



**GREEN  
CLIMATE  
FUND**

**Meeting of the Board**

6 – 8 July 2019

Songdo, Incheon, Republic of Korea

Provisional agenda item 20

**GCF/B.23/02/Add.05**

14 June 2019

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# Consideration of funding proposals - Addendum V

## Funding proposal package for FP111

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### **Summary**

This addendum contains the following seven parts:

- a) A funding proposal titled “Promoting climate-resilient forest restoration and silviculture for the sustainability of water-related ecosystem services”;
- 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.

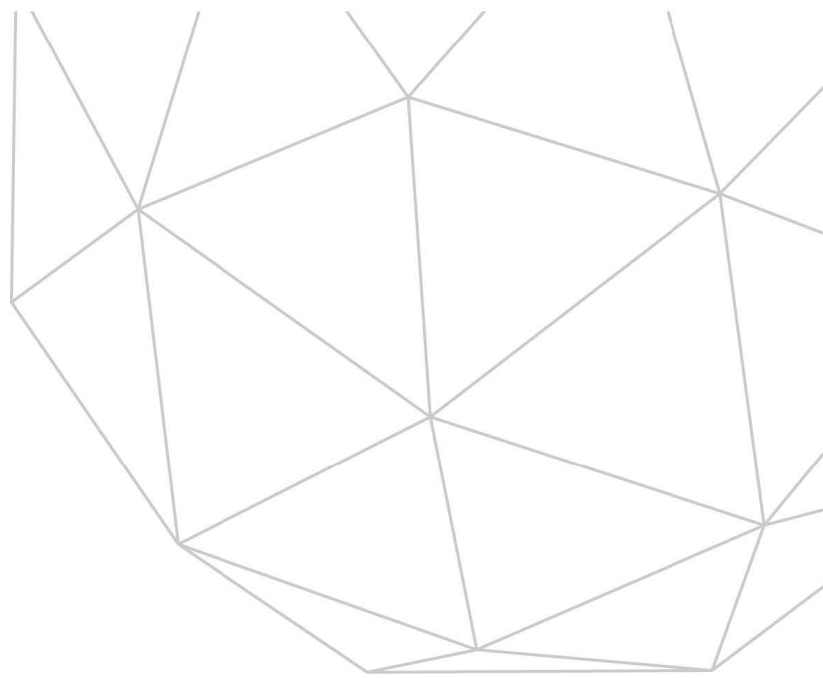
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# Funding Proposal

Version 1.1

**The Green Climate Fund (GCF) is seeking high-quality funding proposals.**

Accredited entities are expected to develop their funding proposals, in close consultation with the relevant national designated authority, with due consideration of the GCF's Investment Framework and Results Management Framework. The funding proposals should demonstrate how the proposed projects or programmes will perform against the investment criteria and achieve part or all of the strategic impact results.

Project/Programme Title:	"Promoting climate-resilient forest restoration and silviculture for the sustainability of water-related ecosystem services"
Country/Region:	Honduras
Accredited Entity:	Inter-American Development Bank (IDB)
Date of Submission:	1 <sup>st</sup> Submission: June 20 <sup>th</sup> , 2018

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Section I	<b>ANNEXES</b>

### Note to accredited entities on the use of the funding proposal template

- Sections **A, B, D, E** and **H** of the funding proposal require detailed inputs from the accredited entity. For all other sections, including the Appraisal Summary in section F, accredited entities have discretion in how they wish to present the information. Accredited entities can either directly incorporate information into this proposal, or provide summary information in the proposal with cross-reference to other project documents such as project appraisal document.
- The total number of pages for the funding proposal (excluding annexes) is expected not to exceed 50.

Please submit the completed form to:

[fundingproposal@gcfund.org](mailto:fundingproposal@gcfund.org)

Please use the following name convention for the file name:

“[FP]-[Agency Short Name]-[Date]-[Serial Number]”

PROJECT / PROGRAMME SUMMARY

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A.1. Brief Project / Programme Information		
A.1.1. Project / programme title		"Promoting climate-resilient forest restoration and silviculture for the sustainability of water-related ecosystem services"
A.1.2. Project or programme		Project
A.1.3. Country (ies) / region		Honduras
A.1.4. National designated authority (ies)		Ministry of Energy, Natural Resources, Environment and Mining (MiAmbiente)
A.1.5. Accredited Entity:		Inter-American Development Bank (IDB)
A.1.5.a. Access modality		<input type="checkbox"/> Direct <input checked="" type="checkbox"/> International
A.1.6. Executing entity / beneficiary		<p>Executing Entity: Ministry of Finance (SEFIN)</p> <p>Beneficiary: It is estimated that 27,000 farmer households will be direct beneficiaries of the project, of which 6,000 are female headed households. These beneficiaries are mostly participants in ICF's agroforestry and micro-basin organizations. Total indirect beneficiaries from increased water services from the project are 450,000 citizens, equivalent to 4.8% of total population.</p>
A.1.7. Project size category (Total investment, million USD)		<div> <input type="checkbox"/> Micro (<math>\leq 10</math>)           <input type="checkbox"/> Small (<math>10 &lt; x \leq 50</math>)         </div> <div> <input checked="" type="checkbox"/> Medium (<math>50 &lt; x \leq 250</math>)           <input type="checkbox"/> Large (<math>&gt; 250</math>)         </div>
A.1.8. Mitigation / adaptation focus		<input type="checkbox"/> Mitigation <input type="checkbox"/> Adaptation <input checked="" type="checkbox"/> Cross-cutting
A.1.9. Date of submission		1 <sup>st</sup> Submission: June 20 <sup>th</sup> , 2018
A.1.10. Project contact details	Contact person, position	Gines Suarez, Natural Disaster Specialist Gloria Visconti, Lead Climate Specialist
	Organization	Interamerican Development Bank
	Email address	<a href="mailto:giness@iadb.org">giness@iadb.org</a> <a href="mailto:gloriav@iadb.org">gloriav@iadb.org</a>
	Telephone number	+1202 6233360
	Mailing address	1300 New York Avenue, NW 20577, Washington DC, USA

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### A.1.11. Results areas (mark all that apply)

#### Reduced emissions from:

- ☐ Energy access and power generation  
(E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)
- ☐ Low emission transport  
(E.g. high-speed rail, rapid bus system, etc.)
- ☐ Buildings, cities and industries and appliances  
(E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)
- ☒ Forestry and land use  
(E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)

#### Increased resilience of:

- ☒ Most vulnerable people and communities  
(E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)
- ☒ Health and well-being, and food and water security  
(E.g. climate-resilient crops, efficient irrigation systems, etc.)
- ☐ Infrastructure and built environment  
(E.g. sea walls, resilient road networks, etc.)
- ☒ Ecosystem and ecosystem services  
(E.g. ecosystem conservation and management, ecotourism, etc.)

## PROJECT / PROGRAMME SUMMARY

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### A.2. Project / Programme Executive Summary (max 300 words)

***Please provide a brief description of the proposed project/programme, including the objectives and primary measurable benefits (see section E). The detailed description can be elaborated in [section C](#).***

According to Germanwatch's 2018 Global Climate Risk Index, Honduras ranks first on the list of the countries most affected by negative impacts from extreme climate-related events over the last two decades. Recently, the country was affected by a reduction in rainfall associated to the 2011-2015 El Niño event, which triggered a severe Pine-bark Beetle outbreak that destroyed 480,000 Ha of pine forest (about 10% of the total national forest cover and 25% of coniferous forest). According to established climate change scenarios, Honduras will face rising temperatures and lower rainfall over the next thirty years, increasing the probability of similar types of severe pine-bark beetle outbreaks. This is expected to impact negatively the provision of key ecosystem services, in particular, water availability: models show that, if no measures are taken, the impacts of climate change by year 2050 will double the areas affected by severe Pine-bark Beetle outbreaks in 29 basins which represent the main source for water supply for the most populated region of the country. This would correspond to a reduction in total water availability by an estimated 40%, affecting the livelihoods of a large proportion of the Honduran population, especially of groups that are highly dependent on environmental resources for their economic activities. This will make more acute the so called "environmental migration", both to other areas in Honduras and abroad.

To avoid this scenario, the project's main goal is to improve the resilience of vulnerable coniferous forests by implementing forest restoration, agroforestry practices and adaptive forest management in critical areas for the provision of water services. The project fosters a paradigm shift in forest management towards a model based on active participation of local communities and the private sector, the diversification of livelihoods in rural areas and the creation of enabling conditions for a better governance of the forest sector and its financial sustainability, shifting from a reactive model to a preventive one in the face of climate change.

The project will produce the following impacts.

- Increased water security, especially during the dry season, for 450,000 men and women in the central zone of Honduras, with an improved resilience to climate change.
- Protection of 270,000 Ha of pine forests with adaptive forest management and an increased resilience to climate change.
- Reduction of 10.5 million tCO<sub>2</sub>e from improved forest and land use.
- Economic and social benefits for 27,000 households (male and female headed) due to the adoption of diversified, climate resilient forestry and agroforestry livelihood options.

The project is aligned with the framework of forest and climate change policies, including the National Development Plan, the Nationally Determined Contribution (NDC), the Water, Forest, and Soil Master Plan, and the REDD+ National Strategy, among others.

Honduras has made significant progress in the preparation of the National REDD + Strategy; which has developed its participation in the Forest Carbon Partnership Facility -FCPF-. This project will

## PROJECT / PROGRAMME SUMMARY

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support the implementation of several strategy components to comply with the Warsaw Framework. The project includes the implementation of two REDD+ options considered in the strategy, (i) Restoration and reforestation and (ii) Incentives for the sustainability of the productive sector. Likewise, the methodological alignment is included with the National Reference Level of Emissions, where the project will estimate the net contribution of this intervention for the reduction of emissions (an indicator is included). The project applies processes for the implementation of REDD + and IDB safeguards, including a stakeholder consultation and participation process (improvement of forest governance), alignment with the National Forestry Program, strengthening of monitoring, reporting and verification system, among others. All these actions will allow the country to implement a process that allows it to explore the application to payment for results.

### A.3. Project/Programme Milestone

Expected approval from accredited entity's Board (if applicable)	November 2019
Expected financial close (if applicable)	December 2024
Estimated implementation start and end date	Start: first quarter 2020 End: last quarter 2024
Project/programme lifespan	5 years (60 months)



DETAILED PROJECT / PROGRAMME DESCRIPTION

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B.1. Description of Financial Elements of the Project / Programme

Components	Indicative Cost	GCF Financing		Co-financing		
	(USD)	Amount	Financial Instrument	Amount	Financial Instrument	Institution
		(USD)		(USD)		
<b>Component 1 - Output 1. Forest restored in the prioritized areas to improve climate resilience</b>	<b>\$30,418,000</b>	<b>\$11,018,000</b>		<b>\$19,400,000</b>		
1.1) Forest restoration to increase resilience to climate change	\$21,137,364	\$2,887,364	Loan	\$18,250,000	Loan	IDB
1.2) Climate resilient forest restoration through Agroforestry Systems (AS)	\$8,999,985	\$7,849,985	Loan	\$1,150,000	Grant	IDB (agrolac)
	\$280,651	\$280,651	Grant			
<b>Component 2 - Output 2. Institute of Forest Conservation (ICF) with improved capacities on climate change response</b>	<b>\$3,100,000</b>			<b>\$3,100,000</b>		
2.1) Strengthening of the Forest Health Department and ICF forest extension services	\$1,820,831			\$1,820,831	Loan	IDB
2.2) Early warning system for forest plagues	\$1,016,669			\$1,016,669	Loan	IDB
2.3) Identification of agroforestry species resilient to climate change	\$262,500			\$262,500	Loan	IDB
<b>Component 3 - Output 3. Strengthen governance and financial sustainability to increase forest resilience to climate change</b>	<b>\$42,550,000</b>	<b>\$22,840,000</b>		<b>\$19,710,000</b>		IDB+GoH+service beneficiaries
3.1) Development of enabling conditions for decentralized watershed and forest resources management	\$5,690,000	\$5,340,000	Grant	\$350,000	Grant	IDB (AgroLAC)
3.2) Implementation of a Payment for Ecosystem Services (PES) system	\$35,000,000	\$17,500,000	Grant	\$17,500,000	Grant	GoH and water beneficiaries (in 10 years)

3.3) <i>Development of a coordination mechanism for accessing and implementing climate finance resources on Adaptive Forest Management (AFM)</i>	\$1,860,000			\$1,860,000	Loan	IDB
<b>Component 4. Administration</b>	<b>\$2,932,000</b>	<b>\$1,142,000</b>	Grant	<b>\$1,790,000</b>	Loan	IDB
<b>Indicative Total Cost (USD)</b>	<b>\$79,000,000</b>	<b>\$35,000,000</b>		<b>\$44,000,000</b>		

There are key complementarities between IDB's SFM project and this GCF proposed intervention. The co-financing of components 1 and 3 are critically structured to assure: (i) immediate attention to recovering Pine forest after heavy losses due to the 2014-2016 Pine Bark infestation; (ii) develop a long-term approach to sustainable forest management. In component 1, the proposed GFC funding will attend areas that could not be covered by the IDB project due to resource restrictions. If these areas are not covered, there is a higher risk of losing a large part of potential gains due to a persistent high vulnerability of these areas to future and more aggressive infestations. Likewise, by triggering a PES mechanism to finance maintenance of good forest practices (component 3), GFC funds will assure the financial sustainability of a more decentralized and efficient forest management system in Honduras, one that will be less prone to lack of human and financial resources to face future bark attacks under increasingly challenging climate conditions.

The project proposes the use of three different financial instruments characterized by different levels of concessionality, tailored to the type and urgency of each of the focus areas.

**1. Non-reimbursable Donations [USD 8.27 million]:** These will be used to finance capacity building and institutional strengthening activities to establish an enabling environment for the implementation of the project's proposed model. Includes a GCF technical assistance donation of USD 6.76 million, which will be accompanied by a USD 1.5 million donation from the IDB-managed AGROLAC fund.

**2. Loan to GoH [USD 35.73 million]:** In order to respond to the emergency caused by the loss of forests and water availability, the project will use a combination of reimbursable resources, in the form of loans from IDB (USD 25 million) and GCF (USD 10.7 million). These amounts will allow covering the 100% of the restoration needs in the project intervention area, as an immediate response action that will prevent the change of land use and the loss of ecosystem services in the prioritized basins. The resources will be used to finance economic contributions to local groups (water committees, agroforestry cooperatives, private users, etc.) covering part of the costs of the forest cover restoration activities in degraded areas, both public (through a participatory mechanism with local communities) and private (through a participatory mechanism with local communities) and private (through a participatory mechanism with local communities), and in water production basins, as well as to promote agroforestry systems in deforested areas. These activities will generate the recovery of forest cover in watershed areas recognized as crucial for the provision of water services to the country's most important urbanized areas.

**3. Conditional Donations [US\$ 35.00 million]:** Given the fiscal effort of the Government of Honduras (GoH) to respond to the Pine-beetle infestation emergency, the country's high vulnerability towards Climate Change, and the widespread poverty level of the country's population, the project

proposes to use conditional-based non-reimbursable resources to promote a financing mechanism that support the sustainability of the project's model in the mid-term and long-term, promoting a paradigm shift towards an adaptive forest management model that will enable the country to reduce and withstand future climate change impacts. These resources will be addressed to the initial capitalization of Water Fund (WF). WF will be tasked with the selection and financing of activities related to the restoration, conservation and maintenance of forest cover (forestry and agroforestry systems) in water-production basins, complementing in the mid- and long term the activities financed under Component 1. Disbursements of these resources by GCF (USD 17.5 million) will be linked to milestones that will include parallel disbursements and in-kind contributions by the Government of Honduras and beneficiaries (USD 17.5 million, an estimate of USD 8.76 million of disbursements and USD 8.74 million of in-kind contributions). The in-kind contributions correspond to communitarian work in fire prevention provide by the local communities located near the forest areas. These contributions will be established as local counterpart as part of the agreements between the communities and the beneficiaries of the ecosystem services located downstream. The contributions by GCF will gradually reduce as national contributions increase. National contributions

will come from water services and water resources users in the lower basins, such as water management and distribution companies, hydroelectric power generation companies and irrigation cooperatives and in-kind contributions of the communities located near the forest areas. These actors, who up to date have carried out isolated efforts to develop similar types of watershed protection schemes, have clearly expressed their willingness to take part in the project.

Currently, Honduras' fiscal situation does not allow, so far, allocating additional loan resources to those set aside for bark beetle control and forest restoration in component 1 and central government strengthening in component 2. Concessional resources are needed (component 3) to guarantee the adoption of appropriate measures towards forest adaptation and increasing people resilience to climate change.

DETAILED PROJECT / PROGRAMME DESCRIPTION

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B.2. Project Financing Information							
	Financial Instrument	Amount	Currency	Tenor		Pricing <sup>1</sup>	
(a) Total project financing	(a) = (b) + (c)	79.00	million USD (\$)				
(b) Requested GCF amount	(i) Senior Loans	10.7	million USD (\$)	40 years		0.00%	
	(ii) Subordinated Loans	-	Options				
	(iii) Equity	-	Options				
	(iv) Guarantees	-	Options				
(b) Requested GCF amount	(v) Reimbursable Grants *	24.2	million USD (\$)				
	(vi) Grants **						
	Total requested (i+ii+iii+iv+v+vi)	35	million USD (\$)				
(c) Co-financing	Financial Instrument	Amount	Currency	Name of Institution	Tenor	Pricing	Seniority
	Senior Loans	15 (OC)	million USD (\$)	IDB	30	Libor Based rate*	Pari passu
	Senior Loans	10 (FSO)**	million USD (\$)	IDB	40	0.25%	Pari passu
	Grant	1.5	million USD (\$)	IDB (AgroLac)			
	Grant	3.5	million USD (\$)	Honduras Gov			
	Grant	5.26	million USD (\$)	Water Benefic PES			
	Grant	8.74	million USD (\$)	Local Comm. Contr in kind			
	Grant		million USD (\$)				
	Grant		million USD (\$)				
	Total cofinancing	44.0	million USD (\$)				
Lead financing institution: IDB							
(d) Covenants	As per project term sheet.						
(e) Conditions precedent to disbursement	As per project term sheet.						
* The borrower will pay interest on outstanding balances on this portion of the Ordinary Capital (OC) loan at a LIBOR-based rate. The rate on the outstanding balance will be fixed whenever such balance reaches 25% of the approved net amount or US\$3 million, whichever is greater.							
** Fund for Special Operations (FSO) was, until 12/31/2016, the concessional window from the IDB.							

### B.3 Financial Markets Overview (if applicable)

The activities in this project to be funded by GCF are not related to any revenue or cost recovery actions from the Government of Honduras. As the Government of Honduras is seeking exclusively non-reimbursable resources from GFC, a financial market overview is not applicable.

## C. Detailed Project/Programme Description

### C.1. Strategic Context

1. In 2016, the Gross Domestic Product (GDP) of Honduras was approximately USD 21,500 million<sup>2</sup>, with a share of USD 2,361 GDP per capita for the 9.1 million population. This makes Honduras the country with the highest poverty rate in Central America: 63% in 2014<sup>3</sup>. Indeed, in 2014 Honduras had the highest rate of poverty among 14 countries in Latin America and the Caribbean<sup>4</sup>. In addition to the high levels of widespread poverty, according to Germanwatch's 2018 Global Climate Risk Index, Honduras ranks first on the list of the countries most affected by negative impacts from extreme climate-related events over the last two decades (the period between 1996 and 2016). At the same time, it is the Central American country with the largest forest cover of 5.4 million Ha (ICF Forest Map, 2014), equivalent to 48% of the national territory. In Honduras, coniferous forest (37% of the forest area) is of strategic importance due to its location and capacity to generate key ecosystem services such as water for the largest part of the country's population. Due to the strategic importance of forests for climate change mitigation and adaptation, Honduras has committed to restore 1 million Ha. of forest by 2030 in its National Determined Contribution (NDC).

As many as 12 species of *Dendroctonus* bark beetles have been reported in Central America as well as several species of pine beetles of the genus *Ips*. Most economically important outbreaks are caused by *Dendroctonus frontalis* and *Ips calligraphus* (= *I. apache*). (See Billings and Espino, 2018<sup>5</sup>). Bark beetles (Coleoptera: *Curculionidae*, *Scolytinae*), particularly those in the genus *Dendroctonus*, are important pests throughout the range of pine forests in Guatemala, Honduras, El Salvador, Belize, and Nicaragua (Billings and Clarke,

<sup>2</sup> Current dollars. Source: World Bank at <https://datos.bancomundial.org/>

<sup>3</sup> Poverty rate based on official poverty lines of each country. Source: World Bank at <https://datos.bancomundial.org/>

<sup>4</sup> CEPALSTAT. [http://estadisticas.cepal.org/cepalstat/web\\_cepalstat/estadisticasindicadores.asp?](http://estadisticas.cepal.org/cepalstat/web_cepalstat/estadisticasindicadores.asp?)

<sup>5</sup> Billings, R. F. and Espino M., J. V. 2018. El escarabajo descortezador del pino (*Ips calligraphus*) en el Caribe y Centroamérica: Cómo reconocer, controlar y prevenir plagas. U. S. Agency for International Development, U. S. Forest Service /International Programs and others. Washington, D. C. 19 p.).

2010<sup>6</sup>). In Guatemala, *Dendroctonus adjunctus* also causes frequent outbreaks. *Dendroctonus frontalis* also is a major pest of pines in the southern and northeastern United States and has been the subject of much research and successful prevention programs (See Coulson and Klepzig, 2011<sup>7</sup>). Adult pine beetles can fly up to 2 km but may travel much farther when aided by prevailing winds, easily crossing from one country to an adjacent one during seasons of long-range dispersal.

Outbreaks of *Dendroctonus frontalis* in Central America have increased in frequency since the early 1960s (Billings, 2016<sup>8</sup>) and the frequency and severity are predicted to reach unprecedented levels in the future due to climate change (Rivera et al., 2010<sup>9</sup>). In addition to placing more stress on pine forests, predicted increases in ambient temperatures may allow bark beetles to complete more generations per year (Bentz et al., 2010<sup>10</sup>), further adding to their potential to cause severe damage throughout Central America if the forests and beetle populations are not managed.

In general, Central American countries have been slow to respond to periodic bark beetle outbreaks due to many factors, including the lack of permanent forest pest control programs, frequent turnover of trained personnel, lack of funding for suppression, lack of markets for beetle-killed trees, and insufficient training in forest pest management protocols.

2. Between 2014 and 2016, Honduran pine forests were seriously affected by the pine bark beetle infestation (*Dendroctonus frontalis*). The 2014-16 outbreak was one of the most severe in the last decades as can be seen in the chart.

<sup>6</sup> Billings, R. and Clarke, S. 2010. Bark beetles and management options in Central America December 2010 Conference: Entomological Society of America Annual Meeting 2010.

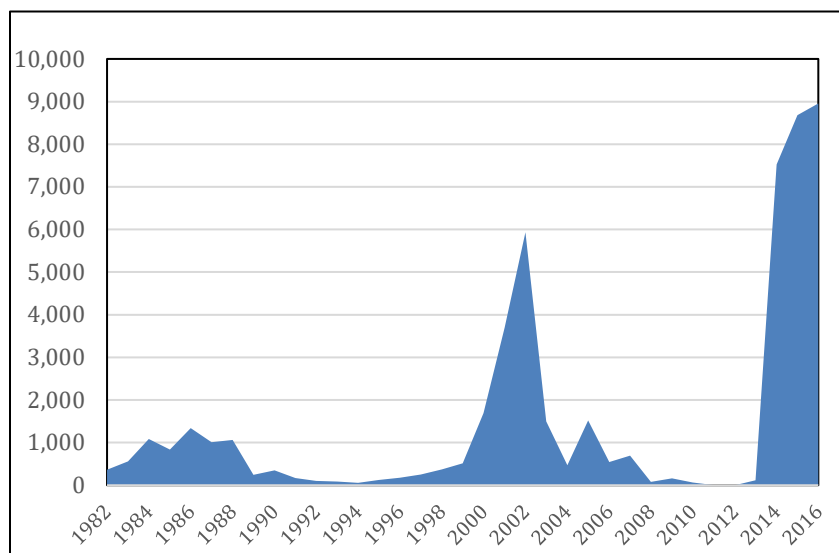
<sup>7</sup> Coulson, R. N. and Klepzig, K. D. 2011. Southern pine beetle II. USDA Forest Service, Southern Research Station General Technical Report SRS-140. Asheville, North Carolina. 512 p.

<sup>8</sup> Billings, R. 2016. Final Report: Assessment of the Direct Control of the Pine Beetle Plague Programme and establishment of a Forest Health Permanent Programme. Final Report for IADB. Revised Version September 2016. 63pp. Dr. Billing report refers that the most devastating attack by pine bark in Honduras was in 1962-65, when two thirds of total pine coverage was compromised by the plague. Since early 1980s Honduras implemented a more systematic register of pine bark outbreaks which is the main source of information about the plague in Central America.

<sup>9</sup> Rivera-Collazo, I., Winter, A., Scholz, D., Mangini, A., Miller, T., Kushnir, Y., and Black, D. 2015. Human adaptation strategies to abrupt climate change in Puerto Rico ca. 3.5 ka. The Holocene, 25(4), 627–640. <https://doi.org/10.1177/0959683614565951>

<sup>10</sup> Bentz, B. J., Régnière, J., Fettig, C. J., Hansen, E. M., Hayes, J. L., Hicke, J. A., Kelsey, R. G., Negrón, J. F. and Seybold, S. J. 2010. Climate change and bark beetles of the western United States and Canada: Direct and indirect effects. Bioscience 60 (8): 602-613.

Chart 1. Number of detected pine bark beetle outbreaks in Honduras 1982-2016



Source: [Billings \(2016\)](#)

3. By the end of 2016, it was estimated that 511,000 ha of pine were lost due to the plague in Honduras (ICF, 2017<sup>11</sup>). The scale and severity of the 2014-2016 outbreak are attributed to various factors, both natural and human, such as (i) a significant and extended rainfall decrease and drought due to El Niño during 2012-2015; (ii) large portions of old and mismanaged pine areas which are more susceptible to massive bark beetle attacks; (iii) recent changes in forest laws and regulations that eliminated the National Forest Pest Control Department, and (iv) lack of an effective early warning system and long delays in the application of control plans in the face of a rapidly increasing outbreak in 2012-2014 (Billings, 2016). It is estimated that the loss in ecosystem services<sup>12</sup> which resulted from this outbreak affected about 70% of the country's population around 5.9 million people). The outbreak caused pine forest losses equivalent to the deforestation (by human action) that would have occurred in 110 years according to forest loss rates recorded before the outbreak. Within the infestation crisis context, the Government of Honduras, through the Institute for Forest Conservation (ICF Spanish acronym), directly intervened with a USD 26 million investment to effectively control the infested areas in 2015-2017, thus preventing even more catastrophic losses.
4. This event has exposed the high vulnerability of Honduras' pine forest to bark beetle attacks. Such high vulnerability is related to forests made up of almost exclusively pines, with predominance of more than 50 years old trees. Forest susceptibility to attacks is exacerbated by the lack of key forest management practices like thinning and fire control activities (Billings, 2016). It is estimated (Flórez and Mairena, 2005<sup>13</sup>) that 72% of the country's pine forest areas (public and private) were degraded<sup>14</sup> before the last beetle attack. Both human and



spontaneous wildfires in pine areas are considered an important factor behind increasing bark beetle outbreaks in Honduras as well (Rivera et al, 2010, Hernández et al 2013<sup>15</sup>, Billings, 2016).

5. Currently, it is well established in the research literature that climate change will increase the intensity and recurrence of pine bark beetle attacks in Honduras and elsewhere. Recent analysis (Rivera et al, 2010; Hernández et al, 2013; Bentz and Jonsson, 2015<sup>16</sup>, Kolb et al 2016<sup>17</sup>) shows evidence of a strong influence of climate variability on the occurrence of bark beetle outbreaks, identifying a positive correlation between higher temperatures and the occurrence, intensity and spread of *D. Frontalis*. A warmer climate favors a faster rate of reproduction of the insect (Bentz and Jönsson, 2015), that can achieve its maximum of 12 generations per year, posing a permanent year round threat even to young and healthy pines (Billings, 2016). Higher temperatures and lower rainfall expected for the middle of this century as a result of climate change will create more favorable conditions for the bark beetle outbreak to occur and proliferate more frequently. According to estimates developed specifically for this project proposal (Hernández, 2018<sup>18</sup>), in the 2018-2050 period the pine forest area susceptible to bark beetle attacks will double in the country's central zone if there are not significant changes in policies and forest management. Likewise, the reduction of rainfall will further affect the own pine's ability to thrive in an area with the most limited rainfall in the country.

<sup>11</sup> ICF. Report on the episode of pine bark beetle *dendroctonus frontalis* in Honduras 2014-2017. <http://icf.gob.hn/wp-content/uploads/2018/02/INFORME-EPIODIO-DE-PLAGA-2014-2017.pdf>

<sup>12</sup> Services that provide ecosystems to society and that have a direct or indirect impact in people's life quality; among these are: mitigation of greenhouse effect gases, water conservation and regulation, biodiversity protection and conservation, landscape beauty, land protection, conservation, and recovery. Art. 11 of the Honduras forest law

<sup>13</sup> Flórez, E. and Mairena, R. 2005. Diagnostic of the pine forests situation in Honduras. Tegucigalpa, Honduras: Rainforest alliance. Recovered from: <http://www.bio-nica.info/biblioteca/FI%20C3%B3rez2005PinosHonduras.pdf>.

<sup>14</sup> In the [Billings \(2016\)](#) & Flores and Mairena (2005). Reference contexts, the forest degradation refers to physical, genetic, and density conditions, which make it vulnerable to attack of plagues such as the bark beetle.

<sup>15</sup> Hernandez, A., Saborio, J., Ramsey, R. and Rivera, S. 2013. "Likelihood of occurrence of bark beetle attacks on conifer forests in Honduras under normal and climate change scenarios." Geocarto International, DOI:10.1080/10106049.2011.650652

<sup>16</sup> Bentz, B. J. and Jönsson, A. M. 2015. Modeling bark beetle responses to climate change. In *Bark Beetles* (pp. 533-553).

<sup>17</sup> Kolb, T. E., Fettig, C. J., Ayres, M. P., Bentz, B. J., Hicke, J. A., Mathiasen, R and Weed, A. S. 2016. Observed and anticipated impacts of drought on forest insects and diseases in the United States. *Forest Ecology and Management*, 380, 321-334.

<sup>18</sup> Hernández Alexander. 2018. "Support to Hydrological Modelling to the GFC project's proposal" Report - Activity 01. Hydrologic Simulations as inputs to the Global Climate Fund GCF proposal. Consultancy Report for IDB



6. Pine bark beetle is considered one of the most destructive and economic damaging plagues for coniferous forest around the world ([Billings, 2016](#)). In Central America, *D. Frontalis* is by far the most important threat to forest health. Outbreaks of the plague are common not only in Honduras but also in Belize, Guatemala, El Salvador and Nicaragua (FAO, 2004<sup>19</sup>). Some outbreaks, as the 2000-2002 outbreak which affected Honduras, Nicaragua, El Salvador and Belize, can have a regional impact ([Billings, 2016](#)). As a result, in 2002-2004 FAO launched a regional strategy for forest health in Central America. The strategy's proposals, however, were not fully implemented by the countries ([Billings, 2016](#)). Currently there is a renewed interest with the updated strategy proposed by the Central American Commission for Environment and Development-CCAD (CCAD, 2017<sup>20</sup>) that seeks to move governments and societies in the same direction in terms of information and knowledge sharing, prevention and control strategies, which will contribute to reduce the risk of migration of the outbreaks.
7. The best integrated management system available for *Dendroctonus frontalis* consists of a permanent system of prevention through adaptive forest management, early warning and direct control on time, using the method "cut and leave"<sup>21</sup> ([Billings, 2016](#)).
8. Climate change and its effects on ecosystem services supplied by pine forests will impact mainly the poorest population in Honduras' central zone. The loss of ecosystem services will affect mainly the central zone of Honduras where the bulk of the country's population is located, and which includes the capital city of Tegucigalpa's urban area, with more than 1 million inhabitants. This area also holds a significant proportion of the population living in poverty: approximately 1.1 million people, equivalent to 22% of country's population living below the poverty line (4.8 million). Furthermore, the area is characterized by soils which are prone to significant erosion and heavily dependent coniferous forest for water generation services, will see precipitation levels drop significantly due to climate change.
9. More frequent and severe bark beetle attacks is not only destroying the increasingly vulnerable Pine forest of Honduras but also negatively affecting the livelihoods of hundreds of thousand people living in surrounding areas that are heavily dependent on environmental resources<sup>22</sup>. This is a situation where

<sup>19</sup> FAO. 2004. Regional Strategy for Forest Health Management in Central America. International Consultants Report. <http://www.fao.org/forestry/7039-07aceb500d412a80f01807b5b537d2697.pdf>

<sup>20</sup> CCAD. 2017. Regional strategy for health and sanitary forest in Central America and Dominican Republic. file:///C:/Users/Eduardo%20Zegarra/Downloads/doc\_1417514524.pdf

<sup>21</sup> Cut and leave consists of knocking down all the pines under attack or newly attacked (Phase 1) and with young beetles (Phase 2) plus a preventive strip of healthy pines of 10 to 20 meters adjacent to those attacked.

<sup>22</sup> Setting aside the Central District of Tegucigalpa, 70% of the area's population is rural and 56% lives mainly from agricultural activities, with rates of poverty of about 67%. Data taken from the National Census 2013 and the National Survey on Multiple Purposes, ENPM, 2013, National Institute of Statistics, INE.

climate change exacerbates an existing vicious circle between a biological process (plague) and harsh socio-economic realities of poverty and high climate vulnerability of local communities. At a broader scale, this also feeds up what in the literature is known as "environmental migration" (Reuveny, 2007<sup>23</sup>) both to other regions in Honduras and abroad towards Mexico and the US<sup>24</sup>.

10. It is important to note here that recognizing the high levels of climate vulnerability, Honduras has developed a comprehensive regulatory framework to respond to the threats posed by climate change (see Section E.5.1). Such regulatory framework represents the foundation for the development and implementation of the response actions proposed in this project.

## C.2. Project / Programme Objective against Baseline

### C.2.1 Modeling of the risk of future beetle attacks

11. The topic of modeling the likelihood of future bark beetle outbreaks is one of rising and widespread interest and can be found across peer-reviewed and grey literature. Invariably, relevant literature assesses the relative effect that climate change will have in determining how said likelihood is predicted. There is a vast amount of empirical evidence (Kolb et al., 2016) that intense drought and associated tree water stress will increase bark beetle performance and tree mortality, thereby justifying the inclusion of climatic drivers (namely precipitation and temperature) in modeling future bark beetle outbreaks. The logistic model framework to assess future bark beetle likelihood used in this study can be classified within the ecosystem model domain (Bentz and Jönsson, 2015), which are used to "describe the effect of climate variables and host plant conditions on bark beetle populations". Samples of the application of these ecosystem-type models that include the effect of climate change have been reported for all of Western North America using correlative niche models (Sidder et al., 2016<sup>25</sup>) across the spectrum of representative concentration pathways RCP (Moss et al., 2010<sup>26</sup>). Findings of how climate change can alter the future distribution of beetle outbreaks using spatial-temporal logistic

<sup>23</sup> Reuveny, R. 2007. "Climate change-induced migration and violent conflict". Political Geography 26, pp. 656-673.

<sup>24</sup> See note in the Washington Post "How climate change is affecting rural Honduras and pushing people north", November 6, 2018. [https://www.washingtonpost.com/news/global-opinions/wp/2018/11/06/how-climate-change-is-affecting-rural-honduras-and-pushing-people-north/?utm\\_term=.9c80148bcbfd](https://www.washingtonpost.com/news/global-opinions/wp/2018/11/06/how-climate-change-is-affecting-rural-honduras-and-pushing-people-north/?utm_term=.9c80148bcbfd)

<sup>25</sup> Sidder, A.M., Kumar, S., Laituri, M. and Sibold, J.S. 2016. Using spatiotemporal correlative niche models for evaluating the effects of climate change on mountain pine beetle. Ecosphere 7.

<sup>26</sup> Moss, R.H., Edmonds, J.A., Hibbard, K.A., Manning, M.R., Rose, S.K., Van Vuuren, D.P., Carter, T.R., Emori, S., Kainuma, M. and Kram, T. 2010. The next generation of scenarios for climate change research and assessment. Nature 463, 747.

regression models (Sambaraju et al., 2012<sup>27</sup>) were reported for Canadian forests as well. Research targeted at the actual species that affects Honduras conifers forests (*Dendroctonus frontalis*) was recently reported. Projections of expansion (Lesk et al., 2017) of the current bioclimatic range using RCPs 4.5 and 8.5 (same RCP used in the GCF study) suggest that bark beetle outbreaks will occupy vast areas of previously unaffected forests. This type of research also highlights the ecological risk of potential disruption of ecosystem services, and threats to native biodiversity. To the best of our knowledge the only study that has been reported about incidences of climate change in the likelihood of *Dendroctonus frontalis* in Honduran conifer forest is the one by (Hernández et al., 2012<sup>28</sup>). However, this study did not utilize RCPs philosophy, and thus should be revised with care. Also, future research to be conducted in Honduras will benefit from using field-based information of the most (2013-2016) recent attacks. A global synthesis (Seidl et al., 2017<sup>29</sup>) of climate change effects on biotic agents such as bark beetles signals that disturbances in coniferous forests are significantly ( $p < 0.001$ ) likely to be more pronounced than in other biomes such as broadleaved or mixed forest types. Research such as the aforementioned clearly demonstrates that conifer forests will be under more pressure from biotic agents in the future. Further, newly described empiric evidence (Pureswaran et al., 2018<sup>30</sup>) points out that recent outbreaks are definitely influenced by climate change, and are not a product of chance. While this review is not by any means comprehensive, it clearly summarizes that all recent research points out that the risk of future bark beetle outbreaks will be exacerbated with severe climate changes.

### C.2.2 Modeling climate change scenarios

12. Intervention Area: It is comprised by 29 prioritized watersheds<sup>31</sup> (Map 1), which are foreseen to be the most affected by climate change in terms of water availability in the coming years.

<sup>27</sup> Sambaraju, K.R., Carroll, A.L., Zhu, J., Stahl, K., Moore, R.D. and Aukema, B.H. 2012. Climate change could alter the distribution of mountain pine beetle outbreaks in western Canada. *Ecography* 35, 211–223.

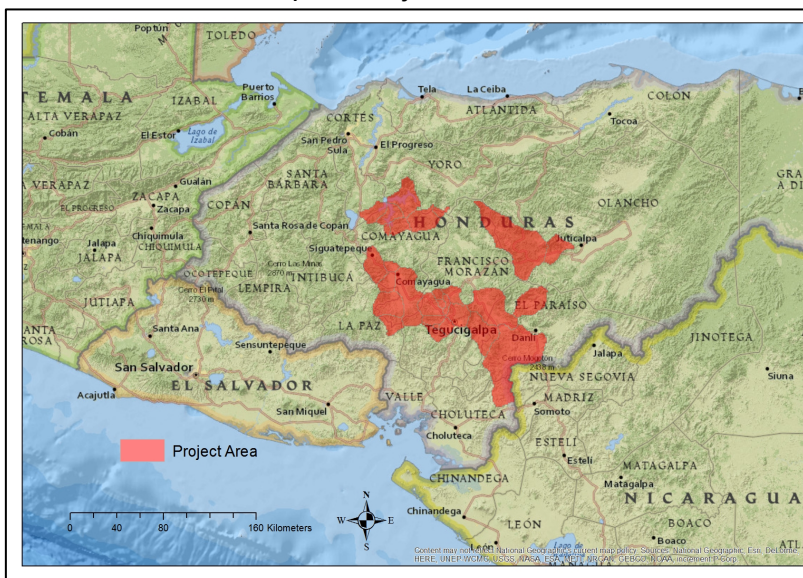
<sup>28</sup> Hernandez, A.J., Saborio, J., Ramsey, R.D. and Rivera, S. 2012. Likelihood of occurrence of bark beetle attacks on conifer forests in Honduras under normal and climate change scenarios. *Geocarto International* 27, 581–592.

<sup>29</sup> Seidl, R., Thom, D., Kautz, M., Martin-Benito, D., Peltoniemi, M., Vacchiano, G., Wild, J., Ascoli, D., Petr, M., Honkaniemi, J., Lexer, M.J., Trotsiuk, V., Mairota, P., Svoboda, M., Fabrika, M., Nagel, T.A. and Reyher, C.P.O., 2017. Forest disturbances under climate change. *Nature Climate Change* 7, 395.

<sup>30</sup> Pureswaran, D.S., Roques, A. and Battisti, A., 2018. Forest Insects and Climate Change. *Current Forestry Reports* 4, 35–50. <https://doi.org/10.1007/s40725-018-0075-6>

<sup>31</sup> These watersheds were selected according to the following criteria: (i) precipitation will reach lower values due to climate change, (ii) water sources depend on ecosystems in which coniferous coverage plays a key role, coverage that has been very affected by the beetle plague, (iii) there is high demand of water

Map 1. Project location



The project's prioritized scope includes a number of strategic areas for water production or usage, including the urban area of Tegucigalpa; the Comayagua valley, one of the most fertile agricultural valleys in Honduras, which hosts the El Coyolar irrigation dam; and El Cajón, the largest hydroelectric dam of the country, with generation capacity of 300 MW (62% of the country's installed capacity), which is vulnerable to changes in water availability. The geographic scope of the intervention encompasses eight cities with more than 10,000 inhabitants, including Tegucigalpa, Comayagua, Siguatepeque, Juticalpa, Talanga, El Paraíso, and San Marcos de Colón.

13. Scenarios **considered for analysis:** Three scenarios were taken into consideration for project analysis:

A. Current situation without climate change (Baseline) which takes into consideration current forest status, weather and hydrological conditions.

B. 2050 scenario with climate change and no project (*business as usual* BAU-CC).

C. 2050 scenario with climate change and project (Project-CC).

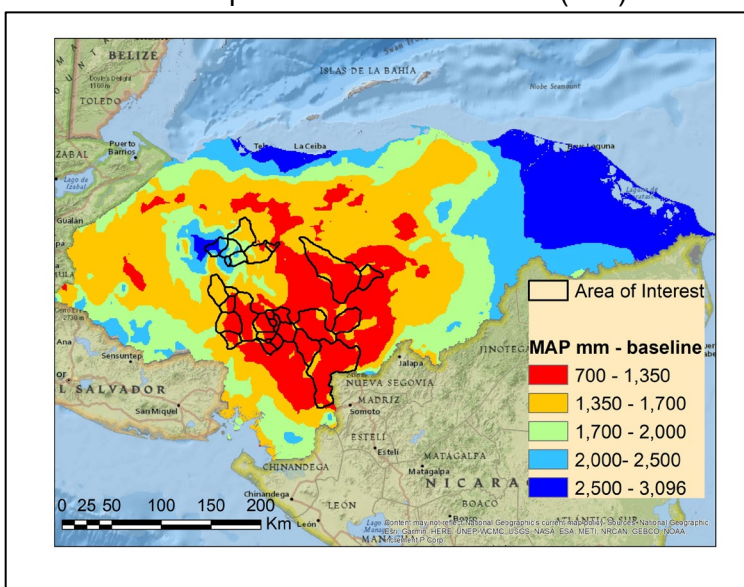
14. **A. Baseline scenario: Current situation without climate change:** The project area includes an estimated population of 2.7 million<sup>32</sup> (29% of the

resources associated to population density (2.7 million estimated in 2018, including the capital city of Tegucigalpa), agricultural use, and the location of the main hydroelectric dam of the country, (iv) soils are very prone to erosion, and (v) there are high rates of poverty: there are approximately 1.1 million people in poverty conditions in the central area, equivalent to the 22% of total poor people in the country (4.8 million).

