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HONDURAS

SUSTAINABLE FOREST MANAGEMENT

(HO-L1179)

LOAN PROPOSAL

This document was prepared by the project team consisting of: Project Team Co-leaders: Ginés Suárez (RND/CES) and Omar Samayoa (CCS/CGU). Team members: Sergio Ardila and Lisa Sofia Restrepo (CSD/RND); Gloria Visconti (CSD/CCS); Kelvin Suero and María Cecilia del Puerto (FMP/CHO); Amalia Guzmán and Carlos Morán (CID/CHO); María Sofia Greco (LEG/SGO); and Rachel Atkinson (VPS/ESG).

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ELECTRONIC LINKS

REQUIRED

1. Multiyear execution plan
2. Annual work plan
3. Monitoring and evaluation plan
4. Environmental and Social Management Report (ESMR)
5. Procurement plan

OPTIONAL

1. Economic analysis of the project
2. Institutional analysis
3. Design study for the forest health subcomponent
4. Design study for the forest governance subcomponent
5. Design study for the governance subcomponent to expand access to climate financing
6. Assessment report on deforestation in Honduras
7. Report on hydrological simulation of the bark beetle's impact on representative watersheds
8. Report on prioritization of intervention areas
9. Report on the component of support for the forest monitoring system of the Forest Conservation Institute (ICF)
10. Studies on the cost of water in Tegucigalpa
11. Safeguard policy filter (SPF) and safeguard screening form for classification of projects (SSF)

ABBREVIATIONS

APP	Alliance for Prosperity Plan in the Northern Triangle
Climate+	Oficina Presidencial de Cambio Climático Clima Plus [Climate Plus Presidential Office on Climate Change]
COHDEFOR	Corporación Hondureña de Desarrollo Forestal [Honduran Forest Development Corporation]
CRF	Corporate Results Framework
ESMP	Environmental and Social Management Plan
ESMR	Environmental and Social Management Report
FSO	Fund for Special Operations
GCF	Green Climate Fund
ICB	International competitive bidding
ICF	Instituto de Conservación Forestal [Forest Conservation Institute]
IRR	Internal rate of return
NAMA	Nationally Appropriate Mitigation Action
NCB	National competitive bidding
NDC	Nationally Determined Contribution
NPV	Net present value
OC	Ordinary Capital
PES	Payment for environmental services
PMU	Project management unit
QCBS	Quality- and cost-based selection
SEFIN	Ministry of Finance
SIAFI/UEPEX	Sistema Integrado de Administración Financiera [Integrated Financial Administration System]
SFM	Sustainable forest management
TSC	Tribunal Superior de Cuentas [Superior Audit Court]

PROJECT SUMMARY

HONDURAS
SUSTAINABLE FOREST MANAGEMENT
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<table>
<tr><th colspan="6">Financial Terms and Conditions</th></tr>
<tr><td colspan="3" rowspan="2">Borrower: Republic of Honduras

Executing agency: Ministry of Finance (SEFIN) through its project management unit (PMU)</td><td></td><td>OC</td><td>FSO</td></tr>
<tr><td>Amortization period:</td><td>30</td><td>40</td></tr>
<tr><td colspan="3" rowspan="2"></td><td>Disbursement period:</td><td>5 years</td><td>5 years</td></tr>
<tr><td>Grace period:</td><td>5.5 years</td><td>40 years</td></tr>
<tr><td>Source</td><td>Amount (US$)</td><td>%</td><td>Inspection and supervision fee:</td><td>(a)</td><td>N/A</td></tr>
<tr><td rowspan="2">IDB (OC)</td><td rowspan="2">15,000,000</td><td rowspan="2">60</td><td>Interest rate:</td><td>(b) SCF-fixed</td><td>0.25%</td></tr>
<tr><td>Credit fee:</td><td>(a)</td><td>N/A</td></tr>
<tr><td>IDB (FSO)</td><td>10,000,000</td><td>40</td><td rowspan="2">Currency of approval:</td><td rowspan="2">U.S. dollars</td><td rowspan="2">U.S. dollars</td></tr>
<tr><td>Total</td><td>25,000,000</td><td>100</td></tr>
<tr><th colspan="6">Project at a Glance</th></tr>
<tr><td colspan="6">Project objective/description: The general objective of the project is to recover and maintain forest ecosystem services in priority watersheds affected by the bark beetle. The specific objectives are: (i) to restore the areas affected by the bark beetle in both public and private forests; (ii) to strengthen the government's forest health system and create forest management alternatives adapted to the impacts of climate change and climate variability; and (iii) to expand access to climate financing to foster sustainable forest management (SFM).</td></tr>
<tr><td colspan="6">Special contractual conditions precedent to the first disbursement of loan proceeds: (i) evidence that a coordinator, financial specialist, procurement specialist, and planning and monitoring specialist have been appointed to the project management unit (PMU) of the Ministry of Finance (SEFIN), and a social specialist and an environmental specialist have been appointed to the Forest Conservation Institute (ICF); (ii) approval and entry into force of the project Operating Manual in accordance with terms agreed upon with the Bank, including the environmental and social requirements in the Environmental and Social Management Plan (ESMP) and a complaints and claims mechanism; and (iii) signature and entry into force of an interagency cooperation agreement between the executing agency and the ICF, identifying the obligations of each one during the implementation of project activities (paragraph 3.7).
Special contractual conditions of execution: (i) evidence that a specialized firm has been contracted to support the execution of Component 1, prior to the startup of the activities indicated in that component; (ii) presentation, to the Bank's satisfaction, of the design of the pilot program of incentives, prior to the startup of the program implementation activity indicated in section (iii) of Component 1; (iii) presentation of evidence of the creation of a forest health department under the ICF, prior to the startup of the activities indicated in section (i) of Component 2; and (iv) presentation, to the Bank's satisfaction, of the updated Environmental and Social Analysis and the ESMP for the project, prior to the startup of the activities indicated in Component 1 (paragraph 3.8).</td></tr>
<tr><td colspan="6">Exceptions to Bank policies: None</td></tr>
<tr><th colspan="6">Strategic Alignment</th></tr>
<tr><td colspan="2">Challenges:(c)</td><td colspan="4">SI ☐ PI ☐ EI ☐</td></tr>
<tr><td colspan="2">Crosscutting themes:(d)</td><td colspan="4">GD ☐ CC ☑ IC ☑</td></tr>
</table>

(a) The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the applicable policies.

(b) The borrower will pay interest on outstanding balances on this portion of the Ordinary Capital loan at a LIBOR-based rate. The rate on the outstanding balance will be set whenever such balance reaches 25% of the approved net amount or US$3 million, whichever is greater.

(c) SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).

(d) GD (Gender Equality and Diversity); CC (Climate Change and Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

I. Description and Results Monitoring

A. Background, problem addressed, and rationale

1.1 Forests cover half of Honduras (5.4 million hectares). Of this total forested area, 36.7% (1.94 million hectares) are pine forests, and 5% (0.3 million hectares) are a mix of pine and other species. The national productive development plan has identified the forestry sector as a priority. In fact, in its nationally determined contribution (NDC) to the United Nations Framework Convention on Climate Change, Honduras has committed to restoring one million hectares of forest by 2030. Since 2012, pine forests have been infested by the bark beetle, which as of August 2016 had destroyed 488,111 hectares of forest (25% of the total area of pine forests), equivalent to 110 years of deforestation for this type of forest according to the deforestation rates prior to this epidemic.[1] The resulting loss of forest-based ecosystem services[2] could potentially affect 71% of the country's population (5.9 million people).[3]

1.2 In Honduras, rights of forest use depend on the type of land ownership (public or private, Article 45 of the Forestry Law) and on the categories of use defined by the State (protection or production, Article 63) through various legal instruments approved by the Forest Conservation Institute (ICF) as the regulatory agency for the sector (Article 14). The ICF is a deconcentrated entity attached to the Office of the Secretary for Natural Resources, Environment, and Mines. It is responsible for national forest conservation and development policy, protected areas, and wildlife and has regulatory and supervisory duties in the area of forest protection and production (Article 14). The ICF is funded through the national budget (Article 34). In order to be used for forest-related production purposes, private forests are required to have ICF-approved forest management plans (Articles 70-89). In addition, the ICF assigns public production forests to communities pursuant to forest management agreements and management plans in the framework of the Social Forestry System (Articles 77-130). Protection forests as defined as such by the ICF by means of statements declaring them protected areas or water-supplying microwatersheds. Of the country's pine forests, 18% are private production forests, 19% are public production forests, 14% are protected areas, and 48% do not have a defined use.[4]

1.3 **Role of rural communities in forest management.** Rural communities are significant participants in forest management. Under Social Forestry System policy, the State has allocated 596,603 hectares of public production forest to these communities, three times the forest area managed by private owners (ICF, 2016). In addition, acting through water councils, communities manage all protection forests

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1 Annual deforestation in pine forests (optional electronic link 6) is on the order of 4,970 hectares. Most of the deforestation takes place in forests that do not have a defined use (65% of the total), followed by private production forests (11%), national forests (10%), forests on communal lands (6%), protected areas (4%), water-supplying microwatersheds (3%), and areas allocated to communities (1%).

2 Services provided to society by ecosystems that directly or indirectly impact the population's quality of life. They include: mitigation of greenhouse gas emissions; water conservation and regulation; biodiversity protection and conservation; scenic beauty; soil protection, conservation, and recovery (Article 11 of the Forestry Law).

