Indicator(s):</p> <ul style="list-style-type: none"> Number of climate information 	<p>Measure: Number of Climate information products developed responding to local needs linked to monitoring the capacity of</p>	<p>Responsible: FLACSO-Cuba jointly with AMA</p> <p>Participants: DMA, ICIMAR, INSMET, FMC, IPF, ENPFF, CICA, IDICT, CES,</p>			<p>X</p>	<p>X</p>	<p>X</p>	<p>X</p>	<p>X</p>		

change impacts		products developed through the project	ecosystem to provide services in managing climate impacts (water quality, protective capacity, community vulnerability, etc.) Targets: At least 10 per municipality	CGC, CAP, DPCITMA, CMP, CIGET, DPFF, CESA, CAM, DMPF, SEF, MMC, and ANAP									
Activity 2.3. Mainstream EBA approaches into regulatory and planning frameworks at the territorial and national levels for long term sustainability of EBA conditions and investments	2.3.1. Gender equitable participation in the preparation of proposals for Mainstream EBA approaches into regulatory and planning frameworks at the territorial and national levels.	Baseline: 0 Target: 50% of the total people involved in the preparation of proposals for the inclusion of EBA in regulations Indicator(s): • Number of women involved in the preparation of proposals related to EBA in regulations and Land Management Plans	Measure: EBA proposals prepared for inclusion in the Municipal Development Strategies of coastal municipalities Targets: At least 2 EBA proposals	Responsible: FLACSO-Cuba jointly with AMA Participants: DMA, ICIMAR, FMC, IPF, ENPFF, CICA, IDICT, CES, CGC, CAP, DPCITMA, CMP, CIGET, DPFF, CESA, CAM, DMPF, SEF, MMC, and ANAP	X	X	X	X	X	X	X	X	238,002

for coastal protection	<p>2.3.2. Design and validate methodological tools for addressing gender during the project implementation and to mainstream gender in natural resource planning, investment and use</p>	<p>Baseline: 0 Target: 2 Indicator(s):</p> <ul style="list-style-type: none"> • Number of methodological tools 	<p>Measure: EBA proposals prepared for inclusion in the Municipal Development Strategies of coastal municipalities</p> <p>Targets: At least 2 EBA proposals</p>	<p>Responsible: FLACSO-Cuba jointly with AMA.</p> <p>Participants: DMA, ICIMAR, FMC, IPF, ENPFF, CICA, IDICT, CES, CGC, CAP, DPCITMA, CMP, CIGET, DPFF, CESA, CAM, DMPF, SEF, MMC, and ANAP</p>	X	X	X	X	X	X	X	X
	<p>2.3.3. Gender equitable participation in the project implementation at national and local levels</p>	<p>Baseline: 0 Target: 50% of the total people involved in the project implementation (projects decision-making bodies) at national and local level are women Indicator(s):</p> <ul style="list-style-type: none"> • Number of women involve in the coordination of the 	<p>Measure: Number of direct and indirect beneficiaries</p> <p>Targets: Direct beneficiaries (female): 219,372</p>	<p>Responsible: AMA</p> <p>Participants: At national level: CITMA/AMA-ICIMAR At local level: DPCITMA, FMC, IPF,</p>	X	X	X	X	X	X	X	X

		project implementation		ENPFF, IDICT, CES, CGC, CAP, CMP, CIGET, DPFF, CESA, CAM, DMPF, SEF, MMC, and ANAP										
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