

## AGRICULTURAL TECHNOLOGY PROGRAM

(VE-0125)

### EXECUTIVE SUMMARY

<b>Borrower and guarantor:</b>	Bolivarian Republic of Venezuela	
<b>Executing agency:</b>	National Institute for Agricultural Research (INIA)	
<b>Amount and source:</b>	IDB: (OC)	US\$22.5 million
	Local:	US\$22.5 million
	Total:	US\$45.0 million
<b>Terms and conditions:</b>	Amortization period:	20 years
	Grace period:	4 years
	Disbursement period:	4 years
	Interest rate:	variable
	Inspection and supervision:	1%
	Credit fee:	0.75%
	Currency:	U.S. dollars under the Single Currency Facility
<b>Objectives:</b>	The general objective of the program is to help increase productivity in the agricultural sector by transforming the National Institute for Agricultural Research (INIA) into a dynamic agency that will stimulate the agricultural technology system to generate technologies and provide efficient services.	
<b>Description:</b>	The program will enhance sector efficiency by consolidating the institutional reform of INIA, strengthening investments with PRODETEC funding, generating the financial and technical conditions needed to ensure INIA program sustainability, and strengthening the capacity of INIA to respond to demand and needs of the environment and among its agents in the agricultural sector. The program will also strengthen technology development capacity by modernizing services through adoption of modern technologies, laboratory accreditation, and consolidation and development of information systems. The program consists of three subprograms and seven components:	

**Subprogram 1.** Institutional modernization (direct costs: US\$9.6 million). Component 1.1: Consolidation of the technical information and institutional management system; and Component 1.2: Job retraining. The purpose of this subprogram is to implement and consolidate new institutional systems and increase institutional efficiency.

**Subprogram 2.** Financial sustainability (direct costs: US\$5.2 million). Component 2.1: Strengthening capacity for technological linkage; and Component 2.2: Support for Establishment of a Capital Fund. This subprogram is designed to generate institutional mechanisms for building linkages with the environment to strengthen the sustainability of INIA.

**Subprogram 3.** Modernizing agricultural technology (direct costs: US\$17.5 million). Component 3.1: Technological modernization; and Component 3.2: Support for research consortia and third-party technical assistance. The purpose of this subprogram is develop and disseminate new technical capacity and to promote research consortia.

In addition, the program has an administration component for US\$1.5 million equivalent, which includes the costs of the Program Coordination Unit and training for INIA senior management.

**The Bank's  
country and  
sector strategy:**

The proposed program will contribute directly to three of the objectives in the Bank's strategy for the country: (i) it will support for the management and sustainability of INIA and of agricultural technology, thereby contributing to modernization of the State; (ii) it will help increase productivity in non-oil sectors, enhancing international trade, diversifying production and increasing exports; and (iii) it will enhance regional development and decentralization.

**Environmental  
and social  
review:**

This document was submitted to CESI for information, as recorded in the minutes of the 13 July 2001 meeting. The environmental impact of the operation is clearly positive and includes: (i) a training program for 489 officials, by means of 20 courses dealing with environmental issues relevant to their functions and the institution's objectives; (ii) development of institutional capacity to certify organic production, which will help disseminate clean technologies and practices, with a consequent reduction in the use of pesticides; (iii) accreditation of selected laboratories in accordance with Venezuelan Standard COVENIN 2534:2000 (ISO/IEC Guide 25) and five laboratories in accordance with COVENIN ISO 14000, with the consequent improvements in environmental management and in worker health and hygiene in those laboratories, and in the quality and reliability of the services they provide; (iv) worker retraining, as a means of mitigating the social impact of institutional reengineering of

INIA, including a training program for microentrepreneurs, with special attention to working women, in order to ensure gender equity; and (v) inclusion of an environmental specialist on the INIA staff to conduct the program's environmental activities and to promote institutionalization of environmental issues in INIA.

The following environmental risks were identified in the program: lack of monitoring of emissions from diagnostic laboratories and biotechnology units, existing environmental liabilities on the current property of the Veterinary Research Institute (IIV), and the lack of a frame of reference for monitoring the potential impact of genetically modified organisms.

The environmental risks will be mitigated by the following measures: (i) environmental audits will be conducted in 20 groups of diagnostic laboratories and biotechnology units, and advisory services to help them comply with environmental regulations, and inclusion of INIA in the Registry of Environmentally Harmful Activities (RASDA) of the Ministry of the Environment and Natural Resources (MARN); (ii) a frame of reference will be established, defining institutional powers and responsibilities for the control, development, adaptation, introduction and marketing of genetically modified organisms for agricultural purposes; (iii) a plan will be developed and implemented to shut down activities and dismantle operations of the IIV, as required by Venezuelan environmental legislation. Execution of the IIV closure plan calls for remediation of environmental liabilities that will include sealing 20 septic tanks and any others that may be found; and (iv) an Environmental Impact Assessment—EIA, consistent with the country's environment legislation, for the new IIV.

**Benefits:**

**Increased agricultural productivity.** The institutional changes and technological modernization supported by the program will help increase productivity by strengthening the ability of INIA to provide reliable services and technological products efficiently in response to needs in the environment. The program will have national coverage and its beneficiaries will be producers engaged in crop-farming, livestock-farming, forestry and fishing. The productivity increases, which are a significant part of the expected benefits, will result from the renewal of INIA, so that it can respond more effectively to the needs of the environment. These benefits will be derived from the increased volumes of output achieved through greater yields and lower losses from pests and diseases, and from better product quality. The population will benefit from greater availability of food, of better quality. The agroindustrial sector will benefit from inputs of better quality. The country will benefit from foreign exchange generated by greater exports and import savings.

**Building linkages to the environment.** The program will diversify, expand and develop links between INIA and researchers and clients. The new project selection methodology allows other stakeholders in the technological system to be closely involved. Establishment of the Consortium Fund will ensure resources to be allocated to projects on a competitive basis. The program will also establish linkages between INIA and the technology system and its clients in three ways: (i) it will strengthen the capacities of the Business Department so that INIA can work more closely with clients and potential customers for its research services, (ii) it will develop business units and research consortia so that INIA can increase and diversify the technology services it offers, using a business development approach, while providing technical assistance to third parties through training; and (iii) it will market technologies to create value added based on its previous experience and at the same time responding to the needs of its current and potential clientele.

**Sustainability of INIA.** The long-term sustainability of INIA will depend on its social and economic utility. Strengthening linkages to the environment will generate social and political support, which in turn will mobilize budgetary support, partnerships and service contracts that will help it become self-financing. The program will strengthen INIA so that it can produce a significant impact on the technology system, developing its linkage with similar local and international organizations and improving its ability to identify demand for technology, respond to it and meet expectations expeditiously.

**Risks:**

**Failure to complete institutional reengineering.** The program calls for a series of institutional changes that will imply cultural and operational changes that might encounter resistance. This risk should be reduced by the fact that the institution has been preparing for change since 1998. Furthermore, the commitments made and the nature of the new legislation governing INIA make such resistance unlikely. At the same time, INIA management is considered to have the capacity as well as the commitment and desire to carry out the reforms.

**Failure to achieve financial sustainability.** Uncertainty in the oil market affects the amount of financing available for the public sector and, in particular, for the Ministry of Science and Technology. The design of the Financial Sustainability Subprogram consists of a series of mechanisms to increase the number of sources for financing research in addition to the regular budget and thus to establish INIA financial sustainability. These measures include strengthening the Business Department to encourage undertakings with the private

sector, reinforce the capacity to produce and market technology services (business units), and make economic use of technologies with business potential (Marketing Fund), establishing a Capital Fund using underperforming assets, and expanding participation by partners in INIA's priority competitive projects.

**Failure to establish the Capital Fund.** The Capital Fund is to be established through the sale or concession of the fixed assets of INIA to the private sector, partnerships with the private sector, or other arrangements to be devised during program execution. The best option will be selected based on studies to be financed by the program. The decision to implement any of the options will be taken by the INIA board of directors pursuant to national legislation and INIA's legal rights. The MCT authorities and the INIA board have shown their determination to establish the fund. If the option selected is to sell off the assets, it will require nonobjection by the Public Assets Disposal Commission. There is a risk that the commission might not authorize the sale, but it is considered small because there are a number of precedents in INIA and other institutions. If the commission should refuse to authorize the sale of INIA assets, there are other options that do not require authorization by the commission.

**Special  
contractual  
clauses:**

The first disbursement under the loan is conditional upon submission by the borrower to the Bank's satisfaction of the following:

- a. certified copy of the Agreement for the Transfer of Resources between the MF and INIA (paragraph 4.1);
- b. certified copy of the service contract for the environmental specialist of the executing agency (paragraph 3.9);
- c. eligibility: (i) of the regulations for the Marketing Fund, the Capital Fund and the Consortium Fund (paragraphs 3.6, 3.8 and 3.13); (ii) the operations plan for the first year (paragraph 3.16); and (iii) the operations manual for the program (paragraph 3.17);
- d. presidential decree for the reorganization of INIA or any other suitable alternative legal provisions that would allow reorganization of the executing agency, in accordance with local legislation (paragraph 2.5); and
- e. certified copy of the legal document constituting the Fundación INIA (paragraph 3.20).

### **Other conditions**

Within the first 12 months after the effective date of the loan contract, the borrower, through the executing agency, will submit evidence to the Bank's satisfaction that the new financial system (SIFA) has been implemented (paragraph 4.15).

During the program execution period, the borrower, through the executing agency, will hold meetings with the Bank within the third quarter of each year as part of the budgetary exercise to assess performance under the annual operations plan for the year in question and to agree on any necessary adjustments. These meetings will also serve to assess and agree on the operations plan for the following year (paragraph 3.16).

Within six and 11 years after program completion, the borrower, through the executing agency, will submit a program impact evaluation to the Bank that will review two areas: (i) the degree of modernization achieved by INIA through the program; and (ii) evaluation of the progress achieved in institutional, technical, financial, environmental and consortium development. The evaluation will use baseline data similar to that to be used for the final evaluation financed with program resources.

### **Poverty-targeting and social sector classification:**

This operation does not qualify as a social equity enhancing project, as described in the key objectives for Bank activity set forth in the Report on the Eighth General Increase in the Resources of the Bank (document AB-1704).

### **Exceptions to Bank policy:**

See section on procurement.

### **Procurement:**

As an exception to the procedure for selecting consultants through competitive bidding, it is recommended that the IICA be contracted directly to carry out the tasks of hiring consultants, minor procurement and other activities using program funds, in accordance with the applicable Bank procurement policies and procedures. The proposed direct hiring is consistent with section GS-403 of the Procurement Manual (see paragraph 3.23). In the procurement of machinery, equipment and other goods and services for project execution, and in the awarding of the contract for execution of works, normal Bank procedures will be followed. International competitive bidding will be required for the procurement of goods exceeding US\$350,000, consulting services exceeding US\$200,000, and civil works exceeding US\$3 million. Although there are not expected to be any construction projects in excess of US\$3 million, INIA believes that some contracts below the threshold, such as the IIV project for

US\$2 million, should be subject to international competitive bidding because of their complexity. In other cases, for contracts below the thresholds, when the works or equipment can be supplied locally, the procedures set forth in local legislation will be followed. Details on the number of tenders and the type of bidding expected are attached as Annex III-1.