3 Estimated by the authors based on data from the 2013 Honduran census (INE, 2013).

4 Estimated by the authors based on data provided by the ICF.

classified as water-supplying microwatersheds[5] (426,042 hectares, equivalent to 8% of the total forested area of the country) and part of the national protected areas[6] pursuant to co-management agreements. The remainder of the protected areas are managed by nongovernmental organizations and municipalities. Of the 1.94 million hectares of pine forests, communities manage around 13% (243,000 hectares) in the form of production and protection forests.

1.4 **The pine bark beetle epidemic.** A primary cause of the loss of pine forests in Honduras is recurrent infestations by *Dendroctonus frontalis*, or pine bark beetle (optional electronic link 3). The most devastating attack on record took place from 1962 to 1965, with an estimated loss of 1.7 million hectares. A new epidemic, which broke out in 2012, is the second most destructive. The 488,111 hectares of pine forest destroyed by the beetle are concentrated in four departments: Olancho, Francisco Morazán, Yoro, and Comayagua, which respectively account for 44%, 23%, 14%, and 10% of the total infested area (ICF, 2016). In terms of forest use categories, the pest has affected 29% of all private pine production forests, 32% of public production forests, 21% of protected areas, 43% of public areas managed by communities, and 17% of pine forests with no defined forest use classification.[7]

1.5 At present, the Honduran government is taking steps to treat the infested areas (ICF, 2016), having allocated US$10 million in 2015 and US$16 million in 2016 (ICF, 2016). Pest control activities in public and private forests are carried out by specialized crews hired by the Honduran government for this purpose, as well as by approving salvage plans prepared by individuals and communities and granting noncommercial licenses for use of the felled timber (CONADEH, 2016). Due in part to the slow pace of approvals, most of the timber in the areas infested by the bark beetle will not be useable since the timber deteriorates after nine months and to date only 5% of it has been put to use (optional electronic link 3). The government's efforts to control the infestation have been deployed in all affected departments. Control activities have been carried out on 189,124 hectares, and it is estimated that these actions have prevented 1.8 million hectares of pine and mixed-species stands from becoming infested (optional electronic link 3).

1.6 For purposes of differentiating and enhancing the efficiency of the control actions, three areas of intervention have been mapped out (optional electronic link 3 and map 1). Area (a) encompasses the departments that have been heavily affected by the pest and where most of the infestations are already inactive; efforts in this area should focus on carrying out regeneration/reforestation, on preventing land-use changes, and on suppressing and preventing fires during the dry season. Area (b) is where active infestations still remain; consequently, this area should be monitored using satellite imagery to detect and control active outbreaks. Area (c) is where the early detection and control work should be concentrated, since this is the direction in which the epidemic is advancing. As of August 2016, infestations have declined, and active outbreaks account for only 3% of the total affected area. A control program, designed in part with support from an IDB technical cooperation operation

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5 These are declared as such by the ICF under the Forestry Law by means of an administrative procedure (Article 124).

6 These are declared as such by the National Congress.

7 Estimated by the authors based on data provided by the ICF.

(HO-T1253), is ongoing. However, forest restoration activities have only just begun (ICF, 2016).

1.7 **Impacts of the epidemic.** Loss of forest due to bark beetle infestations is creating and will create environmental, economic, and social impacts. Environmental impacts are associated with the loss of ecosystem services. Economic impacts are related to: (i) future increase in control costs due to an acceleration in the intensity of infestations in the absence of early control; and (ii) loss of goods associated with forests (lumber, firewood, and resin). Social impacts are related to loss of income for residents of the affected areas, most of whom are members of low-income groups.

1.8 **Environmental impacts.** The deforestation associated with the bark beetle epidemic leads to a permanent or temporary loss of forest-based ecosystem services such as biodiversity, carbon sequestration, and water regulation. A permanent loss of these ecosystem services occurs when there is a land-use change or when erosion causes soil degradation, preventing the forests from regenerating naturally, while a temporary loss is associated with the lack of sustainable forest management (SFM).

1.9 **Economic impacts associated with the loss of ecosystem services.** The analysis of the economic impact associated with a loss of ecosystem services focused on the water regulation ecosystem service, since there was more data available to characterize it and because it is expected to have an economic impact in the short term (optional electronic link 1). It is estimated that in the country's subwatersheds, with 10% losses in pine forest cover from the bark beetle (which is the national average rate of loss in subwatersheds),[8] annual flows in the dry season could decline by 1.5% (optional electronic link 7).

1.10 This reduction in surface water flow levels in the dry season as a result of the bark beetle, coupled with the overall lack of water regulation infrastructure (reservoirs) in the country (GWP Central America, 2015), particularly affects the population located in the subwatersheds in which water demand in the dry season months, without considering the bark beetle effect, already exceeds water supply (map 1). The economic impacts on the population include costs associated with the treatment of illness and disease related to water shortages, as well as the cost of resorting to alternative water sources to offset the shortfalls in supply (optional electronic link 10). These critical subwatersheds include those that supply the municipio of Tegucigalpa, where at present, without considering the effect of deforestation from bark beetle infestations, an average of 32% of the population does not receive the minimum necessary amount of water from the water supply system (IDB, 2016) and has to get water from alternative sources such as tanker trucks.

1.11 **Socioeconomic impacts associated with the loss of forest goods.** It is estimated that bark beetle infestations from 2012 to 2016 have resulted in losses on the order of 18.6 million cubic meters of pine wood. The economic loss associated with the value of this wood is estimated at US$284 million. In addition, the loss of the forests directly affects the household economy of low-income families organized

[8] Estimated by the authors based on data provided by the ICF.

under the social forestry system, with a projected loss of nearly 120,000 jobs (ICF, 2016) related to use of the forests.

1.12 **Causes of the high impact of bark beetle infestations.** The high impact of the recent epidemic is associated with: (i) climate factors (Rivera et al., 2010); (ii) deficiencies in early warning and control (optional electronic link 3); and (iii) limited use of SFM practices in public and private forests, contributing to the degradation of the forests and increasing their susceptibility to the bark beetle (optional electronic link 3).

1.13 **Climate factors.** Honduras, just as the rest of the Central American region, experienced a drop in rainfall between 2011 and 2015, associated with the El Niño phenomenon. Recent analyses reinforce the theory of the influence of climate on the bark beetle outbreaks, identifying a positive correlation between the rise in average temperatures and the annual effects of forest fires, on the one hand, and the occurrence and expansion of *Dendroctonus frontalis* infestations, on the other (Rivera et al., 2010). Climate change scenarios for 2020, 2050, and 2090 consistently show a trend toward rising temperatures and lower rainfall (Argeñal, F. 2010), which could increase the recurrence of conditions favoring outbreaks.

1.14 **Weaknesses in pest control.** Following the 1962-1965 epidemic, bark beetle infestations remained at endemic levels until 1982, when another significant outbreak destroyed some 11,000 hectares of forest, with an average of 12 infested hectares per source of infestation (optional electronic link 3). That year, the Honduran government created a forest pest control unit within the Honduran Forest Development Corporation (COHDEFOR). This unit implemented a control system based on early detection and prompt application of control measures, mainly cut-and-leave.[9] This method proved effective, and the 19,737 outbreaks detected over the next 20 years (1984-2003) were kept at an average expansion rate of 2.1 hectares per outbreak. This containment was the result of applying timely control measures, and it turned the Honduran program into a model for Central America (optional electronic link 3). However, with the institutional reform associated with the new forestry law of 2007, which created the ICF as the new regulatory body replacing COHDEFOR, the pest control unit was eliminated. Partly as a result of this, efforts to focus on the current epidemic were delayed following the initial outbreaks in 2012 until 2014. By then, only 6% of all outbreaks had been controlled, and by 2015 the average outbreak affected 36.5 hectares (optional electronic link 3). Furthermore, the technique used to detect new outbreaks through low-resolution satellite imagery can only detect trees that are in stage three[10] and outbreaks of at least five hectares, thus limiting early intervention. The ICF's main deficiencies in the area of bark beetle management are associated with the lack of a permanent department for forest health; the shortage of personnel trained in the phytosanitary control of forest pests; limited equipment, capacities, and organizational structure to deploy an early warning system for outbreaks (optional electronic link 3); and an inadequate satellite monitoring system (optional electronic link 9).

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[9] The cut-and-leave method consists of felling infested trees, including a buffer of healthy trees as protection, and proceeding to restore the area (through reforestation/regeneration).

[10] With respect to pine trees, there are three stages of bark beetle infestation: (i) stage one: pine trees recently infested; (ii) stage two: pine trees colonized; and (iii) stage three: bark beetle brood abandon dead pine trees.

1.15 **Limited use of sustainable forest management (SFM) practices.** It is estimated that 72% of production pine forests (including public and private forests) are degraded (Flores and Mairena, 2005), making them highly susceptible to the bark beetle. This degradation is due to the limited adoption of SFM practices such as thinning[11] and controlled fires (optional electronic link 1), despite the fact that private owners and communities are responsible for these activities under the management plans. This limited adoption of SFM practices is associated with the existence of barriers, such as high transaction costs to obtain permits and regulations governing forest development, which may account for 46% of SFM costs (Rodas, 2012).

