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DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PANAMA

SUSTAINABLE AND INCLUSIVE AGRICULTURAL INNOVATION PROJECT

(PN-L1166)

LOAN PROPOSAL

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REQUIRED

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2. Monitoring and evaluation plan
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4. Procurement plan

OPTIONAL

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2. Project economic analysis
3. Sustainable productive innovation
4. Inclusive market innovation
5. Digital management of information and processes
6. Use of information and communications technologies in agriculture
7. Climate change annex
8. Gender, youth, and indigenous peoples annex
9. Project Operating Regulations
10. Budget by output
11. Support projects
12. Target area
13. Scores by territory
14. Strategic environmental and social analysis
15. Incentive management mechanisms
16. Execution mechanisms

ABBREVIATIONS

ACGAFs	Asociaciones, cooperativas, y grupos de la agricultura familiar [family farming associations, cooperatives, and groups]
CGR	Contraloría General de la República de Panamá [Comptroller General of the Republic of Panama]
CIPAV	Centro para la Investigación en Sistemas Sostenibles de Producción Agropecuaria [Center for Research on Sustainable Agricultural Production Systems]
CONADAF	Comité Nacional de Diálogo de Agricultura Familiar [National Family Farming Dialogue Committee]
CONALSED	Comité Nacional de Lucha contra la Sequía y la Desertificación [National Committee to Combat Drought and Desertification]
COVID-19	Disease caused by the 2019 novel coronavirus, or nCoV2019
ECLAC	Economic Commission for Latin America and the Caribbean
ESMR	Environmental and social management report
FAO	Food and Agriculture Organization
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
FIAP	Finca de innovación agroecológica participativa [participatory agroecological innovation farm]
Ha	Hectare
IARNA	Instituto de Investigación y Proyección sobre Ambiente Natural y Sociedad [Institute of Research and Projections on the Natural Environment and Society]
ICAP	Institutional Capacity Analysis Platform
IDIAP	Instituto de Innovación Agropecuaria de Panamá [Institute of Agricultural Innovation of Panama]
IMA	Instituto de Mercado Agropecuario [Agricultural Market Institute]
INEC	Instituto Nacional de Estadística y Censo [National Statistics and Census Institute]
MEF	Ministry of Economy and Finance
MIDA	Ministerio de Desarrollo Agropecuario [Ministry of Agricultural Development]
PCU	Project coordination units
PNIM	Plan de negocio e innovación de mercado [business and market innovation plan]
SENACYT	Secretaría Nacional de Ciencia, Tecnología e Innovación [National Department of Science, Technology and Innovation]
SIGAP	Sistema de Información y Gestión Agropecuaria de Panamá [Agricultural Information and Management System of Panama]
WEAI	Women's Empowerment in Agriculture Index

PROJECT SUMMARY
PANAMA
SUSTAINABLE AND INCLUSIVE AGRICULTURAL INNOVATION PROJECT
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Financial Terms and Conditions				
Borrower:			**Flexible Financing Facility**[a]	
Republic of Panama			**Amortization period:**	15 years
Executing Agencies:			**Disbursement period:**	5 years
Ministry of Agricultural Development (MIDA) Institute of Agricultural Innovation of Panama (IDIAP)			**Grace period:**	6 years[b]
			Interest rate:	LIBOR-based
Source:	**Amount (US$)**	**%**	**Credit fee:**	[c]
IDB (Ordinary Capital)	41,000,000	88%	**Inspection and supervision fee:**	[c]
Local:	5,601,560	12%	**Weighted average life (WAL):**	10.50 years
Total:	46,601,560	100%	**Currency of approval:**	United States dollars

Project at a Glance
Project objective/description: The project's general objectives are to improve the food security and incomes of smallholder family farmers. The specific objectives are to: (i) increase profitability; (ii) improve resilience to shocks (climate, pests, diseases, and market shocks); and (iii) increase the environmental sustainability of these farms and ranches.
Special contractual condition precedent to the first disbursement of the financing: The first disbursement of the loan proceeds will be contingent on meeting the following conditions to the Bank's satisfaction: (i) an interagency agreement has been signed by and among the Ministry of Economy and Finance (MEF), representing the borrower, the Institute of Agricultural Innovation of Panama (IDIAP), and the Ministry of Agricultural Development (MIDA) establishing the responsibilities of each entity in project execution and financial management of the resources (see paragraph 3.2); (ii) the two project coordination units have been created, and their key personnel appointed (see paragraph 3.3); and (iii) the project Operating Regulations (optional link 9) have been approved and have entered into force on the terms agreed upon with the Bank, including, among others, the environmental and social commitments described in Annex B, Section C, of the environmental and social management report (ESMR) (required link 3) (see paragraph 3.6). See other socioenvironmental contractual conditions in Annex B of the ESMR. **Special contractual conditions for execution:** Prior to the disbursement of the loan proceeds for: (i) output 1.2 (innovation vouchers) of Component I; and (ii) Component II, the borrower, acting through the executing agency, has submitted evidence that the service provider has been contracted on the terms agreed upon with the Bank (see paragraph 3.4). See other socioenvironmental contractual conditions for execution in Annex B of the ESMR.
Exceptions to Bank policy: None.

Strategic Alignment			
Challenges:[d]	SI ☒	PI ☒	EI ☐
Crosscutting issues:[e]	GE ☒ and DI ☒	CC ☒ and ES ☒	IC ☒

[a] Under the terms of the Flexible Financing Facility (document FN-655-1), the borrower has the option of requesting changes to the amortization schedule, as well as currency, interest rate, commodity, and catastrophe protection conversions. The Bank will take operational and risk management considerations into account when reviewing such requests.

[b] Under the flexible repayment options of the Flexible Financing Facility, changes to the grace period are permitted provided that they do not entail any extension of the original weighted average life of the loan or the last payment date as documented in the loan contract.

[c] 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 applicable policies.

[d] SI (Social Inclusion and Equality); PI (Productivity and Innovation); and EI (Economic Integration).

[e] GE (Gender Equality) and DI (Diversity); CC (Climate Change) and ES (Environmental Sustainability); and IC (Institutional Capacity and Rule of Law).

I. Description and Results Monitoring

A. Background, problem addressed, and rationale

1.1 **Macroeconomic context.** Prior to the COVID-19 pandemic, Panama was growing steadily in comparison with the rest of Latin America and the Caribbean. Between 2008 and 2019, GDP growth averaged 6.1%, versus 2.2% for the region as a whole, and per capita GDP stood at US$32,850 in purchasing power parity terms in 2019. This economic buoyancy enabled the country to be categorized as high income. However, this growth did not translate into commensurate social gains. The poverty rate (21.5%) in 2019 is high compared with other countries with similar income levels, particularly in rural areas and the indigenous comarcas. Moreover, inequality is very high with a Gini coefficient of 49 in 2015 (National Statistics and Census Institute (INEC), latest available data).[1]

1.2 **Impact of COVID-19.** Panama had Latin America's highest number of COVID-19 cases per 100,000 population, and its economy has been among the hardest hit by the crisis. GDP has fallen 17.9% in real terms, with a marked impact in several different areas. The nonfinancial public sector deficit stood at 10.1% of GDP, while debt rose from 46.4% to 69.8% of GDP. Unemployment has risen from 7.1% to 18.5%, and poverty may rise by 7 points (IDB, 2020). As many as 76% of households have lost some or all of their income, and 27% of families lack the money to meet their basic needs, with 21% of households having had toa take on debt or sell assets to cope with the crisis. Food insecurity has also worsened (47% of households report having eaten less than usual) (United Nations Children's Fund (UNICEF, 2020). This state of affairs jeopardizes meeting the government's target to reduce the prevalence of undernourishment to 5% of the population by 2025. These circumstances highlight the importance of supporting the agricultural sector, which is the country's socioeconomic backbone, accounts for the livelihood of hundreds of thousands of vulnerable families, brings in foreign currency, and is the mainstay of food security. It is also a sector with great potential that, contrary to the national trend, grew 3% in 2020. Nonetheless, this growth has not been equitable, as rural families are still badly affected by the current crisis and face high levels of food insecurity.

1.3 **The agricultural sector in Panama.** The sector has been losing competitiveness and market share in recent years. Its exports declined from US$874.5 million (US$939.6 million, if agroindustry is included) in 2007 to US$388.8 million (US$496 million including agroindustry) in 2019. However, until 2019 (when a new copper mine came into operation) the sector was the main engine of the country's exports. In 2018, export sales of agricultural produce made up 51.1% of total exports of goods produced[2] in Panama (67.1%, if agroindustry is included). Moreover, although in relative terms its contribution to Panama's GDP is limited (2.1% in 2019), the value of agricultural production has remained stable since 2012 with average annual growth of 1.5%, and its contribution to regional GDP demonstrates that the agricultural sector is an

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1 The references mentioned in the document can be found in optional link 1.

2 Excludes re-exports.

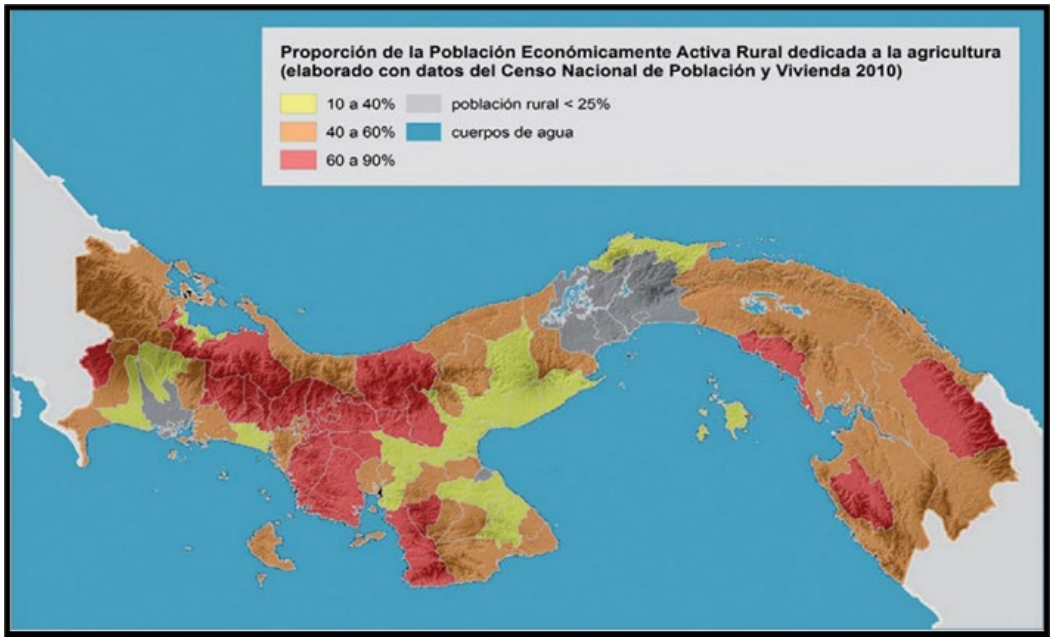
essential part of the productive structure in most of the country's provinces (Table 1) (Chacon et al., 2019; INEC, 2019).