<sup>32</sup> Based on intercensal data from 2001 to 2013, a population estimate was carried out by municipality, using population growth rates to forecast population by the year 2018.

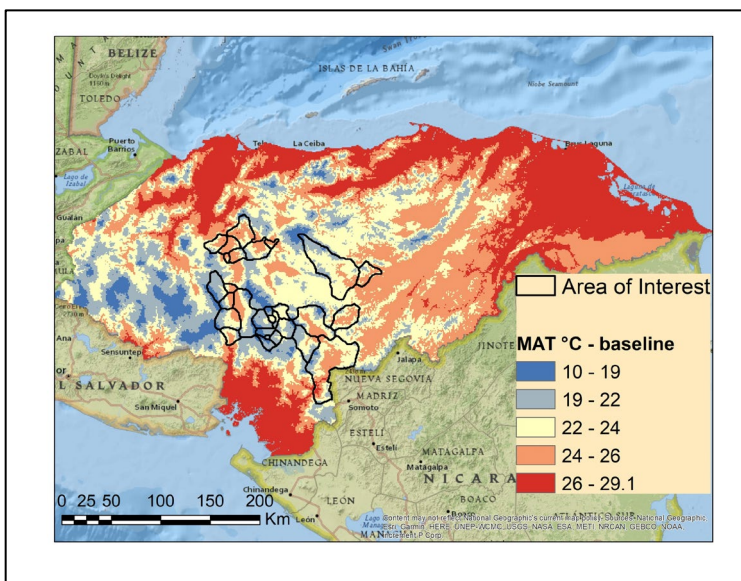
15. The project covers an area larger than 1 million Ha. Of these, 564,832 Ha. are forest areas, from which approximately **480,000 Ha. are pine forest**. Agriculture and livestock use covers 334,562 Ha., and urban use another 17,570 Ha. Within agriculture use, there are 292,172 Ha. of grazing/crops; 28,094 Ha. of coffee plantations, and 14,238 Ha. of pressurized irrigation agriculture. Mean **annual rainfall and temperature** across the different zones of Honduras is shown in the two maps below:

Map 2. Mean annual rainfall (mm)



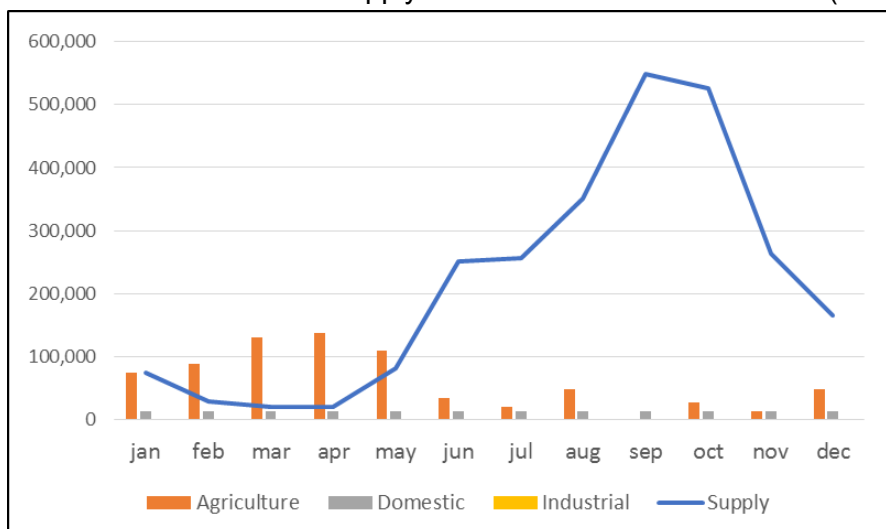


Map 3. Mean annual temperature (°C)



16. As seen (Map 2), the project area is located in zones with the lowest mean rainfall in the country. The proposed intervention covers more than 1 million Ha. Of these, 239,000 Ha of forest located in upper areas are considered key for the provision of water services. Between 2013 and 2016, **52,000 Ha (22%) of these strategic forest zones were attacked by the pine-bark beetle**. There is also increasing pressure along forest's boundaries for land use change towards agricultural activities. It is estimated (Hernández, 2018) that in the absence of any intervention, changes in land use would occur in an estimated 46% (24,000 Ha) of the pine forest infected by the bark beetle in the period 2013-16.
17. With regard to **water availability**, the 29 prioritized watersheds already show water deficit (demand outweighs available supply). Most of the deficit occurs during the dry season, from January to May. Analysis carried out for this proposal show that currently the demand of the agriculture and livestock sector (irrigation) from February to May exceeds the supply, as it is seen in the following chart.

Chart 1. Baseline: Water supply and demand in 29 watersheds (HM3)

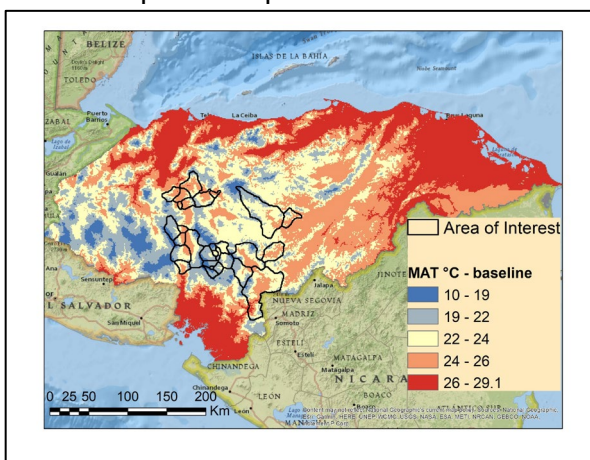


18. In the dry months of January to May, data shows that even human consumption can be affected by water shortages. The section below, representing the scenario with climate change, shows that this situation of water deficit will become even more critical.
19. **B. Scenario calculated by 2050 with Climate Change and no project (*Business as usual, BAU-CC*):** To estimate the expected situation with Climate Change, the 8.5 scenario (Riahi et al, 2011<sup>33</sup>) was used for year 2050 (2.5 degrees higher) (Annex Hernández, 2018<sup>34</sup>). The comparison of mean temperature levels between the baseline and 2050 scenario without project (BAU-CC) is shown below.

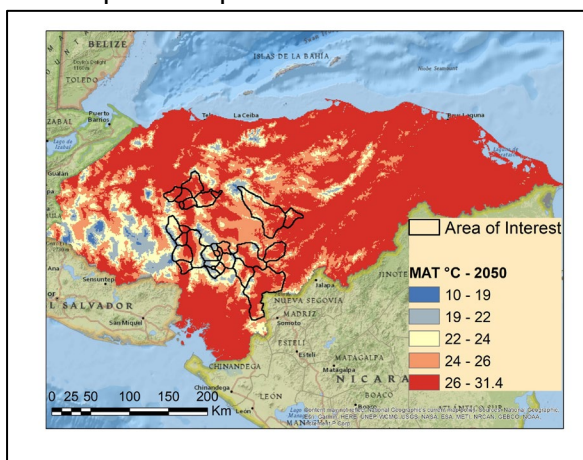
<sup>33</sup> Riahi, K., Rao, S., Krey, V., Cho, C., Chirkov, V., Fischer, G., Kindermann, G., Nakicenovic, N. and Rafaj, P. 2011. RCP 8.5—A scenario of comparatively high greenhouse gas emissions. In Climatic Change, Springer, Netherlands.

<sup>34</sup> Hernández. 2018, op. cit.

### Map 4. Temperature Baseline

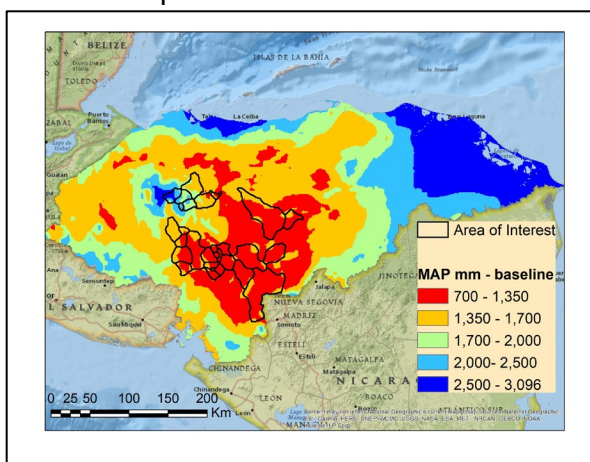


Map 5. Temperature 2050 BAU-CC

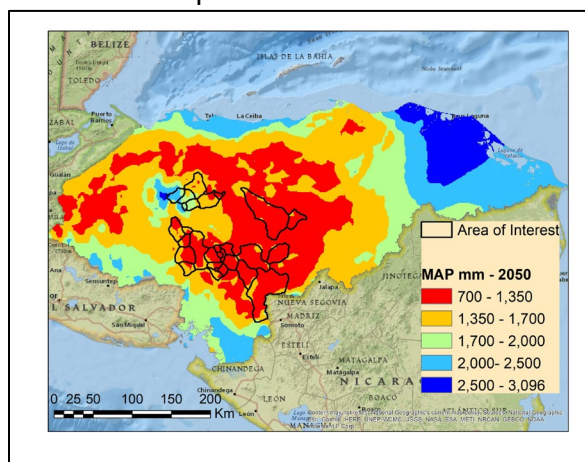


20. The model shows that, due to the projected climate change, by 2050 the mean temperature will rise considerably in the project area, and several zones would move to the range with maximum mean temperatures of the country (from 26 to 31.4 degrees). Expected changes in mean rainfall are also significant, as can be seen in the following two maps.

### Map 6. Rainfall Baseline



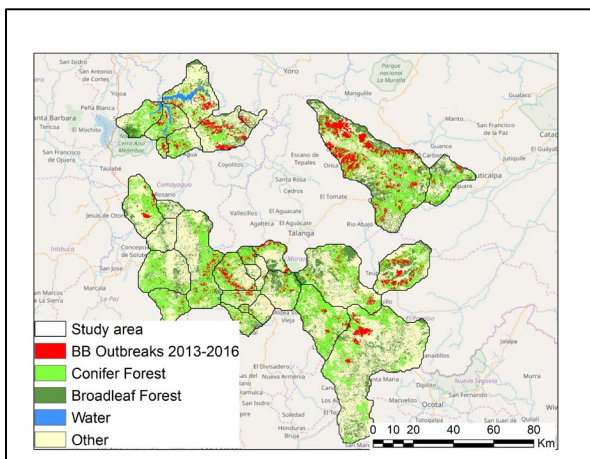
Map 7. Rainfall 2050 BAU-CC



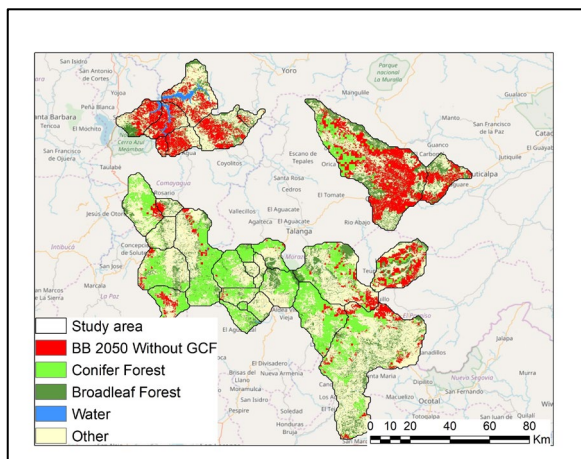
21. Based on these scenarios, a model of Pine-bark Beetle probability of occurrence was developed for 2050 with climate change and no project (Hernández, 2018). The results of the projected occurrence of beetle outbreaks are shown below.



Map 8. Bark-pine beetle Baseline



Map 9. 2050 Bark-pine beetle CC-BAU



22. Results show that the expected loss of pine forest attributable to the bark beetle outbreak and associated land change use would amount to approximately 84,000 Ha, if the 29 prioritized watersheds are not intervened. The expected loss of forest would generate emissions correspondent to 12.6 million tons of CO<sub>2</sub>e<sup>35</sup>.
23. On the other hand, the charts below show what would happen to water availability (supply and demand) by 2050 under the baseline and BAU-CC scenarios.

Chart 2. Water S/D Baseline

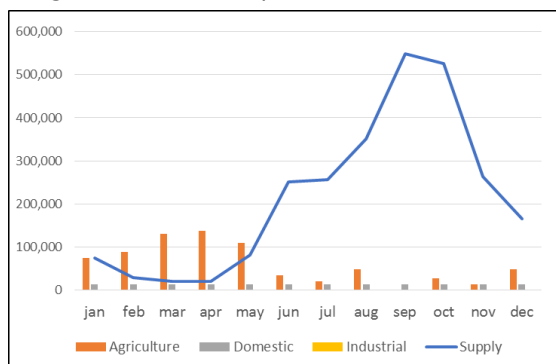
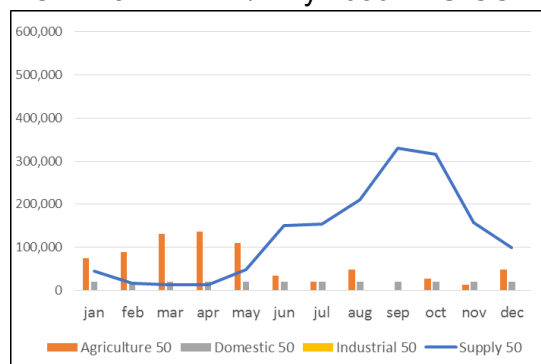


Chart 3. Water S/D by 2050 BAU-CC



<sup>35</sup> Estimated amount taking into consideration the emission values of the Reference Levels of the REDD+ National Strategy that estimates 150 T CO<sub>2</sub>/Ha in pine forest (84,000 Ha x 150 t CO<sub>2</sub>e/Ha). It is also presumed that the pine forest changes to clean crops. This value is considered to be conservative since it is a mean value (thick and thin forests), and forests of the upper basins may have much higher values because of their density.

24. The forecast was carried out based on the estimated probability of a large beetle attack in the baseline period by 2050 and using a water balance model (Hernández, 2018) applied to the scenario with climate change and no project (BAU-CC). It is worth mentioning that, for the water demand estimate, the model assumes an increase in water demand due to population growth (1.7% annual), but does not account for any demand increase coming from the agriculture and industrial sectors. Even with these conservative assumptions, it can be seen that water supply in these 29 watersheds will not be enough to attend human consumption during February, March, and April. This is a scenario that may put at serious risk the water and health security of most inhabitants of the central zone of Honduras (29% of the national population).
25. **C. Project scenario: Scenario calculated by 2050 with climate change and project.** The most important barriers affecting the expected loss of ecosystem services (water regulation) from pine forest due to climate change in Honduras are:
  - a) **Limited capacity and limited incentives for forest users to apply Adaptive Forest Management (AFM).** It is calculated that 72% of the pine forests in Honduras (including public and private) were already degraded before the 2013-16 outbreak ([Flores y Mairena, 2005](#)). The persistent degradation makes extensive areas of pine forest highly vulnerable to the beetle infestation and less resilient in the face of climate change. Such degradation is largely due to limited to no application of key Adaptive Forest Management (AFM) practices<sup>36</sup> such as thinning<sup>37</sup> and fire controls ([Navarro et al, 2016](#)<sup>38</sup>) and also related to the low diversity of the coniferous forest. The limited adoption of appropriate risk-reducing forest management techniques is linked to the existence of financial, cultural, and technical barriers such as: (i) lack of economic resources for AFM; (ii) high transactional costs connected to the processing of forest extraction permits, which may represent 46% of the overall activity costs ([FAO & BM, 2012](#)<sup>39</sup>); and (iii) very limited capacity (and lack of the corresponding technical assistance) to guide forestry management with appropriate technical and economic criteria.
  - b) **Cultural barriers, land tenure insecurity, limited capacity and low incentives for the adoption of agroforestry systems (AS).** Similarly to what observed with regard to AFM, in a context of high rural poverty, there is a very

<sup>36</sup> Adaptive forest management is a system to deal with the functionality of forests under conditions of climate change as a prerequisite for fulfilling the future needs of forest ecosystem services. From: Bolte, A., Ammer, C., Löf, M., Nabuurs, G. J., Schall, P., and Spathelf, P. 2010. Adaptive forest management: A prerequisite for sustainable forestry in the face of climate change. In Sustainable Forest Management in a Changing World (pp. 115-139). Springer Netherlands.

<sup>37</sup> Thinning or pruning is the forest practice to reduce the density of a pine stand by removing some trees.

<sup>38</sup> Navarro, G., Louman B. and Valera V, 2016. Design of component 1 and ex ante economic assessment of the operation HO-L1179. <https://www.iadb.org/Document.cfm?id=40695172>

<sup>39</sup> FAO & BM. Honduras: Impact assessment of the collection for usage rights of “standing timber” and other rates on forest management. Case studies: Volume III of VI.

low rate of adoption of agroforestry systems by farmers. Key barriers include: (i) low-income producers do not have capital for the costly upfront investments required for the establishment of climate-resilient agroforestry systems, since benefits are not received until the at least the third year, depending on type of crops/trees being established; (ii) land tenure insecurity makes investing in AS more difficult as farmers are less sure that they will accrue the overall benefits of the investment in the long run; (iii) limited access to appropriate information and capacity development assistance for the establishment of climate-resilient agroforestry systems (AS); and, (iv) limited availability of the most climate-resilient varieties of crops and trees which are suitable for agroforestry systems. An analysis carried out by Navarro et al. (2016) shows that agroforestry practices are more profitable, in the mid-term, compared to traditional agriculture or extensive livestock practices. At the same time, AS have better climate adaptation and mitigation potential at landscape level than traditional practices.

**c) Weak forest governance and lack of long-term financial mechanisms.**

Although the current Forest Law of Honduras sets out a decentralized model, (FAO-ITTO<sup>40</sup>; Davis, 2014<sup>41</sup>) in which communities and other local actors are beneficiaries and accountable agents for forest management, in practice, the implementation of such model has been sparse. In a similar fashion, despite the administrative delegation of watershed management responsibilities to local actors by the national Institute for Forest Conservation (ICF), Local Water Committees show low levels of formalization. Thus, often these local governance structures do not have management capacities to administer incentive schemes such as Payments for Ecosystem Services (PES).

The main weaknesses regarding ICF's plague control capacity are associated with administrative and technical factors, as analyzed in Morales (2016<sup>42</sup>). These include:

- Limited resources and capacity to provide technical assistance services to forest management local organizations to implement bark beetle outbreak prevention measures. This issue affects the management of forest resources in both public and privately-owned forested areas;
- Limited capacity of ICF to provide early warning services in case of initial outbreaks. This is related to the fact that the institution does not count with a permanent department focusing on forest health services, as well

<sup>40</sup> FAO-ITTO, 2009. Forest governance and climate change mitigation. <http://www.fao.org/forestry/19488-0a2b1be34bcc2f24f780036ed0c5f9d69.pdf>.

<sup>41</sup> Davis, A. 2014. Pathways to forest governance in Central America: Lessons from forest tenure reforms processes in Petén (Guatemala) and Gualaco and Guata (Honduras). 1<sup>a</sup>. Ed.: Fundación PRISMA, San Salvador, El Salv.

<sup>42</sup> Morales, J. 2016. Project: Sustainable Forest Management (HO-L1179). Final Component 3 Report: Analysis of actions to strengthen the forest sector governance. <https://www.iadb.org/Document.cfm?id=40693287>

as to the lack of trained personnel trained in forest pest control (Morales, 2016). This is also worsened by insufficient capacities for remote sensing and satellite monitoring (Hernández, 2016<sup>43</sup>); and

- An excessively centralized model to control plagues and forest fires, where the participation of communities located closer to the forests is limited and not actively promoted, weakening forest governance and emergency responses (Morales, 2016).

26. In addition to the above, the delegation of forest management responsibilities to local actors is further hampered by the lack of financial support mechanisms that would allow them to bear the incremental costs of AFM, especially under climate change scenario being considered. Although the existing regulatory framework establishes the basis for a PES scheme, such type of incentives has seldom been operationalized due to the lack of dedicated fiscal resources. Some initial experiences with financial incentives, however, are some emerging and PES-type mechanisms are being tested in some of the intervention areas. For instance, the association of agricultural water users of Comayagua, located at El Coyolar reservoir, and water committees and private aquaculture companies located at El Cajón reservoir are currently assigning some financial resources to invest in forest and basin management in a number of the watershed catchment areas. These experiences, however, remain isolated and do not benefit from a coordinated planning effort to identify investment priorities and maximize at watershed level the impacts of the prioritized activities. Moreover, the current contributions still are limited in scope and are insufficient to carry out AFM in all the areas affected by, or prone to, Pine-beetle outbreaks.
27. **Project Purpose.** The main purpose of the project is to improve the climatic resilience of the Honduran population through actions aimed at removing barriers that prevent forest restoration, adaptive forest management and sustainable agroforestry systems in watersheds critical for water regulation and where a large proportion of the population is heavily dependent on environmental resources for their livelihoods. Governance, cultural, technological, and financial barriers will be attacked with instruments designed to achieve the long-term sustainability of the proposed model.
28. **Foreseen Interventions.** The total area to be covered by the project amounts to 270,000 Ha. Of this, a total of 82,235 Ha. will be restored, of which 52,235 Ha correspond to pine forests affected by the beetle pest and 30,000 Ha. are degraded areas at risk for future outbreaks. These additional 30,000 Ha. will be restored through the adoption of agroforestry systems in lands that were previously covered by forest and currently have well defined property rights. In addition to the above, AFM practices will be established in 187,367 Ha., in areas not affected by the 2013-16 outbreak event. AFM activities will include tree thinning, fire risk management and control, enrichment of forest with non-pine

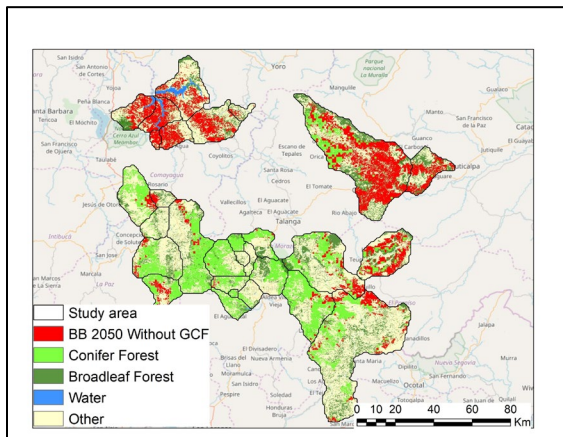
<sup>43</sup> Hernández, H. 2016. Report on component of forest monitoring system support of the Institute for Conservation and Forest.



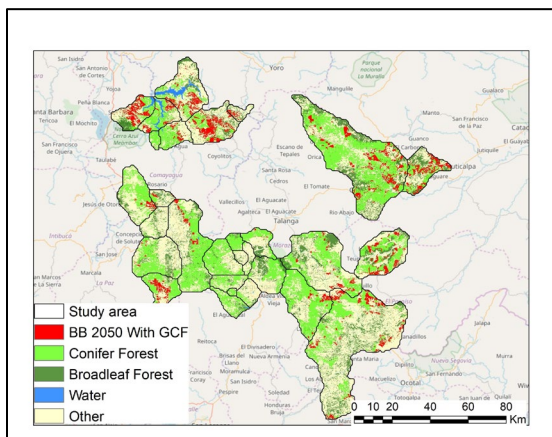
species, and other related activities to improve forest resilience to climate change.

29. To estimate the project impacts, the Hernández (2018) model was used, which modelled the previously described project interventions. The results are shown in the following two maps.

Map 10. 2050 BAU-CC w/o project



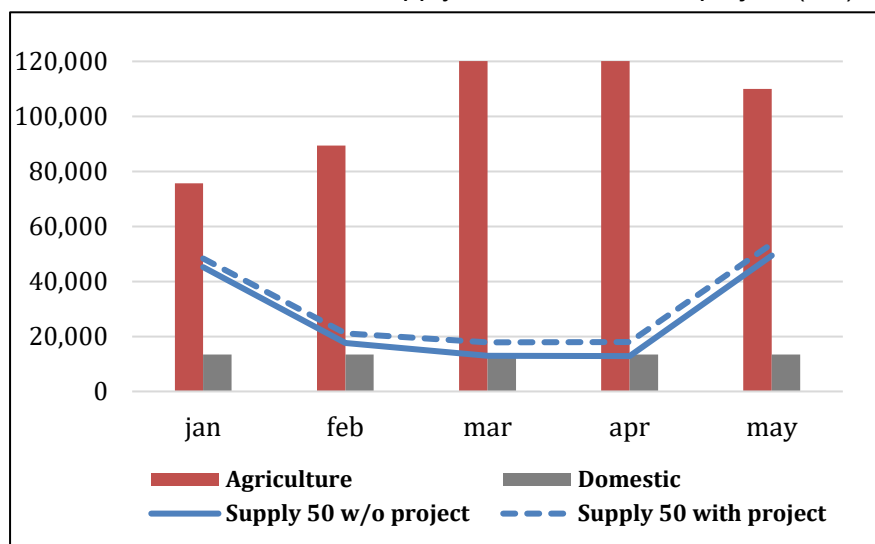
Map 11. 2050 CC with project



30. In the situation BAU-CC without project, it is estimated that by 2050, 84,402 Ha. will be lost in the project area due to highly likely beetle attacks and the expected associated changes in land use. With the implementation of the project (restoration, AS and AFM), the expected losses in the project area will decrease to 14,376 Ha, with an avoided loss of 70,026 Ha. in forest (correspondent to emission reductions of approximately 10.5 M tCO<sub>2</sub>e<sup>44</sup>).
31. The project interventions will increase water availability in the dry season, due to the water regulation ecosystem service provided by a healthy and well managed forest cover. On average, the project will increase the annual water availability by 32 million m<sup>3</sup>, which will increase water availability in the dry season in line with what presented in chart 4.
32. The dotted line represents water supply with the project, while the solid line represents the scenario without project. On average, through the conservation and restoration of forest water regulation ecosystem services, the project will reduce the water deficit of up to 15% in the dry season, with a positive impact on the total water availability of 2% per year. This effect will allow the access to water for approximately 450,000 individuals, estimating an average consumption of 200 liters/person/day.

<sup>44</sup> Using the estimated emission values for the pine forest in the Reference Levels of the REDD+ National Strategy (150 Ton CO<sub>2</sub>e).

Chart 4. Increase in water supply attributable to the project (m3)



Source: model estimation.

33. The main project impacts expected are:

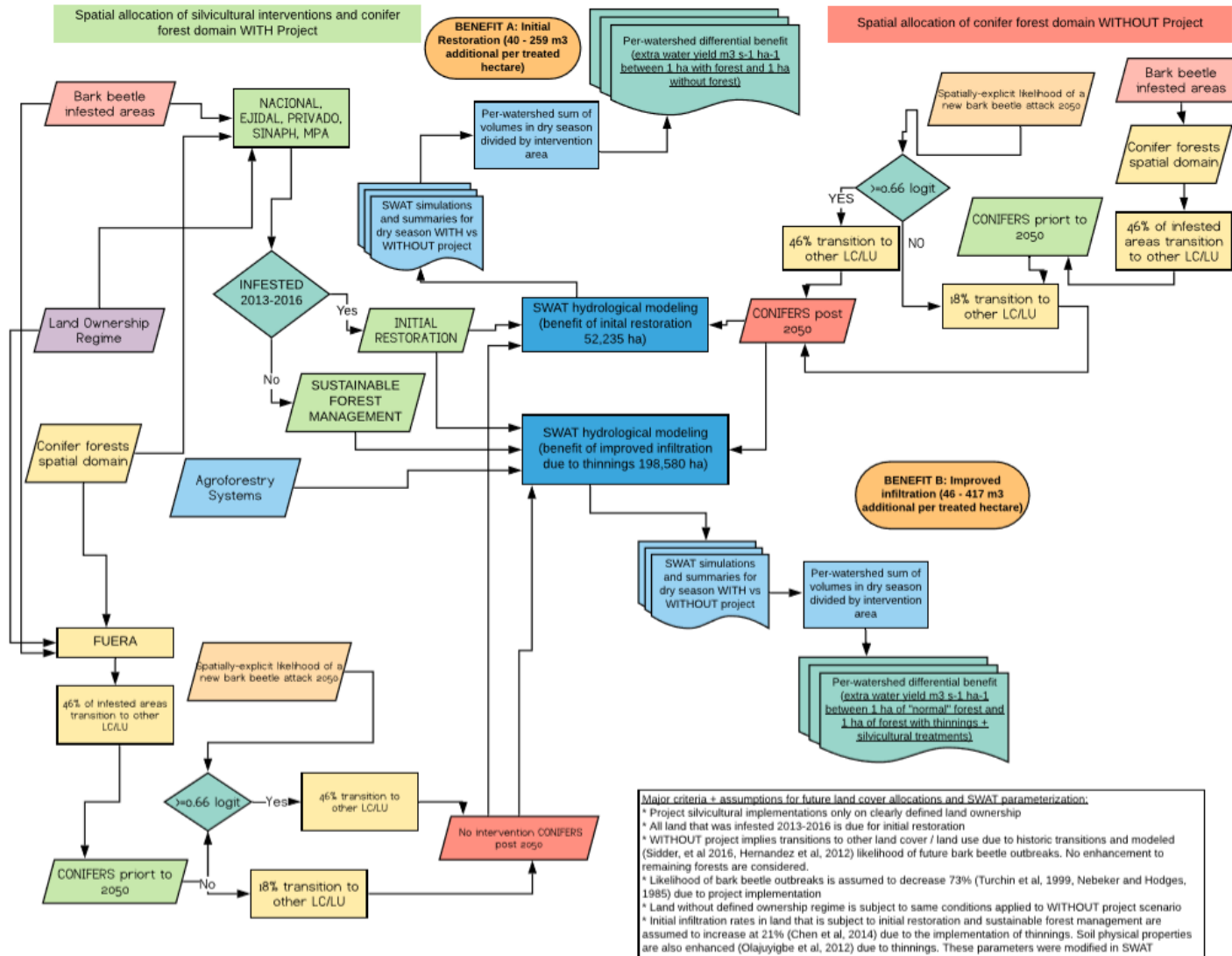
- 27,000 households receiving direct support towards the implementation of restoration, adaptive forest management, and agroforestry systems activities, which would also result in the diversification of their economic activities and thus result in greater capacity to face adverse shocks linked to climate change-related extreme weather events and pest outbreaks.
- 450,000 individuals in the central zone of Honduras will benefit from increased water supply security during the dry season and increased resilience to climate change, improving their life conditions and reducing the risk of diseases related to lack or poor quality of water resources;
- 270,000 ha. of areas suitable for forests protected and increased resilience to climate change by an assisted restoration, use of adaptive forest management and adoption of agroforestry systems; which will avoid losses of 70,026 Ha of Pine forest from forest conversion, forest loss and land use change, and 10.5 M tCO<sub>2</sub>e reduced.

34. The expected project outcome is a new forest management model, more resilient to climate change, implemented with local actors' participation and incorporating a sustainable financing and sustainability mechanism. A visual explanation of the basic premises of the project is showed below:

## DETAILED PROJECT / PROGRAMME DESCRIPTION

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C



### C.3. Project / Programme Description

35. Intervention Strategies: The project proposes the following intervention strategies to achieve its main goals:

a) Strengthening forest governance. Participation of local actors (communities, private sector, local governments) in forest and watershed management will be promoted with the formalization of their legal status where needed, assistance for the preparation of land management plans, simplification of administrative procedures, decentralization of land management responsibilities, among others. This will enable a more active and efficient forest management and administration by local actors.

b) Creating sustainable financial mechanisms for Adaptive Forest Management<sup>45</sup>. Financing mechanisms will be created based on a Payment for Ecosystem Services (PES) model which will reward upstream users for adopting AFM practices. This scheme will promote coordination between local watershed management activities which are currently disjointed and create synergies among interventions by public and private actors.

c) Removing technical, cultural and information barriers. With resources from the IDB Loan, ICF will be strengthened with the view of ensuring the effectiveness of early responses to Pine-beetle (and other pests) outbreaks. To overcome cultural barriers, capacity development and technology transfer services will be provided to individuals and organizations responsible for forest management, in both public and private lands.

36. The Project is organized around the following three components:

37. Component 1.

Output: 1: Forest restored in the prioritized areas to improve climate resilience. This component will implement forest management activities as defined in each of the prioritized watersheds' Management Plans, as well as the promotion of agroforestry systems (AS) in zones adjacent to forested areas to improve their resilience to climate change and to protect key ecosystem

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<sup>45</sup> We consider Adaptive Forest Management (AFM) very similar to the Sustainable Forest Management (SFM) approach proposed in the IADB project, but with a long-term perspective. AFM is explicitly related to climate change, and in this case will take the form of active adaptation where, for example, more climate resistant tree species are actively promoted in the intervened landscape to increase resilience of local forest systems. AFM *"does not primarily aim at preserving and developing forest composition and structures but at fostering a system to deal with the functionality of forests under conditions of climate change as a prerequisite for fulfilling the future needs of forest ecosystem services (c.f. Wagner 2004)"* (p. 121-122). Bolte A., C. Ammer, G. Nabuurs, P. Schall and P. Spathelf (2010). "Adaptive Forest Management: A Prerequisite for Sustainable Forestry in the Face of Climate Change". Chapter 8. In P. Spathelf (ed) Sustainable Management in a Changing World. A European Perspective. Springer-Science + Business Media B.V. 2010



services like erosion control and water regulation. It includes the following Activities:

Activity 1.1) Forest restoration to increase resilience to climate change.

This activity aims to restore forest in areas affected by the recent bark beetle outbreak. Selected forest management practices will include planned thinning, fire prevention and control and diversification with non-pine species. The distribution of pine species to use in restoration according to altitude is shown in the following table.

Table 1: pine species to use in restoration

Species	Altitude (masl)
<i>Pinus caribaea</i>	0-650
<i>Pinus oocarpa</i>	700-1800
<i>Pinus maximinoi</i>	800-1800
<i>Pinus tecumumanii</i>	400-2000
<i>Pinus ayacahuite</i>	1800-2800
<i>Pinus pseudostrobus</i>	1800-2800
<i>Pinus hartwegii</i>	2500-2800

Also, non-pine species will be introduced like Oak (*Quercus*), Nance (*Byrsonima crassifolia*) and Liquidambar (*Liquidambar styraciflua*<sup>46</sup>) and Chaparro (*Curatella americana*) in order to increase the ecosystem's resilience to climate change. These species are of high economic value both in timber (Oak) and non-timber products like fruits (Nance) and pulp (Liquidambar). These trees will be a significant source of economic diversification for users in restored areas as well. As a result of these practices forest cover recovery is expected to occur within shorter timeframes than it would with natural recovery. The species were selected by the ICF, considering native species, in order to avoid the promotion of exotic species that can weaken the natural forest ecosystem.

Financing: Financing provided by the IDB loan will cover the restoration of 34,571 Ha of public forests and 7,000 Ha of private forests affected by the bark beetle. The public forest will be restored through agreements and direct payments and provision of inputs (plants, equipment, etc.) to the communities located in the forest areas to implement participatory forest restoration plans. The payments will cover around 70% of the total cost of the restoration

<sup>46</sup> Navarro, G., Louman, B. and Valera, V. 2016. "Diseño del componente 1 y evaluación económica ex ante de la operación HO-L1179". Consultancy Report for IDB.

activities, the additional 30% will be provide by the communities. The restoration of the private forest areas will be implemented through a system of incentives designed by the program<sup>47</sup>. Reimbursable resources from the GCF, in the form of a parallel loan, will be used to restore an additional 10,664 Ha in privately managed forests. The agreements to carry out the reforestation activities will be signed between the Government of Honduras and the communities and private owners. To total area to be restored amounts to 52,235 Ha, which corresponds to 100% of the area affected by the bark beetle outbreak within the prioritized watersheds.

Forest management activities, as planned for and described in the watershed management plans, will be financed through the Water Fund (WF), as described under Component 3, however there is the urgency to implement reforestation activities and access funds for restoring deforested areas. The WF will take a maximum of two years to be completed and if the reforestation activities are not implemented urgently, the ecosystem services can be lost permanently because of the erosion, and the cost of reforestation can increase exponentially if the fires affect the natural regeneration process. Immediate activities as part of Component 1 aims to minimize possible erosion caused by extreme rainfalls (that are frequent in a tropical country as Honduras) in the deforested areas through reforestation and the irreversible recovering of the forest area; control fire activities will help stablish the forest regrowth, thus reducing reforestation process cost.

#### Activity 1.2) Climate resilient forest restoration through Agroforestry Systems (AS).

The implementation of AS will be supported by the project in a total of 30,000 Ha., located in areas adjacent to pine forests with agriculture and livestock activities that were previously covered by forest and where property rights are well defined. This will allow increasing forest cover within prioritized watersheds, while alleviating the existing pressure towards land use change in the nearby forested areas.

The development of agroforestry systems for small farmers in Honduras has important antecedents. In the 1990s, as part of the Lempira Sur Project in Lempira Department, the Ministry of Agriculture and FAO implemented a project with corn smallholders to develop alternative land management technologies in very degraded areas. By far the most successful alternative

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<sup>47</sup> The national forestry law recognizes the forestry incentives mechanism, but this mechanism has not been implemented. The economic analysis of forest restauration in private forest, carry out during the design of SFM, evidenced that the activity is not profitable at the current market conditions. The objective of the incentives to forest private owners is incentivize the implementation of AFM activities for the recovery and preservation of the ecosystem services and to prevent future pine beetle outbreaks.

was agroforestry based on ancestral knowledge and modern techniques. The experience is known as the Quesungual Agroforestry System<sup>48</sup>. This system proved to be highly profitable and resilient, improving farmers livelihoods and reducing poverty. Similar experiences have been documented in the Trifinio Plan located in the three-border area among Honduras, Guatemala and El Salvador<sup>49</sup>. The adoption of AS with specialty coffee under shade was successful in the area allowing small poor farmers to diversify and improve their livelihoods in a sustainable way. Key issues that the program attended were technical assistance, financing of initial inputs and well sequenced training and monitoring.

The main barriers to AS adoption in the project area are lack of financial resources, limited knowledge of AS practices and weak provision of technical assistance and quality of key inputs like seedlings. Land tenure insecurity is also a problem in some areas. The project will promote the adoption of AS in 30,000 Ha mainly in special coffee under shade, financing installation of coffee trees and suitable shading forest, with the provision of training and technical assistance. The intervention will be oriented to areas with clearly defined property rights of degraded land near the areas under restoration. To avoid creating perverse incentives towards additional land use changes, this modality will be applied only to areas that had forest cover before the 2013-2016 bark beetle outbreak. The implementation of AS will allow the introduction of forestry related activities in areas which were characterized by low to none agricultural productivity. This is expected to generate several positive impacts, including improving rainfall infiltration and aquifer recharge, reducing soil erosion, providing additional revenue streams for rural families and local communities through the generation of marketable forest products and by-products and, finally, ensuring the provision of water services (both in terms of water quantity and quality) to the downstream population. The specific type of AS to be supported, in terms of species composition and land use patterns, will be tailored to the specific characteristics of each site. The model to implement will also benefit from lessons from a previous successful IDB experience in the region, the PAGRICC project in Nicaragua, where direct incentives were provided to low-income producers to encourage the adoption of AS. Eligibility conditions for potential beneficiaries of this component are described in the C.7. section.

### 38. Component 2.

Output 2: Institute of Forest Conservation (ICF) with improved capacities for climate change response.

<sup>48</sup> FAO. 2005 "El Sistema Agroforestal Quesungual: Una opción para el manejo de suelos en zonas secas de ladera". FAO, Honduras. 50p.

<sup>49</sup> Plan Trifinio. 2014 "Sistemas agroforestales en el Trifinio. Experiencias y aprendizajes con pequeños productores en seis microcuencas". Plan Trifinio, German Cooperation and GIZ.75p.

It includes the following Activities:

Activity 2.1) Strengthening the Forest Health Department and ICF forest extension services, including inter alia, the establishment of an early warning system for forest plagues and a permanent entomology-phytopathology laboratory in one of the Universities affiliated to the ICF.

Between 1962 and 1965, some 1.7 million hectares (almost two thirds of the native pine forests of the country) were affected by the pine beetle. So far this is still the most devastating epidemic caused by the pine beetle in the country's history. After the epidemic of 1962-1965, the pine beetle populations remained at endemic levels until 1982, when another important epidemic occurred that destroyed 11,000 hectares of forest, with an average impact of 12 ha per infestation (Billings, 1982<sup>50</sup>; Billings, 2016). Starting this year, Honduras created a forest pest control unit within the Honduran Forestry Development Corporation (COHDEFOR), which implemented a control system based on early detection and early application of control measures, mainly cut-and-leave (Billings, 1982; Macias et al., 2017<sup>51</sup>). The method proved to be effective. During the 20-year period 1984-2003, a total of 20,585 individual beetle infestations were detected in Honduras and 13,930 (68%) of the most rapidly spreading infestations were controlled with cut-and-leave. As a result, the average size of infestations was limited to 2.1 Ha (compared to 15 Ha./infestation in 1983), due to the application of control promptly after detection. Based on this excellent record, the Honduran program was considered a model at the Central American level (Billings, 2016). However, with the institutional reform linked to the new forestry law of 2007, which created the ICF as the governing body to replace COHDEFOR, the pest control unit was eliminated. This contributed to the fact that response to the most recent bark beetle outbreak was delayed from the appearance of the first outbreaks in 2012 until 2014, a period in which only 6% of the total outbreaks were controlled. In 2015, infestation size averaged 36.5 Ha. (Billings, 2016). Intensive control of active infestations with cut and leave during 2015 and 2016 eventually brought the outbreak under control by 2017.

The main deficiencies of ICF in relation to the management of the pest are associated with the lack of a permanent department of forest health, lack of personnel trained in phytosanitary control of forest pests, limiting equipment, capacities, highly centralized model and organization to have a system of early warning for the plague (Billings, 2016 ) and deficiencies in satellite

<sup>50</sup> Billings, R. F. 1982. Evaluation and recommendations for control of the 1982 outbreak of *Dendroctonus* in the pine forests of Honduras. Unpublished report submitted to U.S.D.A. Office of International Cooperation and Development and U.S. Agency for International Development. 26 p.