## **I. FRAME OF REFERENCE**

### **A. Socioeconomic setting**

#### **1. Macroeconomic situation**

- 1.1 When the current government assumed office in 1998 the economy was severely depressed, in part because of low oil prices, and later because of climatological factors that resulted in heavy human and material losses in late 1999. Real GDP declined by 6% between 1998 and 1999. The government's response was to launch an expansive fiscal policy that, together with improvements in the terms of trade, produced positive growth in 2000 and the first six months of 2001. This fiscal expansion will be sustainable as long as oil prices and the terms of trade remain favorable.
- 1.2 The greatest challenge facing the government, however, is to make this growth sustainable. If this is to happen, the private sector must have the confidence needed to expand investment. For now, the private sector is keeping a wait-and-see attitude with respect to new legislation governing the financial sector and public administration, and the rate of private investment remains lower than historical levels. It is hoped that once the government and the National Assembly have approved key pieces of legislation for the country's development, investment levels will improve.
- 1.3 Despite these risks, the short-term economic outlook for the Venezuelan economy is good. In particular, foreign currency-denominated liabilities of the public sector have shrunk significantly in the last three years, and the level of reserves is sufficient to keep the local currency, the bolívar, within the Central Bank's target band through the end of the year.

### **B. The agricultural sector**

#### **1. Recent history**

- 1.4 Agriculture represents one of the most important sectors of the non-oil economy in Venezuela, accounting for about 5% of GDP and employing nearly 10% of the economically active population. Agricultural exports represent close to 3% of total exports. Despite the great diversity and the natural advantages enjoyed by the sector, the country is a net importer of food. The agricultural trade balance runs an average annual deficit of US\$1.2 billion.
- 1.5 Between 1980 and 1988, the most widely planted crops were corn, sorghum, peanuts, cotton and sugarcane; in contrast, between 1989 and 1997 the leading crops were rice, oil palm, fruits and vegetables, and certain roots and tubers such as potatoes, yams, and cassava. Livestock production was focused on cattle, while swine had predominated in the previous decade, and poultry was significant during



both periods. In general, there has been a shift away from traditional products towards items for which there is strong demand in the cities and in export markets. In turn, these changes for the most part have gone hand-in-hand with substantially improved yields, reflecting technological change. On the other hand, the more dynamic role of external markets during the 1990s has brought with it a deterioration in domestic markets, caused by a gradual decline in incomes and the consequent drop-off in per capita food consumption.

- 1.6 The competitiveness of Venezuelan agricultural output has been significantly affected by the oil sector, primarily through the phenomenon known as the “Dutch disease”. In the first place, oil revenues have led to a real exchange rate that is unfavorable to the agricultural sector. In the second place, heavy dependence on fiscal revenues from oil exports means that government funding for the sector is subject to great volatility.
- 1.7 Estimates of land productivity, such as value added per hectare of arable land, show that it rose steadily at an average rate of 2.8% between 1966 and 1997, and at 3.1% for the period 1990-97, clearly confirming the vitality of Venezuelan agriculture. Yet there is broad room for technological improvement. In four of the six headings covered by a recent competitiveness analysis, the differentials between maximum yields achieved using the “state-of-the-art” technology and maximum yields obtained in the country vary between 50% and 150%. The area under cultivation declined between 1991 and 1997 by 20%, reflecting changes in pricing policies and subsidies, but also continued technical improvements.
- 1.8 The supply of Venezuelan agricultural products and their productivity have also been negatively impacted by a series of factors that, in contrast to the effects of the “Dutch disease”, can be readily corrected: for example, shortcomings in irrigation systems, marketing, human capital development, and production support services such as agricultural research and plant and animal health.
- 1.9 A study prepared by IFPRI suggests that the annual contribution of technological change in agriculture amounted to around 1.5% between 1966 and 1997. Assuming moderate growth in this contribution and in that of capital and labor, together with a neutral policy stance, it should be feasible to sustain and enhance productivity, meet the demands of a growing population with rising income levels, and sustain a moderate increase in agricultural exports.

## **2. Agricultural policy**

- 1.10 Until the late 1980s, all agricultural policies were characterized by a focus on import substitution, encouraged by import licensing, price fixing at both the consumer and producer level, direct or indirect subsidies, and active State involvement in the distribution of land and development of infrastructure, all of which was made possible by high oil revenues. Perhaps for this reason, and despite

other negative effects of the oil economy, the country's agricultural sector has maintained rates of growth comparable to the average for Latin America, without many obvious manifestations of the "Dutch disease". Yet the historic regime of protection and import substitution significantly distorted incentives for agricultural productivity. This reflected not only the effect of protectionism but also a marked tendency to address competitive problems through subsidies and compensatory benefits, which reduced the need to find technically innovative solutions.

- 1.11 Beginning in 1989-90 there has been a shift to greater openness, involving both progress and reversals, that have had a profound impact on Venezuelan agriculture, as noted earlier. In this context, the government proposed a political reform in 1999 that highlights the importance of sustainable growth, integrated rural development and productivity, among other aspects, all of which pose special challenges to technological know-how. In order to achieve these objectives, the government has prepared a National Agricultural and Food Development Plan that establishes a number of priority areas and sets three broad guidelines for national agricultural policy: (a) invigorate the agricultural production chains, by promoting competitiveness and sustainable development; (b) promote rural development; and (c) guarantee food security.

## **C. Status of agricultural technology**

### **1. The technology system**

- 1.12 The country has a fairly complex and well-developed innovation system, in which the chief player is INIA. Other important players are the universities, certain private research centers and a few agroindustries involved in sugar, corn, tobacco, dairy, and tomato production. The ratio of agricultural research spending to agricultural GDP is about 0.8%, while in developed countries it is closer to 2%, and the average for Latin America is about 1%. These figures indicate the importance of increasing spending on agricultural research in the country.
- 1.13 A diagnostic study conducted as part of the PRODETEC program financed by the Bank shows that agricultural technology in Venezuela presents the following characteristics and limitations: (i) much of the country's agricultural research capacity is not being well employed; (ii) lack of mechanisms for articulating production and research, evident in the unfortunate "inward" focus of INIA efforts, which should instead address demand in the environment, and the diffuse nature of the institution's mandate; (iii) inadequate and erratic financing and excessive dependence on government, together with a lack of mechanisms for INIA to generate its own income; (iv) weaknesses in record-keeping and the dissemination of technical and managerial information; (v) the low standing of agricultural science in the national and international scientific community, and (vi) the country's lag in incorporating the technological advances that have been made in agriculture in recent years.

- 1.14 The most important experiments at financing and building linkages between the private sector and the public research centers have been those of the Rice Foundation, which has an ambitious program under way for genetic and agronomic improvement, the Sardine Project, which seeks new approaches to sustainable management of this fishery resource, the Oil Palm Research Fund, constituted by producers and processors to overcome agronomic limits on the crop, the Tropical Viticulture Center, a joint initiative among producers, a private research center and a regional government, and several initiatives by dairy processors and cattle producers to overcome health and productivity problems in the national herd.

## **2. The National Institute for Agricultural Research**

- 1.15 With more than 40 years in existence as the Venezuelan Institute for Agricultural Research, the INIA (formerly FONAIAP) has played a central role in meeting the needs of Venezuelan agriculture through research, technical assistance, services and production of strategic inputs, such as basic seeds and immunobiological products. It also collaborates with the Agricultural Health Service (SASA) of Venezuela in areas such as seed research, fishery products and veterinarian services. Agricultural research spending by INIA accounts for roughly 80% of total spending in this area.
- 1.16 Consistent with the analysis indicated above, the INIA Act instituted several major institutional reforms: (i) it established INIA as an autonomous institution with independent operation and financial management; (ii) the proceeds from development and marketing of technologies generated by INIA accrue to INIA itself; (iii) the assets of INIA are its own property; and (iv) an Advisory Council was established, representing associations in the agricultural sector, to provide advice to management on policy and strategy and to audit results<sup>1</sup>. In addition to clarifying what was previously a diffuse mandate, the new legislation established incentives for exploiting the research capacities of INIA and provided for clear linkages to its client base and the possibility of generating greater revenues.
- 1.17 In implementing the reforms contained in the Act and in its 1998-2003 Strategic Plan, INIA has taken a series of initiatives, with support from PRODETEC, including the following: (i) it has successfully established links with different players in the technology system, in particular with producers' associations such as the Rice Foundation, the Oil Palm Industry and livestock associations, which are financing research projects jointly with INIA; (ii) it has identified research projects with significant commercial potential and has targeted its research<sup>2</sup>; (iii) it has begun to reorganize regional service units as cost centers; (iv) it is at an advanced

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<sup>1</sup> The Advisory Council consists of the President and General Manager of INIA, and nine advisers, including four representatives of the private sector, two representatives of INIA researchers and other staff, a representative of the State foundations involved in the sector, and a representative of the Ministry of the Environment and Natural Resources.

<sup>2</sup> The portfolio of research projects has been cut back from 550 to 118.

stage in designing financial and technical information systems that will not only enhance the quality of information but will also decentralize that information to the regional units, thereby strengthening their role as cost centers; (v) it has launched plans to enhance productivity and identify personnel capacities, which have already resulted in the elimination of 537 redundant positions, based on the new role of INIA; and (vi) it has plans to create a Foundation to manage the income it generates.

- 1.18 Efforts are still required, however, to carry out the mandate and the legal reforms and to resolve the limitations indicated in the analysis. INIA'S links to the environment need to be consolidated and extended, its research needs to be refocused, it must generate greater financial resources and achieve cost economies, as well as consolidate the technical information and institutional management system. These areas will be included in the operation under consideration.

**D. Bank experience in the sector**

- 1.19 **PRODETEC.** Financed under loan 692/OC-VE, the PRODETEC project was executed by FONAIAP<sup>3</sup>. The program was originally structured with a focus on agricultural research and technological development, with few links to the sector, and was found to be too ambitious for the institution's capacity. Research activities did not necessarily reflect the priorities of beneficiaries or clients. In light of execution difficulties and design problems, the government and the Bank agreed in 1997 to streamline and refocus the program, the last disbursement of which is planned for 18 December 2001.
- 1.20 Based on this reformulation, significant success has been achieved and a new operation can be considered. The proposed program will be managed by an INIA that is much better organized and more focused, thanks to the reformulation under loan 692/OC-VE. Experience to date has made it possible to identify priority issues and programs and to define specific areas of institutional strengthening in which the Bank can collaborate through the proposed program. The program will build upon PRODETEC and consolidate the efforts initiated under it.
- 1.21 PRODETEC also financed the first external evaluation of INIA<sup>4</sup>. The most important specific recommendations from that external review were as follows: (i) create a capital fund [*fondo patrimonial*] to ensure financial sustainability for the programming of INIA activities, by converting a portion of INIA assets that are currently unproductive; (ii) maintain a set of scientific and technological capacities to provide monitoring and support in areas of strategic importance for agriculture;

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<sup>3</sup> Loan 692/OC-VE, for US\$64.5 million, was approved on 19 August 1992. The loan was reduced to US\$34.5 million in 1999, after experiencing severe execution difficulties reflecting weaknesses in INIA and fiscal constraints.

<sup>4</sup> External Review of FONAIAP, MCT, Maracay, 2000.

(iii) pursue the development of capacities and requirements for opening the organization and linking it to the environment, in other words, develop its capacity to respond to external demands; (iv) assign priority to managing available technical and scientific information within the organization, as a strategic resource for making its activities more effective and supporting its linkage with the environment; (v) reinforce technological infrastructure and capacities in basic technical areas, consistent with ISO quality standards, in order to become a national benchmark for those standards; (vi) promote changes in the organization and execution of technical and administrative activities alike, in a context of internal automation and interconnection. These recommendations laid the foundations for preparation of the proposed program.

- 1.22 **CONICIT.** The National Council for Scientific and Technological Research (CONICIT), financed with loan 1220/OC-VE through the Science and Technology Program, is launching an ambitious program to expand the capacity to generate scientific and technological knowledge and to strengthen innovation. The proposed program has therefore been designed to reflect the existence of CONICIT, and consequently is more an institutional reengineering than a research program. In this respect, it will finance components that: (a) do not have access to the Science and Technology Program; (b) will allow INIA to compete for available funding and therefore make use of Bank resources; and (c) are located in areas that, given their sectoral priority and their importance for the transformation of INIA, should not depend on accessing competitive funds. The proposed program was reviewed jointly with the CONICIT authorities, who expressed their full agreement with it.

