

AGRICULTURAL SERVICES MODERNIZATION PROGRAM

(PN-0032)

EXECUTIVE SUMMARY

**BORROWER AND
GUARANTOR:** The Republic of Panama

EXECUTING AGENCY: The Ministry of Agricultural Development (MIDA)

AMOUNT AND SOURCE: IDB: US\$33.6 million (OC)
Local counterpart funding: US\$14.4 million
Total: US\$48.0 million

**FINANCIAL
TERMS AND
CONDITIONS:** Amortization period: 20 years
Disbursement period: 5 years
Interest rate: variable
Inspection and supervision: 1%
Credit fee: 0.75%

OBJECTIVE: The objective of the program is to improve the profitability and productivity of the agricultural sector and the quality of its products, and to facilitate the adaptation of Panamanian farmers to a more competitive economic system by modernizing the national services for the generation and transfer of technology, plant and animal health, market information, and the land titling. The program supports the institutional upgrading of MIDA and promotes participation by the private sector in the execution and financing of the activities. The program will: (i) increase the output of agricultural products for export and competitive domestic consumption; (ii) reduce losses from pests and diseases and gain greater access to international markets; (iii) improve the efficiency and reliability of market information; and (iv) expand land titling coverage.

DESCRIPTION: The program has been structured in four subprograms: (i) technology generation and transfer, (ii) plant and animal health, (iii) market information; and (iv) land titling.

1. Technology generation and transfer subprogram, aimed at making production more diversified, improving yields and quality, and reducing production costs, through two components:

Technology generation component, to generate broad-impact agricultural technologies to be considered government property, under the responsibility of Instituto de Investigación Agropecuaria de Panamá [Agricultural Research Institute of Panama] (IDIAP) and Dirección Nacional de Acuicultura [National Directorate for Aquaculture] (DINAC), and to fund research projects based on open competition between the public and private entities that constitute the national research system. Emphasis will be on studies with practical results for immediate commercial application, especially in competitive lines of production.

Technology transfer component, to restructure MIDA's current public extension system as it refers to this program with services to be performed by the private sector, cofinanced by the program and the farmers, under two arrangements: a plan to provide business-related technical assistance to small-scale farmers (PATEP), aimed at operators of small farms with productive potential; and Panamanian agricultural technology transfer groups (GTAPs), geared to operators of medium-sized farms, organized in groups and by agroecological areas.

2. Plant and animal health subprogram, to improve the quality of the services of MIDA's Dirección Nacional de Sanidad Animal [National Directorate for Animal Health] (DNSA) and Dirección Nacional de Sanidad Vegetal [National Directorate for Animal Health] (DNSV), so that they may, in conjunction with the private sector, help minimize losses from pests and diseases, and facilitate marketing. It has four components:

Animal health component: to preserve the national livestock population and ensure the sanitary condition of the products. It includes intensification of epidemiological surveillance; expansion of the veterinary laboratory facilities; the establishment of a laboratory to examine toxic residues; the structuring of the Animal Health Registry Department; the organization of campaigns for the control of brucellosis and bovine rabies; and the introduction of technology for the care of other diseases of economic importance.

Plant Health component: to protect the plant health situation, improve diagnostic capabilities, and strengthen campaigns by: updating the plant health surveillance system; setting up surveillance

laboratories and units; registering and analyzing pesticides; reinforcing the campaigns to control Mediterranean fruit flies and the tristeza virus of citrus fruits; and implementing measures for the management of pesticides and inspection of nurseries and exports.

Agricultural quarantine component: to prevent the entry of exotic health problems and the spread of those already present by upgrading the livestock quarantine station and setting up and equipping control posts.

Institutional strengthening component: to support the plant and animal health operations by: providing sanitary education for farmers and the general public; expanding the information and communication network; and training personnel. To support those efforts, the organizational structure would be consolidated, plant and animal health legislation would be modernized, and field and laboratory operations would be coordinated with farmers and public agencies.

3. Market information services subprogram, to assist in the decision-making of farmers, agroindustrial processors, and the public sector by providing efficient, reliable market information. This will be accomplished by setting up a system (SIPAN) for the management and dissemination of trade information of economic importance in the public domain. SIPAN will supply the basic trade information needed for the project to support services to agribusiness investors, presented for consideration by the Multilateral Investment Fund for parallel financing (US\$1.8 million).

4. Land titling subprogram, to facilitate access to technology, greater use of credit, and the increase of investment, by affording greater security of tenure, and to encourage the development of a responsive, transparent land market. The operations will be carried out in the province of Veraguas. It consists of the following components:

Rural cadastral survey component: a massive survey and mapping effort will be conducted, by digital methods for efficiency in the field work, for which the geodesic network will be expanded, aerial photographs taken, cadastral maps compiled for 41 corregimientos, and surveys conducted for the collection of property information.

Cadastral updating component: the cadastral survey will be kept up to date by using a geographic information system (GIS) and strengthening the ongoing land title registry service.

Titling of public lands component: based on the field survey and supported by the GIS, to make the granting and deeding service efficient and facilitate the process for settling current disputes.

Institutional strengthening component: for the training of the personnel of Dirección Nacional de Reforma Agraria [National Directorate for Land Reform] (DINRA) and to monitor the subprogram.

**ENVIRONMENTAL
CLASSIFICATION:**

The Environment Committee, at its meeting of December 7, 1994, classified this as a Category III operation.

BENEFITS:

The management of research activities will facilitate a reallocation of resources to products with a greater competitive advantage. Strengthening technology transfer and the reduction of losses from diseases and pests will increase the volume of agricultural production; efficient services and higher quality will be reflected in an increased presence of producers on external markets and higher incomes for them. Rational use of agrochemicals will help preserve the environment. The price and market information will make it easier to make the right decisions and reduce transaction costs. The titling of lands will foster better preservation of soils and make for increased capital investment.

RISKS:

The levels of tariff protection negotiated in the framework of the WTO are regarded as high and will be gradually lowered over an extended period. While the economy will be stimulated as a result, the effectiveness of technology generation and transfer of some products could be reduced to some extent, because farmers will lack any incentive to convert to more competitive products. However, the agreements reached for the second disbursement from the second tranche of the economic recovery loan will further open up the economy and so make it easier to identify the most competitive and promising products on markets. Moreover, the Bank and the executing agency will hold yearly meetings to review progress based on reports of what was done in the preceding year and the targets set for the next, which will help make the necessary adjustments.

It is proposed to gradually withdraw MIDA from the execution and financing of extension activities and to transfer this service to the private sector. While the program is in execution MIDA's extension workers could feel uncertain about entering the private sector. Also, the private sector could be slow in making the services available either by not offering them in full response to the demand or because of the lack of appeal of the technological changes. In regard to financing, though farmers have expressed a readiness to gradually assume the costs, their acceptance will depend on the quality of the services provided. Any of these circumstances would slow down execution of the program. To reduce these risks, a substantial component of training for extension workers has been provided. Moreover, the activities of the program's Consultative Council, on which all groups involved will be represented, will make it possible to review program execution and take corrective steps to keep progress on schedule.

There is a limited supply of bank credit for the agricultural sector in Panama, especially for operators of small and medium-sized farms, and this could reduce their ability to adopt the technology to be offered them. This risk could be partly offset by titling their lands, which would give them more access to bank credit, by financing from input suppliers, and by the organization of small farmers into production enterprises and the provision of business management training for them. Moreover, generating competitive, high-profit product lines will make access to credit more attractive.

**POVERTY-TARGETED
INVESTMENT:**

Beneficiaries have been identified who, prior to participating in the program, fall below the low-income threshold as defined for Panama using the reference monthly income of US\$50 per capita for 1995. Nevertheless, in accordance with the criteria of the Eighth General Increase in the Resources of the Bank, the program is not considered to be aimed at low-income groups inasmuch as the weighted index of resources from the financing targeted at low-income groups is 29%.

PROCUREMENT:

The amounts above which procurement under the program will require international competitive bidding will be US\$250,000 for goods and services, and US\$1.5 million for works.

**THE BANK'S
COUNTRY AND
SECTOR STRATEGY:**

The Bank's strategy in Panama is to: (i) intensify the program of economic and sector reforms (deregulation and privatization); (ii) enhance the

efficiency of public spending and support the modernization of the State; (iii) make social spending more efficient and target it more at the poor; (iv) rehabilitate and expand the country's basic infrastructure and revise the regulatory frameworks to encourage participation by the private sector; (v) identify options for development in the interoceanic region. The proposed operation is consistent with the Bank's strategy of promoting comprehensive reform of the agricultural sector that will make it more competitive in the production, pricing and exportation of agricultural products. The modernization of key services will stimulate the private sector to participate by increasing activities in the production of commodities for competitive export and domestic consumption. In addition, services should become substantially more efficient as they will be the responsibility of the private sector operating in a situation free competition.

**SPECIAL
CONTRACTUAL
CONDITIONS:**

The borrower, acting through MIDA, must present, to the Bank's satisfaction:

As a condition precedent to the first disbursement under the program, evidence that: (a) the central coordination unit (CCU) and technical support units (TSUs) have been set up and the personnel they require has been appointed (paragraph 3.20); (b) the program's Consultative Council has been formed and taken up its duties (paragraph 3.20); and (c) an agreement with IICA for administration of the program resources has been signed (paragraph 3.16).

As a condition precedent to the first disbursement under the technology generation and transfer subprogram, evidence that the Administrative Committee for Agricultural Research Support has been formed and begun working (paragraph 3.20).

Within six months following the date on which the loan becomes eligible for disbursement, evidence that: (a) the directorate of the market information system (SIPAN) has been established in the IMA (paragraph 3.32); (b) the timetable for the hiring of the consultants and their terms of reference for execution of the program have been presented as agreed upon with the Bank (paragraph 3.40); (c) the entity that will administer the Research Support Resources has been contracted, the account for those resources has been opened in a bank, and the Operating Regulations for those resources have been put into effect (paragraph 3.26); and (d) the

consulting firm or specialized agency that will execute the technology transfer component has been hired (paragraph 3.28).

