

Concept Note

Bio-CLIMA Nicaragua: Integrated climate action for reduced deforestation and strengthened resilience in the BOSAWÁS and Rio San Juan Biosphere Reserves

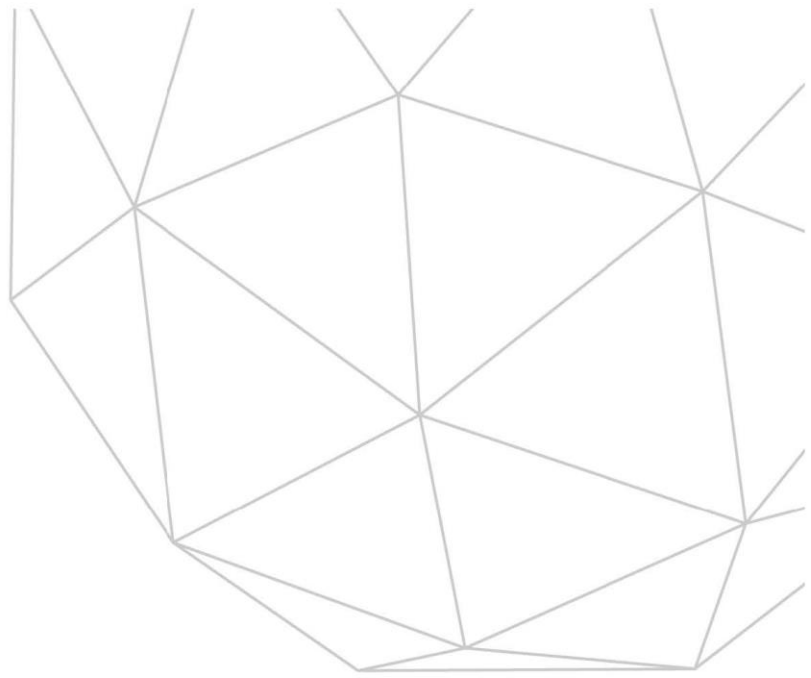
Nicaragua | Central American Bank for Economic Integration (CABEI)

18 March 2019





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Concept Note

The Green Climate Fund (GCF) is seeking high-quality projects or programmes.

The Accredited Entity is encouraged to submit a concept note, in consultation with the National Designated Authority, to present a project or programme idea and receive early feedback and recommendation.

Project/Programme Title: **Bio-CLIMA Nicaragua:** Integrated climate action for reduced deforestation and strengthened resilience in the BOSAWÁS and Rio San Juan Biosphere Reserves

Country: Nicaragua

National Designated Authority (NDA): Ministry of Finance and Public Credit (MHCP)

Accredited Entity (AE): Central American Bank for Economic Integration (CABEI)

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"CN-[Accredited Entity or Country]-yyyymmdd"

PROPOSAL | 2017

A. Project / Programme Information (max. 1 page)			
A.1. Project or programme	<input checked="" type="checkbox"/> Project <input type="checkbox"/> Programme	A.2. Public or private sector	<input checked="" type="checkbox"/> Public sector <input type="checkbox"/> Private sector
A.3. Is the CN submitted in response to an RFP?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, specify the RFP: _____	A.4. Confidentiality	<input type="checkbox"/> Confidential <input checked="" type="checkbox"/> Not confidential
A.5. Indicate the result areas for the project/programme	<p>Mitigation: Reduced emissions from:</p> <input type="checkbox"/> Energy access and power generation <input type="checkbox"/> Low emission transport <input type="checkbox"/> Buildings, cities and industries and appliances <input checked="" type="checkbox"/> Forestry and land use <p>Adaptation: Increased resilience of:</p> <input type="checkbox"/> Most vulnerable people and communities <input type="checkbox"/> Health and well-being, and food and water security <input type="checkbox"/> Infrastructure and built environment <input checked="" type="checkbox"/> Ecosystem and ecosystem services		
A.6. Estimated mitigation impact (tCO₂eq over lifespan)	5,414,627 t CO₂eq (20 years)	A.7. Estimated adaptation impact (number of direct beneficiaries and % of population)	26,260 people (31% of rural households of the Project Region)
A.8. Indicative total project cost (GCF + co-finance)	USD 110.4 million	A.9. Indicative GCF funding requested	USD 37.7 grant USD 42.2 loans
A.10. Mark the type of financial instrument requested for the GCF funding	<input checked="" type="checkbox"/> Grant <input type="checkbox"/> Reimbursable grant <input type="checkbox"/> Guarantees <input type="checkbox"/> Equity <input type="checkbox"/> Subordinated loan <input type="checkbox"/> Senior Loan <input checked="" type="checkbox"/> Other: specify: Sovereign guarantee		
A.11. Estimated duration of project/ programme:	a) disbursement period: 7 years b) repayment period: TBD	A.12. Estimated project/ Programme lifespan	20 years
A.13. Is funding from the Project Preparation Facility requested?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Other support received <input checked="" type="checkbox"/> If so, by who: CABEL and FAO	A.14. ESS category	<input checked="" type="checkbox"/> A or I-1 <input type="checkbox"/> B or I-2 <input type="checkbox"/> C or I-3
A.15. Is the CN aligned with your accreditation standard?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.16. Has the CN been shared with the NDA?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.17. AMA signed (if submitted by AE)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If no, specify the status of AMA negotiations and expected date of signing:	A.18. Is the CN included in the Entity Work Programme?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.19. Project/Programme rationale, objectives and approach of programme/project (max 100 words –	<p>Bad practices in extensive livestock and agricultural production, as also forests/landscape degradation are causes of deforestation, climate vulnerability, natural capital and biodiversity depletion for farmers/communities in the Biosphere Reserves of Nicaragua's Caribbean Region.</p> <p>Bio-CLIMA will incentivize and bring to scale sustainable, climate-smart land-use practices, landscape restoration and sustainable forestry; strengthen capacities, improve the governance and business-climate, with the objective to reduce deforestation and improve livelihood resilience through a trans-sectoral/integrated approach.</p> <p>Bio-CLIMA shall be implemented under the National-REDD+Strategy¹, complementarily with the ERPD², by national/regional institutions in charge of rural development, environmental protection and the private sector, with intensive TA, market and financial service support.</p>		

B. Project / Programme details (max. 8 pages)

B.1. Context and Baseline (max. 2 pages)

1. Nicaragua is the second poorest country in the Western Hemisphere, with most poor and extreme poor people living in the Caribbean Region (CR), which constitutes more than half of the national territory and contains approximately 89% of the country's forests (3.19 M ha). It is inhabited by only 15% of national population (12.7 inhabitants/km²) most (67%) in rural areas. The main economic activities in the CR are subsistence agriculture, livestock, coffee, cocoa, palm oil, bamboo, fishing (including shrimp and lobster), logging, tourism and mining³. The CR is home of most indigenous and afro-descendant people that control 71% of closed broadleaved forests, nevertheless, the deforestation rate in the CR has been very high: Between the years 2000 and 2015 Nicaragua lost 147,202 ha of tropical forests every year - equivalent to 15.65 M t CO_{2eq.}/year, at a rate of 2.3%, mainly in the CR⁴. Most of these areas have been converted into pastureland, crops or to secondary vegetation "tacetales", which increased in area 30% and 53% respectively during that decade.

2. Favorable market conditions created by free trade agreements with Central American countries, Venezuela, and the US have stimulated livestock expansion. Between the years 2000 - 2009, the national livestock sector grew at a 5% annual rate, and between 2006 and 2015 the export value of livestock products increased by 176%⁵. Presently, beef and dairy products are among the top four exports in terms of value. In 2015, Nicaragua exported over 222,000 metric tons of livestock and dairy products, valued at nearly US\$700 million, which represents almost 10% of GNP and contributes more than 25% of the total value of exports.

3. While in year 2000 the AFOLU sector accounted to nearly 92% of Nicaragua's GHG emissions, sectoral contribution has been reduced steadily to reach 68% in 2010 most of it still being generated through loss of forest. Both CH₄ and N₂O emissions increased by 36% between years 2000 to 2010 to 6,492 and 2,252 GgCO_{2eq.}, respectively, mainly from the enteric fermentation of livestock (41%) and the management of agricultural soils (47%)⁶.

4. Administratively the CR is divided into the North (RACCN) and South (RACCS) Autonomous Regions, and the *Departamento Río San Juan*. The RACCN contains the BOSAWÁS Biosphere Reserve⁷ in its Northwest, while the Río San Juan Biosphere⁸ stretches from the Southeast of the RACCS into the *Departamento Río San Juan*. Within these protected areas, forest cover diminished by 2.7% between years 2010 and 2015⁹, demanding urgent action and substantial investment to protect them. Deforestation in the municipalities located within the buffer zones of both Biosphere Reserves continues to be alarming, as shown by the recent forest cover change assessment for the period 2015 and 2018 carried out by MARENA¹⁰ (Annex 1: Figures 1 – 5; 8, 9; and Annex 4-b).