**E. Bank strategy in the sector**

- 1.23 The proposed program will contribute directly to three of the Bank's strategic objectives for the country: (i) it will support the management and sustainability of INIA and agricultural technology, thereby contributing to modernization of the State; (ii) it will help increase productivity in non-oil sectors, enhancing international trade, in particular integration among Andean countries, diversifying production and increasing exports; and (iii) it will enhance regional development and decentralization.

**F. Program design**

- 1.24 Venezuela is endowed with agroecological conditions representing comparative advantages that have yet to be effectively exploited. Various productivity gaps have been identified, and closing them will require action on several fronts, including steps to strengthen technological development. Technological development will depend essentially on reinforcing the national system for agricultural innovation, by establishing a series of institutions and firms that can effectively offer services, technologies, inputs and products required by the sector to maintain its growth and promote its competitiveness. INIA plays a central role in coordinating the system,

since: (i) it controls the bulk of scientific resources, (ii) it is an agency for technical coordination and a clearinghouse on quality and regulation, and (iii) it provides technological support for the agricultural extension system. This role needs to be enhanced by strengthening its capacity to link the different players in the innovation system so that it can respond better to demand in the environment.

- 1.25 Consequently, by consolidating the reforms now under way and the investments made with the help of PRODETEC, the proposed program will strengthen INIA capacity to act as an interface and establish linkages with the national agricultural innovation system and give institutional and financial sustainability to INIA. The program will enhance the capacity of INIA and of the system to: (i) provide leading-edge technological services and thereby stimulate the agricultural innovation system; (ii) market and transfer technologies to the productive sector; (iii) target its research to market needs and social and environmental policies; and (iv) provide technical information on natural resources and conditions indispensable for modern agriculture.

## **II. THE PROGRAM**

### **A. Objectives and description**

- 2.1 The general objective of the program is to help increase productivity in the agricultural sector by transforming INIA into an agent for stimulating the agricultural technology system so that it can generate technologies and provide services efficiently.
- 2.2 To achieve this objective, the program will: (a) create and strengthen internal financial resources so that INIA can achieve greater financial independence and sustainability<sup>5</sup>; and (b) strengthen INIA so that it can respond to the needs of the environment and to become an integral part of the agricultural research system.
- 2.3 The program will enhance sector efficiency by consolidating the institutional reform of INIA, taking advantage of the investments made with PRODETEC funding, generating financial and technical conditions for the sustainability of INIA programs, and strengthening the capacity of INIA to respond to the demands of agriculture and of agents in the agricultural sector. It will also strengthen technological development capacities by modernizing the service through the adoption of modern technologies, the accreditation of laboratories, and the consolidation and development of information systems. The program has three subprograms and seven components.

### **B. Program structure<sup>6</sup>**

#### **1. Institutional modernization (direct costs: US\$9.6 million)**

- 2.4 **Consolidating the technical information and institutional management system (US\$4.5 million).** This component will strengthen institutional mechanisms for providing strategic inputs to INIA in order to systematize programs and planning, decision-making and performance monitoring. To meet these objectives, funding will be provided for: (i) procurement and installation of a system of telephone servers; (ii) replacement of obsolete computer hardware to meet the needs of the information systems; (iii) consulting services for administering and operating the management information system; (iv) consulting services for developing and maintaining technical and scientific information systems in agrometeorology, soils and waters, agricultural health, biodiversity, genetic resources and fisheries resources; (v) consulting services for developing a project evaluation system; (vi) consulting services for developing and consolidating the financial

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<sup>5</sup> Greater independence from government financing for INIA is particularly important, given the volatility of fiscal revenues in Venezuela and the fact that GDP growth is so dependent on oil prices.

<sup>6</sup> Annex II.1 contains the logical framework for the program.

administration information system; (vii) consulting services involving studies, particularly for identifying critical technological components in the agrifood chains and to assess the impact of technologies, including on the environment; and (viii) consulting services for external evaluation of institutional, technical, economic, environmental and partnership aspects, and preparation of the INIA Strategic Plan for the following period.

- 2.5 **Job retraining (US\$5.1 million)**<sup>7</sup>. The intent here is to continue modernizing the institution by reducing surplus personnel: the current INIA staff of 1,630 will be cut by 151 positions<sup>8</sup>. The workforce adjustment plan is based on previous experience acquired by INIA under similar programs, and on a study of the institution's human resource needs and a profile of its existing personnel. A job retraining program will therefore be designed and implemented, to include: (i) training for establishing microenterprises producing goods and services; (ii) training and refresher courses for placement in the labor market, including continuation of training grants already provided; and (iii) payment of social benefits in accordance with legislation. A presidential decree will have to be issued for the new INIA retraining program, or else the MCT and Ministry of Planning and Development will have to approve it. Entry into force of the decree or the alternative legal instrument will be a condition precedent to the first disbursement. INIA expects that the instruments will be approved before the end of the year. This component will be financed entirely through local counterpart resources.

## **2. Strengthening financial sustainability (direct costs: US\$5.2 million)**

- 2.6 **Strengthening technological linkage capacities (US\$4.3 million)**. INIA's relationship to its client base will be strengthened, particularly as regards the industry providing products and technological services, and this will ensure that better use is made of its research and development capacities. Assistance will be provided for strengthening the overall national innovation system for the sector, as well as improving the transfer and dissemination of its technologies. The intent is to optimize INIA's own revenues by charging for certain services and generating value added for existing technologies as a means of attracting the private sector.
- 2.7 This component will support strengthening in the area of business technology and linkages, by financing: (i) advisory services, studies and training for the development of the Business Department and research centers, in areas of business development and cost calculation; (ii) commercializing technologies, promoting complimentary research, market analysis, scaling tests, and intellectual property management, as the first step towards negotiating marketing agreements, and

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<sup>7</sup> INIA began a workforce adjustment program in 1998, as a result of which 537 employees have retired. That program was considered successful, and the acquired experience has been used in designing the new program.

<sup>8</sup> The total workforce adjustment program of INIA covers 298 employees.



establishment of a Marketing Fund [*Fondo de Valorización*] for financing activities of this type<sup>9</sup>; (iii) implementation of the Fundación INIA<sup>10</sup>; (iv) establishment of about 11 business units (such as in the soil laboratories and food safety testing for export) to manage the marketing of technological services, including minor equipment, cost studies, and studies of willingness to pay and pricing; and (v) training in participatory research for small producers.

- 2.8 **Support for establishment of a Capital Fund (US\$900,000).** This component is intended to establish permanent sources of revenue for INIA, over a period of 24 months, through the conversion of assets that are currently unproductive. The institution intends to earmark in this way 50 hectares that it owns in Maracay. The value of this property is estimated at no less than US\$40 million, which could generate a permanent income of some US\$3 million annually. Funding will be provided for financial, legal, environmental and cadastral survey studies, as well as the study of options, the design of the selected option, calls for tender and negotiations, and the design and implementation of a fiduciary mechanism administered by a financial institution.
- 2.9 The authorities have agreed that resources from the Capital Fund may be used in such areas as maintaining equipment and laboratories, developing human resources and priority research areas, i.e., in areas essential to INIA operations. Operating regulations have been prepared and reviewed by the project team, and they include priorities for use of the resources from the Capital Fund. Eligibility of the operating regulations of the Capital Fund is a condition precedent to the first disbursement. As in the case of the proceeds from sale of technological services and products, the income from the Capital Fund will be administered by the Fundación INIA. In selecting research projects, the method described below for prioritizing the research consortium component will be applied.

### **3. Modernizing agricultural technology (direct costs: US\$17.5 million)**

- 2.10 **Technological modernization (US\$13.5 million).** This component will support the development of capacities to apply new techniques considered critical for the competitiveness of the national innovation system, the production of chemical-free foods and their dissemination to the rest of the system through training, thereby reinforcing the impact of the technological linkages component. This includes three

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<sup>9</sup> Eleven projects with commercial potential have been identified, representing one-third of the resources earmarked for the fund. These projects were selected on the basis of their profitability and their potential for marketing. The Marketing Fund will constitute an account within the Fundación INIA for financing these projects. If they are successful, they will return the money to the fund, as part of the revenues of the Fundación INIA. The results of previous and ongoing research as well as the institution's equipment and human resources will be used.

<sup>10</sup> Foundation for the Development of Agricultural Technology Research ("Fundación INIA"), which is explained below.

subcomponents: updating technologies, accrediting laboratories, and upgrading environmental performance.

- 2.11 **Updating technologies (US\$5.9 million).** Biological and information technologies will be strengthened, particularly with respect to new techniques for characterizing germplasm, supporting phyto-improvement, phyto and zoosanitary diagnosis and geographic information systems and satellite imaging analysis in 24 labs identified on the basis of demand for products and services.
- 2.12 The capacities for using technologies will be strengthened through financing for training and specialized advisory services, procurement of required equipment and upgrading or construction of the necessary laboratory infrastructure and construction of a new Veterinary Research Institute (IIV) and an environmental impact assessment in accordance with current national standards<sup>11</sup>. INIA must be modernized in order to retain its relevance and its linkages to the sector. The current IIV is obsolete and is located on the property in Maracay. Training will involve both national and international study, in which the trainee will gain hands-on experience in applying the technology in question, with the assistance of an expert researcher. This is essential given the complexity of the technologies and the specificity of application to particular situations. In order to disseminate the new technologies to the rest of the innovation system, workshops will be held for non-INIA professionals.
- 2.13 **Accreditation of INIA laboratories (US\$7.2 million).** In the area of services, quality control is a key element of the new institutional strategy for building linkages to the sector and for responding to industry demands. This will require accrediting 18 INIA laboratories selected on the basis of their volume of analytical work and the potential future market for the services offered.
- 2.14 Funding will be provided for: (i) purchase and incorporation of equipment and upgrading of infrastructure required to take advantage of new biological and information technologies; (ii) training and specialized advisory services in the areas involved; (iii) training in the corresponding organizational and management changes; (iv) training as a certifying institution for organic products; and (v) costs flowing from the process of securing ISO 17025 (ISO Guide 25) and ISO 14000 accreditation for the selected laboratories. The equipment needed for the corresponding accreditation has been identified. These new technologies and laboratory accreditation will help INIA establish more effective linkages with agents of the technology innovation system.
- 2.15 **Environmental upgrades (US\$0.4 million).** INIA and the technology system will be strengthened in accordance with new environmental requirements for trade and productive activities. Among these are biosecurity, environmental control and

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<sup>11</sup> These technologies are new for INIA but are in use in other countries of the region.

laboratories, and organic farming. Technical assistance will be provided to INIA to develop a methodology for ex ante and ex post environmental assessment of its projects. Twenty training courses will be provided for 489 participants from INIA and other agents, covering administrative rules and procedures, health and environmental impact assessment for agricultural activities, environmental audits and environmental impact indicators. With respect to genetic engineering, technical assistance will be provided to develop an institutional basis for safe handling of these techniques and to give INIA the capacity to certify organic farming. Financing will also be provided for an environmental audit of 20 laboratories, meeting environmental standards, and registration of INIA in the RASDA (Registry of Environmentally Harmful Activities) and accreditation of five laboratories to the ISO 14000 standard<sup>12</sup>.