<sup>51</sup> Macias S., J. E., Billings, R. F. y Espino M, V. 2017. Guía para implementar el método de cortar y dejar y la franja de contención como medios de control del gorgojo descortezador del pino (*Dendroctonus frontalis*) para Centroamérica y México. US Forest Service/International Programs y Instituto Nacional de Conservación y Desarrollo Forestal, Areas Protegidas y Vida Silvestre (Honduras).48 p.

monitoring (Hernandez, 2016<sup>52</sup>). Based on recommendations (Billings, 2016), ICF created a Department of Forest Health and Protection in 2017 but has failed to date to fully staff the department with trained personnel and equipment. All those aspects will be strengthened with the present project.

In this component it also planned to strengthen ICF forest extension services, with an approach to migrate from a system where the government provides most of the extension to a system where the Water Fund (3.a) provide most of the extension services through private providers. The project proposes to migrate from a 100% public extension system to an extension system provided 100% per private contractors (including NGO's) that will be financed by the Water Fund. The role of the ICF extension service will be monitoring and certifying the quality of the private contractors; and also, the quality of the AFM activities. During the implementation of the project ICF will be strengthened with consultants for monitoring activities.

As an activity of this component it is also considered the development of a certification course on Adaptive Forest Management. The training course will create capacities in ICF and private contractors' personnel, including AFM practices and phytosanitary control of forest pests. The project staff will seek interactions with local and international centers specializing in adaptive forest management, reforestation, and agroforestry. For example, the World Agroforestry Centre (ICRAF) in collaboration with Biodiversity International and The Tropical Agricultural Research and Higher Education Center (CATIE) has published an Atlas titled 'Suitability of key Central American agroforestry species under future climates. The Atlas presents current and future suitability maps for 54 species that are commonly used as shade in agroforestry systems in Central America. The 54 species that were selected include 24 species of fruit trees, 24 timber trees and six species used to improve soil conditions (de Sousa et al., 2017<sup>53</sup>).

Activity 2.2) Early warning system for forest plagues, especially for *Dendroctonus frontalis* outbreaks in Honduras (Billings, 2016) is being implemented with funding from IDB and consists of a network of pheromone-baited survey traps in beetle-prone forest regions (Macias et al., 2017). Changes in the abundance of *Dendroctonus frontalis* and its major insect predators during the peak dispersal periods are used to forecast pending

<sup>52</sup> Hernández. 2016. Reporte sobre componente de apoyo al sistema de monitoreo forestal del Instituto de Conservación Forestal. Consultant report for the design of the HO-L1179 loan for IDB.

<sup>53</sup> de Sousa, van Zonneveld, K. M., Imbach, P., Cassanoves, F., Kindt, R. and Ordóñez, J. C. 2017. Suitability of key Central American agroforestry species under future climates: An atlas. ICRAF Occasional Paper 26. Turrialba, Costa Rica.

outbreaks (Billings and Upton, 2010<sup>54</sup>), allowing authorities more time to respond. This system will be backed up by pine beetle hazard maps, satellite imagery to monitor forest conditions, weather stations and periodic aerial detection flights. The GCF project will help to ensure this early warning system is fully in place and operational, encouraging its application in other Central American countries.

The design of the early warning system is based on the successful implementation of a similar system in the southern United States since 1986 (Billings and Upton, 2010). Other components in addition to pheromone trap monitoring, will include monitoring the variables that trigger the pests, particularly temperature, satellite monitoring of forest conditions with the innovative use of high-resolution satellite image and the cut and leave control of beetle infestations (Macias et al., 2017) with the involvement of the local communities, for fire and pest control. The involvement of the local communities will be ensured through the Payment for Ecosystem Service (PES) scheme. By the second year of the project the system will be fully in place and operational to ensure it can be scaled up to the national level and fully embedded across the various government structures.

Activity 2.3) Identification of agroforestry species resilient to climate change. This will include financing for research on, and the creation of a germplasm bank of, agroforestry species resilient to climate change. Such species will be used to promote climate-friendly species diversification in coniferous forests; the research and the germplasm will be implemented through agreements with the National University Forestry School, an institution that has technical leadership not only nationally but regionally. The National University Forestry School (NUFS or UNACIFOR) has a forest tree seed bank and the capabilities to test various native tree species as candidates for reforestation using adaptive forest management schemes. In collaboration with the NUFS, demonstration areas could be established within the GCF project to evaluate the potential of selected native, non-pine species in reforestation programs. Successes will be shared with other Central American countries as part of the CCAD initiative.

In addition, the project includes the strengthening of ICF capacities to monitor land use changes using satellite images. So, in case of an unexpected leakage happen and there is an increase of the deforestation in another area ICF will have the capacities to identify the land use change and to implement measures to control it.

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<sup>54</sup> Billings, R. F. and Upton, W. W. 2010. A methodology for assessing annual risk of southern pine beetle outbreaks across the southern region using pheromone traps. In J. M. Pye, H. M. Rauscher, Y. Sands, D. Lee, C. and Beatty, J. S. [eds.], *Advances in threat assessment and their application to forest and rangeland management*. USDA Forest Service Pacific Northwest Research Station, Portland, OR. Gen. Tech. Rpt. PNW-GTR-802, pp. 73-85



39. Component 3.

Output 3: Strengthen governance and financial sustainability to increase forest resilience to climate change. This component supports the Government of Honduras with financial resources. It includes the following Activities:

Activity 3.1) Development of enabling conditions for decentralized watershed and forest resources management. This activity includes: (i) setup or formalization of, and legal arrangements for, 200 Water Management Committees (WMCs); (ii) creation of 11 watershed councils; (iii) capacity development for 200 WMCs and 53 municipalities (including the municipality of Tegucigalpa) on financial management and AFM; (iv) development of legal framework (regulations, governance mechanisms, and arrangements with financial institutions for the deposit and management of funds) for the establishment of a Water Fund (WF); (v) development and approval, by ICF and municipalities, of Basin Management Plans prioritizing the specific forest conservation and resources management activities to be implemented; (vi) detailed mapping of areas under forest management within the scope of the project; and (vii) approval of a national forest incentives mechanism.

Activity 3.2) Implementation of a Payment for Ecosystem Services (PES) system.

Component 3 of the project will finance sustainable forest management activities, as fire control and thinning, and not reforestation activities, that will be financed under Component 1.

Under the proposed model, public and private resource users in the lower part of each watershed will contribute to finance AFM upstream, where the water resources ecosystem services are generated. The interventions in restoration and forest management in the upper lands of the basins are aimed to increase water supply in the dry season and reduce costs and negative effects in the operation and lifetime of the infrastructure for irrigation, safe water, and hydropower generation located in the lower lands and urban sites of the project's area. The extension services for AFM will be provided by private contractors (including NGO's) financed by the WF. It is estimated that 0.67 million m<sup>3</sup> of less sediment per year will be generated by the interventions saving about US\$ 1.1 million annually in sediment removal to hydropower companies, water utilities and irrigation systems (see Annex on Economic Assessment). Improvements in water quality is also beneficial. For power generating companies, for instance, poor quality of water generates pollution of reservoirs and of water-piping infrastructure, as well as damage to the hydroelectric turbines. Both aspects create over costs due to dredging and cleaning work, and down time that reduces the power generation, which forces resorting to stationary engines which increases GHG emissions and reduces the mitigation potential of the hydroelectric plant. In the case of irrigation dams, the impact is similar as the same clogging effect is caused. For water utilities, the costs for water purification before distribution are also

added to the abovementioned impacts, because they raise according to the increase of sedimentary load and associated expenditures in flocculants.

The expected flow of benefits coming from the ecosystem services of the project are explicitly related (see D.2) to a proposed payment scheme from direct beneficiaries using a PES mechanism that will draw financial resources from a variety of sources, including in kind contribution for forest control activities of the communities located in forest areas. Where feasible, water service tariffs will be adjusted to include a watershed management fee. Additional contributions will be provided by the Municipality of Tegucigalpa that manage Concepción and Laureles reservoirs and the energy company Empresa Nacional de Energía Eléctrica (ENEE) that manages El Cajon dam and has hydropower plants that are dependent on the security of water supply from some of the prioritized watersheds. WMCs and other public and private agents (including for instance the El Coyolar association of agricultural water users) will also provide additional financial resources. Such funds will be used to capitalize the WF, which in turn will administer and disburse resources to finance the planned AFM activities; the payments are subject to the implementation of a management plan that guarantees the restoration or protection of the forest.

The management plan will include, among others, the following key activities to be implemented to increase the resilience of the forest: (i) fire risk management and control (ii) enrichment of forest with non-pine species, and (iii) tree thinning.

Fire risk management and control. In order to stimulate the natural succession of the forest and species migration under climate change it is key to implement activities to reduce the incidence of fires in the coniferous forest. Naturally the coniferous forest include species as Oak (*Quercus*), Nance (*Byrsonima crassifolia*) and Liquidambar (*Liquidambar styraciflua*) and Chaparro (*Curatella americana*). These species are of high economic value both in timber (Oak) and non-timber products like fruits (Nance) and pulp (Liquidambar). But these species are not as resilient to the fires as the pine, so the lack of fire risk management and control has contributed to forest with only pine trees. The diversification of the coniferous forest is a strategy to increase the resilience of the forest to climate change, and fire control is a key action of this strategy.

Enrichment of forest with non-pine species. The fire control will contribute to the enrichment of forest with non-pine species. Additionally, as part of the restoration activities, during the evaluation of the natural regeneration it will be identified if the intensity of regeneration is sufficient for the recovery of the forest. If this is not the case reforestation will be carried out with a proportion of non-pine species. The proportion of non-pine species is defined by ICF based on technical guidelines for forest restoration. As mentioned in the



previous activity the enrichment of the forest with non-pine species is key to increase the resilience of the forest ecosystem to climate change.

Tree thinning. Empirical studies show how thinning contribute to improve the infiltration in pine forests and reduce the impact of pine beetle, so it contributes to increases water availability under climate change scenarios and increase the resilience of the forest to the increase of pine beetle outbreaks as a result of climate change.

The social sustainability and equitable distribution of the funds is ensured through the existing social forest management system. Honduras has implemented a social forest management system through the 80's. Though under this system the government assigns forest areas through long term contracts (for 20 years) to communities. The contracts include i) protected forest areas that are assigned to Water Committees, and ii) productive forest areas that are assigned to Agroforestry Cooperatives. Both, the Water Committees and Agroforestry Cooperatives are constituted legally by the communities that live in the forest, and both have an assembly of the members, a board and regulations agreed among the members. These existing community organizations are key for the sustainability of the scheme.

Recent studies carry out for the design of the program evidenced that in forest areas assigned to communities there is less deforestation (50% less deforestation in percentage in forest areas assigned to communities), confirming communities' contribution to reduce deforestation. The agreements to implement sustainable forest management activities will be signed between the Water Fund and these community organizations (Water Committees and Agroforestry Cooperatives).

The payments for ecosystem services will be transferred directly to bank accounts of those community organizations and will be conditional to the production of ecosystem services and to the implementation of Adaptive Forest Management activities. A small advance will be provided to the communities considering the high level of poverty. The communities can decide if these funds will be used to pay the people that participate in the sustainable forest management activities or to be invested in community projects. The technical assistance firm, as part of its terms of reference, will assist the communities if they plan to use the funds for a community project, for example to improve their water system.

The community organizations will be responsible for the equitable distribution of the resources. This is not a new scheme, because the community organizations have managed resources in the past and distributed the resources equitably to the members.

The community organizations have their mechanisms to control the equitable use of the resources, including the assembly and the existence of a

prosecutor as part of the board. The equitable distribution of the resources is part of the essence of these organization, however the project includes, as part of the ESMF a complain mechanism (which is mandatory for all IDB projects). All grievances received through such compliant mechanism that are related to distribution of payments will be handled and addressed through conflict resolution management with the Water Committees and Agroforestry Cooperatives. The technical assistance firm has the responsibility to socialize this complain mechanism with the communities, which is included to Community Liaison Plan attached to the ESMF.

The project will provide technical assistance for the participatory design of the sustainable forest management activities and agreements, that will be financed by the WF and executed by technical firms or ONGs. ICF will be responsible for the supervision of all the model, a contribution that is viable considering its consolidated technical capacities and budget.

The agreements to carry out the AFM activities will be signed between the Water Fund and the communities and private owners. The focus of these activities will be preventive, aimed at reducing the probability of occurrence of future bark beetle outbreaks in areas not affected by the 2013-2016 events.

Most of the area (90%) that will be intervened with AFM is managed by communities and 10% by private owners. The payments of the communities will cover a significant part of the cost of the Sustainable Forest Management activities (70%). On the other hand, the rationale in the design of the payment for private owners is different. The economic analysis of forest restauration in private forest, carried out during the design of the program, evidenced that the activity of forest production including AFM is not profitable at the current market conditions. The objective of the incentives to forest private owners is incentivize the implementation of AFM activities for the recovery and preservation of the ecosystem services and to prevent future pine beetle outbreaks. The amount paid per hectare for private owners will be significant less than the amount paid to communities.

Two ecosystem service indicators will be measured as part of the PES scheme: (i) Tons of carbon equivalent (tCo2e) reduced and (ii) Increase in the average availability of surface water during the dry season in the sub-watersheds located in the area of intervention. A baseline will be established for both indicators.

The indicator Tons of carbon equivalent (tCo2e) reduced, will be calculated from the carbon stocked by the growth of the forests under restoration in project intervention area, and the emissions from avoiding deforestation of primary forest areas under sustainable management. In both cases, additionality will be measured against a historical baseline of previous attacks of the pest and will be aligned with the national reference emission levels

prepared by the country as part of the National REDD + Strategy. The baseline will be estimated for year one and additional emission reduction measurements will be made for years 3 and 6, using maps of forest cover dynamics and carbon content for avoided deforestation, as well as sampling plots to measure basal area and height of trees in areas under restoration and then estimate by formula the CO<sub>2</sub> captured.

The ecosystem service of water regulation will be estimated through the variable increase in the average availability of surface water during the dry season in the sub-watersheds located in the area of intervention, too. Using the methodology of matching, 6 watersheds with similar conditions (area, slope, soil and forest cover) will be selected, three where forest restoration activities will be implemented and 3 where adaptative forest management activities will be implemented. Rain gages and flow meter will be installed in the watersheds and real-time data will be collected. The data of rain gages and flowmeters will be used to calibrate a water balance model, SWAT (Soil Water Assessment Tool) that was used to design the program. The modelling will allow to calculate the additional improvement in the curve number, that explain the infiltration capacity of the soil. The average number of curves improved as a result of the project intervention will be utilized to model the benefits of the project in terms of water availability in all the area of intervention using SWAT. The results will be communicated to the Water Councils and the population.

The monitoring of the ecosystem service of Tons of carbon equivalent (tCO<sub>2</sub>e) reduced will be carried out by the “Centro de Información y Patrimonio Forestal (CIPF) from ICF. The project will provide them training and financial support to measures the ecosystem service in the parcels in year 1, 3 and 6, as well as deforestation through remote sensing (under component 2 of the project). After the end of the project the CIPF will continue monitoring the indicator, as part of its responsibility of monitoring the status of the forest and reference emission levels from REDD+ Strategy. The CIPF has a specific budget for the technical personnel for satellite information analysis and for the measure of the reduction of tCO<sub>2</sub>e in the parcels. CIPF is the unit responsible for monitoring emissions as part of the National REDD + Strategy, so that project measurements will be aligned with this strategy.

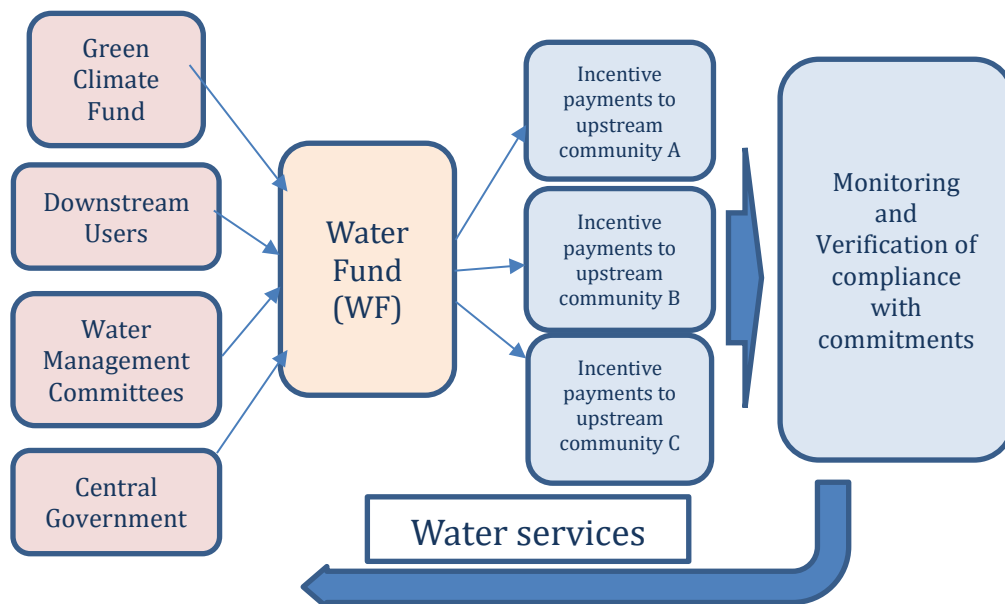
The monitoring of the ecosystem service of water regulation will be carried out through an agreement between the National Forestry University and the Finance Secretariat and ICF. The project will support the acquisition of rain gages and flow meters in the selected watersheds. When the WF will be constituted, agreements will be signed between the Funds and the National University to continue the monitoring and modelling as the water availability as part of the social and research projects of the University.

The PES mechanism will have the following key elements:

- Set up and legal formalization of the WF and capacity development of local institutions and Water Committees staff on financial management;
- For the WF, agreements will be signed for the transfer of the financial resources from SEFIN;
- Agreements will also be signed between the WF and the competent Water Committees, to regulate the use of financial resources received by the WF, in line with the approved Watershed Management Plans. This will include monitoring and verification activities;
- For the capitalization of WF, financial resources received during the project execution period from GCF will be progressively replaced by local resources, including a combination of (i) central government funds, (ii) payments by water services users, and (iii) contributions by Water Committees (including contributions in kind);
- The verification of the disbursement of the co-financing resources pledged by the GoH and by the relevant downstream water users towards the implementation of the PES scheme will be a condition precedent to the annual GCF disbursements (conditional grant mechanism);
- Contributions from the GCF will also be linked to milestones relative to the establishment of enabling conditions for the decentralization of forest management responsibilities. Financial resources managed by the WF will be used to implement the AFM activities identified in each forest management plan. The project's operation manual will detail the mechanics of the conditional grant mechanism, including the specific milestones for disbursement of GCF resources. The key elements of the PES mechanism (describe above) will constitute milestones: (I) formalization of water committees, (ii) contributions by Water Committees and (iii) completion of AFM activities.
- Additional information regarding the PES performance-based mechanism, as well as financial projections relative to the capitalization and financial sustainability of the WF system is included in section D.2. of this Funding Proposal.

The sources of funding and the structure of PES mechanism are shown in the diagram below.

Diagram 1. WF funding and structure.



- In terms of the financial scheme of the WF, the central government will provide USD3.5M and the beneficiaries USD14M. The beneficiaries counterpart includes monetary contribution from the beneficiaries of the ecosystem services (municipalities, electricity company) and in kind contributions of the communities that will implement the AFM activities. The in-kind contributions of the communities represent 25% of the total contribution to the WF (GCF + government + local communities + beneficiaries of the ecosystem services). This contribution will be agreed with the communities as part of the elaboration of the forest management and restoration plans. Those plans are prepared with the support of a technical assistance firm and approved by ICF and include all the activities required for forest restoration and AFM for 25 years, with operational plans of 5 years. Of the total amount required to complete the activities, 30% will be provide as in-kind contribution by the communities and 70% will be payments provide by the WF, following a payment for results scheme. This scheme has been designed and approved by ICF as part of the activities of the SFM program. The in-kind community contribution is critical in the scheme, because allow to preserve the traditional community mechanisms for forest management, that have been very important for the conservation of the forest in Honduras. The in-kind contribution will be certified by a technical assistance firm, as part of the certification of AFM results required for the payments to the communities.
- In terms of eligibility any community or organization (i.e. NGO, cooperative) located in the area of influence of the project is eligible to participate in the PES scheme. To be eligible the community should have under their responsibility the management of a forest area. This

responsibility is defined through an agreement with ICF, under the framework of the social forestry system defined in the existing Forestry Law.

- The disbursement of the GCF will not be proportional to the counterpart funds. The first 3 years the disbursement of the GCF will exceed the disbursements of counterpart, in a scheme designed to incentivize the creation and regulation of the Water Fund (see table 2). GCF's disbursements will be linked to specific milestone to make the WF operational. It is projected that after the fourth year GCF's disbursements will exceed the counterpart disbursements.

Table 2. Summary of projected contributions, during the implementation of the program (2020-2024) and after. Values in million USD.

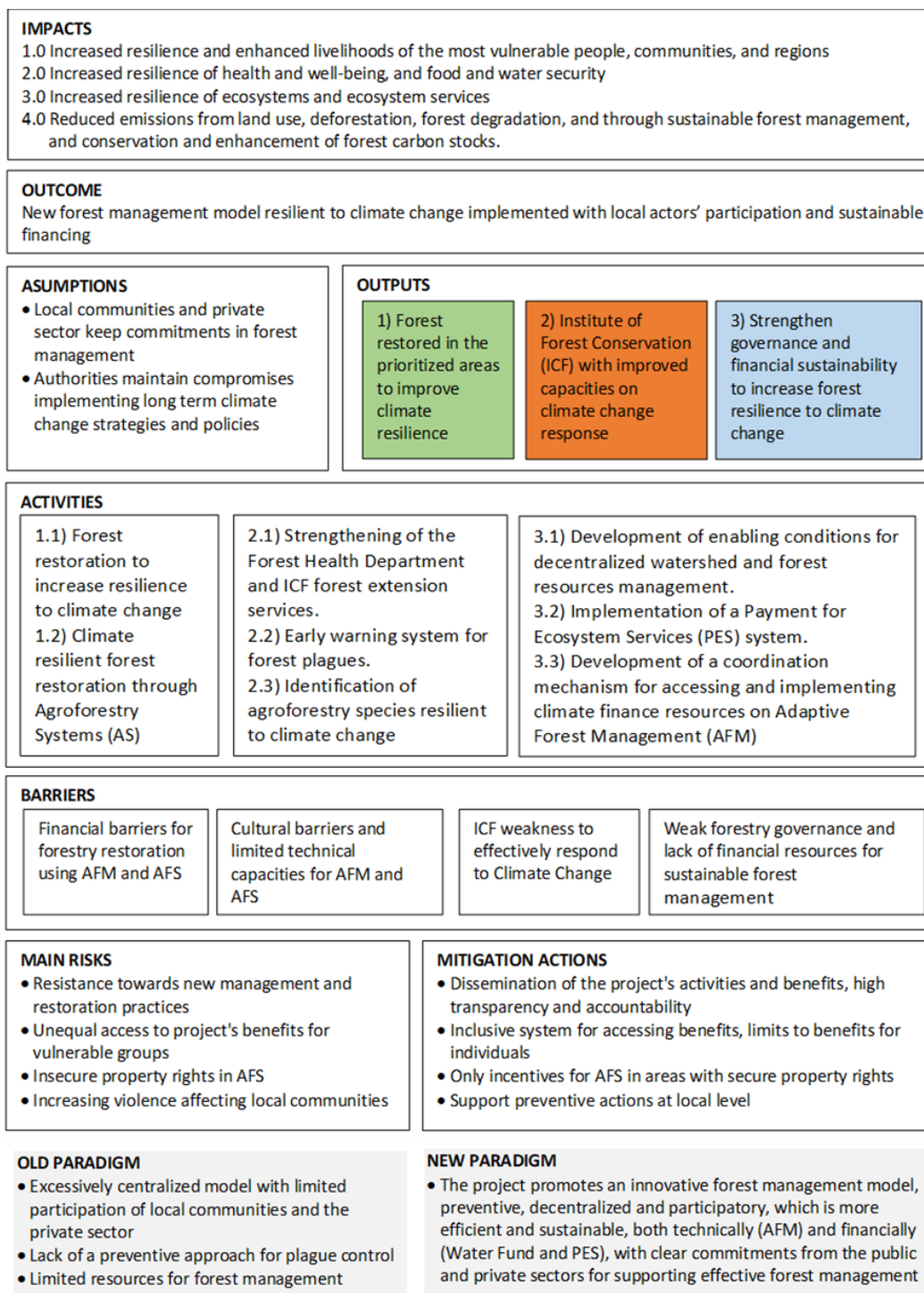
	GFC	Beneficiaries of ecosystem services	Communities (in-kind)	Honduras Government	Total counterpart
2020	2	0	0.2	0.2	0.4
2021	4.8	0	0.5	0.5	1
2022	4.7	0.1	2.4	0.8	3.3
2023	4	2	3	1	6
2024	2	3.16	2.64	1	6.8
TOTAL project	17.5	5.26	8.74	3.5	17.5
2025	0	3.9	2.1	1	7
2026	0	3.9	2.1	1	7



Activity 3.3) Development of a coordination mechanism for accessing and implementing climate finance resources on Adaptive Forest Management (AFM). Design and implement an inter-ministry coordination mechanism for accessing resources for AFM. The mechanism will comply with climate fund requirements and be based on increased GoH capacities to leverage more funds to tackle climate change challenges.

40. Component 4. Administration: This includes running of the Executing Unit at SEFIN/UAP, monitoring, report and assessment, and audit.
41. Relations among barriers, components and outcomes of the project, as well as assumptions and risks are shown in the following diagram with the proposed theory of change towards a new paradigm of adaptive forest management.

Diagram 2. Project's Theory of Change



#### C.4. Background Information on Project / Programme Sponsor (Executing Entity)

42. The **Ministry of Finance (SEFIN)**, through its Project Management Unit (*Unidad Administradora de Proyectos*, UAP) will be the Executing Entity for this project. SEFIN is also acting as the executing entity for the "Sustainable

Forest Management - SFM" project financed by IDB, and its role is the execution of the program in coordination with sectorial Ministries, as the Institute for Forest Conservation. An institutional assessment of the capacity of SEFIN to implement project activities was carried out in accordance with the Accredited Entity's own policies and procedures in the context of the approval process of the SMF project, which returned satisfactory results.

43. SEFIN is responsible for the formulation, coordination, execution, and assessment of policies regarding public finance and the general budget of the Republic. It is also in charge of the public debt and public investment planning, and it has recently taken the role of tracking the country's public investments in the climate change sector. SEFIN is also part of a new scheme for the public policy coordination on climate-related investments (Clima+ scheme).

The EE will be responsible for the management of the entire program including: (i) the general and financial administration of the Program, ensuring the efficient management of its resources; (ii) the planning of the execution of the Program, including the preparation and implementation of the Annual Operating Plans (AOP); (iii) monitoring the progress of the Program and compliance with pre-established goals; (iv) the planning, execution and monitoring of procurement processes for goods, services and works, ensuring compliance with the Bank's Acquisition and Contracting Policies; (v) the preparation and processing of the corresponding payments; (vi) maintenance of an adequate accounting and financial system to record the financial transactions made, the preparation of the financial statements and processing of the disbursement requests; (vii) the preparation and sending to the Bank of the semi-annual monitoring reports of the Program; and (viii) other aspects that are defined in the Program Operations Manual.

Monitoring. For monitoring, the EE will be responsible for preparing: (a) Pluriannual Project Execution Plan (PEP), which must include the complete planning of the Project in accordance with the structure of the expected outputs according to the Project Results Matrix and the route criticism of milestones or critical actions that must be executed in order for the program to be disbursed according to the provisions of the contract. The PEP should be updated when necessary, especially when there are significant changes that imply or could imply delays in the execution of the Project or changes in the product goals of the intermediate periods. (b) Annual Operating Plans (AOP), which will be prepared from the PEP, will contain the detailed operational planning for each annual period. (c) Semi-annual progress reports, which must be prepared and presented by the Executing Agency within the sixties (60) days following the end of each calendar semester and will include the results and products reached in the execution of the POA, the Procurement Plan and the Project Results Matrix.

Supervision of the financial management of the Project. The EE will be responsible for preparing the audited financial statements of the Project, duly audited by an independent auditor acceptable to the Bank, within a period of

one hundred and twenty (120) days following the close of each fiscal year and during the term for disbursements of the Loan, including a final report, one hundred and twenty (120) days following the date stipulated for the last disbursement of the Loan and its extensions. In addition, the presentation of annual operational evaluations to be developed by an independent auditor acceptable to the Bank will be required. Evaluation of results. The EE will be responsible for the preparation of the baseline and the measurement of the results of the program.

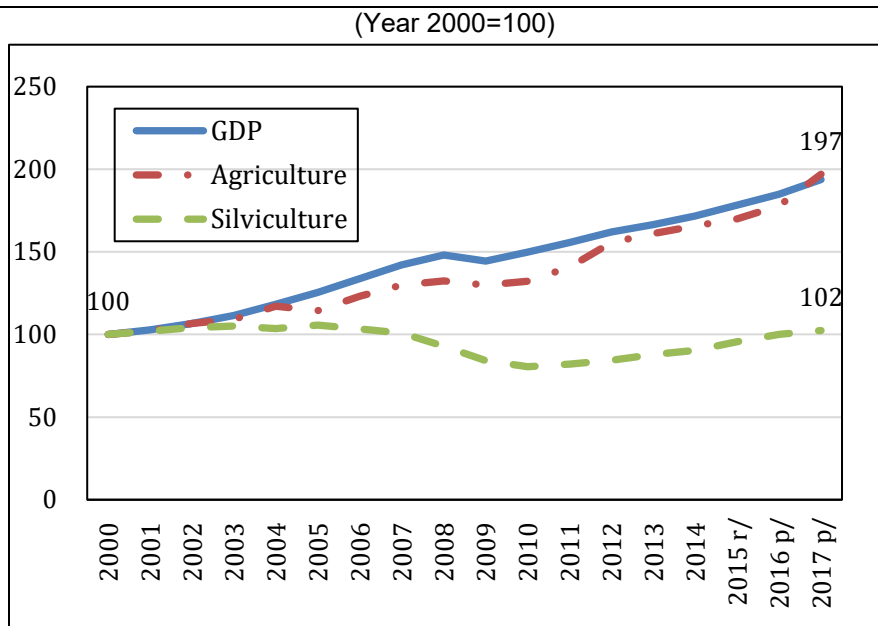
44. Currently, SEFIN is in the accreditation process as National Implementing Entity for GCF. Government authorities consider that its involvement as executing agency for this Project is strategic, since it will provide direct exposure to GCF procedures, criteria, and investment priorities. SEFIN is the one of the implementing agencies of the SFM project in coordination with ICF. SEFIN has appointed a dedicated team to this task, and it will assure both continuity and institutional strength to the new GFC operation due to its experience with the SFM project and its high capacity for mobilizing public and private resources for key interventions like this. SEFIN is the only EE that will be channeling GFC proceeds or undertaking activities on behalf of IDB.

### C.5. Market Overview

45. **Forest products.** Honduras has an important potential for forest production, especially in coniferous forests that are the main source of timber products with commercial value (Santamaría y Cerna, 2017<sup>55</sup>). Despite the economic importance of forest resources, as shown in the chart below, the economic value of silviculture has remained stagnant over last two decades.

Chart 5. Gross Domestic, Agriculture and Forestry Sector Production

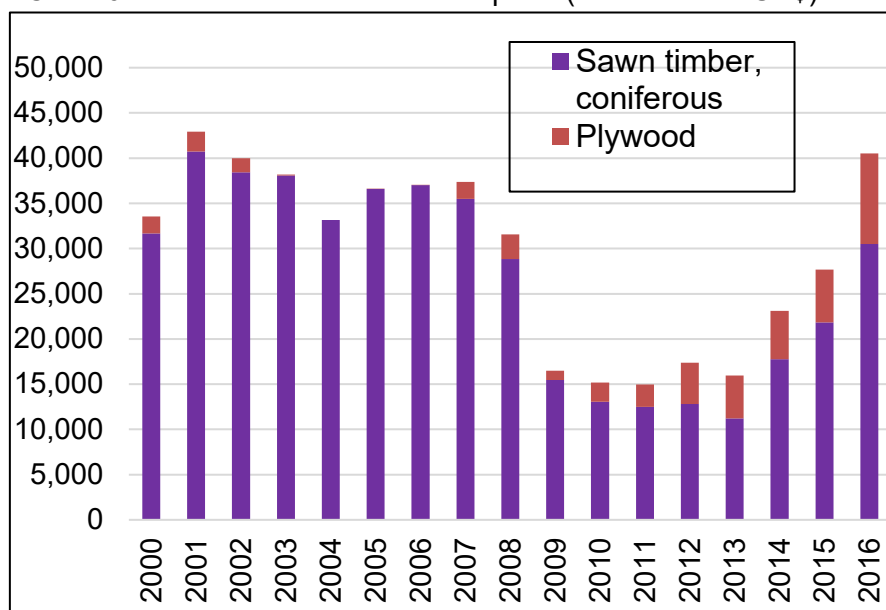
<sup>55</sup> According to Santamaria and Cerna (2017) report, the production of pine forest wood is 97% or the total amount of extracted wood, while the remaining 3% comes from the broadleaf forest. This information is based on ICF data according to authors' references. Ver Santamaría Oscar y Luis Cerna. 2017. "Aportes al fomento del mercado de productos forestales en Honduras: Lineamientos para una propuesta multisectorial de políticas públicas". Tegucigalpa, FAO.



Source: Central Bank of Honduras ([http://www.bch.hn/pib\\_base2000.php](http://www.bch.hn/pib_base2000.php))

46. Between 2000 and 2017, the value of silviculture production to Honduras' economy barely increased. Contrary to both GDP and total value of agriculture (which doubled their value in constant prices) the forestry sector did not grow and saw a decline between 2007 and 2011 (20% drop). Between 2012 and 2017, however, the forestry production began to gradually recover until it reached about the same value as in the year 2000.
47. A very important part of the forestry production's recovery in recent years is associated to increasing wood exports from coniferous forests, as shown in chart 6.
48. The main export destinations are USA, Guatemala, and China.
49. Domestic demand for forest products (especially wood) is very important for the Honduran forestry sector. According to Santamaría and Cerna (2017), 78% of the Honduran forest production is directed to domestic consumption, for primary and secondary industries and other actors (businesses, builders, etc.). These authors identify the forest value chain structure in table 3.

Chart 6. Honduras Annual Wood Exports (thousands of US\$)



Source: FAOSTAT (<http://www.fao.org/faostat/es/> \ "data/FQ, access 23-04-2018)

Table 3. Forest value chain structure in Honduras

Forest value chain sector	Value	Value %	Volume	Employment	Employment %
	(million USD)		(thousand m3)	direct	
Wood extractors (m³r)	14	6%	567	6,700	23%
Primary Industry (m³a)	97	39%	359	2,904	10%
Bioenergy	17	7%	476	2,812	10%
Packing and wood flooring	9	4%	40	440	2%
Secondary Industry	101	40%	114	10,599	37%
Other	12	5%	75	5,107	18%
Total in the value chain	250	100.0%		28,562	100%

Source: Adapted from Santamaría and Cerna (2017)

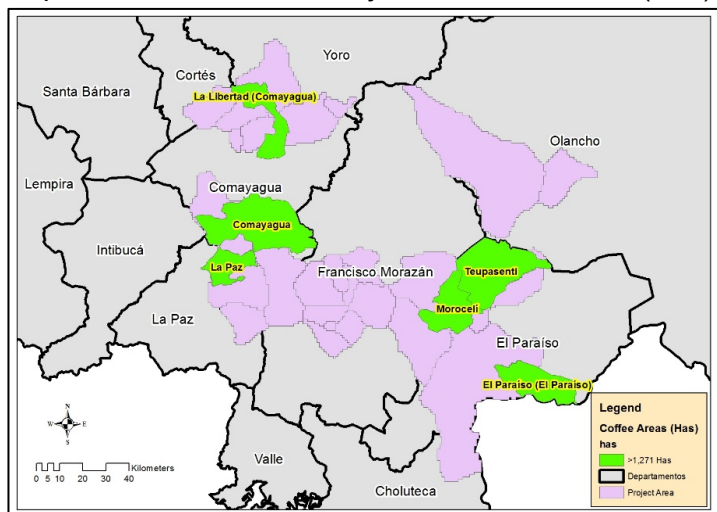
50. The total value of the forest value chain amounts to USD250 million. In terms of employment, the sector is responsible for approximately 30,000 direct jobs, a significant share of which in the transformation and processing industry (37%). This represents approximately 6.8% of the country's GDP in 2017, indicating the strategic importance of the sector for the Honduran economy.
51. The main competitive advantages of the county rest on a number of elements, including: (i) its privileged geographic location, with proximity to large wood and wood product markets in the United States, Canada, Mexico and the Caribbean; (ii) the transportation infrastructure, with four seaports in the



Caribbean and one in the Pacific, of which Puerto Cortés, on the Atlantic coast, stands out as the most efficient seaport in Central America and four international airports; (iii) the diversity of high-value timber species; (iv) around 5 million Ha suitable for reforestation in every region of the country; (v) the relative availability of trained forest workforce; (vi) three universities specialized in vocational training for forest and protected areas management; and (vii) important fiscal incentives and tax exemptions.

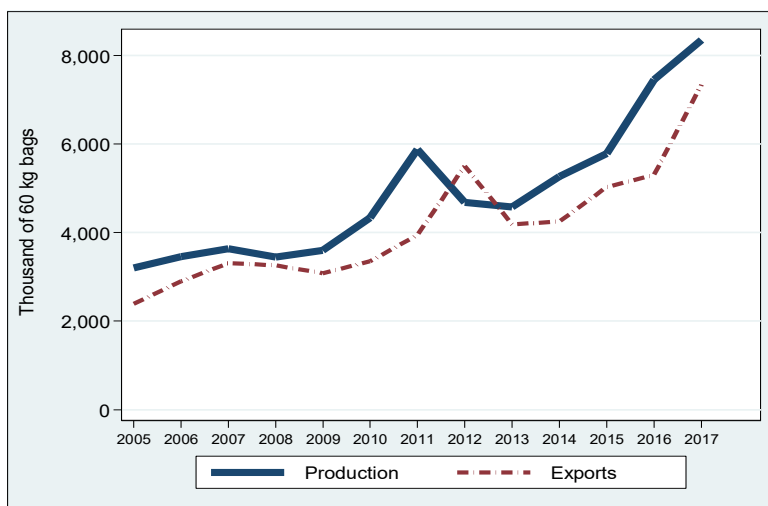
52. According to a survey of forestry sector actors by Santamaría and Cerna (2017), including from the primary and secondary or processing industries, the forest sector in Honduras faces a number of challenges to achieve and maintain sustainable levels of growth. For direct forest producers and holders of forest concessions for timber extraction, the main obstacles relate to the regulatory framework (25%), followed by the competition from illegal sources (23%) and from wood-product substitutes (13%). Other factors mentioned were high prices for the consumer (8%) and the poor quality of wood (8%).
53. Much of the same reasons are quoted by actors in the forest products processing sector, which include the competition from illegal wood sources (21%) and from wood substitutes (19%). 18% of the informants from this sub-sector considers that the regulatory frameworks also pose significant barriers, while 13% highlight the high prices of primary wood products and 10% their poor quality.
54. As for the production and export of non-timber forest products from pine forests, the most important is the pine tree resin. This is used for a variety of products, such as varnishes, adhesives, and food additives. It is also a usual component of perfumes and incense-based products. According the same research by Santamaría and Cerna (2017), 19,583 barrels of pine resin and 313 barrels of sweetgum were exported in 2015, for a total economic value of US\$ 11 million.
55. Regarding the use of trees for firewood, it is worth mentioning that low-income rural population in Honduras is still highly dependent on this energy source. A 38.3% of the population consumes firewood for domestic purposes. Likewise, the annual domestic consumption of firewood reaches 6.5 million m<sup>3</sup> (National Energy Balance, quoted by ICF-MOSEF).
56. **Coffee production and Agroforestry systems.** Coffee is the key crop being considered by the project for introduction in the areas where 30,000 Has of Agroforestry Systems (AS) are proposed. Currently, there are about 30,000 Has of coffee plantations in the projects' area, which are partially located inside three of the most important coffee producing regions in Honduras: Comayagua, El Paraiso and La Paz. Within the project's area there are six municipalities with significant coffee areas as can be seen in the following figure.

Map 12. Coffee areas in Project's influence zone (Has)



57. In general, coffee is traditional and a very well-established crop in Honduras, with production and exports rapidly growing during the last 15 years as can be seen in next graph.

Chart 7. Production, exports and local consumption of coffee



Source: ICO (2018) <http://www.ico.org>

58. According to the International Coffee Organization (ICO), by 2017 Honduras produced more than 8 million of 60 kg bags of coffee (480,000 tm). That year the Central American country was the 6th coffee exporter worldwide and the third in Latin America (only behind Brazil and Colombia).

59. Currently world demand for coffee from importer countries is not growing very rapidly, at about 1% annually (IDB, 2018<sup>56</sup>), and the main driver of increasing demand is coming from domestic markets of large coffee growers like Brazil, Vietnam and Indonesia. In the case of Honduras, however, the domestic market is still very small (in 2017 it was only about 4.5% of total production according to ICO figures). Although domestic consumption has some potential for expansion by far the most promising venue for increasing demand (and price) for Honduran coffee comes from the specialty and certified markets (certifications basically seek to assure that social and environmental standards are met), giving an interesting price premium to growers. These specialty and certified markets have been much more dynamic than the conventional ones, and it is estimated that about 25-30% of current exports in Honduras are in these segments (IDB, 2018).
60. Coffee is a product with strong support from public policies in Honduras. For instance, the coffee sector has an interesting governance structure based on public-private entities, with a trust fund (fideicomiso) financed with US\$ 9 per 100 pounds of exported coffee. These resources are used for the operation of IHCAFE, the Honduran Institute for Coffee, a public-private institution that offers market, technical and financial assistance to all coffee growers and their local organizations. During the last decade ICF and IHCAFE have been promoting the adoption of coffee under shade in agroforestry systems (based on Agroforestry Plans), especially in areas which are most vulnerable to soil erosion and severe and recurrent droughts.
61. The context for coffee expansion using AS in the projects' area is highly favorable. There are already important coffee producing areas in this environment; there is a growing market for special and certified coffees based on agroforestry systems; and there are clear policies and efficient institutional arrangements that promote sustainable coffee production in Honduras.