Within the 12 months following the effective date of the loan contract, evidence that: (a) the laws on animal health and plant health have been put into effect (paragraph 3.31); (b) agreements have been signed with: (i) the Ministry of Health (MINSA), for it to coordinate with the executing agency for the exchange of information on activities the latter undertakes in terms of oversight, control and registration of plants processing agricultural, pharmaceutical, biological, and pest-control products, and for it to assist the executing agency with training (paragraph 3.31); (ii) the Instituto Especializado de Análisis [Specialized Analysis Institute] (IEA), for the analysis of pharmaceuticals and personnel training (paragraph 3.31); and (iii) the Instituto de Recursos Naturales Renovables [Institute of Renewable Natural Resources] (INRENARE) for the coordination of environmental matters (paragraph 3.44); (c) DINRA and the Public Registry Directorate of the Ministry of Government and Justice have signed an agreement for registration of the deeds issued (paragraph 3.35); and (d) the engineering consultancies needed to draw up the final designs for the works to be built have been contracted in accordance with terms of reference acceptable to the Bank (paragraph 3.37).

Within the 24 months following the effective date of the loan contract, evidence must be produced that: (a) the regulations for the use and handling of pesticides, the operating manuals for laboratories, surveillance, input registration and control, and inspection and quarantine have been issued (paragraph 3.31); (b) the Environmental Unit has been established directly under the Office of the Minister (paragraph 3.44).

Before July 31 every year during execution of the program, MIDA must present to the Bank the consolidated annual work plan (AWP) for the following year. On the basis of this AWP, MIDA and the Bank will jointly determine the adjustments to be made in the execution of the program (paragraph 3.23).

The loan contract will also include the Bank's standard clauses regarding, *inter alia*, auditing, progress reports, inspection, loan evaluation, and procurement.

Maintenance: The borrower, through the executing agency, will: (a) make sure that the works and equipment called for under the program are operated and maintained properly in keeping with generally accepted technical standards; (b) submit a report during execution of the program and for five years following its termination, on the maintenance carried out during the preceding year; and (c) submit, during the useful life of the program works and equipment, evidence that a sufficient amount has been included in MIDA's annual budget to cover the cost of such maintenance (paragraph 3.38).

**COMPLIANCE WITH
THE MANDATE OF
THE EIGHTH
REPLENISHMENT:**

The program is consistent with the objectives of the Eighth Replenishment as follows: modernization of the State, by solving problems in MIDA's services; poverty relief, by generating employment; and environmental protection, through the design of measures that will mitigate any possible adverse environmental impact of the program. The gender issue is dealt with by facilitating access to services and furthering the economic stability of the family unit.

Specifically, the program will help modernize the agricultural sector and facilitate and diversify exports of farm products that offer competitive advantages (paragraphs 1.17 and 1.30 of the Report on the Eighth Replenishment). In addition, it places special emphasis on projects that increase the production of small farmers (paragraph 2.14 of the report). Lastly, the report notes the importance of agricultural programs designed to facilitate access to new technologies through applied research and extension services, and to enhance efficiency in the production and marketing of agricultural products (paragraph 2.35 of the report).

**EXCEPTION TO THE
BANK'S POLICIES:**

It is recommended that IICA be contracted to administer the resources of the program for the reasons stated in paragraph 3.16 of the loan proposal.

I. FRAME OF REFERENCE

A. General economic setting and the agriculture sector

1. General economic setting

- 1.1 The Government of Panama is embarked on an economic reform program that will enable the country to position itself in the world market. ^{1/} This reform program is needed to sustain the pace of economic growth, change the existing protectionist policies and diversify the economy toward competitive exports.
- 1.2 In 1995 the government made significant gains in the implementation of this reform. It entered into a stand-by agreement with the International Monetary Fund and made progress toward the privatization of telecommunications, ports and highways. It has also concluded an agreement for a restructuring of the commercial external debt and is finalizing negotiations for the country's accession to the World Trade Organization (WTO).
- 1.3 As a result of the reforms, the Panamanian economy has entered a transition from heavy protection with dependence on a few services to a more diversified economy. Despite a per capita income of US\$2,580 and inflation of about 1.3% a year, favorable indicators compared with those of other countries in the region, the structure of the economy is such as to generate unemployment and a skewed income distribution.
- 1.4 In the last few years the economic growth rate has shown signs of slowing down. In 1995, gross domestic product (GDP) grew an estimated 3%, down from 4.7% in 1994. This deceleration was caused by the slowdown in the service sector, which has had to function as the linchpin of the economy. These years have seen the International Banking Center less active, greater competition with trade in the free zone, and reduced pumping through the trans-isthmian oil pipeline. In addition, the economy is beginning to feel the impact of the phased transfer of the United States military bases.
- 1.5 This situation makes it necessary to develop new options for the generation of foreign exchange and employment, and to facilitate the conversion and adaptation of the productive sectors to international competition, which demands heightened efficiency of the public and private institutions, a reduction of production costs, and improved productivity.

^{1/} "Políticas Públicas para el Desarrollo Integral: Desarrollo Social con Eficiencia Económica" [Public policies for comprehensive development: social development with economic efficiency] MIPPE, September 1994.

2. Economic context of the agriculture sector

- 1.6 In this economic setting, agriculture is a productive sector with comparatively good prospects for expansion if it can increase productivity and achieve competitive prices that will offset the constraint of an inflexible exchange rate in terms of encouraging farm exports. In 1994, the sector generated 10.3% of GDP (US\$655 million) and attained a growth of 3.9%. Agriculture has traditionally been the main source of merchandise exports, accounting for 49% (US\$315 million) of their total value in 1994.
- 1.7 Current policy for the sector is aimed at transforming the extensively protectionist arrangements under which activities have been carried on in the last decades, to allow resource allocation in response to an open-market economy. ^{2/} With these measures, the government seeks to increase international competitiveness and make domestic production more efficient, for the purpose of making the cost of the final products cheaper and improving the population's income. The protection measures used have included high tariffs, quotas, and import permits, reference prices for imports, and controlled prices on the domestic market. These measures have focused on basic goods such as rice and corn and on final products from the poultry and pork meat food chain.
- 1.8 The policy changes that have been implemented include converting specific import tariffs to ad valorem ones; reducing tariffs on agroindustrial products; eliminating reference prices and import quotas; and unifying tariffs for agricultural goods (inputs and final consumer goods). In addition, direct government intervention has been reduced in terms of both price setting and the purchase of crops at guaranteed prices.
- 1.9 The actions to liberalize the economy are reinforced through two important negotiations. The first involves fulfillment of the contractual conditions of the World Bank's economic recovery loan (ERL), agreed upon in 1992. As a condition precedent to the second disbursement from the ERL, in December 1995, the National Import Tariff Schedule was amended for 40 tariff items. They were set as follows: 60% for 10 items related to pork meat and byproducts; 50% for eight poultry items; 45% for onions and chayotes; between 15% and 80% for eight bean items; 40% for wheat; and 34% for fuel oil. The reduction of specific tariffs and remaining quantitative restrictions are to take place prior to the third disbursement, scheduled for June 1996.

^{2/} Marco Orientador de la Política Agropecuaria, Áreas y Proyectos para la Modernización y Reconversión del Sector Agropecuario y Forestal 1994-1999 [Guiding framework for agricultural policy, areas and projects for the modernization and transformation of the agricultural and forestry sector, 1994-1999]. MIDA, Panama City, September 1994.

- 1.10 The second negotiation is related to joining the WTO. This government commitment entails eliminating most nontariff barriers, gradually reducing duties to a range between 0% and 30%, and progressively dismantling fiscal incentives. To join the WTO Panama will have to set up established sanitary surveillance systems and stop using quasi-tariff measures.
 - 1.11 As a result of this situation, the sector faces the necessity of a modernization that will enable it to operate competitively. In the present economic climate in Panama, there are clear indications of significantly reduced government intervention in the management of farm prices. The government recognizes the potential for making several production items in which Panama has a comparative advantage more competitive and is seeking to support change through mechanisms that will lead to modernization. Hence private farmers face the challenge of becoming more efficient and developing new, competitive lines of production that will meet with acceptance on the domestic and foreign market.
- B. Factors preventing the modernization of agricultural production
- 1.12 Studies done in preparation for the program show that agricultural production in Panama is hindered by several factors, some of them deriving from the policy of intense protectionism, others from the incipient capacity of private operators to meet the farmers' demand for services, and others from deficiencies of production support services. All these factors are direct impediments to the modernization and competitiveness of the sector.
 - 1.13 Low productivity and high production costs keep the sector uncompetitive in important traditional product lines, such as rice and maize, compared with indicators of exporting countries. In addition, the situation reflects the effect of protection in sustaining inefficiency and keeping prices on the domestic market artificially higher than those on the world market.
 - 1.14 Among the principal factors that work against competitiveness is the mechanism of technology generation and transfer. Today technology is generated with very little coordination among the participating institutions. There is no precise definition of fields of research, which hampers the efficient use of financial and human resources and results in repetition of some work. At present private enterprise and nongovernmental organizations (NGOs) are involved in the validation, transfer and demonstration of the results of few products and with the participation of few farmers.
 - 1.15 Moreover, productivity has not changed in recent years because the existing extension service, which includes public and private institutions, operates under diverse and uncoordinated arrangements and procedures. Additional reasons for the impaired effectiveness of the extension service are the lack of integration between the generation and transfer of technology and the fact that the work

does not focus on a clearly defined target population to meet the effective demand. Extension services are now provided to 16,500 farmers a year, and all efforts are directed at reaching as many as possible and none at improving the quality of the service.

- 1.16 The animal and plant health service is beset by several problems, among them the fact that the sanitary personnel participate in extension services, which reduces the impact of surveillance measures and sanitary campaigns. In addition, the service has a limited capacity to attract public and private investment, as a result of which the facilities are in need of upgrading. Besides, the existing equipment is obsolete, and additional laboratory facilities are required for diagnostic and control work. The problems caused by low productivity are aggravated by the enormous losses inflicted by existing diseases and pests. The annual losses from the most important of them are estimated at US\$12 million in animal production and US\$60 million in crop production.
- 1.17 Farmers have no access to reliable market information services, and so operate under uncertainty about access to potential markets. For example, there is need of timely information on seasonal price changes and on conditions in product presentation and packaging. The pricing and market information service has not been modernized because the present service suffers from limitations in staff training and the lack of a structure within the Instituto de Mercado Agropecuario [Agricultural Marketing Institute] (IMA) and of resources and equipment for telecommunications and the information processing systems.
- 1.18 There is a serious problem of access to investment credit, a key requirement for the improvement of competitiveness. This problem reflects, among other things, the lack of registered title deeds that could be offered as collateral. The magnitude of this lack is borne out by the Agricultural Census of 1991, which found that 134,500 farms (63% of the total) comprising 1.2 million hectares of land, were without land titles. The titling of land is not proceeding at the requisite pace owing to lack of modern technology that could be used on a large scale; Dirección Nacional de Reforma Agraria [National Directorate for Land Reform] (DINRA) is short of human resources and operating capacity. Since 1963 DINRA has issued only 36,200 titles, at a rate of 1,200 a year; at that pace it would take 136 years to issue titles to the remaining 150,000 farms.
- 1.19 The lack of irrigation systems prevents the adoption of leading-edge technology. This situation exposes crops such as rice to the vagaries of rainfall, heightens the risk of loss and impairs productivity. The country has a total of 29,200 hectares of land under irrigation, and the existing irrigation districts operate at 40% efficiency. No irrigation studies have been done because of the lack of a national plan and the failure to establish criteria for the prioritization of investments. In the field, the

maintenance of investments has been neglected, as a result of which the farmers do not receive quality service and so lose their incentive to pay the rates.