5. The population of the CR was estimated at 1.1 million inhabitants (2013) with most people living at the coast. The population is multi-ethnic, including Miskito, Rama, Mayagna and Ulwa (indigenous), Garifuna and Creole afro descendent) people. In the RACCN the population is predominantly Miskitu (72%) and Mestizo (22%), while in the RACCS most people is Mestizo (81%) and Creole (8.5%)¹¹. Bio-CLIMA will strive to support indigenous people within both Biosphere Reserves (Annex 1: Figures 3, 4 and 6).

6. Due to Nicaragua's geographic position the country is highly exposed to frequent climatic shocks produced by excessive precipitation (hurricanes and tropical depressions) and droughts of varying intensities, sometime associated with the El Niño Southern Oscillation (ENSO). Events that were declared natural disasters occurred in 1982, 1988, 1996, 1998, 2001, and 2014, primarily hurricanes and tropical storms that caused damage to infrastructure, displaced people from their homes, and produced losses to the agriculture sector. Recently, in November 2016 Hurricane Otto hit the Río San Juan Biosphere damaging and defoliating severely 22% of the area. In 1998 Hurricane Mitch caused losses of US\$1,3 billion, of which US\$ 244.6 million was in the agriculture sector. In contrast, in 2001, one of the most severe droughts on record caused losses of US\$49.1 million, of which US\$41.4 was in agriculture¹². Many of the 162,000 people who suffered significant of total damages from Hurricane Felix in 2007 have not yet recovered¹³.

7. Nicaragua Long Term Climate Risk Index is rated as very high, ranking 4th from 182 countries¹⁴. Family farming is particularly vulnerable to climate risk: it encompasses the vast majority of producers in number, land holdings, and agricultural production. In number, family agriculture incorporates 98 percent of all producers. In land area, family farming comprises 90 percent of agricultural land. In agricultural production, their output value comprises 89 percent of the total. Their relevance for food security is irrefutable. Family farms contribute an estimated 60 percent of agricultural GDP from production of basic grains (maize, rice, beans, and sorghum) and livestock¹⁵.

8. Future climate scenarios¹⁶ foresee a temperature rise of 0.7 °C for the period 2010-2039 in the CR, an increase in number of days were maximum temperature surpasses 35 °C and an increase of 10% in dry days. The rates of temperature increases are significantly higher in deforested areas, more than 50% higher than average temperature changes in tropical areas¹⁷. These changes will affect the suitability of the main crops that support rural livelihoods in the CR, especially livestock and coffee. As temperatures increase above the current suitability range (18–28 °C) for coffee production, an opportunity opens for cocoa cultivation, which may become an important alternative crop within agroforestry systems, which increases heat tolerance¹⁸ Bio-CLIMA intends to tap into this window of opportunity that CC offers to future local socio-economic development (Annex 1: Figure 7).

9. Bio-CLIMA is fully aligned with the National Human Development Plan 2018-2021¹⁹ and the National REDD+ Strategy and will directly implement following four (out of seven) strategic lines of action of the National Climate Change Mitigation and Adaptation Policy²⁰: Nr.1."Development of agriculture that is resilient to actual climate variability and future climate change, with actions that favour low GHG emissions"; Nr. 5. "Use and conservation of ecosystem services to achieve low-carbon sustainable development that is adapted to climate change", Nr. 6."Conservation, restoration and rational use of forests, as the promotion of planted forests in forest land-use zones" and Nr. 7."Promote knowledge,

research, finance and information about climate change mitigation and adaptation, as the modernization and strengthening of alert and early-warning systems”.

10. In its NDCs²¹ Nicaragua proposes to implement following concrete measures in the AFOLU sector: i.) Encourage agro-ecological production of permanent crops under tree shade, more resilient to the impacts of CC, ii.) Reduce extensive cattle grazing and introduce sylvo-pastoral systems, iii.) Establish planted forests on idle or degraded forest land, prioritizing the use of natural regeneration of native tree species, iv.) Extend the use of bio-digesters, v.) Restore and conserve ecosystems and ecosystem services, taking advantage of adaptation and mitigation synergies, with special emphasis on watersheds management and risk reduction, as conservation of biological diversity and protected areas. Through these measures, which will be implemented also by Bio-CLIMA, Nicaragua offered to raise its carbon absorption capacity by 20% in relation with the reference scenario to 2030²².

11. Following priority measures to improve the countries capacity to adapt to CC are listed in the NDCs and will be implemented by this Project: i.) Modernization of hidro-meteorological services to produce relevant climate information and early warning alerts²³, ii.) Raise the efficiency for the protection of the biosphere reserves through land-use-planning and reforestation, iii.) Cooperation to strengthen capacities in climate finance, iv.) Capacity development, access to technologies and finance for the agricultural sector, and v.) Implement programmes to manage prioritized ecosystems in a resilient way through a landscape approach.

12. The main underlying causes for deforestation and forest degradation in the CR have been thoroughly assessed recently in both, Nicaragua’s REDD+ Strategy (2018-2040)²⁴, and in its Emissions Reduction Program²⁵. Strong demographic pressures, poverty, and an expanding road system have generated strong migration flows from the Pacific and Central Regions of Nicaragua into the CR, where “idle” forest-covered land is abundant and cheap, and government institutions capacity to enforce environmental, land planning and forestry laws is still weak. These factors combined with low land prices and undervaluation of the standing forest, lack of access to TA, finance and markets demanding sustainably produced products, induce land owners to convert forests into extensive crops or pastures. Between years 1983 and 2015, 2.2 million ha of forests were cut down and 1.4 million ha of pastureland was established. The area converted to perennial crops, mainly oil palm and cocoa multiplied by ten during this period²⁶.

13. Within a socio-cultural setting where the ownership of a vast, extensively used pasture-land area and a bi herd cattle (even poorly managed) gives an individual a high social standing, attractive financial and marked incentives, targeted TA, strong communication and awareness rising, as adequate governance mechanisms and institutional law enforcement has to be put in place to promote sustainable land-use intensification to revert ongoing deforestation and land degradation processes. The main barriers to reduce deforestation and forest degradation are the following:

14. Economic/productive barriers:

- Limited knowledge and capacities, financial resources, incentives and TA to invest in more intensive sustainable production methods by producers
- Local/regional markets do not recognize quality or sustainable production, and limited access to more demanding/sophisticated markets
- Low value of standing forest, forest products and environmental services
- Difficult access and high transaction costs for environmental and forest law compliance disincentive sustainable forest use and management

Institutional/cultural barriers:

- Forests/ecosystem conservation has a low profile in sectoral plans and governmental budgets
- Scarce institutional presence on the territory (including land-use monitoring, control and forest law enforcement, extension services, private and public finance)
- Insufficient coordination between government levels related to rural development and planning
- Lack of information about impacts of climate change, dissemination and public awareness raising

B.2. Project / Programme description (max. 3 pages)

15. Bio-CLIMA has the objective to transform extensive cattle ranching, agriculture and timber exploitation that causes deforestation and forest degradation, into sustainable, more intense, deforestation-free production forms that integrate ecosystem and ecosystem services conservation with production of goods and services. This paradigm shift that the Project intends to catalyse follows a tree pronged strategy: i.) Provide farmers with capacities, TA and solid financial incentives for sustainable intensification of their agricultural practices and on-farm resource conservation; ii.) Create an enabling environment in which clear and simple norms, efficient local institutions and transparent governance promotes law enforcement, cuts red tape and environmental impunity and; iii.) Strengthen local producer organization and facilitate access to markets that recognize the real value of quality, sustainable production, climate action and biodiversity conservation.