- 2.16 **Support for research consortia and technical assistance to third parties (US\$4 million).** Support for research consortia will help shift the focus for selecting research projects by INIA, by directly involving agents of the system and articulating INIA more squarely with the sector. Since it will take at least 24 months to have the Capital Fund up and running, the INIA research program will need support. With the participation of academic and private bodies from the agriculture research sector, INIA will identify and select research projects using a methodology based on economic, social and environmental criteria, as well as opportunities in the agricultural sector<sup>13</sup>. Demand for two types of research projects will be identified: (i) in areas of interest to the private sector, for example, market-oriented technological innovation projects; and (ii) in areas of interest to society as a whole, for example, systems for exploiting fragile watersheds or for respecting the biodiversity of the Amazon basin. Support will cover direct research costs, specialized equipment and consulting services for establishing the prioritization methodology. This component includes creation of a Research Consortium Fund [*Fondo de Consorcios*] that will provide financing on a competitive basis for projects involving INIA and one or more institutions or businesses, or in cooperation with outside researchers. The Consortium Fund will be administered by the Fundación INIA.
- 2.17 In the allocation of research resources from the Innovation Consortium Fund and revenues from the Capital Fund, a methodology will be used that can prioritize headings, scenarios for the farming sector and profiles for projects, in terms of responding to sector demands. This methodology is highly participatory, and the identification of research problems and priorities will involve private agents, universities, research centers, associations, INIA researchers and others.

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<sup>12</sup> The costs of the laboratory audits and purchase of equipment for environmental upgrading are included in the subcomponent for laboratory accreditation.

<sup>13</sup> The RE3/RE3 files include a document on the research project selection methodology.

- 2.18 Technical assistance for third parties will help strengthen other agents of the technology system and will involve a series of training activities in project formulation, use of new techniques, quality assurance, establishment of external consortia.
- 2.19 **Administration (US\$1.5 million).** This component includes costs of the Program Coordination Unit, the wages and salaries of which will be financed through the local contribution, while training for INIA senior management will be provided with Bank funding.
- 2.20 **Concurrent costs (US\$2.9 million).** This covers incremental operating expenses such as travel, fuel, lubricants, office equipment and vehicle maintenance, office materials, furnishings, vehicle insurance premiums, postage expenses, communications and other costs inherent in the bidding process, such as newspaper advertisements, import duties, customs services and charges. These expenses, financed entirely with local resources, were calculated on the basis of experience with some other costs under PRODETEC. The item also covers the estimated cost of external audits for the program, which was calculated on the basis of the prices charged by local audit firms. Finally, it includes funding for preparation of the SASA health program to supplement the agricultural production support services<sup>14</sup>.
- 2.21 **Other costs.** Costs relating to contingencies and escalation, as well as financial costs were calculated using normal Bank criteria.

### **C. Costs and financing**

- 2.22 The total cost of the program is US\$45 million, distributed among the components and other categories as shown in Table II.1.

#### **1. Bank financing**

- 2.23 The Bank will fund US\$22.5 million (50%) of the total cost of the program, from Ordinary Capital resources. The National Assembly has provided authorization for the external borrowing. The Bank loan will be subject to the following conditions:

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<sup>14</sup> The SASA program was originally included as a subprogram in its own right. The SASA program consists of several components for strengthening the institution in the areas of animal and plant health. The SASA program is important for increasing productivity in the agricultural sector, the ultimate objective of this proposed program.

Fund:	IDB-OC
Amortization period:	20 years
Disbursement period:	4 years
Interest rate:	variable
Inspection and supervision:	1%
Credit fee:	0.75% on undisbursed balances
Currency:	US\$ from the Single Currency Facility

## **2. Local contribution**

- 2.24 Counterpart funding to the equivalent of US\$22.5 million (50% of the total) will be contributed by the Bolivarian Republic of Venezuela. The contribution for the first year of program operations is included in the National Budget Act.

**Table II-1**  
**Program Costs**  
**(US\$000)**

<b>CATEGORIES</b>	<b>IDB</b>	<b>LOCAL</b>	<b>TOTAL</b>	<b>%</b>
<b>1.- ADMINISTRATION</b>	<b>200.00</b>	<b>1,300.00</b>	<b>1,500.00</b>	<b>3.3</b>
1.1. PCU staff		1,300.00	1,300.00	2.9
1.2. Senior Management training	200.00		200.00	0.4
<b>2.- DIRECT COSTS</b>				
<b>2.1. Institutional Modernization</b>	<b>3,880.00</b>	<b>5,684.00</b>	<b>9,564.00</b>	<b>21.3</b>
2.1.1. Consolidation of Info & Management System	3,880.00	584.00	4,464.00	10.0
2.1.2. Workforce Adjustment	0.00	5,100.00	5,100.00	11.3
<b>2.2. Strengthening Financial Sustainability</b>	<b>3,800.00</b>	<b>1,380.00</b>	<b>5,180.00</b>	<b>11.5</b>
2.2.1. Linkage capacities	2,910.00	1,380.00	4,290.00	9.5
2.2.2. Establishment of the Capital Fund	890.00		890.00	2.0
<b>2.3. Modernization of Technology</b>	<b>8,500.00</b>	<b>9,029.00</b>	<b>17,529.00</b>	<b>39.0</b>
2.3.1. Technological modernization	6,500.00	7,029.00	13,529.00	30.1
2.3.1.1. Technology updating	4,100.00	1,800.00	5,900.00	13.1
2.3.1.2. Laboratory accreditation	2,400.00	4,844.00	7,244.00	16.1
2.3.1.3. Environmental education	0.00	385.00	385.00	0.9
2.3.2. Research and TA consortia	2,000.00	2,000.00	4,000.00	8.9
<b>Sub-Total DIRECT COSTS</b>	<b>16,180.00</b>	<b>16,093.00</b>	<b>32,273.00</b>	<b>71.8</b>
<b>3. CONCURRENT COSTS</b>	<b>600.00</b>	<b>2,300.00</b>	<b>2,900.00</b>	<b>6.4</b>
3.1. Operating expenses		2,300.00	2,300.00	5.1
3.2. Program audit	400.00		400.00	0.9
3.3. Preparation of the SASA program	200.00		200.00	0.4
<b>4. CONTINGENCIES AND ESCALATION</b>	<b>1,765.00</b>	<b>2,481.00</b>	<b>4,302.00</b>	<b>9.6</b>
<b>5. FINANCIAL COSTS</b>	<b>3,725.00</b>	<b>300.00</b>	<b>4,025.00</b>	<b>8.9</b>
5.1. Interest	3,500.00		3,500.00	7.8
5.2. Commitment fee		300.00	300.00	0.6
5.3. Inspection and Supervision	225.00		225.00	0.5
<b>T O T A L C O S T</b>	<b>22,500.00</b>	<b>22,500.00</b>	<b>45,000.00</b>	<b>100</b>

### **III. PROGRAM EXECUTION**

#### **A. Project execution and administration**

##### **1. Organization of execution**

- 3.1 The program will be executed by INIA. Technical execution will be the responsibility of the departments and offices most directly relating to each component. The Program Coordination Unit (PCU) under the General Manager will maintain liaison with the Bank and with national and international entities, and will be responsible for monitoring, coordinating and general control of the program. Its duties will include: (i) coordinating the preparation of annual operating plans for the program, monitoring execution of those plans, identifying variance between plans and execution, and determining the necessary adjustments and the organizational responsibility for implementing them; (ii) monitoring and control of compliance with contractual requirements; (iii) timely presentation of reports and financial statements as required by the Bank; (iv) timely securing of local resources and timely presentation to the Bank of disbursement requests; and (v) promoting coordination, communication and integration of the desired objectives among the units involved in program execution. The PCU has already been established and is in operation.
- 3.2 In addition, drawing upon earlier experience under PRODETEC with respect to procedures for the procurement of goods and services (preparing tender documents, calling for bids, evaluating bids, etc.), and consistent with Bank requirements, the PCU will retain responsibility for coordinating these processes for the program. The PCU will consist of the Coordinator-Manager, four professional coordinators and two administrative assistants.

##### **2. Method of execution**

- 3.3 Technical responsibility for executing the various components of the program will fall to distinct units of INIA, as shown in Table III-1.
- 3.4 Component 1.1. Consolidation of the institutional management system will be the responsibility of the Institutional Development Office (ODI), in coordination with the Research Department, the Systems Division and the PCU, with the support of consultants to be contracted through IICA.
- 3.5 Component 1.2. Workforce Adjustment will be conducted on the basis of: (a) experience acquired during the workforce adjustment that began in late 1998 and was considered successful in that it reduced staffing by 537 positions; and (b) studies on staffing needs for the newly reorganized INIA, and an inventory of existing staff positions. The process of separation for 151 surplus employees and the hiring of a consultant to design and implement the Workforce Adjustment Plan

will be the responsibility of the Office of Human Resources, together with the senior management of INIA. Special care will be taken during execution of this component to apply equal treatment, including from a gender viewpoint. As well, the INIA will give priority to providing the microenterprises to be created under this component with opportunities to contract for services. Finally, special care will be taken to ensure that workers affected by the adjustment component are protected in their rights, that national labor legislation is respected, and that adequate compensation is provided in accordance with labor market standards.

**Table III-1**  
**Units responsible for program execution**

<b>Subprogram</b>	<b>Component</b>	<b>Responsible unit</b>
1. Institutional modernization	1.1. Consolidating the institutional management system	Office of Industrial Development
	1.2. Workforce adjustment	Office of Human Resources Office of Institutional Development
2. Strengthening financial sustainability	2.1. Strengthening technological linkages	Business Technology Department
	2.2. Establishment of a Capital Fund	General Manager's Office
3. Modernizing agricultural technology	3.1. Technological modernization	Research Department
	3.2. Research consortia and assistance to third parties	

- 3.6 Component 2.1. Strengthening technological linkages. Strengthening the Business Department (GN) will involve contracting consultants through IICA to conduct the studies and training proposed. The staff required for this department will also be hired. The work of creating and implementing the Marketing Fund will be led by the GN, with support from the Administration and Services Department. These activities are related to preparation of Operating Regulations, including rules for use and accounting of program resources. The draft Operating Regulations were reviewed by the project team, and their eligibility is a condition precedent to the first disbursement. Allocation of funding for marketing activities will be done through specific proposals prepared by the responsible researchers, which will include a financial analysis assessing the likelihood that the investment can be recovered. Administration of the Marketing Fund will be entrusted to the Fundación INIA through a trust arrangement.
- 3.7 Instituting the business units in the laboratories and input production areas will require training, a financial information system, equipment procurement and an



administrative system to supervise and control operations. The training topics have already been identified and IICA will provide administrative support for contracting instructors and handling the training grants. Equipment procurement will be done by the PCU in accordance with specifications prepared by the GN. The work of setting up the Fundación INIA will be done by consultants under supervision of the GN on behalf of INIA'S senior management.

- 3.8 Component 2.2. Studies for establishing a Capital Fund will be contracted to a specialized consultant hired and supervised by the President and General Manager. Draft terms of reference for the consultant have been prepared, and will be finalized during program execution. Revenues of the Capital Fund will be administered by the Fundación INIA through a trust fund established with a financial institution. The Capital Fund will have its own operating regulations, the draft of which was reviewed by the project team. Its eligibility is a condition precedent to the first disbursement.
- 3.9 Component 3.1. Technological modernization consists of three subcomponents, which will be executed as follows. The training needs of researchers, equipment and infrastructure construction requirements have been identified by the GI in coordination with the directors of the executing units and the heads of the laboratories involved. The GI will be responsible for executing this component with the support of the directors and laboratory heads, a quality control expert and an environmental specialist. Hiring of an environmental specialist within INIA will be a condition precedent to the first disbursement. The administrative aspects of hiring the instructors will be looked after by IICA, while minor upgrades will be undertaken and supervised by the individual research centers. The design, execution and supervision of major rehabilitation works will be contracted by the PCU.
- 3.10 Component 3.2. Research Consortia and Technical Assistance will be executed by the GI through: (i) contracting of consultants to implement the project evaluation and selection methodology; (ii) contracting an economist to assess the economic feasibility of all projects submitted, and a professional to design the project competition; and (iii) the process of selecting lines and submitting projects for competition will be organized in accordance with guidelines issued by the General Manager.
- 3.11 Before the selection of projects, the INIA General Manager will organize a series of topic-specific workshops at the regional and national level to identify problems and opportunities in the agricultural sector in order to determine priority issues and areas of research. Agricultural businesses, universities, public and private research centers, associations, INIA researchers and members of the INIA Advisory Council will be involved, among others. Participants will be sent invitations and agendas for the meetings at least two weeks in advance. Based on the results of these workshops, the General Manager will prepare and issue the documents inviting competitive bids from researchers wishing to submit research proposals. INIA will

publicize the call for proposals through the printed media and over the Institute's web site. A period of 60 days will be allowed for the submission of proposals.