C. Conceptual basis of a program to modernize the sector

- 1.20 To accomplish the requisite improvement of the sector's competitiveness, in the economic transition stage the problems of some key services are to be solved through a modernization program that will enable the Ministry of Agricultural Development (MIDA) to take up its role as a regulatory institution and permit the design of incentives to adapt the private sector to international competition.
- 1.21 A technology generation mechanism will be set up to make the public and private sectors active participants in a system to provide access to competitive resources. Also proposed is a new technology transfer system designed for groups of farmers who finance the service and benefit directly from the results, by adopting appropriate leading-edge technologies, enhancing their production efficiency, and making sensible, sustainable use of resources, all of which will directly increase the sector's productivity and competitiveness.
- 1.22 Animal and plant health will be provided for by strengthening the services for the improvement of public health to comply with the new international trade standards and avert significant losses from lack of sanitary services. It has been considered essential to introduce the innovative accreditation of privately practicing professionals for the administration of field operations. There will also be a transfer of responsibilities to farmers' organizations.
- 1.23 The IMA's conversion will include a market information system designed to support public policies and commercial decision-making in the private sector. A public agricultural statistical and market information service is essential to support catering to new markets.
- 1.24 To step up the pace of land titling, a massive operation will be launched for the issuance and registration of titles to some 35,000 farms in the province of Veraguas, where the most land (314,300 hectares) is occupied without titles. A system for ongoing registration has been designed to evolve towards supporting the financial operations of an active land market, which provides security and so supports technological change.
- 1.25 Another important action that complements the design of the program relates to the advantages of doing irrigation studies. Also of value is an operation parallel to this program, presented for financing to the Multilateral Investment Fund (MIF), for the organization of services to support private agroindustrial export

processors. This operation will strengthen an organization of private farmers by giving it the capability to develop exportable products and open new markets.

D. Experiences applicable to the design of the program

1. The Bank's operations in the agriculture sector

- 1.26 Through 1988 the Bank approved 18 loan operations aggregating US\$147 million for global credit programs and agricultural projects in animal health, irrigation, aquaculture, and seeds. The Bank has financed no agricultural projects in Panama since 1988. Of the loans mentioned, the one for seed production, processing and distribution (727/SF-PN) is in execution; it had an available balance, which has been reallocated to the preparation of this program. Upon reactivation in 1995, this loan was used to facilitate measures for the private sector, the production of certified seed having been transferred to the farmers. This precedent reinforced the decision to involve the private sector more in the design of this program.
- 1.27 The program draws on the experience of the financing of 500 hectares of shrimp farms and the development of 1,600 fish culture tanks (98/IC-PN), which yielded optimal economic results. The incidence of disease was reduced by execution of the animal health program (616/SF-PN and 372/OC-PN). An additional effort is required to consolidate these gains, and attention must be given to experiences in the sustainability of the measures taken, and to an administrative, technical and financial structure that will facilitate execution. Another important experience was the analysis of the operation approved in 1987 (PN-0055) for similar services, which, though never signed, provided useful background for the design of this program.

2. Operations of other international agencies

- 1.28 The World Bank has coordinated with the Bank on major modifications of economic policy. An operation is now in preparation for the natural resources management and rural poverty - US\$20 million - for approval in fiscal 1996-1997. The executing agency could be the Instituto de Recursos Naturales Renovables [Institute of Renewable Natural Resources] (INRENARE). The components would be management of protected and transitional areas, titling work, and institutional strengthening. To facilitate coordination with the World Bank, information has been exchanged and a study has been made of the possibility of using the cadastre and registry method.
- 1.29 The country has received important support from other international agencies. The Inter-American Institute for Cooperation on Agriculture (IICA) has participated with the Bank in the performance of studies and the administration of resources, including those used to prepare this program; the experience of the

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) facilitated the design of the plant health laboratories and surveillance; and the United States Department of Agriculture (USDA) has provided information on inspection, epidemiological surveillance and prevention of foot-and-mouth disease and other exotic diseases, and on the control and eradication of the screwworm.

E. Consistency with the Bank's strategy

- 1.30 The Bank's strategy in Panama is to: (i) intensify the program of economic and sector reforms (deregulation and privatization); (ii) enhance the efficiency of public spending and support the modernization of the State; (iii) make social spending more efficient and target it more at the poor; (iv) rehabilitate and expand the country's basic infrastructure and revise the regulatory frameworks so as to encourage participation by the private sector; and (v) identify options for development in the interoceanic region.
- 1.31 The proposed operation is consistent with the Bank's strategy of promoting comprehensive reform of the agriculture sector that will make it more competitive in the production, pricing and exportation of agricultural products. The modernization of key services will stimulate the private sector to participate by increasing activities in the production of commodities for competitive export and domestic consumption. In addition, services should become substantially more efficient as they will be the responsibility of the private sector operating in a situation of free competition.
- 1.32 The program is consistent with the objectives of the Eighth Replenishment as follows: modernization of the State, by solving problems in MIDA's services; poverty relief, by generating employment; and environmental protection, through the design of measures to mitigate any possible adverse environmental impact of the program. The gender issue is dealt with by facilitating access to services and seeking economic stability for the family unit.
- 1.33 Specifically, the program will help modernize the agriculture sector and facilitate and diversify exports of farm products that offer competitive advantages (paragraphs 1.17 and 1.30 of the Report on the Eighth Replenishment). In addition, it places special emphasis on projects that increase the production of small farmers (paragraph 2.14 of the report). Lastly, the report notes the importance of agricultural programs designed to facilitate access to new technologies through applied research and extension services, and to enhance efficiency in the production and marketing of agricultural products (paragraph 2.35 of the report).

II. THE PROGRAM, ITS COST AND FINANCING

A. Objectives

- 2.1 The general objective of the program is to improve the profitability and productivity of the agriculture sector and the quality of its products, and to facilitate the adaptation of farmers to a more competitive economic system. The specific objectives are to enhance the efficiency of production of traditional and new products that offer competitive advantages, to reduce losses from diseases and pests, to meet the standards of importing countries, facilitate the expansion of markets and make tenure of rural property secure. The program supports the institutional upgrading of MIDA and promotes participation by the private sector in the execution and financing of the activities proposed.
- 2.2 The program will: (i) increase exportable agricultural production and the yields per hectare of items that are expected to have a competitive advantage; (ii) reduce post-production losses from pests and diseases and gain greater access to international markets; (iii) enhance the efficiency and reliability of market information; and (iv) expand land titling coverage (for the specific targets see the Logical Framework of the program in Annex II-1).

B. Description

- 2.3 The program has been structured into four subprograms: (i) technology generation and transfer; (ii) plant and animal health; (iii) market information; and (iv) land titling.

1. Technology generation and transfer subprogram (US\$23,494,000)

- 2.4 The objectives of the subprogram are to achieve greater diversification of production, improve the yields and quality of the final products and bring down their unit costs, and make them competitive internationally by using technology that ensures environmental sustainability. These objectives will be accomplished by measures provided in the following components:
- 2.5 **Technology generation component** (US\$13,875,000). To generate broad-impact agricultural technologies to be considered public property, and to fund research projects based on open competition between the public and private entities that constitute the national research system, which comprises Instituto de Investigación Agropecuaria de Panamá [Agricultural Research Institute of Panama] (IDIAP), Dirección Nacional de Acuicultura [National Directorate for Aquaculture] (DINAC), the universities, NGOs and the private sector. Emphasis will be placed on studies

with practical results for immediate commercial application, especially in competitive lines of production. This will be achieved, in the first case, by supporting a new approach in IDIAP and DINAC research activities and, in the second, by an innovative arrangement under which the allocation of resources for research will be entrusted to a private specialized agency. The component consists of two subcomponents:

a. Upgrading of research in IDIAP and DINAC (US\$10,475,000)

- 2.6 In the case of IDIAP, broad-impact medium- and long-term studies will be conducted on profitable and competitive crops for operators of small and medium-sized farms and on the sustainability of natural resources. DINAC will conduct research in fish and crustacean species for the benefit of small and medium-sized producers. These studies will be done in coordination with the agencies that make up the technology research and transfer system. The activities include training in short and graduate courses to build up a small corps of specialists to have charge of research in different products, the hiring of local scientists for specific tasks, the procurement of equipment and vehicles, and the rehabilitation of laboratories and libraries.

b. Research support resources (US\$3,400,000)

- 2.7 The purpose of this subcomponent is to encourage participation by private entities and enterprises, as well as public agencies of the system, in the execution of research projects. It will also promote strategic arrangements between domestic and foreign research institutions. The resources will be allocated by a private specialized agency, in response to demand on the part of producers and to items selected on the basis of standards of competitiveness on the world market, focusing on technology adaptation trials, profitable export crops, and the testing of inputs and varieties. Farmers will be expected to put up at least 30% of the total cost of the projects. The projects will be evaluated on the basis of criteria established in the Operating Regulations, available in the files of Regional Operations Department 2 (RE2).
- 2.8 **Technology Transfer component** (US\$9,619,000). Designed to restructure MIDA's current public agricultural extension system as it refers to this program, through a system in which services are provided by professionals, NGOs and enterprises operating in the private sector, which will be cofinanced with resources of the program and the farmers. The latter will progressively take on the costs of the assistance, and their share will reach 30% and 100% for operators of small and medium-sized farms respectively, by the fifth year of execution of the program. Under this new system, private agents will be selected on a competitive basis to provide

the extension services and will be hired by a specialized firm or agency that will function as technical executing unit (TEU).