Table 1. Contribution of the agricultural sector to GDP in selected provinces (INEC, 2019)

Province	Darién	Bocas del Toro	Los Santos	Herrera	Coclé	Veraguas	Chiriquí
Sector's weight in provincial GDP (%)	33.9	15.5	18.6	14.3	12.1	11.6	7.8

1.4 Approximately 30% of Panama's land area is devoted to agricultural production, including basic grains (rice, corn, and beans), fruit and vegetables, sugar cane, coffee, beef, chicken, pork, and dairy products. There are approximately 248,000 farmers in the country, 81.5% of whom work less than 10 hectares of land. Agriculture employs 14.2% of the economically active population nationally but is the main occupation and source of income for 40% of the population living in rural areas (Map 1) (INEC, 2017).

Map 1. Agricultural employment



Source: Bouroncle et al., 2014.

1.5 The economic gap between Panama's rural and urban areas is substantial. Average wages in rural areas are 68% of those in urban areas (INEC, 2019). The poverty rate in rural areas is also much higher than in urban areas (31% versus 7.2%) (Economic Commission for Latin America and the Caribbean (ECLAC), 2020). This means less access to food and, ultimately, heightened food insecurity, particularly in the most disadvantaged areas. There is also a

considerable inequality gap within rural areas. The average annual income of small-scale producers (less than two hectares) is estimated at US$519, compared with US$7,361 for a medium- or large-scale producer (Food and Agriculture Organization of the United Nations (FAO) et al., 2020). This means that small-scale producers earn just 7% of the average earnings of medium- and large-scale producers. The scarcity of economic resources faced by small-scale farmers results in more difficulty obtaining food. To make matters worse, in Panama, a healthy diet is five times more expensive than one that simply meets the minimum calorie requirements (FAO et al., 2020). Consequently, rural smallholder households are more vulnerable to high levels of food insecurity, owing to their lack of access to nutritious foods (i.e., the access to and utilization of foodstuffs dimensions of food security).[3] The factors underlying this insecure situation include low profitability, limited environmental sustainability, and a lack of resilience among Panamanian small-scale farmers.

1.6 **Low profitability.** The low profitability of Panamanian farms is largely due to low agricultural productivity, high production costs, and lack of access to markets. In the case of productivity, with the exception of corn, Panama's yields of key crops are systematically below regional averages (Table 2). Moreover, production costs are considerable, accounting for up to 71% of the value of production for cassava, 62% for corn, and 76% for coffee (considering only variable costs, and excluding labor).

Table 2: Average yields (hectograms per hectare)

Products	CR/NI/HO/GU/ES average	Panama
Paddy rice	46,257	33,385
Sugar	914,370	756,509
Banana	540,874	382,656
Coffee	9,296	4,461
Beans	8,379	4,419
Corn	19,030	21,736
Watermelon	354,928	179,056
Plantain	169,959	102,530
Tomato	397,933	297,268

Source: FAO Corporate Statistical Database (FAOSTAT) (2018).

1.7 Additionally, producers face difficulties selling their products, which results in small volumes and low prices. Post-harvest losses come to between 20% and 40%, as a result of physical damage (up to 30%) and rejection by buyers (up to 10%). Approximately 83% of family farmers sell primary products, and 92% of producers interviewed said they depend wholly or partially on just a handful of buyers, while producers are fragmented and have limited bargaining power, leading to high selling margins. The marketing and value-added stages capture between 30% and 50% or more of the price of the product, while the share

[3] Food security has four dimensions: availability, access (households' availability of financial and physical resources with which to obtain an appropriate quantity of foods), utilization (quality of the diet to achieve an adequate nutritional status), and stability of foods.

retained by the family farmer averages less than 10%. The reasons for this include: (i) farmers' lack of market orientation: 83% say they are unaware of demand in terms of market requirements (such as product types, quality, or safety), prices, abundance or scarcity of the product on markets and so do not take this information into account in their farming activities; (ii) limited availability of appropriate equipment and infrastructure for storage, processing, and transportation, a problem cited by 87% of farmers; and (iii) inability to meet quantity, quality, and safety requirements or to deal with the red tape involved in accessing formal markets (such as public procurement, supermarkets, or specialty stores), a problem cited by 50% of farmers interviewed (optional link 4). These problems could be partially mitigated by strong collective action, but just 20% of farmers say they belong to any form of association (Agricultural Market Institute (IMA), 2017).

1.8 **Low environmental sustainability.** Agriculture in Panama operates with low levels of environmental sustainability, which limits the possibilities of improving productivity and jeopardizes the sector's future. Indeed, the "Agriculture" and "Loss of forest cover" variables of Panama's Environmental Performance Index are low (at 25.6/100 and 33/100, respectively). Moreover, the expansion of the agricultural frontier has been the main driver of deforestation in Panama (Global Forest Watch, 2019), and farming practices are causing serious soil degradation (28% of soil is degraded, National Committee to Combat Drought and Desertification (CONALSED), 2018). This is due to the fact that the country's farming and ranching activities are largely based on monoculture, intensive soil tillage, large-scale use of agrochemicals, limited organic soil fertility management, and overgrazing. These factors are known for their negative impacts on ecosystem services (i.e., soil formation and conservation, nutrient recycling, water cycle regulation, pollination, and natural pest control), which are key to agricultural production and reducing farms' vulnerability to a variety of shocks (climate, pests, diseases, and market shocks) (Inter-American Institute for Cooperation on Agriculture (IICA), 2019; Chaput, 2020). Widespread monoculture also reduces agrobiodiversity, exacerbating the vulnerability to pests that threaten food production and consequently food security (Nicholls et al., 2015). This contrasts with sustainable production practices based on agroecological principles,[4] which are still emerging and developing in Panama (Santamaría Guerra and González Dufau, 2017; optional link 3).

1.9 **Low climate resilience**. Vulnerability to climate change is another factor influencing the profitability of the agricultural sector. The economic impacts of climate change in Panama over the past three decades come to around US$3.5 billion, with the productive, infrastructure, and agriculture sectors being hardest hit. In November 2020, Hurricanes Eta and Iota caused agricultural losses estimated at US$11 million. If ambitious measures are not implemented immediately, the economic cost of climate change for Panama is projected to reach 8.4% of GDP by 2030. Rising temperatures and precipitation are elevating the country's climate vulnerability. Climate change scenarios project an average temperature rise in Panama of between 2.5°C and 4.2°C and a reduction in

[4] Agroecology aims to utilize and strengthen ecosystem services to enable agricultural production.

precipitation of between 3% and 18% (ECLAC, 2012). This will contribute still more to the increasing frequency and intensity of weather phenomena. In the case of the agricultural sector, by 2050 yields of irrigated corn and nonirrigated corn and beans are expected to decrease 25.6%, 31.1%, and 26.9%, respectively; and the amount of land suitable for growing bananas and arabica and robusta coffee could decrease 77.8%, 53%, and 30.7%, respectively (Prager et al., 2020). Water availability is also projected to decrease by between 33% and 68%, and the cumulative cost of climate change impacts on water resources could be as much as 12.95% of GDP (optional link 7).

1.10 In this context, it is key to promote the adoption of agricultural systems that are productive, profitable, environmentally sustainable, and highly climate resilient. However, there are barriers to this change, such as:

a. **Lack of access to knowledge about best practices.** This is due to: (i) low national investment in innovation and research with a concentration on a handful of topics (50% of the efforts of the Institute of Agricultural Innovation of Panama (IDIAP) are concentrated on rice and corn (International Food Policy Research Institute (IFPRI), 2016)); and (ii) low coverage of the technical assistance system, which reaches less than 4% of farmers (INEC, 2011). This is due to, among other factors, the top-down and face-to-face approach to technical assistance, which is less cost-effective than the peer-to-peer approach and the use of digital tools. Furthermore, a large part of the advisory support received by farmers is provided by technical specialists from companies trying to sell inputs.

b. **Liquidity constraints and model of access to credit.** Just 2.5% of farmers receive credit from the banking system (INEC, 2011; IMA, 2017), such that most farmers depend on inputs obtained in advance from companies that are paid from the harvest, promoting the continuity of conventional practices.

c. **Sector support policy.** The majority of support (86%) is provided in the form of market price protection mechanisms or subsidies linked to production volumes (rice, corn, and milk) or use of inputs (Chacón et al., 2019). International evidence suggests that this type of support has low social returns, disincentivizes private investment and innovation, and delays the adoption of efficient and/or sustainable technologies (Valdez, 2012; Institute of Research and Projections on the Natural Environment and Society (IARNA) and the Agronomy Faculty of the Universidad de San Carlos de Guatemala (FAUSAC), 2013; Jayne and Rashid, 2013; Cannock, 2012; Avila-Santamaria and Useche, 2016). It therefore threatens the shift toward more efficient, sustainable, and competitive models of production.

1.11 **Gender, youth, and diversity issues.** Panama's gender inequality index was 0.46 in 2018, ranking it 108th out of 162 countries (United Nations Development Programme (UNDP), 2019). Gender inequality is particularly severe in rural areas, where women's low levels of empowerment and participation in productive activities intensifies their economic dependence: 31.9% of women in rural areas have no income of their own, compared with 7.9% of men in rural areas and 22.5% of women in urban areas. Young people in rural areas face the highest levels of economic dependence, with 53.8% of young women and 24.7% of young men between ages 15 and 24 who live in rural areas lacking any income

of their own (UN Women, 2020). Difficulties accessing resources of their own are also particularly significant in the indigenous comarcas, where the majority of women report monthly incomes of their own of between US$2 and US$101 per month: 93% of Guna women, 86.4% of Emberá women, and 85.1% of Ngäbe women (UNDP, 2016). The sector also faces a challenge in terms of generational change, given the faster relative growth of the over-50s age group in rural than in urban areas (IDB, 2019). Moreover, the poverty rate among the indigenous population is double (82%) that of the rural population as a whole (40.8%) and four times the rate for the entire country (20.7%). Meanwhile, most employment in the indigenous comarcas is in the agricultural sector: 81.4% in the Ngäbe-Bugle comarca, 66.8% in Emberá Wounaan, and 51.8% in Guna Yala (UNDP, 2016). The gap in stunting rates between the less developed and more developed parts of Panama is the widest in the region. While 57% of children in Guna Yala and 64% of children in Ngäbe-Bugle suffer from chronic malnutrition, this is the case for only 13% of children in areas with average levels of development. Lack of income (monetary poverty) with which to access healthy foods is frequently cited as one of the most important factors in the existence of areas with high levels of malnutrition (FAO, 2020).