1.16 Honduras' forestry law envisages public SFM incentives both for communities that manage public forests and for private owners. However, these incentives have not been applied in practice, and their design is not based on an economic analysis that can justify their existence and ensure their effectiveness (optional electronic link 4). Meanwhile, the country does have incentives to promote agriculture, such as the Agrifood Sector Investment and Reactivation Funds, which in a context of poor coordination between the agriculture and forestry sectors may be contributing to deforestation.

1.17 In addition, Honduras has a potential opportunity to obtain concessional financing for climate change in consideration of its commitment to restoring forests under its NDC (paragraph 1.21). This financing would provide resources to implement payment for environmental services (PES)[12] strategies to foster SFM. However, an analysis of the governance structure for access to climate financing reveals that the country currently lacks efficient governance to formulate proposals, efficiently administer resources, comply with the requirements under the various financing mechanisms (e.g. safeguards), and show results (optional electronic link 5).

1.18 **The Bank's experience and lessons learned**. The Bank's most recent experience in this sector in Honduras is the Multiphase Program for Natural Resources Management in Priority Watersheds (MARENA, HO-0179) and the Multiphase Sustainable Forest Development Program (PROBOSQUE, HO-0218), both of which were finalized in 2011. The Bank's experience in natural resources management indicates that: (i) clarity regarding property rights, coupled with the right incentives, can foster SFM; and (ii) empowering the local communities helps to create social benefits that reinforce the commitment to conservation. Based on these lessons learned, the project will focus on areas with well-defined forest rights, incentives will be designed to promote forest restoration, and the communities will be involved in their role as key stakeholders in making forest restoration sustainable.

1.19 **Project rationale.** To mitigate the environmental and socioeconomic impacts associated with the loss of pine forests, the project calls for SFM actions to reclaim public production and protection forests infested by the bark beetle in subwatersheds in which ecosystem services are most critical. In addition, the project envisages interventions aimed at reducing the likelihood of high-intensity bark beetle infestations in the future: (i) building the ICF's early warning and control capacities;

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[11] Thinning or selection-cutting is the silviculture practice of reducing the density of a pine stand by eliminating some of the trees.

[12] PES is the compensation resulting from negotiation processes in which protectors and producers of environmental services are given fair payment by or on behalf of the consumers of these services pursuant to defined quantity and quality criteria for a given period (Article 11 of the Forestry Law).

(ii) designing and implementing a pilot initiative involving incentive mechanisms in private forests to ramp up the use of SFM practices that can help make forests better able to withstand bark beetle outbreaks; and (iii) financing the operation of a financial and operating mechanism for access to and management of climate financing directed toward promoting SFM.

1.20 The SFM actions to reclaim public production and protection forests infested by the bark beetle are aimed at: (i) controlling land-use changes and preventing forest fires in the first five years; and (ii) facilitating the natural regeneration of healthy forests, with medium densities that favor water regulation and the production of forest-based goods (optional electronic link 1) while reducing susceptibility to bark beetle infestation. In addition, the project calls for enriching the forests with seedlings of other native species compatible with pine trees, thereby helping to regenerate forests so as to make them less susceptible to bark beetles and more resilient to climate change. These activities will help forests regenerate more rapidly, in 12 years rather than the 25 years typically required for forests without SFM, thereby reducing the loss of ecosystem services for production and protection forests (optional electronic link 7) and the time it takes for a forest to produce goods such as lumber and resin in the case of production forests (optional electronic link 1).

1.21 To make pest control more efficient, the project will use the best available comprehensive management system, comprised of prevention, early warning, and direct, on-time control system using the cut-and-leave method, as recommended by various studies (optional electronic link 3) and as shown to be effective in Honduras in the past. The factors giving rise to the outbreaks should be monitored (optional electronic link 9), mapping the most susceptible forests by means of warning systems (optional electronic link 3) and controlling the susceptibility conditions whenever possible.

1.22 The Honduran government, using advisory services engaged via a Bank-financed technical cooperation operation (ATN/OC-15620-HO), is currently creating a new forest health department at the ICF, with staff that will be funded using national resources. The proposed project will strengthen this department to create an efficient forest pest early warning and control system by means of: (i) equipment provision; (ii) training in forest pest control and monitoring; and (iii) research on native forest species resilient to the bark beetle and on the bark beetle's behavior. While pine bark beetle infestations appear to be declining as of August 2016, the ICF should continue to deploy direct control efforts in areas (b) and (c) until the outbreaks are entirely under control. The cost of this work (optional electronic link 3) will be covered by the government.

1.23 In addition to early warning, some successful bark beetle prevention programs (paragraph 1.10) promote SFM in order to make forests more resistant to the pest, including incentives to private owners. To promote SFM in private forests, the project will finance design studies and development of a pilot to identify incentives that are economically efficient and effective in promoting recovery in private forest areas infested by the bark beetle and the adoption of SFM practices, preferably in areas that can generate environmental externalities.

1.24 In addition, in order to promote access to climate financing with a view to investing in SFM and PES, the project will support the launch of an efficient governance structure to coordinate interventions in the climate change sector and obtain access

to climate financing. These interventions include (optional electronic link 5): (i) creating a multi-member governing body, at the highest executive level, to assume responsibility for making decisions and adopting public policy guidelines on climate change; (ii) strengthening the Ministry of Finance (SEFIN) as an implementing agency of the Green Climate Fund (GCF) and in its role in managing climate funds; and (iii) launching a technically independent financial and operational mechanism known as the Climate Plus Presidential Office on Climate Change (Climate+) to execute climate funds. Through resources from technical cooperation operation HO-T1253, the Bank is providing technical advisory services to help the Honduran government prepare the regulatory instruments needed to formalize the creation of the multi-member governing body and Climate+.

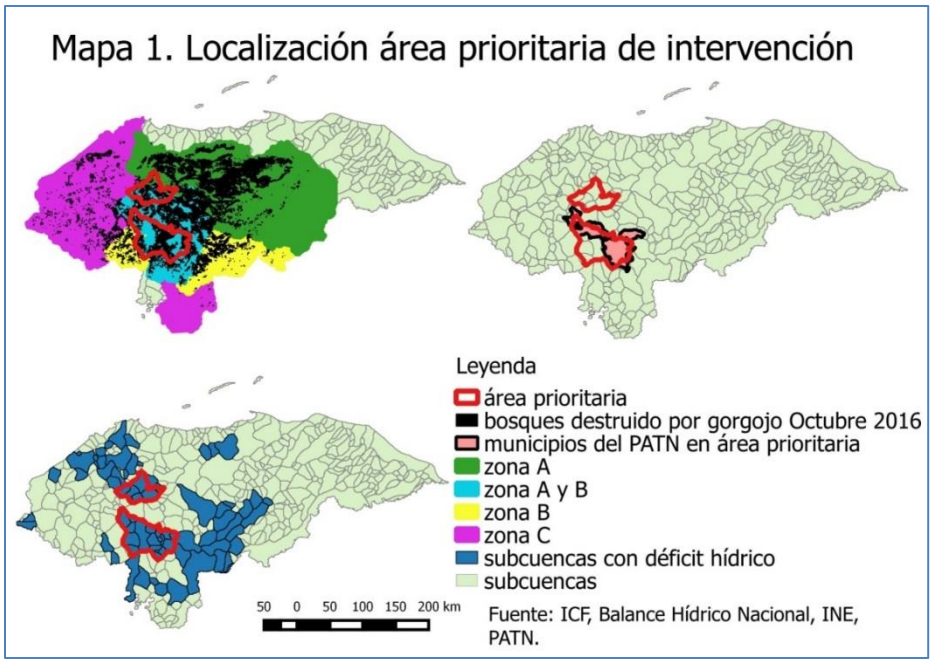
1.25 **Effectiveness of results.** With regard to the pine forest restoration activities that are planned: (i) several studies confirm the benefit of the water regulation ecosystem service associated with pine forests, since these forests generate greater effective infiltration and availability of water during the dry season than other land uses such as livestock farming and annual crops (Dortignac and Love, 1960; Pinheiro et al., 2009), as has been confirmed by modeling of bark beetle-infested watersheds performed for Honduras (optional electronic link 7); and (ii) there is evidence that forest density management reduces susceptibility to bark beetle infestation (Billings et al., 2004) and increases the water regulation service (Ilstedt et al., 2016). Regarding the efficiency of incentives for private forest owners, the literature is limited. However, Billings et al. (2006) and Novak et al. (2015) have shown that these incentives help reduce forest susceptibility to bark beetles, and Jones et al. (2016) have shown that they contribute to the recovery of forest cover. With respect to activities aimed at strengthening the forest health system, there is evidence that early warning and cut-and-leave methods are effective (S. R. Clarke and R. F. Billings, 2003). The proposed project will not implement PES mechanisms, but it will launch a pilot incentive program. The design of this incentive program will take into account the lessons learned from PES programs (Wunder et al., 2010), which indicate the importance of having diagnostic and design studies and methodologies to reliably quantify the beneficial impacts of the actions to be contracted, their spatial variation, and the real opportunity costs for potential providers of environmental services.