- 2.9 The new system will operate under two arrangements of group action: a plan to provide business-related technical assistance to small-scale farmers (PATEP) and, for operators medium-sized farms, agricultural technology transfer groups (GTAPs). The assistance will respond to the effective demand of farmers located and organized in microregions of productive potential and accessible to markets, who are interested in modernizing their operations. The methodological approach is to make the operators of small and medium-sized farms more efficient by providing technologies, available from the national research system, that will reduce production costs, preserve of the production base and the rural environment, and assist with farm management and marketing. The experience of group action in other projects of the Bank has shown that groups of 15 to 25 farmers facilitate group dynamics while at the same time reducing the cost of assistance activities. One agricultural professional can service up to 80 farmers, that is, a module consisting of four groups averaging 20 farmers each.
- 2.10 In Panama, 47% of all farms are small and medium-sized - 31,615 and 69,395 respectively - including those with potential for conversion to commercial production. Of these numbers it has been projected that about 10,000 farmers organized in groups of operators of small (PATEP) and medium-sized (GTAP) farms will receive technical assistance directly while the program is in execution. Assuming a rate of indirect knowledge dissemination of 2 to 1, a total of 30,000 farmers will benefit. Large-scale farmers (13,314) and marginal farmers (100,581) will not benefit under this component because the former finance their own technical assistance and the latter, who produce solely for on farm consumption, will be served by the programs of MIDA's Rural Development Directorate, which will be strengthened with the human resources that the new transfer mechanism will make available. As mentioned in chapter I, the World Bank is preparing an operation to support these programs. The document on the technical analysis of the component includes a form for selection of a farmer on the basis of such criteria and characteristics as time lived on the farm, sex, age, availability of irrigation, assets and income. 3/
- 2.11 **Plan to provide business-related technical assistance to small-scale farmers (PATEP).** Technical assistance will be provided to

3/ A small-scale farmer is defined as the owner of a farm with a productive system capable of generating a gross income between 2.5 and 18.5 times the national minimum wage, and the operator of a medium-sized farm as the owner of a farm that generates a gross income equal to or above 18.5 times the national minimum wage, and having assets of not less than US\$47,000 or more than US\$90,000.

economically viable small farmers organized in groups. The beneficiaries will finance part of the cost of the services in accordance with the schedule shown in Table 1. The highest contribution from each small farmer is US\$4 a month starting in the fifth year. As part of the mid-term monitoring, MIDA will evaluate the capacity of the farmers to take on a higher percentage of the cost. Under this modality about 7,600 farmers assembled in 380 groups will be covered directly by 95 professionals, NGOs or private enterprises contracted by the TEU.

Table 1. Financing and sizing of the PATEP component

YEAR	Relative share of costs (% of total)			Number of PATEP groups	
	IDB	LOCAL (GOP)	FARMER	NEW	TOTAL
0	0	100	0	0	0
1	70	30	0	60	60
2	65	30	5	120	180
3	55	35	10	120	300
4	40	45	15	40	340
5	10	70	20	40	380
6	0	70	30	0	380

- 2.12 The TEU will organize the PATEP groups and, with the beneficiaries' participation, will select, hire and supervise the service providers. Contracts will be renewed annually as warranted by performance. Providers will be selected and hired on the basis of the criteria and point scores stated in the related technical document.
- 2.13 **Panamanian agricultural technology transfer groups (GTAP).** Will meet the technical assistance needs of organized operators of medium-sized farms especially interested in increasing their production of competitive traditional crops for the domestic market or in converting to products with export potential. Each group will consist of farmers with shared interests who are prepared to pay the cost of the service gradually and in an increasing proportion up to 100% as shown in Table 2, following criteria that maximize the use of the resources.

Table 2. Financing and sizing of the GTAP component

YEAR	Relative share of costs (% of total)			Number of GTAP groups	
	IDB	LOCAL (GOP)	FARMER	NEW	TOTAL
0	0	100	0	0	0
1	65	25	10	40	40
2	45	25	30	40	80
3	30	20	50	20	100
4	5	20	75	20	120
5	0	0	100	0	120
6	0	0	100	0	120

- 2.14 Under this arrangement, about 2,400 farmers assembled in 120 groups will be served directly by 30 professionals, NGOs or private enterprises contracted by the TEU, each of which is expected to be in charge of four groups. The maximum amount to be contributed by each farmer will be US\$20 a month when he assumes the total cost of the service.

2. Plant and animal health subprogram (US\$8,288,000)

- 2.15 This subprogram is intended to improve the quality of the services provided by the National Directorate for Animal Health (DNSA) and the National Directorate for Plant Health (DNSV), both attached to MIDA, in order to help, in conjunction with the private sector (professionals and farmers' associations), minimize losses from pests and diseases and facilitate marketing. The subprogram consists of the following components:
- 2.16 **Animal health component** (US\$3,921,000). It aims to preserve the national livestock population and ensure the sanitary condition of the products through (i) **intensification of epidemiological surveillance** to establish a modern, internationally integrated system of information on the sanitary situation and for the facilitation of trade, with the support of the Ministry of Health (MINSA), accredited private professionals, and the Committee for the Prevention of Foot-and-Mouth Disease, among others; (ii) **expansion of the veterinary laboratories**, which includes upgrading them so that they may perform more veterinary diagnoses and biological analyses, with the direct participation of the farmers' organizations in recovering the cost of the services and area administration, and later of the regional laboratories; (iii) the establishment of a laboratory to test for toxic residues in products so as to ensure their quality; (iv) the structuring of the Animal Health Registry Department for the control of animal production inputs; and (v) the organization of campaigns for the

control of brucellosis and rabies, particularly of bovine, swine and equine species, and the care of diseases such as mastitis, leukosis and external parasites, in joint work with extension workers, accredited professionals and farmers.

- 2.17 **Plant Health component (US\$2,961,000).** It aims safeguard the plant health situation, improve diagnostic capabilities, and strengthen campaigns through the following activities: (i) **updating of the plant health surveillance system** on the basis of selected farms, education for the recognition and reporting of pests, campaigns, inspection posts; (ii) **setting up of surveillance laboratories and units** to improve the diagnostic capabilities; (iii) **registry and analysis of pesticides** by setting up a laboratory for minimum-risk pest control, chemical control, and inspection of distributors, and to publicize sound farming practices; and (iv) **reinforcement of control campaigns** through the inspection of nurseries, on-farm quarantines for plant material, plant health control of seeds and exports, campaigns for control of the Mediterranean fruit fly and the tristeza virus of citrus plants, and health measures on observation plots for the handling of pesticides in conjunction with technology transfer staff, accredited professionals and farmers.
- 2.18 **Agricultural quarantine component (US\$866,000).** It aims to prevent the entry of exotic and the spread of existing health problems through the following activities: (i) **upgrading the livestock quarantine station**; (ii) **establishing three control posts** Chiriquí, Panama City and Comarca Kuna Yala; and (iii) **outfitting control posts**, especially those at Panama City, Bocas de Toro, Colón, and Comarca Kuna Yala.
- 2.19 **Institutional strengthening component (US\$540,000).** It aims to support the plant and animal health activities by: (i) providing **sanitary education** for farmers and the general public; (ii) **expanding the information and communications network** to facilitate decision-making; and (iii) **training for personnel** by consultants, through study-grants and courses. These activities will be supported by: consolidation of the organizational structure so that personnel will perform specific functions; approval of the legal mechanisms, especially the updated laws on animal and plant health; coordination of field and laboratory work with the farmers through farmers' committees, and with international agencies for the provision of technical assistance; and also formalization of operations with IDIAP, the Seed Committee and MINSA.
3. **Market information subprogram** (US\$674,000)
- 2.20 The purpose of this subprogram is to facilitate decision-making by farmers, agroindustrial processors and the public sector by providing efficient and reliable market information. This purpose will be accomplished through the IMA by the establishment of the

market information system (SIPAN) to compile, process, analyze and distribute expeditiously information of use to farmers and those responsible for sector policies. This will be done through coordination with the data-generating centers, associations, and joint-and-several associations or organizations, cattle fairs, supermarkets and other private and public entities, especially MIDA's Sector Plan Directorate. SIPAN will supply the basic trade information required for the project to support services to agribusiness investors, presented for consideration by the MIF for parallel financing (US\$1.8 million).

- 2.21 This subprogram will finance the following activities: (i) **technical assistance**, including economic and technical analysis and public information; (ii) **procurement** of computers, materials, and subscriptions to international information services; and (iii) **personnel training**, both in-service and on short trips to similar entities in other countries of the region. Starting in the fourth year of execution the private sector is expected to take on increasing responsibilities for the compiling, processing and release of information. The functions relating particularly to policy-making will continue in the public sector.

4. Land titling subprogram (US\$4,484,000)

- 2.22 The aims of this subprogram are the facilitation of access to technology, increased use of credit and an increase in sustainable investments made possible by improved security of land tenure. In addition, it will encourage the development of a responsive and transparent land market. The measures will be carried out in the province of Veraguas, which has been selected for its production potential and the largest number of farms and tenure problems, as the first phase of the national land titling plan. It is made up of the following components:
- 2.23 **Rural cadastral survey** (US\$2,644,000). A massive survey will be carried out using digital methods for efficient field work. The activities include: (i) extending the national geodesic network of the Instituto Geográfico Tommy Guardia (IGTG); (ii) aerial photography; (iii) digital surveys; (iv) digital plotting; (v) collection of the basic cadastral information on place names, infrastructure, and applications for awards and boundary drawing; (vi) compilation of the cadastral map of 41 corregimientos; and (vii) establishment of a database to define the relationship between the geographic information and the farm property. The work will be contracted out to specialized private enterprises and supervised by DINRA.
- 2.24 **Cadastral updating** (US\$768,000). A new Geographic Information System (GIS) in MIDA, linked to the Public Registry Directorate of the Ministry of Government and Justice, will use the results of the preceding component to keep the cadastral survey updated. The

activities of this component are: (i) acquiring the equipment for the GIS; (ii) organizing for receipt of the information prepared by the specialized firms to convert the GIS into a multi-user service that will support MIDA and DINRA in preparing the cadastral maps that will accompany each award decision; (iii) adjusting the Veraguas Provincial Public Registry Office to enable it to receive the awards from DINRA and issue formal title deeds to the farms; and (iv) organizing the mechanism for updating the land transactions.