1.12 **Sector institutional structure, progress, and outstanding challenges.** The lead agency in the sector is the Ministry of Agricultural Development (MIDA). In addition to its sector policy formulation and coordination role, it has operational functions, such as supporting business and community organization and training, increasing the value-added of primary production, and promoting marketing channels to benefit the rural population. The sector's institutional structure also includes autonomous entities under reporting to the MIDA, such as the IDIAP, which is responsible for standard-setting, design, execution, and evaluation of agricultural research and innovation activities. Both the MIDA and the IDIAP face significant institutional challenges. The lack of relevant and reliable agricultural information affects decision-making, as well as monitoring and evaluation of policies and public investments. The development of the Agricultural Information and Management System of Panama (SIGAP)—a MIDA application managed by its information technology (IT) unit, which is responsible for the system and its operation, updating, and maintenance)—to provide a unified registry of all the country's producers, farms, and associated variables, is a big step forward. However, the SIGAP is still in the early stages of implementation. Paper-based management without adequate IT support also has a negative impact on the sector's efficiency and transparency (optional link 5). Since December 2020, the IDIAP has been governed by a new law[5] that, beyond research, lays out a holistic vision for agricultural innovation, establishing participatory methods with the full involvement of producers, and identifies food security, environmental sustainability, and climate resilience as priority issues. This poses institutional challenges in terms of how to fulfill this new mission. The proposed project will help the IDIAP address some of these institutional changes, for instance by implementing new participatory research instruments, encouraging the adoption of sustainable innovations, and measuring sustainability indicators.

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5 Legislative bill: 208, Law: 162.

1.13 **International evidence.** The proposed operation's design has been based on a broad range of empirical evidence, which is outlined below:

a. **Agroecological practices.** The project promotes the adoption of agroecological systems that utilize, maintain, and enhance biological and ecological agricultural production processes. These systems seek to increase agrobiodiversity, improve soil management, and reduce dependence on external inputs, particularly agrochemicals. The practices concerned include diversification of production, managing habitats for functional biodiversity, natural pest control, soil health management, efficient water use, biological nitrogen fixation, and nutrient recycling (HLPE, 2019). The scientific evidence shows that these agroecological practices: (i) foster biodiversity; (ii) increase agricultural productivity; (iii) improve the climate resilience of production; (iv) mitigate climate change by sequestering carbon in biomass and soils; (v) increase the resilience of crops to pests and diseases; and (vi) provide a wide range of key ecosystem services (Dainese et al., 2019; De Stefano and Jacobson, 2017; Leippert et al., 2020; Nicholls et al., 2017; Sinclair et al., 2019; Snapp et al., 2021; Tamburini et al., 2020).

b. **Incentives for the adoption of sustainable farming practices.** The Bank has financed more than 20 projects (optional link 11) supporting the adoption of environmentally and/or climate friendly technologies by providing incentives (in the form of vouchers), accumulating broad empirical evidence on the effectiveness of this new incentive model to foster changes in production practices while helping alleviate the problem of liquidity. In Bolivia, the impact evaluation of the "Direct Supports for the Creation of Rural Agrifoods Initiatives Project (CRIAR)" (loan 2223/BL-BO) demonstrated that access to agricultural technologies by means of vouchers increased the likelihood of beneficiary households being food secure by 32%. Specifically, beneficiary households had a lower probability of going without food for a whole day (10%), skipping a meal (14%), or having a diet with little variety (17%). These improvements were explained by increased access to foods (household incomes rose by 36%) and increased availability of foods (productivity rose by 92%) (Salazar et al., 2015). In the Dominican Republic, the results of the impact evaluation of the "Program in Support of Subsidies for Innovation in Agricultural Technology (PATCA)" (loan 2443/OC-DR) demonstrated that livestock producers who adopted pasture improvement technologies increased their income by 12%, and agricultural producers switched to higher value added crops (Aramburu et al., 2019). As regards food security, income, and climate resilience, similar positive results were found with the "Environmental Program for Disaster Risk and Climate Change Management (PAGRICC)" (loan 2415/BL-NI) (González and Le Pommellec, 2019) and the "Socioenvironmental and Forestry Development Program II" (POSAF II) (loan 1084/SF-NI) (De Los Santos-Montero and Bravo-Ureta, 2017). Additionally, after reviewing almost 18,000 studies on the impact of incentive-based interventions on the adoption of sustainable practices and their effect on the environment, economy, and productivity, Piñeiro et al. (2020) found that: (i) practices that generate short-term economic benefits have a higher rate of adoption than those aimed solely at providing an environmental service; and (ii) technical assistance and

extension services to promote sustainable practices are key conditions for success, as confirmed by Acevedo et al. (2020).

c. **Marketing and market access.** The Bank has financed several programs seeking to increase market access and the marketing of agricultural products by small-scale producers through cooperative arrangements and by financing business plans. In the case of Honduras, the impact evaluation of the "Rural Business Development Program" (PRONEGOCIOS) (loan 1919/BL-HO) showed evidence of increased annual income for producers of US$662 per beneficiary producer, generated by the development and implementation of sustainable business plans through eligible producer associations (Bravo-Ureta, 2015). Similarly, an impact evaluation of the "Support Program for Small Producers of the Wine Industry in Argentina (PROVIAR)," which financed the promotion of cooperative arrangements and the implementation of business plans for small-scale producers of grapes in Argentina, showed an increase in production of 9.4%. Additionally, a review of 239 studies in 24 countries concluded that services offered to improve producer cooperatives' coordination with markets (e.g., marketing, market information, transportation, storage, etc.) have a positive impact on incomes, yields, and product quality (Bizikova et al., 2020).

1.14 **Lessons learned.** The operation draws on the experience of Bank-financed projects to support the adoption of agricultural technologies that foster environmental sustainability and climate change resilience (see paragraph 1.13). The following table summarizes the lessons learned.

Table 3. Lessons learned

Lesson learned	Reflected in project design
1. Technical Assistance. Technology adoption requires physical assets and technical assistance. The latter is key and must be offered in a timely manner during the crop cycle and with the appropriate frequency.	The operation includes the provision of inputs and/or agroecological technologies, as well as individual technical assistance for at least two years. The technical assistance will be provided on a peer-to-peer basis (knowledge dialogue between outreach workers and producers) and utilizing digital tools.
2. Liquidity constraints. Liquidity constraints limit the adoption of technologies with environmental benefits that have a high initial cost and long payback period.	The operation will provide nonreimbursable financial support through vouchers exchangeable for agroecological technologies and inputs.
3. Transparency of the selection. Projects providing direct incentives to producers (i.e., vouchers) must have transparent and readily verifiable eligibility criteria for beneficiary selection and independent mechanisms for third-party oversight during implementation, to guarantee targeting of the beneficiary population (effectiveness) and to ensure transparency.	The project envisages clear criteria for innovation voucher beneficiary selection and a lottery-based allocation mechanism to ensure equal opportunities for participation when demand outstrips supply. These lotteries will be verified by the district agroecological innovation committee and by civil-law notaries. In the indigenous comarcas, the selection mechanisms have been adapted to maintain cultural customs.

Lesson learned	Reflected in project design
4. Cultural appropriateness and gender lens. To ensure broad participation by the target group, mass communication campaigns need to be conducted using appropriate language/dialects to avoid the exclusion of eligible beneficiaries. Strategies to ensure participation by women must also be included.	The project envisages mass communication campaigns in the project target areas, including the indigenous comarcas. Moreover, the implementation mechanisms have been designed and discussed with indigenous leaders in the target areas. In the case of households run by couples, the vouchers will be in the name of the man and woman heads of household so that women can also take part in the decision-making process and benefit from technical assistance.
5. Marketing. Programs that focus on improving farm profitability must also consider initiatives to increase market access for small-scale producers so they can complete the production and marketing cycle.	The operation will support the formulation and implementation of business plans to improve linkages between producers and higher-value markets. This will be achieved by providing management services and/or partial financing of business plans.
6. Incentivizing the involvement of small-scale producers. The evidence shows that the value and scope of the services/inputs provided by means of the vouchers must be designed to incentivize the involvement of small-scale producers and disincentivize the involvement of producers with larger amounts of land (medium- and large-scale producers).	The operation will finance vouchers that provide inputs/technologies for a value of US$3,500. This amount disincentivizes the involvement of medium- and large-scale producers, since the opportunity/transaction costs for them outweigh the benefits. The opposite is the case for small-scale producers.

1.15 **Knowledge.** Technical cooperation operations ATN/OC-17783-PN, “Diagnostic Assessment of Agricultural Innovation in Panama” (2019, US$200,000), and ATN/OC-18399-PN, “Formulation and Support for the Launch of the Sustainable and Inclusive Agricultural Innovation Project” (2020, US$300,000), both in execution, financed the studies used as inputs for the design of this operation.

1.16 **Coordination.** The project was prepared in close coordination with the FAO, the leading cooperation agency in family farming issues in Panama. The FAO’s Investment Center designed Component II and part of the project’s digital strategy. Consultations were also held with the UNDP, the National Department of Science, Technology and Innovation (SENACYT), and the project teams of the “Chi Nugüe Kwin” and “Cuencafé” projects (operations ATN/OC-16319-PN, 2017, and ATN/ME-14683-PN, 2014), to learn from their experience in Panama and hear their viewpoints. Lastly, all the proposals for digital transformation were developed in coordination with the Government Innovation Agency, the lead agency for digital government issues in Panama.

1.17 **Complementarity.** The project will pursue synergies with the operations in Table 4, all of which are now in execution. Coordination will occur as part of the initiative launched at the Bank's Country Office in Panama to address OVE's recommendations to find mechanisms for continuing and strengthening the comprehensive focus on rural and indigenous areas, which includes territorial mapping of interventions and intersector working groups.

Table 4. The project's complementarity with the Bank's portfolio in Panama

Loan	Name	Year of approval	Amount (US$)	Area of complementarity
ATN/JO-18345-PN	Post-COVID Economic Recovery Project for Indigenous Coffee Producers	2020	600,000	Similar objectives and two similar target areas
5251/OC-PN	Global Credit Program for Promoting the Sustainability and Economic Recovery of Panama	2021	150,000,000	Access financial resources for producer organizations/cooperatives
4689/OC-PN	Program to Support Productive Development through Human Capital in Panama	2018	20,000,000	Human capital building in the agricultural sector
3683/OC-PN	Panama Online Program	2016	22,000,000	Digitalization of the public administration and digital literacy of vulnerable populations
4790/OC-PN	Universal Energy Access Program	2019	90,000,000	Promoting the productive use of energy in the agrifood sector
3512/OC-PN	Social Inclusion and Development Program	2015	50,000,000	Links between comprehensive care in early childhood and gender issues (workload, ability to attend training, empowerment of rural women)
3615/OC-PN	Integrated Health Service Networks Strengthening Program	2015	140,000,000	Links between food security and health
4357/OC-PN	Program to Improve Efficiency and Quality in the Education Sector	2017	100,000,000	Buying food locally for school cafeterias

1.18 **Alignment with country priorities.** The proposal is aligned with: (i) the Government Strategic Plan 2019-2024 (agriculture and food security); (ii) the National Climate Change Plan for the Agricultural Sector 2018-2030 (sustainable and low greenhouse gas emissions production models); (iii) the Agricultural Sector Plan (innovation, technology, marketing, sustainability, resilience, and family farming); (iv) the National Food Security Plan 2017-2021, which aims to reduce the prevalence of undernourishment to below 5% by 2025 and meet the sustainable development goal of "Zero Hunger"; (v) the Comprehensive Development Plan for Indigenous Peoples (strengthening traditional production systems and promoting food sovereignty); (vi) the Family Farming Law, law 127 of 3 March 2020, defining and instituting measures for the promotion and development of family farming in Panama; and (vii) Law 144 making digital management obligatory at public institutions and establishing the Panamanian Strategic Digital Agenda. Lastly, the

proposal will help achieve the objectives of the "Plan Colmena," Panama Free from Poverty and Inequality.