16. To demonstrate that transformational change is possible Bio-CLIMA will focus its interventions on the areas with highest risk of deforestation and forest carbon loss located in the buffer zones of the carbon and biodiversity rich BOSAWÁS and Indio Maíz Protected Areas²⁷. Administratively they are located in the municipalities of Bonanza and Siuna (BOSAWÁS Biosphere); and Nueva Guinea, Bluefields and El Castillo (Río San Juan Biosphere). (Please see Annex 1: Figures 5 a-c). Potential land uses within the buffer zones were determined and areas for project intervention identified: according to the Agricultural Census²⁸ they total 5,208 agricultural production units (families) on an area of 66,223 ha²⁹ (Annex 1: Figures 10-a, 10-b and 11). The socio-economic profile of the target region is relatively

homogenous (with the exception of the Municipality of Bonanza), the following preliminary information³⁰ shall be described and analysed further during the in-depth socio-economic analysis to be done during the FFPP:

- 98% of the land is titled: 53% communal property, 45% private property
- 99.7% of farms are owned/in use by a single family and managed individually (not collectively)
- 18.8% of farms are headed by women
- Only 12.3% of farmers work outside their farm, the main income comes from the farm
- Non-forest land use of the farm is 45% crops, 54% pastureland
- Other land uses of the farm are 16% forests, 13% idle land (secondary vegetation “*tacotales*”)
- 56% of the farms have forests (47% primary, 56% secondary, 5% planted), but only 26% of farmers use the forests for commercial timber production
- 77% of farmers raise cattle at an average of 36 head / farm, and 72% of farmers use herbicides
- 12% of farmers grow cocoa, only 5% grow coffee
- Only 4% of farmers are members of a cooperative or association
- Only 9% of farmers have received TA
- Only 3% of livestock farmers have received credit

17. Bio-CLIMA’s transformative vision and its objectives shall be achieved through the implementation of mutually reinforcing activities which are organized within the following three components.³¹

Component 1: Conserving and producing for life

Bio-CLIMA will offer to farmers³² financial incentives, technical assistance and market access facilitation for the sustainable intensification of livestock production, coffee and cocoa farming through Agroforestry Systems³³ (AFS) and the productive restoration of degraded, idle land frequently covered with secondary vegetation (“*tacotales*”), as well as sustainable management of natural forests. Farmers will first need to draft and agree on a Land-Use Management Plan (LUMP) of their farm³⁴ through which land use areas are defined and delimited, as areas for restoration, watershed protection and sustainable management of existing natural forests demarcated. LUMP is a key tool to be pioneered by the project to promote sustainable land use intensification in an integrated way. Its bottom-up nature facilitates participatory investment planning and capacity building at grass-root level, contributes to reduce migration and stabilize the agricultural frontier. LUMP will be first developed and described for the Project, then field tested, evaluated and adjusted, to be subsequently added to the normative framework (Comp. 2). Once the planning phase has been successfully achieved through the LUMP, on-farm investment will be done through implementation of proven best practices for sustainable intensification of agriculture and cattle ranching, landscape restoration and forest management at production-unit level which provide important mitigation, adaptation and livelihood-resilience co-benefits. These best-practices are described within the following five Climate-Smart Production Modules by technical staff of the institutions participating in Bio-CLIMA with support from the FAO (Annex 1: Figure 11, Annex 3 and Pre-feasibility Annex 4-a).

18. Silvo-pastoral livestock production: introduction of rotational grazing, improved forage, deep rooting and nutrient rich pastures and protein producing shrubs and vines reduce methane emissions from enteric fermentation and reduce the use of herbicides. Living tree fences and valuable tree species in pastures provide shade, animal welfare, improve value and productivity and capture more CO₂. Soil structure is improved and stabilized. Animal load can be doubled from 1.2 to 3 AUE/ha while carbon sequestration improved from 5.1 in BAU to 7.7 CO₂ eq/ha/yr.

19. Agroforestry cocoa / coffee production: Introduction of improved varieties more adapted to the climate conditions and with higher yield, in combination with banana, fruit and native tree species to produce shade, micro-climate regulation, green manure for soil protection, and family asset increases due to high value timber tree species. Yield increases from BAU are estimated to be 10% higher from year 3 onwards, while carbon sequestration increases from 3.8 to 10.49 tCO₂ eq/ha/yr for cocoa, and from 5.7 to 16.4 tCO₂ eq/ha/yr for coffee grown in AFS.

20. Close-to-nature Planted Forests (CTNPF)³⁵: Sustainable intensification of agricultural and livestock practices and LUMP will leave part of the farm area, especially the one located on steeper slopes and/or alongside water courses idle. These idle land get covered quickly by natural shrubs and pioneer vegetation (“*tacotales*”) within a process of natural succession that eventually will lead to the formation of a secondary forest. Project incentives and TA will support farmers to learn and apply simple silvicultural techniques and undertake enrichment plantings with high-value native tree species to accelerate the natural succession and landscape restoration process in such areas. The resulting CTNPF will not only provide a wide array of ecosystem goods and services, but also an important intergenerational asset of high value timber for the family that can be sustainably managed and selectively harvested in the future. Carbon sequestration increases from 3.3 (BAU: *tacotal* to secondary forest), to 12.5 tCO₂ eq/ha/yr in CTNPFs.

22. Sustainable Management of Natural Forest (SFM): Bio-CLIMA will support farmers and indigenous communities with incentives and TA to manage natural forest areas sustainably. Forest management and conservation categories will have to be established within the LUMP at farm or community level (conservation areas (e.g. on steep slopes or alongside water courses) and production forest. Intensive TA support to undertake forest inventories, management and harvesting in a sustainable way will be provided. Simplified forest management and harvesting techniques at farm level will be introduced, evaluated and adapted in order to inform the legal and normative adjustment process that will be supported through Component 2. SFM will provide beneficiaries a long term, sustained benefits from certified timber production, non-timber forest products and environmental services. I will increase of carbon sequestration from 9.4 to 12.5 tCO₂ eq/ha/yr.

23. Small farmers ($3.5 \leq 50$ ha) will be free to choose and combine modules on their property once their LUMP has been agreed upon up to a maximum grant amount per family³⁶ to be determined. To grant for integrated land management and ecosystem services conservation, an adequate combination of rather “production” oriented, with more “restoration and conservation” oriented modules will be encouraged within the LUMP. Selection criteria shall include the LUMP commitment, vulnerable, especially women headed household and young people. With the aim to target and stabilize the most vulnerable and itinerant households on the agricultural frontier and reduce migration, formal land tenure will not be required as long as the tenure situation of the family is uncontested, does not affect indigenous territories nor infringes current law.

24. “Middle to big-sized” producers (owing > 50 ha of land) will access concessional loans³⁷, TA and markets through a public-private Silvo-Pastoral Trust (SPT) that will be established with participation of the national private financial system, producer associations and exporters (see also Annex 1: Figure 12)³⁸. The SPT scheme will allow all Project beneficiaries to obtain up-front payments for their calves, access to TA to improve quality and weight, develop steers in “*mediería*”³⁹, access to climate smart agricultural practices and low carbon technologies, including bio-digesters. The steers can then be sold to feedlots and fattening farms of the slaughterhouses with higher profit gains. To participate in the SPT scheme a LUMP with commitments for land restoration and SFM of natural forests will be required.

25. Once the planning phase (LUMP) has been successfully concluded, Bio-CLIMA will support individual farmers and producers with the investments (modules) and TA, business plan development, creation and strengthening farmer and community organizations, and support access to markets that demand and value quality and sustainable production. The approach is not only comprehensive at farm and landscape level, but also integrative, since through the SPT the Project strives to build bridges and value chains that link small, medium and bigger producers with the market.

Financial incentives for landscape restoration, the establishment for CTNPFs and sustainably managed natural forests (SFM) will be channelled through FONADEFO, which is the official mechanism to incentivize reforestation and forest conservation administered by INAFOR. A new pilot scheme to operationalize these payments will be developed in coordination with World Bank GEF “Resilient Landscapes Management Project”⁴⁰.

26. **Component 2: Good governance**

Nicaragua ranks at the bottom third of the Worldwide Governance Indicators. Bureaucratic quality indicators suggest a need to strengthen knowledge, capabilities, and systems for the civil service, including informing the public of the collection and use of public resources in delivering government services⁴¹. Through Bio-CLIMA the Government of Nicaragua will invest substantive additional financial resources to strengthen public institutions, especially in the CR where its presence is weak. Promotion of sustainable land-use and forest management, planning and monitoring; local territorial governance as also environmental and forest law enforcement urgently need additional capacities and resources, which currently are scarcely present in the Region. The relevant public institutions in charge of environmental protection, forest conservation and sustainable, climate adapted agricultural production will be provided with new, additional technical personnel, logistical means, vehicles, information technologies, equipment and operational costs.