- 2.25 **Titling of public lands** (US\$616,000). Based on the field survey and supported by the GIS, this component will contribute to the settlement of existing disputes and improve the efficiency of DINRA's award and titling service, which will process about 35,000 title deeds in Veraguas province. The activities will concentrate on training and equipping DINRA to: (i) improve the preparation of land award and titling cases; and (ii) facilitate the process for resolving existing property disputes using community motivation and information mechanisms.
- 2.26 **Institutional strengthening** (US\$456,000). The component focuses on training the DINRA personnel and monitoring the subprogram, for which consultants will be hired and bids, courses in land registry, computer science and planning will be prepared. It includes a study to determine and define measures to mitigate the possible adverse environmental impact of the migration of families to other marginal areas.

C. Cost and financing

- 2.27 The total cost of the program, at October 1995 prices, is estimated at US\$48 million, broken down as follows:

COSTS OF THE PROGRAM (US\$ thousands)

Investment categories	Bank	Borrower^a	Total	Percentage
I. ENGINEERING AND ADMINISTRATION	1,783	1,333	3,116	6.5
1.1 Engineering and supervision	93	445	538	
1.2 Central coordination unit	414	511	925	
1.3 Supervision technology transfer	534		534	
1.4 Program administration entity	742	377	1,119	
II. DIRECT COSTS	23,692	6,003	29,695	61.9
2.1 Research support resources	3,000	400	3,400	
2.2 Technology transfer services	4,415	3,685	8,100	
2.3 Construction	2,958	989	3,947	
2.4 Machinery and equipment	3,127	130	3,257	
2.5 Vehicles	2,278		2,278	
2.6 Inputs and publications	1,130	292	1,422	
2.7 Consultancies	2,152	37	2,189	
2.8 Training	2,228	470	2,698	
2.9 Cartography/titling services	1,904		1,904	
2.10 Studies	500		500	
III. ASSOCIATED COSTS		5,595	5,595	11.7
3.1 Incremental remuneration		1,743	1,743	
3.2 Travel		1,880	1,880	
3.3 Upkeep and insurance		1,050	1,050	
3.4 Materials and general services		922	922	
IV. UNALLOCATED EXPENDITURES	1,806	969	2,775	5.8
4.1 Contingencies	1,046	544	1,590	
4.2 Escalation	760	425	1,185	
V. FINANCIAL COSTS	6,319	500	6,819	14.2
5.1 Interest	5,983		5,983	
5.2 Credit fee		500	500	
5.3 Inspection and supervision	336		336	
Total	33,600	14,400	48,000	
% of total	70.0	30.0	100.0	100.0
a/ There is also a contribution of US\$2,265,000 from the beneficiaries of the transfer component.				

- 2.28 The details of the different investments and expenditures to be financed under the program are on file in RE2/EN2. The content of each category and the distribution of the cost by subprogram are available in RE2's files. Some aspects of the categories of the proposed financing in the foregoing table are worth noting which reflect the decentralized structure of the program and the active participation of the private sector, as described in chapter III.

The "engineering and supervision" category (I.1.1) includes the costs of hiring private firms to prepare final designs and oversee the construction of the civil works. The program administration entity category (I.1.4) is the cost of the services to be performed by IICA as the entity managing the resources.

- 2.29 "Research support resources" (II.2.1) are the funds for which the public and private organizations of the research system will compete, which will be managed by a specialized private entity to be hired for the purpose. "Technology transfer services" (II.2.2) is the cost of hiring the private specialized firm or agency that will perform this service, plus the cost of the professionals, NGOs or private enterprises that will provide the extension services, which will be partly financed by a contribution from the farmers, estimated at US\$2,265,000.
- 2.30 The "consultancies" category (II.2.7) includes, in addition to the technical services called for in each component, monitoring for possible environmental impacts, and tariff studies, which will be contracted out to private firms or consultants. The training comprises specialization studies abroad and courses at home, notably the training of MIDA's extension workers who will transfer to the private sector. "Cartography and cadastral services" is the cost of the work to be done in those areas by private consulting firms. "Studies" comprises resources for the preparation of investment projects, mainly in irrigation, by private firms.

D. Financing of the program

- 2.31 The Bank will put up 70% (US\$33,600,000) of the total cost of the program from the ordinary capital for a period of 20 years, including a five-year disbursement period and a grace period of the same length. The loan will bear interest at a variable rate, and there will be a credit fee of 0.75% on undisbursed balances and a commission for general inspection and supervision by the Bank of 1% of the loan amount.
- 2.32 The local contribution, in the equivalent of US\$14,400,000, covers 30% of the total cost of the program. These resources will be put up by the Republic of Panama from the national budget. The portion for the first year of execution of the program, US\$1.8 million, is included in MIDA's budget for 1996. The amounts of the counterpart contributions for the subsequent years are considered feasible because they lie within ranges that are reasonable and consistent with foreseeable fiscal expenditure in the years ahead.

III. THE BORROWER, THE EXECUTING AGENCY, AND EXECUTION OF THE PROGRAM

A. The borrower and the executing agency

- 3.1 The borrower will be the Republic of Panama and the executing agency the Ministry of Agricultural Development (MIDA), through five of its national directorates, and through IDIAP and IMA, which are two of its decentralized entities. To this end, MIDA will set up an organizational structure attached to the Office of the Minister and headed by a central coordination unit (CCU) to coordinate and supervise execution of the program.

B. The Ministry of Agricultural Development (MIDA)

1. Institutional considerations

- 3.2 MIDA is the apex governmental organization of the agriculture sector, created in January 1973 by Law 12 with the functions of: (i) framing policies and planning the development of the agriculture sector; (ii) research in and the transfer of technology to foster agricultural production; (iii) plant and animal sanitation and quarantine work; and (iv) protection of renewable natural resources.
- 3.3 MIDA's present organizational structure, a detailed description of which is available in RE2's files, is in part the outcome of internal organizational changes implemented over recent years in keeping with the policies for readjustment of the sector. These policies have brought about a shift in the functions of MIDA, and a reduction of its staff and operating costs and, at the same time have given it a new role in and vision of the sector's development. As a result of these institutional changes and adjustments, MIDA's role will be reduced to no more than the regulation and oversight of the agriculture sector.
- 3.4 The program is designed to support the institutional, technical, operational and financial aspects of MIDA's readjustment to its new role in keeping with the government's policies and measures to dynamize the development of the agriculture sector. It may be noted that with execution of the technology transfer subprogram a substantial part of the agricultural extension services provided by MIDA will gradually be transferred to specialized entities in the private sector.

2. Present institutional capacity of MIDA

- 3.5 The organizational structure of MIDA is the target of an institutional strengthening plan encompassing the functions of planning, design and implementation of agricultural policies, which is being financed and executed under the technical cooperation

project for the agricultural development of Central America (RUTA III), which has received financing from the IDB (ATN/SF-5049) and other international agencies. At the completion of this plan MIDA is expected to have an enlarged capacity to frame, and coordinate with the private sector, development strategies that will enable the agriculture sector to enlarge and consolidate its domestic markets and penetrate external markets with new and/or improved products, which will reinforce this program's measures in support of the private sector.

- 3.6 Though MIDA has made changes in its organizational structure, the administrative execution of its budget is still restricted by the country's current relatively complex laws and regulations for fiscal control of all government resources. The effect is to substantially prolong the processes for hiring and procurement of goods and services and the disbursements for them thereafter.
- 3.7 To get around this situation in projects financed with resources from international financing agencies, in different cases the Panamanian government has provided that, by way of exception, the resources involved would be administered by a specialized international agency engaged for the purpose. The projects in the country currently being financed by external entities and employing this administration mechanism are proving viable and being executed briskly. It has therefore been decided that this exception will be applied in this program, with which it is anticipated that MIDA will circumvent the stated restrictions.

3. MIDA staff

- 3.8 From 1989 to 1995, a total of 1,230 MIDA employees were encouraged to take voluntary retirement, which resulted in a 33.4% reduction. At mid-1995 MIDA had a total work force of 2,635 employees, of whom 553 (21%) were professionals and 210 (8%) middle-level technicians. It has been decided that some of MIDA's 380 agricultural extension workers will undergo retraining under the technology generation and transfer subprogram and then be transferred to provide agricultural extension services through the private sector, and that the rest of these workers will be eventually transferred to other extension programs for low-income farmers.

4. Financial and budgetary characteristics of MIDA

- 3.9 In keeping with the government's policies for the institutional and operational reorganization of MIDA, the budgetary resources available to it from 1992 to 1995 (tables available in RE2's files) were reduced by US\$7.7 million, 27% below the total allocated for 1992, which resulted in a decline of 24% in total operating expenditures and of 60% in investment expenditures.
- 3.10 Budget execution, however, averaged annually 81% of the total resources allocated. Of that execution, 78% was for personnel

expenditures and 22% for investment expenditures. The budget approved for 1996 came to US\$23.5 million, or 0.5% of the general government budget, and 10% more than the amount approved for 1995.

- 3.11 MIDA's financial projections for the next six years point to a substantial growth of its investments as a result of the program. By the sixth year of execution, operating costs should go down as a result of the transfer to the private sector of about 50 extension workers, for a savings of about US\$620,000 a year. In addition, new legal provisions and rates to be applied in plant and animal health services are expected to increase the income from those services by an estimated US\$670,000 by the sixth year, by which time all these savings are expected to reduce MIDA's operating costs to about 12% below their present level.

5. External auditing

- 3.12 The law requires that the external auditing of MIDA and its decentralized entities be performed by the Office of the Comptroller General of the Republic (CGR). The CGR has been performing the external auditing of the IDB-financed projects in a satisfactory manner, and it is recommended that, during the execution of the program, its financial statements be audited yearly by the CGR.

C. Organization and coordination for execution of the program

1. Coordination and supervision

- 3.13 The program will be coordinated through an organizational structure (a description of which is available in RE2's files) to be set up in MIDA, consisting of a central coordination unit (CCU) assisted by six technical support units (TSUs) that will provide liaison with the subprograms' executing agencies. This structure has been designed to improve the quality and efficiency of the agricultural services by having the private sector participate more in providing them.
- 3.14 To circumvent the complexities of budget execution, for purposes of the program MIDA has proposed that the Inter-American Institute for Cooperation on Agriculture (IICA), in its capacity as an international agency, be the administrative agency for all the program's resources. It may be noted that IICA is widely experienced in the management of resources under similar projects in different countries of Latin America, and possesses technical capacity of a high order in the agriculture sector.
- 3.15 The functions of IICA will be mainly to contract, following the Bank's procedures, the following specialized service and consulting firms and entities: (i) one to administer the research support resources; (ii) one to perform the extension services, including consultancies and specialized training; (iii) those that will

prepare the final designs and construction work, and supervise the civil works; and (iv) those that will carry out the digital surveys, geodesics, aerial photography, cartographic plotting and the cadastral survey. IICA will also administer the study-grants and hire the consultants required for execution; it will be responsible for the procurement of equipment, vehicles and their insurance, laboratory materials and supplies, and other associated program expenditures.