1.19 **Strategic alignment.** The project is consistent with the second Update to the Institutional Strategy 2020-2023 (document AB-3190-2) and contributes to the Bank's Corporate Results Framework 2020-2023 (document GN-2727-12) through the development challenges of: (i) social inclusion and equality, as the beneficiaries will be farmers facing economic and food insecurity; (ii) productivity and innovation, as it fosters increased profitability of farms through productive innovation (technical assistance and innovation vouchers) and market innovation (formulation and implementation of business and market innovation plans (PNIMs)) and the digital transformation. It is aligned with the crosscutting themes of: (i) gender equity and diversity, by promoting the participation of women and indigenous peoples through differentiated interventions and by incorporating dedicated indicators; (ii) climate change and environmental sustainability, by promoting sustainable and resilient production; and (iii) institutional capacity and the rule of law, by supporting improvements in institutional management, training of civil servants, and by strengthening digital technology capabilities. It will contribute to Corporate Results Framework outcomes 2.9, "Micro, small, medium enterprises financed"; 2.11, "Farmers with improved access to agricultural services and investments"; 2.16, "Women beneficiaries of economic empowerment initiatives"; 2.20, "Beneficiaries of enhanced disaster and climate change resilience"; and 2.21, "Habitat that is sustainably managed using ecosystem-based approaches." The project is also aligned with the country development challenges of: (i) social and geographic inequality; (ii) water security/climate change; (iii) productivity/competitiveness; and (iv) institutional framework. The project is aligned with the IDB Group Country Strategy with Panama 2021-2024 (document GN-3055), specifically the strategic objectives of "Developing services for sustainable and inclusive growth of tourism and agriculture" and "Promoting the digital transformation of the public administration", by addressing the crosscutting themes of gender, diversity, environmental sustainability, and climate change. The operation is included in the 2021 Operational Program Report (document GN-3034). The project is consistent with the following sector framework documents: Agriculture (document GN-2709-10); Food Security (document GN-2825-8); Environment and Biodiversity (document GN-2827-8); and Climate Change (document GN-2835-8); as well as lines of action 3.7(ii), "Improving the capabilities of women and men to contribute to climate change adaptation and resilience, through the transfer of knowledge and technology" and 3.7(v), "Promoting equitable access of women farmers to extension services, climate-smart technologies, and land rights," identified in the Update to the Gender Action Plan for Operations 2020-2021 (document GN-2531-19). According to the multilateral development banks joint methodology for tracking climate finance, an estimated 61.84% of the funding will count as climate finance, given the investments in agroecological farming techniques (Component I), which help build resilience and reduce greenhouse gas emissions. These resources contribute to the IDB's climate finance target of 30% of the volume of annual approvals.

1.20 **Innovation.** The project has multiple innovative features in the Panamanian context, including: (i) the promotion of alternative production systems, based on

agroecological principles; (ii) inclusive marketing models that support sustainable production; (iii) agricultural incentives that foster innovation, in contrast to supports (traditional subsidies) that favor the status quo; (iv) participatory agricultural research models geared toward offering tangible solutions to farmers' problems; (v) supports for farmers that put them at the center of the decision-making process; and (vi) new methods and tools for multicriteria evaluation farm sustainability by means of student research work.

1.21 **Digital transformation** (optional link 5 and optional link 6). The project will support the digital transformation of the agricultural sector through: (i) the strengthening, development and implementation of information systems (including the SIGAP) and automated process management to ensure the sustainability of the project outcomes and increase management efficiency, quality, and transparency; (ii) the use of digital tools to improve coverage and quality of technical assistance to producers in remote areas (84% of producers use WhatsApp® to sell products, organize meetings, and exchange farming information, and 50% would like to receive technical and market information via this channel (Kremer, 2021)), and mobile infrared spectroscopy devices for fast, cost-effective soil analysis; and (iii) the use of digital tools to organize virtual business matchmaker events to facilitate the selling of family farm products.

1.22 **Gender, youth, and sociocultural adaptation** (optional link 8). The project envisages the development of specific technical assistance content and methods for women, young people, and indigenous peoples for more and better participation in production and organizational systems and commercial processes, including: minimum percentages for significant participation by women (in vouchers, business plans, rural business schools, formalization of producer organizations, etc.); workshops geared toward women's empowerment and the training needs they prioritize; forums for exchange of know-how among women. For young people, the project will seek to strengthen their participation and capabilities through school campaigns to promote biodiversity and agroecological systems; joint research with young people in the community; research opportunities for university students; training of young people in management, technology, and business through rural schools; internships with management service providers for the preparation of business and market innovation plans (PNIMs). For interventions in indigenous communities, mechanisms will be implemented during execution that respect indigenous cultures, forms of organization, and decision-making. Emphasis will also be put on promoting, preserving, and strengthening the traditional knowledge of indigenous women and men and the traditional agroecological systems of each indigenous people.

B. Objectives, components, and cost

1.23 **Objective.** The project's general objectives are to improve the food security and incomes of smallholder family farmers. The specific objectives are to: (i) increase profitability; (ii) improve resilience to shocks (climate, pests, diseases, and market shocks); and (iii) increase the environmental sustainability of these farms and ranches. To achieve these objectives, the project has been structured in three components.

1.24 **Component I. Sustainable productive innovation (IDB US$23.5 million; local counterpart US$2,896,200).** This component, which will be executed by the Institute of Agricultural Innovation of Panama (IDIAP), seeks to promote the adoption of agroecological farming systems through financing of the following activities:

a. **Farm plans**, which will guide the work of farmers implementing agroecological systems[6] on their properties. These plans will be formulated by agriculturalists hired by the project (outreach workers) by consensus with the farmers and validated by an area coordinator (a technical specialist assigned by the IDIAP).

b. **Agroecological innovation vouchers**, which, rather than being cash vouchers, can be exchanged for agroecological technologies and inputs such as: agricultural diversification, agroforestry and forest-pasture systems, rainwater harvesting, drip irrigation with solar pumps and low-pressure systems, biodigesters, mixed fodder banks, kitchen gardens, adaptation of livestock facilities, hedgerows to fence off water sources, and electric fences for livestock production, etc. These vouchers will be for a maximum amount of US$3,500 and may only be exchanged for inputs and/or technologies on a predefined list agreed upon by consensus between the farmer and an outreach worker based on the farm plan. Voucher beneficiaries will buy their chosen inputs/equipment directly from the supplier. If necessary, in areas with only limited supplier outlets, fairs can be organized to bring together voucher beneficiaries and suppliers to facilitate transactions. Suppliers of inputs/equipment[7] may participate in the project if: (i) they can provide evidence of their legal and tax status in the country; and (ii) they meet the technical and availability requirements of the project's authorized list of inputs and equipment. An alternative mechanism will be used in remote areas where suppliers of inputs do not operate (indigenous comarcas), consisting of public procurement of the inputs and the delivery of inputs and equipment on site. The vouchers will benefit approximately 5,000 family farmers; the be eligible, they must: (i) possess an identity document; (ii) guarantee their land tenure (i.e., deed, individual, collective, or community rights of possession, right of usufruct); (iii) be a smallholder family farmer (up to 30 hectares for arable farms and 50 hectares for ranches). Eligible producers will be selected by a random public lottery, except in the indigenous comarcas, where culturally appropriate selection mechanisms will be implemented, based on additional, acceptable criteria validated by the communities. Prior culturally appropriate communication campaigns (in terms of language and communication channel) will broadcast information about the opportunities offered by the project, the eligibility criteria, selection mechanisms, and grievance procedures. The vouchers will be issued in the name of the man

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6 These systems have features that make them more resilient to climate change and can also contribute to reducing greenhouse gas emissions.

7 A preliminary mapping (Kim and Kremer, 2021) was able to 110 suppliers in the targeted areas, but none in the comarcas.

and woman of the household, 25% are to be issued to women heads of household, and 30% to producers in indigenous communities.[8]

c. **Technical assistance with a gender lens and cultural relevance**, which will be provided by the outreach workers to the farmers receiving the agroecological innovation vouchers. The technical assistance, focused on agroecological practices, will last at least two or three years. Differentiated methodologies will be employed that reflect appropriate times of day for women, domestic responsibilities, childcare options, local languages, and other considerations.

d. **Participatory agroecological innovation farms (FIAPs)**, where farmers, outreach workers, project professional staff, and anyone else interested can learn about agricultural production using agroecological principles through the transfer of knowledge and technology. These FIAPs will also serve as demonstration farms, where nonbeneficiary producers are expected to learn about and institute agroecological practices. The project will finance a network of FIAPs with 30 farms distributed across all the prioritized districts. The owners of the FIAPs must meet the same criteria as voucher beneficiaries and will be selected by a committee of IDIAP staff and representatives of local communities, who will also take into account unobservable but essential variables for the success of the FIAPS, such as being recognized as a leader and change agent in their community.

e. **Agroecological research and innovation projects**, which will be financed with resources from a competitive fund open to groups of researchers attached to the IDIAP and national institutions. A total of 13 projects will be financed.

1.25 **Component II. Inclusive market innovation (IDB US$10 million; local counterpart US$873,900).** This component, which will be executed by the Ministry of Agricultural Development (MIDA), seeks to reduce post-harvest losses, increase the value-added of agricultural products, and/or improve family farmers' market access. The following activities will be financed:

a. Formulation of an estimated 200 business and market innovation plans (PNIMs) for family farming associations, cooperatives, and groups (known by their Spanish-language acronym as ACGAFs).[9] To participate, ACGAFs must have at least 10 members can take part (at least 75% being family farmers as defined by the Family Farming Law) and show evidence of having been in business at least for the past year. The PNIMs are intended to strengthen ACGAFs and the services offered to their members, such as: bulking, storage, processing, transportation, market intelligence, negotiations with new customers, compliance with formal requirements (legal registration and certificates), certifications (e.g., environmental, fair trade, etc.).

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[8] Reflecting their weight in the sector, since approximately 25% of the total producers in the target areas are women, and 30% are indigenous.

[9] A preliminary mapping (Kim and Kremer, 2021) was able to identify 450 ACGAFs in the targeted areas, 50% of which are active and generally participate in the production, marketing, transformation, and joint purchase of inputs, and credit.

b. Implementation of an estimated 100 PNIMs, which will be selected based on quality criteria set out in the project Operating Regulations, fostering the inclusion of women and young people, demonstrating a positive environmental impact and/or incorporating environmental innovations, such as the use of solar panels, reuse of waste, or circular economy. Only ACGAFs with their legal status in effect will be able to receive this financing. Eligible expenditures of PNIMs will include: managerial support and technical assistance, small capital works, goods, equipment, and machinery, training, costs of formalization, certifications, and registration, and all costs associated with implementation of the social and environmental management strategy, which will be a mandatory part of the PNIMs. Two windows have been established, according to the technical characteristics, scope, and complexity of each proposal and with different levels of counterpart contribution from the ACGAFs (Table 5).