27. Legislation, norms and instruments for Sustainable Rural Development and Land-use Planning (LUMPs) need to be developed and put in place to make sure that multi-sectoral development interventions accrue into an integrated, sustainable development approach at farm, landscape and ecosystem level. On the other hand, legislation needs to be developed or up-dated to promote sustainable management, conservation and harvesting of natural forests at small-scale.⁴² Bio-CLIMA will provide expert support, facilitate the dialogue between different sector and actors and promote public participation to produce such legislation with the objective to make the rules of the game clear and simple to understand for farmers and communities, and forthrightly administered, monitored and enforced by public officials. Such a fundamental paradigmatic shifting, policy and legal innovation must be constructed and socialized in a broad and participatory manner. Bio-CLIMA will facilitate and promote the societal dialogue involving all relevant local actors and institutions, producer organizations, indigenous peoples, communities and academia, which shall also foster social control and transparency. Unduly competition by illegal logging and deforestation will have to be addressed through efficient and effective law enforcement: the Government will invest important resources to guarantee that forest, land use and environmental regulations are duly complied with and that infringements are duly sanctioned: two interinstitutional illegal logging and forest fire control patrols that will be strengthened by Bio-CLIMA will operate with participation of civil society and indigenous community participation.

28. **Component 3: Adaptive capacity development**

To move from a fractioned and sectoral land use approach towards the integrated and sustainable farm, landscape and ecosystem approach that Bio-CLIMA strives to promote, a huge training and capacity-building effort will need to be undertaken: Technical personnel from public extension services, farmers and beneficiaries will be trained in integrated land use management and planning (LUMP), implementation and maintenance of productive “modules”, innovations in administrative processes, legislation and norms, strengthening of local organizations, quality management and market access, among others.

29. Information generation and management systems to generate data and intelligence to support law enforcement and deter infringement that need to be put in place include a Deforestation and Forest Fire Early Warning System (SAT) and Timber Tracking System (TTS). Bio-CLIMA will also invest to strengthen the LULUC and REDD+ M-MRV System actually operated by MARENA, which will need to be up-dated and linked to the National Forest Inventory and other relevant sectoral information systems will also be supported by the Project, in coordination with the FAO/GEF CBIT Nicaragua Project⁴³.

To expand the project approach to other municipalities in the CR, more precise information on the mitigation and adaptation results and impact of the Project will need to be produced. To this End the monitoring and evaluation capacities

of INETER will be supported so that climate and socio-economic impact can be assessed at the farm, landscape and ecosystem level. This will encompass the installation and operation of additional automatic weather stations and other agro-climatic resources in the Project region.

The very high ambition to shift the prevailing development paradigm, which is based on extensive natural resources and landscape exploitation, towards climate smart, sustainable development can only be achieved if very deep cultural and behavioural transformation of attitudes and values within the society is achieved. A great effort will be done, and huge resources invested to inform and create awareness to political decision makers at regional and local level, to private operators, farmers and communities and to the general public in general. This will be done through an intensive and efficient public communication strategy and a specifically designed and targeted education program for schools and universities.

30. Bio-CLIMA comprehensive intervention strategy is designed to go beyond a one-off project: its climate resilient production models have been field tested and assessed and have the potential to be replicated in other municipalities within the Region. The STF mechanism provides sustainability and scale, and an important investment in additional technical capacities and strengthened institutions will serve to replicate and expand the project approach. The Project will showcase how to change the prevalent sectoralized approach, through which different institutions and actors act separately and in silos, towards a comprehensive integrated approach and intervention at the farm, landscape and ecosystem level. Project interventions aim to create the enabling regulatory and governance environment, paving the way to transform extensive and predatory land use-forms into sustainable, climate smart and climate resilient practices, targeting especially small vulnerable farmers and households on the deforestation frontier.

Bio-CLIMA is crosscutting between climate change mitigation and adaptation, since it contributes to the achievement of GCF Impact Results M.4 “Reduced emissions from land use, deforestation, forest degradation and through sustainable management of forests and conservation and enhancement of forest carbon stocks (5.414.627 t CO_{2eq}.)” and A.4 “Improved resilience of ecosystems and ecosystem services (coverage/scale (66,223 ha) of ecosystems protected). The Theory of Change illustrates how project activities address each of the main economic, institutional and cultural barriers, to produce the project outputs needed to reach GCF outcomes M.9 and A.7, and impact results M.4 and A.4 mentioned above. (see Annex 2)

31. CABEL is a multilateral bank for the development of Central America. CABEL’s mission is to promote the economic integration and the balanced economic and social development of its founding member countries, attending and aligning itself with their national policies and development priorities. CABEL supports public and private development projects that generate jobs and contribute to improving its member countries productivity and competitiveness, as well as contribute to increasing the Region’s human development indicators. During the past 57 years, CABEL’s support to the Region has resulted in credit approvals of more than US\$30.9 billion and disbursements by more than US\$26.2 billion through its network of more than 100 intermediate financial institutions, 10 of which operate in Nicaragua. Derived from CABEL’s mission and vision, CABEL 2015-2019 Institutional Strategy focuses on sustainable competitiveness and targets the Bank’s contributions at the strategic axes of social development, competitiveness and regional integration with a transversal axis of Environmental Sustainability. In this sense, CABEL requires that its operations comply with environmental and social standards, based on international best practices, aligned with CABEL’s Environmental and Social Policy. Hence CABEL is well placed to act as Accredited Entity for this Project.

While MARENA would be responsible for overall coordination of Bio-CLIMA within the ENDE-REDD+, the Executing Entity responsible for the implementation of the Project could be the Ministry for Home Economics, Communities, Cooperatives and Associations (MEFCCA)⁴⁴, which would form a Project Management Unit (PMU). To implement the project, the PMU would be supported by specialized units, specialists and support staff from MARENA, INTA, INETER, INAFOR who will be assigned to assume specific responsibilities in the implementation of the project, with support of international partners like the FAO. Implementation arrangement specifying roles and responsibilities, as will have to be further discussed and agreed upon during full funding proposal preparation. Financial and operative risks of these implementation arrangements and financing modalities will be identified, described and analysed in detail during preparation, as well as mitigation measures identified and proposed.

B.3. Expected project results aligned with the GCF investment criteria (max. 3 pages)

32. Impact Potential Bio-CLIMA is crosscutting between mitigation and adaptation:

Mitigation (Impact Result M.4): The Project will contribute to a shift towards a low-emissions sustainable development pathway by creating an enabling environment (investment, knowledge transfer, markets and governance) for climate smart production and conservation with the potential of be expanded and scaled up in the CR. It has been estimated that Bio-CLIMA will contribute to reduce 4.8 million t CO_{2 eq} trough better land use and sequestration in AFS, landscape restoration trough CTNPF and SFM of forest areas. It is also expected that 547,560 t of CO_{2 eq} will be avoided through reduction of methane emission from improved livestock management. The total mitigation impact is estimated to be 5.4 million t of CO_{2 eq} in 20 years (Please refer also to GHG emissions sequestration estimates presented in Annex 4-c).

33. Adaptation (Impact Result A.4): Bio-CLIMA will contribute to increased-climate resilient development through following results: Resilience of ecosystems and ecosystem services will be improved on approximately 66,000 ha of land in the buffer zones of the BOSAWÁS and San Juan Biosphere Reserves. Introduction of climate smart agriculture practices and improved land management tools and instruments will strengthen the adaptive capacity and reduce the exposure to climate risks of more than 26,000 direct project beneficiaries at vulnerable household level.

34. Through Bio-CLIMA relevant institutional systems within MARENA, MEFCCA and INAFOR for land use and planning, environmental protection and forestry development will be strengthened through additional personnel, resources and capacities that will empower them to implement the integrated LUMPs and promote the climate smart development approach the project will introduce. This new approach will be institutionalized and reinforced through the regulatory improvement in the forest and land use norms that will be supported through the project. The Project will also improve the generation and use of climate information in decision making through support to INETER (automatic weather stations); INFONA (Deforestation Early Warning and Fire Detection System) and MARENA (LULUC MRV). This information will feed the public awareness and information campaign Bio-CLIMA will support.

35. Paradigm Shift Potential

Scaling-up and replication: Once climate smart modules have been implemented at small-scale successfully, farmers will expand them on their farms⁴⁵, an effect that should spill over to the territory of the municipality and the region. In this sense Bio-CLIMA will contribute to create capacities and the enabling environment for incentives for forest conservation paving the way for the result-based payments for REDD+ (Phase III) programmed within the overall framework of Nicaragua's Emission Reduction Program.

Knowledge and learning: A huge investment will be done in training and capacity building to strengthen the knowledge basis at the local level, strengthen institutions and human capital basis.

Enabling environment: Through the Trust Fund, costs and risks to invest in climate smart agriculture and sustainable cattle ranching and forest conservation will be reduced, and market access and development improved. The Trust provides long-term financially sustainable continuity of activities and removes barriers, thus catalyses impact beyond the scope to the project.