- 3.12 During the project selection process, the first stage will consist of prequalifying proposals through a peer assessment system involving the responsible research reviewer in INIA and an external expert. Once proposals are prequalified in accordance with the guidelines established in the call for tenders, the technical, economic and environmental aspects of the prequalified projects will be rated. The selection committee, composed of INIA technical staff, including the economist and the environmental specialist and external evaluators of recognized expertise, will select the projects for submission to the INIA Board of Directors. The involvement of external evaluators and representatives in the process of identifying priority topics, prequalifying and selecting projects will strengthen the transparency of the process. This process is based on a highly participatory methodology involving agents of the technology system. The draft methodology has been reviewed by the project team and will be used for all INIA research projects.
- 3.13 A Consortium Fund will be created to finance the selected projects, and will be placed in trust with the Fundación INIA. The Research Consortium Fund will provide project financing on a competitive basis, jointly with INIA and one or more institutions or firms, or in cooperation with external (non-INIA) researchers. In the case of market-oriented technology innovation projects, INIA partners will contribute cofinancing for a minimum of 25% of total project cost. It is expected that at least 50% of the funding under this component will be used in cofinancing with other agents. In the case of projects of general social interest (agricultural exploitation of fragile watersheds), strategic alliances will be struck with private and academic research entities with strengths in the specific project area. In such cases, the Consortium Fund will finance the entire research cost. The Fund will have its own operating regulations, a draft of which has been reviewed by the project team. Its eligibility is a condition precedent to the first disbursement.
- 3.14 To ensure transparency in the process of project selection and financing, and to help INIA respond adequately to sector demands, the Assembly of the Fundación INIA and the Advisory Council of INIA will maintain oversight over the process of selecting projects for financing. The membership of the Assembly is primarily from the private sector, but also includes representatives of universities and other research institutes. The Advisory Council has a similar composition to that of the Foundation. The involvement of these two bodies at the final stage of the project selection cycle will guarantee transparency for the process.
- 3.15 Terms of reference are already in hand for the planned consulting and training work, except as otherwise indicated. Rather than increase internal staffing, it was decided to rely on IICA support for the administrative aspects of hiring consultants and domestic and international instructors and payment of travel and allowances for international training, in light of IICA's specialized knowledge, its sizable registry

of consultants and its experience in these areas, as well as the positive relationship it has developed with INIA since 1997, as a result of PRODETEC. The value of contracts that IICA will administer is estimated at US\$3.6 million, or 8% of program funding. In cases where IICA is involved, its counterpart will be the PCU. For the reasons indicated, INIA will sign an agreement with the IICA Agency for Technical Cooperation in Venezuela, similar to the existing agreement between the two institutions. IICA's fee for administering the contracting of consulting and training services will be paid from the local contribution.

- 3.16 The program will be executed on the basis of Annual Operating Plans (OPAs). The eligibility of the OPA for the first year will be a condition precedent to the first disbursement. As a special condition, the OPAs will be submitted to the Bank before the end of the preceding year. The draft OPA for the first year of program execution has been reviewed by the project team. Preparation of the OPAs will be directed by the General Manager of INIA, with coordination support from the PCU, and they will be approved by the INIA Board of Directors. They will contain the following aspects: (i) activities to be conducted and goals to be achieved in each year; (ii) investments and expenditures to be made and sources of financing; (iii) units and officials responsible for meeting the goals; and (iv) environmental commitments indicated in chapter V. The works and the goods to be acquired will be listed, as well as the personnel to be contracted, the consulting services to be performed and the training to be carried out in that year.
- 3.17 As well, the program as a whole will have a Program Operations Manual (OM), which will be prepared by the PCU for approval by the INIA Board of Directors and the Bank. The draft OM has been reviewed by the project team, and eligibility of the Program OM is a condition precedent to the first disbursement. The manual sets out the execution responsibilities of each of the units involved, the execution process in the case of activities involving two or more units, and the relationships among units in the process. The OM will also include the plan for closing and dismantling the septic pits on the Maracay property, and for monitoring the EIA of the new IIV, in accordance with official national standards.

## **B. The Fundación INIA**

- 3.18 One of the main problems facing an institution such as INIA in pursuing a strategy of technological linkages and diversification of financing sources for ensuring its financial sustainability lies in the restrictions that its status as a public agency imposes on its management systems. Building technological linkages and achieving self-financing require a different kind of organizational support than what is usually found in research institutions like INIA. The Fundación INIA offers such an organization, and will allow INIA a degree of budgetary independence from the national government. The importance of establishing the Foundation lies in the need to increase the self-financing of agricultural research activities as a way of

gradually reducing their burden on government finances, and the restrictions that this implies.

- 3.19 The purpose of the Foundation is to promote and facilitate technological linkages between INIA and players in the technology innovation system, by providing administrative and financial support for its activities. The Fundación INIA is the instrument for administering the proceeds from marketing of technology products and services, including those generated by the business units, the Marketing Fund, the Consortium Fund, and income from the Capital Fund. Each of the funds will have its own operating regulations, and INIA will have a framework agreement with the Foundation.
- 3.20 The Fundación INIA will be a nonprofit entity under private law, consistent with the provisions of the Civil Code, and will be independent of the central government in terms of its administrative management of funds, but will be closely tied to INIA, with respect to its policies and operating criteria. The draft constitution and statutes of the Foundation as well as the draft agreement between the Foundation and INIA have been reviewed by the project team. It is expected that the INIA Board of Directors will approve the creation of the Foundation before the end of 2001. The legal constitution of the Fundación INIA is a condition precedent to the first disbursement.
- 3.21 The objectives of the Foundation, the framework agreement with INIA, the project selection methodology and operating standards (which the Bank will approve) will ensure not only that INIA does not compete for funding with the private sector, but that on the contrary it will seek out partners for all the research projects financed by the Foundation.
- 3.22 The management and financial administration of the Foundation will be in the hands of the Assembly, the Board of Directors and the Executive Manager. The Assembly, which will be the senior management authority, will have at least 50% plus 1 of its members from the private sector, in addition to representatives of universities and other research institutions. The majority of members will belong to the private sector. The Board of Directors will consist of the President, the Vice President and a member appointed by the Assembly. The President of the Foundation will be, ex officio, the Chairman of the Board of Directors of INIA. Administration of the Foundation will be the responsibility of the Executive Manager, who will act in close coordination with the Board of Directors, of which he will be the Secretary. In addition to the Manager, a small staff will be required, consisting initially of an administrator and secretary.

**C. Procurement of goods and services**

- 3.23 Normal Bank procedures will be followed in the procurement of machinery, equipment and other goods and services related to project execution and to the

award of the works contract. International competitive bidding will be compulsory for the procurement of goods exceeding US\$350,000, consulting services exceeding US\$200,000, and civil works exceeding US\$3 million. Although there are not expected to be any tenders for works in excess of US\$3 million, INIA expects that some works of lower cost such as the IIV, for US\$2 million, will be put to international competitive bidding because of their complexity. In other cases, those below these limits, or where the works or equipment can be supplied locally, domestic bidding will be followed. Details on the number of tenders and the type of bidding expected are attached as Annex III-1. As an exception to the procedure of selecting consultants through public tendering, it is recommended that IICA be contracted directly for the tasks of hiring consultants, making minor purchases and other activities, in accordance with the Bank's procurement policies and procedures. The proposed contract is consistent with Chapter GS-403 of the Procurement Manual.

**D. Execution period and disbursement schedule**

- 3.24 The program disbursement schedule is shown in the following table, and covers a period of four years, based on estimates of the time needed to carry out each of the components and on evaluations of INIA'S execution capacity, as well as the availability of local counterpart funds. As noted, a major portion of the disbursements is expected to be made during the first two years of program execution, since much of the procurement of goods, civil works such as the IIV, and a great portion of the training and consulting services, will be effected during the first two years.

**Table III-1**  
**Annual Program Disbursements**  
**(US\$ millions)**

Source	Year 1	Year 2	Year 3	Year 4	Total
IDB	7.8	9.9	3.3	2.4	22.5
Local counterpart	10.3	6.9	3.1	2.2	22.5
Total	18.1	15.9	6.4	4.6	45.0
Percentage	40%	35%	14%	11%	100%

**E. Maintenance of equipment and works**

- 3.25 INIA will include funds in its regular budget for maintaining in sound operating order the equipment and assets acquired through PRODETEC, and those acquired under this program. INIA will prepare reports and plans for maintaining equipment and works. In the first three months of each fiscal year, it will submit to the Bank a report on maintenance performed during the previous year, and its plans for the following year. These reports, which will include evidence of budgetary provisions

for maintenance, will be submitted to the Bank for six years following the procurement of the goods or the construction of the works. In the event that budgetary resources of the central government are inadequate for maintaining equipment and works, it has been agreed that funds of the Capital Fund may be used to supplement other resources for this purpose. Identification of the Capital Fund as a supplementary source of maintenance funds will not release the central government from its responsibility and commitment to provide such financing.

**F. Retroactive financing**

- 3.26 The borrower has requested the Bank to recognize as a charge to the local counterpart contribution expenses incurred since 13 June 2000 the date of the loan application, amounting to US\$1 million, and that retroactive financing be provided for further expenditures incurred in the amount of US\$0.3 million, in accordance with Bank policy. These expenditures were related to costs and investments that are part of the program. The project team has reviewed these expenditures, and has determined that they result from contracts that meet Bank standards and procedures. The CVE will review the documentation again before final approval of the local counterpart and retroactive financing.

**G. Monitoring and evaluation**

**1. Internal and external audit**

- 3.27 An internal audit of the program will be conducted by the Internal Comptroller's Office of INIA, which will also appoint an internal auditor for these purposes within the Fundación INIA. The annual audit plans will be presented to the Bank for information. These plans, in the case of the Foundation, will be based on audit principles generally accepted in the private sector.
- 3.28 The financial statements for the program, those for the Capital Fund, Consortium Fund and Marketing Fund, the Fundación INIA and the Institute will be audited by a firm of certified public accountants acceptable to the Bank, and will be submitted to the Bank each year during the program execution period. This will take place within 120 days after the close of the fiscal year. The costs of these external audits will be paid from program resources<sup>15</sup>.

**2. Program supervision and monitoring**

- 3.29 The program's supervision will be the responsibility of the CVE, supported by the project team, on the basis of information contained in the OPAs and in the half-yearly and annual financial reports received from the PCU. As part of the program

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<sup>15</sup> The Commercial Code requires intervention by an external *comisario* who must review the financial statements of the Foundation.

supervision process, there will be a mid-term review that will cover the following topics: (i) progress under the various components, in particular progress and financing of the various funds; (ii) establishment and operation of the Fundación INIA; and (iii) evaluation of the concepts underlying preparation of the program, namely: “linking INIA to the sector”, “gradual increase in the self-financing of research”, “business units” and environmental and social aspects, in accordance with the agreed methodology. For the mid-term environmental assessment, an outside (non INIA) consultant will be hired and paid by the Bank.