Table 5. Levels of required counterpart contribution

Window	Amount (US$)	Minimum counterpart (portion to be contributed in cash may vary)
A	Up to 50,000	20% of total
B	From 50,000 to 150,000	35% of total

c. Training of an estimated 345 young people in rural businesses, so they can participate in PNIMs.

1.26 **Component III. Digital management of information and processes (IDB US$4.5 million; local counterpart US$900,000).** This component, which will be implemented jointly by the IDIAP and the MIDA, seeks to increase the two institutions' management capabilities, achieve the expected outcomes of Components I and II, and ensure their sustainability. The following will be financed: (i) development and implementation of IT systems and tools enabling the two institutions' operational and administrative processes to be streamlined; (ii) improvement of process digitalization, especially processes linked to the registration of family farmers and ACGAFs; (iii) capture and systematic documentation of information required for monitoring using the SIGAP, equipping it with capabilities for interoperability and geospatial information analysis; (iv) development of a mobile application to enable and audit the delivery of products purchased with agroecological innovation vouchers; (v) training on digital skills for the adoption and use of the information systems and information and communications technology tools developed; and (vi) computer hardware and services required for proper management of the implemented processes and information systems. Opportunities will be explored for coordinating this platform with the system for monitoring, reporting, and verifying Panama's Nationally Determined Contributions.

1.27 **Administration (IDB US$3 million; local counterpart US$931,460).** This item includes the cost of administration, monitoring, evaluation, and external audit of the project.

C. Key results indicators

1.28 The expected impacts of the project are an increase in the incomes and food security of family farmers. Improvements in households' food security will be obtained through an increase in incomes and an increase in production for own consumption (improving food access and availability). Agricultural income will be increased by increasing the value of production, increasing sales, and decreasing the cost of inputs. The project outcomes are related to improvements in profitability, environmental sustainability, and resilience. The principal indicators are listed in Table 6.

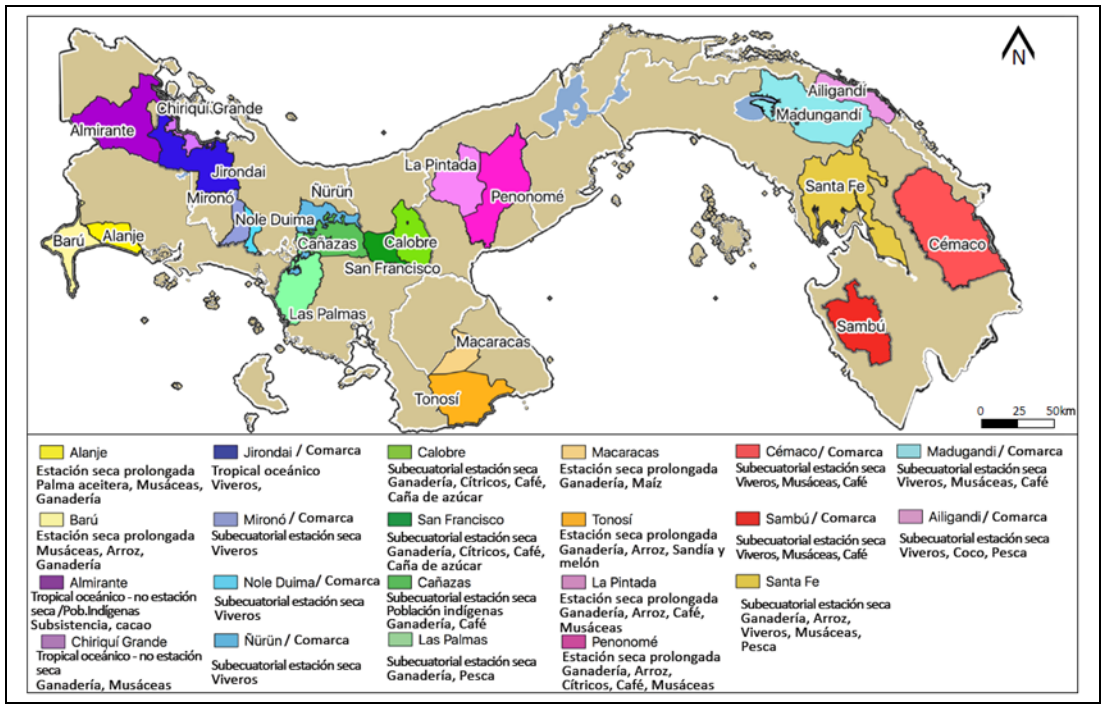
Table 6. Results Matrix principal indicators

Impact and outcome indicators	Time of measurement	Rationale for selection
1. Food security index (FAO)	Years 1 and 5	Measures vulnerability to food insecurity.
2. Net farming income (US$/household)	Years 1 and 5	Measures the impact on profitability of better prices, higher production, or lower costs.
3. Beneficiary farms that increase the value of their agricultural sales (%)	Years 1 and 5	Measures the effect on profitability.
4. Farms that increase their productive diversification (%)	Years 1 and 5	Measures the effect on resilience.
5. Farms that increase organic matter in the soil (%)	Years 1 and 5	Measures the effect on environmental sustainability.
6. Farmland freed for conservation or restoration activities (hectares)		
7. Women who increase their empowerment (%)	Years 1 and 5	Measures the impact on women's empowerment.

1.29 **Target areas.** The project target area (optional link 12) will consist of 21 districts, 13 of which have a significant indigenous population, including the indigenous comarcas of Ngäbe-Buglé, Guna Yala, Madugandí (Guna), and Emberá-Wounaan (Map 2). These areas were selected based on a score (optional link 13) that reflected the following criteria: (i) high levels of food insecurity; (ii) at least one small town or corregimiento[10] in the "Plan Colmena," Panama Free from Poverty and Inequality; (iii) proportion of extreme poverty; (iv) presence of small and medium-sized producers (0.5 to 50 hectares); (v) presence of family farmers; (vi) presence of women producers; (vii) presence of family farmer organizations and/or associations; (viii) agriculturalists available; (ix) road access; and (x) presence of watersheds with agricultural systems.

[10] Corregimientos are the smallest political/administrative division in Panama.

Map 2. Prioritized areas



Source: Kim, 2021.

1.30 **Beneficiaries.** The project beneficiaries are smallholder farmers and ranchers in the family farming segment. Component I is expected to benefit 6,800 producers (1,250 women and 1,500 indigenous people) directly and indirectly (through spillover effects), distributed as follows: 50% Type 1 farmers producing for their own consumption (0 to 2 hectares), 40% Type 2 farmers producing for their own consumption but with a small surplus for sale on markets (2 to 5 hectares), and 10% Type 3 farmers producing for their own consumption and selling the surplus on markets (5 to 50 hectares).[11] Component II will benefit approximately 4,000 family farmers in agricultural associations and 345 rural young people. Lastly, the investments under Component III will benefit the whole agricultural sector.

1.31 **Expected cobenefits.** In addition to the outcomes identified in the Results Matrix (Annex II), a series of additional benefits are expected that will be monitored during execution, including: (i) carbon sequestration in areas of new tree coverage and in the soil; (ii) increased availability of water resources for domestic and productive use; (iii) prevention of soil erosion, and pollution of soils and aquifers; (iv) conservation or restoration of biodiversity; (v) creation of rural jobs through implementation of the PNIMs; and (vi) more efficient public management and use of public resources. The relevant information is to be provided in the annual progress reports.

[11] Type 1, 2, and 3 farmers are defined by Law 127 of 2020, which establishes measures for the development of family farming in Panama.

D. Other key issues

1.32 **Economic evaluation.** The ex ante cost-benefit analysis used a horizon of 15 years and a discount rate of 12%. The costs included the loan investments, as well as additional recurrent costs of production, operation, and maintenance. The quantified differential benefits were: (i) the increase in income obtained from higher value-added, lower costs, and/or lower agricultural losses, including spillovers; (ii) the environmental benefits generated from increased carbon capture and increased water availability; and (iii) the benefits deriving from the investment in research and innovation. The results of the analysis, using efficiency prices and assuming an adoption rate of 75%, confirm that the project is viable in economic terms, with a net present value of US$24.5 million and an internal rate of return of 28.91% (optional link 2).

1.33 **Project sustainability.** The project was conceptualized in such a way as to maintain and potentially expand the outcomes beyond the implementation horizon. Key elements of the model include: (i) the FIAPs, which aim to be long-lasting and to play a demonstration role over the long term to promote the adoption of new practices by neighboring producers; (ii) the technical assistance provided to beneficiary producers over two to three years, under a methodology of "knowledge dialogue" between outreach workers and producers, to increase the likelihood of continued adoption of new practices; (iii) the implementation strategy for Component II, which envisages partnerships between ACGAFs and management service providers[12] (essentially private sector actors), which will be jointly responsible with the ACGAFs for the identification, formulation, and implementation of PNIMs;[13] (iv) training of young people, to address the challenge of generational change in the sector; and (v) anchoring of the project information system in the SIGAP, so that institutions do not lose the information generated during project implementation and can continue operating this information system to implement other similar projects.

II. Financing Structure and Main Risks

A. Financing instruments

2.1 The project has been structured as a specific investment loan, since the subprojects to be financed will have specific objectives, and their successful implementation depends on the project's indivisibility, i.e., that all the specified activities must be executed. The total cost is US$46,601,650. Of that amount, the IDB will finance US$41 million from the Ordinary Capital, and the local contribution will be US$5,601,650. Cofinancing resources will be sought from climate funds or other sources, to increase the impact of the intervention.

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[12] A preliminary mapping (Kim and Kremer, 2021) enabled the identification of over 50 potential management service providers nationally.

[13] Experience (PRONEGOCIOS) shows that these partnerships can persist over time, even after the end of the project.

Table 7. Estimated project costs (US$)

Components	IDB	Local	Total	%
Component I. Sustainable productive innovation	**23,500,000**	**2,896,200**	**26,396,200**	**56.64**
Participatory agroecological innovation farms (FIAPs)[14]	1,137,050	2,884,200	4,021,250	
Vouchers	17,600,000		17,600,000	
Technical assistance	4,142,950		4,142,950	
Research projects	620,000	12,000	632,000	
Component II. Inclusive market innovation	**10,000,000**	**873,900**	**10,873,900**	**23.33**
Formulation of business and market innovation plans (PNIMs)	3,402,202	873,900	4,276,102	
Implementation of PNIMs	6,241,750		6,241,750	
Business schools	356,048		356,048	
Component III. Digital management of information and processes	**4,500,000**	**900,000**	**5,400,000**	**11.59**
IDIAP digitalization	2,262,700		2,262,700	
MIDA digitalization	2,237,300	900,000	3,137,300	
Administration	**3,000,000**	**931,460**	**3,931,460**	**8.44**
Total	**41,000,000**	**5,601,560**	**46,601,560**	**100.00**

2.2 The project disbursement period will be five years, based on the operational experience from similar projects. Operation ATN/OC-18399-PN (see paragraph 1.15) includes a project launch support component that will finance experts in project management and the application of IDB policies and tools, who will support the executing agencies during the first year following approval, to streamline eligibility, prepare priority bidding packages, and accelerate the learning curve of the executing agencies. Table 8 provides the disbursement schedule.