1.26 **The Bank's country strategy with Honduras.** The project is aligned with the Bank's country strategy with Honduras for 2015-2018 (document GN-2796-1), inasmuch as it will contribute to the crosscutting area of climate change and disaster risk management and to the objective of reducing marginalization and improving urban quality of life in the Central District by helping to facilitate access to water for vulnerable population groups in Tegucigalpa (paragraph 1.10). The project is also aligned with the Honduran government's Country Vision and National Plan, specifically goal 3.6, to bring one million hectares of forest land into the process of ecological and productive restoration, and with the 20-20 plan. In addition, the project is aligned with the Alliance for Prosperity Plan in the Northern Triangle, under its line of action to promote strategic sectors and attract investment, as well as at the territorial level, since the municipios of Tegucigalpa, Siguatepeque, Comayagua, and Talanga, which have been prioritized under the project, have also been selected under the Alliance for Prosperity Plan.

1.27 **Strategic alignment.** The project is consistent with the Update to the Institutional Strategy 2010-2020 (document AB-3008) and is directly aligned with the crosscutting themes of: (i) climate change and environmental sustainability; and (ii) institutional capacity and rule of law through the CRF country development results indicators "Reduction of emissions with support of IDBG financing," with the project contributing to an estimated reduction of about 200,000 tons of CO_2 (5.8 tons/hectare) by year five, and "Government agencies benefited by projects that strengthen technological and managerial tools to improve public service delivery," with the project supporting better governance for access to climate financing through SEFIN, the ICF, and Climate+. The project will contribute to the Corporate Results Framework 2016-2019 (CRF) (document GN-2727-6) through the indicators: (i) beneficiaries of sustainable management and use of natural capital; (ii) reduction of greenhouse gas emissions with project support; and (iii) government agencies that have modified their legal and administrative instruments in alignment with climate governance reform. All project resources are invested in climate change activities, according to the joint methodology for estimating climate financing. These resources contribute to the IDB Group's goal of increasing financing for projects related to climate change to 30% of total annual approvals.

1.28 **Project beneficiaries**. The average human development index in municipios within the project's area of influence is 0.6, with a 42% malnutrition rate, a 34% illiteracy rate, and a 42% poverty rate. A priority area for the project to target, based on its potential for providing ecosystem services and the intensity of bark beetle infestation, was identified in the departments of Francisco Morazán and Comayagua (optional electronic link 8 and Map 1). This area encompasses 23 municipios in three zones: the subwatersheds that supply water to the capital city; the valley of Comayagua; and the subwatersheds that surround the El Cajón dam. The population living in these subwatersheds and expected to indirectly benefit from recovery of the forests' ecosystem service of water regulation totals 1,526,826 inhabitants. In addition, it is estimated that 37,000 seasonal jobs will be created in the short term (optional electronic link 1) in forest restoration activities. Poverty rates are high among the population located in the upper elevations of the watersheds to be restored and expected to benefit from these temporary jobs, with 90% of families earning less than the minimum wage in some subwatersheds. Private sector participation is concentrated in the areas of technical assistance, research, and activities laying the foundation for a comprehensive SFM strategy through the pilot incentive program. This SFM strategy in private forests is significant because private forests account for a large percentage of pine forests (paragraph 1.2), which are heavily infested by the bark beetle (paragraph 1.4), and because of the private owners' responsibility to manage these forests (paragraph 1.15).

Figure 1. Location of priority intervention area



1.29 **Coordination with other initiatives.** The design of the proposed project is aligned with the National REDD+ Strategy, the Forest Investment Program and Pilot Program for Climate Resilience, the State modernization program, and the forestry sector climate change adaptation program. In addition, the proposed project complements other actions being promoted by the Honduran government, such as a Nationally Appropriate Mitigation Action (NAMA) aimed at reducing the use of firewood for cooking purposes, and contributes to the country's NDC. The project will strengthen the country's capacity to obtain access to climate financing and will form a basis for presenting a scaling-up proposal to the GCF, the profile for which is being prepared with funds from technical cooperation operation HO-T1253. Resources from this project will be used to prepare base studies to enable completion of the proposal. These resources will make it possible to expand the spatial and temporal coverage of funding for restoration of the areas affected by the bark beetle, as well as to potentially expand the pilot program of SFM incentives for private forest owners, which will be designed, run, and evaluated under the proposed project.[13] In the short term, access to additional resources is envisaged through the NAMA Facility and Carbon Fund windows.

B. Objectives, components, and cost

1.30 **General objective.** The general objective of the project is to recover and maintain forest ecosystem services in priority watersheds affected by the bark beetle. The specific objectives are: (i) to restore the areas affected by the bark beetle in both public and private forests; (ii) to strengthen the government's forest health system and create forest management alternatives adapted to the impacts of climate

[13] The pilot program of incentives will be designed on the basis of inclusive criteria to ensure that they are not concentrated among a small number of beneficiaries.

change and climate variability; and (iii) to expand access to climate financing to foster sustainable forest management (SFM).

1.31 **Component 1. Restoration of forests infested by the bark beetle (US$18.25 million).** This component includes: (i) financing to restore public forests infested by the bark beetle (conservation areas, protective forests in microwatersheds that feed aqueducts, and public forests classified as productive but delivered to community organizations on a comanagement basis), prioritizing high-value areas based on their ecosystem services; (ii) an economic and strategic analysis of existing forest incentives and a study on the design of new incentives to foster sustainable management of the country's forest resources, including the design of a pilot program of incentives for private forest owners; (iii) based on the results of the aforementioned study for the design of incentives, implementation and evaluation of a pilot program of incentives for restoring private forest areas infested by the bark beetle and expanding the use of SFM practices in private areas, generating both private and public benefits; and (iv) the dissemination of information on the scope and benefits of activities to restore forests infested by the bark beetle. The study for the design of new incentives will analyze: (a) the geographic areas in which they should be used; (b) the incentive amount that it is economically efficient to deliver in view of the environmental, social, and economic benefits being induced; (c) the delivery mechanism to be used (lottery, auction, or other), the specific items to be covered (inputs delivered in kind in the form of a voucher for the purchase of services from trained private providers); (d) the method of supervision and evaluation of results; (e) possible mechanisms for repaying the government; (f) how the investment in private sector beneficiaries will redound to the benefit of the State; and (g) the exit strategy. The activities to be encouraged through incentives will include thinning of private forests.

1.32 The financing to restore public land affected by the bark beetle will cover technical assistance to update and/or prepare the management plans, the labor costs involved in carrying out SFM actions, and materials (seedlings and equipment) over the course of five years (the most critical years for fires and land-use changes). The beneficiary groups will undertake the commitment to maintain the forest in subsequent years as specified in the management plans (optional electronic link 1). The activities to be financed include removal of dead wood, enrichment with native species other than pine, fire protection, and thinning in the fifth year. The estimated cost is US$345 per hectare in protection forests (not including enrichment with other species) and US$572 per hectare in production forests. The comanagement agreements will promote the participation of women both in restoration activities and on the boards of directors of the organizations.

1.33 **Component 2. Strengthening of the forest health system and enhancement of forest resilience to climate change (US$3.1 million).** This component includes: (i) strengthening the ICF forest health department; (ii) research on agroforestry species resilient to climate change and forest pests; and (iii) enrichment of a seed bank of agroforestry species resilient to climate change.

1.34 Strengthening of the ICF forest health department, which is in the process of being created, includes setting up seven regional ICF offices to monitor bark beetle infestations, grants to train ICF staff in phytosanitary control of forests, training in early warning using high-resolution satellite imagery, and funds to finance studies

on the bark beetle. The research on agroforestry species will be determined and conducted by the members of the National Forest, Protected Area, and Wildlife Research System, an academic advisory board created by the Forestry Law (Article 29) to support the ICF and comprised of representatives from public universities and private research centers.

1.35 **Component 3. Improved access to climate financing to promote SFM (US$2.1 million).** This component includes: (i) support and the launch of a financial and operational mechanism, which includes Climate+, for obtaining access to climate financing in order to invest in SFM and PES; and (ii) support for the preparation of legal instruments to operate the governance structure for access to climate financing. To launch the financial mechanism, consulting services will be contracted to provide technical support for the mechanism's operation, procurement of equipment, commissioning of prefeasibility studies to supplement the financing proposal for GCF, training for staff at the ministries involved with the mechanism, and studies to identify additional potential interventions for climate financing. The legal instruments to operate the governance structure of the above-described financial mechanism include consulting services for preparing operating regulations and manuals for the new committees and units associated with this structure.

1.36 **Project management, administration, audits, and evaluation (US$1.55 million).** Financing will be provided for: (i) administrative, social, and environmental management of the project; (ii) staff and equipment for the project management team; (iii) external financial and operating audits; and (iv) monitoring and evaluation activities.