- 3.16 Hiring IICA with resources of the program will provide administrative facilities and operational advantages for the administration of its resources. Its services will be provided under an agreement to be signed with MIDA, which will spell out its functions and how the resources will be administered. Presentation of this agreement to the Bank will be a condition precedent to the first disbursement from the loan, and it will also be required that, to that end, the Bank grant an exception to the applicable policy (see the Executive Summary).
- 3.17 The executing agencies for the different subprograms will be the National Directorates for Agrarian Reform, Animal Health, Plant Health, and Aquaculture, and MIDA's Technical Secretariat for the technology transfer component, as well as IMA and IDIAP. Each of these directorates and other entities will have a TSU to coordinate its work with the CCU. 4/
- 3.18 To secure proper internal coordination of the different components of the program, there will be two collegial consultative bodies: (i) a **Central Operations Coordination Committee**, and (ii) a **Regional Coordination Committee**. The details on the membership and functions of these two consultative bodies are available in RE2's files.
- 3.19 To facilitate communication and coordination with the agriculture sector and its supervision of the program, there will be two consultative bodies: (i) the **program's Consultative Council**, which will be chaired by the Minister and have as its members representatives of different associations of agricultural producers and the general coordinator of the CCU; and (ii) the **Administrative Committee for Agricultural Research Support**, chaired by the Minister of MIDA and with five members appointed by him from nominations by the farmers' organizations, the associations of agricultural professionals and the agricultural scientific community. The details on the functions of these two consultative bodies are available in RE2's files.

4/ Except for the National Directorates for Animal Health and Plant Health, which will be served jointly by one single UAT.

- 3.20 As a condition precedent to the first disbursement from the loan, MIDA must present, to the Bank's satisfaction, evidence that (i) the CCU and TSUs have been set up and staffed with the requisite personnel; and (ii) the program's Consultative Council has been set up and put into operation (see Executive Summary). As a condition precedent to the first disbursement under the technology generation and transfer subprogram, MIDA will have to present evidence of having set up and put into operation the Administrative Committee for Agricultural Research Support (see Executive Summary).

2. Required personnel

- 3.21 During execution of the program, the CCU will have the following senior staff: (i) a general coordinator; (ii) a technical subcoordinator; and (iii) an administrative-financial subcoordinator. Each of these people will be selected in accordance with the eligibility requirements (a description is available in RE2's files) and be hired by MIDA with program resources following receipt of the Bank's statement of nonobjection. This unit will be supported by: (i) an **environmental consultant** for 24 months; (ii) an **institutional financial consultant** for six months; and (iii) five additional persons as administrative staff. Details on equipment, budgetary allocations to cover operating costs and the terms of reference for those consultants are available in RE2's files.
- 3.22 Each TSU will have the technical and administrative personnel needed for the performance of its assigned functions (descriptive document available in RE2's files). These employees and consultants will have to work in close coordination with the staff of the CCU. The above-mentioned document specifies that the personnel of the TSUs will number 57 persons, of whom 16 will be additional personnel hired on a temporary basis and 41 will be permanent employees of MIDA or of one of its decentralized entities. All the personnel of the CCU and the additional personnel of the TSUs will be terminated at the close of program execution.

D. Execution of the program

1. Annual working plan

- 3.23 The program will be executed in accordance with annual working plans (AWPs) to be drawn up by the CCU on the basis of what the various national directorates of MIDA and its decentralized entities work out for the purpose in the medium-term (five years) and to be approved by the Central Operations Coordination Committee. The AWPs will include an account of the activities proposed to be carried out each year under the program, which are itemized in Annex III-1. Before July 31 of every year during

execution of the program, MIDA will present to the Bank the consolidated AWP for the following year (see Executive Summary). On the basis of the AWP, MIDA, together with the Bank will determine the adjustments to be made in the execution of the program. The Bank will evaluate the execution of the program every year, and the first evaluation will be made 12 months after the first disbursement from the loan.

2. Technology generation and transfer subprogram

a. Implementation of the technology generation component

- 3.24 The part of the technology generation component relating to broad-impact medium- and long-term studies toward the generation of public property will be executed by: (i) IDIAP, through the network of experimental centers, laboratories and land of participation farmers on the basis of medium-term strategic planning worked out with the participation of the users; and (ii) DINAC, through its experimental stations and laboratories located in the principal areas of the country, with the support of the specialized animal health laboratories.
- 3.25 Moreover, the resources (research support resources) for the partial financing of studies for adapting the technology of profitable export products and new products will be administered by a local or international specialized institution to be selected and contracted on a competitive basis. This institution will be attached to the Administrative Committee for Agricultural Research Support and be subject to the Operating Regulations. It will also encourage the public and private entities of the national research system to use the resources, and will engage consultants and scientific specialists to sit on panels for the review, evaluation and selection of projects.
- 3.26 The Administrative Committee will: select, coordinate and supervise the institution that will administer the resources; frame the policy for their management; and approve the eligibility of entities and projects. Within the six months following the date on which the loan becomes eligible for disbursement, the executing agency will have to present evidence that it has hired the entity to administer the research support resources, opened the account for those resources in a bank, and put the Operating Regulations into effect (see Executive Summary).

b. Technology transfer component

- 3.27 To execute this component, MIDA will hire a consulting firm or specialized entity (TEU) which in turn, in consultation with the farmers' associations, will select and hire private extension workers (enterprises or individual professionals). The work of the TEU will be supervised by MIDA's Technical Secretariat, which will act in conjunction with the regional directorates.

- 3.28 The TEU will have to be contracted within the first six months after the date on which the loan becomes eligible for disbursement (see Executive Summary). The TEU will be responsible for training the extension workers in methodological and management matters and new technologies generated by the research system.

3. Plant and animal health subprogram

- 3.29 The subprogram will be executed in a manner consistent with the new approach of adapting the services to the demands of the international market, especially in view of Panama's accession to the WTO. Its execution will be the joint responsibility of the DNSA and DNSV operating through their different departments, which include diagnostic laboratories, livestock quarantine stations and control posts. Those installations will be complemented by biological, residue and pesticide control laboratories. The field operations, scheduled and supervised by the central departments, will be carried out by the technical plant and animal health staffs of the regional directorates and the agencies.
- 3.30 The execution of this subprogram will be related to the activities of the technology transfer subprogram, and have the support of professionals accredited for field operations and inspection, of farmers' associations through sanitary control and laboratory administration committees, of the Ministry of Health (MINSA), the Instituto Especializado de Análisis [Specialized Analysis Institute] (IEA), and of the universities.
- 3.31 To streamline operations, within the 12 months following the effective date of the loan contract, MIDA will have to show evidence that: (a) the new animal and plant health laws have been put into force; (b) agreements have been signed with: (i) MINSA, to coordinate the provision of information to plants processing agricultural, pest-control, pharmaceutical and biological products, and personnel training; and (ii) the IEA, for the analysis of pharmaceuticals and personnel training. Also, within the 24 months following the effective date of the loan contract, evidence must be provided that the regulations on the use and handling of pesticides, the operating manuals for the pesticide laboratories and other laboratories, for surveillance, for input registration and control, and for inspection and quarantine have been issued (see Executive Summary).

4. Market information subprogram

- 3.32 This subprogram will be executed under the responsibility of the IMA, which has launched an internal reorganization that will permit the establishment of the Directorate of SIPAN, with its economic analysis, technical analysis, and public information departments. Within the six months following the date on which the loan becomes eligible for disbursement, the executing agency will have to present evidence that that structure is in operation (see Executive

Summary). SIPAN will have the support of the other directorates of the IMA (agribusiness, marketing, and finance) and of its regional directorates. In addition, it will coordinate with 12 selected farmers' associations, the supermarket chains and government entities such as MIDA's Planning Directorate, the Statistics and Census Directorate of the Office of the Comptroller General of the Republic, the Office of Price Regulation, and the Panamanian Institute of Foreign Trade.

5. Land titling subprogram

- 3.33 This subprogram will be executed by DINRA in conjunction with the Public Registry Directorate of the Ministry of Government and Justice. The general coordinator and the subprogram's planning coordinator will be full-time consultants. Specialized firms will be hired to perform the cartography and rural cadastre tasks.
- 3.34 DINRA's internal procedures for preparation of the cases for the award of public lands, including those involving topographical surveying, will be complemented by procedures that incorporate new technologies for digitized cartography. DINRA will supervise the work of the firms contracted and the field work, to which end it will prepare a manual of team procedures. It will frame regulations on official use of the Global Positioning System (GPS) for the drawing of property boundaries and of the aforementioned manual.
- 3.35 The Public Registry Directorate will receive, at its Provincial Public Registry Office in Veraguas, the land awards issued by DINRA for registration of the titles. Within 12 months following the effective date of the loan contact, the executing agency must show evidence that DINRA and the Public Registry Directorate have signed an agreement for registration of the titles issued (see Executive Summary).
- 3.36 The subprogram will be coordinated with and complemented by the activities under the project on natural resources and rural poverty scheduled to be launched in 1997 by INRENARE with World Bank financing, under which titles are to be issued for land in forest management and buffer areas.

E. Final designs for works and land availability

- 3.37 The preliminary designs of the technology generation structures proposed by IDIAP and DINAC and those for plant and animal health have all been completed. The final designs will be drawn up by engineering services to be contracted for within 12 months following the effective date of the loan contact (see Executive Summary). The proposed structures will be built on land belonging to IDIAP and MIDA. All that remains is to determine the legal ownership of the land for two internal control posts. Before invitations to bid are sent out or the respective works are begun,

the borrower will have to show the Bank that it holds legal title to the lands or the right to use them.

F. Maintenance of works and equipment

- 3.38 The borrower, acting through the executing agency, undertakes to ensure that the works and equipment financed with program resources will be operated and maintained properly in accordance with generally accepted technical standards. For the duration of the amortization period of the loan, the borrower must include in its annual budget, during the service life of the program structures and equipment, an amount sufficient to cover the cost of such maintenance. During execution of the program and for the five years following its completion, the borrower will submit to the Bank a report on the maintenance done in the preceding year (see executive summary).