Table 8. Estimated project disbursements (US$000s)

Source	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IDB	2,730.00	11,592.00	13,240.00	9,650.00	3,788.00	41,000.00
Local	1,910.00	905.00	937.00	9,650.00	919.56	5,601.56
Total	4,640.00	12,497.00	14,177.00	10,580.00	4,707.56	46,601.56
(%)	10%	27%	30%	23%	10%	100%

B. Environmental and social safeguard risks

2.3 The operation is classified as category “B” with a substantial environmental and social risk and moderate disaster risk, due to the fact that the main environmental

[14] The breakdown by output is indicative.

and social impacts relate to agricultural activities and the culturally appropriate management of natural resources in ten provinces and four indigenous comarcas. A Strategic Environmental and Social Analysis was prepared (optional link 14), along with a Strategic Environmental and Social Management Plan and Sociocultural Impact Evaluation with its Indigenous Peoples Action Plan, which included a qualitative analysis of the disaster risk corresponding to Step 3 of the Disaster and Climate Change Risk Assessment Methodology for IDB Projects, exclusion and eligibility criteria, identification and analysis of socioenvironmental risks, management and monitoring of individual projects. No resettlement, displacement, or purchase of land is required, and no significant impact is foreseen on critical natural habitats. Most of the environmental impacts can be avoided with measures designed in a culturally appropriate way, incorporated into the project activities with a high degree of flexibility, to meet the needs of indigenous peoples. The risks of indirect or cumulative impacts of deforestation or intensive use of soil, water resources, flora, and fauna can be managed and avoided by proper monitoring of the executing agencies. A gender sensitive and socioculturally appropriate public consultation was conducted with a focus on good faith negotiations with the authorities and indigenous communities, using innovative online methodologies to avoid COVID-19 infection. At events held virtually (focus groups) and face-to-face (at the request of comarca authorities) with stakeholders from all 21 selected districts, regional agriculture specialists from the Institute of Agricultural Innovation of Panama (IDIAP), the Ministry of Agricultural Development (MIDA), and/or the indigenous comarcas served as leaders and facilitators to obtain meaningful and representative feedback for the design of the program, mitigation measures, and cultural relevance adjustments. The good faith negotiation process with indigenous peoples began with the identification mission, to ensure the participatory design of the project. It included presentation of the project to the Office of the Deputy Minister of Indigenous Affairs, dialogues on the selection of target areas (at the district level) with representatives of the authorities of the Ngäbe Buglé, Guna, Madugandí, and Emberá Wounaan Congresses, and an Intercultural dialogue event with indigenous comarca representatives, agricultural specialists, and representatives of organizations of women producers, to obtain feedback for cultural relevance adjustments. The comarca authorities confirmed their support for the project and its communication and stakeholder integration strategy. The suggestions of the consultation participants (regarding communication and consultation at the community level, empowerment of women and youth, and other issues) were incorporated into the environmental and social management plans. The consultation report was published with the final socioenvironmental studies on the IDB website.

C. Fiduciary risks

2.4 A medium fiduciary risk was identified in relation to fiduciary management capacity (procurement, finance, and accounting), associated with the lack of experience applying Bank policies and procedures. To mitigate this risk, the project Operating Regulations will stipulate the creation of management and fiduciary teams with the required qualifications and dedication to project execution, as well as the mechanisms to ensure validation by the authorities of the priorities to be achieved during project execution and coordination among the

offices involved and the IDIAP financial and administrative management unit and the MIDA, to ensure timely management. The Bank will also provide advisory support on compliance with, and application of, the procurement and financial management policies.

D. Other risks

2.5 **Development risks.** The ICAP institutional capacity analysis of the IDIAP and the MIDA revealed a lack of experience in project execution under Bank policies, since their experience has been limited to government-financed projects or small, externally financed projects run under government policies. Shortcomings were also detected in environmental and social management areas; governance for project execution; and knowledge of the earned value management methodology. Moreover, as part of project preparation, systematization studies and analysis of operational lessons learned were conducted on: (i) different incentive management mechanisms (optional link 15) implemented in a selection of Bank-financed projects in the region, and their respective conditions for success; and (ii) different implementation mechanisms for IDB loans in Panama (optional link 16), with their corresponding performance. This all made it possible to identify a medium-high risk of implementation delays associated both with the limited capacity of the two executing agencies to perform key operational and technical processes required by the project, and with the general legal and institutional context in Panama. To mitigate this risk, execution arrangements were designed that include a service provider to perform the following functions: (a) support the executing agencies in management tasks; and (b) outsource execution of complex activities (under the supervision of the executing agencies). Other medium-high risks include: (i) lack of information and accountability reporting capacity, which will be mitigated by establishing a robust information system; (ii) execution delays, associated with: (a) possible delays in the contracting of key services such as the service provider or the information system; to mitigate this risk, progress will be made on the prior stages of contracting with the Bank's support in parallel with the fulfillment of the eligibility conditions; and (b) insufficient budget allocations to execute the project in accordance with the timeline; this risk will be mitigated by taking the relevant steps with the Ministry of Economy and Finance (MEF) to ensure that the budget allocation meets the requirements; (iii) failure to allocate counterpart resources, potentially limiting effective supervision and monitoring by the executing agencies; this risk will be mitigated by taking the relevant steps with the MEF to ensure that the counterpart budget allocation meets the project requirements; and (iv) capture of project benefits by beneficiaries with high socioeconomic or political power; this will be mitigated by applying strict eligibility criteria to obtain innovation vouchers or PNIM financing resources, and the application of random selection methods (lotteries) to select beneficiaries from among the eligible actors.[15]

[15] With the exception of indigenous comarcas, where selection processes will be based on their customs and cultural features.

III. Implementation and Management Plan

A. Summary of implementation arrangements

3.1 The borrower will be the Republic of Panama. The executing agencies will be the Institute of Agricultural Innovation of Panama (IDIAP), which will be responsible for the execution of Component I, and the Ministry of Agricultural Development (MIDA), which will be responsible for the execution of Component II. The IDIAP and the MIDA will share responsibility for execution of Component III. Under this arrangement, each executing agency will have sole responsibility for the management of the resources of the components corresponding to it.[16]

3.2 The first disbursement of the loan proceeds will be contingent on meeting the following conditions to the Bank's satisfaction. **As a special contractual condition precedent to the first disbursement, an interagency agreement will have been signed by and among the Ministry of Economy and Finance (MEF), representing the borrower, the IDIAP, and the MIDA establishing the responsibilities of each entity in project execution and financial management of the resources.**

3.3 The loan will be executed through independent project coordination units (PCUs), reporting, respectively, to the senior management of the IDIAP and the maximum institutional authority of the MIDA. The PCUs will include the local counterpart resources for each fiscal year in their budgets. Each PCU will be responsible for planning, financial and procurement management, and monitoring and evaluation activities. **As a special contractual condition precedent to the first disbursement, the two project coordination units will have been created, and their key personnel appointed** (project coordinators and specialists in procurement, finance, planning/monitoring, and socioenvironmental management) in accordance with the requisite qualifications to perform the functions established in the project Operating Regulations.

3.4 The PCUs will engage a service provider with responsibility for: (i) technical assistance for the executing agencies to prepare and update the project management instruments and support for procurement management, the administration of goods and services contracts, and the project's financial management; (ii) delegated execution, under the technical supervision of the IDIAP, of the voucher program (including payment of vouchers) and of the technical assistance for producers; and (iii) delegated execution, under the technical supervision of the MIDA, of the entirety of Component II (including payment of the costs of implementing the business and market innovation plans (PNIMs)). The service provider will be financed with the loan proceeds. As a special contractual condition for execution, prior to the disbursement of the loan proceeds for: (i) output 1.2 (innovation vouchers) of Component I; and (ii) Component II, the borrower, acting through the executing agency, will have submitted evidence that the service provider has been contracted on the terms agreed upon with the Bank.

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[16] Component III includes two outputs, each with its own budget and under the responsibility of the IDIAP and the MIDA, respectively.

3.5 A sector coordination unit will be created that meets at least four times a year. Its tasks will include monitoring compliance with the project timeline and allocation of the local contribution by the MEF, as well as approval of status reports prior to delivery to the Bank. The sector coordination unit will be made up of high-level staff from the MIDA and the IDIAP, as well as from Panama's National Family Farming Dialogue Committee (CONADAF), which is responsible for representing family farming groups at the national, provincial, and comarca levels and the level of collectively held lands, in general, and for dialogue with public institutions in the agriculture sector, in particular.

3.6 **Project Operating Regulations.** The project Operating Regulations (optional link 9) address all aspects of loan execution, including: (i) the organizational arrangements, including details of the functions of the PCUs and the service provider; (ii) technical and operational arrangements for execution and, in particular, details of the management of the agroecological innovation vouchers and the formulation and implementation of the PNIMs; (iii) the environmental and social commitments described in Annex B of the environmental and social management report (ESMR); (iv) the arrangements for programming, monitoring, and evaluating results; and (v) the guidelines for financial and procurement management and for audits. **As a special contractual condition precedent to the first disbursement of the loan proceeds, the project Operating Regulations will have been approved and will have entered into force on the terms agreed upon with the Bank, including, among others, the environmental and social commitments described in Annex B, Section C, of the ESMR (required link 3).**

3.7 **Procurement.** Procurements will be conducted in accordance with the Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank (document GN-2349-15) and the Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank (document GN-2350-15). Annex III presents the general framework for procurement management. Procurement supervision by the Bank will be as established in the Procurement Plan (required link 4).

B. Summary of arrangements for monitoring results

3.8 The project has a monitoring and evaluation plan (required link 2) that specifies the measurement of indicators, the impact evaluation methodology for the various components, data requirements (baseline and monitoring survey), the parties responsible, and the estimated budget for implementation of the activities. The impact evaluation will focus on evaluating the effectiveness of Components I and II. Component I will be evaluated using an experimental methodology (randomized control trial), whereas Component II will be evaluated using a quasi-experimental methodology. This evaluation will be financed with loan resources in the amount of US$400,000.

3.9 **Monitoring.** The IDIAP and the MIDA will deliver a report on the progress of the activities in their respective components to the Bank, no later than 60 days after the end of each six-month period of each year during execution. These reports will include information on: (i) technical and financial targets met, explanations of deviations and corrective measures; (ii) compliance by producers, suppliers of inputs, family farming associations, cooperatives, and groups (known as

ACGAFs), and management service providers with the terms established in the agreements/contracts signed with the project (oversight by outreach workers, the PCU teams, staff of the IDIAP offices and the UFRs, as applicable, with information duly recorded on the information system); and (iii) progress on results, including those mentioned in paragraph 1.31. Reports for the second six-month period will include the annual work plan for the following calendar year with updated disbursement, procurement, and risk management plans.

