

SIMULTANEOUS DISCLOSURE

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

## **DOMINICAN REPUBLIC**

### **AGRICULTURAL RESEARCH AND DEVELOPMENT PROGRAM**

**(DR-L1054)**

### **LOAN PROPOSAL**

This document was prepared by the project team consisting of César Falconi (INE/RND) and Alvaro Garcia (RND/CDR), Project Team Co-leaders; Luis Macagno (RND/CUR); Pedro Martel (RND/CGU); Conner Mullally (SPD/SDV); Juan Carlos Perez-Segnini (LEG/SGO); Carolina Escudero (FMP/CDR), Christian Contin (FMP/CDR); and Rosario Gaggero (INE/RND).

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ELECTRONIC LINKS	
<b>REQUIRED</b>	
1.	Annual work plan <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947440">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947440</a>
2.	Monitoring and evaluation plan <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947430">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947430</a>
3.	Procurement plan <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36955568">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36955568</a>
4.	Environmental and Social Management Report (ESMR) <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947436">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947436</a>
<b>OPTIONAL</b>	
1.	Documents for program technical support <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36939560">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36939560</a>
2.	Economic assessment <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947431">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947431</a>
3.	Institutional capacity assessment <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36939929">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36939929</a>
4.	Environmental and Social Management Plan (ESMP) <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947435">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947435</a>
5.	Draft Program Operations Manual <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947432">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36947432</a>
6.	Itemized budget <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36939935">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36939935</a>
7.	Preliminary Progress Monitoring Report <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36957054">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36957054</a>
8.	Safeguard Policy Filter (SPF) and Safeguard Screening Form for Classification of Projects (SSF) <a href="http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36950519">http://idbdocs.iadb.org/wsdocs/getDocument.aspx?DOCNUM=36950519</a>

## ABBREVIATIONS

CONIAF	Consejo Nacional de Investigaciones Agropecuarias y Forestales [National Council for Agricultural and Forestry Research]
EIRR	Economic internal rate of return
ESMP	Environmental and Social Management Plan
ESMR	Environmental and Social Management Report
GCI-9	Ninth General Increase in the Resources of the Bank
ICAS	Institutional Capacity Assessment System
IDIAF	Instituto Dominicano de Investigaciones Agropecuarias y Forestales [Dominican Institute for Agricultural and Forestry Research]
LIBOR	London Interbank Offered Rate
OEP	Oficina Ejecutora de Proyectos [Project Execution Office]
PATCA	Proyecto de Apoyo a la Transición Competitiva Agroalimentaria [Program of Support for the Transition to Competitive Agriculture]
RTTP	Research and technology transfer project
SINIAF	Sistema Nacional de Investigaciones Agropecuarias y Forestales [National Agricultural and Forestry Research System]
TPP	Technological product project
WAL	Weighted average life

## PROJECT SUMMARY

### DOMINICAN REPUBLIC AGRICULTURAL RESEARCH AND DEVELOPMENT PROGRAM (DR-L1054)

Financial Terms and Conditions					
<b>Borrower:</b> Dominican Republic  <b>Executing agency:</b> The borrower, acting through the Ministry of Agriculture			<b>Flexible Financing Facility*</b>		
			<b>Amortization period:</b>		24.0 years
			<b>Original WAL:</b>		15.25 years
			<b>Disbursement period:</b>		6.0 years
			<b>Grace period:</b>		6.5 years
<b>Source</b>	<b>Amount</b>	<b>Interest rate:</b>		LIBOR-based	
<b>IDB (Ordinary Capital)</b>	US\$22,000,000	<b>Inspection and supervision fee:</b>		**	
<b>Local</b>	US\$2,000,000	<b>Credit fee:</b>		**	
<b>Total</b>	US\$24,000,000	<b>Currency:</b>		U.S. dollars from the Bank’s Ordinary Capital	
Project at a Glance					
<b>Program objective:</b> To help boost the productivity of the agricultural sector by building the country’s capacity to generate and transfer technologies.					
<b>Special conditions precedent to the first disbursement:</b> (i) signature of the execution agreement between the borrower, acting through the executing agency, and the Dominican Institute for Agricultural and Forestry Research (IDIAF) under the terms previously agreed on with the Bank (paragraph 3.1); (ii) entry into force of the program Operations Manual, duly agreed on between the Project Execution Office, the IDIAF, and the Bank (paragraph 3.1); and (iii) selection of the program’s general coordinator in accordance with the terms of reference and selection procedures agreed on with the Bank (paragraph 3.3).					
<b>Exceptions to Bank policies:</b> None.					
<b>Project consistent with country strategy:</b>					
	Yes [ X ]	No [ ]			
<b>Project qualifies as:</b>	SEQ [ ]	PTI [ X ]	Sector [ X ]	Geographic [ ]	Headcount [ ]

\* Under the Flexible Financing Facility (document FN-655-1), the borrower has the option of requesting changes to the amortization schedule, and currency and interest rate conversions, subject in all cases to the final amortization date and the original weighted average life (WAL). When considering such requests, the Bank will take market conditions into account, along with operational and risk-management considerations.

\*\* The credit fee and inspection and supervision fee will be established periodically by the Board of Executive Directors as part of its review of the Bank's lending charges, in accordance with the applicable provisions of the corresponding policies. In no case will the credit fee exceed 0.75% or the inspection and supervision fee exceed, in a given six-month period, the amount that would result from applying 1% to the loan amount divided by the number of six-month periods included in the original disbursement period.

## I. DESCRIPTION AND RESULTS MONITORING

### A. Background, problems to be addressed, and rationale

- 1.1 **General context of the agricultural sector.** Rural areas and the agricultural sector are strategic for the socioeconomic development of the Dominican Republic. One third of the Dominican population lives in rural areas, 56% of this group lives below the poverty line (World Bank, World Development Indicators 2010). In 2010 the agricultural sector accounted for about 7.7% of GDP while generating 15% of all jobs and close to 40% of the total value of exports. Also in 2010, agricultural exports totaled a record US\$400 million—a 60% increase in the period 2000-2010.
- 1.2 The agricultural sector may be categorized into traditional (sugar cane, coffee, cacao, tobacco, rice, beans, livestock) and nontraditional products (fruits and vegetables), with disparities in productivity and trade. Nontraditional exports have posted strong numbers, growing 65% in 2000-2009, whereas traditional exports have fallen 20%. The agricultural production structure shows a predominance of small farmers. Some 80% of Dominican producers own farms with an area of 100 *tareas* (6.3 hectares) or less, amounting to a little over one quarter of the total land area. Excluding land used for animal husbandry, these percentages increase to 90% of farmers and almost 50% of the land area ([Ministry of Agriculture, 1999](#)).
- 1.3 **Productivity gaps.** The agricultural sector has posted positive GDP growth rates since 2000, averaging 4% annual growth in the 2000-2009 period (DEA, 2010). This, however, is slower than the rest of the economy, which grew 5.1% overall. Moreover, an analysis of the 1960-2005 period reveals that the country has the second-lowest rate of technical change in sector GDP (0.3%) among the countries of Central America—well below the rate in Costa Rica (3.4%), for example ([Zegarra, 2009](#)). This disparity is partly due to a relative deficiency in crop productivity in recent years.
- 1.4 For most staple crops in the Dominican diet, yields are stagnant or slightly increasing, with only rice posting a significant increase in the past 10 years. This situation is even more striking when the country's yields are compared to those of other countries with similar characteristics. The productivity gap for most crops is significant, and in some cases—such as corn and cacao—the yield is nearly 50% below the regional average. In fact, the strongest Dominican agricultural exports show sharp disparities in yield; for example, the yield on mangoes, citrus fruits, and bananas is 60% of that in Costa Rica. This indicates a real opportunity to improve the sector through technological change.
- 1.5 Some of the reasons for these productivity gaps include the lack and/or poor quality of pest- and disease-resistant genetic material, varieties and seeds adapted to farmers' agroecological conditions and updating of cultural practices. These factors are exacerbated by inappropriate agricultural practices and the ineffective use of technology. Irrigated land—representing 40% of all farmed land and 67% of the production of crops such as rice—is plagued by the inefficient use of water (75% of irrigation water is used inefficiently; [Dominican National Water Resources](#)

[Institute](#), 2006) and salinity problems (in 42% of irrigation districts, World Bank 2005). Moreover, there is heavy use of agrochemicals, with 40% of them highly toxic ([U.S. Agency for International Development](#), 2009).