Regulatory framework and policies: The project will contribute to the advancement of the national land use planning regulations in two steps: first operationalizing the LUMP within the Project field operations and, second adjust and improve the LUMP through open and participatory dialogue process with the objective to produce a draft national LUMP regulation to be enacted. The legal and normative framework that regulate forest management, harvesting and transport of forest products will be thoroughly revised with the objective to propose simple and transparent legislation that farmers and communities can apply and comply with, removing barriers and red tape and reducing their transaction costs.

36. Sustainable Development Potential

Bio-CLIMA will contribute to the protection of the areas most threatened and richest in biodiversity in Nicaragua: The BOSAWÁS Biosphere Reserve has an area of approximately 2 million ha, 15% of the nation's total land area and as such the second largest rainforest in the western hemisphere, after the Amazon. Being largely unexplored it is extremely rich in biodiversity. The Indio Maíz Biological Reserve, which is part of the Rio San Juan Biosphere, is the second largest area of lowland rainforest reserve in Nicaragua and contains a higher number of tree, bird, and insect species than all of Europe. Taken together, these areas are home to some seventy ecosystems, thirteen of the nation's 21 most important watersheds, and close to one million inhabitants⁴⁶. The livelihoods of these residents depend upon the forest, and they are highly vulnerable to impacts driven by climate change.

The international literature has widely documented the multiple ecosystem services provided by agro-forestry and silvo-pastoral production systems (AFS) indicating their suitability for restoring degraded soils⁴⁷: Besides increasing resilience to climate change⁴⁸, AFS can buffer the effects of extreme climate events, lower temperatures and provide alternative sources of food during droughts or floods⁴⁹. Moreover, AFS are known to improve the microclimate⁵⁰. They are also effective at controlling erosion and landslides and at producing organic matter and cycling nutrients⁵¹. Agroforests have also been shown to regulate the quantity and availability of water, improve water quality, increase groundwater recharge and provide riparian buffers⁵².

37. Social co-benefits: Regarding socio-economic benefits, productive agroforestry landscapes provide promising options for sustaining livelihoods⁵³. They enable diversified production systems because of various intercrops, and reduce risks associated with pests and diseases, while also enabling a wider diversity of products, which reduces the ebb and flow of seasonal harvests⁵⁴. Bio-CLIMA will specifically target families that have been pushed by the vicious cycles of poverty to migrate to the most remote and marginal zones of the Caribbean Region of Nicaragua. Project interventions will support these families to stabilize their livelihoods at the agricultural frontier procuring higher income from deforestation free, sustainable production schemes, which improve both their livelihood and climate resilience. Through the Trust Fund mechanisms, organizational and market access support Bio-CLIMA will support these vulnerable households to have more equitable and fair benefits from their produce. The Project will also attain improvements in the nutritional quality of the diets of participating families, as an indirect benefit resulting from increases in crop diversity aimed at reducing exposure to the risks of CC-related crop failure and improved social cohesion as a result of support to community-based governance mechanisms.

38. Economic co-benefits: There is strong evidence that biomass production and delivery of ecosystem services improves with tree diversity and that forest plantations that are diverse in species, structure and function are better able to adapt to changing environmental conditions than monocultures⁵⁵. Projected climate scenarios predict a much higher frequency of forest fires and a growing incidence of pests to which monocultures are much more vulnerable compared to mixed, sustainable, multi-functional "Close-to-Nature Planted Forests" (CTNPF) that will be introduced through this project. Through Bio-CLIMA sustainability of land management will be enhanced, including improvements in soil fertility and organic matter content, as a result of climate-smart agriculture and landscape restoration, including increases in the numbers of trees on farms and pasture land, and a reduction in the use of fire. Bio-CLIMA will strive to stabilize migration flows, not only at the agricultural frontier, but also migration from the countryside to the cities and abroad.

39. Gender-sensitive development: All activities within Bio-CLIMA, like for example the LUMPs at farm level will ensure women's participation and accounting for their specific needs in decision-making. The leadership role of women in land management and agriculture will be promoted and women's participation in agroforestry, silvo-pastoral, restoration and forest management activities will be enhanced.

40. Needs of the recipient: Vulnerability of the country: According to the 2016 Standard of Living Survey by the National Development Information Institute, general poverty in Nicaragua dropped from 29.6 to 24.9 percent between 2014 and 2016; while in the same period extreme poverty fell from 8.3 to 6.9 percent. Despite this progress, poverty remains high. Nicaragua is still one of Latin America's least developed countries facing persistent high fiscal deficits and public debt which are a major barrier to making effective and long term public sector investments.⁵⁶ Should Nicaragua be able to grow at 3.6 percent in per capita terms (its average growth since 2010), it would still take 79 years in order to reach the average GDP per capita of Latin America and the Caribbean⁵⁷. Nicaragua is expected to experience a severe economic contraction in 2018 and years to come as the country's economic and social situation is expected to deteriorate, threatening recent efforts in poverty reduction and the conservation of the environment.⁵⁸

41. Vulnerable groups and gender aspects: Economic and social development level of the country and affected population: Bio-CLIMA is located in the Caribbean Region, which has been singled out within Nicaragua's National Human Development Plan as a high priority, since it contains 54% of the national territory, 80% (3.16 million ha) of Nicaragua's forestland, the majority of the nation's indigenous populations, a quarter of the country's poor, and accounts for the large majority of national deforestation. While it is true that both poverty and extreme poverty have been halved since 2005, Nicaragua is the second poorest country in the Western Hemisphere, and the RACCS, RACCN and Río San Juan department have the lowest human development indices (0.50-0.55) of Nicaragua. Bio-CLIMA will put in place a bottom-up approach in which each family will first plan on-farm development and investment through a LUMP and a business plan: none of these instruments will be done without full involvement of all family members, securing that rights and needs of women and the young are being duly considered. Women headed households will be prioritized as beneficiaries.

42. Need for strengthening institutions and implementation capacity: Institutional indicators suggest that Nicaragua faces significant challenges in these areas.⁵⁹ The Global Competitiveness Index 2016–17 ranked Nicaragua 122nd out of 138 countries. The country ranks low in several categories, in particular in judiciary independence, property rights, and transparency. The Worldwide Governance Indicators (WGI) also signal broad institutional weaknesses. According to the WGI, for 2015 Nicaragua ranked at the bottom third of all countries.⁶⁰ These problems are exacerbated in the Caribbean Region, where the presence of governmental institutions is weak, extension of the territory is vast and the access is difficult. The Government of Nicaragua is well aware of the urgent need to strengthen its presence in the CR to reduce deforestation and therefore plans to invest significant budgetary resources in governance, institutions and state-building measures through the Bio-CLIMA Project.

43. Country ownership: Section B.1 describes Bio-CLIMA's aligned with Nicaragua's National Policies and Strategies and specifically with its National Climate Change Mitigation and Adaptation Policy and its NDCs.

Within Nicaragua's REDD+ Strategy⁶¹ Bio-CLIMA has been designed to be complementarily and act synergistically with the Emission Reduction Programme (ER-PD) that Nicaragua has prepared to be submitted to the Forest Carbon Partnership Facility. While Bio-CLIMA's Component 3 will further strengthen REDD+ Readiness (Phase I) actions, components 1 and 2 will implement REDD+ Pilot activities on the ground. The ER-PD will build on and scale-up Bio-CLIMA's impact to the whole CR as accounting area and will include result-based payments from the FCPF (REDD+ Phase III).

Bio-CLIMA is being developed since April 2018 by the "*Grupo Técnico Interinstitucional*" (GTI) lead by MARENA, with the active participation of MHCP (as NDA), MEFCCA, INTA, INETER, INAFOR and the technical support of the FAO (please refer to Annex 6: Documentation of formulation process). Unquestionable full ownership of the country is the fact that the Government of Nicaragua will co-finance Bio-CLIMA through a loan to the GCF backed by a sovereign guarantee.

44. Capacity of accredited / executing entity to deliver: All institutions of the GTI mentioned above are experienced in executing rural development projects with financial support of different cooperation partners including the World Bank, the European Union, Inter-American Development Bank, IFAD and CABEI. Lessons learnt, especially the flaws, and best practices will be capitalized by Bio-CLIMA when designing the detailed implementation arrangements during full FP preparation. In this regard the sustainable livestock program BOVINOS (21.7 M € - European Union) which is being implemented also in the Municipality of Nueva Guinea (RAACS); as also the program to support climate change adaptation for coffee and cocoa producers NICADAPTA (37.05 M USD – IFAD/CABEI), benefitting also indigenous territories of the RAACN and the RAACS, will be especially relevant to build upon. Both Projects are being executed by MEFCCA in alliance with relevant national and regional institutions through local implementation structures. In difference with both these projects that benefit members of agricultural cooperatives and indigenous communities, Bio-CLIMA will also target vulnerable households that are not yet organized (please see Annex 1 Figure 6-a, and Annex 5).