#### C.6. Regulation, Taxation and Insurance

62. Honduran forestry sector legislation recognizes the proper management of natural resources and protected areas as vital elements to promote sustainable development and meet the demand for environmental goods and services. The following are the main relevant regulations for the sector: Forestry, Protected Areas, and Wildlife Law (LFAPVS); General Environmental Law; Framework Law on Safe Water and Sanitation Sector; Land-Use Planning Act. A series of taxable profits related to forestry, forestation, and reforestation were established in the LFAPVS. The project's Environmental

<sup>56</sup> IDB. 2018.

and Social Management Framework (ESMF) document details how the project is framed within such regulatory context. In terms of environmental permits, Honduras's regulations establish that if the restoration or reforestation activities are carried out with native species, no environmental permission is required. In the context of forest management and restoration activities, forest management plans must be approved by ICF. Requirements relative to the preparation and approval of forest management plans are already being complied with within the context of the implementation the SFM IDB loan. The approval of the forest management plans is the only requirement to implement the activities of the project. The approval is an ongoing process as part of the technical assistance to the local organizations that will participate in the project. This approval is a short-term process (around two months) and it is expected that all the forest management plans will be approved by the end of 2019.

### C.7. Institutional / Implementation Arrangements

63. The project implementation and institutional arrangements have been defined in the context of the preparation of the IDB parallel loan and are already in place as of mid-2018. The IDB loan project's Operating Manual details the project operational procedures and defines the roles of different actors involved. The manual will be updated to accommodate the additional financing component from the GCF.
64. The Ministry of Finance - SEFIN - is the executing agency of this operation. SEFIN has set up a Project Management Unit (UAP) with has technical experience for the management of projects funded by bilateral and multilateral sources, including the IDB. SEFIN's UAP is also the executing agency for the SFM project financed with the parallel IDB loan.
65. For the project execution, IDB and SEFIN will sign a contract (the subsidiary agreement) which will detail roles and responsibilities of both organizations. The policies and procedures to be applied for the execution of administrative, financial, and operational activities will be described in the Operating Manual, which will be subscribed by the parties, and which will be based on the IDB policies and procedures, on SEFIN's Investment Tracking Guide, and which will leverage as much as possible the implementation arrangements established by the two organizations for the execution of the parallel SFM loan.

66. SEFIN, through the UAP, will be responsible for the implementation of the operation, the drafting and tracking of the Annual Procurement and Operating Plans, the implementation of the Communication and Visibility Strategy, the drafting of the progress reports, and of the technical and financial execution reports.
67. Moreover, SEFIN will sign an agreement with ICF that will act as technical execution agent. In particular, ICF will be responsible for approving the forest management plans, monitoring the compliance with the commitments related to the implementation of the restoration activities, providing technical assistance for the establishment of Agroforestry Systems (ASs), monitoring any undue change in land use, and monitoring the implementation of the Environmental and Social Management Framework (ESMF). In order to fulfill these roles, ICF will receive a package of technical assistance activities, and will be strengthened with technical consultants, including a social specialist tasked with the implementation of the Community Liaison Plan and the management of the project's Grievance Redress Mechanism. The technical assistance activities foreseen for Component 1 will be provided by a specialized firm, hired by SEFIN. A firm has been already selected.
68. SEFIN will establish cooperation agreements with the local governments of the interested areas and will provide institutional capacity development to ensure their effective participation in the implementation of the project and their appropriation of the project activities' after the end of the project's implementation period. SEFIN and ICF will jointly coordinate the design and implementation of the Project Monitoring and Evaluation System (SiSE), a project's management and accountability tool. SiSE will also enable institutional learning and knowledge management and will provide inputs for the adjustment of sectoral public policies (Component 3, Governance).
69. Restoration activities and AFM of public and private forests affected by the bark beetle will be carried out through forest management contracts, in line with what established under the approved forest management plans. Such contracts will be subscribed by ICF with organizations with the relevant implementation capacity, such as Water Committees and Agroforestry Cooperatives, and private owners. To implement those contracts, Water Committees, Agroforestry Cooperatives, and private owners will be supported through technical assistance, provision of forestry inputs such as more resilient seedling and cash incentives. Organizations and private owners will contractually commit themselves to carry out reforestation or restoration activities and AFM practices as specified in the Forest Management Plan and to continue with AFM activities in the areas they manage once the project ends. The project will encourage women participation in the decision-making process and in forest employment opportunities created through the project's implementation.

70. The key activities to be carried out for the restoration and AFM components are described below:

- a) **Hiring of technical assistance firm(s)** to provide support to beneficiary groups and individual producers regarding organization and technical aspects. The provider will have a broad sectoral and geographical experience in matters regarding the project's implementation.
- b) **Project outreach.** This will include public hearings to present the project, its objectives and proposed activities to local communities, as well as to individual producers involved in the management of forest resources in the interested areas.
- c) **Eligibility of interested groups in forest restoration:** Community groups and individual producers interested in taking part in the project, with support from the technical assistance firm(s), will have to submit documentation that established their legal capacity compliance with the project's eligibility criteria for their participation. Any community or organization (i.e. NGO, cooperative) located in the area of influence of the project is eligible to participate in the PES scheme. To be eligible the community should have under their responsibility the management of a forest area. This responsibility is defined through an agreement with ICF, under the framework of the social forestry system defined in the existing Forestry Law. Around 200 organizations than can be eligible has been identified in the area of influence of the project.
- d) **Eligibility of individual farmers in Agroforestry Systems (AS) activities.** The farms should be located within the socially and environmentally sensitive areas located near the forest areas of intervention. Farmers don't have economic capacity to implement the AS, as evidenced by a socioeconomic survey.
- e) **Creation of the Water Fund (WF):** A WF will be created for the 11th water districts with 11 accounts and 11 governance structures to channel resources to AFM activities. For the creation of this fund, the project will support the creation of a trust fund, the set-up of its operation procedures and governance structure. The WF will be set up and managed by a Bank. A procurement process will be carried out to select the Bank that will manage the trust fund. Honduras legal framework facilitates the creation of trust funds and Honduras Banks have extensive experience in the managing of trust funds.

The governance structures will be the water councils which congregate the relevant stakeholders in each watershed. The water councils are regulated by Honduras water law.

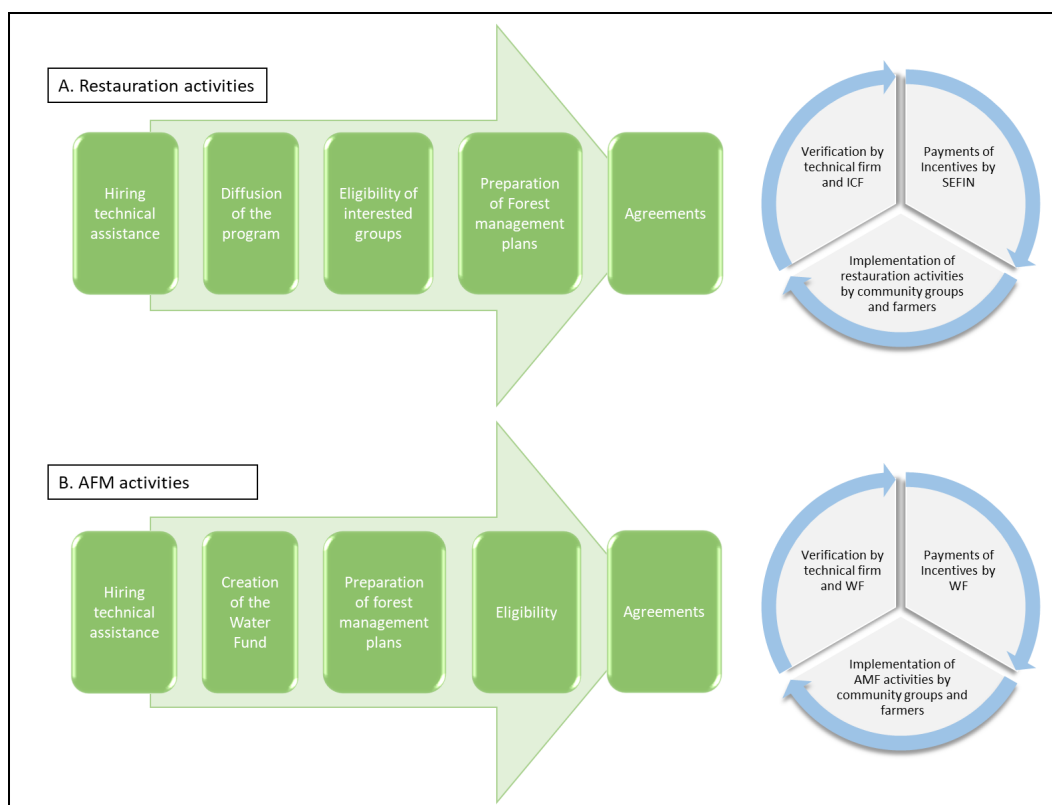
Each water council has an assembly, that select a board for a period of two years, which will be responsible of the technical decisions. The strategic decision should be supported by the assembly. Every water council will be legalized under the legal figure of association and will have specific regulations.



- f) **Preparation of forest management plans.** Preparation of forest restoration and management plans by the technical assistance firm(s) with the active participation of local forest communities and water user associations. These plans will be subject to approval by ICF.
- g) **Training of community groups.** This will focus on matters related to restoration and AFM. The training will be provided by the selected technical assistance firm(s).
- h) **Implementation arrangements for the restoration and Adaptive Forest Management activities.** Two separate agreement modalities will be used for (i) restoration and (ii) AFM activities. Agreements to implement restoration plans will be signed directly between the ICF and local community groups/individual producers. Agreements to implement AFM actions will be signed between ICF and the watershed councils once the Water Fund is created and the forest management plans are developed. The watershed council will sign agreements with community groups and individual producers to implement the AFM activities in the forest areas.
- i) **Verification:** The selected technical assistance firm(s) will verify that restoration and AFM activities were carried out in line with the forest management plans. In the case of restoration activities, once the verification is carried out, the ICF will receive the relative notification and will issue its approval to formalize the completion of the activity. In the case of AFM actions, the watershed councils will approve the actions through their technical units. ICF and watershed councils' technicians will be involved in field visits to verify the accuracy of the information provided by the technical assistance firm(s), complementing information obtained through high-resolution satellite images.
- j) **Payment of incentives.** A cash payment equivalent to the estimated value of the contribution or incentive to implement the restoration will be transferred from the government accounting system to the community groups or individual producers responsible for that activity. Once the WF is created, resources provided by GCF, the GoH and the relevant water users will be transferred to the WF for the implementation of the AFM activities. There will be separate accounts for the resources received by the three classes of finance providers (GCF, GoH, and water users/beneficiaries). Two transfers are estimated per year; once the 80% of the advanced payment has been committed, a new transfer will be carried out. The operation the WF will be in line with IDB policies and procedures, as well as with the project's Operation Manual. Table 2 in paragraph 39 3.b) summarizes the disbursement scheme between the different sources of funds. The first 3 years the disbursement of the GCF will exceed the disbursements of counterpart, a scheme designed to incentivize the creation and regulation of the Water Fund. GCF's disbursements will be linked to specific milestone to create and make the WF operational. It is projected that after the fourth-year counterpart's disbursements will exceed GCF's disbursements.

- k) Chart 8 below depicts the two different mechanisms for the transfer of incentives, one for restoration and one for AFM activities. The implementation track of restoration activities, given the emergency of the problem, will be expedited and will use the implementation structure already established locally through the SFM IDB loan. In addition to that, the mechanism to carry out AFM activities will be established and will, in the medium term, substitute the one used for the restoration activities promoting the modal shift from responsive emergency actions to a preventive forest management strategy.

Chart 8. Different mechanisms for the transfer of incentives



71. Contractual arrangements and flow of financial resources are shown in the Diagrams 3 and 4, below:

Diagram 3. Flow of Funds

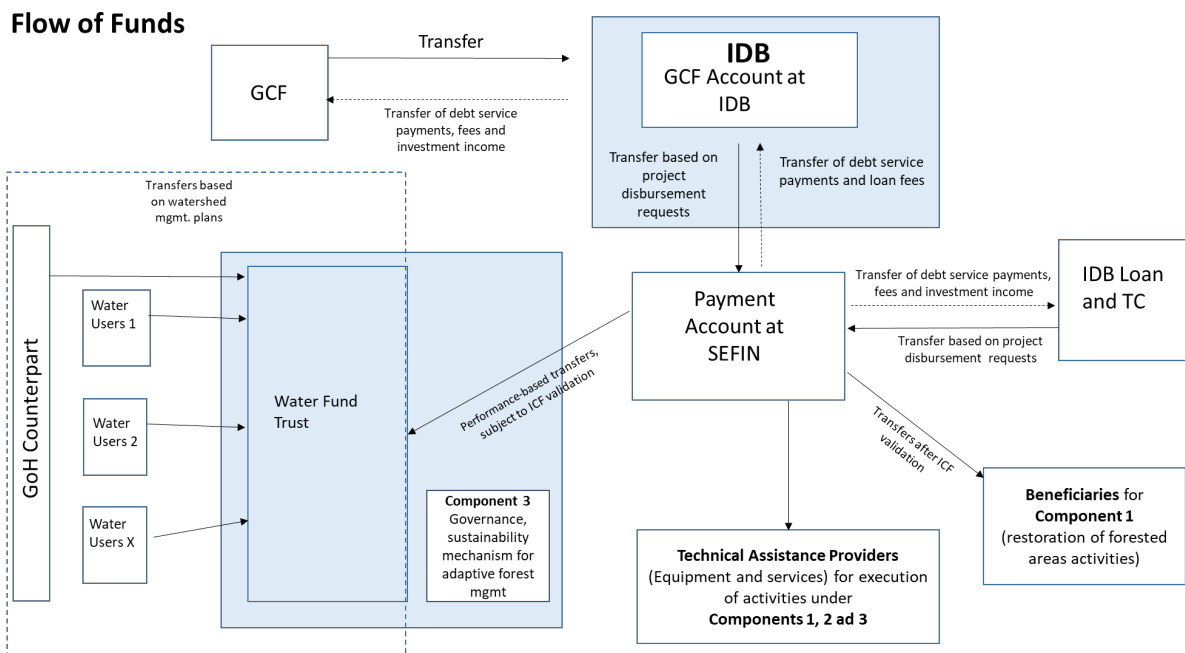
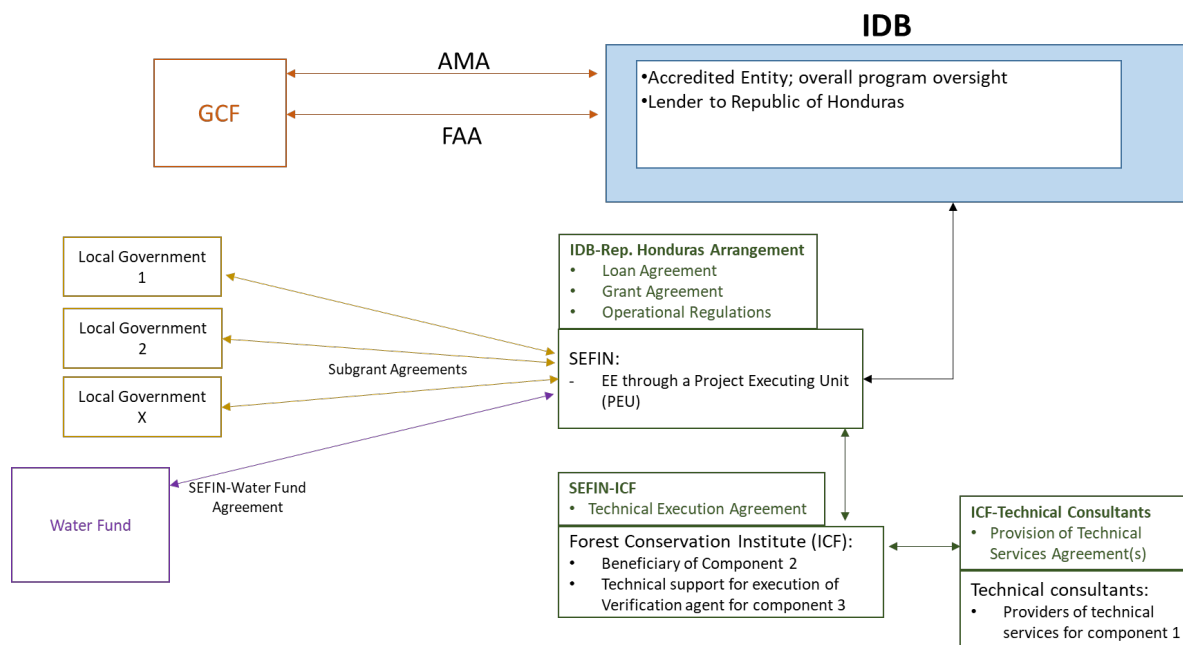


Diagram 4. Contractual Structure

### Contractual Structure



Note: Illustration of feasible arrangements that SEFIN may enter into. Not all structures may actually occur.



### C.8. Timetable of Project/Programme Implementation

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## C

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## C

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## DETAILED PROJECT / PROGRAMME DESCRIPTION

C

GREEN CLIMATE FUND FUNDING PROPOSAL | PAGE 61 OF 124

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Development of a coordinated mechanism for accessing and implementing Climate financing resources on Adaptive Forest Management (AFM).

### D.1. Value Added for GCF Involvement

72. Honduras is one of the most vulnerable countries to disasters related to climate events (Germanwatch, 2017<sup>57</sup>). According to the Economic Commission for Latin America and the Caribbean (ECLAC), during the past three decades, Honduras has had economic losses for more than USD 5.2 billion; and the country has not totally recovered from the Mitch Hurricane's devastating effects occurred 20 years ago. Climate Change scenarios forecast that these impacts will be greater if the country does not develop strong adaptation measures.
73. Honduras has a long history of bark beetle attacks, but the recent 2014-2016 event exposed the extremely high vulnerability to this plague, with climate change playing an additional exacerbating factor. Such high vulnerability is related to forests made up of predominantly old pines, without adequate forest management and lack of long-term financial mechanisms to face the recurrent costs of a sustainable management. In this context, the probability of more frequent and increasingly devastating attacks is looming in the near future of the country if no new measures and policies are adopted.
74. Currently, Honduras' fiscal situation does not allow, so far, allocating additional resources to those set aside for bark beetle control and forest restoration, which represent around USD30 million. Due to the scale and urgency of the problem, additional concessional resources are needed to guarantee the adoption of appropriate measures towards forest adaptation and increasing people resilience to climate change. Within this context, GCF resources are key to extend the intervention area, and to assuring a long-term climate change adaptation approach, with paradigm shifts that will assure water protection in the region in which lives most of the country's population.
75. Considering climate change scenarios, GCF resources are vital to produce a paradigm shift towards a preventive forest management model and more resilient forests. Those climate change scenarios were not considered in the design of the SFM program, so the financing of GCF is critical to incorporate the perspective of climate change in SFM actions and to incorporate new actions required for a paradigm shift to Adaptive Forest Management, for an effective adaptation to climate change. GCF involvement will allow creating a sustainable financial mechanism that guarantees a flow of resources to finance adaptive forest management actions, contributing conclusively to increase Honduras resilience to Climate Change and to promote low-carbon development.
76. GFC involvement is critical to generate the paradigm shift required to increase the resilience of the pine forest and reduce the vulnerability of the local communities to climate change. For instance, in component 1 the proposed

GFC funding will attend areas that could not be covered by the SMF project. If these areas are not attended, there is a higher risk of losing a large part of potential gains due to a persistent high susceptibility to future and more aggressive bark beetle infestations. Likewise, by triggering a PES mechanism to finance maintenance of good forest practices and more diversified landscape (component 3), GFC funds will assure the financial sustainability of a more decentralized and efficient forest management system in Honduras, one that will be less prone to lack of human and financial resources to face future bark attacks under increasingly challenging climate conditions.

77. The problem which the project aims to handle has a clear climate origin and, therefore generates significant inputs within the GCF outcome framework regarding adaptation and mitigation. At the same time, it creates important co-benefits for the most vulnerable and poor population in the country.

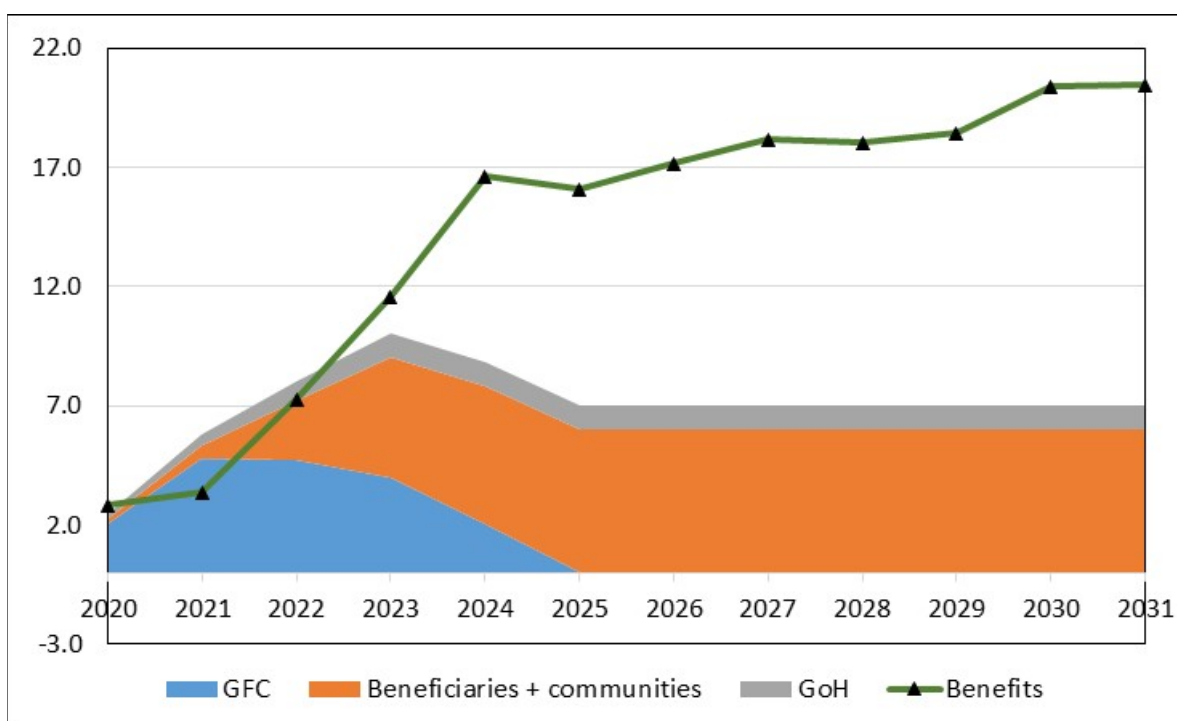
## D.2. Exit Strategy

78. The exit strategy of the project rests on the creation of a long-term funding system based on payment for ecosystem services linked to the expected flow of benefits from the interventions, which will enable the sustainable implementation of a participatory management system for the landscape and users which are providers of such services.
79. A payment system for ecosystem service based on a series of strong governance arrangements and on a Water Fund (WF) will be created under Component 3 of the Project. In the first phase, this fund will reach prioritized watersheds, so the model may be later replicated in other water production areas nationwide.
80. GCF's "conditional grant" resources will allow covering the temporary gap between the current situation and the future scenario, in which the Government of Honduras and water users' contributions (cities, energy firms, irrigation users, etc.) will be combined in order to cover the 100% of the necessary funds that guarantees climate change resilience of forests located in water production watersheds. The contribution of the government represents only 18% of the annual cost of the sustainable forest management in the area of intervention, so only a small part of the payments depends on the resources provide by the central government. The funds of the central government are relevant specially because they represent a cross-subsidy to compensate the availability of resources for the PES in the watersheds where the total population is small in relation with the forest to manage. Those funds will come from environmental

<sup>57</sup> Eckstein, D., Künzle, V. and Schäfer, L. 2017. "Global Climate Risk Index. Who Suffers Most From Extreme Weather Events? Weather-related Loss Events in 2016 and 1997 to 2016." Briefing Paper. Germanwatch e.V. 36 pp. Downloaded from <https://germanwatch.org/de/14638>.

taxes, as the “ecotasa”, a tax to the importation of secondhand vehicles. This intervention of the government contributes to the equality of the model and to promote a sustainable forest management based on the prevention that is most cost effective from a government perspective. The expected flow of benefits (see Annex of economic feasibility) will be correlated to project disbursements and a PES mechanism according to the following scheme, Chat 9.

Chart 9. Flows of Expected Benefits and Financing Forecast of the PES in US\$ million



81. As benefits start to kick off in year 3 (2021) of the intervention, a PES mechanism with additional GoH funds start financing operational and maintenance costs of the intervention, so a gradual transition is set out to gradually reduce GCF resources. The disbursement will be conditioned on gradual increase of government and users' contributions until the expected scenario is achieved in the last year of the project, when GCF contribution is removed and an equal annual contribution is achieved through the GoH, water beneficiaries and in-kind contributions of the communities located in forest areas. Chart 9 shows the financing forecast of the PES funds created by the project. The model suggests a constant funding from the central government, while beneficiaries of each ecosystem service at each district increase their contribution. Financial forecasts have been carried out based on expected

benefits and current and potential contributions to be made by water beneficiaries in each district; therefore, the model is considered feasible, with similar contributions to those identified in current small-scale Honduran experiences. Approximately USD1.5 will be required monthly from each water beneficiary to create a sustainable system. This amount lies within the existing willingness to pay in the intervention area<sup>58</sup>. Therefore, GCF contributions through the results-based payments mechanism at the beginning of the project are crucial in order to create incentives for the creation of water funds by water beneficiaries.

82. For a long-term success, the project will carry out important actions for capacity building at institutional and human level to enable an efficient participatory governance. At the end of the project's disbursement period the participatory governance mechanism will be sustainable, producing a significant paradigm shift in forest management.

Baseline and future projections regarding the economic schemes of the WF applied to each of the selected basins for a period of 10yrs is described in Annex "**Water Fund rationality and description**"

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<sup>58</sup> Studies of willingness to pay have been examined for rural users and, for Tegucigalpa in particular, there is information of willingness to pay for the access to water considering the level of poverty and hours of service. The PES model has used very conservative values.

## E.1. Impact Potential

**Potential of the project/programme to contribute to the achievement of the Fund's objectives and result areas**

### E.1.1. Mitigation / adaptation impact potential

***Specify the mitigation and/or adaptation impact, taking into account the relevant and applicable sub-criteria and assessment factors in the Fund's investment framework.***

***When applicable, specify the degree to which the project/programme avoids lock-in of long-lived, high emission or climate-vulnerable infrastructure.***

#### Mitigation impacts

83. The Project will contribute significantly to the reduction of emissions, with an estimated volume of 10.5 M Ton CO<sub>2</sub>e, equivalent to some 350,000 Ton CO<sub>2</sub>e per year (during 30 year, 2020-2050), product of both the recovery of areas affected by the Pine bark beetle (which would be lost in the absence of the project), as well as for avoided deforestation in areas that will be subject to change of use in the future.
84. In terms of contribution to the NDC, the project contributes with 82,000 Ha of restored forest or about 8% of the 2030 goal of one million hectares of forest restoration presented by the GoH to the UNFCCC. The implementation of agroforestry systems will also have a contribution, although less, in the reduction of emissions, and above all its impact will be in its buffering function to reduce pressure for land use change of forests. These mitigation impacts will increase over time due to the payment program for ecosystem services, which will allow restoring other areas in the future.

#### Adaptation impacts

85. The most significant impacts of the Project are expected in adaptation. The area to be intervened is extremely critical to ensure the provision of water to most of the population of Honduras, and that hosts critical storage infrastructure and water supply for electricity generation, agriculture and human consumption. The area already has problems of water deficit, and the climate change scenarios project that this situation will become more critical when combining the effect of temperature increase and reduction of precipitation, with social factors such as population growth and poverty. In the situation without project, it is estimated that by 2050, 84,402 Ha. will be lost in the project area due to highly likely beetle attacks and the expected associated changes in land use.

Coniferous forests in Honduras have always been and should continue to be dominated by native pine species, particularly *Pinus ocarpa*. However, experience has repeatedly shown that pure pine stands over extensive areas, particularly dense, unmanaged stands of older pines, are susceptible to periodic bark beetle



outbreaks (Fettig et al. 2007<sup>59</sup>). This natural pine ecosystem should be maintained but any modification to increase species diversity (i.e.: diversity in species and age composition), in association with sound forest management (i.e.: periodic thinning's) will render native ecosystems more resilient to climate change and less susceptible to beetle outbreaks.

With the implementation of the project (restoration, AS and AFM), the expected losses in the project area will decrease to 14,376 Ha, with an avoided loss of 70,026 Ha. in forest. These interventions will also allow diversification of livelihoods for forest users due to introduction of other high value species and due to expanded agroforestry systems mainly associating trees with special under shade coffee plantations.

86. About 450,000 people (5% of Honduras total population and 16% of Central Area in 2018). will benefit from the project, by improving their resilience to water supply, especially during times of water stress.
87. Other additional benefits will be the reduction of diseases linked to lack of water access; poverty reduction in intervened watersheds with payments for ecosystem services; strengthening of local governments and the improvement of access to information that prevents potential impacts of phenomena.

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<sup>59</sup> Fettig, C. J., Klepzig, K. D., Billings, R. F., Munson, A. S., Nebeker, T. E, Negron, J. F. and Nowak, J. T. 2007. The effectiveness of vegetation management practices for prevention and control of bark beetle infestations in coniferous forests of the western and southern United States. Forest ecology and management. 238(1-3): 24-53

E.1.2. Key impact potential indicator			
<b>Provide specific numerical values for the indicators below.</b>			
	Number of males and female headed households benefiting from the adoption of diversified, climate resilient forestry and agroforestry livelihood options	Total	27,000
		Percentage of population in poverty (%)	
	Number of males and females with year- round access to reliable and safe water supply despite climate shocks and stresses	Total	450,000
		Percentage of population (%)	4.8% of total population (2018) 16% of Central Honduras population (2018)
	Ha of forestry and agroforestry ecosystems protected and strengthened in response to climate variability and change	Total	270,000 Ha
		Percentage (%)	
	tCO2e reduced from forest/land use	Annual	350,000 tCO2e
		Lifetime	10.5 million tCO2e (during 30 year, 2020-2050)
Other relevant indicators			
<p><b>Describe the detailed methodology used for calculating the indicators above.</b></p> <p><b>Describe how the project/programme's indicator values compare to the appropriate benchmarks (i.e. the indicator values for a similar project/programme in a comparable context).</b></p> <p>88. For the <b>emission</b> reductions calculation, project impacts in restored and AFM areas were taken into account. Forest losses were compared in the situation without project (84,400 Ha) and with project (14,400 Ha) to determine the total area of avoided forest loss (70,026 Ha). This avoided loss area was multiplied by the mean CO2e per Ha from the Honduras' national reference emissions levels</p>			

(150 tCO<sub>2</sub>/Ha), in order to obtain the total emissions avoided (10.5 M tCO<sub>2</sub>e). For annual estimation of avoided emissions this total divided by 30 years (2020-2050).

89. To estimate the project's **direct beneficiaries**, records from forest organizations, cooperatives, water committees, and users of private ICF forests were used, as well as the average area of forest managed by organization/user type in each department. Based on these averages, the number of direct beneficiaries was forecast according to the intervention area expected in each department by intervention type. The ratio of males/females in the ICF organization record was used for gender classification. For the total number of members of beneficiary families, a four-member size family per home, two males and two females, was used as average. It is estimated that 27,000 farmer households will be direct beneficiaries of the project, of which 6,000 will be women. These beneficiaries are mostly participants in ICF's agroforestry and micro-basin organizations.
90. For indirect beneficiaries, Honduras population was projected for year 2018 (based on the annual rate of population change by municipality between the two censuses, 2001 and 2013). Using the annual average of water expected to be produced by the project (32 million m<sup>3</sup>), the annual average demand that such amount may cover was estimated based on a daily consumption of 200 liter per person. That is the equivalent of fulfilling the population demand of 450,000 individuals within the scope of the project intervention. This population is equal to the 4.8% of the national population and the 16.5% of the population within the intervention area (data from 2018).

## E.2. Paradigm Shift Potential

Degree to which the proposed activity can catalyze impact beyond a one-off project/programme investment

### E.2.1. Potential for scaling up and replication

#### *Innovation.*

91. The project promotes an innovative forest management model, preventive, decentralized, and participatory, which is more efficient and sustainable for Honduras than a more reactive and excessively centralized model. On the other hand, it proposes the incorporation of innovative technologies for the forest monitoring system and early alert of beetle outbreaks by using applications that facilitate the participatory monitoring and the use of high-resolution satellite images to reduce costs of field verification. The existing system is described under C.3.

*Level of contributions to global low-carbon development pathways, consistent with a temperature increase of less than 2 degrees Celsius.*

92. The project will allow the development of a model to address the main cause of GHG emissions in Honduras, which is the land use change, through pine forest management of approximately 270,000 Ha in process of land use change, and which would represent the emissions reduction of about 10.5 million tCO<sub>2</sub>e. (avoided forest loss of 70,026 Ha). Therefore, the project will contribute with a low-carbon global development model.

*Potential for expanding the scale and impact of the proposed programme or project (scalability).*

93. The geographic scope of the project may be extended to include a larger forest area and a greater number of beneficiaries (owners of private forests; community managers of public forests; natural protected areas) as the incorporation of ecosystem service users and the fund capitalization progress.
94. Even though the restoration and management cost per hectare will not be modified in the expansion of the model to other geographic areas, the technical assistance costs will decrease, since ICF will have improved capacities for this. Also, the regulation model for Local Fund for Water Management may be replicated. On the other hand, the model will allow the optimization of Central Government resources for the Adaptive Forest Management. Currently, the Central Government must finance all the emergencies in public and private forest areas, while with the new model, beneficiaries of Payments for Ecosystem Services-PES will co-finance the forest management.
95. This project covers the 10% of the area affected by the Pine bark beetle outbreak; therefore, it may be replicated in other areas and watersheds, using as learned lessons coming from the monitoring system of the project. As well, the PES system and the administrative and operating structures that will be set for its implementation may be used as model for replication. In addition, the 1,000,000 Ha forest restoration commitment by the Government of Honduras by 2030 as part of its NDC, will favor the replication of the model in other areas in Honduras.

*Potential for exporting key structural elements of the proposed programme or project elsewhere within the same sector as well as to other sectors, regions or countries.*

96. Several countries in the region have defined forest restoration areas as part of their NDCs. For this, innovative financing mechanisms are required, taking into account climate change effects. In this sense, this WF model associated to water, along with the central government contributions, is a model that may be shared to other countries in the region. IDB has regional dialogue spaces on climate change, where good experiences are exchanged among countries, so these may be used to disseminate this experience.

Project accomplishments will serve as a model for application in neighboring countries with similar pine forest ecosystems and pine beetle pests (i.e., Guatemala, Nicaragua, El Salvador and Belize). To facilitate technology transfer, the existing network of forest pest specialists in these countries should be supported financially and trained in improved methods of early alert, prevention and suppression of pine bark beetles. The principal forest pest specialist in each of the five CA countries with pine bark beetle problems should be provided financial resources needed to meet at least once annually. These meetings will serve to share information on current pest conditions and successful practices to manage pine bark beetles and other forest pests. It is estimated that a budget for such activities would total \$10,000 per country, or a total of \$50,000 (including Honduras). This cost will be integrated under the line "Research on plagues and forest diseases, sustainable forest management and species resilient to CC fulfilled and validated" of the budget.

97. The proposed project has promising potential for increasing knowledge about the complex relationship between climate change and the resilience/vulnerability of populations highly dependent on environmental resources like the one in the project's area. A very important issue related to this is the dynamics of so called "environmental migration", a situation where part of or entire communities cannot sustain their main economic activities due to environmental degradation, and are forced to emigrate, most likely in a permanent fashion. If this project is successful, it is expected that less migration of this type will occur versus similar areas without project.
98. There are also key lessons to be learned about how to manage and control a devastating plague like the pine-bark beetle in a context of high vulnerability of people living near the forest areas. This is especially important for other Central American countries like Guatemala, Belize and Nicaragua, that also have regular outbreaks of this plague under similar conditions. The paradigm shift seek by the project will be tested as an innovative and potentially scalable model for plague control and sustainable forest management in a context of climate change in developing countries.

In the early 2000s, a network of forest pest specialists was created, and this group met to share experiences with pine bark beetle prevention and control practices. Since then, this group has met infrequently, and the personnel involved have changed in most countries. The GCF project will provide the opportunity and resources to recreate this group of specialists as the preferred method for transferring pest management information among countries.

### **E.2.2. Potential for knowledge and learning**

99. In operational terms component 2 considers relevant activities to strengthen knowledge, group learning processes and institutions. It is foreseen to strengthen ICF capacities to foster AFM and pest control through a certification course to train 60 technicians nationwide. Thus, ICF will train 240 technicians on AFL and forest health control, including municipal and private technicians. In addition, it is expected--under IDB finance-- that universities will develop research on AFM and forest health control, which will be disseminated nationwide and internationally, and will considerably broaden the knowledge on the matter.
100. Additionally, the project has a Monitoring and Evaluation System that considers carrying out an intermediate and final evaluation, as well as an impact assessment. The evaluation system will generate useful data to analyze specific issues of the project, but also for assessing larger questions about changes in resilience/vulnerability of environmentally dependent local communities to climate change. These documents will be thoroughly disseminated nationwide and workshops will be carried out to publish the outcomes, contributing to expand national knowledge on matters of adaptive forest management.
101. Finally, research outcomes and documents developed from the monitoring and evaluation system will be disseminated in the region through regional dialogue on climate change. The GFC project will be developed in a context in which a new regional strategy for forest health management has been recently launched by the Central American Commission for Environment and Development (CCAD, 2017). Under this regional initiative, the experiences, research and lessons from forest management from Honduras and other Central American countries will be shared as knowledge and information exchange are a cornerstone of this renewed strategy proposed for the 2016-2026 period.



### E.2.3. Contribution to the creation of an enabling environment

102. The overall project is focused on creating an “enabling environment” to handle the various barriers identified for the adaptive and sustainable management of forest: a) lack of technical assistance and incentives to apply AFM by forest users, b) cultural barriers, lack of technical assistance and incentives for the adoption of agroforestry systems (AS) to adapt to climate change, and c) forest governance weakness and lack of financial mechanisms in the long term.
103. **Creating an “enabling environment” to overcome the gap on lack of technical assistance.** The project is strongly focused on capacity-building of local actors (communities, local governments -municipalities-, private sector) for AFM. It also considers the development of a technical assistance scheme that enables such actors to acquire abilities on AFM and agroforestry systems, as well as knowledge on forest law requirements. Institutionally, the Ministry of Finance - SEFIN - and the Institute for Conservation and Forest - ICF -, will build capacities to implement an incentive scheme for local groups, supporting the decentralization of preventive forest management to make them more resilient to climate change, and responding rapidly and efficiently to future Pine bark beetle attacks, protecting the key water supply. In terms of capacity-building, the project will collaborate with the academia for the implementation of a certification course on forest health.
104. ICF will develop an innovative and comprehensive Early Warning System that permits early anticipation (months, years) of conditions that favor plague attacks, including new climate change scenarios considerations. The use of climate scenarios and high-resolution satellite images for forecasts will allow a significant raise of reliability on the alert system.
105. This system will also include a strong dissemination mechanism towards different type of users (forest management communities, local governments, public sector, private sector, etc.) to share useful and opportune information using mobile applications (apps), so they may develop preventive actions. Improving institutional capacities for developing this type of information and user’s capacity-building for its access and interpretation will allow a considerable reduction of plague impacts in water production and lower costs for the Central Government.

106. Another important element to develop an enabling environment is the availability of forest technology packages adjusted to new climate conditions. In this sense, the project will be focused on providing forestry and agroforestry producers with good techniques and practices adjusted to new climate scenarios; therefore, resources will be invested in capacity-building at professional, technical, and operating fields in order to change the country's forest culture in the long term.
107. Through this project, a new integration model will be developed at basin level which will enable producers of forest goods and services benefit from foreseeable financing funds coming from downstream users of these services.
108. The project will promote the decentralization of forest management with an increasing participation of municipalities, water committees, non-governmental organizations, private sector, and local communities. In this way, efforts and resources will be set aside for building and strengthening institutional capacities of these actors to provide them with technical and administrative capacities to perform an efficient management of natural and financial resources in the long-term.
109. Information and education campaigns will be developed to raise awareness among environmental services' beneficiaries regarding the importance of preserving water sources based on forest and agroforestry management strategies that allow adapting to climate change effects. In addition to the expected impact in terms of adaptation to climate change of the Honduran population by reinforcing the resilience of their water, energy and food security production systems, it is expected a variety of economic, social, and ecological benefits to support producers in poverty situations.

#### **E.2.4. Contribution to regulatory framework and policies**

110. The existing Forestry Law and other policy instruments are aimed to foster local participation, as well as the economic incentives and valuation of forest goods and services. To date, these policy instruments have not been implemented and the Government has a very centralized approach for the forest management which limits an effective implementation of AFM, causing less resilient forests towards climate change.
111. The project will strengthen a participatory and decentralized governance scheme for the AFM. It will implement actions established in the existing Forest Law which empower regional/local governments regarding territorial management and technical assistance for the prevention of and response to forest fires and plague events. This implies putting the existing legal framework into operation to inclusively implement necessary changes to remove bureaucratic obstacles to AFM in the country.
112. On the other hand, the implementation of a PES system will contribute the operationalization of the recently approved ecosystem service regulation, and to implement an instrument which has had some attempts to carry through.
113. The project also contributes directly to Honduras' NDC by supporting almost 25% of forest restoration goals, as well as the National Development Plan which also includes forest restoration as a strategic line, the REDD+ National Strategy and the National Climate Change Policy and Law.
114. This experience can be scaled to other territories or other Central American countries with similar conditions and threats. As previously explained, the project suggests recovering approximately 10% of the affected area by the pine beetle; therefore, this experience may be scaled to other Honduran territories by using the sustainability scheme proposed. In addition, biophysical and climate conditions where the project is focused on are present in approximately 40% of the Central American region (the so-called Dry Corridor), thus, this experience may build knowledge in all the region.
115. The project provides a very important input to improve climate resilience for water safety in Honduras, especially in the area that gathers most part of the population, important productive activities and infrastructure for hydropower generation. Guaranteeing water safety is certainly the most important matter for Honduras climate adaptation; therefore, the input of this project is highly important for several sectors in the national adaptation agenda, which is also included in the National Adaptation Plan.