- 1.6 The Bank has been supporting the sector to increase the adoption of agricultural technologies in the country since 2002 through the Program of Support for the Transition to Competitive Agriculture (PATCA) (loans 1397/OC-DR and 2443/OC-DR). The final evaluation of loan 1397/OC-DR found that its targets were met and 13,500 farmers (5% of the total) received financial support that partially covered the cost of technology adoption, with preliminary evidence that the number of producers adopting PATCA-promoted technologies was even greater through the technologies' demonstration effect (spillover effect) (see [PATCA final evaluation](#)). Despite progress in the adoption of existing technologies, the capacity to generate and validate new technologies to serve the changing demands in the sector and reduce the technological gaps in the main items is limited. The proposed program will strengthen the system for researching, validating, and transferring technologies to address these productivity gaps and facilitate farmers' access to innovation.
- 1.7 **Underinvestment in agricultural research.** Only 25% of the support for the country's agricultural sector is used to provide public goods, which includes spending on agricultural research ([Peña, H. et al, 2011](#)). Specifically, Dominican public expenditure on agricultural research as a percentage of agricultural GDP was 0.24% (2011), compared to 1% in Honduras, Costa Rica, and Panama (2006) and the Latin American (2006) average of 1.15% ([Stads and Beintema, 2009](#)). This indicates significant underinvestment in agricultural research in the Dominican Republic.
- 1.8 **Institutional landscape for research.** The National Agricultural and Forestry Research System (SINIAF), established in 2000 by presidential decree, consists of: (i) the National Council for Agricultural and Forestry Research (CONIAF), established by presidential decree in 2000 to unite, coordinate, and lead the SINIAF; (ii) the Dominican Institute for Agricultural and Forestry Research (IDIAF), established by Law 2899/85 of July 1985 as the Dominican Institute for Agricultural Research, which has its own legal status and assets and is under the Ministry of Agriculture; it is the main entity responsible for generating and transferring technologies for the sector, and has been operating under the IDIAF name since a 2000 presidential decree; (iii) the National Fund for Agricultural and Forestry Research, established in 2000 to provide nonreimbursable financing for research to the entities comprising the SINIAF; and (iv) universities, nonprofit nongovernmental organizations, private enterprises, and entities with the capacity to conduct agricultural research. The IDIAF's resources represent 85% of all spending on agricultural research and 60% of all SINIAF researchers ([Taveras, 2012](#)). To strengthen the SINIAF, the Dominican Congress is currently considering a bill that would bring all entities in the System together under one law and more clearly define the IDIAF's institutional structure through the integration of its nationwide

network of research centers, experimental stations, and laboratories. The proposed operation will help strengthen the technical and strategic capacity of the IDIAF.

- 1.9 The IDIAF has 128 researchers (12 with doctorates and 59 with master's degrees) working in four research centers, four regional centers, and a nationwide network of experimental stations. The IDIAF's most notable achievements include the generation of varieties of rice; the introduction of varieties of plantain, potato, yucca, and kidney beans; and the development of new technologies for handling coffee, mango, cacao and other crops.
- 1.10 The IDIAF's total annual budget is US\$7 million. In recent years, the contribution from the national treasury (representing some 85% of its budget) has fallen 25%, and this has caused delays in modernizing its infrastructure and equipment and in updating the capacity of its scientific personnel and its operational capacity.
- 1.11 In 2008 the IDIAF carried out a prospective planning initiative that resulted in the Strategic Plan 2009-2018. This plan emphasizes its mandate in research and technology transfer activities to raise current levels of production and productivity for the products most crucial to the country's economic and social development. The Strategic Plan also notes the need to integrate, and promote greater interaction with, the other entities in the agricultural public sector. To fulfill the targets of the Strategic Plan, the IDIAF must overcome the following limitations, which it faces as the lead entity of the agricultural innovation system.
- 1.12 **Weaknesses in research capacities.** The IDIAF's work is scattered and its research capacities are weak, with a lack of critical mass in strategic research areas. The IDIAF is executing 47 projects for more than 31 product types, with an average of 1.63 full-time researchers per project, which is below the recommended minimum of two full-time researchers per project ([BOE, 2010](#) and [Álvarez, 2011](#)). Its human resources need to be renewed (only 10% hold doctorates, and 30% of these are near retirement), and its infrastructure, equipment, and laboratories are outdated. These constraints impact its capacity to generate and validate technologies in accordance with the sector's needs. Multiple studies have shown the need to set research priorities at research centers and the importance of the linkage between increased investment (especially in human resources, equipment, and infrastructure) and improved agricultural productivity ([Gijsbergs et al, 2001](#), and [World Bank, 2008](#)).
- 1.13 **Weaknesses in technology transfer capacity.** Under current conditions, with the opportunity to achieve short-term results, the IDIAF's research, validation, and technology transfer activities should be part of a single technological development process. Technology transfer activities have been somewhat neglected at the IDIAF, as evidenced by the small number of staff members specializing in technology transfer (less than 10% of all personnel) and the lack of a formal, regular link with the national extension service or with private sector specialists. Scientific equipment is lacking, usage of information and communication technologies is limited, and there is no systematic training program. Despite some



successes in disseminating generated technologies, these cases are rare and limited to traditional products (e.g., rice and kidney beans) ([Preissing and Moras, 2012](#)). Studies examining the worldwide context of research and agricultural extension have concluded that improved technology transfer capacities foster increased dissemination of generated technologies relevant to the sector's needs ([Pardey, P. et al, 2008](#)).

- 1.14 **Limited ties with international entities and the private sector.** Weaknesses in research and technology transfer are exacerbated by the IDIAF's limited ties with international agricultural research centers and the private sector. This limitation is due to the lack of a linkage management strategy and of personnel specializing in this area. The IDIAF currently has few agreements with international entities and the private sector, and most of the ones they do have are short-term agreements for specific objectives (less than 20% are with foreign universities or research centers, and/or with local private enterprises) ([Álvarez, 2011](#) and [Obreque, 2012](#)). A recent study by the World Bank (2012) on agricultural innovation noted the benefits of promoting interaction between public and private actors, both locally and internationally.
- 1.15 **Lessons learned.** The proposed program has taken into account the lessons learned from similar Bank-financed operations in the region (loans 2412/OC-AR, 1057/OC-BO, 1595/OC-BR, 1283/OC-JA, 2547/OC-ME, 2531/OC-PE, and 1131/OC-UR). The following lessons stand out:
  - a. **Comprehensive management of research and technology transfer.** One good practice based on experience in this type of project is the need to integrate research and technology transfer to ensure the linkage with the productive sector and achieve results. The proposed program will strengthen the comprehensive management of research and technology transfer through experimentation and validation on farmers' demonstration plots.
  - b. **Interaction with external and private actors.** Research and technology transfer capacities are strengthened through interactions with the innovation system, both public and private, at the national and international levels. A small country in particular has greater needs to form linkages with international research centers in order to tap into the latest science. Moreover, linkages with the private sector represent an opportunity to build on its capacity to identify new demands for innovation. The proposed program will strengthen linkages with international entities and the private sector for innovation.
  - c. **Impact evaluation.** Based on experience with this type of project, the evaluation system should be properly designed from the start of the program. The proposed program will include an evaluation plan to help measure outcomes more accurately (see [Monitoring and Evaluation Plan](#)).