45. Engagement of civil society organizations and relevant stakeholders: Both the National REDD+ Strategy as well as the ER-PD have undergone intensive consultation and participation processes in which relevant actors and stakeholders have been involved. During full FP preparation the consultation and participation process will be targeted and intensified within the zones identified within the five municipalities chosen, especially within indigenous territories and its governance mechanisms and authorities, where FPIC will be integrated into further project design.

46. Efficiency and effectiveness

The following table shows some key cost-effectiveness indicators estimated by considering the amounts of total investment and donation from the Green Climate Fund (please refer also to the EFA in Annex 3).

Estimated cost-effectiveness indicators	Over the total investment cost	Over the GCF Grant
Cost per direct beneficiary (USD/ha)	1,667.3	568.7
Cost per direct beneficiary (USD/person)	4,205.2	1,434.4
Cost per direct/indirect beneficiary (USD/ha)	637.0	217.3
Cost per direct/indirect beneficiary (USD/person)	1,508.8	514.7
Cost per carbon sequestration (USD/tCO ₂ eq)	20.4	7.0

47. The estimated investment costs per beneficiary, area and carbon sequestration reflect the technical particularities of the proposed models to be implemented and the characteristics of the production units in the region in terms of land tenure and demographic composition. In general, these values are in the average ranges for investment projects in the region considering that the beneficiaries will be groups of small, medium and large producers. The project efficiency will be significantly improved by the social, environmental, institutional and economic externalities generated by the implementation of the resilient modules, the building capacities and the institutional strengthening of the local, regional and national actors involved in the project.

48. Amount of co-financing (please refer also to section C.1 below and Annex 3)

It is expected that 72% of the total cost of Bio-CLIMA (USD 110.4 million) will be financed through GCF resources: these would be put together by a USD 37.7 million grant (34%); and a USD 42.2 (38%) loan component, backed by Sovereign Guarantee from the Government of Nicaragua. Co-financing would be provided by grants from other cooperation partners^a (11%); as also the counterpart financing from direct beneficiaries (workforce) and participating institutions (operational costs), that would sum 17% of the total budget. Total co-financing accounts for 28% of total project cost.

The GCF grant, which accounts for only 34% of total project cost, would be invested mainly in incentives for small-holders and indigenous communities at the agricultural frontier to transform their agricultural practices and restore landscapes; as also in tools, instruments and activities to generate and gather climate relevant information for strategic decision making and monitoring.

The incentives for medium and big producers canalized through the Trust Fund (19%), as also the budgetary support for capacity building, good governance and institutional strengthening (20%) would be financed by the GCF loan. Project management costs account for less than 1%. The Logical Framework and Financial Model included in Annex 3 presents more detailed tentative costs per activity and financing source.

49. Economic and Financial viability

Preliminary estimates of the project's economic and financial indicators for a 20-year period, a social discount rate of 8% and valuing the ecosystem services of carbon sequestration, show that the investment would have positive returns. The incremental financial and economic NPV would be USD 160.9 and USD 177.1 million, respectively. Likewise, the value of the financial and economic IRR would be 19% and 22%. Because of the project implementation, each productive unit would have an additional net income of USD 122 per hectare benefited per year. The following table shows the preliminary estimates of the economic and financial indicators per hectare of the resilient models proposed by the project. These estimated of the economic and financial indicators are in the range of studies carried out in other Latin-American countries.

Resilient models	Estimated Economic and Financial Indicators (per hectare)			
	NPV	IRR	NPV	IRR
Agroforestry system - Cocoa	256	9%	2,087	16%
Agroforestry system - Coffee	3,556	16%	3,584	20%
Silvo-pastoral system	868	15%	2,036	25%
Close to Nature Planted Forests	1,164	11%	3,830	20%
Sustainable Management of Natural Forest	3,225	25%	4,999	35%

C. Indicative financing / Cost information (max. 3 pages)

C.1. Financing by components (max ½ page)

^a The Government of Nicaragua has already advanced consultations with the EU and other bilateral cooperation partners which have expressed interest in co-financing Bio-CLIMA. Higher co-finance as projected would result and diminishing grant portion for the GCF accordingly.

Component	Indicative cost	GCF financing		Co-financing		
	(USD)	Amount (USD)	Financial Instrument	Amount (USD)	Financial Instrument	Name of Institutions
C 1: Producing and conserving for life	81.282.233	31.803.807	Grant	3.591.567	Grants	Other donors
		31.318.074	Sovereign guarantee	14.568.784	In kind	Beneficiaries
C 2: Good governance	8.748.857	1.017.327	Grant	393.663	Grants	Other donors
		6.373.866	Sovereign guarantee	964.001	In kind	Beneficiaries
C 3: Capacity development	19.566.140	4.783.501	Grant	7.742.196	Grants	Other donors
		3.974.629	Sovereign guarantee	3.065.814	In kind	Beneficiaries
Sub-total components	109.597.229	79.271.204		30.326.025		
Project management	819.113	58.800	Grant	144.223	Grants	Other donors
		514.579	Sovereign guarantee	101.511	In kind	Institutions
Total / financial instrument and source	34%	37.663.436	Grant	11.871.648	Grants	Other donors
	38%	42.181.147	Sovereign guarantee	18.700.111	In kind	Beneficiaries / Institutions
Indicative total cost (USD)	110.416.342	79.844.583	72%	30.571.759	28%	

(Please note that percentages (%) are relative to indicative total project cost, while "in kind" contribution refers mainly to wages invested by beneficiaries, as also basic operating costs contributed by institutions) Please refer also to Annex 3, Label 5 "Financing by Component"

C.2. Justification of GCF funding request (max 1 page)

50. To achieve transformational change proposed through Bio-CLIMA the Government of Nicaragua is making a big financial effort to invest in creating the state building measures, institutional capacities, normative and governance conditions and an investment climate to reduce deforestation in the CR. GCF funding in addition to the public and the private sector funding that will co-finance Bio-CLIMA is required to add to that finance in order to reach the most vulnerable subsistence farmers at the agricultural frontier in Nicaragua: they have very limited market access, limited access to financial markets and agricultural and climate technological advice, and suffer from poor basic infrastructure. Vulnerable groups such as women, youth, and indigenous peoples are particularly disadvantaged. GCF support will support the transformation of farming techniques, leading to climate smart and resilient agricultural production systems that sequester carbon, conserve ecosystems and ecosystem services. Without GCF support the Government of Nicaragua could not invest in all the actions required to achieve the challenge posed by the transformational process needed to revert the vicious cycle of poverty, natural resources depletion and deforestation in the Caribbean Region.

51. The CR of Nicaragua, especially the vast and remote areas within the buffer zones of BOSAWÁS and Indio Maíz Protected areas have a very weak presence of any of the institutions: not only public regulators, technical assistance or service providers of any nature, but also financial service providers and financial markets are completely absent. Private financial institutions are not present in the region, thus new and specially tailored instruments to provide financial incentives, TA and market access, like the Trust Fund will need to be created.

Within such a challenging environment public investment (national and international) need to first create an enabling environment to catalyze sustainable development and arrange for the provision of public goods.

52. While the financial analysis shows that for all models the IRR is higher than the discount rate of 8% and NPV always above zero, a high level of concessionality will be necessary to act as a real incentive to trigger the behavioral change needed. Return on investment happens only after 3 and up to 15 years, which makes models attractive only with a strong incentive since the project are has extremely complex conditions regarding public infrastructure, accessibility and services that are completely absent, and that must also be taken into consideration. Terms of concessionality and flow of funds will be further determined during full FP.

C.3. Sustainability and replicability of the project (exit strategy) (max. 1 page)

53. The resilient modules introduced by the Project will generate financial benefits that are much higher than the investment and produce important financial benefits in the long term. Bio-CLIMA will catalyze climate resilient

development through TA and investment during the first years. Bio-CLIMA will initially impact on 30% of farms within the selected municipalities to be then scaled-up to additional farms through INTA's FIIT⁶²-model to other municipalities and the Caribbean Region.

This will also be achieved through the public-private Trust Fund mechanism which will strive to integrate small, medium and larger producers through financial support, technical assistance and market support.

Strengthened local institutions and capacities will be the basis for replication and scaling-up of best practices introduced by Bio-CLIMA. This, together with an updated legal and normative framework for climate-smart sustainable land and forest use, governance conditions and a general enabling environment will permit scaling-up to the whole CR through the much more ambitious Emission Reduction Program (ER-PD).