G. Procurement of goods

- 3.39 Goods will be acquired, construction works executed, and related services contracted for in accordance with the procedures spelled out in Annex B to the loan contract. International competitive bidding will be mandatory for the procurement of goods and services valued in excess of US\$250,000, and for the execution of works and performance of related services valued in excess of US\$1,500,000. These thresholds are justified by the fact that in similar projects in the country foreign bidders present themselves when the amounts involved are above them. Procurement in amounts below the thresholds will be carried out in accordance with domestic law, which requires competitive bidding when the amount involved is above US\$250,000, and permits price comparison for amounts between US\$10,000 and US\$250,000; for items below US\$10,000, the procedure for minor contracts based on getting price quotes may be used. (The timetable of scheduled bidding operations is available in RE2's files).

H. Hiring of consultants and selection of study-grant recipients

- 3.40 To speed up execution of the program, and benefiting from the experience and assistance of IICA, the subprograms' executing agencies will select the consultants, who will then be hired by IICA. This will be done following the standard procedures delineated in Annex C to the loan contract. The study-grants will be administered by IICA in view of the work it is doing in the countries of the Americas and its connections with universities and the international research network. Study-grant recipients will be selected in accordance with the national legislation governing professional development for civil servants. Within six months following the date on which the loan becomes eligible for disbursement, the executing agency must present to the Bank a timetable for the hiring of the consultants and their terms of reference in keeping with what has been agreed upon with the Bank

(see Executive Summary). The terms of reference of the consultants appear in the various technical annexes.

I. Collection of income for services provided

- 3.41 MIDA recovers part of the costs of its veterinary diagnostic, residue analysis, and export and import products inspection and quarantine services; this income runs to US\$450,000 a year. It has been provided that the rates for the services to be upgraded by the program, such as plant health diagnosis and the registration and control of pesticide, biological and pharmaceutical products, will be revised; thus, analyses of biological products residues and pesticide formulation will be charged back at 100% of the cost. For the other services, given the national importance of epidemiological information, 40% of the direct costs will be recovered. A system also exists for the collection of charges for the government's land sale and titling services.
- 3.42 The program provides that the directorates that generate income have direct access to the funds they themselves collect, which will be used essentially to cover part of their operating costs and keep them sustainable. To this end, MIDA will have to establish an operating mechanism for cost recovery that institutes pertinent rules for this purpose. In addition to facilitating operations, that income will reduce budgetary expenditures, especially from the fourth year of execution of the program.

J. Environmental considerations

- 3.43 To follow up on and institutionalize the environmental protection measures, MIDA will establish an Environmental Unit (EU) within its structure and draw up and execute a monitoring and action plan. To this end, a consultant will be hired for 18 months and attached to the CCU, to be assisted by four MIDA professionals. The latter will be selected by the minister based on their knowledge of environmental sciences or natural resource management and will, after in-service training and short courses abroad, in the third year of program execution, make up the EU, which will be directly under the Office of the Minister. The consultant will remain in the EU for an additional six months. Afterwards he will be hired for one month every year to monitor the operation of the EU, compliance with the environmental briefs for the research projects, the measures taken by the laboratories, pesticide handling, use and control, and other activities relating to environmental protection. The EU will work closely with the CCU, IDIAP and MINSA, and with INRENARE on preparation of the environmental impact assessments (EIAs).
- 3.44 The measures listed in the environmental summary of the operation will be carried out through the components for the support of sound management of natural resources, integrated pest control and efficient use of agrochemicals. Those measures will be supported

by the following recommendations: (i) supervise the use of pesticides, evaluate the measures for proper management of the biological and chemical wastes of laboratories; (ii) in the first year have the consultant draw up the plan for monitoring the environmental variables; (iii) within 12 months following the effective date of the contract, sign an agreement with INRENARE for coordination of environmental matters (see Executive Summary); and (iv) establish the EU in MIDA to evaluate the effectiveness of the mitigating and preventive measures recommended, a contractual condition to be satisfied within 24 months following the effective date of the contract (see Executive Summary). The CCU will write a report that will include a plan for the measures to be taken for protection of the environment. The program will allocate resources (US\$412,200) for setting up the EU, the environmental monitoring and management plan, and the training of extension workers in the use of pesticides and natural resource management.

K. Disbursement schedule

- 3.45 The disbursement schedule for the execution period, based on the investment calendar drawn up for each subprogram and component, appears below.

Disbursement schedule (in thousands of U.S. dollars)

Year	IDB/OC	Government	Total	Percentage
1	5,254	1,765	7,019	14.6
2	13,219	3,478	16,697	34.8
3	6,986	3,124	10,110	21.1
4	4,411	2,831	7,242	15.1
5	3,730	3,202	6,932	14.4
Total	33,600	14,400	48,000	100.0

L. Ex post evaluation

- 3.46 MIDA's Directorate for Agricultural Planning and Policy will be in charge of the ex post evaluation. This work will be done by the personnel of the Projects Department, which will be attached to that directorate. A system will be set up for issuing periodic reports comprising the information requested from the participating entities. Three years after the end of the execution period, the Directorate for Agricultural Planning and Policy will, with its own resources, perform the ex post evaluation to determine the extent to which the program objectives have been accomplished, based on the lists of impact indicators for the different subprograms. This determination will be made by comparing the changes in the impact indicators, such as: (i) increase in sales on export markets;

(ii) reduction of diseases and pests that have affected international sales; (iii) yields of items that producers consider to have competitive potential; (iv) reduction of production costs; (v) reduction of losses; (vi) acquisition of new products and markets; (vii) the increase in on-farm investments resulting from the issuance of titles in the province of Veraguas; (viii) cost-recovery for services provided; (ix) contribution of farmers to the financing of the transfer services; (x) changes in the government's extension services and institutionalization of private services; and (xi) impact of the market information, and efficiency of the media employed.

IV. FEASIBILITY AND RISKS

4.1 While the program was in preparation, two workshops to consult those involved were held, one in Panama City and the other in Santiago, which were attended by farmers, cooperatives, agroindustrial processors, and representatives of the agricultural and professional associations. In addition to presenting recommendations (which were taken into account in the design of the components), participants expressed interest in taking part and sharing responsibilities in the planning, evaluation and cofinancing of the research; in sponsoring extension services by professionals or private enterprises and cofinancing them; in supporting activities for making small farmers more efficient; in paying for the services of the laboratories provided the amounts paid went directly for their maintenance and upgrading; in working jointly and in an organized way to make the best use of market information; and in investing in their land when they have been issued titles thereto.

A. Technical feasibility

4.2 Technology generation will concentrate on the products that are most important and producer demand. Priority will be evaluated from year to year owing to the dynamic economic changes. IDIAP has a physical plant that will be adapted and experienced personnel who will be trained in response to present needs. In addition, there are public and private institutions that are prepared to ask for research support resources, which will promote efficient action on new, commercially viable product lines, especially nontraditional export items.

4.3 The new technology transfer system, privately operated, and including promotion with farmers themselves, training courses for professionals both on the technical and on the methodological and management side, will provide services by enterprises and individuals and include the farm owners as participants in the selection and evaluation of those services.

4.4 The DNSA and DNSV have a basic infrastructure which, if upgraded and staffed with trained technical personnel, will respond to the interest of farmers and industrial processors in participating in pest and disease control, complying with sanitary requirements and paying part of the costs. Comprehensive epidemiological information will make it easier for measures to be consolidated and for the country to be declared free of some plant and animal health problems. Operational integration between the central level and the regions will enable the DNSA and DNSV to supervise the processing, dispensing and use of drugs and pesticides, which in the short run will reduce environmental pollution, increase benefits (lower costs and greater competitiveness) and promote public

health. In addition, the GTZ and USDA are prepared to collaborate with the program, as noted in paragraph 1.28; the Food and Agriculture Organization (FAO) will assist with the prevention of exotic diseases; the Pan American Health Organization (PAHO), with the control of diseases that affect human health; and the International Regional Organization for Health in Agriculture and Livestock (OIRSA), with quarantine support.

- 4.5 The IMA has had one pilot experience with market information. Trained and reassigned personnel will be able to develop the proposed system. There is a demand among farmers and investors in agribusiness for a tool that would enable them to operate competitively on the domestic and international markets, and the technical conditions for telecommunications in the country are good. Coordination with the work of the project to support services to agribusiness investors ensures that best use will be made of the market information.
- 4.6 With its administrative and technical capacity strengthened, DINRA will be able to contract and supervise firms specializing in cartography and cadastres and perform efficient titling services. In addition, field support is to be forthcoming from units of the Global Positioning System (GPS), using technology available on the market at competitive prices, which will bring down the unit cost of the plan and titling service, thereby increasing the demand among users. The systems to be implemented will save time: it will take an average of a month and a half to issue a title for a farm.

B. Institutional and financial feasibility

- 4.7 The institutional feasibility of the program is based on the recognition that MIDA is currently in the process of changing and adjusting its operating structures and functions, in keeping with the economic policy objectives laid down by the present government for the agriculture sector. This means that the new goal of this ministry is to transform itself over the medium term into a smaller government entity with lower operating costs and greater private-sector participation in the provision of support services to farmers, essentially confining itself to regulating and overseeing the sector.
- 4.8 The institutional, operational and personnel structure of the program has all the basic elements needed for its proper execution, and it has been provided that MIDA will contract a specialized international agency to administer all the program resources throughout the execution period. This administrative arrangement will shield the execution of the program from the complex operating requirements and fiscal controls that burden the management of funds from the government Treasury.