## **B. Program design**

- 1.16 Empirical evidence from both inside and outside the region suggests several reasons why technology generation and technology transfer services should receive public financing. The impacts of investment in technology generation and transfer on agricultural sector development have been thoroughly studied in the economic literature, which shows that such investment is essential to boosting farmers' productivity and income. The average return on investment in agricultural technology generation and transfer has been estimated at 43% for developing countries ([Alston, J., et al, 2000](#)) and at 27% for the Dominican Republic ([Walker, T., 2000](#)).
- 1.17 Program design is based on a strategy of bringing the identification of production problems and market opportunities closer to the available supply of duly validated technological solutions. To this end, priority areas will be strengthened to help adapt knowledge and make use of available technologies while the country can avail itself of all scientific and technological capacities to provide a comprehensive response to the productive sector. This can be achieved by making direct contact with the productive sector and its needs, forming linkages with renowned international entities, and seeking complementarity to adapt, validate, and transfer knowledge and technologies.
- 1.18 In view of existing capacities at the IDIAF, the program's intervention strategy is to: (i) strengthen strategic research areas; (ii) achieve greater integration between research and technology transfer; (iii) improve technological ties at the regional and international levels; and (iv) respond to needs for innovation in partnership with the private sector. The intervention strategy is based on research projects, adaptive experimentation, and technology validation and transfer, through the integration of researchers, transfer specialists, and farmers. As such, the program will: (i) train human resources and adapt equipment and infrastructure; (ii) strengthen the management of linkages with international research centers and the private sector; (iii) strengthen technology transfer and dissemination capacities; and (iv) strengthen the IDIAF's institutional management.
- 1.19 **Consistency with the GCI-9.** The proposed program will contribute to the following priority objectives of the Ninth General Increase in the Resources of the Bank (GCI-9) (document AB-2764): (i) support for the development of small and vulnerable countries; (ii) poverty reduction and social equity, by raising the productivity of small farmers representing 80% of the 54,000 expected beneficiaries (10% of them women); (iii) support for climate change, sustainability, and environmental initiatives, by developing and adapting technologies to promote sustainable environmental practices (paragraph 2.9); and (iv) improved regional integration, by implementing technological linkage agreements with renowned international entities from inside and outside the region, generating mechanisms for exchanging the latest scientific information to contribute to the provision of regional public goods (paragraph 1.23). The program also fits within the institutional priority to "protect the environment, respond to climate change,

promote renewable energy, and enhance food security,” thereby contributing to its regional development target on food security by raising the agricultural GDP growth rate and its output of “farmers with access to better agricultural services and investments.”

- 1.20 **Alignment with the Bank’s country strategy.** This program is aligned with the priorities of the Country Strategy with the Dominican Republic 2010-2013 (document GN-2581), under the objective of increasing productivity in the agricultural sector. The program will help achieve the expected outcomes of the country strategy, specifically in increased yields of agricultural production units, and is included in the 2012 Operational Program Report (document GN-2661-4). The program complements the Program in Support of Subsidies for Innovation in Agricultural Technology (loan 2443/OC-DR) and the Agrifood Health and Safety Program (loan 2551/OC-DR), approved in 2010 and 2011 for US\$30 million and US\$10 million in financing, respectively. Both of these operations also contribute to the aforementioned objective.

**C. Objectives, components, and cost**

- 1.21 **Objective.** The objective of the program is to help boost the productivity of the agricultural sector by building the country’s capacity to generate and transfer technologies.
- 1.22 **Component 1. Support for strategic areas of research, technology transfer, and innovation at the IDIAF (US\$19 million).** This component will seek to enhance the strategic capacities of research and adaptive experimentation, including transfer and innovation, through two subcomponents: (i) support for strategic areas of research and technology transfer; and (ii) support for innovation.
- 1.23 **Subcomponent 1.1. Support for strategic areas of research and technology transfer.** This subcomponent will strengthen strategic areas (genetic resources and improvement, management of production systems, and sanitary protection). To this end, financing will be provided for: (i) research and technology transfer projects (RTTPs), identified through a prioritization process,<sup>1</sup> with emphasis on adaptive experimentation, validation, and transfer; (ii) support for modernization of infrastructure and provisioning of equipment for research centers and laboratories, including quality accreditation of quality management in lab testing; (iii) development and implementation of a technology transfer and dissemination strategy; (iv) human resource development through postgraduate education and training courses; and (v) technological linkage agreements with renowned

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<sup>1</sup> During program preparation, a workshop attended by participants from the public and private sectors and international experts reviewed the prioritization of strategic areas and products in view of economically and socially significant considerations, technological gaps, and environmental considerations. It was decided that the program would address three strategic areas: (i) genetic resources and improvement; (ii) management of production systems; and (iii) sanitary protection. In addition, the following projects were identified: phylogenetic resources, rice, cacao, coffee, milk, Eastern vegetables, avocado, mango, banana, plantain, and protected crops.

international agricultural research centers—including EMBRAPA in Brazil, CATIE in Costa Rica, and INTA in Argentina—to promote South-South intraregional cooperation. As part of the transfer and dissemination strategy, financing will be provided for a monitoring and evaluation system; training for technical specialists, extension specialists, and IDIAF personnel; pilot projects on usage of information and communication technologies; dissemination campaigns; and provisioning of equipment for IDIAF information centers.

- 1.24 The RTTPs will describe the expected outcomes, the mechanisms for forming technological linkages, the intervention strategy, and the main participating technical specialists/extension workers and producers. These projects will include activities for: (i) validating and transferring technologies that are available in the country and/or that require a short validation period before being transferred; and (ii) research and adaptive experimentation for internationally available technologies that need to be validated and transferred locally.
- 1.25 **Subcomponent 1.2. Support for innovation.** This subcomponent will finance the formation of partnerships between the private sector (enterprises) and the IDIAF to develop technological solutions and solve specific problems in accordance with market needs (production, post-harvest, processing, etc.). These partnerships will be pursued through technological product projects (TPPs), which will include design, prototype, and market-launch phases. TPPs will be identified on the basis of end-user demand and will be cofinanced with the private sector. The criteria for forming these partnerships are set forth in the program Operations Manual. Training will be provided to IDIAF personnel on how to manage technological innovation and technological business initiatives.
- 1.26 **Component 2. Institutional management at the IDIAF (US\$2.7 million).** This component will finance: (i) development and implementation of a strategy for forming linkages, technological monitoring, and intellectual property, along with the establishment of the corresponding management unit; (ii) development and implementation of an environmental program, along with the establishment of the corresponding management unit; (iii) strengthening of the planning, monitoring, and evaluation system; (iv) strengthening of the administrative, financial, and human resource system; (v) development and implementation of a strategy for managing its own resources for the sale of goods and services; and (vi) strengthening of its corporate image. Financing will also be provided to support the CONIAF in developing a strategic plan.

#### **D. Key outcomes and selection rationale**

- 1.27 The main benefits of the program are related to the increased productivity of small farmers benefiting from the program. This operation is expected to benefit more than 54,000 agricultural producers<sup>2</sup> (10% of them women). The program's [results matrix \(Annex II\)](#), which was agreed on with the IDIAF, details the program's

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<sup>2</sup> The estimated figures for beneficiaries are explained in the evaluation plan.

outcome and output indicators. In accordance with the results matrix, Table I-1 shows the key outcomes expected from the operation. The increased yields on demonstration plots and the related transfer and dissemination efforts will help increase the adoption of technologies promoted by the program. Meanwhile, the increased adoption of the most productive technologies will help the program's potential beneficiaries to produce more with fewer resources, thereby achieving greater net income and an improved standard of living.

**Table I-1: Main program outcomes**

<b>Key outcomes</b>	<b>Time of measurement</b>	<b>Selection rationale</b>
Increase in the average net income per hectare for program beneficiaries.	At program completion	To approximate the effect of increased productivity on the standard of living of farmers in the sector.
Increase in the average rate of adoption of technologies transferred in the program.	At program completion	To approximate the contribution of transfer activities to the adoption of new technologies.
Increase in the yields of products on demonstration plots as a result of the program.	At program completion	To measure the effect of technologies resulting from the projects.
Increase in the number of producers receiving services and information through IDIAF transfer and dissemination activities.	At program completion	To measure access to services generated through improved management at the IDIAF.

## **II. FINANCING STRUCTURE AND RISKS**

### **A. Financing instruments**

- 2.1 Total program cost is estimated at US\$24 million, of which US\$22 million (91.6%) will be financed with resources from the Bank's Ordinary Capital and US\$2 million (8.4%) will be financed by the local contribution (see Table II.1).
- 2.2 The program is structured as a specific investment operation to be executed over six years. The disbursement schedule is provided in Table II.2 below.

**Table II-1: Costs (US\$ million)**

Investment category*	Bank	Local contribution	TOTAL	%
<b>Direct costs</b>	<b>20.1</b>	<b>1.6</b>	<b>21.7</b>	<b>90.4%</b>
I. Support for strategic areas and innovation	18.0	1.0	19.0	79.2%
I.1 Support for strategic areas	17.0	1.0	18.0	75.0%
I.2 Support for innovation	1.0	0.0	1.0	4.2%
II. Institutional management	2.1	0.6	2.7	11.2%
<b>Administration</b>	<b>1.1</b>	<b>0.4</b>	<b>1.5</b>	<b>6.2%</b>
<b>Monitoring, evaluation, and audits</b>	<b>0.8</b>	<b>0.0</b>	<b>0.8</b>	<b>3.4%</b>
<b>TOTAL</b>	<b>22.0</b>	<b>2.0</b>	<b>24.0</b>	<b>100%</b>
<b>Percentage</b>	<b>91.6%</b>	<b>8.4%</b>	<b>100%</b>	<b>-</b>

\* The finance charges will be paid by the borrower outside the program.