C.4 Engagement among the NDA, AE, and/or other relevant stakeholders in the country (max ½ page)

54. Bio-CLIMA builds and ENDE REDD+ and the ER-PD: Project interventions are the response to the ongoing consultation and participation process that is being undertaken since 2015 among all the relevant stakeholders in the CR⁶³. Under the leadership of MARENA and the active participation of the NDA (MHCP) an Interinstitutional Working Group (GTI) was formed with INAFOR, INTA, INETER and MEFCCA, which has formulated the concept of Bio-CLIMA since May 2018 with technical and facilitation support of the FAO. More than 20 workshops and technical meetings were held, during this time during which relevant stakeholders and institutions, like the Secretariat for Development of the Caribbean Coast (SDCC), CONAGAN, as also other relevant actors were informed and consulted (please refer also to Annex 6).

Consultation will continue during the formulation of the full Funding Proposal, especially with Indigenous Governments and Communities, from which FPIC will be sought on each and every project intervention projected on their territories.

D. Supporting documents submitted (OPTIONAL)

- Annex 1: Maps, figures and tables
- Annex 2: Theory of change and Result Framework
- Annex 3: Project outputs and activities, costs and preliminary financial model
- Annex 4: Pre-feasibility studies: (a) Climate smart production models, (b) Prioritization of intervention areas, (c) GHG emission sequestration estimates
- Annex 5: Previous and ongoing relevant projects in the project area
- Annex 6: Documentation and memoires of meetings of the GTI for Bio-CLIMA formulation process
- Annex 7: Letter of support from to Bio-CLIMA by the NDA of the Government of Nicaragua

Link: https://drive.google.com/drive/folders/1Mna0AQOf2uTuYENxGJ_opl18f33oLUaQ?usp=sharing

Self-awareness check boxes

Are you aware that the full Funding Proposal and Annexes will require these documents? Yes No

- Feasibility Study
- Environmental and social impact assessment or environmental and social management framework
- Stakeholder consultations at national and project level implementation including with indigenous people if relevant
- Gender assessment and action plan
- Operations and maintenance plan if relevant
- Loan or grant operation manual as appropriate
- Co-financing commitment letters

Are you aware that a funding proposal from an accredited entity without a signed AMA will be reviewed but not sent to the Board for consideration? Yes No

AFS	Agroforestry and sylvo-pastoral system
AFOLU	Agriculture, forestry and land use
ASOGAN	Asociación de Ganaderos de Nicaragua
AUE	Animal Unit Equivalent (1 mature cow of 450 kg)
BAU	Business as usual
CC	Climate Change
CANICARNE	Cámara Nicaragüense de Plantas Exportadoras de Carne Bovina
CO ₂ eq	Carbon dioxide equivalent
CONAGAN	Comisión Nacional de Ganaderos de Nicaragua
CR	Caribbean Region of Nicaragua
EU	European Union
FAGANIC	Federación de Asociaciones de Ganaderos de Nicaragua
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
FONADEFO	Fondo Nacional de Desarrollo Forestal
GHG	Green house gases
Ha	Hectare
INAFOR	National Forestry Institute
INETER	National Institute of Territorial Studies
INTA	National Institute of Agricultural and Livestock Technologies
LUMP	Land use management plan
M	Million
MARENA	Ministry of Environment and Natural Resources
MEFCCA	Ministry for Home Economics, Communities, Cooperatives and Associations
MHCP	Ministry of Finance and Public Credit
M-MRV	Measurement, monitoring, reporting and verification
RACCN	Autonomous Region of the North Caribbean Coast
RACCS	Autonomous Region of the South Caribbean Coast
REDD+	Reduction of emissions from deforestation and forest degradation
SDCC	Secretariat for Development of the Caribbean Coast
t	Ton
UNAG	Unión Nacional de Agricultores y Ganaderos de Nicaragua

Footnotes to the text

- ¹ Estrategia de reducción de emisiones provenientes de la deforestación y degradación de los bosques. ENDE-REDD+ 2018-2040. MARENA. Nicaragua.
- ² Caribbean Coast Emission Reduction Program Document (ER-PD). Nicaragua, May 29, 201 – in preparation – to be submitted to the Forest Carbon Partnership Facility FCPC, Carbon Fund, World Bank.
- ³ Agriculture contributes 17% to Nicaragua’s GDP and represents more than 70% of the country’s total exports.
- ⁴ Niveles de Referencia de las Emisiones Forestales. MARENA 2019.
- ⁵ TechnoServe, 2017. In ER-PD in preparation, *ibid*.
- ⁶ Contribución Nacionalmente Determinada a la Mitigación del Cambio Climático (NDC) de la República de Nicaragua antes la Convención Marco de Naciones Unidas sobre Cambio Climático (CMNUCC). 2018.
- ⁷ Includes six Natural Reserve Areas (Bosawas, Cerro Kilambe, Cola Blanca, Banacruz, Macizo de Peñas Blancas y Pis Pis) and the National Park “Cerro Saslaya”.
- ⁸ Incluye: Historical monument “Fortaleza La Inmaculada Concepción”, National Monument “Archipiélago de Solentiname”, two Wild Life Refuges (Río San Juan y Los Guatuzos), the Biological Reserve “Indio Maíz” and three Natural Reserve Areas (Cerro Silva, Punta Gorda, Serranía de Yolaina).
- ⁹ World Bank; CIAT. 2015. Climate-Smart Agriculture in Nicaragua. CSA Country Profiles for Africa, Asia, and Latin America and the Caribbean Series. Washington D.C.: The World Bank Group.
- ¹⁰ MARENA 2018 Priorización de áreas de intervención del Proyecto BIO-CLIMA “ Fortalecimiento Integral de la Resiliencia al Cambio Climático de las Zonas de Reserva de Biosfera BOSAWÁS y Río San Juan” Noviembre 2018.
- ¹¹ Caribbean Coast Emission Reduction Program Document (ER-PD) submitted to the Forest Carbon Partnership Facility FCPC. Carbon Fund. Nicaragua, May 29, 2018
- ¹² Agriculture in Nicaragua: Performance, challenges and options. World Bank, IFAD, Cooperación Suiza. November 2015.
- ¹³ World Bank; CIAT. 2015. Climate-Smart Agriculture in Nicaragua. CSA Country Profiles for Africa, Asia, and Latin America and the Caribbean Series. Washington D.C.: The World Bank Group.
- ¹⁴ Germanwatch. 2017. Global Climate Risk Index 2017, Available online at: <https://germanwatch.org/en/download/16411.pdf>.
- ¹⁵ Agriculture in Nicaragua: Performance, challenges and options. World Bank, IFAD, Cooperación Suiza. November 2015.
- Note:** The authors include in the concept of “family farming” all types of farms, only excluding the agro-industries.
- ¹⁶ Atlas de Escenarios Climáticos de Nicaragua hasta el año 2080. INETER. 2017. Proyecto “Desarrollo de capacidad adaptativa para el Cambio Climático en el sector transporte”. Ministerio de Transporte e Infraestructura, 2015.
- ¹⁷ Gourdj S; Läderach P; Martínez Valle A; Zelaya Martínez C; Lobell D. 2015. Historical climate trends, deforestation, and maize and bean yields in Nicaragua. *Agricultural and Forest Meteorology* 200:270–281.
- ¹⁸ Läderach P; Martínez Valle A; Castro N. 2012. Predecir el impacto del cambio climático sobre las áreas de cultivo de cacao en Nicaragua. Managua: International Center for Tropical Agriculture (CIAT).
- ¹⁹ Ejes del Programa Nacional de Desarrollo Humano 2018-2021. Diciembre 2017. Managua.
- ²⁰ Política Nacional de Mitigación y Adaptación al Cambio Climático. Gobierno de Reconciliación y Unidad Nacional. Managua, Nicaragua 2018.
- ²¹ Contribución Nacionalmente Determinada a la Mitigación del Cambio Climático (NDC) de la República de Nicaragua antes la Convención Marco de Naciones Unidas sobre Cambio Climático (CMNUCC). 2018.
- ²² *ibid*
- ²³ Density of weather stations in the CR and precipitation is shown in Annex 1, Figure 14
- ²⁴ Estrategia de reducción de emisiones provenientes de la deforestación y degradación de los bosques. ENDE-REDD+ 2018-2040. MARENA. Nicaragua.
- ²⁵ Caribbean Coast Emission Reduction Program Document (ER-PD) submitted to the Forest Carbon Partnership Facility FCPC. Carbon Fund. Nicaragua, May 29, 2018
- ²⁶ ENDE REDD+. Marena 2018.
- ²⁷ Deforestation hotspots were identified by the REDD+ Team of MARENA through a multidimensional analysis for which following criteria were used and weighted: i.) Total forest area at high risk of deforestation and degradation, “Roughness Index” (20%), ii.) Total area forest loss, years 2015-2018 (30%); iii.) Total forest area gain, years 2015-2018 (20%) and iv.) Unchanged forest area, years 2015-2018 (30%). See also: Annex 5. MARENA 2018 Priorización de áreas de intervención del Proyecto BIO-CLIMA “ Fortalecimiento Integral de la Resiliencia al Cambio Climático de las Zonas de Reserva de Biosfera BOSAWÁS y Río San Juan” Noviembre 2018.
- ²⁸ CENAGRO III. Tercer Censo Nacional Agropecuario. Instituto Nacional de Estadísticas y Censos. Managua 2012
- ²⁹ Potential project implementation areas prioritized by MARENA were adjusted with data from the National Agricultural Census CENAGRO 2012.
- ³⁰ Sources: CENAGRO 2012 and ERP, 2019 (*ibid*)
- ³¹ Annex 3 presents a preliminary Logical Framework, which includes outcomes, outputs, activities, indicators, targets and tentative costs.
- ³² In the context of the project at this stage “farmer” includes small and big scale owners, as also members of communities undertaking agricultural activities on their family plot. A much more detailed beneficiary characterization will be done during full project preparation.
- ³³ AFS includes sylvo-pastoral systems
- ³⁴ For members of indigenous communities LUMPs will have to be articulated within the respective management plan of the community territory, and approved by community and local governance structures and authorities.
- ³⁵ Close-to-nature Planted Forests (CTNPF) are established with more than one tree species, often native, adapted to the site and its ecological conditions. These forests are often vertically structured in more than one layer and may be uneven aged. They provide a wide range of products and environmental services and have a higher resilience to external disturbances (Kanowski, 1997, in FAO 2009).³⁵
- ³⁶ Through a comprehensive socio-economic assessment to be done during FFPP maximal grant thresholds per family will be set depending on combination of chosen models, production/conservation ratio, family needs typology and other criteria. It has been estimated that the grants may range between USD 1,500 – 2,500 / family.
- ³⁷ Levels of concessionality for various producer typologies and options for performance based loans that can be turned into grants will be further explored and determined during FFPP.