### E.3. Sustainable Development Potential

#### Wider benefits and priorities

##### E.3.1. Environmental, social and economic co-benefits, including gender-sensitive development impact

116. Besides the expected benefits regarding adaptation and mitigation to climate change, a variety of economic, social, and ecological benefits aligned with the Agenda 2030 targets for sustainable development are also expected.
117. At economic level, it is estimated that restoration, agroforestry, and AFM activities will create direct impacts regarding the increase of forestry and agroforestry yield that would be positively evidenced in more livelihood diversification at community level, and also with impacts on GDP and trade balance of forestry and agroforestry related products like coffee.
118. In the mid-term, in prioritized basin, income for residents will increase due the use of wood, firewood, tree-resin, and agricultural products, thus creating sustainable and more diversified sources of income. In a longer timeframe, potential benefits will be associated to the increase of the forest resilience and agriculture and livestock productive systems. At the same time, this will reduce economic losses, as well as costs for disaster handling and plague control, reducing the impact on public finances.
119. It is important to mention the possibility to reduce costs and negative effects in the operation and lifetime of the infrastructure for irrigation, safe water, and hydropower generation. These benefits are associated to a better availability of flow and quality of water. The sustainable management of the vegetal cover and the land conservation influence to reduce erosion, lessening the dragging of sediment and suspended particles which means a better water quality.
120. For power generating companies, a poor quality of water generates pollution of reservoirs and of water-piping infrastructure, as well as damage to the hydroelectric turbines. Both aspects create over costs due to dredging and cleaning work, and down time that reduces the power generation, which forces resorting to stationary engines which increases GHG emissions and reduces the mitigation potential of the hydroelectric plant. In the case of irrigation dams, the impact is similar as the same clogging effect is caused. In the case of water and sanitation companies, the costs for water purification before distribution are also added to the abovementioned impacts, because they raise according to the increase of sedimentary load and associated expenditures in flocculants.
121. In social terms, the benefits will be: (i) strengthening capacities of community forest cooperatives and other social organizations involved in the project implementation. These actors will benefit from knowledge acquired on good practices for sustainable forest, water, and land management; (ii) capacity-

- building with gender considerations for the population, especially the youth sector that will find a dignified livelihood in the forest and agroforestry management. The project includes a gender equality plan; (iii) creation of local employments for semi-trained and trained workforce; and, (iv) an increasing empowerment of local communities responsible for the sustainable management of natural resources, which will be also in better conditions to engage dialogue with the Government.
122. At environmental level, the operation will contribute to the goals of the Convention Biological Diversity Strategy and Action Plan from Honduras (goal 8: strengthen inter-institutional coordination with the climate change agenda and guarantee socio-economic sustainability of the population that lives ecosystems vulnerable to climate change) through the recovery of natural habitats, which will enable biodiversity conservation at different levels, from landscapes, population, and species to genetic background. Additionally, the project contributes to the Sendai Framework, through component 2, by increasing disaster preparedness in order to provide an effective response and to rebuild better, in this case, associated with the loss of forest due to the plague and its impact on availability of water.
  123. The productivity increases through the development of agroforestry activities. Adapting to climate change scenarios will help reducing pressure on forests towards change of land use.
  124. It is demonstrated that crops adapted to shade, such as coffee and cacao plantations, benefit from multiple existing ecological services in wooded landscapes (as shown by Jagoret et al., 2014a<sup>60</sup> and Tscharntke et al., 2005<sup>61</sup>). Appropriate agroforestry productive models, which adapt better to climate change than agricultural and livestock models due to their species diversity and stratum complexity, will create better yields and motivate other producers to adopt and maintain the association of crops with trees.

<sup>60</sup> Jagoret, P., Kwessey, J., Messie, C., Michel-Dounias, I. and Malézieux, E. 2014a. Farmers' assessment of the use value of agrobiodiversity in complex cocoa agroforestry systems in central Cameroon. *Agrofor Syst* 88(6):983–1000. <https://doi.org/10.1007/s10457-014-9698-1>

<sup>61</sup> Tscharntke, T., Klein, A. M., Kruess, A., Steffan-Dewenter, I. and Thies, C. 2005. Landscape perspectives on agricultural intensification and biodiversity – ecosystem service management. *Ecology Letters* 8(8):857-874. <https://doi.org/10.1111/j.1461-0248.2005.00782.x>

#### E.4. Needs of the Recipient

##### Vulnerability and financing needs of the beneficiary country and population

###### E.4.1. Vulnerability of country and beneficiary groups

125. One of the most important dimensions of Honduras' high climate vulnerability is related to the scarce access to water and its relationship with the forest as source of water regulation service. More specifically, the population located in the 29 sub-basins prioritized for this project (2.7 million people) has a high vulnerability due limited access to water for human consumption, especially during the dry season from January to May.
126. In Tegucigalpa city, population segments in poverty conditions are the ones who suffer most from these limitations. (González, 2011<sup>62</sup>) The average cost of water rationing per household in Tegucigalpa is US\$17 per month, equivalent to 18% of total monthly income of families in the poorest quintile, and the 8% of the second poorest quintile (Source: National Survey on Multiple Purposes 2016, INE). These percentages are very high and indicate a high economic and social vulnerability in water access for large and vulnerable population sectors.
127. Low access to water aggravates health problems, especially in the poorest segments of the population, as they assume a high cost of rationing and sickness. Diseases associated to the lack of water and sanitation (diarrhea, Hepatitis A, Hepatitis B, Schistosomiasis, and Malaria) not only increase families' expense in health but also affect their economic income due to less working hours and loss of children schooling because of lower attendance.
128. The project is intended to reduce vulnerability of the population regarding access to water, which will be aggravated by climate change and the growing forests loss in the upper part of the basins, impacting the ecosystem service of water regulation for the middle and lower zones. Forest restoration and protection in the project areas will increase the available water supply during critical dry months.
129. The project if a complement and has synergies with the IADB SMF project, supporting a long-term approach to sustainable forest management. By triggering a sustainable PES mechanism to finance maintenance of good forest practices and more diversified landscapes, GFC funds will assure the financial sustainability of a more decentralized and efficient forest management system in Honduras.

<sup>62</sup> González, L. M. 2011. "Economic and Financial Analysis on the Current Situation of Public Services in Tegucigalpa. Water and Sewage System, Solid Waste, and Drainage System". Consultancy for the IDB. Final Report. March, 2011.



E.4.2. Financial, economic, social and institutional needs

130. Honduras is still a majority poor country and has the highest poverty rate in Central America: 63% in 2014, greater than 59% in Guatemala for the same year and very far from 22% in Costa Rica<sup>63</sup>. According to ECLAC, during the past three decades Honduras has had losses for more than USD 5.2 billion due to adverse climate events; and the country has not yet been able to totally recover from Mitch Hurricane' devastating effects occurred 20 years ago.
131. In the last years, the GoH has been making important efforts to reduce its fiscal deficit, which rose to a critical 7.1% of the GDP in 2013. For 2016, the country reduced it to 0.5% of the GDP, a very important recovery<sup>64</sup>. Although this performance has been positive for the country's economic stability, it has also implied restrictions of investment for climate change programs and projects and sustainable management of natural resources, such as forests and water. Therefore, despite recent efforts indicated in section D.1 (USD30 million to fight and control the pine beetle outbreak) public investment aimed directly at climate change projects has not exceeded 0.85% of the annual expense in public investment from 2015 to 2017: USD5 million in 2015 and USD 6.1 million in 2016, achieving only USD4.8 million in 2017 (for 2018, a slight recovery of USD7.3 million is expected due to the beginning of the SFM project co-financed by IDB).
132. Altogether, and due the big scale of the challenges, the public investment expense aimed at climate change is still very low in Honduras, and the country faces difficulties to increase it in the context of fiscal adjustments and the growing pressure on public budget for more basic needs of infrastructure, education, health, and higher social program expenses. These conditions imply that the country cannot handle, at least in the short term, the increasing needs of financial resources for projects and programs on adaptation and mitigation towards climate change.
133. Due to the magnitude of the adaptive forest management problem, Honduras does not have the capacity of solving this only with own funds. In fact, it has requested a USD25 million loan from IDB to restore 40,000 Ha of affected areas. This loan joins investments with public resources for more than USD26 million to control the infestation. The country has made efforts despite the resource limitations, sacrificing other investment needs. These interventions have had an "emergency response" status to prevent greater infestation impacts and their immediate consequences (forest fires, massive land use change, significant decrease in water supply).

<sup>63</sup> Poverty rate based on official poverty lines of each country. Source: World Bank at <https://datos.bancomundial.org/>

<sup>64</sup> SEFIN. 2017. "Institutional Memory of the Secretariat of Finance 2016". Memory submitted to the National Congress of Honduras. Tegucigalpa: SEFIN. 153 p.

## E.5. Country Ownership

Beneficiary country (ies) ownership of, and capacity to implement, a funded project or programme

### E.5.1. Existence of a national climate strategy and coherence with existing plans and policies, including NAMAs, NAPAs and NAPs

134. Honduras has already a climate change regulatory framework which includes the **Climate Change Law** (Decree 297-2013) that establishes “*principles and regulations necessary to plan, prevent and respond in an appropriate, coordinated and sustained manner, to climate change impacts in the country*”. Also, the **National Climate Change Strategy (NCCS)** through which the country seeks achieving “*low climate vulnerability levels to control and minimize negative climate change impacts*”. The strategy prioritizes seven sectors: **water resources, agriculture, lands, food safety, forests, and biodiversity**, coastal-marine systems, human health, risk management, and hydropower energy. Fifteen out of the seventeen strategic targets are focused on increasing adaptation capacities.
135. In line with the NCCS, the **National Determined Contribution (NDC)** establishes that **climate change adaptation is priority** for Honduras. Nevertheless, the country commits itself also to GHG emission reductions of about 15% regarding the *Business as Usual* (BAU) scenario from 2012 to 2030. **The commitment also includes afforestation and reforestation of one million Ha by 2030** and the target to reduce 39% of wood consumption in households through the NAMA of firewood clean cook stoves. As for adaptation, NDC prioritizes two sectors identified in the NCCS: agrifood and coastal-marine. With GCF resources, this project will contribute with approximately 25% of the restoration target set out in Honduras’ NDC.
136. This project proposal to the GCF is consistent with national development policies such as the National Vision 2038 and National Plan 2022. It is also well aligned to the Climate Change Law, the National Climate Change Strategy and the National Determined Contribution (NDC). The project will cover the seven NCCS’ prioritized sectors: **water resources, agriculture, lands, food safety, forests, and biodiversity**; it will contribute to fulfill NDC reforestation targets and the commitment to emission reductions goals, emphasizing the priority for climate change adaptation. In addition, it is well aligned to the implementation of the Forest, Protected Areas, and Wildlife Law, the Water, Forest and Land Master Plan, and the National REDD+ Strategy. There are currently several financing initiatives in the forestry sector in Honduras, including the UN-REDD Program and the Forest Carbon Partnership Facility, which finance the preparation of the National REDD + Strategy; Honduras has presented its mid-term report on this strategy, which establishes within its strategic options the restoration and integral management of watersheds, to which this proposal contributes directly in the implementation of these options in 270,000 Ha (5% of the Honduras forest), as

well as the application of Monitoring, Reporting and Verification and Safeguards. This proposal is also built on actions that have developed recent programs such as the Program for Adaptation to Climate Change in the Forest Sector -CLIFOR- and the Modernization Project for the Forest Sector of Honduras -MOSEF- financed by the European Union.

#### E.5.2. Capacity of accredited entities and executing entities to deliver

137. The **Inter-American Development Bank (IDB)** is the entity accredited by the GCF that will act as the delivery partner for the implementation of this project. IDB has more than fifty years of experience in developing projects in different sectors in Latin America. Regarding climate change, the Bank currently supports several countries in the region with the implementation of climate finance mechanisms such as the Green Climate Fund (GCF), the Forest Carbon Partnership Facility (FCPF), Climate Investment Fund (CIF), NAMA Facility and SECCI Fund (IDB Sustainable Energy and Climate Change Initiative). In Honduras, IDB funds and supervise the “Sustainable Forest Management - SFM” project through a \$25 million dollars loan, which execution has already begun.
138. IDB’s support to the Government of Honduras is fundamental for achieving the operational goals. It is important to emphasize that IDB fulfills monitoring roles in the SFM project. For this project operation, the Government and the IDB have agreed to apply the same administration, operation, and communication methods established for the SFM project. In this way economies of scales are better used, and financing sources are combined with the purpose of achieving more ambitious targets and impacts.
139. During the SFM project design IDB conducted an institutional capacity analysis for UAP/SEFIN (“Institutional Capacity Analysis and Proposed Implementation Arrangements for the Sustainable Forest Management Project HO-L1179”, IDB, September 2016) which covered the following dimensions: (i) **legal framework, governance, and institutional environment**. As a conclusion, it was identified that the UAP/SEFIN has the legal responsibilities related to “implementing a unique central system to execute and follow-up international cooperation programs and projects executed by SEFIN”. SEFIN has a specific legal mandate granted by the Climate Change Law for the management of programs within the Climate Change Policy; (ii) **Human resources and technical and management capacities**. The UAP/SEFIN has expertise and capacity on projects execution and management but must reinforce its technical capacity with specialized staff on the forest matter; (iii) **Project management**. Due the number of active projects, UAP needs to be strengthened with complementary personnel fully dedicated to the project, specially to fulfill roles on procurement, administrative and financial management, and monitoring and evaluation (M&E). Therefore, the program considers hiring a minimum work team: coordinator and supportive fiduciary and

procurement specialists; (iv) **Procurement management.** Procurement planning is properly carried out and includes the stages of the processes and those responsible. In the case of projects funded by IDB, staff to be hired must have experience in the Procurement Plans Execution System (*Sistema de Ejecución del Plan de Adquisiciones*, SEPA). (v) **Financial Management.** The financial management module includes all the updated budgetary regulation and documentation regarding processes.

### E.5.3. Engagement with NDAs, civil society organizations and other relevant stakeholders

140. An interinstitutional work group was established for the development of the proposal and is comprised by SEFIN, ICF, the Secretariat of Agriculture and Livestock – SAG -, MIAMBIENTE, and the Coordination Secretariat of the Presidency to prepare, review, and align the proposal with national priorities, as well as with the main policies and strategies on climate change, including NDC, REDD+ National Strategy, Climate Change Policy and Law, and the Water, Forest, and Soil Master Plan, among others. This work group developed the proposal that lead the Sustainable Forest Management Project, as well as this proposal submitted to GCF. IDB provided technical assistance and accompanied this exercise, supported by a consultant team to generate information.
141. On the other hand, during 2016, four consultation workshops were carried out within the SFM project framework in the departments of Olancho (Campamento), Francisco Morazán (Guaimaca), El Paraíso (Danli) and Comayagua (Siguatepeque). A total of 126 stakeholders participated in those workshops (97 men and 29 women). This process was reinforced in a second round carried out in May 2018, which also included new territories within the GCF proposal. The following table records the participants to this event:

Table 4. Participants in the GCF project dissemination workshop

	Females	Males	TOTAL
<b>LAUNCHING WORKSHOP (May 3)</b>			
Representatives from community organizations	0	1	1
Representatives from municipalities	6	11	17
Representatives other institutional actors	13	20	33
Press	3	13	16
Representatives project executing institutions	27	30	57
<b>SubTotal</b>	<b>49</b>	<b>75</b>	<b>124</b>
<b>REGIONAL WORKSHOPS (May 4, 7, 8, and 9)</b>			
Representatives from community organizations	26	73	99
Representatives from municipalities	23	38	61
Representatives other institutional actors	11	25	36
Representatives project executing institutions	45	58	103
<b>SubTotal</b>	<b>105</b>	<b>194</b>	<b>299</b>
<b>GENERAL TOTAL</b>	<b>154</b>	<b>269</b>	<b>423</b>

142. During these workshops, stakeholders expressed their main concerns and opinions on the project scope and situation, among which are:

- Considering the inclusion of an activity to remove the remaining dead wood in the beetle affected areas;
- Training on forest management;
- Providing resources to begin forest restoration;
- Studying how private forests lacking management plans and affected by the plague may be included;
- Simplifying the procedures to access contributions;
- Taking into account that the water deficit is more noticeable each time;
- Considering the existing of land use change in forests areas;
- Strengthening the ICF for the entitlement of lands;
- There is concern that the project might be politicized due to the mechanism for the fund and risk management of the project;
- Needs to strengthen the environmental education work in schools.

143. Several of these subjects were taken into consideration in the design of SFM and GCF proposals. The ESMP Annex includes an abstract that gathers stakeholders' proposals during the consultation process.

144. Finally, specific consultations were held with potential actors to take part within the Payment for Ecosystem Services - PES - scheme, from the Mayor's Office of Tegucigalpa, irrigation groups, administrators of El Cajón dam, local governments, and community groups. All of them agreed on the need to develop a scheme to provide financial sustainability to the management of the forest cover area in the watershed. Annex includes support letters from Mayor's Office of Tegucigalpa.
145. Annex includes a non-objection letter from the National Designated Authority - NDA - (Ministry of Energy, Natural Resources, Environment, and Mining). Such entity has participated during the proposal development and review processes, verifying its alignment with the corresponding policy and institutional frameworks described in E.5.1.

## E.6. Efficiency and Effectiveness

### Economic and, if appropriate, financial soundness of the project/programme

#### E.6.1. Cost-effectiveness and efficiency

146. Interventions proposed within the project are cost-effective. The cost of build storage infrastructure to regulate the surface flows and increase the annual water availability in 42 million M3<sup>65</sup>, instead of using the forest water regulation ecosystem service is of between \$126 million and \$168 million; \$3 to \$4 per cubic meter to be stored<sup>66</sup>, compared with the budget of \$47.2 million in forest restauration and forest management of the present project. Likewise, the cost of removing sediments from the reservoirs is estimated at \$7.5 per ton. The project has the capacity for an average sediment prevention of 0.67 million tons per year, with a potential of saving about US\$ 1.1 million per year in sediment removal costs for reservoir management entities (hydropower companies, water utilities, irrigation organizations).
147. In addition, the project is cost-effective since it is more expensive to restore a forest hectare than prevention through AMP (thinning, firebreak rounds) and an early alert system of beetle outbreaks. Restoring 1 Ha. of Pine costs \$590 in 5 years, while the preventive treatment costs \$189. In the long term, investments

<sup>65</sup> To estimate the benefits of water availability in the dry season, the project used the Curve Number from the United States Department of Agriculture, that estimates the benefits of forest restoration and reforestation in an aggregate manner, without considering differences between forest species. However, the research planned as part of the project will contribute to increase the knowledge of the contribution of different species to water infiltration

<sup>66</sup> Estimates obtained from the entity responsible of building storage systems in Honduras, Service of Aqueducts and Sewer Systems (SANNA).



on a forest resilient to climate change and bark beetle plague is more cost-effective than the need to face the restoration of an attacked forest.

148. Likewise, the project PAGRICC in Nicaragua, implemented between 2010 and 2016, has shown that the use of agroforestry systems to stop deforestation and improving the quality of the landscape in forest surroundings is cost-effective. Such project achieved increasing a 26% of the production value of agriculture and livestock per hectare for the beneficiaries (compared to the control group); and producing an increase of the forest cover of 22 plants and 3 hectares per intervened hectare (Source: Impact Assessment Report on Component 1 of the Environmental Program for Disaster Risk Management and Climate Change PAGRICC, NI-L1048, June 16, 2017, Mario González Flores).
149. The Project will support an early alert system for pine bark beetles. The prediction of future outbreaks of *Dendroctonus frontalis* will be based on monitoring pheromone-baited survey traps during peak beetle dispersal seasons, as has been successfully applied in the southern United States since 1986 (Billings and Upton 2010<sup>67</sup>). The early alert system also includes components of aerial survey using satellite imagery, weather monitoring and creation of hazard maps. Before the implementation of the project there was not an early warning system in Honduras (section C1). The program will ensure that the early alert system is installed and fully functional in the project-designated areas as a demonstration, to eventually be expanded throughout Honduras and other Central American countries.

#### E.6.2. Co-financing, leveraging and mobilized long-term investments (mitigation only)

***Please provide the co-financing ratio (total amount of co-financing divided by the Fund's investment in the project/programme) and/or the potential to catalyze indirect/long-term low emission investment.***

Please refer to [E.6.5 \(core indicator for the expected volume of finance to be leveraged\)](#).

150. The co-financing ratio is 1.26 (USD44 million / USD35 million).

IDB co-financing is represented by a loan of USD25 million and a grant of USD1.5 million. Additional USD8.76 will be provided by the Government of Honduras and by the beneficiaries of the ecosystem services, USD8.74 million in-kind contribution by the communities. Furthermore, it is expected to obtain additional USD52.5 million by payment for results under the REDD + mechanism (10.5

<sup>67</sup> Billings, R. F. and Upton, W. W. 2010. A methodology for assessing annual risk of southern pine beetle outbreaks across the southern region using pheromone traps. In Pye, J. M., Rauscher, H. M., Sands, Y., Lee, D. C. and Beatty, J. S. [eds.], *Advances in threat assessment and their application to forest and rangeland management*. USDA Forest Service Pacific Northwest Research Station, Portland, OR. Gen. Tech. Rpt. PNW-GTR-802, pp. 73-85.

million Ton CO<sub>2</sub> x USD5 / Ton CO<sub>2</sub>). The reference price for Ton CO<sub>2</sub> is that used by the Carbon Fund for REDD+.

### E.6.3. Financial viability

151. Funds allocated to IDB's Sustainable Forest Management Project (SFM, HO-L1179) have already been assessed regarding its economic and financial viability ([Navarro et al. 2016](#)). The cost-benefit or profitability analysis was carried out through three indicators: Net Present Value (NPV), Internal Rate of Return (IRR), and Cost-Benefit Ratio (CBR). For Component 1 of the SFM (public forest restoration), the IRR in the base scenario rose to 15%, with a cost-benefit ratio of 1.28. In the case of Component 2 aimed to strengthening forest health warning system, the estimated IRR was 156%, with a cost-benefit ratio of 2.39. Jointly, the ex-ante economic assessment of the SFM displayed positive figures regarding economic profitability and viability.
152. For this proposal to the GCF, a new economic assessment was developed based on new components to be funded (restoration of private forests, agroforestry systems - AS -, and adaptive forest management - AFM). The amounts considered to be invested in the proposed project by components are the following.

Table 5. Investment on GCF project (USD)

	GCF	IDB	GoH/Others	TOTAL
C1	11,018,000	19,400,000	0	30,418,000
C2	0	3,100,000	0	3,100,000
C3	22,840,000	2,210,000	17,500,000	42,550,000
C4	1,142,000	1,790,000	0	2,932,000
TOTAL	35,000,000	26,500,000	17,500,000	79,000,000

153. There is a total of USD79 million to be invested in a 5-year period in the project. The results of the cost-benefit analysis of the proposed project in a base scenario at a discount rate of 12% and a 25-year timeframe is shown in the following table (see detailed explanation of assumptions used for the assessment and analysis of sensitivity below in *section F1*).

Table 6. Economic assessment of the project. Base Scenario

	Restoration of private production	AFM	AS	TOTAL
<b>BASE SCENARIO</b>				
Covered area (Ha.)	10,664	187,367	30,000	228,032
NPV 12% Discount Rate	13,610,415	46,275,318	14,465,192	74,350,925
IRR %	125.3%	54.2%	26.2%	45.7%
NPV per Ha. US\$/Ha	1,276	247	482	326
Benefits at PV (US\$)	17,246,852	76,074,085	20,984,465	114,305,402
Costs PV (US\$)	3,636,437	29,798,768	6,519,273	39,954,477
Cost-benefit Ratio	4.74	2.55	3.22	2.86

154. The GCF project has an NPV of 74.4 million (with a discount rate of 12%). The income net flow of the project has an IRR of 45.7%, with a cost-benefit ratio of 2.86. The NPV per hectare of the project is US\$ 326. The present value benefits rise to US\$ 114.3 million, while the costs rise to US\$ 39.9 million.

155. As seen in above the table, the intervention on restoration has a higher profitability (IRR of 125.3%), while AFM has 54.2% and 26.2% for the promotion of agroforestry systems.

#### E.6.4. Application of best practices

156. Several studies confirm the benefit of the Ecosystem Service of water regulation associated to pine forests, since these produce a better and more efficient water infiltration and availability during the dry season than other land uses, such as livestock and crops yearly (Dortignac and Love, 1960<sup>68</sup>; Pinheiro et al. 2009<sup>69</sup>), which has been confirmed in modellings on beetle affected basins for Honduras ([Hernández, 2016a](#)<sup>70</sup>, and Hernández, 2018). On the other hand, empirical studies show how thinning contribute to improve the infiltration in pine forests (Chen et al, 2014<sup>71</sup>).

<sup>68</sup> Dortignac, E.J. and Love, L. D. 1960. Relation of plant cover to infiltration and erosion in Ponderosa Pine forests of Colorado. Transactions of ASEA 1960 p58-61. Available at:

[http://www.fs.fed.us/rm/pubs\\_exp\\_forests/manitou/rmrs\\_1960\\_dortignac\\_e001.pdf](http://www.fs.fed.us/rm/pubs_exp_forests/manitou/rmrs_1960_dortignac_e001.pdf)

<sup>69</sup> Pinheiro, A., Poeta Teixeira, L. and Kaufmann, V. 2009. Water infiltration capacity under different land uses and agricultural management practices. Environment and Water4(2): 188-199.

Available at: [http://www.ambi-agua.net/seer/index.php/ambi-agua/article/view/211/pdf\\_297](http://www.ambi-agua.net/seer/index.php/ambi-agua/article/view/211/pdf_297)

<sup>70</sup> Hernández. 2016a. Simulation report with the Soil and Water Assessment Tool (SWAT).

<sup>71</sup> Chen, L., Yuan, Z., Shao, H., Wang, D. and Mu, X. 2014. Effects of thinning intensities on soil infiltration and water storage capacity in a Chinese pine-oak mixed forest. *The Scientific World Journal*, 2014.

157. The project is based on best international forestry which have been tested and validated in several contexts and show a high efficiency for the achievement of targets regarding sustainable and adaptive management of pine forest. The evidence shows the efficiency of incentives for private forest owners to reduce susceptibility of forests towards the pine beetle (Billings et al., 2006<sup>72</sup>, Novak et al., 2015<sup>73</sup>, Kolb et al., 2016) and to promote the recovery of forest cover (Jones et al, 2016<sup>74</sup>).
158. On the other hand, the proposed governance model is based on a decentralized approach with a high involvement of direct forest users, who are the main actors in forest restoration, and better forest management practices. This approach is recommended by FAO ([FAO-ITTO, 2009](#)) and is considered to be a good practice worldwide.
159. The project will also develop some of the recommended instruments to achieve a vision of comprehensive water resources management (CWRM), vision fostered by several international organizations, such as GWP<sup>75</sup> and ECLAC in the region<sup>76</sup>, promoting the setup of watershed or basin councils, the active involvement of water committees and organized and registered users in the decision-making process and allocation of project resources.
160. A scheme of payments for ecosystem services proposal is also a good practice to cope with sustainability challenges in the long term, guaranteeing a proper funding commitment by diverse social and economic local actors in order to maintain a forest resilient to climate change and attack of plagues, such as the beetle. Lessons learned in PES programs ([Wunder, 2013](#)<sup>77</sup>) will be applied for its design. The lesson learned evidenced the relevance of having diagnosis and design studies, as well as methodologies to reliably quantify beneficial impacts of the actions.

<sup>72</sup> Billings, R. F., Smith, L. A. and Murphrey, M. 2006. How to prevent southern pine beetle infestations: A guide to cost sharing thinning operations in east Texas. Texas Forest Service Publication 3/06/5000, College Station, TX. 19 p.

<sup>73</sup> Novak, J. T., Meeker, J. R., Coyke, D. R., Steiner, C. A. and Brownie, C. 2015. Southern pine beetle infestations in relation to forest stand conditions, previous thinning, and prescribed burning: Evaluation of the southern pine beetle prevention program.

<sup>74</sup> Jones, K. W., Holland, M. B., Naughton-Treves, L., Morales, M., Suarez, L. and Keenan, K. 2016. "Forest conservation incentives and deforestation in the Ecuadorian Amazon. Environmental Conservation" pp 1-10. doi: 10.1017/S0376892916000308

<sup>75</sup> See Global Water Partnership. 2009. "Integrated Water Resources Management in River Basin". [https://www.rioc.org/IMG/pdf/RIOC\\_GWP\\_Manual\\_para\\_la\\_gestion\\_integrada.pdf](https://www.rioc.org/IMG/pdf/RIOC_GWP_Manual_para_la_gestion_integrada.pdf)

<sup>76</sup> See Toolbox from CEPAL: <https://www.cepal.org/dnri/proyectos/samtac/drsam00403.pdf>

<sup>77</sup> Wunder, S. 2013. When payments for environmental services will work for conservation. Conservation letters, 6(4), 230-237.

161. The project also fosters the use of state-of-the-art technologies in the detection and monitoring of plagues and forest fires through satellite images ([Hernández, 2016](#)).

#### E.6.5. Key efficiency and effectiveness indicators

GCF core indicators	Estimated cost per t CO <sub>2</sub> eq, defined as total investment cost / expected lifetime emission reductions (mitigation only)
	(a) Total project financing USD79 million
	(b) Requested GCF amount USD35 million
	(c) Expected lifetime emission reductions overtime 10.5 million tCO <sub>2</sub> e
	(d) Estimated cost per tCO <sub>2</sub> e (d = a / c) USD2.7/ tCO <sub>2</sub> e
	(e) Estimated GCF cost per tCO <sub>2</sub> e removed (e = b / c) USD 1.2 / tCO <sub>2</sub> e
	The amount of emission reduction (10.5 million tCO <sub>2</sub> e) is estimated taking into consideration the values of the Reference Levels of the REDD+ National Strategy that estimates 150 T CO <sub>2</sub> /Ha in pine forest (70,000 Ha x 150 t CO <sub>2</sub> e/Ha). It is also presumed the shift of pine forest to clean crops.
	For the estimate of (d) and (e), it was assumed that 4.8% of the project is going to mitigation, 31.55% to adaptation, and 64.07% to both (dual). 50% of the dual component was assigned to mitigation and 50% to adaptation. This implies that 36.4% of the project is guided to mitigation. This 36.4% was assigned to the total investment amount and then divided by the amount of carbon.
	Expected volume of finance to be leveraged by the proposed project/programme and as a result of the Fund's financing, disaggregated by public and private sources (mitigation only)

	GCF	Leveraged resources					Leverage Ratio (B/A)	TOTAL
		IDB	Beneficiaries of ecosystem services	Communities (in-kind)	Honduras Government	Total (B)		
C1	11.0	19.4	0.0	0.0	0.0	19.4	1.8	30.4
C2	0.0	3.1	0.0	0.0	0.0	3.1	n.a.	3.1
C3	22.8	2.2	5.3	8.7	3.5	19.7	0.9	42.6
C4	1.1	1.8	0.0	0.0	0.0	1.8	1.6	2.9
TOTAL	35.0	26.5	5.3	8.7	3.5	44.0	1.3	79.0
Not applicable								
Other relevant indicators (e.g. estimated cost per co-benefit generated as a result of the project/programme)		See section E.3.1.						

\* The information can be drawn from the project/programme appraisal document.

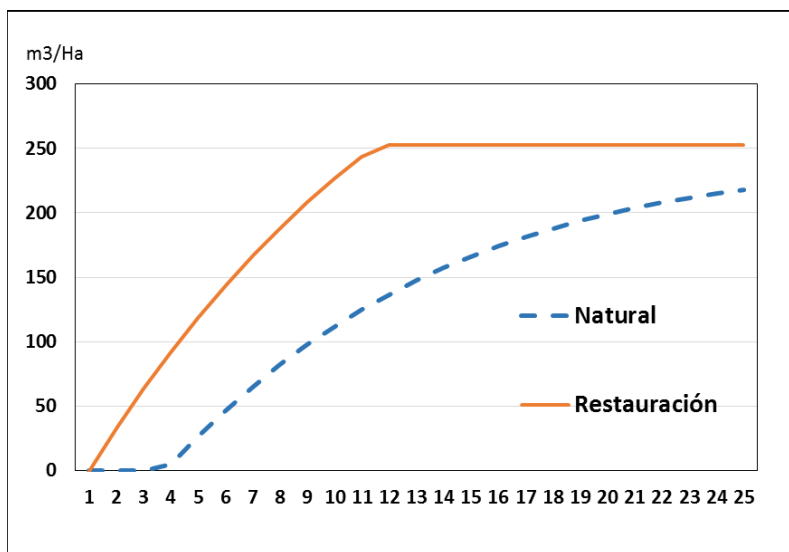
## F.1. Economic and Financial Analysis

162. Benefits assigned to the proposed project are focused on the water production as a result of avoided forest loss as a result of forest restoration and AFM. Likewise, benefits coming from the production of forestry and agroforestry products were taken into consideration, as well as those from emission reductions. Benefits assigned to each intervention type are shown in the table 7.
163. The expected benefit (in water supply) from the forest restoration intervention was estimated through a hydrological model that simulates the situation with and without project in the intervention area (Hernández, 2018). The project used the Curve Number from the United States Department of Agriculture, that estimates the benefits of forest restoration and reforestation in an aggregate manner, without considering differences between forest species.
164. The benefits from the restoration process were assigned gradually in relation to expected forest growth and based on the differential between forest restored with project intervention and natural regeneration without project intervention. These benefits were assigned to the component of private managed forest restoration. Chart 10 shows the evolution pattern of benefits per restored Ha.

Table 7. Intervention Benefits Matrix

	Restoration of private forest	Agroforestry Systems - AS	Adaptive Forest Management - AFM
1. More water from restoration	X		
2. More water from avoided forest losses	X		
3. More water from adaptive forest management			X
4. Forest products	X		
5. Agroforestry products from		X	
6. Less sediments in reservoirs	X		
7. Carbon from avoided forest losses	X		X

Chart 10. Differential restoration benefits (m3/Ha)



165. Likewise, the estimate of the additional benefit from water obtained through AFM, which improves the infiltration levels and regulates the river runoff in the intervened zone, was based on the Hernández (2018) model.
166. To estimate the value for water the following assumptions were applied: (i) a consumption structure of 30% in urban areas and 70% in rural areas and (ii) the



- value in the agriculture-rural zone is equal to the 30% of the water value in urban zones, based in a similar ratio in a case study in México (OECD, 1999<sup>78</sup>).
167. The amounts, prices, and expected costs of the SFM economic assessment (IDB, 2016<sup>79</sup>) were used for the benefits from the forestry products (firewood, wood, and resin). Likewise, net profits expected of the agroforestry component of the PAGRICC project in Nicaragua (BID, 2010<sup>80</sup>), were used for the benefits from agroforestry systems.
  168. The benefits from less sedimentation going into reservoirs in the intervened areas were also estimated based on the hydrological model developed by Hernández (2018) and that predicts a reduction in 34% in the amount of sediments due to the intervention. We used an average cost of US\$ 7.5 per ton of sediment removed to evaluate the benefits from restoration in terms of cost savings in four reservoirs<sup>81</sup> along the project's area.
  169. Finally, for the carbon assessment, the equivalent average of carbon content was applied, which was taken from the national reference report (NCR) of Honduras (Government of Honduras, 2017<sup>82</sup>) for pine forest, and the average carbon price in the voluntary market for the year 2016 (Hamrick y Gallant, 2018<sup>83</sup>) was also used (USD 5).
  170. The flow of projected net benefits from the project in the base scenario is shown in table 8.
  171. In addition, a sensitivity analysis was also developed for the different criteria influencing the profitability. The criteria changes used for the sensitivity reduce 30% of the profitability criteria (adverse), and increase 30% in the favorable scenario, as shown table 9.

<sup>78</sup> OECD. 1999. "The Price of Water: Trends in OECD Countries". Organization for Economic Co-operation and Development, Paris.

<sup>79</sup> Banco Interamericano de Desarrollo. 2016. "Diseño del Componente 1 y Evaluación Económica Ex ante de la Operación HO-L1179". Informe de consultoría, preparado por G. Navarro, B. Louman y V. Valera.

<sup>80</sup> Banco Interamericano de Desarrollo. 2010. "Apoyo Técnico a la Preparación del Programa Ambiental de Gestión de Desastres y Cambio Climático (PAGDCC ATN/FW-1137-NI)" Informe de Consultoría.

<sup>81</sup> Dams are Coyolar (irrigation), Concepcion and Los Laureles (drinking water) and Cajon (Hydropower).

<sup>82</sup> Gobierno de Honduras. 2017 "Propuesta Nivel de Referencia de Emisiones Forestales por Deforestación en la República de Honduras-NREF". Secretaría de Energía, Recursos Naturales, Ambiente y Minas (MiAmbiente).

<sup>83</sup> Hamrick, K. and Gallant, M. 2017. "Unlocking Potential. State of the Voluntary Carbon Markets 2017". Ecosystem Market Place. Iniciativa de Forest Trends.

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Table 8. Projected ne benefits in base scenario for the project

BASE SCENARIO ECONOMIC ANALYSIS (US\$)				
	RESTORATION	AFS	AFM	TOTAL
1	-500,183	-1,916,951	-1,393,790	-3,810,925
2	-225,311	-3,400,379	-3,703,540	-7,329,230
3	-95,859	-3,001,749	-2,588,602	-5,686,209
4	-263,031	322,492	1,247,395	1,306,856
5	973,000	1,731,046	4,279,346	6,983,392
6	375,384	1,735,034	11,583,192	13,693,610
7	394,603	2,725,371	11,583,192	14,703,165
8	413,063	3,649,812	11,583,192	15,646,067
9	349,134	3,488,744	11,583,192	15,421,070
10	342,769	3,852,510	11,583,192	15,778,471
11	1,284,690	4,819,924	11,583,192	17,687,805
12	571,394	5,635,509	11,583,192	17,790,095
13	527,153	5,226,374	11,583,192	17,336,719
14	405,367	5,827,690	11,583,192	17,816,249
15	450,655	7,020,886	11,583,192	19,054,733
16	417,822	7,020,886	11,583,192	19,021,900
17	-7,418,662	7,020,886	11,583,192	11,185,416
18	22,367,003	7,020,886	11,583,192	40,971,081
19	178,340	7,020,886	11,583,192	18,782,418
20	316,319	7,020,886	11,583,192	18,920,397
21	297,157	7,020,886	11,583,192	18,901,235
22	280,018	7,020,886	11,583,192	18,884,096
23	264,687	7,020,886	11,583,192	18,868,765
24	46,778	7,020,886	11,583,192	18,650,856
25	35,197,694	7,020,886	11,583,192	53,801,772

Table 9. Criteria for the Sensitivity Analysis

	Base	Adverse	Favorable
Water Price (US\$/m3)	0.385	0.269	0.500
Forestry good prices (factor)	1.0	0.7	1.3
AS Profitability (factor)	1.0	0.7	1.3
Carbon Price	1.0	0.7	1.3
Discount rate	12%	15%	8%

172. The following table displays the sensitivity analysis outcomes.

Table 10. Sensitivity analysis on the economic viability of the project

	REST. PROD. PRIVATE	AFM	AS	TOTAL
<b>Base Scenario</b>				
NPV AT 12% DR	13,610,415	46,275,318	14,465,192	74,350,925
IRR %	125.3%	54.2%	26.2%	45.7%
<b>H2O PRICE</b>				
<b>Decrease 30%</b>				
NPV AT 12% DR	12,931,627	26,008,343	14,465,192	53,405,163
IRR -30%	119.6%	32.6%	26.2%	34.1%
<b>Increase 30%</b>				
NPV AT 12% DR	16,504,090	66,542,292	14,465,192	97,511,574
IRR +30%	130.9%	85.5%	26.2%	59.6%
<b>FORESTRY GOOD PRICES</b>				
<b>Decrease 30%</b>				
NPV AT 12% DR	11,658,698	46,275,318	14,465,192	72,399,208
IRR %	95.0%	54.2%	26.2%	44.9%
<b>Increase 30%</b>				
NPV AT 12% DR	15,562,131	46,275,318	14,465,192	76,302,641
IRR %	186.1%	54.2%	26.2%	46.5%
<b>AS PROFITABILITY</b>				
<b>Decrease 30%</b>				
NPV AT 12% DR	13,610,415	46,275,318	6,190,288	66,076,021
IRR %	125.3%	54.2%	17.9%	40.6%
<b>Increase 30%</b>				
NPV AT 12% DR	13,610,415	46,275,318	22,740,096	82,625,829
IRR %	125.3%	54.2%	36.9%	51.8%
<b>CO2E PRICE</b>				
<b>Decrease 30%</b>				

NPV AT 12% DR	13,542,643	43,720,067	14,465,192	71,727,902
IRR %	125.30%	49.0%	26.2%	34.3%
<b>Increase 30%</b>				
NPV AT 12% DR	13,678,187	48,830,569	14,465,192	76,973,948
IRR %	125.31%	60.4%	26.2%	48.3%
<b>DISCOUNT RATE VARIATION</b>				
NPV 12% Discount Rate (BASE)	13,610,415	46,275,318	14,465,192	74,350,925
NPV 15% Discount Rate	9,783,609	33,173,169	8,700,577	51,657,354
NPV 8% Discount Rate	22,671,881	74,708,326	27,802,705	125,182,913

173. As noted, all outcomes create positive NPV and IRR higher than 12%; therefore, it is concluded that the project is economically viable. This a conservative figure that don't consider other benefits as reduction of flooding and erosion.

## F.2. Technical Evaluation

174. The project is based on a set of internationally validated and recommended forest practices. In the section E.6.4, the empirical evidence that support these practices are identified.

## F.3. Environmental, Social Assessment, including Gender Considerations

175. A Social and Environmental Impact Assessment was developed in the design of the SFM project. According to the IDB Environment and Safeguards Compliance Policy (OP-703), the environmental risk of the SFM project has been classified as Category B. This is a moderate risk, since the intensity of foreseeable social-environmental impacts is low-moderate, localized, and temporal, and knowledge and procedures are established to design and implement efficient mitigation measures. It is worth mentioning that the project (and the full operation) will be developed in a geographic area exposed to natural risks. Climate change has the potential of increasing the frequency and intensity of some risks.

176. Based on the available information up to date, it was determined that the GCF project will cause neither environmental nor social negative cumulative impacts. On the contrary, it is expected to have eminently positive social-environmental impacts (refer to section D.3, Co-benefits).

177. Within the development framework of the SFM project, an Environmental and Social Management Plan (ESMP) was also designed, including the following components applicable to this operation:

- Risk Management Plan for Natural Disasters: The greater risks in the foreseen intervention area are droughts, floods, and landslides. The ESMP takes into consideration these threats and suggests some mitigation

measures at general detail. For a proper incorporation of these risks in the reforestation activities plan, and before these are executed, the Risk Management Plan for Natural Disasters must be updated, detailing the mitigation activities to be implemented and the responsible individuals of the implementation and monitoring.

- Work Safety and Health Plan: There are safety risks for the workers involved in the controlled felling and burning of trees affected by the plague and in the clearance of such areas.
- List of native species: It must be guaranteed that only native species will be used in the active reforestation activities and that local material is used for projects regarding production of plants more resilient to plagues. The ESMP includes a tentative list of species to be used in the active reforestation project. This list must be updated and adapted to the specific intervention areas.
- Community Liaison Plan: The ESMP includes general guidelines to build respect and trust relationships and to foster the involvement of communities, social organizations and other actors in the project development. Based on these guidelines, a Community Liaison Plan that includes a grievance redress mechanism will be developed.