**Table II-2: Disbursement schedule (in US\$ million)**

SOURCE	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Total	%
Bank	3.2	4.2	4.4	4.7	3.4	2.1	22.0	91.6
Local	0.2	0.4	0.4	0.5	0.3	0.2	2.0	8.4
<b>TOTAL</b>	<b>3.4</b>	<b>4.6</b>	<b>4.8</b>	<b>5.2</b>	<b>3.7</b>	<b>2.3</b>	<b>24.0</b>	<b>100</b>

## **B. Economic viability and sustainability**

2.3 The [economic assessment](#) estimated the return on program investments using the cost-benefit methodology. The assessment is based on: (i) increased yields and/or reduced unit costs of production expected from implementing the technologies on farmers' demonstration plots; and (ii) rates of adoption of technological packages among producers of prioritized products, to be attained 7 to 10 years into the program. On the basis of these assumptions, the economic indicators yielded a net present value of US\$59.6 million, with an economic internal rate of return (EIRR) of 48% and a benefit-cost ratio of 4.85. Sensitivity analyses were conducted on the basis of variation in productivity, prices, and technology adoption rates. In scenarios where productivity is 15% and 30% lower than estimated, the EIRR is estimated at 18% to 35%. In a scenario with a negative variation of 20% to 30% in projected prices, the program maintains a return on investment of 33% and 39%. If the technology adoption rate is 40% to 60% lower than expected, the EIRR is estimated at 24% to 34%.

2.4 In addition to being economically viable, the program is sustainable on the basis of the IDIAF's greater permanent capacities, stemming from strengthened human resources, equipment, and infrastructure in strategic areas; achievement and dissemination of program outcomes; greater and better technological linkages at the international level; and an institutional management model with clearly defined objectives to meet demand in the sector. This will provide for greater recognition of the IDIAF in the country's public and private sectors, as well as greater complementarity with the regional and international scientific community.

**C. Fiduciary and other risks**

- 2.5 Program risks were assessed using the methodology for risk management in sovereign-guaranteed projects. A workshop attended by those involved identified risks and their associated mitigation measures. While a medium level of risk was identified for fiduciary management capacity, the overall risk level of the program is rated as low ([risk matrix](#)).
- 2.6 An institutional analysis of the Ministry of Agriculture's Project Execution Office (OEP) and the IDIAF was conducted using the Institutional Capacity Assessment System (ICAS). The operational structure of the OEP was found to be consistent with the Bank's requirements for technical and administrative execution of loan operations. For the IDIAF, the ICAS found a medium level of risk, with some administrative strengths and other areas that need institutional strengthening for financial management. To mitigate the fiduciary risks identified in view of increased procurement responsibilities, the OEP's procurement specialist will conduct the major procurement processes set forth in the procurement plan. In addition, three procurement officers/assistants will be hired to support the IDIAF at its headquarters and regional research centers in conducting minor local procurement processes included as part of the research and innovation projects.
- 2.7 **Audits.** In accordance with the Financial Management Policy for IDB-Financed Projects (document OP-273-2), the executing agency will submit the program's audited financial statements to the Bank every year within the contractually established period. These statements will be prepared by a firm or office of external independent auditors acceptable to the Bank. The Ministry of Agriculture, acting through the OEP, will: (i) prepare the program's financial statements and furnish them to the external auditors in accordance with Bank policies; (ii) review and accept the audited financial statements; and (iii) forward the audited financial statements to the Bank within the contractually established period. Moreover, the external auditors will prepare a preliminary semiannual auditing report, to be submitted by the Ministry of Agriculture to the Bank.

**D. Environmental and social risks**

- 2.8 In accordance with the Bank's Environment and Safeguards Compliance Policy (OP-703), this has been classified as a category "B" operation. As such, an environmental and social review was conducted during program preparation. The review identified the most significant social and environmental characteristics, weaknesses, and risks of program activities and helped to develop measures to reduce the operation's risks and enhance its social and environmental sustainability. These measures were set forth in the program's Environmental and Social Management Plan ([ESMP](#)) in accordance with Bank policies (OP-703, OP-710, OP-765, and OP-102). The ESMP, which also set forth the execution and monitoring mechanisms, is an annex to the program Operations Manual. The outcomes of the analyses are presented in the Environmental and Social Management Report ([ESMR](#)).

- 2.9 The program's environmental benefits include research, validation and transfer of organic production technologies, integrated pest and disease management, soil conservation, efficient use of irrigation water, and reuse of organic waste. Through these activities, the program will help reduce the use of pesticides and develop technologies adaptable to climate change. The program will also help adapt crops to climate change through the project for phytogenetic resource conservation and for biological pest controls.
- 2.10 The social benefits of the program include improved yields and quality of the crops and livestock of producers—most of them small farmers—and therefore higher income. Health benefits are expected for farm workers through the transfer of technologies for integrated pest management, which will reduce the use of pesticides. On RTTPs, the IDIAF will involve women's organizations, and the participation of these organizations will be monitored. Improvements are also expected in managing safety and health risks to IDIAF personnel.
- 2.11 The program will strengthen the social and environmental management of the IDIAF and support the establishment of the Social and Environmental Management Unit. Another outcome of the program will be the conversion of at least two existing research centers into green facilities, which entails not only meeting social and environmental standards but also implementing mechanisms to support environmental sustainability in their operations.

### III. IMPLEMENTATION AND ACTION PLAN

#### A. Program execution and administration

- 3.1 The borrower for the program will be the Dominican Republic, and the executing agency will be the Ministry of Agriculture. The Ministry of Agriculture will carry out program planning, administration, supervision, and evaluation through its OEP. The IDIAF, in its capacity as subexecuting agency, will be responsible for the technical aspects of the program, as well as for administering the resources allocated and transferred to it. Program execution will be within the framework of an execution agreement to be signed between the Ministry of Agriculture and the IDIAF. **Signature of the execution agreement between the borrower, acting through the executing agency, and the IDIAF in accordance with the terms previously agreed on with the Bank will be a special condition precedent to the first disbursement.** The responsibilities of, and linkages between, the various actors in the program are described in the program Operations Manual. **Entry into force of the Operations Manual, which must be duly agreed on between the OEP, the IDIAF and the Bank, will be a special condition precedent to the first disbursement.**
- 3.2 The OEP was created by Ministerial Resolution 14-2010 for externally financed projects, initially from the Bank and the International Fund for Agricultural Development. Its duties include: (i) ensuring fulfillment of the program's contractual conditions; (ii) requesting disbursements from the Bank; (iii) planning,



- developing, and organizing the annual work plans and coordinating, implementing, and monitoring program activities; and (iv) preparing the reports required by the Bank and the government. The IDIAF has the institutional capacities needed to implement, monitor, and evaluate the technical duties entailed in the program.
- 3.3 To this end, the OEP will be strengthened with a general program coordinator and two assistant coordinators, one for each component of the program. They will be under the technical supervision of the executive director and the directors of research and planning and development of the IDIAF, respectively, and will contribute to the IDIAF's work related to planning, operational management, and technical and environmental supervision of program activities. The program's general coordinator will report to, and coordinate his or her work with, the OEP Directorate with regard to developments and progress in implementing the program, as well as relevant administrative and operational considerations. **Selection of the program's general coordinator in accordance with the terms of reference and selection procedures agreed on with the Bank will be a special condition precedent to the first disbursement.**
- 3.4 During program preparation, proposals for RTTPs were developed with the participation of farmers, technical specialists, and researchers. The final versions of the RTTPs will be prepared by multidisciplinary teams of researchers and technical specialists who identified the main problems, opportunities, and technological limitations to be addressed. To enhance the quality of the RTTPs, the IDIAF's Technical Committee will be strengthened with the participation of international experts for preparing, evaluating, and assisting in project execution. The proposed RTTPs will include a transfer plan duly validated by international experts and must meet technical, socioeconomic, and environmental assessment criteria. The RTTPs will also be supported by renowned international research entities in the strategic areas prioritized through technological linkage agreements.
- 3.5 The support-for-innovation subcomponent will boost the IDIAF's capacity to generate and evaluate the technological products demanded by the market through TPPs. They will be executed through partnerships between the IDIAF and private enterprises, using an open-window mechanism. The TPP selection criteria include: economic feasibility (e.g. expected earnings, potential demand for product, implementation costs), cofinancing commitments, and expected short- and medium-term results. During program preparation, project profiles were developed as a potential sample of demand. The IDIAF's Technical Committee will approve the TPPs after an evaluation, selection, and cofinancing process as described in the Operations Manual.
- 3.6 To implement the IDIAF's transfer and dissemination strategy in a coordinated fashion with the Agricultural Extension and Training Department of the Ministry of Agriculture, within the framework of the execution agreement with the ministry, a work plan will be prepared to complement the technology transfer and extension efforts. The scope of this work plan will be based on the IDIAF's transfer and dissemination strategy.