³⁸ The institutional architecture of the SPT shall be further defined and may include producer associations such as FAGANIC, CONAGAN, UNAG, ASOGAN and CANICARNE. A more detailed description of the SPT is included in Nicaragua's Emission Reduction Document and will be further developed during Full Funding Proposal Preparation.

³⁹ System of cow lending for dry season pasture and calving.

⁴⁰ https://www.thegef.org/sites/default/files/project_documents/03-29-17_Project_Document_Concept_Stage.pdf

⁴¹ Nicaragua. Systematic Country Diagnostic. World Bank 2017.

<http://documents.worldbank.org/curated/en/365991498843795990/pdf/Nicaragua-SCD-Copyedit-final-jun-20-06272017.pdf>

⁴² Navarro G et al. 2012. Legal Timber. Verification and Governance in the Forest Sector. VERIFOR. OCI/CIFOR/CATIE, 2005.

⁴³ The GEF Project "Strengthen institutional and technical capacities in the agricultural and forestry sectors of Nicaragua to respond to the requirements of the enhanced transparency framework under the Paris Agreement" (CBIT Nicaragua) will be executed by INTA as lead agency with the participation of INAFOR, MARENA and INETER; and with the assistance of FAO. The total GEF financing is USD 1 million provided from GEF's Trust Fund in the framework of Capacity Building Initiative for Transparency (CBIT), to support countries enhance monitoring and reporting capacities that will lead to enhanced transparency in the reporting of NDC and other activities in support of the Paris Agreement.

⁴⁴ MEFCCA has proven experience and capacities in executing investment projects of higher financial volume with financial support of international financing institutions (IFAD, WB, others). Nevertheless a detailed institutional analysis and implementation arrangements proposal for Bio-CLIMA with a special emphasis on regional and local implementation partners, will be undertaken at a later stage during Full Funding Proposal Preparation (FFPP).

⁴⁵ INTA has successfully proven experience with participatory on farm extension and participatory innovation through the Research and Innovation Farms established in partnership with small farmers (*FIIT Fincas de Investigación e Innovación Tecnológica*), which will be fertilized by FAO Farmer Field Schools experience, know-how and methodological resources.

⁴⁶ ER-PD, *ibid*

⁴⁷ Miccolis Andrew et al 2017: Restoration through agroforestry: options for reconciling livelihoods with conservation in the Cerrado and Caatinga biomes in Brazil. Cambridge University Press doi:10.1017/S001447971700013

⁴⁸ Jacobi, J., Schneider, M., Bottazzi, P., Pillco, M., Calizaya, P. and Rist, S. (2013). Agroecosystem resilience and farmer's perceptions of climate change impacts on cocoa farms in Alto Beni, Bolivia. *Renewable Agriculture and Food Systems* 30(2):170–183.

⁴⁹ Lasco, R. D., Delfino, R. J. P. and Espaldon, M. L. O. (2014). Agroforestry systems: Helping smallholders adapt to climate risks while mitigating climate change. *Wiley Interdisciplinary Reviews: Climate Change* 5:825–833.

⁵⁰ Kandji, S. T., Verchot, L. V., Mackensen, J., Boye, A., Noordwijk, M., Tomich, T. P., Ong, C., Albrecht, A. and Palm, C. (2006).

Opportunities for linking climate change adaptation and mitigation through agroforestry systems. Chapter 13. In *World Agroforestry into the Future*, 113–123 (Eds D. Garrity, A. Okono, M. Grayson and S. Parrott). World Agroforestry Centre.

⁵¹ Souza, M. de and Piña-Rodrigues, F. (2013). Desenvolvimento De Espécies Arbóreas Em Sistemas Agroflorestais para Recuperação de Áreas Degradadas na Floresta Ombrófila Densa, Paraty, RJ. *Revista Árvore* 37(1):89–98.

⁵² Araújo Filho, J.A. de (2013). Manejo Pastoril Sustentável da Caatinga, 200. Recife, PE: Projeto Dom Helder Camara. Bargués Tobella, A., Reese, H., Almaw, A., Bayala, J., Malmer, A., Laudon, H. and Istedt, U. (2014). The effect of trees on preferential flow and soil infiltrability in an agroforestry parkland in semiarid Burkina Faso. *Water Resources Research* 50:2108–2123.

⁵³ Bene et al., 1977; Sinclair, 2004; Vira et al., 2015, in Miccolis A 2017

⁵⁴ Izac, a. M. N. and Sanchez, P. a. (2001). Towards a natural resource management paradigm for international agriculture: The example of agroforestry research. *Agricultural Systems*. 69(1-2):5–25.

⁵⁵ Nadrowski et al 2010, Sherer-Lorenzen 2014, van Hensberg 2006, Bauhus et al 2010, in Verheyen K 2016

⁵⁶ Nicaragua Country Profile. <http://www.worldbank.org/en/country/nicaragua/overview>, visited November 11, 2018.

⁵⁷ Nicaragua. Systematic Country Diagnostic. World Bank 2017.

⁵⁸ <http://www.worldbank.org/en/country/nicaragua/overview>

⁵⁹ Since the 1990s, Nicaragua has gradually embarked on a transition process from being a conflict-affected state toward becoming a relatively effective state. According to the 2011 WDR, even the fastest transforming countries have taken between 15 and 30 years to raise their institutional performance from that of a fragile state to that of a functioning institutionalized state.

⁶⁰ Nicaragua. Systematic Country Diagnostic. World Bank 2017. (*ibid*)

⁶¹ Estrategia de Reducción de Emisiones Provenientes de la Deforestación y Degradación de los Bosques (ENDE-REDD+). Ministerio del Ambiente y de los Recursos Naturales. Managua, 2017.

⁶² FIIT: "*Finca de Investigación e Innovación Tecnológica*": Research and Innovation Farms operated in cooperation with local farmers with technical support of INTA have proven to be very effective for rural extension and capacity building within the farmer-to-farmer approach.

⁶³ The documentation of the consultation process can be found in the following site:

<http://www.marena.gob.ni/Enderedd/componentes/dialogos-y-consultas-para-la-preparacion/>.

At least 3,564 people participated in 79 consultation events and workshops at national, regional and local level. Please refer to relevant sections both in the ENDE REDD+ and the ER-PD (pages 120 ff.) (*ibid*).