178. **Guidelines for an equal and inclusive result-based payment mechanism:**  
The ESMP includes guidelines and factors to assure that the system does not exclude, either directly or indirectly, vulnerable groups or individuals, such as small producers, low-income owners, women or weak social organizations.

#### F.4. Financial Management and Procurement

179. As part of the Project and following IDB policy, IDB determines the on-lending, financial management and oversight activities and contractual responsibilities in the framework of the Subsidiary Agreements with the Republic of Honduras.
180. The approval of the Program Operations Manual (POM) of the Project by SEFIN, following the non-objection of the Bank, will be a prerequisite for the first disbursement of the GCF's resources. Such regulations will have to be consistent with the policies and operational standards of SEFIN, the IDB, and the laws and financial practices of the country. Any change to the POM (POM) will require the non-objection of the IDB.
181. The risk management system for environmental and social risks will be detailed in the Report for Environmental and Social Management of the project, an integral part of its POM.
182. The disbursements, reporting (including external audit reports), monitoring, and evaluation of the Project will be done in accordance to IDB Policies and

- Procedures, among others the IDB's Financial Management Guidelines (OP-273-6).
183. Also, during the project disbursement period and its extensions, the project's financial statements will be audited annually by an independent audit firm acceptable to the Bank, with terms of reference previously approved by the Bank.
  184. To the satisfaction of the IDB, the SEFIN must present reports relating to the implementation of the project, within the sixty (60) days following the end of each semester. The report shall include as a minimum: (i) the status of the implementation of the activities of the program (ii) the extent that environmental and social safeguards of the program are being met; and (iii) the achievement of the indicators of product and expected results, as they materialize. These reports will provide the inputs for the Annual Performance Reports (APRs) the IDB will have to deliver for the GCF according to the AMA.
  185. SEFIN undertakes to maintain, in terms that will be set in the POM, an information system from which held the collection of project information, so that the IDB can implement, with its resources, an assessment of impact ex post of the same, which will assess the extent that the objectives of the project were achieved.
  186. SEFIN and the IDB will carry out a mid-term evaluation of the project about 36 months after first disbursement or once 50% of the loan proceeds have been committed, whichever occurs first. This evaluation will assess the progress in achieving the expected results in the project's results matrix to identify any corrective action that may be required. SEFIN will also provide the IDB with the necessary information to make a completion report of the project 90 days after the end of the execution period or from the date of the last disbursement. Regular monitoring meetings will also be scheduled. The Monitoring and Evaluation Plan of the project, an integral part of any IDB project, will include a strategy to carry out an impact evaluation as of the last year of the project's execution period. This evaluation will be covered with part of the GCF non-reimbursable resources which complement this proposed GCF loan.
  187. SEFIN, through the Project Management Unit, will be responsible for the planning, execution and monitoring of procurement processes for goods, services and works, ensuring compliance with the Bank's Acquisition and Contracting Policies. IDB will monitor the procurement processes in accordance with the program operational manual.
  188. SEFIN, through the Project Management Unit, will be responsible for preparing the audited financial statements of the Project, duly audited by an independent auditor acceptable to the Bank, within a period of one hundred and twenty (120) days following the close of each fiscal year and during the term for disbursements of the Loan, including a final report, one hundred and twenty (120) days following the date stipulated for the last disbursement of the Loan and its extensions. In

addition, the presentation of annual operational evaluations to be developed by an independent auditor acceptable to the Bank will be required.

### G.1. Risk ASSESSMENT Summary

***Please provide a summary of main risk factors. Detailed description of risk factors and mitigation measures can be elaborated in G.2.***

#### *Social and environmental Risk.*

- 189. Resistance towards the implementation of forest restoration, agroforestry, and AFM activities by community organizations, private sector, and local governments.
- 190. Unequal access to project activities and associated benefits for vulnerable social groups, specially, women and populations in conditions of poverty.
- 191. Change of land-use of forest vocation land to agriculture or livestock uses that may affect the sustainability of the restoration process, the establishment of agroforestry systems, and the sustainable forest management.
- 192. Political and crime violence affects local communities participating in the project.
- 193. Risk of natural disasters that may affect the processes of forest restoration and sowing increase the recurrence of conditions that favor the spreading of plagues and diseases (specially the pine bark beetle), or produce forest fires, landslides, or floods.

#### *Technical and operational.*

- 194. Risk of work-related accidents.
- 195. Coordination difficulties regarding the involvement of many institutional actors.

### G.2. Risk Factors and Mitigation Measures

- 196. Below, the risks identified for the operation are described, as well as the occurrence probability and impact level, and mitigation measures (strategies) proposed to address them.



Selected Risk Factor 1			
Description	Risk category	Level of impact	Probability of risk occurring
Resistance towards the implementation of restoration, agroforestry, and sustainable forest management activities by community organizations, private sector, and local governments.  Insecure property rights for agroforestry systems	Social and environmental	Medium (5.1-20% of project value)	Medium
Mitigation Measure(s)			
<ul style="list-style-type: none"> <li>• Broad dissemination of activities and expected outcomes</li> <li>• Providing information on progress and development achieved with the implementation of the project</li> <li>• Maintaining communication channels with local actors regarding progress and operation achievements</li> <li>• Design of a procedure and definition of channels to receive and handle concerns, claims, and complaints</li> <li>• Design, implementation, and follow-up of a community liaison plan to involve communities and local actors in the execution</li> <li>• Design, implementation, and follow-up of a strengthening plan for community organizations, Water Committees, and other participating organizations</li> <li>• The project only will give incentives for agroforestry systems in areas with clear land rights assigned.</li> </ul>			
Selected Risk Factor 2			
Description	Risk category	Level of impact	Probability of risk occurring
Unequal access to project activities and associated benefits for vulnerable social groups, specially, women and populations in conditions of poverty.	Social and environmental	High (>20% of project value)	Medium
Mitigation Measure(s)			
<ul style="list-style-type: none"> <li>• Design and implementation of an inclusive system to access activities and benefits and that prevents the centralization and adverse or incorrect selection of beneficiaries</li> </ul>			

<ul style="list-style-type: none"> <li>Dissemination of opportunities, risks, and commitments associated to the operation, so individuals and organizations interested may take informed decisions on their participation</li> <li>Setting a financing limit for private owners in order to prevent the centralization of resources on such potential beneficiaries.</li> </ul>			
Selected Risk Factor 3			
Description	Risk category	Level of impact	Probability of risk occurring
Change of use of forest vocation land to agriculture or livestock uses that may affect the sustainability of the restoration process, the establishment of agroforestry systems, and the sustainable forest management and monitoring.	Social and environmental	Medium (5.1-20% of project value)	Medium
Mitigation Measure(s)			
<ul style="list-style-type: none"> <li>Developing, implementing, tracking of a Risk Management Plan for Natural Disasters</li> <li>Implementation of good practices on forest management and forest monitoring to reduce fire risks</li> <li>Identification of areas sensitive to natural threats in lands to be intervened in order to exclude intervention in those with a high hazard, according to the National Commission for Contingency Prevention (COPECO) approved methodologies.</li> </ul>			
Selected Risk Factor 4			
Description	Risk category	Level of impact	Probability of risk occurring
Political and crime violence affects local communities participating in the project	Social and environmental	Medium (5.1-20% of project value)	Medium
Mitigation Measure(s)			
<ul style="list-style-type: none"> <li>Assuring the project's goals are well understood by local agents and avoiding political interference in projects' decision making</li> <li>Contributing with government sponsored prevention policies based upon community action</li> <li>Developing help-lines and asking specialized assistance for people working with the project and affected by crime or political violence of any type</li> </ul>			

Selected Risk Factor 5			
Description	Risk category	Level of impact	Probability of risk occurring
Risk of natural disasters that may affect the processes of restoration and AFM, increase the recurrence of conditions that favor the spreading of plagues and diseases (specially the pine beetle), or produce fires, landslides, or floods.	Social and environmental	Medium (5.1-20% of project value)	Medium
Mitigation Measure(s)			
<ul style="list-style-type: none"> <li>Developing, implementing, tracking a Risk Management and Monitoring Plan for Natural Disasters</li> <li>Implementation of good practices on forest management to reduce fire risks</li> <li>Identification of areas sensitive to natural threats in lands to be intervened in order to exclude intervention in those with a high threat hazard, according to COPECO approved methodologies</li> </ul>			
Selected Risk Factor 6			
Description	Risk category	Level of impact	Probability of risk occurring
SEFIN's expertise in the execution of multilateral-agency projects, as well as its capacity and experience to implement administrative, procurement, and monitoring processes, allow foreseeing that the set of risks is low. Nevertheless, the following challenges are identified: <ul style="list-style-type: none"> <li>Coordination difficulties regarding the involvement of many institutional actors.</li> </ul>	Technical and operational	Medium (5.1-20% of project value)	Medium
Mitigation Measure(s)			
<ul style="list-style-type: none"> <li>Fostering the appropriation of the operation, starting from the highest level, taking advantage of the scheme adopted by the Government to encourage the coordination and cooperation in climate change investments, operations, and public policies</li> <li>Strengthening SEFIN's Executing Unit</li> <li>Monitoring the effectiveness of the implementation arrangements on a regular basis.</li> </ul>			

Selected Risk Factor 7			
Description	Risk category	Level of impact	Probability of risk occurring
Risk of work-related accidents	Social and environmental	Low (<5% of project value)	Low
Mitigation Measure(s)			
<ul style="list-style-type: none"> <li>Establishing a work safety plan</li> </ul>			
Other Potential Risks in the Horizon			
<p>Fiduciary risk</p> <ul style="list-style-type: none"> <li>Occurrence probability: Low</li> <li>Level of impact: Low</li> </ul> <p>Strategies:</p> <ul style="list-style-type: none"> <li>Design of Follow-up and Assessment guidelines for the restoration, agroforestry, and sustainable forest management activities</li> </ul>			

## H.1. Logic Framework.

### H.1.1. Paradigm Shift Objectives and Impacts at the Fund level <sup>84</sup>

#### Paradigm shift objectives

Increased climate-resilient sustainable development	<p>The project opens a new way of coping climate change regarding forest management and access to water, with a preventive approach, with active involvement of forest users and a financial sustainability by indirect beneficiaries who demand water (PES).</p> <p>The project may be scaled to the set of forest areas and water sources in the country and will build knowledge on the relation between forest management and water, as well as on sustainable institutional arrangements for the water protection.</p> <p>Significant changes are expected towards an enabling environment for the protection and sustainable management of forests, with strengthened capacities and appropriate regulations for the forest and water resource protection.</p> <p>New forest management model more resilient to Climate Change implemented with local actors' participation and sustainable financing.</p>
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<sup>84</sup> Information on the Fund's expected results and indicators can be found in its Performance Measurement Frameworks available at the following link (Please note that some indicators are under refinement): [http://www.greenclimate.fund/documents/20182/239759/5.3\\_-\\_Performance\\_Measurement\\_Frameworks\\_PMF\\_.pdf/60941cef-7c87-475f-809e-4ebf1acbb3f4](http://www.greenclimate.fund/documents/20182/239759/5.3_-_Performance_Measurement_Frameworks_PMF_.pdf/60941cef-7c87-475f-809e-4ebf1acbb3f4)

### H.1.2. Outcomes, Outputs, Activities and Inputs at Project/Programme level

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
Fund-level impacts						
M4.0 Reduced emissions from land use, reforestation, reduced deforestation, and through sustainable forest management and conservation and enhancement of forest carbon stocks	Tons of carbon equivalent (tCo2e) reduced	ICF annual reports about rates of deforestation in project's area.  Impact evaluation.	0  0	5.25 million t Co2e	10.5 million t CO2e	The project's area is not seriously disrupted by a major natural disaster affecting forest areas  Major factors behind forest land change do not worsen due to policies or economic pressures
A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions	1.2. Number of males and females headed households benefiting from the adoption of diversified, climate resilient forestry and agroforestry	Monitoring reports.  Baseline and Final Evaluation Household Surveys	0	12,000  M: 9,400  H: 2,600	27,000  M: 21,000  F: 6,000	Beneficiaries adopt AFM and AFS, and they actively participate in training activities

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	livelihood options					
A4.0 Improved resilience of ecosystems and ecosystem services	4.1. Ha of forestry and agroforestry ecosystems protected and strengthened in response to climate variability and change	Annual evaluation of deforestation based on high resolution satellite imagery prepared by ICF.	0	130,000	270,000	<p>The project's area is not seriously disrupted by a major natural disaster affecting forest areas</p> <p>Major factors behind forest land change do not worsen due to policies or economic pressures</p>
	4.2 Value (US\$) of ecosystem services generated or protected in response to climate change	<p>Modelling of water supply based on updated parameters measured at project's termination.</p> <p>Impact evaluation.</p>	0	US\$ 20 million of increased supply of water	US\$ 58 million from increased supply of water	Water supply is not affected by a major natural disaster and there are no abrupt changes in water cycle at local level
A5.0 Strengthened institutional and regulatory systems for climate-responsive planning and development	5.1. Institutional and regulatory systems that improve incentives for climate resilience and their effective	Progress reports, legalization documents of Water Fund.	0	1	1	Relevant authorities and legislative body maintain political commitments to sustaining an institutional and regulatory systems that give incentives for effective climate



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	implementation in selected watersheds.					resilience policies and actions.
	5.2. Number of levels (1=no coordination, 4=effective mechanism in place) of effective Coordination mechanisms	Monitoring reports	0	2	4	National government and regional/local authorities maintain political commitments to sustain increasing and formalized levels of coordination
A6.0 Increased generation and use of climate information in decision-making	6.2 Use of climate information and early warning system's products/services in decision-making in climate-sensitive sectors	Annual reports on the number and type of web users directly related to the use of the early warning system	0	5 public sector entities using the warning system  250 male and 250 female private users of the warning system	20 public sector entities  500 male and 500 female private users of the warning system	Early warning information system is highly accessible and useful for taking decisions regarding plague prevention and control both for public and private users
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	7.1. Use by vulnerable households, of Fund supported activities to respond to	Monitoring reports.	0	15,000 households (separated by male or female head of family)	27,000 households (separated by male or female head of family)	Beneficiaries adopt AFM and AFS, and they actively participate in training activities

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	climate change and variability					
	7.2. Number of institutions providing strengthened training and technical assistance services in AFM and AFS	Monitoring reports.	0	30 strengthened institutions (ICF and 29 municipalities with improved capacities to provide technical assistance on AFM and AFS)	54 strengthened institutions (ICF and 53 municipalities with improved capacities to provide technical assistance on AFM and AFS)	ICF and municipalities attract and retain trained personnel in charge of offering technical assistance and improving beneficiaries' skills in AFM and AFS
M9.0 Improved management of land or forest areas contributing to emissions reductions	9.1 Hectares of land or forests under improved and effective management that contributes to CO2 emission reductions	Annual evaluation reports on forestry management activities prepared by a consulting firm and approved by the ICF.	0	130,000	270,000	<p>The project's area is not seriously disrupted by a major natural disaster affecting forest areas</p> <p>Major factors behind forest land change do not worsen due to policies or economic pressures</p>

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Project/programme outputs	Outputs that contribute to outcomes					
Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
Component 1  Output 1: Forest restored in the prioritized areas to improve climate resilience	1.1 Area (ha) with established incentives mechanism for adaptive forest management (AFM) and agroforestry systems (AFS)	Monitoring reports	0 Ha.	180,000 Ha.	270,000 Ha.	The project's area is not seriously disrupted by a major natural disaster affecting forest areas  Major factors behind forest land change do not worsen due to policies or economic pressures
	1.2 Number of forest management and water related legislations and regulations mainstreaming climate risks/adaptation	Legislation reports	1	2	3	Legislative body keeps political commitment for adequate regulatory systems for climate adaptation and sustainable water management
	1.3 Percentage of Local Water Management Committees with women participating in the integration of	ICF registries of LWMCs	20%	60%	100%	ICF and local authorities promote and enforce women participation in LWMC's

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	climate-informed practices into water management					
	1.4 Percentage of local communities benefiting from the technical and financial incentives and using cash resilient seedings	Monitoring reports	0%	70%	100%	Beneficiaries adopt AFM and AFS, and they actively participate in training activities
Component 2 Output 2: ICF with improved capacities on climate change response.	2.1 Functional Early Warning System for Forestry Plagues in operation in the ICF Forest Health Department.	Monitoring reports	0	1 System	1 System	Infrastructure required for Warning System is in place
	2.2 # of technicians (disaggregated by gender) from ICF and from the Mayor's Office with capacity to manage and implement AFM and plague control	Monitoring reports	0 Males 0 Females	50 Males 50 Females	100 Males 100 Females	ICF and municipalities attract and retain trained personnel in charge of offering technical assistance and improving beneficiaries' skills in AFM and AFS
	2.3. percentage (%) of community uptake of the use of climate-friendly	Monitoring reports	0%	70%	100%	Beneficiaries adopt AFM and AFS, and they actively participate in training activities

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	agroforestry species					
<p>Component 3</p> <p>Output 3: Strengthened governance and financial sustainability to increase forest resilience to climate change</p>	3.1 Existence of a functional and efficient results-based PES system	Monitoring reports	0	11	11	<p>Local communities and private sector keep increasing commitment for PES contributions and operation</p> <p>Public resources are available for Water Fund</p>
	3.2 Number of water associations and providers contributing financially to the cost of climate resilient water services	Monitoring reports	0	11	11	<p>Local communities and private sector keep increasing commitment for PES contributions and operation</p> <p>Public resources are available for Water Fund</p>
	3.3 Number of community forest associations (disaggregated by men and women associations) participating in adaptive forest management control	Monitoring repots	0	40	120	Beneficiaries adopt AFM and AFS, and they actively participate in training activities
	3.4 Number of municipalities and national institutions with	Monitoring reports	0	30	53	ICF and municipalities attract and retain trained personnel in charge of offering technical

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	improved capacities to provide technical assistance on adaptive forest management)					assistance and improving beneficiaries' skills in AFM and AFS
Activities	Description	Inputs			Deliverables	
1.1. Forest restoration to increase resilience to climate change	<p>This activity aims to restore forest in areas affected by the recent bark beetle outbreak. Selected forest management practices will include planned thinning, fire prevention and control and diversification with non-pine species.</p> <p>As a result of these practices forest cover recovery is expected to occur within shorter timeframes than it would with natural recovery. The species were selected with the ICF, considering native species, in order to avoid the promotion of exotic species that can weaken the natural forest ecosystem.</p>	<p>Incentives for private owners</p> <p>Support for the restoration of public forests</p> <p>Technical assistance for private forest restoration</p> <p>Equipment purchase.</p> <p>Plants production</p>			<p>By Q4 of year 5<sup>th</sup> of the program, 17,164 Ha of private forest has been restored with the support of the program.</p> <p>By Q2 of year 5<sup>th</sup> the program, 34,00 Ha of public forest has been restored with the support of the program.</p> <p>By Q4 of year 3<sup>rd</sup> of the program, a Communication and Visibility Strategy has been implemented in the area of intervention.</p> <p>By Q4 of year 3<sup>rd</sup> of the program, all the plants for restoration activities have been produced.</p> <p>By Q4 of year 3<sup>rd</sup> of the program, all the equipment for the restoration activities have been purchased and delivered to the communities.</p>	
1.2. Climate resilient forest restoration through Agroforestry Systems (AS)	The implementation of AS will be supported by the project in a total of 30,000 Ha., located in areas adjacent to pine forests with agriculture and livestock activities where property rights are well defined. This will allow increasing forest cover within prioritized	<p>Incentives for AS</p> <p>Consultancy for incentive design</p> <p>Technical Assistance for AS</p> <p>Communication and Visibility Strategy</p>			<p>By Q4 of year 5<sup>th</sup> of the program, 30,00 Ha of agroforestry systems has been established with the support of the program.</p>	

## RESULTS MONITORING AND REPORTING

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GREEN CLIMATE FUND FUNDING PROPOSAL | PAGE 112 OF 124

	<p>watersheds, while alleviating the existing pressure towards land use change in the nearby forested areas.</p> <p>The implementation of AS will allow the introduction of forestry related activities in areas which were characterized by low to none agricultural productivity. This is expected to generate several positive impacts, including improving rainfall infiltration and aquifer recharge, reducing soil erosion, providing additional revenue streams for rural families and local communities through the generation of marketable forest products and by-products and, finally, ensuring the provision of water services (both in terms of water quantity and quality) to the downstream population. The specific type of AS to be supported, in terms of species composition and land use patterns, will be tailored to the specific characteristics of each site. The model to implement will also benefit from lessons from a previous successful IDB experience in the region, the PAGRICC project in Nicaragua, where direct incentives were provided to low-income producers to encourage the adoption of AS.</p>		
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## RESULTS MONITORING AND REPORTING

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2.1. Strengthening of the forest health department and ICF forest extension	<p>Strengthening the ICF Forest Health Department, including inter alia, the establishment of an early warning system for forest plagues and a permanent entomology-phytopathology laboratory in one of the Universities affiliated to the ICF</p> <p>ICF will be strengthened with the present project. Training and equipment will be provided for the forest health and extension departments.</p>	<p>Technicians trained on sustainable forest management, heath and forest health</p> <p>Equipped Department on Forest Health (including forest health units)</p> <p>Research on plagues and forest diseases, sustainable forest management and species resilient to CC fulfilled and validated</p>	<p>By Q2 of year 5<sup>th</sup> of the program, research on plagues and forest diseases, sustainable forest management and species resilient to CC has been fulfilled and validated</p> <p>By Q4 of year 4<sup>th</sup> of the program, 200 technicians have been trained on sustainable forest management, heath and forest health</p> <p>By Q2 of year 5<sup>th</sup> of the program, the Department on Forest Health (including forest health units) has been equipped.</p>
2.2 Early warning system for forest plagues	<p>The design of the early warning system is based on the previous system of COHDEFOR, which consists of monitoring the variables that trigger the pests, particularly the temperature, the monitoring of pheromone traps to measure pine beetle populations, the satellite monitoring with the innovative use of high resolution satellite image and the cut and leave control of the outbreaks with the involvement of the local communities, for fire and pest control. The involvement of the local communities will be ensured through the Payment for Ecosystem Service (PES) scheme. By the second year of the project the system will be fully in place and operational to ensure it can be scaled up to the national level and</p>	Equipment	<p>By Q2 of year 5<sup>th</sup> of the program, an early alert system for plagues and forest restoration is operating.</p>

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	fully embedded across the various government structures.		
2.3. Identification of agroforestry species resilient to CC	Research on, and the creation of a germplasm bank of, agroforestry species resilient to climate change. Such species will be used to promote climate-friendly species diversification in coniferous forests; the research and the germplasm will be implemented through agreements with the National University Forestry School, an institution that has technical leadership not only nationally but regionally.	Equipment  Consultancies	By Q2 of year 5th of the program, a Germplasm bank of agroforestry species resilient to CC has been created and operating
3.1. Developing of enabling conditions for decentralized watershed and forest resources management	This activity includes: (i) setup or formalization of, and legal arrangements for, 200 Water Management Committees (WMCs); (ii) creation of 11 watershed councils; (iii) capacity development for 200 WMCs and 53 municipalities (including the municipality of Tegucigalpa) on financial management and AFM; (iv) development of legal framework (regulations, governance mechanisms, and arrangements with a Bank for the deposit and management of a trust fund) for the establishment of the Water Fund (WF), (v) development and approval, by ICF and municipalities, of Basin Management Plans prioritizing the specific forest conservation and	Equipment for municipalities and committees  Consultancies	By Q2 of year 3rd of the program, 11 watershed councils equipped, PES designed, and training for 200 water committees, 53 UMA's and 11 watershed councils of district basins has been completed.  By Q2 of year 3rd of the program, the development of participatory basin plans and municipal by-laws has been completed including: (i) formalization and legal arrangements for 200 WMCs; (ii) creation of 11 watershed councils; (iii) development of legal framework for the establishment of the Water Fund, (iv) development and approval of 11 Basin Management Plans and (v) approval of a national forest incentives mechanism.

## RESULTS MONITORING AND REPORTING

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	resources management activities to be implemented; (vi) detailed mapping of areas under forest management within the scope of the project; and (vii) approval of a national forest incentives mechanism.		
3.2 Implementation of a Payment for Ecosystem Services (PES) system	<p>Under the proposed model, resource users in the lower part of each watershed will contribute to finance AFM upstream, where the water resources ecosystem services are generated. The interventions in restoration and forest management in the upper lands of the basins are aimed to increase water supply in the dry season and reduce costs and negative effects in the operation and lifetime of the infrastructure for irrigation, safe water, and hydropower generation located in the lower lands and urban sites of the project's area.</p> <p>The extension services for AFM will be provided by private contractors (including NGO's) financed by the WF. It is estimated that 0.67 million m<sup>3</sup> of less sediment per year will be generated by the interventions saving about US\$ 1.1 million annually in sediment removal to hydropower companies, water utilities and irrigation systems (see</p>	Incentives for AFM Consultancies	By Q3 of year 6 <sup>th</sup> of the program, 240,000 Ha of forest under Adaptive Forest Management with the support of the program.

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	Annex on Economic Assessment). Improvements in water quality is also beneficial. For power generating companies, for instance, poor quality of water generates pollution of reservoirs and of water-piping infrastructure, as well as damage to the hydroelectric turbines. Both aspects create over costs due to dredging and cleaning work, and down time that reduces the power generation, which forces resorting to stationary engines which increases GHG emissions and reduces the mitigation potential of the hydroelectric plant. In the case of irrigation dams, the impact is similar as the same clogging effect is caused. For water utilities, the costs for water purification before distribution are also added to the abovementioned impacts, because they raise according to the increase of sedimentary load and associated expenditures in flocculants.		
3.3. Development of a coordination mechanism for the access and implementation of climate	Design and implement an inter-ministry coordination mechanism for accessing resources for AFM. The mechanism will comply with climate fund requirements and be	Consultancies	By Q4 of year 4 <sup>th</sup> of the program, a mechanism to access and implement climate funds has been designed and implemented.

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financing resources for the AFM	based on increased GoH capacities to leverage more funds to tackle climate change challenges.		
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## H.2. Arrangements for Monitoring, Reporting and Evaluation

197. **Monitoring System.** The project monitoring system will be formed by the following instruments: (i) Outcome Matrix (OM); (ii) Project Execution Plan (PEP); (iii) Annual Operating Plan (AOP); (iv) Procurement Plan (PP); (v) Risk Matrices (RM), and Assessment and Mitigation of Project Risks; (vi) Progress Monitoring Reports (PMR); (vii) Bi-annual Progress Reports (BPR); (viii) Audited Financial Statements (AFS); (ix) Financial Intermediary Unaudited Statements (IFINA) at discretion of IDB's fiduciary specialist; (x) terms of reference of consultancies; (xi) annual disbursement forecast; and (xii) PME. These tools will be presented and reviewed in the Project startup workshop (at the beginning of the execution), in which the Executing Unit, the ICF, and the Inter-American Development Bank (IDB) will take part, and lately, throughout the Project execution, these will be reviewed on a regular basis.
198. The Executing Unit will be responsible for the supervision and operating and administrative coordination of the Project monitoring system. SEFIN through UAP as Executing Agency commits itself to use the OM, outcome/product indicators and costs defined in the PMR and monitoring tools defined in the previous paragraph as main elements for the accompaniment of the Project, as well as to coordinate, along with the ICF, the gathering of necessary data for such monitoring.
199. **Monitoring by the Bank.** The Bank will carry out Administrative Missions or inspection visits, depending on the importance and complexity of the Project execution, according to the monitoring plan developed each year by the Project team of the Bank. Likewise, the Bank will use PMR, which include a temporal estimate of costs and compliance of physical targets and outcomes, as well as a mechanism to assess the project performance.
200. The main contents and characteristics of the Project monitoring instruments, by both the Executing Unit and the Bank, are detailed below:
  - a. **OM:** is organized in: i) products; ii) costs; iii) outcomes, iv) priority operation impacts. OM is a vital tool to guide the planning, monitoring and assessment of the project. OM will be used in every instance of the AOP development and PEP updating (which are described below), and the design, follow-up and assessment of a component or sub-component, an action line or a specific activity.
  - b. **PEP:** lists actions to be carried out throughout the operation execution period to achieve expected outcomes of the Project. PEP specifies the amounts and terms for each Project product and activity and indicates the different critical routes for the achievement of each product.
  - c. **AOP:** constitutes the privileged instrument of the Project activities planning for each year. The AOP must be submitted each November 30 in order to execute it in the following calendar year. It must include: i) products expected to be fulfilled

with the OM indicators per component; ii) foreseen activities; iii) estimated budget by activity and product; and iv) execution timeline.

- d. **PP:** lists hiring to be carried out throughout the Project execution. It must be reviewed at least every 12 months or as needed by the Project and have the non-objection of the Bank. PP must include the following for each hiring: (i) selection/procurement method; (ii) reviewing method; (iii) associated component; (iv) execution timeline; and (v) estimated hiring amount.
- e. **RM:** enumerates and classifies risks identified for the Project implementation. Defines mitigation measures for those considered high and medium, their corresponding follow-up indicators, and depending on the case, the budget for the mitigation activities.
- f. **PMR:** gathers the temporal compliance estimate of physical targets, costs, and outcomes, and is a mechanism to assess the project performance.
- g. **BPR:** the Executing Unit will develop the BPR for the Bank to review. These reports are bi-annual and aimed to submit to the IDB the outcomes and products achieved in the AOP and the PP related to the execution processes and the disbursements authorizations. All BPR must include a summary of outcomes, products and costs achieved by the components. The BPR corresponding to the second part of the calendar year must also include the forecast of products and costs for the following year, also analyzing the degree of impact or no-risk impact. Likewise, a consolidated vision of difficulties and lessons learned must be submitted, as well as the explanation of changes carried out to the OM, planned costs and products, and conclusions and recommendations addressed to feedback the project. These reports must be submitted within 60 days of the end of the corresponding semester, as maximum. BPR are a main source of information to feedback the progress report in the PMR.
- h. **AFS and IFINA:** SEFIN, through the Executing Unit, will submit to the Bank, within 120 after the end of each fiscal year and during the operation disbursements period, the Project AFS duly ruled by an independent auditing firm acceptable for the Bank. The last of these reports will be submitted within 120 days after the agreed date for the last funding disbursement. Also, during the operation disbursement period, and as the IDB fiduciary specialist may deem convenient, the Executing Unit will submit to the Bank the corresponding IFINA which contents and delivery periods may vary according to the specific need
- i. **Terms of reference of the project consultancies:** detail the targets, activities, costs, and products of each consultancy to be hired with Project resources. These terms must be sent to the Bank for its non-objection, as well as the final products of each consultancy along with the consultant assessment to be included in the Bank records.
- j. **Forecasts of the Project disbursements:** at the end of each year, the Executing Unit, in coordination with the Bank, will review the forecasts of the monthly disbursements of the Project for the following year, pursuant to the AOP. These forecasts must be submitted each November 30 in order to be recorded in the Bank systems and executed in the following calendar year. The forecasts fulfilment will be part of the Project performance assessment carried out through the PMR.



- k. **PME:** detail the tracking and assessment arrangements, which include systems and multiple methodologies to fulfill the targets, in addition to accompany the outcome and expected impact measuring.
  - l. **Administrative Missions or inspection visits:** will be carried out depending on the importance and complexity of the execution, following the timeline established in the Annual Supervision Plan that identifies moments in which the technical and fiduciary supervision by the Bank is deemed necessary. Besides field trips, bi-annual meetings jointly with the Executing Unit and the Bank will be held to discuss, update, and review progress of the Project management tools, among other aspects, such as: (i) progress of activities identified in the AOP; (ii) level of compliance of the indicators established in the OM for each component; (iii) AOP for the following year and update of PEP; (iv) PP for the following 12 months; (v) financial progress; (vi) updating of the RM; and (vii) possible modifications to the budgetary allocations by component. The Executing Unit commits itself to maintain a Monitoring and Evaluation System of every component, which base will be used to develop the reports and data submitted to the Bank. These aspects will be presented in meetings regarding portfolio review organized by the Bank every six months.
201. The Executing Unit will be in charge of monitoring the Project, with support of the Monitoring and Evaluation (M&E) specialist, and forest specialists - environmental, social, and monitoring.
  202. The territorial level executed by the Programme has a direct role in the monitoring of the project. Their involvement in the monitoring system completes the execution of the activities output. The involvement of the ICF and the technical assistance firm in the monitoring of the adaptive management activities and forest restoration are described in the document.
  203. The base record and monitoring process will be responsibility of the forest specialists (social, environmental, and monitoring) who should have the support of the monitoring and evaluation specialist. The team will be duly trained on the Monitoring System.
  204. Mechanisms and instruments that will be used to disseminate the tracking outcomes will be a source of information for the Project Completion Report (PCR).
  205. The Bank will develop a PCR. This report must start when the Project disbursements reach 95% and will be submitted within 180 days, based on the bi-annual progress reports and the outcome framework, audited financial statements, and the final report on outcome assessment.
  206. Besides the Project assessment documents, there will be: i) an intermediate process evaluation that will be hired once the Project reaches 18 months in operation; ii) a final assessment that will be hired once the 90% of the Project resources has been disbursed and which report will be submitted when the 95% of the Project funding has been disbursed; and iii) a cost-benefit ex post assessment when the Project disbursements reach 95%. Process assessments will be independent and pursuant to the terms of reference agreed with the Bank.

These will be financed with funds from the Project, while the cost-benefit ex post assessment will be financed by the Bank. The mid-term and final evaluation will be carried out by an external consultant or firm that will evaluate aspects as pertinency, efficiency, effectiveness, risks, sustainability and performance of the EA.

207. From the beginning of the Project, a M&E specialist will be hired as part of the Executing Unit for all the activities foreseen in the PME in order to identify possible PEP deviations. The M&E specialist will be accountable for the supervision of every activity related to the assessments, both on impact and process.
208. To the satisfaction of the IDB, the SEFIN must present reports relating to the implementation of the project, within the sixty (60) days following the end of each semester. The report shall include as a minimum: (i) the status of the implementation of the activities of the program (ii) the extent that environmental and social safeguards of the program are being met; and (iii) the achievement of the indicators of product and expected results, as they materialize. These reports will provide the inputs for the Annual Performance Reports (APRs) the IDB will have to deliver for the GCF according to the AMA.
209. **Impact Assessment.** An impact assessment is foreseen to be conducted at the end of the project to measure, at impact level, the values of the main indicators defined. Two impact indicators will be measured through the impact evaluation: (i) Tons of carbon equivalent (tCo2e) reduced and (ii) Value (US\$) of ecosystem services generated or protected in response to climate change. For both indicators a baseline will be established. The indicator of tCo2e will be measured using the differences in differences method. Per each different forest and agroforestry system plots with and without project intervention will be selected at the beginning of the program. In each selected plot, the basal area and height of the regenerating forest should be measured and the carbon stocks of the deposits of dead organic matter (DOM) (litter and dead wood). With these values the tCo2e will be estimated at the beginning and end of the project (5th year) and the benefit estimated using the difference in differences method. For the value of ecosystem services, the variable increase of water supply will be estimated. Using the methodology of matching, 6 watersheds with similar conditions (area, slope, soil and forest cover) will be selected, 3 with project intervention and three without intervention. Raingages and flow meter will be installed in the watersheds. The data of raingages and flowmeters will be used to calibrate a water balance model. The water availability in the dry season for the six watersheds will be modelled using the calibrate parameters. Using the difference in differences the benefit between intervened and not intervened watersheds will be estimated. A budget of USD280,000 was included in the assessment an audits line for the impact evaluation (including baseline).

## ANNEXES

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### I. Supporting Documents for Funding Proposal

- ☒ NDA No-objection Letter
- ☒ Feasibility Study and economic analysis
- ☐ Integrated Financial Model that provides sensitivity analysis of critical elements (xls format, if applicable)
- ☒ Confirmation letter or letter of commitment for co-financing commitment from the Secretaria de Finanzas of Honduras and AMUPROLAGO Association
- ☐ Project/Programme Confirmation/Term Sheet (including cost/budget breakdown, disbursement schedule, etc.) – *see the Accreditation Master Agreement, Annex I*
- ☒ Environmental and Social Impact Assessment (ESIA) or Environmental and Social Management Plan  
(If applicable)
- ☐ Appraisal Report or Due Diligence Report with recommendations (If applicable)
- ☐ Evaluation Report of the baseline project (If applicable)
- ☒ Map indicating the location of the project/programme
- ☒ Timetable of project/programme implementation

Annex:

Hernández, 2018. Hydrological and Forestry modelling considering Climate Change Scenarios

Gender Action Plan

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

# No-objection letter issued by the national designated authority(ies) or focal point(s)



Tegucigalpa, M.D.C. June 6th, 2018

OFICIO No. UCEMR-DMA-0557-2018

Mr.

**Howard Bamsey**

Executive Director

G-Tower, 24-4 Songdo-dong, Yeonsu-gu

Incheon City, Republic of Korea

Re: Funding proposal for the GCF by the Inter-American Development Bank (IADB) regarding the project "Promoting climate-resilient forest restoration and silviculture for the sustainability of water-related ecosystem services"

Dear Madam, Sir,

We refer to the project "Promoting climate-resilient forest restoration and silviculture for the sustainability of water-related ecosystem services" as included in the funding proposal submitted by the Inter-American Development Bank (IADB) to us on June 8th, 2018.

The undersigned is the duly authorized representative of the Secretary of Energy, Natural Resources, Environment and Mines, the National Designated Authority of Honduras.

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 as included in the funding proposal.

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

- A. The government of Honduras has no-objection to the project as included in the funding proposal;
- B. The project as included in the funding proposal is in conformity with Honduras's national priorities, strategies and plans;
- C. In accordance with the GCF's environmental and social safeguards, the project 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 as included in the funding proposal has been duly followed.

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

Kind regards,

**JOSÉ ANTONIO GALDÁMEZ**

Secretary of State in the Office of Energy, Natural Resources, Environment and Mines (MiAmbiente)/ Designated National Authority / Honduran focal point



Cc: Martha Doblado Andara, Secretaria de Estado por Ley, Secretaria de Coordinación General de Gobierno (SCGG)  
Rocio Izabel Tabora, Secretaria de Estado en el Despacho de Finanzas (SEFIN)  
Mauricio Guevara Pinto, Secretario de Estado, Secretaria de Agricultura y Ganadería (SAG)  
Arnaldo Bueso, Director Ejecutivo, Instituto de Conservación Forestal (ICF)  
Mirna Liévano de Márquez, Representante BID Honduras

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

Basic project or programme information	
<b>Project or programme title</b>	Promoting climate-resilient forest restoration and silviculture for the sustainability of water-related ecosystem services
<b>Existence of subproject(s) to be identified after GCF Board approval</b>	No
<b>Sector (public or private)</b>	Public
<b>Accredited entity</b>	Inter-American Development Bank (IDB)
<b>Environmental and social safeguards (ESS) category</b>	Category B
<b>Location – specific location(s) of project or target country or location(s) of programme</b>	Honduras
Environmental and Social Impact Assessment (ESIA) (if applicable)	
Date of disclosure on accredited entity's website	Wednesday, June 5, 2019
Language(s) of disclosure	English and Spanish
Explanation on language	Spanish is the official language of Honduras. The documents were provided in English and Spanish, so both national and international readers can easily understand the content.
Link to disclosure	English: <a href="http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-16">http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-16</a> *  Spanish: <a href="http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-17">http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-17</a> *
Other link(s)	English: <a href="https://www.iadb.org/en/climate-change/creating-innovative-development-opportunities">https://www.iadb.org/en/climate-change/creating-innovative-development-opportunities</a>  Spanish: <a href="https://www.iadb.org/es/cambio-climatico/nuevas-oportunidades-de-desarrollo">https://www.iadb.org/es/cambio-climatico/nuevas-oportunidades-de-desarrollo</a>
Remarks	An ESIA consistent with the requirements for a Category B project is contained in the Environmental and Social Analysis and Environmental and Social Management Framework.
Environmental and Social Management Plan (ESMP) (if applicable)	
Date of disclosure on accredited entity's website	Wednesday, June 5, 2019
Language(s) of disclosure	English and Spanish
Explanation on language	Spanish is the official language of Honduras. The documents were provided in English and Spanish, so both national and international readers can easily understand the content.
Link to disclosure	English: <a href="http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-16">http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-16</a> *



	Spanish: <a href="http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-17">http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-17</a> *
Other link(s)	English: <a href="https://www.iadb.org/en/climate-change/creating-innovative-development-opportunities">https://www.iadb.org/en/climate-change/creating-innovative-development-opportunities</a>  Spanish: <a href="https://www.iadb.org/es/cambio-climatico/nuevas-oportunidades-de-desarrollo">https://www.iadb.org/es/cambio-climatico/nuevas-oportunidades-de-desarrollo</a>
Remarks	An ESMP consistent with the requirements for a Category B project is contained in the Environmental and Social Analysis and Environmental and Social Management Framework.
<b>Environmental and Social Management (ESMS) (if applicable)</b>	
Date of disclosure on accredited entity's website	[ ]
Language(s) of disclosure	[ ]
Explanation on language	[ ]
Link to disclosure	[ ]
Other link(s)	[ ]
Remarks	[ ]
<b>Any other relevant ESS reports, e.g. Resettlement Action Plan (RAP), Resettlement Policy Framework (RPF), Indigenous Peoples Plan (IPP), IPP Framework (if applicable)</b>	
Description of report/disclosure on accredited entity's website	Wednesday, June 5, 2019
Language(s) of disclosure	English and Spanish
Explanation on language	Spanish is the official language of Honduras. The documents were provided in English and Spanish, so both national and international readers can easily understand the content.
Link to disclosure	English: <a href="http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-16">http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-16</a> *  Spanish: <a href="http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-17">http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-1304725458-17</a> *
Other link(s)	English: <a href="https://www.iadb.org/en/climate-change/creating-innovative-development-opportunities">https://www.iadb.org/en/climate-change/creating-innovative-development-opportunities</a>  Spanish: <a href="https://www.iadb.org/es/cambio-climatico/nuevas-oportunidades-de-desarrollo">https://www.iadb.org/es/cambio-climatico/nuevas-oportunidades-de-desarrollo</a>
Remarks	The ESMF includes an Indigenous Peoples Planning Framework and a Community Liaison Plan
<b>Disclosure in locations convenient to affected peoples (stakeholders)</b>	
Date	2016-2018
Place	<ul style="list-style-type: none"> <li>4 public consultations carried in August 2016 at regional level (Departments of Olancho, Francisco Morazán, Comayagua)</li> </ul>

	<ul style="list-style-type: none"> <li>5 socialization events carried out in May 2018 in Tegucigalpa, Department of Comayagua and one in the Department of Francisco Morazán</li> </ul> <p>Note: During Q3 2019, additional consultation events may be carried out in any new areas to be intervened during the preparation stage of this program</p>
<b>Date of Board meeting in which the FP is intended to be considered</b>	
Date of accredited entity's Board meeting	Monday, January 6, 2020
Date of GCF's Board meeting	Saturday, July 6, 2019

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

\*Subsequent to the disclosure of this form to the Board and active observers on 5 June 2019 (attached), the following minor change has been made: the project title in the report was corrected, and this new report-specific URL was created replacing the previous one. The report continued to be accessible through the generic URL across 'Other link(s)'."