### **3. Final and ex post evaluation**

- 3.30 In addition, funds are included for a final external evaluation of the program, covering two topics: (i) the degree of modernization achieved by INIA through the program; (ii) evaluation of the institutional, technical, economic, environmental and consortium<sup>16</sup> areas and preparation of the INIA Strategic Plan for the following period. The final evaluation will lay the basis for the strategy for updating INIA in following years. An external evaluation of this kind was conducted in the past, and was found very useful to INIA in planning the currently proposed program.
- 3.31 INIA has agreed to conduct a program impact evaluation five and 10 years after program completion. The evaluation will review the same areas as the final evaluation and will use baseline data similar to that to be used for the final evaluation. INIA has included a provision in the Fundación INIA by-laws that it will provide the necessary resources to finance the evaluations. The General Conditions of the program stipulate that INIA agrees to conduct the impact evaluations and submit them to the Bank within six and 11 years after program completion.

### **H. Poverty-targeting and social sector classification**

- 3.32 Given its nature, the project is not expected to have a direct impact on poverty reduction or enhanced social equity. Accordingly, it does not include any specific performance indicators for measuring poverty reduction or the enhancement of social equity.

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<sup>16</sup> The baseline of data for external evaluation of the program is expected to be approved before the Board of Executive Directors considers the operation.

#### **IV. BORROWER AND EXECUTING AGENCY**

##### **A. Borrower and guarantor**

- 4.1 The borrower will be the Bolivarian Republic of Venezuela, which will also provide the counterpart contribution. Resources of the loan and the counterpart contribution will be transferred by agreement to INIA as a capital contribution. A condition precedent to the first disbursement will be signature of the Agreement Transferring Loan Resources and the Local Counterpart between the MF and INIA.

##### **B. Executing agency: INIA**

- 4.2 In light of the program's goal of strengthening INIA, this section discusses: (i) the organizational and financial status of INIA; and (ii) the institutional requirements flowing from the new vision of INIA and the expected results of the program in support of the vision.

##### **1. Organization and functions**

- 4.3 The Agricultural Research Institute Act came into effect in August 2000, whereby the former FONAIAP became the INIA under the MCT with a mandate to conduct research and development and to provide technology services targeted at promoting sustainable development and competitiveness in the agriculture, livestock, forestry, fisheries sectors and the rural economy.
- 4.4 The senior management of INIA consists of the Board of Directors, the President, the General Manager and Advisory Council. The Board of Directors establishes the entity's policies, strategies, regulations, structures and budgets. It also has the power to dispose of the entity's assets. The Board is made up of the President, the General Manager and representatives of the MCT (2) and the MPC (1). The President is the legal representative of INIA. The General Manager directs and controls operations and the day-to-day workings of the entity. The Advisory Council which consists of the President, the General Manager and 9 members drawn mainly from the private sector, advises the Board of Directors in defining policies and strategies, in particular those relating to linkages with the productive sector.
- 4.5 The central structure consists of two operating departments, the Research Department (DGI) and Business Technology Department (GN), as well as the following support and advisory offices: Institutional Development, Human Resources, Administration and Services, Internal Comptroller and Legal Adviser. As well, there are 12 research centers and six experimental stations located in 18 of the 22 states. Following is a summary of the functions of these units.



- 4.6 The GI is responsible for designing mechanisms to identify and prioritize research demands, for maintaining the technical and scientific quality of research, through the design and coordination of an integrated planning, monitoring and evaluation process; and developing institutional policy to guide the research process. The new vision of INIA calls for management to establish greater linkages with the sector in its research efforts, and for staff with the capacity to apply new biological information technologies. Better linkages between research and the sector will begin with operation of the Consortium Fund, and will be further pursued by the system for financing research projects using the Capital Fund. Capacity building will be achieved through the training included in the technology modernization component.
- 4.7 The functions of the GN are to coordinate strategies for opening the institution and linking it to the agriculture sector through the Marketing Fund; developing negotiation mechanisms for establishing agreements and strategic alliances; and promoting the value of the know-how and technologies developed by INIA. In support of the new INIA, the department needs to be strengthened in the areas of marketing and intellectual property. In this respect, the program calls for the organization of units in these areas and the training of personnel. As well, the department will need to take the lead in monitoring and supervising operations of the business units, and the program therefore calls for the devolution of powers to Regional Business Coordinators, to be located in the research centers and experimental stations.
- 4.8 The functions of the Institutional Development Office (ODI) include coordinating preparation of the strategic plan and assessing management in light of the plan; and developing and maintaining information, statistical and documentation systems. As the office responsible for supervising the Systems Unit, it will have to play a key role within the new INIA in developing, implementing and maintaining the systems of operational and financial information called for under the program. The unit has the capacity to carry out maintenance, but the program will strengthen it with consultants and experts needed to complete the design of the systems and put them into operation.
- 4.9 The Human Resources Office has been instrumental in conducting studies to determine the profile and number of personnel needed in light of the planned organizational changes in INIA, it has analyzed existing resources in light of personnel needs, and has established a plan to make the appropriate adjustments. The studies form the basis for preparing the workforce adjustment subcomponent. Counterpart resources of the program will provide the office with consulting services to assist in sensitization efforts and the selection and training of participants in the component.
- 4.10 The work of research, development, provision of services and production of strategic inputs is conducted in a decentralized manner in the research centers and

the experimental stations. The areas within the centers and stations engaged in services (such as soil laboratories, phytopathology, plant protection) and production (such as seeds, immunobiological products, and biological controls) formed the basis for organizing the business units to be established under the program.

- 4.11 As operating units and as future business units, the following requirements relating to the incorporation of new technologies will be covered by the program: (i) modernizing laboratory equipment; (ii) minor upgrades to infrastructure; (iii) modernizing systems of operational and financial information, including establishment of the cost accounting systems; (iv) training in the areas of technologies, negotiation and issues relating to the concept of cost centers; and (v) certification of laboratories.
- 4.12 The strategy for incorporating new technologies is based on two interrelated lines of action. One is to reinforce the capacity to use new technologies in laboratories that have begun to incorporate these techniques in order to strengthen their support for the dissemination of new techniques to other internal and external groups, and the second is development of the capacities required within the INIA units that still do not have an adequate mastery of them but that need this in order to increase their effectiveness, productivity and quality, and to help them begin to disseminate these techniques.

## **2. Staffing**

- 4.13 Following the early retirement of 537 staff members, beginning in late 1998, the current personnel complement of INIA stands at 1630. Of this total, about 47% are professional or technical staff engaged in research, about 19% are technicians and support personnel in administrative work, and 34% are laborers. About 96% of the professional research staff have postgraduate degrees. The planned reorganization of INIA will see the elimination of a further 298 staff positions.

## **3. Financial administration**

- 4.14 The current Department of Administration and Services, reporting to the General Manager, is the unit responsible for financial administration of INIA. Systems are mechanized and produce full financial statements covering both the institution's own resources and those derived from the budget. PRODETEC, financed in part by the Bank, has an independent unit for keeping program accounts. This unit keeps its accounts in a form parallel to the formal accounting and produces a statement of investments consistent with Bank requirements.
- 4.15 Constraints in the current financial administration system include: (i) lack of integration among the three types of existing accounts, which causes delays in accounting and produces discrepancies among the three sets of records; (ii) delays in submitting expenditure statements by the regional administrative units, which

means that the closing statements do not reflect all expenditures; and (iii) apart from the single chart of accounts, there is no accounting manual. These limitations will be corrected through a new financial system (SIFA), now at an advanced stage of development with support from PRODETEC. In addition, the new system (which involves devolution of expenditure accounting responsibility and radically improves data transmission and information production systems) will lay a solid basis for the development of financial information systems for the future "business units". Implementation of the SIFA system will be a condition to be met within the first 12 months after signature of the loan contract. The program will help to complete the SIFA communication network between headquarters and the research centers and stations.

#### 4. Internal and external audit

- 4.16 The Office of Internal Control, reporting to the President, fulfills the functions of an internal auditor. The office has an audit manual, annual work programs, and sufficient staff to carry out its duties. The external auditor of the PRODETEC program, partially financed by the Bank, is a firm of certified public accountants acceptable to the Bank. The audited financial statements for the program and those for the entity for the year 2000 were submitted to the Bank within the contractual time limits. In Venezuela, timely presentation of financial statements is not generally a problem. In fact, cumulative statistics for 1998-2000 from ROS/DAU indicate that at 31 July 2001, of all audited financial statements that were to be submitted at that date, only 11.6% were late.

#### 5. Financial aspects

- 4.17 Following is a summary of actual expenditures and their financing for the period 1996 to 2000.

**Table IV-1**  
**ACTUAL EXPENSES OF INIA**  
**(US\$ Millions at December 2000)**

	1996	1997	1998	1999	2000	Average
CURRENT EXPENDITURE	10.9	12.3	11.9	12.6	14.9	12.5
Government of Venezuela	10.9	12.3	11.9	12.6	14.9	12.5
CAPITAL EXPENDITURE 1/	20.4	38.6	28.1	22.7	29.5	27.9
Local resources	15.8	38.3	24.5	19.7	25.0	24.7
Government of Venezuela	14.5	37.3	23.6	18.8	24.1	23.7
Own funds	1.3	1.0	0.9	0.9	0.9	1.0
IDB loans	4.6	0.3	3.6	3.0	4.5	3.2
TOTAL EXPENDITURES	31.3	50.9	40.0	35.3	44.4	40.4
1/ Including PRODETEC	6.7	16.9	11.2	6.5	10.0	10.3

- 4.18 On average, current expenditures over the period amounted to the equivalent of US\$12.5 million, or 31% of total expenditure, while capital expenditures were

US\$27.9 million, or 69% of total expenditure. PRODETEC represented 37% of capital expenditures, or 25% of total expenditures. Current expenditures were financed entirely by government funding, which also paid 85% of capital expenditures. The remaining 15% of capital expenditures was financed by resources from the Bank loan (11%) and with own funds (4%). The average government contribution over these years (current expenditures plus capital expenditures) was US\$36.2 million, with a maximum of US\$49.6 million in 1997, and a minimum of US\$25.4 million in 1999.

- 4.19 Annual total expenditures averaged US\$40.4 million. The difference from the average for PRODETEC amounts to US\$30.1 million, representing approximately 85% in fixed costs, primarily wages and salaries, and 15% (US\$4.5 million) in variable operating costs in the areas of research and negotiation. These operating costs are exposed to sharp volatility, depending on budgetary allocations from the central government.
- 4.20 The institution's own revenues were modest, averaging US\$1 million. These revenues were derived from service fees charged primarily for the sale and certification of seeds and the sale of immunobiological products. The modest level of revenues reflects two factors: (i) subsidized selling prices; and (ii) the lack of technical resources for making more efficient use of capacities. The program seeks to correct these shortcomings, specifically by creating business units and establishing the funds and the Fundación INIA.

## **V. FEASIBILITY AND RISKS**

### **A. Institutional and financial feasibility**

#### **1. Institutional feasibility**

- 5.1 The institutional feasibility of the program derives from the institutional arrangements that will initially make possible its execution and will later support fulfillment of the new vision of INIA.
- 5.2 The bulk of the program involves studies, technical assistance and training, which will require the know-how for properly contracting consultants, and an administrative capacity to manage contracts. As detailed in the Execution Chapter, the various components of the program have been allocated to units of INIA in light of their experience and know-how in each subject area. Together with the strengthening of capacities to administer contracts through IICA support, this will facilitate execution of the proposed activities. The PCU, for its part, having participated in the PRODETEC, has acquired experience in equipment procurement and will therefore continue with this responsibility under the new program. Execution and implementation of the various funds contained in the program will be facilitated by the new legal status of INIA as an autonomous Institute enjoying independence in the handling of its own assets.
- 5.3 The allocation of functions in accordance with the new vision was based on identifying the limitations and requirements of the different units in order to strengthen them through the program. As detailed in Chapter on the Borrower and Executing Agency specific areas of strengthening are directed at resolving specific requirements for the different units. Moreover, in the case of financial administration, as noted in that Chapter, the strengthening effort is already at an advanced stage of design, which means that the new functions and systems in this key area should be ready for immediate implementation.