Table I-1. Project costs

Categories	IDB (US$)	Percentage
Component 1: Restoration of forests infested by the bark beetle		
Restoration of public lands infested by the bark beetle	14,900,000	**59.6%**
Pilot program of incentives for SFM	2,850,000	**11.4%**
Economic and strategic analysis of existing forest incentives and new management alternatives	400,000	**1.6%**
Dissemination of the rehabilitation strategy for forests infested by the bark beetle	100,000	**0.4%**
Component 1 subtotal	**18,250,000**	**73.0%**
Component 2: Strengthening of the forest health system and enhancement of forest resilience to climate change		
Research on adaptation to climate change	600,000	**2.4%**
Strengthening of the forest health department	2,500,000	**10.0%**
Component 2 subtotal	**3,100,000**	**12.4%**
Component 3: Improved access to climate financing to promote SFM		
Studies and development of legal instruments for governance	400,000	**1.6%**
Financial and operational mechanism for access to climate financing	1,700,000	**6.8%**
Component 3 subtotal	**2,100,000**	**8.4%**
Project management		
Management unit subtotal	**1,010,000**	**4.0%**
Evaluations and annual audits subtotal	**540,000**	**2.2%**
TOTAL	**25,000,000**	**100%**

C. Key results indicators

1.37 At the impact level, the project aims to: (i) increase average availability of surface water during the dry season in the subwatersheds reclaimed with project support; (ii) increase the number of controlled outbreaks as a percentage of detected outbreaks; and (iii) reduce greenhouse gas emissions. At the outcome level, the project seeks to: (i) ensure that at least 80% of the 34,000 hectares of public forests restored under the project and private forests subject to incentives have medium densities that maximize the production of environmental goods and services; (ii) benefit 17,844 men and 11,897 women through sustainable management and use of natural capital; (iii) reduce the average size of detected/controlled bark beetle outbreaks throughout the country; and (iv) increase the annual nonreimbursable and concessional reimbursable financing available for climate change adaptation and mitigation. For more detailed information, see Annex II.

1.38 **Economic feasibility.** A detailed cost-benefit analysis was performed for Components 1 and 2. Component 3, the objective of which is to obtain carbon financing resources from the international windows, is expected to easily break even in terms of the ratio of resources obtained to the cost of the financial mechanism. To evaluate Component 1, the returns generated by the two main systems (natural regeneration in public production forests and public protection forests affected by the bark beetle) were separately estimated. The benefits of the first system were estimated as the economic value of incremental flows in the dry season. For production forests, the value of the wood and the resin was taken into account as a benefit in addition to the incremental flows. The evaluation of the proposed management of the protection areas yielded an internal rate of return (IRR) of 18.7% and, at a discount rate of 12%, a net present value (NPV) of L 1,609.7[14] per hectare for the baseline case (i.e. incremental water value of L 13.2/cubic meter and shadow price of labor equal to 58% of the market wage). The system yields positive net benefits at market prices when the incremental water value is equal to or greater than L 15.05/cubic meter. The proposed management for production forests yields an IRR of 14% and an NPV of L 1,734 per hectare for the baseline case. This system yields an IRR of 11% for the baseline case with labor at market value. The component as a whole (i.e. evaluated on the public forest areas expected to benefit) yields an IRR of 15% and an NPV of L 36,457,904 for the baseline case, using a shadow price of unskilled labor. If the value of a cubic meter of water is reduced by 20% to L 10.57, the IRR for the baseline case drops to 12.2% and the NPV drops to L 2,200,030. The water value used in the baseline case (L 13.21/cubic meter) is the amount per cubic meter that families pay for water obtained from tanker trucks during periods of rationing. This value was adopted since the estimated consumer surplus per cubic meter that would have to be added to this value is approximately equal to the operating cost of a typical water company, which would have to be subtracted to obtain the in-situ value. The shadow price of unskilled labor is L 146.60/day (58% of the market wage), but it could go as high as L 194.46/day and the component would still generate a positive net benefit.

1.39 Component 2 yields considerable benefits. Conservative calculations indicate that it would have an NPV of US$10,058,626.64 and an IRR of 156.10%, with a

[14] The average exchange rate for 2016 is 22.86 Honduran lempiras/U.S. dollar. Data from the Central Bank of Honduras.

benefit/cost ratio of 2.39. This performance reflects the heavy damage that the bark beetle can inflict on pine forests when monitoring and control activities are not carried out systematically, allowing infestations to take hold. To estimate damage in a without-project scenario, the analysis used data from the most recent infestation, applying expansion factors from the observed infested area. For the with-project scenario, the analysis was based on the experience that resulted in previous years when the monitoring and control system operated satisfactorily.

II. Financing Structure and Main Risks

A. Financing instruments

2.1 The proposed operation is a specific investment loan in the amount of US$25 million, to be disbursed over five years. In total, 60% of the funds are from the Ordinary Capital (OC) and 40% are from the Fund for Special Operations (FSO).

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IDB and total	4,615,808	9,641,786	5,534,315	2,271,774	2,936,317	25,000,000
Percentage of loan total	18%	39%	22%	9%	12%	100%

B. Environmental and social risks

2.2 The project will have eminently positive social and environmental impacts, helping to improve pest control, maintain and restore high-value ecosystem services, strengthen the capacities of the ICF and the communities to perform SFM, raise forest and agroforest productivity of small producers, and create local jobs.

2.3 Given the nature of project activities, the environmental and social risks and impacts are expected to be temporary and localized, and there are established procedures and knowledge for designing and implementing effective mitigation measures. Consequently, and in accordance with policy OP-703, this project has been classified as a category “B” operation. An environmental and social analysis was performed as part of project preparation, and an environmental and social management plan (ESMP) was developed and will be included in the project Operating Manual.

2.4 Nevertheless, there are environmental and social risks and potential negative impacts, primarily associated with: the introduction of invasive species; land-use changes; risk of natural disasters, mainly fires, floods, and landslides; social conflicts arising from dissatisfaction with the project, especially with the financing of SFM activities, among some members of the communities; unequal access to the system of incentives by low-income social groups and owners, small forest owners, women, and other vulnerable groups; and the risk of work-related accidents. To mitigate these risks and potential negative impacts, the following measures will be implemented: (i) a community relations plan to involve the communities and other stakeholders in project execution; (ii) a communications plan to report on the project, the incentives mechanism and criteria for participation, and the social benefits of sound forest management; (iii) an occupational safety plan; (iv) identification of

criteria for access to the incentives mechanism, taking into account the disadvantages faced by small owners, women, and low-income owners; (v) strengthening of the participating social organizations; (vi) a disaster risk management plan; and (vii) prohibition against using exotic species for reforestation. As part of the project preparation process, four consultations were conducted in August 2016, one for each department in the area of influence (see ESMR). Representative of the various interest groups present in the intervention areas (e.g. water councils, agroforestry cooperatives, private landowners, and civil society organizations) participated in these consultations. The participants acknowledged the relevance and importance of the project to restore forests impacted by the bark beetle.

C. Fiduciary risks

2.5 The project risk associated with financial and procurement management is medium, considering the execution arrangements that have been agreed upon. The arrangements designed to mitigate this risk notably include the use of the SIAFI/UEPEX system for financial management and all country controls derived from such use. Notwithstanding its experience and in view of the marginal load that managing the project would involve, SEFIN will be reinforced by complementary personnel specialized in monitoring, financial management, and procurement under Bank procedures. These personnel will work exclusively on managing the project. Similarly, considering the limits of the executing agency's operational authority, SEFIN will sign a coordination agreement with the Forest Conservation Institute (ICF) to manage the technical aspects falling within its purview. In addition, refresher workshops on Bank procedures will be held during execution, and use of the Procurement Plan Execution System (SEPA) will be implemented. External operational evaluations, to be performed by a consulting firm, will be included as part of project monitoring in order to monitor implementation of the labor and incentive payments envisaged under the operation.

D. Other project risks

2.6 With a view to locking in the ICF commitment to allocate from its annual budget the amount needed to operate and maintain the forest health department and the research products, this commitment will be included in the agreement between the ICF and the executing agency. With regard to the scalability of the restoration work and the pilot program of forest incentives, it is expected that such action can be carried out through the climate financing windows (paragraph 1.29).

2.7 In addition to the aforementioned risks, there is the risk that the forest regeneration process in the restored areas cannot be sustained. To mitigate this risk, the project calls for carrying out fire prevention activities in the parcels to be rehabilitated (paragraph 1.20), organizing and training community-level forest fire control crews, integrating risk analysis into the forest management plans, and strengthening the ICF in the use of satellite monitoring to detect and prevent changes in land use.

III. Implementation and Management Plan

A. Summary of implementation arrangements

3.1 The executing agency for the project will be the Ministry of Finance (SEFIN). SEFIN has a project management unit (PMU) that has managed several Bank-financed operations and has key staff with more than five years of experience in the unit. The PMU will be reinforced with the complementary technical and administrative capacity needed to manage the project (see capacity analysis).

3.2 The executing agency will be responsible for management of the entire project, including: (i) conducting general and financial administration of the project, ensuring efficient management of resources; (ii) planning project execution, including preparing and implementing annual work plans; (iii) monitoring project status and fulfillment of the pre-established targets; (iv) planning, executing, and monitoring the goods, services, and works procurement processes, ensuring that they conform to the Bank's procurement policies; (v) preparing and processing the corresponding payments; (vi) keeping a suitable accounting and financial system for recording financial transactions, preparing financial statements, and processing disbursement requests; (vii) preparing semiannual project monitoring reports and sending them to the Bank; and (viii) performing any other responsibilities set forth in the project Operating Manual.

3.3 As part of the costs of Component 1, a specialized consulting firm will be engaged to provide technical assistance in executing this component. This consulting firm will be supervised by the executing agency and will perform the following activities: (i) support dissemination of the project in the areas of intervention and train the organizations (e.g. water councils and agroforestry cooperatives) that will participate in the SFM project; (ii) provide these organizations with organizational advisory services, including the promotion of women's participation in decision-making and restoration activities; (iii) support these organizations in updating their management plans; (iv) prepare the documents required for signing the management agreements for project participation; and (v) verify and provide documentation evidencing that these organizations have completed the required activities prior to payment (optional electronic link 1). The specialized firm will act in coordination with the ICF and Climate+.