- 3.7 The institutional management component will be executed with the IDIAF's research and planning and development units, in coordination with the OEP.
- 3.8 **Procurement.** Works and goods will be procured and consulting services selected and contracted in accordance with the Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank (document GN-2349-9) and the Policies for the Selection and Contracting of Consultants Financed by the Inter-American Development Bank (document GN-2350-9), and no exceptions are envisaged. Ex post reviews will be conducted of procurement processes for goods, provided that they are within the thresholds established for the Dominican Republic for shopping,<sup>3</sup> and ex ante reviews will be conducted for other processes. On the basis of further evaluation of procurement management, the threshold for goods may be modified, and thresholds for procurement of works and consulting services may be set. The procurement processes for this program must be included in the procurement plan approved by the Bank, and will be conducted in accordance with the bidding methods and time periods set forth in the plan. The Ministry of Agriculture's OEP will reach an agreement with the Bank on a procurement plan for the first 18 months of the program, and this plan will be updated at least every 12 months during the operation. The IDIAF, in its capacity as subexecuting agency, will conduct minor procurement processes<sup>4</sup> using the shopping method.
- 3.9 **Retroactive financing of eligible expenditures.** The Bank will provide retroactive financing (charged against loan proceeds) for eligible expenditures made during the 18 months prior to the loan approval date but after 13 March 2012 (project profile approval date). These expenditures may be for up to US\$350,000, and must be in accordance with the Bank's procurement policies or substantively similar procedures.

## **B. Monitoring and evaluation plan**

- 3.10 The program monitoring and evaluation arrangements are set forth in the [monitoring and evaluation plan](#). The Ministry of Agriculture, acting through the OEP, will generate and maintain the information needed to monitor the output and outcome indicators in the results matrix. The monitoring and evaluation plan will include a schedule of activities and the parties responsible for them, sources of financing and information, means of verification for indicators, and budget for execution.
- 3.11 The OEP will prepare and submit to the Bank program progress reports within 60 days after the end of each six-month period during the operation. These reports will focus on fulfillment of output indicators and progress in attaining the outcomes set forth in the results matrix, identify problems encountered, and present corrective measures. The reports for the second half of each year will also include the annual work plan for the following calendar year, with a projection of disbursements, an

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<sup>3</sup> The current threshold is US\$50,000 (<http://dev/PRM/Spanish/Thresholds.aspx>).

<sup>4</sup> Under Dominican law, the threshold for the minor purchase method is the equivalent of US\$25,000.

- updated procurement plan, and an updated risk matrix. Two independent evaluations will be conducted during the program, one 36 months into the program, and the other at the end of the program. Reports will be submitted by the OEP to the Bank within 90 days after 50% and 90% of the loan proceeds, respectively, have been executed.
- 3.12 **Evaluation.** The proposed impact evaluation is designed to measure the impact of the program on beneficiaries' net income per hectare. The evaluation will also measure the effect of the adoption rate of promoted technologies and the impact of these technologies on the yields of demonstration plots. The evaluation will be based on data gathered at the start and end of the program through household surveys and on data gathered on the demonstration plots during the program (see [evaluation plan](#)).
- 3.13 The evaluation will use a combination of experimental, quasi-experimental, and microsimulation methods. The yield increases resulting from program technologies used on demonstration plots will be measured through fixed-effect regression models to control for the features of the demonstration plots that do not change over time, which will be estimated with data gathered by the IDIAF's technical specialists. The program's impact on the technology adoption rate will be measured for two products through an experimental design. First, the demonstration plots where the transfer activities will be carried out will be selected at random from a list of eligible plots. The program's impact can be estimated by comparing the farmers located near the demonstration plots with those near nonselected eligible plots. Second, the technical and extension specialists and farmers receiving the technologies through transfer events on the demonstration plots will also be selected at random. Information from two surveys—a baseline survey conducted at the start of the program and a monitoring survey at the end of the program—will be used for this purpose.
- 3.14 The overall impact of the program on net income per hectare will be determined through a microsimulation model. This model has been developed to generate an ex ante evaluation per product type and then aggregated at the program level. The model and ex ante analysis is the starting point for the ex post impact analysis. To this end, the coefficients of the model will be updated on the basis of information gathered by the IDIAF from the demonstration plots and other sources. The adoption rates and yield increases used in updating the ex ante analysis will be based on the outcomes of the experimental evaluation and on communications with the producers' associations for all products included in the program.

Development Effectiveness Matrix			
Summary			
I. Strategic Alignment			
1. IDB Strategic Development Objectives		Aligned	
Lending Program	The operation contributes to lending target related to: i) small and vulnerable countries; ii) poverty reduction and equity enhancement; iii) support climate change initiatives, renewable energy and environmental sustainability, and iv) Lending to support regional cooperation and integration.		
Regional Development Goals	The operation contributes to the regional development goal "annual growth rate of agricultural GDP (%)".		
Bank Output Contribution (as defined in Results Framework of IDB-9)	The operation contributes to Bank's output "farmers given access to improved agricultural services and investments".		
2. Country Strategy Development Objectives		Aligned	
Country Strategy Results Matrix	GN-2581	The operation is aligned with Country Strategy objective "to increase productivity in the agricultural sector".	
Country Program Results Matrix	GN-2661-4	The intervention is included in the 2012 Country Program Document.	
Relevance of this project to country development challenges (If not aligned to country strategy or country program)			
II. Development Outcomes - Evaluability		Highly Evaluable	
		Weight	Maximum Score
	9.7		10
3. Evidence-based Assessment & Solution	8.8	25%	10
4. Ex ante Economic Analysis	10.0	25%	10
5. Monitoring and Evaluation	10.0	25%	10
6. Risks & Mitigation Monitoring Matrix	10.0	25%	10
Overall risks rate = magnitude of risks*likelihood		Medium	
Environmental & social risk classification		B	
III. IDB's Role - Additionality			
The project relies on the use of country systems (VPC/PDP criteria)	Yes	Sistema integrado de gestion financiera (SIGEF).	
The project uses another country system different from the ones above for implementing the program			
The IDB's involvement promotes improvements of the intended beneficiaries and/or public sector entity in the following dimensions:			
Gender Equality			
Labor			
Environment			
Additional (to project preparation) technical assistance was provided to the public sector entity prior to approval to increase the likelihood of success of the project	Yes	DR-T1089.	
The ex-post impact evaluation of the project will produce evidence to close knowledge gaps in the sector that were identified in the project document and/or in the evaluation plan.	Yes	The impact evaluation will use a combination of experimental, quasi-experimental and micro-simulation. The proposed evaluation is designed to measure the program's impact on net income per hectare of beneficiaries. In addition, the evaluation will measure the effect of the rate of adoption of the technologies promoted and the impact of these technologies on yields in demonstration plots.	

The project is aligned with IDB institutional priorities. The project contributes to: (i) the IDB lending priorities "small and vulnerable countries"; "poverty reduction and equity enhancement"; "support climate change initiatives, renewable energy and environmental sustainability"; "support regional cooperation and integration"; (ii) the Regional Development Goal "annual growth rate of agricultural GDP (%)"; and (iii) the Bank Output Contribution to Regional Development Goals 2012-2015 "farmers given access to improved agricultural services and investments". The project is also aligned with the country strategy's objectives to increase productivity in the agricultural sector.

The project document and its annexes provide a clear and complete justification for the project. Problems and their causes are clearly identified and discussed. The project's potential beneficiaries are also clearly identified and described. Evidence of the effectiveness of similar interventions in similar contexts is also clearly discussed. The project's metric is well defined and the result matrix includes valid indicators with baseline and targets at all level.

The project document includes a complete and realistic cost/benefit analysis. It also includes a monitoring and evaluation plan (MEP) that is complete and follows the DEM outline. The evaluation strategy is convincing and based on a combination of experimental and quasi-experimental methods, which are clearly discussed in the MEP.