#### **2. Financial feasibility**

- 5.4 This section addresses two questions: (i) are investment and local financing provisions in line with recent experience, so that financial feasibility is highly probable? and (ii) what is the potential impact on INIA finances of the resources to be channeled through the Fundación INIA?
- 5.5 Recent experience is discussed in Chapter IV. In terms of annual averages, current expenses are projected at US\$14 million, compared to the historical average of US\$12.5 million. The increase reflects an early retirement plan additional to that of the program. In terms of capital expenditures, including the IDB program, the projected annual average of US\$28.5 million is similar to the historical average of

US\$27.9 million. As well, the total program for the period, US\$45 million, is similar to the investment figure for PRODETEC, i.e. US\$44.6 million. On the financing side, projections indicate that the government will provide on average (current expenses plus investment) US\$38 million, an amount similar to historical financing of US\$37.2 million. The foregoing indicates investments and local financing in line with recent experience, and this should make the operation's financial feasibility highly likely.

- 5.6 Projections for the Fundación INIA show that net revenues available for investment and INIA expenses increased from US\$1.7 million in 2002 to US\$5.3 million in 2005, with a cumulative amount of US\$15.3 million over the period as a whole. These funds would come from revenues of the Capital Fund, from the proceeds of the sale of INIA services and products, and from returns on the Marketing Fund. The cumulative amount should cover 60% of variable operating expenses<sup>17</sup>. Over the historical period, these expenses were covered almost entirely by the government and represent items subject to great volatility, depending on budgetary allocations from the central government. The foregoing suggests that the potential impact of providing resources through the Fundación INIA team would be: (i) high coverage of variable operating costs, with consequent savings to the government; (ii) substantial increase in self-financing, with the consequent positive effects on the financial sustainability of INIA.

## **B. Technical feasibility**

- 5.7 The program's technical feasibility is based initially on the infrastructure that INIA has accumulated over the last eight years, and particularly since 1998, and on PRODETEC, with which the Institute has made progress in the desired direction. This is clear in the recent external evaluation of the institution, and its results and recommendations have been fully taken into account in the design of the program.
- 5.8 In terms of infrastructure, the physical plant and laboratory of the centers and stations have been upgraded, they have been equipped with transportation, communications and computer facilities, and a basic information processing platform to support administrative and institutional management. The program will help to modernize and accredit these laboratories.
- 5.9 In terms of human infrastructure, an aggressive policy of training grants has doubled the proportion of research staff with postgraduate degrees during the '90s. INIA has been rationalizing and refocusing its research agenda in order to give it coherence, relevance and impact. The program calls for a participatory and methodical approach to defining and allocating funding for the strategic agenda on the basis of the Consortium Fund and the new coordinated methodology for setting

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<sup>17</sup> Variable operating expenses are estimated at 15% of the difference between total expenses and the IDB program.

priorities. In terms of institutional processes, creation of the Business Department has already left the institution more open and made it more responsive to the sector's needs.

**C. Socioeconomic feasibility**

- 5.10 An ex-ante assessment was undertaken of 32 projects in the 2001-2004 research program, selected because they offered verifiable target indicators suitable for this kind of quantitative analysis. The evaluation constituted the baseline (or “no project”) situation. The “project” situation was simulated using a more favorable scenario whereby the values assigned to the three parameters of the baseline were modified (by 10%): two of these are time and the maximum rate of adoption of technology by producers, while the third is the probability of success of the research projects evaluated.
- 5.11 The economic Internal Rate of Return (IRR) and the Net Present Value (NPV) for the program are as follows: IRR of 37% and NPV of US\$79.5 million. These ex ante results show a causal relationship between program-induced institutional change in INIA and productivity in the agricultural sector. The sensitivity analysis was based on the flow of benefits, modifying the three parameters that define the adoption process and the probability of success of the research projects. Values were increased and decreased in 10-percent steps. The optimistic situation produces an IRR of 48% and an NPV of US\$141.7 million, while the pessimistic situation produces an IRR of 19% and NPV of US\$15.1 million. These results fall within the averages for other countries in the region.

**D. Environmental and social feasibility**

- 5.12 The results of the environmental assessment show that anticipated environmental impacts from the operation are clearly positive, since the overall objective is to increase productivity in the agricultural sector, through efforts that will improve living standards for the population and enhance the environment by developing sustainable technologies compatible with the social and environmental context. The positive impacts, represented by activities that the program will finance, and the respective time limits for incorporation, from the date of loan eligibility, are:
- a. Execution of a training program for 489 employees and outside personnel in environmental issues relating to their functions and to the objectives of the institution. This activity will begin within six months.
  - b. Development of a methodology for conducting an ex ante analysis, monitoring and an ex post analysis of technologies developed and supported by INIA. The methodology must be developed within six months.
  - c. Inclusion of environmental criteria in the evaluation of research projects supported by the Research Consortium Fund, within six months.

- d. Establishing the institution's capacity to certify organic produce. This activity, which will help disseminate clean technologies and practices and consequently reduce the use of pesticides, must be developed within twelve months.
  - e. Accreditation of selected laboratories to COVENIN 2534:2000 (ISO/IEC 25) and five laboratories to COVENIN ISO 14,000, with consequent improvements in environmental management and workplace health and safety in these laboratories and in the quality and reliability of the services provided. Accreditation and installation of the necessary emissions control equipment must be concluded within 36 months.
  - f. Workforce adjustment, as a means of mitigating the social impact of redimensioning INIA, includes a training program for microentrepreneurs, with special attention to working women, in order to ensure gender equity. The program for monitoring the operation has been designed and includes following employees who have received training through the workforce adjustment program, disaggregated by sex, to obtain information that can be used to provide specific support and to draw conclusions about lessons learned.
- 5.13 The hiring of an environmental expert within INIA to execute the program's environmental activities and to encourage institutionalization of environmental issues will be a condition precedent to the first disbursement.
- 5.14 The environmental risks of the operation were identified as: lack of control over emissions from laboratories and biotechnology units, existing environmental liabilities in the IIV lands, and the lack of any frame of reference for controlling the possible impact of genetically modified organisms. To mitigate these environmental risks and maximize benefits, the following actions are included in the operation as responsibilities of INIA:
- a. Environmental audits in 20 groups of diagnostic laboratories and biotechnology units and advisory services for meeting environmental standards and registering INIA in the RASDA of the MARN. In this way, INIA will have the mechanisms and equipment needed to control emissions in the laboratories identified as priority ones. Implementation deadline: 18 months.
  - b. Frame of reference for defining institutional powers and responsibilities for the control, development, adaptation, introduction and domestic marketing of genetically modified organisms for agricultural purposes. This frame of reference will consider the rights of ancestral communities to native genetic resources. Establishment of institutional responsibilities and strengthening of the laboratories through introduction of internal and external environmental controls and the ISO-model management systems will help to guide genetic engineering activities and minimize their impact. Implementation deadline: six months.



- c. Formulation and execution of the plan for closing down activities and dismantling operations, as required by Venezuelan environmental legislation, for the current IIV. The IIV closure plan calls for remediation of environmental liabilities, including the capping of 20 septic wells and others that may be found. Implementation deadline: 12 months.
  - d. Preparation and approval by MARN of an EIA, in accordance with Venezuelan environmental legislation, for the new IIV. Implementation deadline: 12 months
- 5.15 The Bank will verify that compliance with these measures is reflected in the OPAs to be developed by INIA, which will be the instruments for executing, monitoring and evaluating the program.
- 5.16 The OM will establish the following: (a) before the disposal of IIV lands the plan for closing and dismantling operations must be approved and implemented, including the capping and cleanup of about 20 septic pits and drains; and (b) before the new IIV is built, an EIA must be prepared and approved by the MARN. The environmental expert hired by INIA will monitor implementation of the EIA recommendations.
- 5.17 The program budget includes funds for the following activities: (i) incorporating the environmental dimension into the institutional management system of INIA, US\$164,000; (ii) institutional and environmental bases for controlling biotechnology, US\$20,000; (iii) new areas of business, such as giving INIA the capacity to certify organic farming, US\$20,000; (iv) environmental management of laboratories, US\$545,000; (v) plan for closing and remediating environmental liabilities of the current IIV, US\$85,000; and (vi) EIA for the new IIV, US\$50,000.

#### **E. Benefits**

- 5.18 **Increased agricultural productivity.** The institutional changes and technological modernization supported by the program will help increase productivity by strengthening the ability of INIA to provide effective and reliable services and technological products in response to sector needs. The program will be of national coverage and its beneficiaries will be producers engaged in farming, livestock, forestry and fishing. The productivity increases, which are a significant part of the expected benefits, will result from the renewal of the INIA, so that it can respond more effectively to the needs of the agricultural sector. These benefits will be derived from the increased volumes of output achieved through greater yields and lower losses from pests and diseases, and from better product quality. The population will benefit from greater availability of food, of better quality. The agroindustrial sector will benefit from inputs of better quality. The country will benefit from foreign exchange generated by greater exports and import savings.

5.19 **Building linkages to the sector.** The program seeks to diversify, expand and develop links between INIA and researchers and clients. The new project selection methodology allows for other players in the technological system to have a greater role. Establishment of the Consortium Fund will allow resources to be allocated to projects on a competitive basis. As well, the program will establish linkages for INIA to the technology system and its clients in three ways: (i) it will strengthen the capacities of the Business Department so that INIA can work more closely with clients and potential customers for its research services, (ii) it will develop business units and research consortia so that the institution can enhance and diversify the technology services it offers, and take a more businesslike approach to them, while providing technical assistance training to third parties, and (iii) it will be able to commercialize technologies in ways that will create added value for its past efforts, while continuing to meet the needs of existing clients and new customers.

5.20 **Sustainability of INIA.** The sustainability of INIA over the longer term will depend on its social and economic usefulness. Strengthening linkages to the sector will generate social and political support, which in turn will mobilize budgetary support, partnerships and service sales contracts that will put it on a more solid financial basis. The program seeks to strengthen INIA so that it can produce a significant impact in the technology system, build up its links with other organizations, at home and abroad, and improve its ability to identify and respond to technological demands and expectations.

**F. Risks:**

5.21 **Failure to complete institutional reengineering.** The program calls for a series of institutional changes that will imply cultural and operational changes that might encounter resistance. This risk should be reduced by the fact that the institution has been preparing for change since 1998. It is made further unlikely by the commitments that have been made and the nature of the new legislation governing INIA. At the same time, the management of INIA is considered to have the capacity as well as the commitment and interest to carry out the reforms.

5.22 **Failure to establish the Capital Fund.** The Capital Fund is to be constituted through the sale or concession of the fixed assets of INIA to the private sector and the development of partnerships of various kinds, to be determined during program execution. The best option will be selected as a result of studies to be financed by the program. The decision to implement any of the options will be taken by the INIA Board of Directors, consistent with national legislation and the institution's legal rights. The MCT authorities and the INIA Board have shown their determination to constitute this fund. If the option selected is to sell off the assets, this will require the concurrence of the Public Assets Disposal Commission. There is a risk that the Commission might not approve the sale. This risk is considered to be reduced in that there are a number of relevant precedents within and beyond

INIA. If the Commission should refuse to authorize the sale of assets, there are other options that do not require such approval.

- 5.23 **Failure to achieve financial sustainability.** Uncertainty in the oil market affects the amount of financing available for the public sector and, in particular, the Ministry of Science and Technology. The design of the Financial Sustainability Subprogram envisages a series of mechanisms to increase the number of sources for financing research beyond the ordinary budget and thus for establishing the institute's financial sustainability. These measures include strengthening the Business Department to encourage undertakings with the private sector, to reinforce the capacity to produce and market technological services (business units), and make economic use of technologies with a business potential (Marketing Fund), establishment of a Capital Fund through disposal of underperforming assets, and broader participation by partners in the institute's priority competitive projects.