3.10 **Evaluation.** The IDIAP and the MIDA will deliver a midterm evaluation report to the Bank within 90 days after the date on which 50% of the loan proceeds have been committed, or 50% of the execution period has elapsed, whichever occurs first, and the project completion report within 90 days after the date on which 90% of the loan proceeds have been disbursed. The final evaluation report will include the results of the project impact evaluation.

Development Effectiveness Matrix		
Summary	PN-L1166	
I. Corporate and Country Priorities		
Section 1. IDB Group Strategic Priorities and CRF Indicators		
Development Challenges & Cross-cutting Issues	-Social Inclusion and Equality -Productivity and Innovation -Gender Equality and Diversity -Climate Change -Institutional Capacity and the Rule of Law	
CRF Level 2 Indicators: IDB Group Contributions to Development Results	-Micro / small / medium enterprises financed (#) -Farmers with improved access to agricultural services and investments (#) -Women beneficiaries of economic empowerment initiatives (#) -Beneficiaries of enhanced disaster and climate change resilience (#) -Habitat that is sustainably managed applying ecosystem-based approaches (ha)	
2. Country Development Objectives		
Country Strategy Results Matrix	GN-3055	i) Develop services for the sustainable and inclusive growth of tourism and agriculture; and ii) Promote the digital transformation of public administration.
Country Program Results Matrix	GN-3034	The intervention is included in the 2020 Operational Program.
Relevance of this project to country development challenges (If not aligned to country strategy or country program)		
II. Development Outcomes - Evaluability		Evaluable
3. Evidence-based Assessment & Solution	9.7	
3.1 Program Diagnosis	2.5	
3.2 Proposed Interventions or Solutions	3.5	
3.3 Results Matrix Quality	3.7	
4. Ex ante Economic Analysis	10.0	
4.1 Program has an ERR/NPV, or key outcomes identified for CEA	1.5	
4.2 Identified and Quantified Benefits and Costs	3.0	
4.3 Reasonable Assumptions	2.5	
4.4 Sensitivity Analysis	2.0	
4.5 Consistency with results matrix	1.0	
5. Monitoring and Evaluation	9.5	
5.1 Monitoring Mechanisms	4.0	
5.2 Evaluation Plan	5.5	
III. Risks & Mitigation Monitoring Matrix		
Overall risks rate = magnitude of risks*likelihood	Medium High	
Environmental & social risk classification	B	
IV. IDB´s Role - Additionality		
The project relies on the use of country systems		
Fiduciary (VPC/FMP Criteria)		
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:		
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		

Evaluability Assessment Note: The objective of this operation is to improve food security and income of small family farmers. The operation has three specific objectives: (i) to increase the profitability of the farms; (ii) to improve the resilience of the farms to shocks (weather, pests and diseases, and the market); and (iii) to improve environmental sustainability of agricultural activity on these farms.

The diagnostic provides evidence of the main problems faced by smallholder farmers in Panama, namely poverty and food insecurity and clearly identifies their causes in low profitability, low environmental sustainability, and low climate resilience.

The proposed interventions are clearly linked to the diagnostic and the vertical logic is clear. The result matrix is well structured and the proposed indicators are generally SMART, although in a few cases they could benefit from additional baseline information as their measurement relies completely on the proposed impact evaluation.

The economic analysis is based on well documented cost-benefit analysis.

The data collection process outlined in the M&E plan is ambitious. It can potentially generate very good information on the effectiveness of the proposed interventions. However, power calculations are incomplete and make it impossible to determine whether there will be enough statistical power to answer all the evaluation questions proposed

RESULTS MATRIX

(See extended matrix)

Project objective:	The project's general objectives are to improve the food security and incomes of smallholder family farmers. The specific objectives are to: (i) increase profitability; (ii) improve resilience to shocks (climate, pests, diseases, and market shocks); and (iii) increase the environmental sustainability of these farms and ranches.

GENERAL DEVELOPMENT OBJECTIVES

Indicators	Unit of measure	Baseline value	Baseline year	Expected year of achieve-ment	Target	Means of verification	Comments
General development objective (GDO): Increase agricultural incomes and food security of beneficiary farmers' households							
GDO-1 indicator Net household farming income (annual)	US$	2,814	2021	2026	3,696	Project impact evaluation	Proxy: Value of total household production, including production for own consumption and subproducts. This indicator will be surveyed to obtain information enabling a disaggregated analysis by gender and diversity (***DPGyD**). **Baseline sources:** ▪ MIDA, 2021. Excel spreadsheet of agricultural costs and yields. **Target sources:** ▪ Gonzalez-Flores and Le Pommellec (2019) (31% increase)
GDO-1.1D indicator Farming incomes of households in indigenous communes	US$	1,629	2013	2026	2,711	Project impact evaluation	**Baseline and target sources:** Torres-Vargas, Santamaría, Santos, Salmerón, and Montezuma (2020) (Before the start of project activities, a baseline survey will be done to update the data.) ***Diversity Flag***
GDO-2 indicator Households facing food insecurity (FAO Food Insecurity Experience Scale)	%	37	2020	2026	27	Project impact evaluation	***DPGyD** **Baseline:** Mesoamerica average based on FAO (2020) **Target:** National Food and Nutritional Security Plan 2017-2021, the country seeks to reduce prevalence from 7% to less than 5% (change -28%)

Indicators	Unit of measure	Baseline value	Baseline year	Expected year of achieve-ment	Target	Means of verification	Comments
GDO-3 indicator Women who increase their empowerment (Women's Empowerment in Agriculture Index)	%	0	2021	2026	15	Project impact evaluation	**Target:** Salazar et al. (2018). Indicator: Women's Empowerment in Agriculture Index.
CRF indicator 2.16 Women beneficiaries of economic empowerment initiatives	#	0	2021	2026	1,250	Project impact evaluation	▪ **CRF Flag (2.16)** ▪ **Gender Flag**

SPECIFIC DEVELOPMENT OBJECTIVES

Indicators	Unit of measure	Baseline value	Baseline year	Year 1	Year 2	Year 3	Year 4	Year 5	End of project	Means of verification	Comments
Specific development objective 1: Increase the farm profitability of family and other smallholder farmers											
Indicator 1.1 Value of agricultural sales.	%	20	2021						34	Project impact evaluation and "Plan Finca" [Farm Plan]	(Among the 2,000 producers participating in business and market innovation plan (PNIMs) that receive financing) **Baseline:** FAO Corporate Statistical Database (FAOSTAT) (2003) **Target:** Torres-Vargas, Santamaría, Santos, Salmerón, and Montezuma (2020) estimate an increase of 70%. ***DPGyD** **Target:** FAO (2021)
Indicator 1.2 Cost of synthetic chemical inputs at beneficiary farms.	% cost of agro-chemicals as a percentage of production value	46	2021						23	Project impact evaluation	**Baseline:** MIDA, 2021. Excel spreadsheet of agricultural costs and yields. **Target:** Center for Research on Sustainable Agricultural Production Systems (CIPAV) (2021) and economic evaluation.

Indicators	Unit of measure	Baseline value	Baseline year	Year 1	Year 2	Year 3	Year 4	Year 5	End of project	Means of verification	Comments
Indicator 1.3 Beneficiary farms adopting at least three additional new agroecological practices during an agricultural cycle.	%	0	2021			25			75	Project impact evaluation and "Plan Finca"	(Among the 5,000 voucher beneficiary producers) ***DPGyD** **Target:** IDB, 2015. Adoption rate of Technology Transfer to Small Farmers Program (PTTA) in Haiti (75%) Bentley, J., Boa, E., et al. (2011). How farmers benefit from plant clinics: an impact study in Bolivia (82%) Aramburu et al. (2019), Direct and Spillover Effects of Agricultural Technology Adoption Programs: Experimental Evidence from the Dominican Republic (64%)
Indicator 1.3.D Beneficiary farms in indigenous comarcas that adopt at least three additional new agroecological practices relating to their ancestral knowledge.	%	0	2021			25			75	Project impact evaluation and "Plan Finca"	
Indicator 1.4 Nonbeneficiary farms adopting at least two additional new agroecological practices during an agricultural cycle (spillover).	%	0	2021						27	Project impact evaluation / monitoring reports	**Target:** Santos-Montero, Bravo-Ureta (2017). Natural Resource Management and Household Well-being: The Case of POSAF-II in Nicaragua. Nonbeneficiary farms used to measure spillover effects will be within a geographic radius of action of 1-5 kilometers of the agroecological innovation farms (P1.1) (geographic spillovers) (see monitoring and evaluation plan).
Indicator 1.5 Postharvest agricultural losses.	% of production	30	2021						15	Project impact evaluation	**Baseline:** FAO (2021). Current situation and analysis of loss of agricultural products in Panama **Target:** FAO (2021) and economic evaluation.
Indicator 1.6 Beneficiary associations implementing their PNIMs to completion.	%	0	2021						95	Monitoring reports	Includes associations that have satisfactorily met the milestones of the business plan and received payment in full. **Target:** PCR, loan 1919/BL-HO (2016)

Indicators	Unit of measure	Baseline value	Baseline year	Year 1	Year 2	Year 3	Year 4	Year 5	End of project	Means of verification	Comments
Specific development objective 2: Improve farms' resilience to shocks											
Indicator 2.1 Beneficiary farms that increase their agricultural diversity with two or more additional crops.	%	0				25			80	Project impact evaluation and "Plan Finca"	***DPGyD** Source: Nicholls (2015), Agroecología y el diseño de sistemas agrícolas resilientes al cambio climático, Agroecología (10).
Indicator 2.2 Beneficiary producers who sell their production or by-products to/on at least one additional customer/market.	%	0				5			25	Project impact evaluation Monitoring reports	***DPGyD**
Indicator CRF 2.20 Beneficiaries of enhanced disaster and climate change resilience.	#	0				1,000			3,750	Monitoring reports and "Plan Finca"	▪ **CRF Flag**
Specific development objective 3: Improve the environmental sustainability of agricultural activity											
Indicator 3.1 Farmland freed up for conservation or restoration activities.	Ha	0	2021						478	Monitoring reports	Source: Center for Research on Sustainable Agricultural Production Systems – CIPAV (2021) **CRF Flag (2.21)**
Indicator 3.2 Beneficiary farms that increase the content of organic matter in the soil with respect to the "Plan Finca" value.	%	0	2021						40	Project impact evaluation	***DPGyD** Source: Nicholls et al. (2015)
Indicator 3.3 Beneficiary producers that adopt at least one additional new technology for sustainable water management and/or alternative energy generation.	#	0	2021			1,000			2,500	Monitoring reports and "Plan Finca"	***DPGyD** Source: CIPAV (2021), economic evaluation.

Country: Panama **Division:** CSD/RND **Operation No.:** PN-L1166 **Year:** 2021

FIDUCIARY AGREEMENTS AND REQUIREMENTS

Executing agencies: Ministry of Agricultural Development (MIDA) and the Institute of Agricultural Innovation of Panama (IDIAP)

Operation name: Sustainable and Inclusive Agricultural Innovation Project

I. FIDUCIARY CONTEXT OF THE EXECUTING AGENCIES

1. Use of country systems in the operation (any system or subsystem that is subsequently approved may be applicable to the operation, in accordance with the terms of its validation by the Bank).