The risks identified in the risk matrix are rated for magnitude and likelihood. The matrix also includes mitigation measures and related metric to track their implementation.

## RESULTS MATRIX

Program objective	To help boost the productivity of the agricultural sector by building the country's capacity to generate and transfer technologies.		
Impact	Baseline	Target	Comments
<p><b>Impact:</b> Increased productivity of agricultural products impacted by the program</p> <p><b>Indicator:</b> Increased average net income per hectare of program beneficiaries</p>	2011: US\$833/hectare	Program completion: US\$870/hectare	<p><b>Source:</b> Monitoring and evaluation plan.</p> <p>The expected impact at year 10, four years after program completion, is US\$937/hectare.</p>
Outcomes	Baseline	Target	Comments
<p><b>Outcomes:</b></p> <p>1.1) Increased average rate of adoption of technologies transferred in the program</p> <p>1.2) Increased yields of products on demonstration plots as a result of the program:</p> <p>Coffee (metric tons/hectare)</p> <p>Plantain (metric tons/hectare)</p> <p>Banana (metric tons/hectare)</p> <p>Cacao (metric tons/hectare)</p> <p>Eastern vegetables (metric tons/hectare)</p> <p>Protected crops (metric tons/hectare)</p> <p>Avocado (metric tons/hectare)</p> <p>Mango (metric tons/hectare)</p> <p>Milk (US\$/liter)</p> <p>Rice (US\$/hectare)</p> <p>1.3) Number of producers receiving information through the IDIAF's transfer and dissemination activities</p>	<p>2011: 0</p> <p>0.27</p> <p>10.7</p> <p>21.0</p> <p>0.39</p> <p>11.8</p> <p>132</p> <p>5.79</p> <p>2.78</p> <p>0.34</p> <p>1,749</p> <p>8,000</p>	<p>Program completion: 9.3%</p> <p>0.54</p> <p>18.73</p> <p>28.35</p> <p>0.62</p> <p>15.2</p> <p>158</p> <p>11.9</p> <p>5.17</p> <p>0.28</p> <p>1,360</p> <p>54,000</p>	<p><b>Source:</b> Monitoring and evaluation plan.</p> <p><b>Means of verification:</b> The IDIAF will be responsible for reporting and documenting these indicators.</p> <p>For rice and milk: reduction in unit cost of production.</p> <p>Demonstration plots: plots selected for use of the technological package being transferred by the program. There will be 321 demonstration plots. The baseline will be updated at the start of the program.</p> <p>Baseline estimation based on the number of technical specialists and extension workers trained by the IDIAF in 2011. Questionnaire to technical specialists / extension workers.</p>

<b>Component 1. Support for strategic areas of research, technology transfer, and innovation at the IDIAF</b>									
<b>Intermediate outcomes:</b>	<b>Baseline (2011)</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>	<b>Target</b>	<b>Comments</b>
1.1) Number of technologies transferred by the program	0		20	30	20	7		77	<b>Technology:</b> New materials such as varieties, hybrids, clones, prototypes, etc., or technological components such as fertilization, planting method, methods, processes, diagnostic assessment models, etc.  <b>Transferred technology.</b> Technology or technological component transferred to leading extension specialists and/or producers.  <b>Validated technology.</b> Technology or technological component tested agronomically and socioeconomically in the producers' fields before being transferred.  <b>Generated technology.</b> Technology or technological component obtained as a result of research.  <b>Means of verification:</b> Program monitoring
1.2) Number of technologies validated by the program	0		10	20	15	7		52	
1.3) Number of technologies generated by the program	0			2	2	4		8	
1.4) Number of publications peer-reviewed under the program internationally	0				2	3	3	8	
1.5) Number of technologies generated and transferred in partnership with the private sector	0			1	1	1		3	

<b>Subcomponent 1.1. Support for strategic areas of research and technology transfer (three areas, 11 projects)</b>	<b>Baseline (2011)</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>	<b>Target</b>	<b>Comments</b>
<b>Output 1.1.1:</b> Research and technology transfer projects in execution.	0	2	8	11	11	11		11	<b>Means of verification:</b> Program monitoring
<b>Output 1.1.2:</b> IDIAF experimental centers and laboratories renovated and equipped.	0		8					8	Outputs 1.1.1 and 1.1.5 start the first year indicated and continue throughout the program.
<b>Output 1.1.3:</b> Laboratory tests ISO-accredited.	0					5		5	
<b>Output 1.1.4:</b> IDIAF personnel receiving postgraduate education.	0					16 M.S.	6 Ph.D.	16 M.S. 6 Ph.D.	
<b>Output 1.1.5:</b> Technological linkage agreements of the IDIAF with international entities, in execution.	0		5	10	15	15	15	15	Leading producers are those on whose farms demonstration technological tests are conducted.
<b>Output 1.1.6:</b> Technical specialists /extension workers receiving training in technologies generated and validated by the IDIAF.	0		138	184	229	225	400	1,176	Information and documentation centers updated means facilities and resources for promoting and sharing IDIAF resources through the planned exchange of knowledge and communication tools through the network.
<b>Output 1.1.7:</b> Leading producers receiving technologies generated and validated by the IDIAF.	0		70	128	65	66		321	Transfer and dissemination campaigns are activities (workshops/forums/conferences, etc.) promoting IDIAF products and services to reach more potential customers and/or new partners, as well as to strengthen relationships with current partners.
<b>Output 1.1.8:</b> System for recording and monitoring technology transfer, up and running.	0		1					1	
<b>Output 1.1.9:</b> Projects on use of information and communication technologies, executed.	0					2		2	
<b>Output 1.1.10:</b> Information centers updated and operating in the network.	0		1	1	1			3	
<b>Output 1.1.11:</b> Transfer and dissemination campaigns executed.	0	1	1	1	1	1	1	6	
<b>Output 1.1.12:</b> IDIAF personnel receiving training in technology transfer.	0	40	60	80				80	
<b>Output 1.1.13:</b> IDIAF personnel receiving training in research techniques and methodologies.	0		50	42	14	5		111	

Subcomponent 1.2. Support for innovation	Baseline (2011)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Target	Comments
<b>Output 1.2.1:</b> Projects for technological products executed.	0		1	1	1	1	1	5	<b>Means of verification:</b> Program monitoring.
<b>Output 1.2.2:</b> IDIAF personnel receiving training in innovation management and technological business initiatives.	0		50					50	TPPs are projects executed in collaboration with enterprises, and aimed at developing commercial products through research.
<b>Component 2. Institutional management at the IDIAF</b>									
Intermediate outcomes:	Baseline (2011)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Target	Comments
2.1) Technological reports on the state of the art of technologies, prepared to support the development and/or execution of research and technology transfer projects	0	2	2	3	3	3	3	16	<b>Means of verification:</b> Program monitoring  Technological report refers to identification of availability of technological solutions, as well as related sources and research capacities at the international level.
2.2) Number of intellectual property rights registered	0						2	2	Property rights related to rights of authorship, for genetic transformations and agricultural and industrial property, including inventions, agroindustrial models, brands, origin denominations, and patents.
2.3) Research centers operating with green procedures	0				2			2	
2.4) Percentage increase in own resources generated by the IDIAF	US\$430 million (2008-2011)						30%	30%	Green research centers are those operating with environmental management plans and procedures set forth in the agreed ESMP.  Own resources refers to the sale of goods and services.
<b>Output 2.1.1:</b> Strategy for technological monitoring and linkages implemented.	0		1	1	1	1	1	1	<b>Means of verification:</b> Program monitoring
<b>Output 2.1.2:</b> Intellectual property	0			1	1	1	1	1	



strategy implemented.									<i>Outputs 2.1.1 to 2.1.7 start the first year indicated and continue throughout the program.</i>
<b>Output 2.1.3:</b> Unit to manage and monitor technological linkages and intellectual property up and running.	0			1	1	1	1	1	
<b>Output 2.1.4:</b> Social and environmental management unit executing the ESMP.	0		1	1	1	1	1	1	
<b>Output 2.1.5:</b> Budget, finance, administrative, and human resource management system up and running.	0	1	1	1	1	1	1	1	
<b>Output 2.1.6:</b> Strategy for managing own resources implemented.	0		1	1	1	1	1	1	
<b>Output 2.1.7:</b> Corporate image strategy implemented.	0			1	1	1	1	1	
<b>Output 2.1.8:</b> IDIAF personnel receiving training in planning, monitoring, and evaluation.	0	20	15	15				50	
<b>Output 2.1.9:</b> CONIAF strategic plan developed.	0			1				1	