### Agricultural Technology Program Logical framework

OBJECTIVE SUMMARY	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	KEY ASSUMPTIONS
Productivity of Venezuelan	Internal Rate of Return of at least 20% within ten years after completion of the program	Ex-post evaluation report	Political support from the government. Readiness of the private sector in agriculture
INIA as a dynamic agency of the national system for agricultural extension by generating and providing efficient services	At the end of the program: <ol style="list-style-type: none"> <li>1. Increase from 5659 to 8489 in the number of consultations handled through the web page and other information services.</li> <li>2. Reduction of 20% in the time devoted to planning, monitoring and evaluation.</li> <li>3. 20 executing units digitally interconnected.</li> <li>4. New fee structure.</li> <li>5. 151 employees terminated.</li> <li>6. Sixty employees trained as entrepreneurs.</li> <li>7. Increase in revenues other than from the government budget, including the Fundación INIA, from 20% to 60% of variable annual research expenditures of INIA.</li> <li>8. Increase from 1.8% to 5% in the portion of INIA annual revenues accounted for by sales of services and products.</li> <li>9. Increased articulation with agribusiness, through 11 new business units.</li> <li>10. Increase in demands for service from 15,000 to 18,000 by the end of the program.</li> <li>11. Increase in number of strategic alliances from 9 to 20.</li> <li>12. Increase in the number of inter-institutional projects with outside support, indirect costs, from 40 projects to 60 projects by the end of the program</li> </ol>	Audit reports. Institutional management reports. Producers' association reports.	Integration into agricultural circuits. Adoption of products and value chain.
Modernization of agricultural technology. the financial sustainability of agricultural technology.	By the end of the program: <ol style="list-style-type: none"> <li>1.1. A system of scientific and technical information with 7 subsystems integrated on a Web site, in operation.</li> <li>1.2. An expanded system of financial administration information with management modules for personnel and for research costs and services and an expanded management information system with projects selection and evaluation modules, in operation.</li> <li>1.3. A digital telephone communication network and a modern information processing platform installed and connecting the executing units among themselves and with the sector.</li> <li>1.4. An approved strategic plan for 2003-2008, with environmental policies and institutional management indicators.</li> <li>1.5. An external evaluation covering economic and technical aspects, consortia and institutional performance.</li> <li>1.6. 151 employees terminated.</li> <li>2.1. A strategic plan consistent with the mission of the program and the INIA, prepared during the first year.</li> <li>2.2. Four procedural manuals prepared during the first year.</li> <li>2.3. A database on intellectual property during the first year.</li> </ol>	Institutional management reports. Program progress reports. External evaluation reports. Reports on the technical and financial audit of the Foundation.	IDB financial support. Government financial support. Institutional commitment by the management. Commitment of researchers and staff. Increasing demand for INIA technological services. Increasing demand for INIA services. Adequate domestic supply of telecommunications services.

BRIEF SUMMARY	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	KEY ASSUMPTIONS
	2.4. 150 employees of INIA and 50 members of the Agricultural Science and Technology System (SCTA) trained in negotiating techniques during the program. 2.5. An intellectual property unit. 2.6. 11 business units functioning properly. 2.7. Twenty marketing projects initiated. 2.8. Six marketing projects involving products and services negotiated. 2.9. 4 participatory research workshops for small producers with 60 participants from the SCTA and 20 from INIA. 3.1. 20 laboratories applying the 8 biological techniques 3.2. 4 laboratories applying the 4 information technologies 3.3. 10 new services based on the new biological and information techniques 3.4. 70 INIA researchers and experts and 30 SCTA members 3.5. 11 executing units registered in SENCAMER by year 3 of the program with their 18 service laboratories accredited under ISO Guide 25 3.6. 100 INIA researchers and experts and 20 SCTA members trained in quality assurance 3.7. 5 laboratories accredited under ISO 14000 3.8. 20 laboratories meet environmental standards and are registered with RASDA 3.9. 20 training courses in the environment covering 498 employees and external personnel. 3.10. 20 projects involving other system members during the three years of the program. 3.11. 10 new strategic partners for innovation development trained in consortium management. 3.12. 10 new strategic partners for the development of innovations trained in consortium management. 3.13. 4 project formulation courses for employees of INIA and other SCTA players.		
on of the technical and institutional systems omation of scientific and nological information solidation of institutional agement systems dernization of internal and rnal communications astructure cial studies in support of tutional policies and egies Adjustment tion in force repreneurial training for ant staff.	The following expenditures will have been made by the end of the program: 1.1.1. US\$ 800,000 1.1.2. US\$ 700,000 1.1.3. US\$ 2,450,000 1.1.4. US\$ 514,000 1.2.1. US\$ 4,600,000 1.2.2. US\$ 500,000	Management reports from the various components Strategic Plan 2003-2008 External evaluation report	<b>INITIAL SITUATION:</b> INIA is currently structuring technological platform and a series of information systems. PRODETEC, and if they are efficiently used in support of research and technology negotiation functions, they will require a modules in personnel management selection and evaluation, control monitoring of services and costs and services. As well, INIA weaknesses in terms of communication that affect its capacity to create with the sector, hence the need investment in communication the information needed to develop and strategic plans, but it is out of date, hence the need to analyze the systemic chains, impact, etc.. The institution's personnel and this affects its and efficiency, increasing its vulnerability through excess

THEME SUMMARY	VERIFIABLE INDICATORS	MEANS OF VERIFICATION	KEY ASSUMPTIONS
<p>ing technological linkage- capacity: capacity building for the negotiation Department support in specific areas commercialization of technologies improving the management of technological services ent of the Capital Fund. cal modernization dating of technologies accreditation of laboratories vironmental upgrading research consortia and assistance</p>	<p>2.1.1 US\$ 720,000 2.1.2 US\$ 1,050,000 2.1.3 US\$ 1,650,000 2.1.4 US\$ 870,000  2.2 US\$ 890,000  3.1.1. US\$ 5,900,000 3.1.2. US\$ 7,244,000 3.1.3. US\$ 385,000  3.2. US\$ 4,000,000</p>		<p>on the government budget. 7 articulation with other players country's agricultural innova Moreover, there are no spec or any management focus fo technological products and s generated. This is made wor number of laboratories that quality standards, and tardin modern biological and infor technologies. There are no a mechanisms of articulation technology innovations or fo key partners into innovation</p>

Procurement schedule						Annex Page
	Value in US\$000	Number of Packages	IDB (US\$000)	LOCAL (US\$000)	Method	Semester
<b>Procurement of goods</b>	<b>5,550.00</b>		<b>5,050.00</b>	<b>500.00</b>		
Specialized equipment	2,100.00	1	2,100.00		ICB	I,II,III,IV
Supplies and computers.	800.00	4	800.00		LCB	I,III,IV
Computers, Accessories & Software	1,150.00		1,150.00			
Access Units (GNT)	200.00	1	200.00		LCB	I,II,III,IV
Technical Strengthening (ODI)	950.00	3	950.00		LCB-ICB	I,II,III,IV
Communication infrastructure (E-I)	1,000.00	1	1,000.00		ICB	
Communications (Red WAN) (*)	500.00	1		500.00	ICB	
<b>Works</b>	<b>7,300.00</b>		<b>1,500.00</b>	<b>5,800.00</b>		
Construction:	6,260.00		1,500.00	4,760.00		
AP-I.I.V.	2,000.00	1	1,500.00	500.00	ICB	
Yucatán-Mérida	1,400.00	1		1,400.00	LCB	I,II,III,IV
Yucatán-Anzoategui	300.00	1		300.00	LCB	IV
AP-IIA-Biotechnology	620.00	1		620.00	LCB	IV
AP-IIA-Phytosan. Diagnosis	785.00	1		785.00	LCB	I,II,III,IV
AP-IIIA-Agroecol. Resources	600.00	1		600.00	LCB	IV
Yucatán-Mérida Biotechnology	45.00	1		45.00	SB	IV
Yucatán-Miranda Phyto & Ento.	198.00	1		198.00	LCB	I,II,III,IV
Yucatán-Monagas- Animal Health	114.00	1		114.00	LCB	I,II,III,IV
Yucatán-Yaracuy Plant Protection	198.00	1		198.00	LCB	I,II,III,IV

Procurement schedule

	Value in US\$000	Number of Packages	IDB (US\$000)	LOCAL (US\$000)	Method	Sen
odeling or repairs.	1,040.00			1,040.00		
IIAP-IIA-Phytogen. Resources.	40.00	1		40.00	LCB	
IIAP-IIZ-Ruminant biotech	85.00	1		85.00	LCB	
IIAP-IIZ-Nutrition	20.00	1		20.00	SB	
IIAP-Seeds	15.00	1		15.00	DP	
E-Barinas-Seeds	30.00	1		30.00	SB	
E-Guarico-Lab. S., N.V. yB.	110.00	1		110.00	LCB	
E-Guarico-Seeds	15.00	1		15.00	DP	
E-Lara-Biotechnology	25.00	1		25.00	DP	
E-Monagas-Plant protection	30.00	1		30.00	SB	
E-Portuguesa-Diagnosis	110.00	1		110.00	LCB	
E-Portuguesa-Natural resources	150.00	1		150.00	LCB	
E-Portuguesa-Seeds	30.00	1		30.00	SB	
E-Sucre- Food tech.	50.00	1		50.00	SB	
E-Sucre-Lab. Aquatic-born path.	15.00	1		15.00	DP	
E-Sucre-Lab. Biolog toxins	20.00	1		20.00	DP	
E-Sucre-Lab. Marine microbes	30.00	1		30.00	SB	
E-Táchira-Animal health.	200.00	1		200.00	LCB	
E-Táchira- Biotec lab	30.00	1		30.00	SB	
E-Táchira-GIS	15.00	1		15.00	DP	
E-Táchira-Pueblo Hondo	20.00	1		20.00	DP	



Annex 1 - Procurement schedule						
Procurement schedule						
	Value in US\$000	Number of Packages	IDB (US\$000)	LOCAL (US\$000)	Method	Semi-annual
<b>Consultants</b>	<b>5,326.00</b>		<b>4,245.00</b>	<b>1,081.00</b>		
International	2,871.00		1,790.00	1,081.00		
b-program 1	1,040.00	5	540.00	500.00	IICA/LP	I,II,III
b-program 2	380.00	7	380.00		IICA	I,II
b-program 3	884.00	4		884.00	LP	I,III
<b>Goods</b>						
International	2,455.00		2,455.00			
b-program 1	1,240.00	6	1,250.00		IICA	I,II
b-program 2	805.00	6	805.00		IICA	I,II
b-program 3	1,185.00	5	1,185.00		ICB/IICA	I,III
<b>Services</b>	<b>1,971.00</b>		<b>1,727.00</b>	<b>244.00</b>		
International	1,206.00		962.00	244.00		
b-program 1	84.00	1		84.00	LP	
b-program 2	462.00	62	302.00	160.00	DP/INIA	I,III
b-program 3	660.00	9	660.00		INIA/IICA	I,III
<b>Design</b>	<b>765.00</b>		<b>765.00</b>			
b-program 1	0.00		0.00			
b-program 2	425.00	13	425.00		IICA	I,III
b-program 3	340.00	1	340.00		IICA	I,III
	<b>20,147.00</b>		<b>12,522.00</b>	<b>7,625.00</b>		

PROPOSED RESOLUTION

VENEZUELA. LOAN \_\_\_\_/OC-VE TO THE BOLIVARIAN REPUBLIC OF  
VENEZUELA  
AGRICULTURAL TECHNOLOGY 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 Bolivarian Republic of Venezuela, as Borrower, for the purpose of granting it a financing to cooperate in the execution of the Agricultural Technology Program. Such financing will be for the amount of up to twenty two million five hundred thousand dollars of the United States of America (US\$22,500,000) from the Single Currency Facility of the Ordinary Capital Resources of the Bank, and will be subject to the "Special Contractual Conditions" and the "Terms and Financial Conditions" of the Executive Summary of the Loan Proposal.