3.4 The ICF will provide technical support, specifically in the framework of the execution of Component 1, for: (i) approving the management plans; (ii) verifying compliance with restoration practices before authorizing payments, relying on the documentation presented by the specialized consulting firm; and (iii) monitoring implementation of the ESMP, including the complaints mechanism. With regard to Component 2, the ICF is expected to provide the support required to facilitate the interventions to strengthen the forest health department. The executing agency is expected to sign a coordination agreement with the ICF for purposes of formalizing the obligations of both institutions, including, on the part of the ICF, allocating the annual budget amount, within the allocated budget ceiling, needed to operate and maintain the forest health department and the research products.

3.5 The restoration activities for bark beetle-infested public forests will be carried out under forest management agreements (in the form of management plans) between the ICF and the organizations (water councils, agroforestry cooperatives, and

others) that manage these areas, which will be supported with technical assistance, seedlings, and cash payments. These activities will be performed only in public forests that have a defined use (paragraph 1.2). Under the management agreements, the organizations will commit to participate in trainings, perform the restoration activities provided in the management plan, foster the participation of women in the decision-making process and in the forestry jobs created by the project, and continue to carry out SFM activities in the areas they manage upon project completion. As part of the ESMP, the project has identified mechanisms for participation by the most vulnerable groups in the restoration activities. In this priority area of intervention (map 1), there are approximately 27,744 hectares of public forest affected by the bark beetle that have a defined use. This is where project execution will begin. The rest of the area to be restored until the target of 34,000 hectares is achieved will be identified using the same criteria (optional electronic link 8).

3.6 The pilot program of incentives for private owners will be designed and implemented as part of this operation, and its design will take into account aspects to ensure that the incentives are inclusive and do not become concentrated (paragraph 1.31).

3.7 Special contractual conditions precedent to the first disbursement of loan proceeds: **(i) evidence that a coordinator, financial specialist, procurement specialist, and planning and monitoring specialist have been appointed to SEFIN's PMU, and a social specialist and an environmental specialist have been appointed to the ICF; (ii) approval and entry into force of the project Operating Manual in accordance with terms agreed upon with the Bank, including the environmental and social requirements in the Environmental and Social Management Plan (ESMP) and a complaints and claims mechanism; and (iii) signature and entry into force of an interagency cooperation agreement between the executing agency and the ICF, identifying the obligations of each one during the implementation of project activities.**

3.8 **Special contractual conditions of execution:** (i) evidence that a specialized firm has been contracted to support the execution of Component 1, prior to the startup of the activities indicated in that component; (ii) presentation, to the Bank's satisfaction, of the design of the pilot program of incentives, prior to the startup of the program implementation activity indicated in section (iii) of Component 1; (iii) presentation of evidence of the creation of a forest health department under the ICF, prior to the startup of the activities indicated in section (i) of Component 2; and (iv) presentation, to the Bank's satisfaction, of the updated Environmental and Social Analysis and the ESMP for the project, prior to the startup of the activities indicated in Component 1.

3.9 **Financial statements and other audited reports.** Within 120 days after the end of each fiscal year throughout the established loan disbursement period, the executing agency will present audited financial statements for the project to the Bank, duly certified by an independent auditor acceptable to the Bank, including a final report within 120 days after the date set for the last disbursement of loan proceeds and any extensions. In addition, the presentation of annual operational evaluations, to be prepared by independent auditors acceptable to the Bank, will be required in accordance with terms of reference agreed upon with the Bank.

3.10 The executing agency will be responsible for conducting processes for the selection, bidding, contracting, supervision, and receipt of project procurements, which will be

carried out in accordance with the Bank policies set forth in documents GN-2349-9 and GN-2350-9 and the provisions established in the operation's procurement plans, which itemize: (i) the contracts for goods and consulting services required to implement the project; (ii) the proposed methods for procurement of goods and selection of consultants; and (iii) the procedures used by the Bank to review each procurement process.

3.11 **Disbursements.** For advances of funds, the executing agency will open a special account for disbursement of the funds, in the name of the project, at the Central Bank of Honduras. The maximum amount of each advance of funds will be determined by the Bank on the basis of the cash flow analysis submitted by the executing agency. There are no plans for the transfer of project resources to be administered by the ICF.

3.12 The project will have an Operating Manual, which will describe the corresponding administrative and accounting policies, procurement execution processes, environmental and social management based on issues identified in the ESMR, the project execution process, internal control processes, and monitoring and evaluation considerations. The section of the Operating Manual on the execution process will indicate the mechanisms for coordination between the executing agency, the ICF, Climate+, the communities, and other stakeholders involved, the actions to be carried out by the consulting firm and how it will be supervised, the steps for performing forest restoration activities, and the corresponding verification processes, among other topics.

B. Summary of arrangements for results monitoring

3.13 The project will be supported by an impact assessment aimed at measuring the increase in flows during the dry season and the estimated increases in carbon capture. To estimate the impact on dry season flows, a rainfall-runoff model will be calibrated and the average impact per hectare of reclaimed forest will be estimated based on a simulation. The carbon capture impact will be estimated by taking a random sampling of areas reclaimed through the project and areas untargeted by the project and then estimating the difference in carbon capture between the two types of areas using established procedures and good practices.

3.14 **Monitoring arrangements.** Project monitoring and evaluation will be performed using the following instruments: (i) the annual work plan, the project execution plan, the procurement plan, and the cash flow and disbursement schedule; (ii) semiannual progress monitoring reports; (iii) the final report; (iv) audited financial statements; and (v) the project completion report, including the ex post economic evaluation. These instruments are described in detail in the monitoring and evaluation plan.

Development Effectiveness Matrix			
Summary			
I. Strategic Alignment			
1. IDB Strategic Development Objectives	**Aligned**		
Development Challenges & Cross-cutting Themes	**-Climate Change and Environmental Sustainability -Institutional Capacity and the Rule of Law**		
Regional Context Indicators			
Country Development Results Indicators	**-Reduction of emissions with support of IDBG financing (annual million tons CO2 e) -Beneficiaries of improved management and sustainable use of natural capital (#) -Government agencies benefited by projects that strengthen technological and managerial tools to improve public service delivery (#)**		
2. Country Strategy Development Objectives	**Aligned**		
Country Strategy Results Matrix	**GN-2796-1**	**Reduce marginalization and improve the quality of urban life in the Central District.**	
Country Program Results Matrix		**The intervention is not included in the 2016 Operational Program.**	
Relevance of this project to country development challenges (If not aligned to country strategy or country program)			
II. Development Outcomes - Evaluability	**Evaluable**	**Weight**	**Maximum Score**
	8.4		**10**
3. Evidence-based Assessment & Solution	**5.7**	**33.33%**	**10**
3.1 Program Diagnosis	**2.0**		
3.2 Proposed Interventions or Solutions	**1.2**		
3.3 Results Matrix Quality	**2.6**		
4. Ex ante Economic Analysis	**10.0**	**33.33%**	**10**
4.1 The program has an ERR/NPV, a Cost-Effectiveness Analysis or a General Economic Analysis	**4.0**		
4.2 Identified and Quantified Benefits	**1.5**		
4.3 Identified and Quantified Costs	**1.5**		
4.4 Reasonable Assumptions	**1.5**		
4.5 Sensitivity Analysis	**1.5**		
5. Monitoring and Evaluation	**9.3**	**33.33%**	**10**
5.1 Monitoring Mechanisms	**2.3**		
5.2 Evaluation Plan	**7.1**		
III. Risks & Mitigation Monitoring Matrix			
Overall risks rate = magnitude of risks*likelihood	**Medium**		
Identified risks have been rated for magnitude and likelihood	**Yes**		
Mitigation measures have been identified for major risks	**Yes**		
Mitigation measures have indicators for tracking their implementation	**Yes**		
Environmental & social risk classification	**B**		
IV. IDB´s Role - Additionality			
The project relies on the use of country systems			
Fiduciary (VPC/FMP Criteria)	**Yes**	**Financial Management: Budget, Treasury. Procurement: Information System.**	
Non-Fiduciary	**Yes**	**Monitoring and Evaluation National System.**	
The IDB's involvement promotes additional improvements of the intended beneficiaries and/or public sector entity in the following dimensions:			
Gender Equality	**Yes**	**The project will increase the participation of women in the forest sector.**	
Labor			
Environment			
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project	**Yes**	**Technical Cooperation (HO-T1253) supported: (i) the pine beetle control system, (ii) the design of the forestry health department design and (iii) the improvement of the climate change governance.**	
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan	**Yes**	**The impact evaluation will produce evidence on the effectiveness of forest restauration in reducing CO2 emissions.**	

Note: (*) Indicates contribution to the corresponding CRF's Country Development Results Indicator.

The motivation of the proposed project is related to the destruction of nearly half a million hectares of pine forest caused by recurrent plague of southern pine beetle and the associated loss of ecosystem services, including hydrological regulation in key watersheds for water supply.

The program aims to restore and maintain ecosystem services of forests in priority watersheds affected by the beetle outbreak. The diagnosis concerning the causes of the problem in public forest area is well identified and proposed solutions seem adequate and potentially effective. Deficiencies of forest management in private areas are not discussed and proposals for action in these areas are limited to the design of incentive schemes and implementation of a pilot program, to be potentially financed by climate funds.