☒ Budget	☒ Reports	☒ Information system	☐ National Competitive Bidding (NCB)
☒ Treasury	☐ Internal audit	☒ Shopping	☐ Others
☒ Accounting	☐ External control	☐ Individual consultants	☐ Others

2. Fiduciary execution mechanism

☐	Cofinancing	Not applicable.
☒	Coexecuting agencies / subexecuting agencies	The executing agencies will be the Institute of Agricultural Innovation of Panama (IDIAP), which will be responsible for the execution of Component I, and the Ministry of Agricultural Development (MIDA), which will be responsible for the execution of Component II. The IDIAP and the MIDA will share responsibility for execution of Component III. Under this arrangement, each executing agency will have sole responsibility for the management of the resources of the components corresponding to it.
☒	Specific features of fiduciary execution	The project coordination units (PCUs) will engage a service provider with responsibility for: (i) technical assistance for the executing agencies to prepare and update the project management instruments and support for procurement management, the administration of goods and services contracts, and the project's financial management; (ii) delegated execution, under the technical supervision of the IDIAP, of the voucher program (and of the technical assistance for producers; and (iii) delegated execution, under the technical supervision of the MIDA, of the entirety of Component II.

3. Fiduciary capacity

Fiduciary capacity of the executing agencies	The fiduciary capacity executing agencies has been evaluated as medium.

ICAP shortfalls/findings	Measures included in the project
Institution lacks experience of IDB policies/projects	Contracting of service provider to provide technical support on project management to the IDIAP and the MIDA and to directly execute some activities (outsourcing). Ongoing advisory services of the Bank on compliance with, and application of, procurement and financial management policies.
Lack of experience in environmental and social impact management	Environmental and social specialist included on the list of key service provider personnel; training of institutional staff on socioenvironmental management policies.
Lack of definition of governance system for execution of investment projects.	Project governance arrangements, matrix of responsibilities and roles, communications matrix, and optimized process flows to be included in project Operating Regulations.
Lack of knowledge of preparation of project status reports under the earned value management (EVM) methodology.	Specialist in project planning and monitoring with experience in the EVM methodology included in the list of key service provider personnel; training of institutional staff in the EVM methodology.
Lack of physical capabilities (equipment and fitting out of offices) for project management.	Counterpart resources assigned, and loan proceeds assigned under Component III for information technology.

4. Fiduciary risks and response to risk

Area (financial management/ procurement)	Risk	Level of risk	Risk response
Procurement and financial management	The executing agencies have fiduciary experience applying procedures under national legislation. However, they do not have experience applying the Bank's policies, which could impact operation execution.	Medium	The project Operating Regulations will stipulate the creation of management and fiduciary teams with the required qualifications and dedication to project execution, as well as the mechanisms to ensure validation by the authorities of the priorities to be achieved during project execution and coordination among the offices involved and the IDIAP financial and administrative management unit and the MIDA, to ensure timely management. The Bank will provide advisory support on compliance with, and application of, the procurement and financial management policies.

5. Policies and guidelines applicable to the operation: documents GN-2349-15; GN-2350-15, and GN-2811 [OP-273-12].

6. Exceptions to policies and guidelines: None.

II. CONSIDERATIONS FOR THE SPECIAL PROVISIONS OF THE LOAN CONTRACT

Special conditions precedent to the first disbursement: No conditions of a fiduciary nature.

III. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

☒	Bidding documents	For procurement of works, goods and nonconsulting services subject to international competitive bidding executed in accordance with the Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank (document GN-2349-15), the Bank's standard bidding documents will be used, or those agreed upon by the Bank and the executing agency for the specific procurement. Consultants will be selected and contracted in accordance with the Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank (document GN-2350-15) and the standard request for proposals issued by the Bank or agreed upon by the Bank and the executing agency for the specific selection will be used. The project's sector specialist is responsible for reviewing the technical specifications and terms of reference of procurement during preparation of the selection processes. This technical review may be ex ante and is independent of the procurement review method.
☐	Use of country systems	Not applicable.
☐	Alternative procurement arrangements	Not applicable.
☐	Additional procurement support	Not applicable.
☐	Direct contracting and selection	Not applicable.
☐	Training	Not applicable.
☐	Recurring expenditures	Not applicable.
☐	Projects with financial intermediaries	Not applicable.
☐	Advance procurement/ retroactive financing	Not applicable.
☐	Special procurement provisions applicable to the operation	Not applicable.

<table>
<tr><td>☒</td><td>Procurement supervision</td><td>Procurement will be subject to ex post supervision, except where ex ante supervision is justified. The (i) ex ante or (ii) ex post supervision method will be determined for each selection process in the procurement plan. Ex post reviews will be conducted at least once every 12 months, in accordance with the project supervision plan, subject to changes during execution. The ex post review reports will include at least one physical inspection visit, selected from the procurement processes subject to ex post review. The thresholds (in US$) for ex post review are as follows:
<table>
<tr><th>Works</th><th>Goods/services</th><th>Consulting services</th></tr>
<tr><td>250,000</td><td>50,000</td><td>Not applicable</td></tr>
</table></td></tr>
<tr><td>☒</td><td>Records and files</td><td>The IDIAP has digital and physical files, as well as procedures and instructions for keeping effective records and files.</td></tr>
</table>

Main procurements

Description of procurement	Selection method	New procedures/ tools	Estimated date	Estimated amount (US$000s)
Goods				
Procurement of equipment and inputs for farm development	International competitive bidding (ICB)	None	January 2022	469.1
Procurement of computer hardware	ICB	None	January 2022	791.0
Nonconsulting services				
Production of dissemination materials for gender focus actions	Shopping	None	January 2023	12
Contracting of unified threat management firewall, navigation control, and Wi-Fi service for research centers	Shopping	None	January 2023	80
Contracting of Wi-Fi service at agencies	Shopping	None	January 2023	12
Works				
Cable-fitting at the three research centers	Shopping	None	January 2023	60

Description of procurement	Selection method	New procedures/ tools	Estimated date	Estimated amount (US$000s)
Firms				
Consulting services for the design and implementation of the IDIAP and MIDA digitalized process and information management system	Quality- and cost-based selection (QCBS)	None	January 2022	3,218.0
Consulting services for the formulation and financing of business and market innovation plans (PNIMs)	Quality- and cost-based selection (QCBS)	None	January 2023	3,757.2
Individuals				
Consulting services for the preparation of the guarantee framework and improvement of project monitoring data quality	3 CVs	None	January 2022	20
Consulting services for the preparation of the process improvement and automation plan (including process documentation)	3 CVs	None	January 2022	30
Consulting services to evaluate project intermediation	3 CVs	None	January 2024	50
Consulting services for the final project evaluation	3 CVs	None	February 2026	50

See 18-month procurement plan.

Procedures	Justification of use
Leasing and second-hand goods	Not applicable
Innovation partnership	Not applicable
Competitive dialogue	Not applicable
Electronic reverse auctions	Not applicable

Other relevant information for the operation (BI).

IV. AGREEMENTS AND REQUIREMENTS FOR FINANCIAL MANAGEMENT

☒	Programming and budget	▪ The IDIAP must include the funds necessary for project execution within the amount stated in its preliminary plan and submit it to the Ministry of Economy and Finance (MEF) before 30 April each year. The MEF formulates and oversees the budget and must submit a proposal, and any increment thereto, to the National Assembly, as the body responsible for its approval, before 31 July of each fiscal year. The budget is annual and includes all public sector investments, income and expenditures. The project's inclusion in the national project bank, the creation of the SINIP codes, and the obtaining of a favorable opinion from the MEF's Investment Programming Division is being processed so that the project can be included in the budget act for the 2021 fiscal year.
☒	Treasury and disbursement management	▪ The effective exchange rate on the date of payment of the expense in the local currency of the borrower's country will be used. ▪ Disbursements will be made in the form of advances of funds and reimbursements. ▪ The disbursement mechanism will take the form of the submission of physical disbursement requests. During the COVID-19 health emergency, disbursement request forms may be submitted signed and scanned via email. They must be sent from an institutional email address, and each signatory must authorize the request by email. ▪ Bank account: the IDIAP and the MIDA must open subaccounts in the Treasury Single Account, with the prior approval of the MEF. ▪ Financial plan: advances will be made for a period of up to six months, depending on the demand for loans. ▪ Percentage for accountability reporting: 80% of advances pending justification. An expenditure will be considered eligible when the executing agency delivers the funds to the first tier financial institutions. Information on the final beneficiaries for the purposes of the project completion report will be received ex post. ▪ The disbursement mechanism will be manual. ▪ The currency in which the operation will be managed is the United States dollar, which is at parity with the Balboa. ▪ The operation will generally work with a financial period of 180 days. ▪ It is envisaged that the operation will justify 80% of cumulative balances pending justification.
☒	Accounting, information systems and reporting	▪ Specific accounting standards: The financial statements are prepared in accordance with International Financial Reporting Standards (IFRS). Among others, these include IFRS 9 15, and 16. ▪ Accountability reporting: Cash flow statement, statement of disbursements, statement of cumulative investments. ▪ Accounting method and currency: A combination of accounting methods will be used depending on the item recognized. The accounting currency is the balboa, which is equivalent to the U.S. dollar and freely convertible with it. ▪ The operation's accounting records will use the country's ISTMO accounting system. ▪ To supplement the policies and guidelines applicable to the operation, the project Operating Regulations will be used, with the documented definition of workflows and internal controls.

☒	Internal control and internal audit	▪ With the agreement of the Bank, the executing agency will select and contract the services of an eligible auditor, in accordance with the terms of reference agreed upon in advance. ▪ The IDIAP has an internal audit unit under the regulatory framework of the Comptroller General of the Republic of Panama (CGR) on governmental internal control.
☒	External control and financial reports	▪ The executing agency will select and contract external audit services based on terms of reference agreed upon in advance between the borrower and/or the executing agency and the Bank. These terms of reference will establish the type of review, timing, and scope. ▪ The selected external auditor and the applicable audit standards will be acceptable to the Bank. ▪ Type of audit: Project audited financial statements: Throughout the original loan disbursement period and any extension thereof, the executing agency will deliver to the Bank the project's annual financial statements, audited by an independent audit firm acceptable to the Bank, within 120 days after the end of the fiscal year and within 120 days after the last disbursement of the loan.
☒	Financial supervision of the operation	▪ Financial supervision will be conducted by means of visits to execution unit work meetings, and review of reports, including the audited financial reports.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-__/21

Panama. Loan ____/OC-PN to the Republic of Panama
Sustainable and Inclusive Agricultural Innovation Project

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the Republic of Panama, as Borrower, for the purpose of granting it a financing to cooperate in the execution of the Sustainable and Inclusive Agricultural Innovation Project. Such financing will be for the amount of up to US$41,000,000 from the resources of the Bank's Ordinary Capital and will be subject to the Financial Terms and Conditions and the Special Contractual Conditions of the Project Summary of the Loan Proposal.

(Adopted on __ _____ 2021)

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