## FIDUCIARY AGREEMENTS AND REQUIREMENTS

<b>Country:</b>	Dominican Republic
<b>Project number:</b>	DR-L1054
<b>Project title:</b>	Agricultural Research and Development Program
<b>Executing agency:</b>	Ministry of Agriculture
<b>Subexecuting agency:</b>	Dominican Institute for Agricultural and Forestry Research (IDIAF)
<b>Prepared by:</b>	Carolina Escudero (procurement specialist, FMP/CDR) and Christian Contín (financial specialist, FMP/CDR)

### I. EXECUTIVE SUMMARY

- 1.1 This Annex III has been prepared using as a reference the latest Public Expenditure and Financial Accounting (PEFA) report, issued in late 2010—which showed progress in some areas of the public finance management system of the Government of the Dominican Republic, such as accounting and budgeting—as well as in the financial supervision carried out by the Bank’s procurement and financial management specialists in the first operation under the conditional credit line for investment projects (CCLIP). The diagnostic assessment of the public procurement system using the Methodology for Assessing Procurement Systems (MAPS) of the Organisation for Economic Co-operation and Development (OECD) is currently under way, and the Bank is working to support and strengthen the country systems for public sector financial management and procurement in coordination with government authorities and other international organizations.
- 1.2 For financial management, the module of the Executing Units for Externally Financed Projects (UEPEX) of the country’s Integrated Financial Management System (SIGEF) is being used for accounting, reporting, treasury, and budget on all current sovereign guaranteed loan operations. The Office of the Comptroller General is responsible for internal control and internal auditing, while the National Audit Office performs external auditing and legislative scrutiny. Both entities have technical limitations in carrying out their designated duties and are therefore not eligible to conduct financial audits on Bank programs. Instead, the services of Bank-eligible external auditing firms are to be used. As for the public procurement system, the Bank provided technical assistance and support for the MAPS/OECD diagnostic assessment, which revealed that one of the system’s strengths is the structure of its legal framework. Significant challenges, however, must be overcome if a degree of development consistent with international standards is to be

achieved to allow for implementation in Bank operations.<sup>1</sup> The improvement plan stemming from this diagnostic assessment includes short-, medium-, and long-term activities. As one of the short-term activities, and with the Bank's support, the authorities are in the process of making improvements to the Regulations for Implementing Procurement Law 490-07; thus, the Bank may evaluate the feasibility of adopting some country subsystems<sup>2</sup> in Bank-financed operations.

## **II. THE EXECUTING AGENCY'S FIDUCIARY CONTEXT**

- 2.1 The technical and administrative capacity of the Ministry of Agriculture, acting through the Project Execution Office (OEP), to execute Bank-financed projects is satisfactory, as evidenced by the institutional capacity assessments and project management evaluations conducted in 2011.<sup>3</sup> The IDIAF, which will serve as subexecuting agency, was the focus of an institutional evaluation on the basis of the components and guidelines of the Institutional Capacity Assessment System (ICAS), including: (i) planning and organization capacity (activity planning system and administrative organization system); (ii) execution capacity (personnel management system, goods and services management system, and financial management system); (iii) control capacity (internal control system and external control system); and (iv) procurement operating system.
- 2.2 Although the fiduciary systems used by the Ministry of Agriculture's OEP and the IDIAF suffice for their regular duties, procurement may be strengthened on a complementary basis to provide for the specialized capacities needed to fully assume the duties associated with this investment program. The recommendations set forth in this document are designed with this in mind. For financial administrative management of this operation, both the Ministry of Agriculture's OEP and the IDIAF will use the UEPEX<sup>4</sup>/SIGEF subsystem.

## **III. FIDUCIARY RISK EVALUATION AND MITIGATION MEASURES**

- 3.1 The Ministry of Agriculture's OEP is quite familiar with the standards and methods for executing Bank-financed loan operations. However, since fiduciary management is to be performed simultaneously for three programs, including this one,<sup>5</sup> the level of risk has been kept at medium. The weighted results of the ICAS

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<sup>1</sup> Prior determination was made of the need to make adjustments to the regulations for implementing the current procurement law; to develop and implement the public procurement portal; to strengthen the capacities of personnel responsible for procurement activities; and to improve control mechanisms.

<sup>2</sup> Shopping and contracting of individual consultant methods; and publication of specific procurement notices on the national procurement portal.

<sup>3</sup> See IDBDOCS #36222532, Institutional Capacity Assessment (ICAS) of the Ministry of Agriculture, prepared by an outside consultant in January 2011, which is complemented by IDBDOCS #36227355, Institutional Capacity Assessment of the Ministry of Agriculture as Executing Agency of Project DR-L1048, prepared by the FMP/CDR fiduciary team in June 2011.

<sup>4</sup> The UEPEX is used by all executing agencies for Bank-financed operations in the Dominican Republic.

<sup>5</sup> Loans 2443/OC-DR and 2551/OC-DR.

assessment of the IDIAF indicate a medium level of development and a medium level of risk in terms of program fiduciary execution; confirming this assessment is the weakness evidenced by a lack of experience executing projects financed by multilateral organizations.

- 3.2 Among the mitigation measures noted in the project's risk management matrix is that the Ministry of Agriculture's OEP should include a full-time procurement specialist in its execution team to effectively absorb the volume of transactions to be generated by this program, and that the IDIAF's headquarters and deconcentrated offices be strengthened by hiring administrative personnel to be responsible for minor shopping procurement processes to be carried out directly by the IDIAF.

#### IV. CONSIDERATIONS FOR THE SPECIAL PROVISIONS OF CONTRACTS

- a. ***Special conditions precedent to the first disbursement of loan proceeds:*** (i) Hiring of the program's general coordinator in accordance with the terms of reference and selection procedures agreed on with the Bank; (ii) signing of an execution agreement between the borrower, acting through the Ministry of Agriculture, and the IDIAF, with the provisions on the obligations of the parties with regard to programmatic aspects and considerations related to administrative and financial management; and (iii) approval and entry into force of the program Operations Manual under the terms previously agreed on with the Bank.
- b. ***Special execution conditions:*** (i) Exchange rate agreed on with the executing agency for accounting purposes: For the purposes of Article 4.09(a) of the General Conditions of this contract, the parties agree that the applicable exchange rate will be the rate stated in line (i) of Article 4.09(a); and (ii) financial statements and other reports, audited or otherwise: During the program the executing agency will submit the program's audited financial statements each year in accordance with Bank policies. In addition, a preliminary audit report may be requested for the first six months of each fiscal year. The program's external audits will be performed by a firm of independent auditors acceptable to the Bank. These audits will be financed by the loan proceeds.

## V. AGREEMENTS AND REQUIREMENTS FOR PROCUREMENT EXECUTION

1. **Execution of procurement processes.** Procurements will be made in accordance with documents GN-2349-9 and GN-2350-9, and will be executed by the Ministry of Agriculture's OEP and the IDIAF, as agreed and described in Section III, paragraph 3.2, of this document.
  - a. **Procurement of works, goods, and nonconsulting services.** Works, goods, and nonconsulting services<sup>6</sup> arising under the project and subject to international competitive bidding (ICB) will be procured using the Bank's standard bidding documents. Procurements subject to national competitive bidding (NCB) will be executed using national bidding documents agreed on with the Bank (or, if not yet agreed on, satisfactory to the Bank). The program's sector specialist is responsible for reviewing the technical specifications for procurements during preparation of procurement processes.
  - b. **Selection and contracting of consultants.** Consulting contracts arising under the program, regardless of amount, will be executed using the standard request for proposals issued by or agreed on with the Bank (or, if not yet agreed on, satisfactory to the Bank). The program's sector specialist is responsible for reviewing the terms of reference for the consulting contracts.
  - **Selection of individual consultants.** Individual consultants will be selected on the basis of a comparison of at least three candidates' qualifications to perform the work. When appropriate, notices will be published in local or international media or in United Nations Development Business (UNDB) to secure qualified consultants. The program's sector specialist is responsible for reviewing the terms of reference for the consulting contracts.
  - **Scholarships.** The postgraduate training described under component 1 of the program will be financed in accordance with the procedures set forth in the Operations Manual.
  - c. **Procurement planning.** The borrower will post the procurement plan on the Procurement Plan Execution System (SEPA) and will update it on at least an annual basis or as necessary to reflect actual program needs and progress.
  - d. **Advance procurement/retroactive financing.** To apply as set forth in the loan contract.
  - e. **Domestic preference.** No domestic preference applies to the procurement of goods for this operation.
  - f. **Procurement executed by the IDIAF.** The IDIAF will use the shopping method for procurements for research projects in amounts under US\$25,000.