The results matrix includes indicators at impact, outcome and output levels that are SMART, which include baseline and target values.

The economic analysis comprises the estimation of potential benefits for components I and II. Analysis of component I is based on the estimate of the increase in volume recovery of water loss due to the pine beetle. The economic benefit attributed to this recovery is based on the value of the resource for water consumption in Tegucigalpa.

The Monitoring and Evaluation Plan meets the requirements of the DEM guidelines. Propensity score matching is proposed to identify similar comparison forest areas and estimate the impact of the intervention.

RESULTS MATRIX

Project objective:	To maintain/expand forest ecosystem services in priority watersheds affected by the bark beetle.

EXPECTED IMPACT

Indicators	Unit of measure	Baseline		Target		Means of verification	Comments
		Value	Year	Value	Year		
EXPECTED IMPACT							
Increase in the average availability of surface water during the dry season in the subwatersheds reclaimed with project support	Cubic meters of surface runoff in the three driest months per hectare of reclaimed forest	0	2016	59.3 cubic meters per hectare	2022	Hydrology analysis report commissioned for the project on the behavior of subwatersheds targeted by the project.	The analysis will measure, for the three driest months of the year, the average number of additional cubic meters of surface runoff per hectare of forest infested by the bark beetle and recovered through the project with respect to the baseline year. This impact will be estimated using a rainfall-runoff model that will be calibrated using precipitation and runoff data for three targeted and three non-targeted subwatersheds. The subwatersheds to be analyzed will be selected as part of the baseline study within the priority area, which includes the subwatersheds supplying water to Tegucigalpa, the valley of Comayagua, and the El Cajón dam.
Reduction of greenhouse gas emissions with project support	Tons of CO_2 equivalent/ hectare of restored forest	0	2016	5.8	2022	Baseline report and evaluation.	The indicator is associated with the Corporate Results Framework (CRF). The analysis will measure the impact on carbon sequestration of the regeneration of beetle bark-infested forests targeted by the program with respect to non-targeted forests. Carbon sequestration will be calculated by means of allometric equations that use the basal area to estimate carbon accumulation in the dry biomass of trees, using references on carbon sequestration in Honduran pines (Flor, 2000).
Percentage of beetle bark outbreaks controlled (number controlled/number detected) nationwide.	%	43	2016	100	2022	Annual reports from the ICF, forest health department	It is expected that 100% of detected outbreaks can be controlled by strengthening the ICF's forest health service.

EXPECTED OUTCOME

Expected outcomes	Unit of measure	Baseline		Intermediate		Target		Means of verification	Comments
		Value	Year	Value	Year	Value	Year		
EXPECTED OUTCOME									
Component I: Restoration of forests infested by the bark beetle									
At least 80% of the hectares of public forest restored through the program have densities that maximize production of environmental goods and services.	Percentage of hectares of public forest restored through the project with average densities of 1,200 trees per hectare	0%	2016	0%	2019	80%	2022	Annual evaluation reports on natural regeneration prepared by the consulting firm and approved by the ICF.	It has been shown that medium pine forest densities of 1,200 trees/hectare maximize the production of environmental goods and services.
At least 80% of the hectares of private forest subject to program incentives have densities that maximize production of environmental goods and services.	Percentage of hectares of private forest subject to project incentives with average densities of 1,200 trees per hectare	0%	2016	50%	2019	80%	2022	Evaluation report on the pilot program of incentives	See comments on previous outcome regarding densities.
Beneficiaries of sustainable management and use of natural capital	Men and women	M: 4,558 W: 3,037	2016	M: 17,844 W: 11,897	2019	M: 17,844 W: 11,897	2022	Report by the consulting firm responsible for technical assistance	This is a CRF country outcome. It refers to the individuals who will be trained by the project and will benefit from the support provided for forest restoration.

Expected outcomes	Unit of measure	Baseline		Intermediate		Target		Means of verification	Comments
		Value	Year	Value	Year	Value	Year		
EXPECTED OUTCOME									
Component II: Strengthening of the forest health system and enhancement of forest resilience to climate change									
Reduction in the average size of detected outbreaks of *Dendroctonus frontalis* throughout the country.	Average number of hectares per detected outbreak per year	24	2016	2	2019	2	2022	Annual ICF reports (should include all detected and controlled outbreaks)	This indicator captures improvements in the early warning system (through better detection) and in research, since a better understanding of the bark beetle will improve monitoring.
Expected outcomes	**Unit of measure**	**Baseline**		**Intermediate**		**Targets**		**Means of verification**	**Comments**
		Value	**Year**	**Value**	**Year**	**Value**	**Year**		
EXPECTED OUTCOME									
Component III: Improved governance to obtain access to climate financing for forest ecosystem services									
Government agencies that have modified their legal and administrative instruments in alignment with the climate governance reform.	Number of agencies	0	2016	1	2019	3	2022	Decrees and administrative instruments approved	Includes the Office of the President, SEFIN, and the ICF.
Amount of climate financing to be invested in expanding/ recovering forest-based ecosystem services in priority watersheds approved in the international windows	US$ millions	59	2016	134	2019	134	2022	Reports by SEFIN, the Office of the President, and the Climate Change Fund	Additional financing of US$75 million is expected to be obtained.

OUTPUTS

Outputs	Estimated cost (US$)	Unit of measure	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	Final target	Means of verification
Component I: Restoration of forests infested by the bark beetle										
Hectares infested by the bark beetle in the process of being restored, with timber removal and controlled fires implemented.	10,105,594	Ha	0	0	34,000	0	0	0	34,000	ICF monitoring system report
Hectares infested by the bark beetle in the process of being restored, with firebreaks implemented.	2,676,343	Ha	0	0	0	34,000	0	0	34,000	ICF monitoring system report
Hectares infested by the bark beetle in the process of being restored, with thinning performed.	2,118,063	Ha	0	0	0	0	0	34,000	34,000	ICF monitoring system report
Analysis of cost-efficient alternatives to foster sustainable management of forest resources completed.	400,000	Analysis completed	0	1	0	0	0	0	1	Consulting report. The study includes the design of a pilot incentive program for private forests.
Hectares of private pine forest subject to SFM program incentives.	2,550,000	Hectare	0	0	3,250	3,250	0	0	6,500	ICF monitoring system report While the program has not yet been designed, a conservative assumption is that the cost of the incentives per hectare will be similar to the financing required to restore public areas.
The pilot program of incentives for private forest owners evaluated	300,000	Evaluation performed	0	0	0	0	0	1	1	Consulting report

Campaign to disseminate the scope and benefits of the program to restore bark beetle-infested forests carried out in the targeted watersheds.	100,000	Campaign conducted	0	0	1	0	0	0	1	Final report on campaign
Component II: Strengthening of the forest health system and enhancement of forest resilience to climate change										
Research on pest control, sustainable forest management, and climate change-resilient species conducted	750,000	Publication	0	1	1	1	1	3	7	Research publications. The research will make it possible to strengthen the early warning system and the seed bank.
Seed bank of climate change-resilient species created	300,000	Seed bank in operation	0	0	1	0	0	0	1	Inventory of species in the seed bank
Forest health units equipped	500,000	Forest health units equipped	0	3	4	0	0	0	7	Equipment delivery certificates. Includes the units in (i) Olancho, (ii) Northeast Olancho, (iii) Yoro, (iv) Francisco Morazán, (v) Choluteca, (vi) Copán, and (vii) Cortés, which together will provide national coverage.
Specialists trained in forest health management	600,000	Trained specialists	0	0	30	0	0	30	60	Specialists certified in pest management. Includes grants and training courses.

Pest monitoring and forest restoration system in operation in the ICF Forest Health Department.	950,000	System	0	0	0	0	0	1	1	Forest Health Department reports. Includes purchase of equipment, satellite imagery, and consultants. System in operation means that the capacities, equipment, and procedures needed to perform monitoring are in place.
Outputs	**Estimated cost (US$)**	**Unit of measure**	**Baseline**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Final target**	**Means of verification**
Component III: Improved access to climate financing to promote SFM										
Government agencies have prepared proposals to modify their legal and administrative instruments in alignment with the climate governance reform.	400,000	Number of proposals	0	1	1	1	0	0	3	Decrees and administrative documents
Design and launch of a financial and operational mechanism to obtain access to climate financing for payment for forest-based environmental services.	1,700,000	Mechanism in operation	0	0	0	0	0	1	1	Annual reports on the mechanism

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Country:	Honduras
Project number:	HO-L1179
Name:	Sustainable Forest Management
Executing agency:	Ministry of Finance (SEFIN)
Fiduciary team:	Kelvin Suero (Financial Management, FMP/CHO) and María Cecilia Del Puerto Correa (Procurement, FMP/CHO)

I. EXECUTIVE SUMMARY

1.1 In close coordination, the Government of Honduras and the Bank have joined efforts to move forward in strengthening the country's project execution capacities. In this regard, the Bank has continued to implement technical support and strengthening actions to enhance the country systems for public finance management. The most recent diagnostic assessments of the public finance management systems reflect significant progress toward international standards and good practices. The Bank continues to support implementation of the Integrated Financial Administration System (SIAFI/UEPEX) module for the financial management of projects and strengthening of the national public resources control system. With regard to the public procurement system, the country has strengths that were identified in the MAPS/OECD diagnostic assessment in 2010, evidenced by a legal framework in line with most international best practices. However, there are some challenges in achieving the standards that would allow the Bank to use the country system for public procurements in Bank-financed operations.