## Secretariat's assessment of FP111

Proposal name:	Promoting climate-resilient forest restoration and silviculture for the sustainability of water-related ecosystem services
Accredited entity:	Inter-American Development Bank (IDB)
Country(ies):	Honduras
Project/programme size:	Medium

### I. Overall assessment of the Secretariat

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

Strengths	Points of caution
Long-term sustainability: establishing a payment for ecosystem services (PES) system assigns value to ecosystem services and provides financial rewards to custodians of those services	Landscape restoration is contingent on a successful strategy to combat the pine beetle infestation
Private sector participation: the project works with private landowners, providing loans for reforestation	Funding of the PES system is through grants initially: consumers of water are not yet paying for it
Policy reform: ecosystem services and their value to the economy and consumers are integrated into policymaking and planning	Lack of reliable data (precise climate and hydrological studies)
A substantial amount of reimbursable funds in an adaptation project	

2. The Board may wish to consider approving this funding proposal with the terms and conditions listed in the respective term sheet and addendum XIII, titled "List of proposed conditions and recommendations".

### II. Summary of the Secretariat's assessment

#### 2.1 Project background

3. The project's overarching objective is to improve the provision of water services by increasing the resilience of vulnerable coniferous forests, which will be achieved by implementing forest restoration, agroforestry practices and adaptive forest management in critical areas. The project fosters a paradigm shift for forest management in Honduras towards a model based on the active participation of local communities and the private sector, the diversification of livelihoods in rural areas and the creation of enabling conditions for better governance of the forest sector and its financial sustainability, shifting from a reactive model to a preventive one in the face of climate change.

4. The project will produce the following impacts:
  - (a) Increased water security, especially during the dry season, for 450,000 beneficiaries in the central zone of Honduras, with improved resilience to climate change;
  - (b) Protection of 270,000 hectares (ha) of pine forests through adaptive forest management and an increased resilience to climate change;
  - (c) A reduction of 10.5 million tonnes of carbon dioxide equivalent (MtCO<sub>2</sub>eq) from improved forest and land use; and
  - (d) Economic and social benefits for 27,000 men and women through the adoption of diversified, climate-resilient forestry and agroforestry livelihood options.
5. The project area is directly influenced by the El Niño–Southern Oscillation (ENSO) cycle, whose intensity is expected to increase by up to 30 per cent in the period to 2050 according to the National Oceanic and Atmospheric Administration of the United States of America. The impacts of climate change in Honduras are twofold: in the short term, an increase in extreme events (e.g. hurricanes, droughts, frosts or floods) can be expected; in the long term, changes in annual average temperature and precipitation are projected for the region, with the project region going from a hydrological surplus to a hydrological deficit. While extreme events have negative impacts on population and infrastructure, changes in average annual temperature and humidity can also modify the characteristics of flora and fauna and impact ecosystems. Both types of impact are detrimental to agricultural productivity.
6. The total size of the project is USD 79 million. Of this amount, a grant request for USD 24.2 million and a request for reimbursable funds of USD 10.8 million is made to GCF.
7. The environmental and social (E&S) safeguards classification of the project is category B, due to changes in the country's vegetation and moderate changes in agricultural practices.

## 2.2 Component-by-component analysis

*Component 1: Forest restored in the prioritized areas to improve climate resilience (total cost: USD 30.4 million; GCF cost: USD 10.7 million in reimbursable funds and USD 0.3 million in non-reimbursable funds)*

8. This component will implement forest management activities as defined in each of the prioritized watersheds' management plans, and it will promote agroforestry systems in zones adjacent to forested areas to improve their resilience to climate change and protect key ecosystem services such as erosion control and water regulation.
9. This component has two subcomponents:
  - (a) Forest restoration to increase resilience to climate change. This subcomponent will restore forest areas that are affected by pine beetle, which is spreading rapidly in Honduras in recent years because of climate change; and
  - (b) Climate-resilient forest restoration through agroforestry systems. The project will support the implementation of agroforestry across a total of 30,000 ha in areas adjacent to pine forests where there are agriculture and livestock activities that were previously covered by forest and where property rights are well defined. This will allow increasing forest cover within prioritized watersheds while alleviating the existing pressure towards land-use change in the nearby forested areas.
10. Improved land management practices and reforestation are considered adequate interventions to improve the hydrological balance, predominantly through reducing surface run-off and improving infiltration of precipitation.

*Component 2: Institute of Forest Conservation (ICF) with improved capacities for climate change response (total cost: USD 3.1 million; GCF cost: nil)*

11. This subcomponent enhances the capacity of Instituto de Conservación Forestal (ICF), the Honduran forestry institution, to respond rapidly to events in the forests of the project area, including providing an early warning system for pine beetle outbreaks. It also includes a component to introduce improved varieties of tree species that are more adapted to the newly emerging climate.

12. This component is critical to ensure that the investment is sustainable over the long term. Adequate response to pine beetle outbreaks is required to ensure that an outbreak does not spread to other areas, resulting in more resilient forests throughout the landscape.

13. This component is fully co-financed by the Inter-American Development Bank (IDB).

*Component 3: Strengthen Governance and financial sustainability to increase forest resilience to climate change (total cost: USD 42.6 million; GCF cost: USD 22.8 million in grants)*

14. This component supports the Government of Honduras with financial resources for two subcomponents:

(a) Development of enabling conditions for decentralized watershed and forest resources management: this subcomponent builds capacity for water management in mountainous areas, predominantly focused on maintaining the natural capacity of the landscape to maintain the hydrological cycle. The establishment of water management committees and watershed councils is foreseen; and

(b) Implementation of a payment for ecosystem services (PES) system: under the proposed model, public and private resource users in the lower part of each watershed will contribute to finance adaptive forest management upstream, where the water resources ecosystem services are generated. The interventions in restoration and forest management in the upper lands of the basins are intended to increase the water supply in the dry season and to reduce costs and negative effects in the operation and lifetime of the infrastructure for irrigation, safe water and hydropower generation, which are located in the lower lands and urban sites of the areas covered by the project.

15. This component ensures that the transformational impact of maintaining the hydrological integrity of the landscape is ensured, leading to long-term sustainability well beyond the project implementation period. This component has substantial co-financing from the Government of Honduras (50 per cent, with the remainder coming from GCF).

### **III. Assessment of performance against investment criteria**

#### **3.1 Impact potential**

*Scale: High*

16. The project has significant impact potential in both mitigation and adaptation. In terms of overall impact, the project's main strength is its integrated approach to addressing complex and interrelated challenges. The project addresses a range of issues relating to the hydrological cycle of Honduras's highlands, both in terms of land-use practices and vegetative cover. By taking an integrated approach, the project is able to impact a range of result indicators.

17. Ecosystem-based activities will be implemented over 270,000 ha of forest land, benefitting a total of 450,000 rural people who are among the least economically developed in the country. The principal environmental problem caused by climate change is pine beetle infestation, which destroys the forest. The project will set up an early warning system such that any outbreaks can be suppressed and will introduce more resilient tree species in the area.

18. Beyond the project area, there will be significant positive impacts through the increased availability of fresh water due to improved land management in the highlands. This benefit has been extensively modelled and it is expected to provide a sustainable supply of fresh water to downstream users, including the metropolitan area of Tegucigalpa.

### 3.2 Paradigm shift potential

*Scale: High*

19. The project is based on the functioning of the hydrological cycle, both locally in the highlands with respect to land-use practices and in the management of surface hydrological resources. This emphasis on an overarching principle that transcends sectoral and localized planning is a true paradigm shift for Honduras and it could serve as an example for other areas in the country and indeed for the entire Central American region.

20. The local communities will be extensively engaged in landscape management through the establishment of water management bodies at different levels. A PES system will ensure that local communities will be compensated for their efforts.

21. The project has a substantial component on knowledge generation and dissemination, providing a strong vehicle for sharing the lessons from this project with other areas in Honduras, thus fostering the potential for scaling up the approach to landscape management.

### 3.3 Sustainable development potential

*Scale: High*

22. The activities that will be developed with the local communities in the highlands will directly contribute to safeguarding the livelihoods and socio-economic well-being of the members of those communities through proper land management and provisioning of timber and other ecosystem goods and services.

23. The project will ensure a sustained financial flow to the communities in the project area through the PES system.

24. The environmental co-benefits are high, as a result of activities aimed at improving the vegetative cover of the highlands, where many areas have steep slopes that are prone to erosion if not properly vegetated. Increasing the infiltration of precipitation leads to increased flows of groundwater, benefitting downstream areas.

### 3.4 Needs of the recipient

*Scale: High*

25. Pine beetle attacks, the main environmental threat exacerbated by climate change, can only be addressed and prevented effectively if a concerted effort is made over the entire landscape. Currently, such an approach is not feasible because of the lack of information and knowledge on pine beetle outbreaks and the best remedial options.

26. The Government of Honduras does not have adequate structures to deal with pine beetle outbreaks. The project will build this capacity in the country's forestry institutions.

27. Highland communities are among the most disadvantaged in Honduras. The project will provide a sustainable source of finance and knowledge to the region, leading to more sustainable and economically viable communities.

### 3.5 Country ownership

*Scale: High*

28. Country ownership is considered high. Several government and non-governmental agencies have collaborated in the development of this proposal and will participate in the implementation of activities. There is strong support in the Government of Honduras for this project.

29. The project aligns well with national policies on climate change, such as the national action plan on climate change and the nationally determined contribution, and long-term strategic visions. Sectoral strategies of interest include the National Forestry Agenda and the Forest Incentive Program for Smallholders.

### 3.6 Efficiency and effectiveness

Scale: High

30. Honduras is a medium-income country and has one of the largest economies in Central America; it also has one of Latin America's highest rates of inequality and one of the worst rates of poverty, malnutrition and mother-child mortality in the region, especially in rural and mountainous areas. Public investment is essential to overcome these problems but is constrained by lack of resources.

31. The project is financed through a combination of grants and reimbursable funds. The application of reimbursable funds to an adaptation project is not very common, but it demonstrates that the project has a solid financial basis. The PES system provides long-term financial support to the population in the region.

## IV. Assessment of consistency with GCF safeguards and policies

### 4.1 Environmental and social safeguards

32. The project aims to improve the resilience of vulnerable coniferous forests by implementing forest restoration, agroforestry practices and adaptive forest management in critical areas for the provision of water services. The project's proposed intervention area covers 29 priority critical sub-basins that are considered to be most affected by the impacts of climate change, particularly in terms of water availability. Within these critical sub-basins are the departments of Choluteca, Comayagua, El Paraiso and Olancho, which are made up of 52 municipalities. The project will directly benefit 27,000 smallholder farmer households and indirectly benefit approximately 450,000 people through improved water services. The accredited entity (AE) has classified the project as having moderate E&S risks, equivalent to category B, following the environment and safeguards compliance policy of the AE based on its assessment and using information from a similar project in the country. The adverse E&S risks of the project are considered not significant, in that they are contained within the project's area of influence and reversible, and they are mitigated through a combination of administrative and technical controls. The AE also identified significant positive impacts of or benefits from the project, mostly regarding the improved resilience and provisioning services of the forests in priority sub-basins.

33. The AE provided an integrated environmental and social analysis (ESA) and an environmental and social management framework (ESMF) for the project. The ESA provides a broad description and overview of the E&S context of the project. The ESA also identifies the legal and policy frameworks that apply to the activities of the project as well as the likely E&S risks and impacts of the project. The ESMF, on the other hand, presents the due diligence processes and methods that will govern the design and implementation of the various activities supported by the project. Both documents are aligned to the requirements of the environmental and safeguard compliance policy of the AE, including the World Bank Group's general

Environmental, Health and Safety Guidelines and its International Finance Corporation performance standards. As part of the continuing due diligence of the AE, further detailed assessments on specific E&S risks and impacts will be undertaken in order to meet the requirements of the applicable policies of the AE. The ESMF also contains a description of the planning framework for meeting the requirements of the safeguard policy of the AE on indigenous peoples. As an appendix to the ESMF, the AE also provided a community liaison plan, which contains the overall strategy for stakeholder engagement and the project-level grievance redress mechanism.

34. The ESA outlines the potential E&S risks and impacts with reference to the experiences learned from a similar sustainable forest management (SFM) project in Honduras supported by the AE. Although the project would be considered as having low potential environmental risk and impact following the country's General Environmental Law, the AE identified some risks and impacts that will need to be managed and mitigated. These risks and impacts may emanate mostly from: (1) component 1, which involves restoration of forest degraded by pine beetle infestation and increasing forest cover through agroforestry systems; and (2) component 3, which, as part of the activities updating the cadastre and definition of rights for forest management, will involve the creation of forest incentive mechanisms and the implementation of a PES system and performance grants mechanisms.

35. The potential social risks and impacts identified by the AE include those related to access to decision-making and project benefits, including potential conflicts within organizations and communities, exclusion of potential beneficiaries due to lack of management plans, elite capture, child labour, and occupational and community health and safety risks. The mitigation measures identified in the ESMF include strengthening the stakeholder engagement plan to ensure transparency in the design of incentive mechanisms and the process for accessing project benefits. As part of the technical assistance, support to local organizations, water bodies and agroforestry cooperatives will be conducted under participatory approaches. Support will also be provided to vulnerable groups and smallholder farmers to enable them to access project benefits (e.g. support in meeting the requirements for the incentive mechanism, for the development of a forest management plan or even advanced financing for natural regeneration). The ESMF expressly bans child labour in the agreements on payment of forest incentives. An occupational health and safety plan will also be developed specific to the activities that will be identified and undertaken.

36. **Indigenous peoples.** The ESA indicated that there would be potential overlap between the project's intervention areas with the territories of two ethnic groups (Lenca and Tolupan). As the actual sites of project activities will have to be further determined and finalized, the AE will determine and confirm the actual presence or absence of indigenous populations specific to the overlap. Where the existence of indigenous populations is confirmed, the Bank's requirements of the IDB following the policy of the AE on indigenous peoples and the indigenous peoples planning framework incorporated in the ESMF will need to be met. The requirements include: (1) conduct a socio-cultural analysis; (2) develop an indigenous peoples plan; (3) implement culturally appropriate consultations and good faith negotiation; and (4) document an agreement as an expression of the communities' free, prior and informed consent. Outlines of the socio-cultural analysis and indigenous peoples plan are provided as an annex to the ESMF.

37. **Land acquisition and involuntary resettlement.** The project is not expected to cause any displacement of the local population or lead to any acquisition of land.

38. Environmental risks and impacts identified in the ESA include increasing pressure on biodiversity, introduction of invasive species, land-use changes, impacts on conservation areas, and pollution caused by the use of hazardous materials. To mitigate the environmental risks and impacts the activities will be aligned with the existing management plans of the protected areas.



The restoration activities will also promote natural regeneration to avoid the introduction of non-native invasive species. The occupational health and safety plan will include provisions for the use, handling and disposal of hazardous materials including agrochemicals and hydrocarbons.

39. **Natural habitats.** The ESA and ESMF identified several protected areas such as national parks, cultural monuments, national forest reserves, wildlife refuges and areas of international conservation importance (e.g. key biodiversity areas and those identified by the Alliance for Zero Extinction). However, the ESA and ESMF did not indicate adverse risks and impacts because the activities will be restoration and reforestation. The ESMF provides measures to mitigate impacts on habitats; for example, avoiding the introduction of invasive species, avoiding any land-use conversions, compliance with the allowable activities and uses in the project areas, and conducting more detailed assessments of local biodiversity and natural habitats in the project intervention areas. The restoration activities will use existing native species in the same zone or locality to protect regeneration from threats. Other species will be used, for example, broadleaf native trees and plants. The list of species for restoration will be reviewed and approved prior to their use.

40. An E&S management plan detailing the proposed mitigation measures for the E&S impacts is presented in the ESMF.

41. The ESA and ESMF present the list of excluded activities that could potentially elevate the overall E&S risk category of the project. The excluded activities include: (1) high E&S risk activities (category A); (2) involuntary resettlement of populations; (3) present adverse impacts on communities and indigenous peoples; (4) conversion or degradation of critical habitats or cultural sites; and (5) activities that have adverse transboundary impacts.

42. The ESA and ESMF present the various rounds of stakeholder consultations that were undertaken. Initial consultations with stakeholders in the identified departments and municipalities were undertaken in 2016 as part of the SFM stakeholder engagement. Following the first round of consultations, further rounds in 2018 included consultation on the new intervention areas of the project and also on PES. The ESMF includes the stakeholder engagement plan and grievance redress mechanism, which are incorporated in a community liaison plan. The stakeholder engagement plan provides the overall strategy for engaging the various identified stakeholders of the project throughout the project's lifetime. The stakeholder engagement plan includes general guidelines on project external communications and the levels of stakeholder participation. The various stakeholders of the project are described and characterized and, on that basis, the activities and participation are developed.

43. The project-level grievance redress mechanism is described in the community liaison plan. The process, as well as responsible agencies and units, are described; namely, the executing agencies, SEFIN (the Honduran Ministry of Finance) and ICF, and the municipal governments are responsible for receiving and resolving complaints from affected or potentially affected individuals or groups. The project-level grievance redress mechanism identifies the agency that is tasked with receiving, validating and resolving complaints. The mechanism also describes the chain of process from reception of complaints to resolution and feedback.

44. The AE will maintain supervision responsibilities in accordance with the accreditation master agreement (AMA) and the policies and procedures of the AE with regard to the project. In terms of specific due diligence functions, the AE will contractually require SEFIN, the executing entity (EE), to manage the project with consideration to the safeguard requirements of the country, including the implementation of stakeholder engagement and the grievance redress mechanism. An E&S coordinator will be engaged by SEFIN to support the implementation of safeguards, supported by E&S specialists from ICF, as the technical executing agency for the project. ICF will also perform E&S risk monitoring consistent with the requirements of the ESMF.



45. The ESMF provides an indicative budget for some of the measures that have not been included as part of the project. These costed activities include external communications and training on occupational health and safety.

## 4.2 Gender policy

46. The AE has submitted a gender analysis as part of the gender action plan. The gender analysis provides information of gender issues in the country and in the areas where the project will be implemented in relation to education, labour market participation and access to resources. In addition, the national institutional and regulatory framework that allows for undertaking gender-related work is also included in the gender analysis. The gender analysis identifies the barriers for producers, particularly women, to participate in agroforestry activities. These include access to resources such as land, finance and inputs, and limited technical capacity to undertake agroforestry practices.

47. Consultation workshops were undertaken and were attended by both women and men. Additionally, beneficiary organizations were interviewed during the preparation of the training plan for the project. It is not clear from the ESMF how stakeholder consultations have been used by the AE to identify the different needs and priorities of women and men in relation to the project. The AE is requested to identify and incorporate the needs and priorities of women and men, as gathered from the stakeholder consultations that have been undertaken. These findings should supplement the gender analysis that has been done by the AE.

48. A project-level gender action plan has been provided, and it includes activities that are based on the barriers identified in the gender analysis. The project aims to address these barriers by providing women with access to finance for agroforestry activities such as coffee production and capacity-building through training. Furthermore, the project will promote the participation of women and men in water management committees, thereby also providing opportunities for women to participate in the governance of water-related matters. Participation in agroforestry cooperatives by women will also be promoted by the project in addition to employing women in forest restoration activities.

49. The action plan includes performance indicators, and some sex-disaggregated targets are provided for the indicators. In addition, targets are included for female-headed households, which are part of the 27,000 households that are direct beneficiaries of the project. There is scope to add more sex-disaggregated targets in the action plan (e.g. on the indicator related to training for activities on the restoration of pine forests), and also scope to provide targets related to men as beneficiaries of the project. The logical framework also includes sex-disaggregated targets at the fund level and output level for beneficiaries of the project. The AE should also use the further socio-economic analysis of beneficiaries to be undertaken during the initial stages of implementation of the project as an opportunity to collect baseline data for the rationalization of targets that have been included in the gender action plan.

50. Timelines for implementation and financial resources allocated for activities listed in the action plan have been provided. Timelines should be provided for each activity listed in the gender action plan. For example, activities on further analysis of the socio-economic conditions of women in beneficiary organizations do not have timelines for implementation. In addition, the implementation arrangements for gender-related work include the appointment of a gender expert who will be responsible for the implementation of activities in the action plan.

## 4.3 Risks

### 4.3.1. Overall programme assessment (medium risk):

51. The funding proposal requests a senior loan of USD 10.8 million and grant of USD 24.2 million from GCF for investing in forest restoration, agroforestry practices and adaptive forest management for the provision of water services in Honduras. The AE is co-financing a senior loan of USD 25 million and grant of USD 2.5 million. The Government of Honduras, water beneficiaries and local communities will provide grant and in-kind contributions totalling USD 17.5 million; and

52. The activities to be financed by GCF are not expected to generate revenue. The AE has proposed a combination of grant and debt financing from GCF considering Honduras's current fiscal situation. Part of the GCF grant (USD 17.5 million) is for initial capitalization of local water management funds (LWMFs). Disbursement of this amount by GCF will be linked to parallel disbursements and in-kind contributions by the Government of Honduras, water users and communities (a total of USD 17.5 million co-financing: USD 8.76 million of grant and USD 8.74 million of in-kind contributions). Thus, timely provision of these co-financing resources is necessary for the project to achieve its impact.

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

53. The AE, IDB, has an extensive track record in the region and has a long-standing presence in Honduras, working with the Government of Honduras. The AE managed a portfolio of 33 projects with a total financing of USD 851.5 million (16 loans and 17 non-reimbursable instrument) between 2015 and 2018. The approach for this project will benefit from lessons from the previous successful experience of the AE in the region. The AE has already been working with the EE on the execution of another project (SFM); and

54. The Ministry of Finance (SEFIN) is the EE for the project. The experience and existing arrangements with the AE will be leveraged for the implementation of the proposed project. During the SFM project design, IDB conducted an institutional capacity analysis of SEFIN. The analysis shows that, due to the number of active projects, the capacity of the EE needs to be strengthened by complementary personnel fully dedicated to the project, especially for procurement, administrative and financial management, and for monitoring and evaluation. This analysis will be reflected in the hiring of project staff and support given by the AE to the EE.

**4.3.3. Programme-specific execution risks (medium risk):**

55. Natural disaster and pine beetle infestation: the funding proposal identified a risk that extreme weather events may affect the processes of restoration and project activities. In addition, as per information from the AE, regardless of the outcome of the project it is very probable that pine beetle outbreaks will continue and their frequency may increase in the future. This pest can easily spread across national boundaries and a regional strategy and regional management are essential. The project will help to reduce the magnitude and negative impacts of the outbreaks through adaptive forest management practices;

56. Land tenure insecurity: the funding proposal states that there is a risk of resistance towards the new practices by farmers due to insecure land property rights. According to the information provided by the AE, an analysis shows that agroforestry practices are more profitable in the medium term compared with traditional agriculture or extensive livestock practices. Farmers are less sure about whether they will get the overall benefits of the investment in the long run. This risk can be mitigated by providing incentives for agroforestry systems in areas with clear land rights are assigned. The project will also maintain communications with stakeholders and provide the necessary information on progress and development achieved during the project implementation;

57. PES mechanism and contributions from the water beneficiaries: as stated in the funding proposal, the PES system has seldom been operationalized owing to the lack of dedicated fiscal

resources. Component 3 for the implementation of a PES mechanism lays out contribution sources for different water users and gradual increased contributions from water management committees and downstream water users. Approximately USD 1.5 will be required from each water beneficiary per month and this amount lies within the existing willingness to pay. However, the initial setting up of the LWMF will be finalized and benefits will start to kick off only in year three of the five-year implementation period. As per the information shared by the AE, although there is equal financing by GCF and other contributors to LWMF, there is frontloading of the disbursement from GCF: 65 per cent of the contribution from GCF is disbursed in the first three years, while 73 per cent of fund from other contributors will be disbursed in years four and five. Thus, the timely contribution by the other financiers is critical for the implementation of this component;

- (a) Security concerns: the AE stated that political and criminal violence may hinder local communities' participation in the project. A recent electoral process was followed by several weeks of violence and a national dialogue process began in August 2018 under the aegis of the United Nations to try to find a solution. This uncertain political situation is compounded by the high level of criminal violence, which will be a challenge for the project. The funding proposal proposed a few mitigation measures, such as developing helplines for assistance, contributions from government-sponsored policies and ensuring that local agents understand the project goals;
- (b) Credit risk for the loan: the debt of USD 10.8 million is a sovereign loan. The project activities are not expected to generate revenue. Currently, Honduras's economic strength is low. The country is rated as B1 by Moody's. However, the concessional loan from GCF has a long tenor, which is expected to ease the debt servicing by the Government of Honduras, – a borrowing member country of IDB, and IDB has a preferred creditor status with Honduras. These factors are expected to partly mitigate the sovereign credit risk; and
- (c) Economic and financial viability: the economic assessment of the project by the AE considers three different activities; namely, restoration of private forest, adaptive forest management and agroforestry. The assessment results in a net present value of USD 74.4 million and an internal rate of return (IRR) of 45.7 per cent with a 25-year time frame. The intervention on private restoration which GCF is financing has an economic IRR of 125.3 per cent, while adaptive forest management shows an IRR of 54.2 per cent, and an IRR of 26.2 per cent for the promotion of agroforestry. A sensitivity analysis was also conducted for different criteria, including a 30 per cent reduction and increase in the profitability, as well as two different discount rates (15 per cent and 8 per cent). The overall assessment shows that the project is economically viable.

#### 4.3.4. Compliance risk (medium risk):

58. The project involves activities which pose elevated risks of money laundering (ML), terrorist financing (FT) and other financial crimes, particularly under component 1 (activity 1.2) and component 3 (activity 3.2). With regard to activity 1.2, the increased exposure arises from the proposed restoration of privately held forests and the concomitant opportunity for financial abuse by the beneficiaries. Likewise, in relation to activity 3.2, the financial contributions - from "watershed users" as well as the incentive payments to communities – introduces a relatively complex financing mechanism involving various entities which may distort the flow of funds.

59. Through the AMA, the AE is contractually bound to apply international best practice standards to manage the risks of ML/FT in the implementation of GCF projects. Pursuant to the discharge of this obligation, the AE has provided a detailed description of the control measures to be put in place to effectively minimise the identified risks, as well as the associated reputational impacts throughout the project cycle. The AE's proposed plan includes regular

financial audits and a rigorous verification due diligence process for the activities under 1.2. Similarly, under activity 3.2, the AE will conduct Anti-ML & Counter-FT capacity assessments as part of the criteria for selecting the escrow holding institution. The AE's Office of Institutional Integrity will proactively advise the Project Team on the implementation of the full range of mitigating actions outlined in the proposed strategy. Moreover, the AE has a robust integrity risk management institutional framework and a strong track record in delivering desired outcomes. The combined impact of these factors is expected to significantly reduce the potential for misuse of GCF resources to a medium risk rating.

**4.3.5. GCF portfolio concentration risk (low risk):**

60. In case of approval, the impact of this proposal on the GCF portfolio remains non-material and within the risk appetite in terms of concentration level, results area or single proposal.

**4.3.6. Conclusion:**

61. It is recommended that the Board consider the above factors in its decision.

Summary risk assessment		Rationale
Overall programme	Medium	<ul style="list-style-type: none"> <li>The AE has an extensive track record in the country and the project is building on the ongoing projects and experience of the AE in the country. SEFIN is acting as an EE</li> <li>Project sustainability will depend on timely financing of the parallel resources from the Government of Honduras and beneficiaries for the LWMF and their support for the operationalization of the LWMF after project implementation</li> <li>Pine beetle outbreaks cannot be completely mitigated regardless of the project output and it may hinder the project activities</li> </ul>
Accredited entity (AE)/executing entity (EE) capability	Medium	
Project-specific execution	Medium	
GCF portfolio concentration	Low	
Compliance	Medium	

## 4.4 Fiduciary

62. Inter-American Development Bank (IDB) is the AE for this project and will conduct overall program oversight. In addition, IDB determines the on-lending, financial management and contractual responsibilities in the framework of the Subsidiary Agreements with the Republic of Honduras.

63. The IDB loan project's Operating Manual details the project operational procedures and defines the roles of different actors involved. The manual will be updated to accommodate the additional financing component from the GCF. The policies and procedures to be applied for the execution of administrative, financial, and operational activities will be described in the Operating Manual, and which will be based on the IDB policies and procedures.

64. The Ministry of Finance (SEFIN), through its Project Management Unit (Unidad Administradora de Proyectos, UAP) will be the Executing Entity for this project. The EE will be responsible for the management of the entire program including monitoring and supervision of the financial management of the Project. SEFIN, through the Project Management Unit, will also be responsible for the planning, execution and monitoring of procurement processes for goods, services and works, ensuring compliance with the Bank's Acquisition and Contracting Policies.

65. The EE will be responsible for preparing the audited financial statements of the Project, duly audited annually by an independent auditor acceptable to the Bank. In addition, the EE will be responsible for the preparation of the baseline and the measurement of the results of the program.

## 4.5 Results monitoring and reporting

66. This project aims to foster a paradigm shift for forest management, creating enabling conditions for better governance of the forest sector and its financial sustainability, shifting from a reactive model to a preventive one in the face of climate change. As a cross-cutting intervention, the funding proposal reports in section E1.2 the value of the core indicators "Expected number of direct and indirect beneficiaries" are an anticipated 27,000 (4.8 per cent of the total population) direct beneficiaries (50 per cent female and 50 per cent male) and 450,000 (16 per cent of the total population) indirect beneficiaries located in the intervention area. The proposal asserts that the intervention will lead to the protection of 270,000 ha of pine forests with adaptive forest management and will lead to a saving of 330,000 tCO<sub>2</sub>eq per annum, and 10.5 MtCO<sub>2</sub>eq over the lifetime of the project from improved forest and land use.

67. Regarding the theory of change provided in section C.3 of the project description, the diagram shows a clear causal linkage/pathway between the problem statement and strategic result areas as well as showing the assumptions and risks envisaged. However, the theory of change needs to be revised in terms of presentation, particularly in relation to the key outputs and project outcomes.

68. Overall, while the funding proposal is clear, with planned components and activities, and has a clear rationale and strategies for implementation, the AE will need to align the information under section B.1 (description of financial elements), section C.3 (programme description) and C.8 (timetable of implementation) and ensure consistency with the activities section of information in the logical framework.

69. With regards to section C.8, relating to the timetable of implementation, this will need to be updated because the current presentation does not align with the standard GCF format. The plan will need to be populated with detailed components, outputs and key activities related to the whole project and not limited to activities to be funded by GCF proceeds only. It should be brought in line with the information provided in sections B.1 and C.3 because there are inconsistencies and variabilities with activities and subactivities across these sections. Also, the timetable should be revised to include key milestones/deliverables and GCF reporting timelines.

70. Regarding section H.1, based on comments from the Secretariat, the logical framework aligns with the climate results and indicators of the performance measurement framework of GCF. However, there is a need to revise the section in terms of the presentation of the activities

section. This section will need to be amended to include the detailed description of the activities rather than simply stating the number of activities (e.g. 1.1, 1.2).

71. Under section H.2, although the information on monitoring and reporting includes detailed information, especially on impact monitoring, the methodologies for the midterm and end of term evaluation would need to be provided; specifically, the details of the approach and methodologies (e.g. whether formative, process, summative).

## 4.6 Legal assessment

72. The AMA was signed with the AE on 29 August 2017, and it became effective on 30 March 2018.

73. The AE has not provided a legal opinion/certificate confirming that it has obtained all internal approvals and that it has the capacity and authority to implement the project. It is recommended that, prior to submission of the funding proposal to the Board; (a) the AE obtain all its internal approvals; and (b) GCF receive a certificate or legal opinion from the AE in form and substance satisfactory to the GCF confirming that all final internal approvals by the AE have been obtained and that the entity has the authority and capacity to implement the project.

74. The proposed project will be implemented in the Republic of Honduras. GCF signed a bilateral agreement on privileges and immunities with the Republic of Honduras on 27 April 2016.

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

- (a) Delivery by the AE to GCF a certificate or legal opinion confirming that it has obtained all its internal approvals within 180 days of the Board approval;
- (b) Signature of the funded activity agreement in a form and substance satisfactory to the Secretariat within 180 days from the date of Board approval, or the date on which the AE has provided a certificate or legal opinion confirming that it has obtained all internal approvals, whichever is later; and
- (c) Completion of legal due diligence to the satisfaction of the Secretariat.



## Independent Technical Advisory Panel's assessment of FP111

Proposal name:	Promoting climate-resilient forest restoration and silviculture for the sustainability of water-related ecosystem services
Accredited entity:	Inter-American Development Bank (IDB)
Project/programme size:	Medium

### I. Assessment of the independent Technical Advisory Panel

#### 1.1 Impact potential

*Scale: High*

1. The primary objective of the project is to improve the provision of water services through increasing the resilience of vulnerable coniferous forests by implementing forest restoration, agroforestry practices and adaptive forest management in critical areas.
2. The project covers an area larger than 1 million hectares (ha) of which 564,832 ha is forest area. It will respond to the challenge faced by the country in terms of the pine beetle outbreak that has destroyed 480,000 ha of pine forest (about 10 per cent of the total national forest cover and 25 per cent of coniferous forest), and that, according to the project proposal, has been spreading rapidly in Honduras in recent years due to climate change.
3. The project has three components. The first component will support forestry activities in the selected watersheds, restoring forest areas affected by pine beetle with selected forest species. The component will also restore 30,000 ha through agroforestry systems in areas adjacent to pine forests, where property rights are well defined. The idea is to increase the forest cover, mainly in properties with coffee and livestock activities, ensuring climate resilience.
4. The second component will strengthen the capacity of the Institute for Forest Conservation (ICF) to respond to the pine beetle outbreaks and to diversify forest species with improved varieties more adapted to climate change.
5. The third component, on forest governance and financial sustainability, will enable conditions for decentralized watershed management and forest resources management, with the establishment of water management committees and watershed councils able to maintain ecosystem services, including water provision. The component will involve the implementation of Payment for Ecosystem Services (PES) systems, including the contribution of private and public entities downstream that depend on the restoration of forests upstream to ensure water supply for irrigation, safe water and hydropower generation. This component will ensure long-term sustainability, focusing on maintaining hydrological integrity of the selected landscapes, involving 50 per cent co-financing from the Government of Honduras.
6. The funding proposal contributes to both climate change adaptation and mitigation. The main adaptation impacts expected include: (i) 450,000 rural people in least economically developed areas in Honduras will have secure water availability; (ii) 270,000 ha of forest land will be protected and made more resilient to climate change; and (iii) 27,000 households will receive direct support towards the implementation of restoration, adaptive forest management and agroforestry systems, improving their economic condition and their capacity to adapt to climate change. The project will work directly with water committees and agroforestry



cooperatives, empowering communities to implement sustainable forest management, using a water fund as an economic and financial mechanism to ensure long-term sustainability.

7. Through the conservation and restoration of forests, the project expects to reduce the water deficit<sup>1</sup> up to 15 per cent in the dry season with a positive impact on the total water availability of 2 per cent per year, allowing water consumption for around 450 individuals (average consumption of 200 litres per person per day) and supporting livelihoods and adaptive capacity.

8. Restoring forests and ensuring water availability takes time. In terms of forest restoration and management, the project expects to achieve the following results after five years: 198,031 ha will be managed with Adaptive Forest Management (AFM) practices (including fire risk control and prevention, tree thinning and enrichment with non-pine species); 30,000 ha with agroforestry systems implemented and 10,664 ha of private forest rehabilitated.

9. In terms of mitigation, the project presents a good scenario analysis, having as the baseline scenario the current situation of forest status, weather and hydrological conditions without climate change, a 2050 scenario with climate change and no project (business as usual (BAU-CC)), and a 2050 scenario with climate change and project.

(a) In the BAU-CC scenario, it is estimated that by 2050, 84,402 ha will be lost in the project area due to highly likely pine beetle attacks and expected land use changes. With the implementation of the project, the expected losses will decrease to 14,376 ha, with an avoided loss of 70,026 ha of forest corresponding to an emission reduction of approximately 10.5 MtCO<sub>2</sub>eq (during 30 years from 2020 to 2050). This estimate includes carbon stocked by the growth of the forests under restoration and the reduction from avoided deforestation of primary forest under sustainable management. This will be done using baseline reference levels prepared by the country for the REDD-plus strategy.

10. The project impact is expected to be high, mostly in terms of adaptation, ensuring water provision for a large population with nature-based solutions that will in time reduce emissions from forest restoration.

## 1.2 Paradigm shift potential

*Scale: Medium-high*

### 1.2.1. Innovation

11. The innovation is grounded in developing effective forest management schemes that will enable water supply while controlling the pine beetle outbreaks with PES involving communities and water users. The project is therefore addressing forest degradation and land-use change, the provision of ecosystem services and sustaining livelihoods of the most vulnerable communities in upper basins while guaranteeing water supply downstream for cities and towns.

12. Few governments are taking loans to restore ecosystems and landscapes to ensure both adaptation and mitigation impacts, understanding that nature-based solutions could be a cost-effective measure with multiple co-benefits.

13. Having the opportunity of testing a mix of forest management practices and forest restoration activities financed by PES could slow down and reverse forest degradation and loss of water retention ensuring climate change adaptation on a longer-term basis.

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<sup>1</sup> The estimates were done using a soil and water assessment tool model in selected basins.

14. The project expects to test a new forest management model that is more resilient to climate change. The proposed forest schemes are not an innovation per se, as it is a common practice in many parts of the world. Moreover, the entry point to address forest degradation is not entirely correct. As the project describes, “It is estimated (Flórez and Mairena, 2005) that 72% of the country’s pine forest areas (public and private) were degraded before the last beetle attack. Both human and spontaneous wildfires in pine areas are considered an important factor behind increasing bark beetle outbreaks in Honduras as well (Rivera et al, 2010, Hernández et al 2013, Billings, 2016.)”. Therefore, the pine forest degradation in Honduras is not just a consequence of pine beetle outbreaks nor global warming (increased temperatures and fewer rains), but it is most importantly due to a long-running process of human settlements in forest areas, land-use changes, forest fires, inadequate forestry (silvicultural) and farming practices, and tree harvesting without assuring regeneration and restoration of ground cover and canopy structure. Bark beetle infestations are therefore a natural consequence of the diminished health of forest ecosystems. And forest degradation for the reasons mentioned above is the principal cause of reduced forest ecosystem health and resilience. Thus, addressing forest degradation, and not only pine beetle attacks, should be the primary objective of this project.

15. The role of the ICF will be critical, not only to reduce the pine beetle infestation but to promote forest practices and restoration schemes that could be effectively delivered by communities and private owners to build the resilience of forest ecosystems.

16. The PES model is an innovative approach to finance and sustained forest management interventions. The project builds on the effective policies and schemes developed by the Government of Honduras to allow the establishment of water councils and their responsibilities in maintaining forests and ecosystems. It also uses a cross subsidy from the energy sector and the revenues from the water tariff to ensure a long-term financial inflow of revenues to sustain PES schemes.

#### **1.2.2. Potential for knowledge and learning**

17. The funding proposal places considerable emphasis on knowledge and learning, especially in its effort to empower local forest-based communities to implement adaptive forest management practices.

18. The project is tackling only 10 per cent of the areas that have been inflicted with pine beetle outbreak but is giving special emphasis to strengthen the capacity of ICF to foster AFM and pest control throughout the country. ICF will develop a certification course to train 60 technicians nationwide and will train 240 municipal and private technicians. Universities will be involved in research to broaden the knowledge on forest management and health control. Overall research and lessons learned from controlling the plague will be crucial to control other areas in the country and to share the knowledge and results with the already established groups in the central American countries and with other countries in the world facing the infection.

19. The project has potential for replication and for knowledge-sharing, as the PES model could be developed in other parts of the country, involving the water councils and the communities. The project could include an activity to involve other water councils to share the experience at the end of the project and encourage them to use the model.

#### **1.2.3. Contribution to the creation of an enabling environment**

20. The Government of Honduras is creating a model to manage the forests and the water they provide with PES schemes that involve communities and the private sector. The project intervention strategies are all targeted to create an enabling environment to strengthen forest and water governance, formalizing the legal status of the water councils and their ability to participate in the design of land management plans and to be responsible for their implementation, involving local actors.

21. The project is also contributing to the creation of a financial mechanism for adaptive forest management, rewarding upstream users for adopting forest management practices, creating synergies between public and private actors. The PES schemes will enable long-term sustainability for efficient forest management, involving cross subsidies from the energy sector and including payments in the water tariff. What is important is to mainstream the “conservation of water use principle” in the water sector, using a water tariff that is equitable and could be increased based on the willingness to pay studies involving different types of users. One of the most important areas for improvement around the world is to charge water tariffs to sectors that are not paying for the water such as the agricultural sector. It is also important to penalize the inefficient use of water with higher fees to those who go beyond a certain amount of cubic metres. The PES scheme projection shows a different tariff system for rural and urban areas and expects an increase of the water tariff over time. However, a stronger effort could be developed to improve the water tariff to account for efficiency, sector inclusion and equitable tariffs.

#### **1.2.4. Contribution to the regulatory framework and policies**

22. The policy instruments of the Forest Law, including local participation and the use of economic incentives, have not been used by the Government of Honduras. The project will make these instruments effective by creating a model that is more decentralized, empowers communities and uses the PES system that has recently been approved in the ecosystem services regulation.

23. The project also provides inputs to improve the water and energy sectors in Honduras, creating a link between the conservation of forests and their ecosystem services to the provision of water and energy services.

#### **1.2.5. Scalability and replicability**

24. The project has enormous potential for scalability and replicability as there are very few nature-based solutions in the world to restore and manage forests with a financial mechanism that is sustainable. Moreover, if the model proves to be feasible, economies of scale could be achieved by managing larger areas of forests in Honduras and optimizing governmental resources.

25. The forest-water-climate change nexus is not commonly understood. The project is aiming to link forest restoration with the provision of water considering climate change with PES schemes that could be replicated within the country and adopted by other countries suffering forest degradation and water scarcity.

26. The model could support the Government of Honduras’s nationally determined contribution commitments to restore one million ha of forest and could be a model for other countries in the world.

### **1.3 Sustainable development potential**

*Scale: High*

#### **1.3.1. Environmental co-benefits**

27. The programme could have several potential environmental benefits, including the recovery of natural habitats, which will enable biodiversity conservation in line with the Aichi targets and the biodiversity convention.

28. The project is also acting in terms of disaster preparedness, controlling the pine beetle plague that is destroying forest resources.

29. Most importantly, the project is ensuring the provision of environmental services, having water at the centre of the strategy, ensuring quality and quantity to the selected regions and enabling climate adaptation practices.