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<sup>6</sup> Policies for the Procurement of Goods and Works Financed by the Inter-American Development Bank (document GN-2349-9), paragraph 1.1: Nonconsulting services are treated similarly to goods.

Such procurement processes will be planned in accordance with the Operations Manual.

## 2. Table of thresholds (in US\$000)

Works			Goods			Consulting	
International competitive bidding	National competitive bidding	Shopping	International competitive bidding	National competitive bidding	Shopping	International consulting notice	Shortlist 100% national
>US\$3,000	>US\$250	≤US\$250	>US\$250	>US\$50	≤US\$50	>US\$200	≤US\$200

The thresholds for ex post reviews are as follows:

Ex post review thresholds		
Works	Goods	Consulting services
Not applicable	≤US\$50,000	Not applicable
Ex ante reviews will be conducted of all goods, works, nonconsulting services, and consulting services procured through direct contracting, with no exceptions.		

Although the OEP has a track record in executing Bank-financed projects,<sup>7</sup> it does not have a full-time procurement specialist. This arrangement has not been efficient, and weaknesses have been reported in procurement planning and monitoring. This operation was designed to include partial financing for hiring a procurement specialist to plan, manage, and monitor procurement activities for the programs financed by the Bank and executed by the OEP. This is included in the risk management matrix to mitigate the potential risk of “procurement delays or failures.” Once this program is under way and the full-time procurement specialist has been hired, the Bank will assess the situation and, if appropriate, modify the ex post review thresholds for goods and set the thresholds for works and consulting services.

- 3. Main procurement processes.** The OEP will prepare the procurement plan, and the executing agency will provide assistance to ensure that procedures are in accordance with the Bank’s procurement policies by issuing an expert opinion for consideration of the sector specialist/project team leader. The main procurement processes for this operation are listed below:

<sup>7</sup> Loans 1397/OC-DR, 2443/OC-DR, and 2551/OC-DR.

Activity	Procurement method	Estimated date	Estimated amount (US\$000)
<b>Goods and nonconsulting services</b>			
Multiple procurement processes for vehicles to implement 11 adaptive research projects and for coordination	S/NCB/ICB	Q1-'13, Q1-'14 Q1-'15	US\$1,155
<b>Consulting services (Firms)</b>			
Consulting services to support the accreditation of five additional laboratory tests at the IDIAF	QBS	Q3-'13	US\$400
Services to support the design, implementation, and monitoring of a unit to manage technological linkages and develop a strategy for forming technological linkages	QCBS	Q2-'13	US\$300
Services to integrate the IDIAF's financial management and administration systems, including provision of software and licenses	QBS	Q2-'13	US\$200

\*To access the [procurement plan](#) for the first 18 months.

4. **Procurement supervision.** Thresholds for ex post review have been set in accordance with the executing agency's fiduciary capacity and may be modified by the Bank to the extent that such capacity may vary. In view of the project's medium level of fiduciary risk, one ex post inspection visit will be carried out each year, and the reviews will include at least one physical inspection visit for procurement processes.
5. **Records and files.** Files must be kept at the office of the Ministry of Agriculture's OEP under proper security conditions.

## VI. FINANCIAL MANAGEMENT AGREEMENTS AND REQUIREMENTS

1. **Programming and budget.** The annual budget is prepared by the Ministry of Finance acting through the General Budget Office, in coordination with the Ministry of the Economy, Planning, and Development, as well as other government agencies. The executing agency will ensure that budgetary allocations to the program are in accordance with the work plans and execution plans previously agreed on with the Bank, both for loan disbursements and counterpart financing. The program will use the Bank's planning mechanisms (project execution plan, annual work plan, procurement plan). Although the IDIAF lacks an institutional structure responsible for strategic and operational planning, it will benefit from the experience of being involved in program operations. This program includes US\$2 million equivalent in counterpart resources, which will be required as part of budgetary programming and subject to Bank verification for each year of the program.
2. **Accounting and information systems.** The executing agency, acting through the OEP, will use the UEPEX accounting/financial and budget control system to process and record accounting transactions and maintain budgetary control, and also to generate the required financial reports in accordance with Bank standards and policies. Cash basis accounting will be used for the time being. The Ministry of Finance, it should be noted, is in the process of improving the

implementation of the International Public Sector Accounting Standards (IPSAS).

3. **Disbursements and cash flow.** The resources to be administered by the executing agency in the form of advances may be: (i) deposited into a special bank account in the name of the program, to be opened by the borrower at the Central Bank (in U.S. dollars) and at the Reserve Bank (in Dominican pesos) through the National Office of the Treasury, as well as a complementary account of the IDIAF to receive funds transferred from the OEP; (ii) recorded in the borrower's general account (in the event that the "single account" at the treasury, currently in its pilot phase, is fully implemented prior to the program's eligibility for disbursements), and then in a separate subaccount, in the name of the project, where all transactions of funds and payments related to the Bank-financed operation will be recorded (provided that this mechanism is satisfactory to the Bank). Project resources are to be used by the borrower and the executing agency for eligible expenses only, and an effective system for financial management and controls should be in place, in accordance with the loan contract, the Operations Manual, and financial plan periodically agreed upon with the Bank.
4. **Internal control and internal audit.** The Office of the General Comptroller (CGRD) is responsible for the internal auditing of the government.<sup>8</sup> To this end, the CGRD is supported by internal auditing units at each entity in the public administration of the Dominican Republic. The executing agency has a unit that performs its duties in accordance with the standards and guidelines of the CGRD's Government Accounting Office and other standards. The IDIAF also has an internal auditor. At this time, the main activities revolve around purchasing and payment processes. The Bank, though it maintains ongoing exchanges with the CGRD to improve the internal control systems of the executing agencies for the operations it finances in the country, plans to involve the IDIAF's internal auditor in future training efforts.
5. **External control and reporting.** The National Audit Office (CCRD) is the autonomous entity responsible for, *inter alia*, the external auditing of entities receiving and handling State resources (Law 10-04). For this operation, medium- or high-level independent auditing firms must be hired to conduct the annual external audits of the program. The external audits will be based on the terms of reference previously agreed on with the Bank. Auditing services must be commissioned in a timely manner, so that the auditor may submit preliminary or midterm reports to assist in monitoring the maintenance of the executing agency's internal controls with regard to program management.
6. **Financial supervision plan.** After the program's coordinating unit is strengthened with additional personnel/consultants, a workshop will be held to review the Bank's fiduciary policies and procedures. Periodic inspection

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<sup>8</sup> See Law 10-07 on the National Internal Control System, the regulations for implementing this law, and Presidential Decree 121-01.



visits—at least one initial visit and another during the second six months—will be programmed, as will frequent meetings during the first six months of the program to ensure internal cohesion between the OEP and the IDIAF with regard to program organization. Efforts will be made to incorporate the external auditor into the internal control review process, and a meeting will be held with the auditors, the executing agency, and the Bank to review the outcomes of the preliminary auditing report before the end of each fiscal year. Risks in the operation will be continually monitored by the project team, especially during the first year.

7. **Execution mechanism.** To fulfill its responsibilities, the IDIAF will be supported by the OEP of the Ministry of Agriculture, which will serve as the liaison with the Bank, the IDIAF's technical, administrative, and financial bodies, and other participating entities. The OEP, in addition to its current structure, will have, at a minimum: (i) a general coordinator for the program, with experience in leading, planning, and managing projects, who will report to the IDIAF leadership for operational purposes and to the OEP general coordinator for administrative purposes; and (ii) three procurement officers/assistants to support the IDIAF at its headquarters and regional research centers in executing minor procurement processes as part of the research and innovation projects. As a strategy for the institutional strengthening of the IDIAF, these additional staff members will be part of the IDIAF's operational structure.

DOCUMENT OF THE INTER-AMERICAN DEVELOPMENT BANK

PROPOSED RESOLUTION DE-\_\_\_/12

Dominican Republic. Loan \_\_\_/OC-DR to the Dominican Republic  
Agricultural Research and Development Program

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 Dominican Republic, as Borrower, for the purpose of granting it a financing to cooperate in the execution of an agricultural research and development program. Such financing will be for the amount of up to US\$22,000,000, 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 \_\_\_\_ 2012)