II. FIDUCIARY CONTEXT OF THE EXECUTING AGENCY

2.1 The executing agency for the project will be the Ministry of Finance (SEFIN). SEFIN has a project management unit (PMU) that has managed several Bank-financed operations and has key staff with more than five years of experience in the unit. The PMU will be reinforced with the complementary technical and administrative capacity needed to manage the project.

III. FIDUCIARY RISK EVALUATION AND MITIGATION ACTIONS

3.1 The project team determined that the project risk associated with financial and procurement management is medium, considering the execution arrangements that have been agreed upon. The arrangements designed to mitigate this risk notably include the use of the SIAFI/UEPEX system for financial management and all country controls derived from such use. Notwithstanding its experience and in view of the marginal load that managing the project would involve, SEFIN will be reinforced by complementary personnel specialized in monitoring, financial

management, and procurement under Bank procedures. These personnel will work exclusively on managing the project. Similarly, considering the limits of the executing agency's operational authority, SEFIN will sign a coordination agreement with the Forest Conservation Institute (ICF) to manage the technical aspects falling within its purview. In addition, refresher workshops on Bank procedures will be held during execution, and use of the Procurement Plan Execution System (SEPA) will be implemented. External operational evaluations, to be performed by a consulting firm, will be included as part of project monitoring in order to monitor implementation of the labor and incentive payments envisaged under the operation.

IV. CONSIDERATIONS FOR THE SPECIAL PROVISIONS OF CONTRACTS

4.1 Below are the agreements and requirements that should be considered in the special conditions of the loan contract:

a. **Special contractual conditions precedent to the first disbursement of loan proceeds:** (i) evidence that a coordinator, financial specialist, procurement specialist, and planning and monitoring specialist have been appointed to SEFIN's PMU, and a social specialist and an environmental specialist have been appointed to the ICF; (ii) approval and entry into force of the project Operating Manual in accordance with terms agreed upon with the Bank, including the environmental and social requirements in the Environmental and Social Management Plan (ESMP) and a complaints and claims mechanism; and (iii) signature and entry into force of an interagency cooperation agreement between the executing agency and the ICF, identifying the obligations of each one during the implementation of project activities.

b. **Special contractual conditions of execution:** (i) evidence that a specialized firm has been contracted to support the execution of Component 1, prior to the startup of the activities indicated in that component; (ii) presentation, to the Bank's satisfaction, of the design of the pilot program of incentives, prior to the startup of the program implementation activity indicated in section (iii) of Component 1; (iii) presentation of evidence of the creation of a forest health department under the ICF, prior to the startup of the activities indicated in section (i) of Component 2; and (iv) presentation, to the Bank's satisfaction, of the updated Environmental and Social Analysis and the ESMP for the project, prior to the startup of the activities indicated in Component 1.

c. **Exchange rate agreed upon with the executing agency/borrower for rendering accounts.** For purposes of Section 4.01 (b) of the General Conditions of the Loan Contract, the parties agree that the applicable exchange rate will be as indicated in Section 4.01(b)(ii). In this case, the applicable exchange rate will be the rate in effect on the date on which the borrower, the executing agency, or any other individual or legal entity that has been delegated the power to incur expenses makes the relevant payment to the contractor or supplier.

d. **Financial statements and other audited reports.** The borrower commits to present the following reports, either directly or through the executing agency:

(i) within 120 days after the end of each fiscal year of the executing agency throughout the established loan disbursement period, the audited financial statements for the project, duly certified by an independent auditor acceptable to the Bank. The last of these reports will be presented within 120 days after the date set for the last disbursement of the loan. In addition, the presentation of annual operational evaluations, to be prepared by an independent auditor acceptable to the Bank, will be required in accordance with terms of reference agreed upon with the Bank

V. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

5.1 The procurement-related fiduciary agreements and requirements establish the applicable provisions for the execution of all procurements under the project.

A. Procurement execution

5.2 SEFIN will be responsible for carrying out the processes for the selection, bidding, contracting, supervision, and receipt of project procurements, which will be conducted in accordance with the Bank policies set forth in documents GN-2349-9 and GN-2350-9 and the provisions established in the operation's procurement plans, which itemize: (i) the contracts for works, goods, and consulting services required to implement the project; (ii) the proposed methods for procurement of goods and selection of consultants; and (iii) the procedures used by the Bank to review each procurement process.

5.3 While use of the country system in Bank-financed operations has not been approved in the case of Honduras, the executing agency may use the website of the National Office for Public Procurement, www.honducompras.hn, to advertise procurement processes that require publicity at the national level.

a. **Procurement of works, goods, and nonconsulting services:** Contracts for works, goods, and nonconsulting services[1] generated under the project and subject to international competitive bidding (ICB) will be executed using the standard bidding documents issued by the Bank. Procurements subject to national competitive bidding (NCB) will be executed using local bidding documents agreed upon with the Bank and published on www.honducompras.hn.

b. **Selection and contracting of consultants**: Contracts for consulting services generated under the project will be executed using the standard request for proposals issued or agreed upon by the Bank. The project's sector specialist is responsible for reviewing the terms of reference for consulting services contracts.

c. **Selection of individual consultants:** At the discretion of the executing agency, local or international announcements may be placed in order to advertise the contracting of individual consultants with a view to creating a shortlist of qualified individuals.

[1] Policies for the procurement of goods and works financed by the Inter-American Development Bank (document GN-2349-9), paragraph 1.1: Nonconsulting services are treated as goods.

B. Threshold amounts (US$000)

5.4 The thresholds determining the use of ICB and the compilation of a shortlist of international consultants will be made available to the executing agency on the website www.iadb.org/procurement.

C. Main procurement items

5.5 The executing agency will be responsible for preparing the project procurement plan.[2,3] The main procurement items planned for this operation are as follows.

MAIN PROCUREMENT ITEMS			
Activity	**Type of procurement**	**Estimated date**	**Estimated amount US$**
Services			
Technical assistance for incentives	QCBS		1,620,299
Procurement of pick-up trucks	ICB		300,000
Procurement of plants	ICB		121,972
Procurement of fire equipment	ICB		129,324
Procurement of license for high-resolution satellite imagery	ICB		337,500
Consulting services for sector studies to support implementation of the forest, soil, and water strategic plan	QCBS		400,000
Consulting services for studies on environmental services (PES)	QCBS		674,640
Consulting services for economic and strategic analysis	QCBS		400,000

* To access the 18-month procurement plan, click here.

D. Procurement supervision

5.6 Pursuant to the analysis of procurement-related fiduciary risk, the supervision method will be set forth in the respective procurement plan of each executing agency.

5.7 **Records and files**. SEFIN will be responsible for keeping files and original supporting documentation for the procurement processes carried out by each institution.

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2 Policies for the procurement of goods and works financed by the IDB (document GN-2349-9), paragraph 1.16., and Policies for the selection and contracting of consulting services financed by the IDB (document GN-2350-9), paragraph 1.23.: the Borrower shall prepare and, before loan negotiations, furnish to the Bank for its approval, a Procurement Plan acceptable to the Bank… [for] an initial period of at least 18 months.

3 See Guidelines for preparing and using a procurement plan.

VI. FINANCIAL MANAGEMENT AGREEMENTS AND REQUIREMENTS

6.1 **Programming and budget.** Implementation of the SIAFI/UEPEX module and the General Treasury Account has led to more prudential and disciplined management of cash resources and greater decentralization of the treasury function. The Bank's financial parameters for the country allow the financing of an entire project or program.

6.2 **Accounting and information systems.** The SIAFI/UEPEX module is used for financial reporting and rendering of accounts in Bank-financed projects. Accounting records are kept on a cash basis.

6.3 **Disbursements and cash flow.** For advances of funds, the executing agency will open a special account for disbursement of the funds, in the name of the project, at the Central Bank of Honduras. The maximum amount of each advance of funds will be determined by the Bank on the basis of the cash flow analysis submitted by the executing agency.

6.4 **Internal control and internal audits.** The executing agency will be responsible for developing the appropriate internal control system and implementing the recommendations arising from the independent auditor's reports. The Bank is carrying out actions intended to strengthen internal control in Honduras.

6.5 **External control and reports.** The Superior Audit Court (TSC) is the institution responsible for the external control of public funds in Honduras. The TSC is eligible to audit Bank-financed operations. The external audit function for the operation will be performed by an independent auditor acceptable to the Bank and will be financed using loan proceeds. Annual operating evaluations are planned.

6.6 Based on the above, the following financial agreements and arrangements have been established:

a. External financial auditing services will be available for the project on an annual basis.

b. The rules to be used in this operation are the financial management policy for Bank-financed projects (document OP-273-6), the operational guidelines for the financial management of Bank-financed projects (document OP-274-2), the guidelines for financial and auditing reports (AF-200), and the model terms of reference for Bank financial audits, as updated.

c. The cost of the auditing services is estimated at US$250,000, to be financed using loan proceeds.

d. The firm of independent auditors will be selected and contracted on the basis of document AF-200, in accordance with the established guidelines. In the case of the TSC, it may be done directly through an interagency agreement.

6.7 **Financial supervision plan.** Supervision will be performed by the Bank's financial management specialist assigned to the operation, with the support of external auditing services and consultants and in coordination with the Project Team Leader.