### **1.3.2. Economic co-benefits**

30. The benefit of ensuring water provision will in turn secure livelihoods (safe water) and the sustainability of the agriculture (irrigation) and energy (hydropower) sectors, providing benefits to the country economy at large. Promoting agroforestry systems will increase the yields of forest and agricultural production, favouring the local economy and impacting the agricultural gross domestic product.

31. Ensuring the quality of the water for hydropower generation and reducing sedimentation costs will reduce the costs of power generation. The same is true for the water companies that will benefit from an increase in water availability and reduction of water treatment costs.

32. The economy of poor communities in the upper basins will also be improved with the revenues from PES schemes and the increased yields of wood, firewood, tree resins and agricultural products.

33. The project will support agroforestry systems, including livestock and coffee farms. The coffee sector generates one million jobs and 30 per cent of the population works in the coffee industry. The number of people living from livestock is not estimated. However, the project will ensure more adaptive agroforestry systems that will benefit the economy of these sectors.

### **1.3.3. Social co-benefits**

34. The communities will strengthen their capacities to manage land and forests and will be able to ensure long-term benefits for conserving the ecosystems. They will benefit from the PES schemes, ensuring livelihood revenues.

35. However, the PES schemes should be designed in an equitable manner to avoid possible conflicts within the communities. There are many examples of employment schemes that are unfair, politically driven or culturally unacceptable, undermining traditional cultures or social cohesion, thus dividing communities. Therefore, the design of the PES schemes should ensure equitable and fair distribution of payments as the key driver.

### **1.3.4. Gender-sensitive development**

36. In terms of gender equitable participation, the project has a gender action plan. Most women's organizations are participants in the ICF agroforestry and micro-basin organizations. The project estimates that around 40 per cent of the members of the organizations are women; however, women have a diminished role in the decision-making process as only 24 per cent of the board members are woman. The assessment also found that due to cultural barriers, women do not consider themselves capable of working in the forest. The project will ensure that women are employed in restoration activities with training schemes and ensure that they are equally employed.

37. The project has also noted lack of access to land and housing, as well to financial services, for women. The project will ensure that women producers will receive finance for agroforest systems, will participate in ICF trainings, and will be part of water management committees and agroforest cooperatives.

38. One of the most important factors is to ensure equitable distribution of payments from the PES schemes. The project includes the following indicator: "Number of beneficiaries that receive payments for environmental services, of which 40% are women". This indicator will be included as part of the contracts with the community organizations and the technical assistance firms will monitor its fulfilment.

39. The project's intervention area includes several indigenous communities belonging to the Tolupan and Lencas peoples. A sociocultural analysis of these communities is currently being carried out in order to identify ancestral forest and water resource management

practices, as well as gender and intergenerational relations and decision-making mechanisms within the communities. The information gathered through this analysis and consultation in accordance with its own decision-making mechanisms with the communities will serve as the basis for defining the activities to implement and the distribution of tasks, resources and benefits. The project will not implement any activity on indigenous lands without the prior and informed consent of the community.

## 1.4 Needs of the recipient

*Scale: High*

### 1.4.1. Vulnerability of the country and vulnerable groups

40. Honduras is a Central American country with an area of about 2,492 km<sup>2</sup> and a population that exceeds nine million.<sup>2</sup> The country is rich in natural resources, including minerals, and has an important agricultural sector, with exports of coffee, fruits and sugar cane. Honduras has a Human Development Index of 0.625, classifying it as a nation with medium development.<sup>3</sup> When the Index is adjusted for income inequality, its inequality-adjusted Human Development Index is 0.443.<sup>4</sup> The country has the highest poverty rate in Central America.<sup>5</sup>

41. Honduras has been affected by extreme climate-related events and is a country especially vulnerable to natural disasters such as Hurricane Mitch in 1998. At the same time 48 per cent of the country is covered with forests that have been affected by pine beetles, with one of the most devastating infections happening between 2014–2016. By the end of the period, 511,000 ha of pine forests were lost, with serious consequences in terms of ecosystem services.

42. Honduras has a long history of forest management, with the Institute of Forest Conservation as the central entity responsible for forest management. According to the project proposal, 72 per cent of the country's pine forest areas (public and private) were degraded before the last pine beetle attack due to human activities and forest fires. Moreover, recent changes in forest laws and regulations eliminated the National Forest Pest Control Department. Therefore, as stated in the paradigm shift section, forest degradation has had many underlying causes and beetle attacks are exacerbated by the lack of efficient forest management practices.

43. The population located in the 29 basins selected by the project have suffered water scarcity, and water prices could represent around 18 per cent of the monthly income of some families in Tegucigalpa, mostly the poorest in the city. Water scarcity aggravates health problems associated with water and sanitation. Even though the project is only tackling forest restoration, there is a need to analyse the relationship between the water and sanitation regimes and tariffs in order to adjust inequities and ensure water availability to the poorest communities upstream and downstream of the project.

### 1.4.2. The need for strengthening institutions and implementation capacity

44. Despite the resource limitations of the Government of Honduras, the country is willing to take a loan from the Inter-American Development Bank (IDB) for USD 25 million to restore 40,000 ha. The country is also recognizing the need to establish a National Forest Pest Control Department again and to invest in a stronger forest management service that together with the efforts of the private sector and the communities will ensure long-term sustainability of ecosystems and the services they provide.

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<sup>2</sup> "World Population Prospects: The 2017 Revision". United Nations Department of Economic and Social Affairs, Population Division.

<sup>3</sup> Human Development Report, 2016.

<sup>4</sup> Human Development Report, 2016.

<sup>5</sup> World Bank, available at <<https://datos.bancomundial.org>>.



45. The project has one design component to strengthen the ICF, as the central component to ensure effective long-term management and effective technological transfer to the regions. There is also an effort to strengthen water governance, formalizing 200 water management committees and 11 water councils in 53 municipalities enabling the conditions for stronger forest-water resilience.

#### **1.4.3. Absence of alternative sources of financing**

46. The Government of Honduras has made important efforts to reduce the fiscal deficit, which rose from 7.1 per cent of the gross domestic product in 2013 to 0.5 per cent in 2016. However, the country's stability has implied difficult investment decisions with pressures to invest in infrastructure, education and health, leaving only 0.85 per cent of the annual expenses in recent years to finance climate change-related issues.

47. Due to the pressing need to solve the pine beetle outbreak, the Government has sacrificed investment needs and accepted the IDB loan as well as investing USD 26 million of its resources as an "emergency response" to avoid greater consequences of the pest. However, the project aims to deliver a more long-term economic model that will ensure long-term management of the forests and water provision with the PES scheme. Therefore, additional concessional resources are needed to support the adoption of appropriate measures for forest restoration and management. Due to the immediate necessity to restore forests, the project is requesting a USD 10.7 million loan from GCF, and will use the grant resources to strengthen ICF and to establish the water fund to ensure sustainability of the project.

## **1.5 Country ownership**

*Scale: High*

### **1.5.1. Alignment with national climate strategy**

48. Honduras has a well-established climate change regulatory framework which includes:

- (a) The Climate Change Law that establishes "principles and regulations necessary to plan, prevent and respond in an appropriate, coordinated and sustainable manner to climate change impacts in the country";
- (b) The Climate Change Strategy (NCCS) prioritizes seven sectors, which are those related to the proposed project, specifically: water, agriculture, lands, food safety, forests and biodiversity and hydropower energy; and
- (c) The country's national determined contribution establishes climate change adaptation as a priority, proposing a reduction of 15 per cent of emissions regarding the business as usual (BAU) scenario from 2012 to 2030 and committing to restore one million ha by 2030.

49. The project is also aligned with other national development policies such as the National Vision 2038 and the National Development Plan 2022, the National REDD-plus Strategy and the Forest, Protected Areas and Wildlife Law and the Water, Forest and Land Master Plan.

50. The project is also aligned with two programmes financed by the European Union, namely the Programme for Adaptation to Climate Change of the Forest Sector (CLIFOR) and the Modernization Project for the Forest Sector of Honduras (MOSEF).

### **1.5.2. Capacity of accredited entities and executing entities to deliver**

51. IDB, as the accredited entity, has more than 50 years of experience in developing projects in all the Latin America and Caribbean countries. IDB has been using several finance mechanisms to support countries implementing climate change projects and programmes. In Honduras, IDB is implementing a USD 25 million loan for sustainable forest management.

52. The Ministry of Finance (SEFIN) is in the accreditation process as a national implementing entity of GCF, and it is responsible for the formulation, coordination, execution and assessment of policies regarding public finance and the general budget of Honduras. SEFIN has a project management unit that will act as the executing entity for management of the entire programme and as the fiduciary. The entity will be responsible for financial administration, planning and execution, monitoring and reporting to IDB. The independent Technical Advisory Panel (TAP) enquired why SEFIN would be responsible for a forestry/water project and was informed that the government authorities consider its involvement as executing entity to be strategic, since the project will provide direct exposure to GCF procedures, criteria and investment priorities.

53. The approval of technical products and supervision of the technical quality of activities will be carried out by ICF, through an agreement with SEFIN. It is important to understand that the Government of Honduras created a forest pest control unit within the Honduras Forestry Development Corporation (COHDEFOR). However, when ICF was created in 2017, replacing COHDEFOR, the pest control unit was dismantled. Therefore, ICF needs to regain capacity to manage the pest, with trained personnel and equipment, as well as information systems.

54. Moreover, the project needs to build its capacity not only to manage pest infestation but also to manage PES schemes and be able to manage the water fund that will serve 11 water basins and involve 200 water councils. The project is relying on hiring technical assistance firms to develop restoration and management plans, and to involve eligible community groups and individual producers interested in forest restoration, by signing agreements with ICF. The water councils will make their own technical decisions and manage the resources provided through the PES schemes.

55. The project is therefore complicated in terms of the roles of the different stakeholders and the need to fine-tune responsibilities after project completion. Moreover, forest restoration will take more than five years of the project duration, and therefore long-term management of the water fund will need to be well structured. In addition, the roles of the water councils that will continue to provide forest management technical assistance and to manage the resources from the PES schemes will need to be clear and well defined. The project will further need to ensure a transitional phase to gradually transfer the activities and responsibilities of the project management unit within SEFIN to the different stakeholders involved in the project after project completion, as effective restoration will take 30 years.

#### **1.5.3. Engagement with civil society organizations and other relevant stakeholders**

56. During 2016 four consultation workshops were carried out in the departments of Olancho, Francisco Marazan, El Paraiso and Comayagua with the participation of 127 stakeholders. A second round of consultations took place in May 2018 involving a total of 423 participants. The project has been designed bearing in mind the overall considerations of the different communities.

57. Specific consultations were held with relevant actors including the mayor of Tegucigalpa, the administration of the El Cajon Dam, local governments, and irrigation groups.

58. An institutional working group was established to design the proposal including SEFIN, ICF, the Secretariat of Agriculture and Livestock, Miambiente and the coordination secretariat of the Presidency.

59. The project will take two years to establish the proper arrangements to manage the water fund. As presented below in the recommendations by the TAP, in order to establish the PES schemes, further consultations will be needed to ensure equitable distribution of benefits, avoid leakages and guarantee long-term sustainability of the fund and sub-funds.



## 1.6 Efficiency and effectiveness

*Scale: Medium–high*

### 1.6.1. Cost-effectiveness and efficiency

60. The total cost of the project is USD 79 million, using three different financial instruments:
  - (a) Non-reimbursable donations for USD 8.27 million (USD 6.76 million from GCF and USD 1.5 million from IDB) that will be used to finance the capacity-building and institutional strengthening for implementation of the project model;
  - (b) A loan to the Government of Honduras of USD 35.73 million (USD 10.7 million from GCF and USD 25 million from IDB) to cover 100 per cent of the restoration needs, part of the costs of forest restoration and to promote agroforestry systems in deforested areas; and
  - (c) A conditional donation of USD 35 million (USD 17.5 million by GCF and USD 17.5 million from the Government of Honduras) to promote a PES scheme to support sustainability of the project model.
61. The intervention proposed in the project is founded on nature-based solutions, proving to be more cost effective than other infrastructure solutions, such as building water storage infrastructure. The project is also implementing a scheme to prevent pine beetle outbreaks with a cost of USD 189 per ha rather than the USD 590 that is the normal restoration cost per ha.
62. The project will start with the reforestation activities to avoid more erosion, forest fires and potential increasing costs of restoration. The project will use technical assistance resources for restoration of agroforestry systems in 30,000 ha mainly of special coffee under shade, financing installation of coffee trees and suitable shading forest. However, clear guidelines need to be defined in order to avoid perverse incentives to additional land-use changes and inequitable assignment of incentives.
63. The resources for the water fund will come from project resources, from the Government of Honduras and from increasing beneficiaries' contributions during the first five years. After year five, funds will be financed from three sources: (i) water tariffs; (ii) electrical tariffs; and (iii) government transfers. The total annual amount to finance is USD 5.7 million (costs of adaptive forest management activities – 30 per cent; community contributions + 10 per cent administration costs).
64. Water tariffs will finance USD 4.7 million (57 per cent), electric tariffs will finance USD 2.5 million (31 per cent), and the Government of Honduras will finance USD 1 million (12 per cent). Total annual financing of the 11 subfunds is estimated at USD 8.2 million, thus there is an expected surplus of USD 2.5 million per year that will be accumulated and used for additional forest management expansion in the future.
65. The financial scheme considers an average onetime increase in monthly water tariffs of USD 0.78 per family, and in the electric tariffs of USD 1.07 per family. These amounts are within the estimated willingness to pay for ecosystem services found in previous studies in Honduras (between USD 0.77 and USD 1.35 per family/month).
66. However, the most important part of a water fund is to have governance schemes and equitable distribution of payments that effectively compensate communities for management of forests. The project is working in 11 different basins with different communities that will need to agree on equitable and efficient ways to use the revenues from the funds. Limiting the use of revenues to paying salaries to individuals in each of the communities could be a disincentive for the communities at large. Therefore, the project needs to ensure that there are incentives in place for the communities, based on transparent and effective agreements.

67. If transparent and effective agreements are not ensured, the expected efficiency of the whole project will be negatively affected and will represent risk to its validity and continuation.

68. The project developed an internal rate of return (IRR) with a discount rate of 12 per cent and a 25-year time frame. The restoration scheme was more profitable with a 125 per cent IRR, while the AFM component had a 54.2 per cent IRR and the agroforestry systems a 26.2 per cent IRR. Even though the restoration scheme proves to be more profitable, a combination of options will ensure models are proven and at the same time will link private owners and communities in a common restoration effort at the landscape level.

69. Finally, the project effectiveness will only be proven when all the water funds are functional and with effective responses from the communities in their restoration efforts.

## II. Overall remarks from the independent Technical Advisory Panel

70. The iTAP recommends that the Board approve the project subject to the following conditions:

- (a) Prior to the first disbursement under the FAA, the Accredited Entity shall deliver to the Fund:
  - (b) An operational manual, developed by the Executing Entity and approved by the Accredited Entity, for the water fund (and sub-funds) including the following items:
    - (i) Guidelines for engagement with indigenous communities, including free, prior and informed consent processes; Minimum criteria on additionality and conditionality to be agreed with all the water councils, encompassing the actions beyond regulatory compliance that the water fund will be paying for and the conditions that trigger payments. Furthermore, it should include obligations on landowners / managers (i.e. what kind of land care is expected of them) and the benefits they may expect to receive from the water fund to achieve adequate protection of the land and delivery of the ecosystem services;
    - (ii) Transparency mechanisms in the use of payments, in accordance with the Policy on Prohibited Practices of the Fund;
    - (iii) Current water tariff projections based on a willingness to pay by downstream water users, including differentiated tariff system based on socio-economic conditions;
    - (iv) Local grievance redress mechanisms;
- (c) A template agreement with private landowners for agroforestry management, including, but not limited to, obligations of landowners/managers to achieve long-term agroforestry systems.
- (d) Prior to the second disbursement under the FAA, a copy of the agreements reached with each of the 11 water sub-funds on the PES systems for the use of resources, including, but not limited to, equitable distribution of payments, mechanism of community participation, empowerment and gender inclusion.

## Response from the accredited entity to the independent Technical Advisory Panel's assessment (FP111)

Proposal name: Promoting climate-resilient forest restoration and silviculture for the sustainability of water-related ecosystem services

Accredited entity: Inter-American Development Bank (IDB)

### Impact potential

We agree with the assessment from the ITAP.

### Paradigm shift potential

We agree with the assessment from the ITAP.

### Sustainable development potential

We agree with the assessment from the ITAP.

### Needs of the recipient

We agree with the assessment from the ITAP.

### Country ownership

We agree with the assessment from the ITAP.

### Efficiency and effectiveness

We agree with the assessment from the ITAP.

### ***Overall remarks from the independent Technical Advisory Panel:***

We agree with the assessment from the ITAP and thank the ITAP team for their thorough analysis.

On the conditions proposed:

### **ITAP proposal:**

- (i) An operational manual, developed by the Executing Entity and approved by the Accredited Entity, for the water fund (and sub-funds) including the following items:

- Guidelines for engagement with indigenous communities, including free, prior and informed consent processes; Minimum criteria on additionality and conditionality to be agreed with all the water councils, encompassing the actions beyond regulatory compliance that the water fund will be paying for and the conditions that trigger payments. Furthermore, it should include obligations on landowners / managers (i.e. what kind of land care is expected of them) and the benefits they may expect to receive from the water fund to achieve adequate protection of the land and delivery of the ecosystem services;
- Transparency mechanisms in the use of payments, in accordance with the Policy on Prohibited Practices of the Fund;
- Current water tariff projections based on a willingness to pay by downstream water users, including differentiated tariff system based on socio-economic conditions;
- Local grievance redress mechanisms;

**IDB response:**

- Regarding **second** bullet point: *Transparency mechanisms in the use of payments, in accordance with the Policy on Prohibited Practices of the Fund*

**Alternative text**

Transparency mechanisms in the use of GCF proceeds, in accordance with Clause 9.03 of the AMA.

**Justification.** The Accreditation Master Agreement signed between the Accredited Entity and GCF, in its Clause 9.03, mentions that the Accredited Entity shall apply its own standards relating to fraud and corruption, misconduct, conflicts of interest, and AML/CTF solely in accordance with own policies and procedures and that it shall not be subject to GCF's Policy on Prohibited Practices; and the IDB already represents in the AMA that the Accredited Entity's policies and procedures allow it to substantially comply with the objectives of the Policy of Prohibited Practices.

- Regarding **forth** bullet point: *Current water tariff projections based on a willingness to pay by downstream water users, including differentiated tariff system based on socio-economic conditions.*

**Alternative text:**

Current water tariff projections based on a willingness to pay by downstream water users.

**Justification:**

We plan to do a willingness to pay study. We cannot commit on the differentiated tariff, because it depends on the current water tariff scheme, and in some cases, there is not differentiation particularly in rural communities with high levels of poverty. For this reason, we suggest deleting the part of the condition related to differentiated tariff.

**ii) ITAP Proposal**

Copy of the agreements executed with each of the 11 water sub-funds on the PES systems for the use of resources, including, but not limited to, equitable distribution of payments, mechanism of community participation, empowerment and gender inclusion; and

**IDB response:****Alternative text:**

Prior to the **second disbursement**, a copy of the agreements reached with each of the 11 water committees on the PES systems for the use of resources, including, but not limited to, equitable distribution of payments, mechanism of community participation, empowerment and gender inclusion.

**Justification:**

The Water fund and sub-funds will be designed as part of the project, with resources under the activity 3.1 of the program (Development of enabling conditions for decentralized watershed and forest resources management), so it cannot be a condition prior to the first disbursement. Also we would like to change the text from 11 water sub funds to 11 water committees, to better reflect the mechanism.

**iii) ITAP Proposal:**

Copy of agreements executed with private landowners for agroforestry management, including, but not limited to, obligations of landowners/managers to achieve long-term agroforestry systems.

**IDB response:****Alternative text:**

A template of agreement with private landowners for agroforestry management, including, but not limited to, obligations of landowners/managers to achieve long-term agroforestry systems.

**Justification:**

The identification of the specific landowners will be done as part of the implementation of the project and cannot be a condition for first disbursement.

Alternatively, we can provide a template of agreement with private landowners.

# GENDER ACTION PLAN

Promoting climate-resilient forest restoration and silviculture for the sustainability of water-related ecosystem services

HONDURAS

## I. GENDER ANALYSIS

Honduras ranks the 55 out of 144 countries in the Global Gender Gap Index, index in which it has climbed 19 positions in the past ten years. In this decade, progress in the social situation and condition of women has been recorded, specifically in the development of the legal framework that includes actions for the protection, promotion, and exercising of their human rights. The country has achieved gender equity in education, although this has been translated neither into economic gain<sup>1</sup> nor work participation for women. Honduras has the second highest rate of women with no own income (39.7%)<sup>2</sup> and registers one of the highest rate of women murders in the region.<sup>3</sup> Female representation in politics is still very low.

### a) INSTITUTIONAL FRAMEWORK

The Institutional Gender Framework of Honduras is mainly made up by the National Women's Institute (INAM), founded in 1998.<sup>4</sup> It has a State Secretariat status and is in charge of making, promoting, and coordinating the execution and tracking of the National Women's Policy, as well as the executing action plans and the inclusion of women to the sustainable development.

INAM has fostered the development of two equal opportunity plans between women and men, while the National Women's Plan - Second Honduran Gender Equality and Equity Plan, 2010-2022 (II PIEGH) was valid.<sup>5</sup> It also encouraged the National Plan to Reduce Violence against Women 2014-2022.

There are gender units in the Secretariat for Security and the Judicial Branch, as well as sectoral gender mechanisms in the Secretariat of Agriculture and Livestock, Finance Secretariat, and Secretariat of Natural Resources and Environment.

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<sup>1</sup> World Economic Forum. The Global Gender Gap Report 2016. Geneva.

[http://www3.weforum.org/docs/GGGR16/WEF\\_Global\\_Gender\\_Gap\\_Report\\_2016.pdf](http://www3.weforum.org/docs/GGGR16/WEF_Global_Gender_Gap_Report_2016.pdf)

<sup>2</sup> Gender Equality Observatory for Latin America and the Caribbean (ALC) from CEPAL

<sup>3</sup> CEPAL. Gender Equality Observatory for Latin America and the Caribbean. <http://oig.cepal.org/es>

<sup>4</sup> National Congress of Honduras. Decree N.º 232-98, from September 30, 1998.

<sup>5</sup> National Women's Institute. National Women's Plan - Second Honduran Gender Equality and Equity Plan, 2010-2022. Decree PCM-028-2010.

[http://portalunico.iaip.gob.hn/Archivos/InstitutoNacionaldeMujer/Regulaciones\(normativa\)/Leyes/2011/II%20Plan%20de%20Igualdad%20y%20Equidad%20de%20Genero%20Honduras%20\(%20II%20PIEGH\).pdf](http://portalunico.iaip.gob.hn/Archivos/InstitutoNacionaldeMujer/Regulaciones(normativa)/Leyes/2011/II%20Plan%20de%20Igualdad%20y%20Equidad%20de%20Genero%20Honduras%20(%20II%20PIEGH).pdf)

## b) LEGAL FRAMEWORK

The country has an Equal Opportunities for Women Act (Decree N.º 34-2000)<sup>6</sup>, Law Against Domestic Violence - enacted in September, 1997; and its reforms, in 2005-, as well as reforms to the Election and Political Organizations Law (*Ley Electoral y de las Organizaciones Políticas*, LEOP) Decree 44-2004. Honduras ratified the Inter-American Convention on the Prevention, Punishment, and Eradication of Violence against Women, (Decree N.º 72-95, 1995), International Convention on the Elimination of All Forms of Racial Discrimination (Decree N.º 61-2002) and Convention 111-ILO Concerning Discrimination in Respect of Employment and Occupation (Decree N.º 209, 1960). The country has neither signed nor ratified the Enforcing Protocol of the Convention on the Elimination of All Forms of Discrimination Against Women.<sup>78</sup>

## c) WOMEN CHARACTERISTICS IN THE COUNTRY

In 2016, Honduran population was estimated at 8,714,641 individuals, from which 47.4% are men and 52.6% are women. From the total female population, 55.5% is located in the urban area and 44.5% in the rural area.

**Education.** The literacy rate is similar for women (89%) and men (88%)<sup>9</sup>. The enrollment rate in elementary education is the same for both sexes (94%). However, in secondary and tertiary education, women have enrollment rates higher than men, 53% vs. 46%, and 24% vs. 18%, respectively<sup>10</sup>. Indigenous women have illiteracy rates 7.2 points above the national average for women. In addition, 1.3 years less in schooling.

**Labour participation.** From 2007 to 2016, labour participation of women increased by more than 8 percentile points (Chart 1). However, the gender gap is still high with a difference of 34.6 percentile points between men and women participation. The country lies within the ones with less female labour participation in the Latin American region, where the average participation rate is 68%<sup>11</sup>.

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<sup>6</sup> National Congress. Equal Opportunities for Women Act. Honduras.

[http://www.inam.gob.hn/web/index.php?option=com\\_phocadownload&view=file&id=11:ley-de-igualdad-de-oportunidades-para-la-mujer&Itemid=110](http://www.inam.gob.hn/web/index.php?option=com_phocadownload&view=file&id=11:ley-de-igualdad-de-oportunidades-para-la-mujer&Itemid=110)

<sup>7</sup> CEPAL. Gender Equality Observatory for Latin America and the Caribbean. Countries that have signed and ratified the Enforcing Protocol of the Convention on the Elimination of All Forms of Discrimination Against Women.

<http://oig.cepal.org/es/indicadores/paises-que-han-firmado-ratificado-protocolo-facultativo-la-convencion-la-eliminacion>

<sup>8</sup> Judicial Branch. Honduras: Main international treaties on human rights (s/f).

<http://www.poderjudicial.gob.hn/transparencia/regulacion/Documents/Tratados/PrincipalesTratadosInternacionales.pdf>

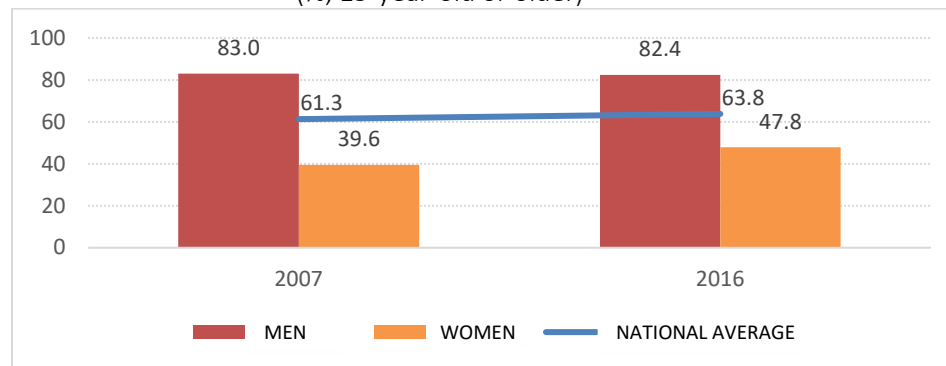
<sup>9</sup> United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics, Education indicators, database, 2015 or latest data available; United Nations Development Programme, Human Development Report 2009, most recent year available between 1997 and 2007

<sup>10</sup> UNESCO Institute for Statistics, Education indicators database, 2015 or latest data available

<sup>11</sup> ILO Estimates



Chart 1: Labour participation rate by sex 2007 and 2016  
(%, 15-year-old or older)



Source: Developed by IDB with data from INE Honduras and ILO.

**Unpaid work.** Women perform unpaid work in higher proportion to men (12.8% vs 10.6%, respectively). In addition, several studies indicate that Latin American women spend 80% more time in care tasks of third-parties, compared to men.<sup>12</sup>

**Wage gap.** In average, the income of salaried employed women, and freelance is equivalent to the 92.2% and 92.9% of men's income, in 2007 and 2016, respectively.

**Informal employment.** Between 2009 and 2013, the informal employment rate of men decreased from 73% to 71.3%. In that same period, the percentage of women with the same type of employments increased from 74.8% to 75.5%. (Chart 3)

**Business sectors.** In 2016, working women were grouped in tertiary area activities, such as wholesale and retail trade (28.7%), as well as in community, social, and personal service activities (25.5%<sup>13</sup>), while their male pairs were occupied in primary activities, such as agriculture, livestock, forestry, and fishery, mainly (41%), and in wholesale and retail trade (15.7%) (Chart 4).

**Enterprises.** Almost half of the businesses in Honduras are female-owned or the main partner is a woman (43.3%)<sup>14</sup>. According to the IDB, in 2014 there were 127,330 micro, small, and medium-size enterprises (MIPYME) from which 52% were female-owned or the main partner is a woman.

**Violence against women.** (i) Honduras is the country with the highest rate of women homicides in LAC, with a rate of 10.9 for every 100,000 women, in 2015. The highest percentage, 62.8%, is committed due to gender reasons, so, they are considered femicides.

<sup>12</sup> Urban, Anne-Marie (2014) "Working mothers: jugglers extraordinaire"

<sup>13</sup> Due to the classification change, a proxy was used by adding: lodging and food service activities, teaching, human health care and social assistance activities, and housing activities as employers and non-differentiated activities of homes as good and service producers.

<sup>14</sup> Enterprise Survey form the World Bank, 2010

(ii) Young women are the most affected by sexual violence. In 2016, Forensic Medicine evaluated 3,075 cases on sex crimes, from which 88.5% were towards girls, adolescents and grown women. From the total amount of evaluations of sex crimes, 8 out of 10 were women under 20 years old. Just like assault and battery, most assailants were known by the victims (75%). (iii) Honduras is the Central American country with highest rates on violence against women, girls, and adolescents.<sup>15</sup> One of every four women between 15 and 49 years old have experienced some kind of partner violence in the past 12 months, with a trend to increase in the different typologies.

**Access to land and housing.** According to ENDESA 2011-12 data, in Honduras 35.3% and 11.7% of women between 15 and 49 years old are owners of housing and lands, respectively, either separately or jointly with other individuals; while these figures are 37.9% and 25.9% for men in the same age range, respectively<sup>16</sup>. It is confirmed that the gender gap is greater regarding ownership of land than housing. In terms of productive lands, women barely own 12% of the agriculture surface<sup>17</sup>.

There are no legal restrictions for women to access land, but despite the law, there are restrictions for women to access property. There is a patriarchal culture that makes men to make most of the decision on lands. In indigenous communities, women are even more marginalized than their male relatives regarding access to land. In terms of productive lands, women barely own 12% of the agriculture surface<sup>18</sup>.

**Access to financial services.** In 2014, 24.9% of women older than 15 years old had an account in a financial institution<sup>19</sup>, 10 percentile points below the access that men had, 35.4%. As for access to credit, 7.2% of women above 15 years old, was granted a credit by a financial institution, while they were granted to 12.2% of men.

#### d) WOMEN CHARACTERISTICS IN THE PROJECT AREA

It is estimated that 27,000 households will be direct beneficiaries of the project, of which 6,000 will be women female headed households. These beneficiaries are mostly participants in ICF's<sup>20</sup> agroforestry and micro-basin organizations. It is estimated that the security and availability of water will benefit 450,000 indirect beneficiaries (4.8% of total population) during the dry season of the year according to the additional amount of water produced from project interventions. These beneficiaries will be located in the

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<sup>15</sup> NNUU. Preliminary report from the visit to Honduras carried out by the United Nations Special Rapporteur on Violence against Women, on July 7, 2014. Available at: <http://www.hn.undp.org/content/honduras/es/home/presscenter/articles/2014/07/07/informe-preliminar-de-la-visita-a-honduras-realizadapor-la-relatora-especial-de-la-onu-sobre-la-violencia-contra-las-mujeres-.html>.

<sup>16</sup> Secretariat of Health, National Institute of Statistics (INE) and ICF International. 2013. National Demographic and Health Survey (NDHS 2011-2012) Tegucigalpa, Honduras: SH, INE and ICF International.

<sup>17</sup> Use of agricultural land. ENCOVI, 2012

<sup>18</sup> Use of agricultural land. ENCOVI, 2012

<sup>19</sup> Gender Data Portal – World Bank

<sup>20</sup> Institute of Forest Conservation

urban area, 75% in Tegucigalpa and 25% in the other cities with more than 10,000 inhabitants. Approximately, 52% are women.

Table : 1 Population profile in the intervention scope  
Component 1/Component 2/ Component 3

	Municipalities	Population	Rural	Agricultural	Extreme Poverty	Poverty
Choluteca	3	33,230	70%	66%	51%	69%
Comayagua	15	383,231	66%	56%	55%	62%
El Paraíso	14	343,412	78%	61%	63%	66%
Central District	1	1,014,652	10%	3%	23%	51%
Francisco Morazán (remaining)	14	196,024	67%	42%	41%	67%
Olancho	6	168,558	67%	58%	55%	79%
<b>Total</b>	<b>53</b>	<b>2,139,107</b>	<b>42%</b>	<b>31%</b>	<b>40%</b>	<b>59%</b>

Sources: Census 2013, National Survey on Multiple Purposes, ENPM, 2013. INE

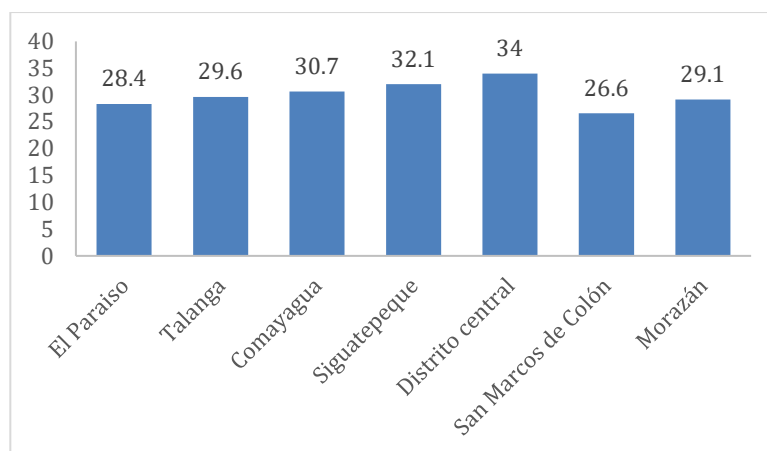
**Women in the workforce.** In Honduras, women workforce in the agricultural labor represent 10.3%. However, in the rural areas where the project is going to be implemented this number is slightly higher according to data from the Census 2013:

- **EL PARAISO.** Women in the urban area work as store merchant (18.8%), the tobacco industry (13.4%), the domestic sector (10,5%) and as teachers in primary education (10,5%). Only 1,8% of women work on the agricultural sector versus 23% of men. In the rural area, the main occupation for women is in the agricultural sector (19%), followed by the domestic sector (11.8%), teachers in primary education (10,5%), and the tobacco sector (6%).
- **FRANCISCO MORAZAN.** The two main occupation of women in the urban area as store merchant (13%) and in the domestic sector (10.3%). Only 0.3% work in the agricultural sector. In the rural area, women work on the domestic sector (20%), store merchant (12%), and agriculture sector (5.8%).
- **COMAYAGUA.** Main occupations for urban women are store merchant (12.7%), domestic sector (10,8%), and teachers in primary education (9,65). 2.5% of women work in the agriculture sector. In the rural area 25% of women work on the agriculture sector compare to 82% of men. Other occupations for women are in the domestic sector (14.5%) and store merchant (12,7%).

- CHOLUTECA. Women in the urban area work as store merchant (25%), domestic service (11%), and as teacher for primary education (11%). 0.8% work in agriculture. In the rural sector women work in the domestic sector (14%), as store merchant (12.7%), and in agriculture (11%). 73% of men work in the agricultural sector.
- OLANCHO. As in the rest of districts, women work as store merchant (16%), domestic sector (13%), and teachers for primary and secondary education (12%). In the rural area, 20% of women work in the agriculture sector, 13% in the domestic sector, and 7.6% as store merchant. 82% of men work in agriculture.

**Female headed households.** In Honduras, the more urban is a municipality the more possibilities of finding a female headed household. For example, the most urban municipality, Central District, has the higher number of women head of households in the intervention area (34%). In San Marcos de Colón, a municipality with 51% of rural population, only has 26,6% of houses with woman as head of the household.

Chart 1: Percentage of women head of households in some of the project municipalities



Source: Developed by IDB with data from INE Honduras

**Organizations in the intervention area.** Most beneficiary women are participants in ICF's<sup>21</sup> agroforestry and micro-basin organizations. During the preparation of the Training Plan for this project, 32 of these potential beneficiary organizations were interviewed. These

<sup>21</sup> Institute of Forest Conservation

organizations comprise a total of 13,079 members, of which 60% are men and 40% are women. The participation of women is drastically reduced in the decision-making processes inside the organizations, since of the 240 members that make up their boards, only 24% are women.

Additionally, during the qualitative information survey phase, it was observed that there are visible gaps in the gender roles due to traditional norms. Women and men play different roles in the house, in the public space, and in the forest. Women are assigned to work in the house with limited participation in the public space and in the forest, where they only “help” their husbands. Women do not consider themselves capable of working in the forest.

A deeper analysis will be carried out during the first months of the implementation of the project to learn more about the socio-economic conditions of women working in the beneficiary organizations.

**Agroforest Systems (AS).** The project will support the implementation AS in a total of 30,000 Ha. located in areas adjacent to pine forests with agriculture and livestock activities. The main barriers to AS adoption in the project area are lack of financial resources limited knowledge of AS practices and weak provision of technical assistance and quality of key inputs like seedlings. These barriers are especially important to women that have worse records than men accessing finance in Honduras and have more difficulties attending technical assistance and training. The project will mainly promote coffee under shade, financing installation of coffee trees and suitable shading forest, with the provision of training and technical assistance.

According to a study carried out in 2018 by the European Commission on the value chain of coffee in Honduras, there have been advances in the participation of women in decision-making, leadership and empowerment in recent years. However, there is still little visibility of the participation of women in coffee activities, and their difficulty in accessing land limits their access to services.

The coffee sector generates on million employments in the country and 30% of the population lives from the coffee. There are 17,978 female producers of coffee in Honduras, 19% of total of producers.

Entire families and individuals move from one municipality to another to work on the coffee sector. This shift of people may cause some unwanted effect on local population. According to ActionAid, in the areas where a coffee plantation is harvest, the health care centers denounce there is an increase in sexual violence against women and pregnancy in adolescents.

## II. GENDER ACTION PLAN

ACTIVITIES	INDICATORS AND TARGETS	TIMELINE	RESPONSABILITIES	COST
<b>Impact Statement:</b> <ul style="list-style-type: none"> <li>Increased water security, especially during the dry season, for 450,000 men and women in the central zone of Honduras, with an improved resilience to climate change.</li> <li>Increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions in the intervention area.</li> </ul> <b>Outcome Statement:</b> Provided economic and social benefits for 27,000 households including 6,000 female headed households due to the adoption of diversified, climate resilient				
<b>Output: Women employed in restauration activities</b>				
(i) Develop a specific training plan for women (ii) Women are trained on activities related to the restoration of the pine forest affected by the beetle (thinning, fire control, and diversification of coniferous forest) (iii) Women are hired to work on activities related to the restoration of the pine forest (iv) Organizations and communities receive gender training	(i) % of women trained on activities related to the restoration of the pine forest (ii) Number of people employed on activities related to the restoration of the pine forest, of which 40% are females	(i) By 2023: 40% of trained people are women (ii) By 2021: 6,200 people are employed, which 40% are females By 2023: 12,918 people are employed, which 40% are females	<ul style="list-style-type: none"> <li>Gender consultant</li> <li>Executing agency</li> </ul>	US\$30,000

(v) Analyze socio-economic condition of women in participating organizations				
<b>Output: Women producers receive finance for Agroforest Systems</b>				
(i) Women receive finance for the installation of coffee trees or other AS (ii) Women receive training (iii) Gender training for producers and organizations (iv) Analyze safety of women in plantations and introduce measurements if needed (v) Analyze socio-economic condition of women in participating organizations	(i) Number of households that receive finance, of which 40% are female headed households. (ii) % of women trained (iii) % of households that receive gender training	(i) By 2021: 3,000 households receive finance of which 40% are female headed households. By 2024: 6,000 households receive finance of which 40% are female headed households. (ii) By 2021: 20% of trained people are women By 2023: 40% of trained people are women (iii) By 2021: 30% of households receive gender training By 20123: 80% of households receive gender training	<ul style="list-style-type: none"> <li>Gender consultant</li> <li>Executing agency</li> </ul>	US\$60,000



<b>Output: Women in the Institute of Forest Conservation (ICF) strength their capabilities</b>				
(i) Women at ICF participate on the training activities (ii) Women take part in the decision-making process for the installation of an early warning system, and the creation of germplasm bank (iii) Employees at ICF receive gender training	(i) % of women that participate in training (ii) % of people that are accredited in the course on Adaptive Forest Management, of which 20% are women <sup>22</sup> (iii) Number of technicians from ICF and from the Mayor's Office with capacity to manage and implement AFM and plague control, of which 20% <sup>23</sup> are women	(i) By: 2021: 10% of trained people are women By 2023: 20% of trained people are women (ii) By: 2021: 10% of accredited people are women By 2023: 20% of accredited people are women (iii) By: 2021: 10% of technicians with capacity to manage and implement AFM and plague control, are women By 2023: 20% of technicians with capacity to manage and implement AFM and plague control, are women	<ul style="list-style-type: none"> <li>Gender consultant</li> <li>Executing agency</li> </ul>	US\$15,000
<b>Output: Women increase their participation in water management committees and agroforest cooperatives</b>				
(i) Women in the communities are empowered through training (gender and technical training)	(i) % of increase in the participation of women in water management committees (ii) % of increase in the participation of women in agroforest cooperatives	(i) By 2021: 10% increased of women in water management committees By 2023: 20% increased of women in water	<ul style="list-style-type: none"> <li>Gender consultant</li> <li>Executing agency</li> </ul>	US\$50,000

<sup>22</sup> Estimated. The target will be updated when final data is provided by ICF about the composition of the organization.

<sup>23</sup> Estimated. The target will be updated when final data is provided by ICF about the composition of the organization.

(ii) Women are incentivized to participate in community assembly (iii) Men in the communities and organizations receive gender training (iv) A gender quota is set (v) Analyze socio-economic condition of women in participating organizations		management committees (ii) By 2021: 10% increased of women in agroforest cooperatives By 2023: 20 increased of women in agroforest cooperatives		
<b>Output: Women receive Payment for Ecosystem Services (PES)</b>				
(i) Women in any community or organization in the intervention area can access to PES (ii) Women participate in the design of the PES (consultations and community boards/committee, etc.) (iii) Women receive PES (iv) PES includes a gender approach in its design (v) Analyze socio-economic condition of women in participating organizations	(i) Number of beneficiaries that receive payments for environmental services, of which 40% are women.	(i) By 2022: 3,100 beneficiaries, of which 40% are women. By 2024: 7,622 beneficiaries, of which 40% are women.	<ul style="list-style-type: none"> <li>Gender consultant</li> <li>Executing agency</li> </ul>	US\$50,000