- 4.9 Involvement of the private agriculture sector in the execution of the program is an important feature of the institutional design. Collegial bodies headed by MIDA will be set up as part of this structure to link the agricultural private sector with the program for the coordination and supervision of its execution. The participation of the private sector will be strengthened by establishment of the program's Consultative Council and the Administrative Committee for Agricultural Research Support. These bodies will seat representatives of the associations of farmers and agricultural professionals, including teachers and researchers.
- 4.10 The following elements will ensure the success of the program: (i) a mechanism in which MIDA, through the CCU and the national directorates and decentralized institutes, will execute the subprograms, with the CCU as the central coordinating body; (ii) participation by private enterprises and specialized institutions in the use of the research support resources, in the operation of the technology transfer component, and in the cadastre and cartography work; and (iii) international consulting specialists with the requisite competence in the fields and areas of the program. These elements will speed up execution of the program and make its procedures more effective.
- 4.11 The hiring of IICA to administer the resources and private firms or specialized entities to execute the research support resources, technology transfer, and cartography and cadastre components and the contracting of international consultants and awarding of study-grants will make for faster and more efficient execution of the activities and procedures, and facilitate the government's regulatory, supervisory, monitoring and evaluation functions, in addition to providing in-service training for its technical and administrative personnel.
- 4.12 Private farmers will participate in the financing of studies to be done with the research support resources; in the selection, evaluation and remuneration of the extension workers who will perform the technology transfer services; and in plant and animal health services, by paying part of the costs of laboratory analyses and quarantine inspections. This is important, as it will ensure that these services will continue to be funded and provided.
- 4.13 IDIAP, IMA and the Animal and Plant Health and Aquaculture Directorates will be upgraded to meet the demands of the program. The system for the accreditation of agents in the private sector, to be developed by the DNSA and DNSV, will make the plant and animal health services required in production and marketing more effective. DINRA will absorb the proceeds from the sales of public lands into its budget and use them to extend the work to other regions of the country.
- 4.14 The amount of the local contribution required totals US\$2.6 million a year, 13% of the annual average allocations of the government to

MIDA in the two preceding years. However, the financial feasibility of the program is grounded in the reduction of MIDA's costs afforded by reductions in force and increased income, which amount to a total estimated reduction of 12% below the present level of operating costs.

C. Beneficiaries

- 4.15 The activities under this program will directly and indirectly benefit all producers in the agriculture sector. The entire population of Panama will benefit as well from the control of animal-borne diseases, toxic wastes and contaminated products. The program is not designed specifically for low-income farmers. Nevertheless, beneficiaries have been identified who before entering the program will be below the low-income threshold as defined for Panama based on the reference monthly income of US\$50 per capita for 1995. The weighted index of resources from the financing targeted at low-income earners is 29%. The following table shows the total beneficiaries of each subprogram and the distribution among those who are low-income earners; note that some farmers will be beneficiaries of more than one subprogram and service.

Summary of direct beneficiaries

Subprogram	Total	Low-income earners
TGT	11,480	1,707
Plant and animal health	147,160	67,210
Market information	6,400	4,100
Land titling	35,000	24,980

D. Economic feasibility

- 4.16 The agricultural services modernization program is designed to generate major economic benefits for Panamanian society, including: (i) the combined effect of productivity increases and development of new farm product lines, chiefly from the establishment of an efficient technology generation and transfer system; (ii) reduction of damage to crops and of diseases in animals, and compliance with the sanitary requirements of external markets; (iii) additional savings to society from the use of efficient technologies to solve problems associated with the titling and registration of land; (iv) greater access for farmers to extension and animal health services and indirectly to credit; and (v) reduction of the cost of supplying information on prices and markets and the benefits thereof for decision-making in general.

- 4.17 For purposes of the economic feasibility analysis, each subprogram was evaluated to determine the direct connection between the costs of its activities and the benefits attributable thereto. Specifically, the feasibility of the technology generation and transfer subprogram and the plant and animal health subprogram were determined using cost-benefit criteria and that of the land titling subprogram by its cost-effectiveness.
- 4.18 The feasibility of the technology generation and transfer subprogram derives from the incremental productivity in priority product lines that would result from the adoption of new techniques or improved technologies. The increment is determined as the difference between the productivity expected from the adoption of new technologies (with the project) and the projection of the present situation (without it). The incremental impact was measured as the combined result of the research and extension services, taking into account that the subprogram is designed to respond to the demand of farmers for solutions to specific problems.
- 4.19 The analytical methodology is based on the prioritization of products done during preparation of the subprogram and IDIAP's AWP 96. This methodology simulates the impact of adopting fast-spreading available technologies as an exercise indicative of the changes that will take place when the new research system is in operation. The results confirm that the agriculture sector is capable of responding to the challenge of economic change with products that are competitive at border prices and are not affected directly by protectionist measures.
- 4.20 The results obtained confirm that there are good prospects on foreign markets for six products: cantaloupe, yams, plantain, dasheen, industrial tomatoes, and cassava). The benefits derive from technological changes based on integrated pest control, genetic improvement, soil management and preparation, and fertilization. The analysis confirms that these product lines can be raised to a high technological level and are profitable to the farmer at domestic market and border prices.
- 4.21 The two animal products considered in the analysis (meat and milk) also show favorable results. Panama exports meat, which is confirmed as the best of the options analyzed. The program will facilitate changes in management technology, which are readily accepted and are directly associated with the plant and animal health subprogram.
- 4.22 The competitiveness of three aquaculture product lines (artemia, shrimp and tilapia) has been confirmed. In particular, artemia production has the potential to replace imports if technology is introduced in the salt lakes and shrimp and tilapia growers can reduce their feeding costs and raise their productivity.

- 4.23 The product lines considered unfavorable and internationally uncompetitive are rice, onions and corn, mainly owing to low productivity and high production costs. From an economic standpoint, the recommendation would be to deemphasize efforts to generate and transfer technology related to these products and to confine them to those of highest export potential, while recognizing that rice is close to becoming competitive, requiring for this purpose an increase in productivity estimated at 4%.
- 4.24 For the technology generation and transfer subprogram in general, it was found that the total investments made and costs incurred by the public and private sectors are offset by the net benefits of the products, which confirms a satisfactory overall profitability reflected in an economic internal rate of return (EIRR) of 62% and net present value (NPV) of US\$54 million discounted at 12%. A sensitivity analysis found that changing the most critical assumptions about delays in the adoption of technology and smaller increases in productivity reduces profitability, which, however, remains above 12%. This result was obtained on the basis of the following assumptions: (i) technological changes are made only in the products that have development potential and are individually profitable to the farmer; (ii) there is moderate acceptance of technology; (iii) the new extension system carries direct messages focused more effectively on the needs of the farmer; and (iv) the technology is adopted most readily by leading farmers selected for their motivation to export and production levels that meet market demand. The material used for the analysis is on file in RE2/EN2.
- 4.25 The plant and animal health subprogram complements the technology generation and transfer operations in such areas as cattle management, but especially in its impact on all production for export. Hence the economic approach is to estimate the advantages of setting minimum conditions for ensuring the quality of exportable products. This situation is consistent with the standards and with accession to the WTO, compliance with the importing conditions of buyer countries and the need for Panama to adapt to world changes in the area of toxic residues. The benefits are quantified by measuring the economic losses avoided by detection of diseases, the reduction of losses from conducting campaigns and the reduction of costs of on-farm crop and livestock treatments. Under these assumptions the figures obtained confirm a substantial profitability for these investments. Using efficiency prices and conservative criteria for benefits yielded an EIRR of 45% with an NPV of US\$16 million discounted at 12%, which makes this subprogram feasible. The sensitivity analysis confirms that the results would be affected especially by a reduction in the volume exported, without impairing the feasibility of the subprogram.
- 4.26 The feasibility of the land titling subprogram derives from the savings generated by the use of a technology of lower cost than the

one in current use. The result is a reduction in the cost of the service from the use of an efficient digital cartography technology. For example, it costs B\$483 to issue a title for a 10-hectare farm by the traditional topographical process. With the project, the new digital technology reduces the cost to B\$219. Complementarily, the title is issued on the basis of recording the file in the Registry Office, with a map and documentation of better quality than at present. The mechanism proposed by the subprogram will afford improved access to the services offered by the program and promote the development of a land market strengthened by the active participation of the Registry Office. In addition, as part of the evaluation of the subprogram's impact, information will be available on the increase in permanent on-farm investment expected as a result of the greater capacity to finance movable goods.

- 4.27 The feasibility of the **market information** subprogram, involving a relatively small investment, has not been quantified, but its recognized economic advantages include the reduction of marketing risks from better identification of reference prices. This advantage leads to a reduction of commercial transaction costs, which leaves a wider profit margin when a sale is made. Another advantage is that of combining the information services with the export support services to be financed with MIF resources. It must also be recognized that this subprogram has been designed with low-cost technology in mind and allows for the ability of private users to participate in financing the service once the government has provided the seed capital.
- 4.28 As can be seen, the program's economic feasibility is based on the acceptable level of profitability of its subprograms, which shows that Panama has competitive options on foreign markets and that these can be improved by the proposed investments. To reinforce the decisions on investments in research, a consultancy has been included to make more intensive use of economic criteria in the allocation of resources to product lines. In the administration missions and the reviews of the AWP's for the subsequent years, these aspects must be monitored to determine the change generated in the agriculture sector by new product lines and the technological progress relating to traditional products.

E. Environmental viability

- 4.29 The technology generation and transfer subprogram calls for measures involving soil and water management and protection practices, and proper use of agrochemicals and machinery in the different agroecological areas, which will improve the environment. The technology developed will permit the provision of basic environmental training to the target population of the technology transfer component (30,000 farm owners). The possible negative impacts, especially of soil erosion, will be monitored through the use of sedimentation traps in a representative area, and extension

workers will have to advise on measures that may be necessary to control any problems.

- 4.30 Under the plant and animal health subprogram the effects are positive or neutral, by helping to keep the agricultural system free of exotic diseases. The analysis of toxic residues in meats and vegetables will facilitate the adjustment of technological packages to the proper use of bioaccumulative pesticides and avert effects on public health and the environment. In plant health the identification of diseases and pests and epiphytological information will make it possible to establish the economic thresholds at which it becomes justifiable to undertake their control by integrated procedures that reduce the use of pesticides. Training courses will be conducted on the use of pesticides (DNSV-IDIAP), including integrated pest management, with public- and private-sector extension workers and technicians (two courses a year for 20 professionals). Lists of imported pesticides will be kept current and their distribution supervised. The diagnostic laboratories would carry out biological containment measures to prevent the off-farm spread of microorganisms by the installation of treatment plants, decontaminating air filters and incinerators; and residue and pesticide laboratories would provide for the treatment of sewage in septic tanks. Samples of effluents will be analyzed periodically in specialized laboratories.
- 4.31 The land titling subprogram will help determine the degree of conservation of soil resources, with recommendations to the farm owner on the advantages and limitations of his holding. Moreover, protected natural areas will be demarcated to protect them and prevent spontaneous settlement on them. While in the province of Veraguas there are no lands reserved for indigenous populations, areas will be demarcated for the purpose under future programs. The results of the GIS will be available for use by other agencies concerned with the management of natural resources. The resolution of 90% of the cases awaiting titles in Veraguas will reduce the potential for settlement in marginal areas by a similar proportion. To minimize the risk, the subprogram includes a monitoring plan to facilitate measuring the effect of issuing titles on the land settlement process and a feedback mechanism so that the process will minimize the environmental consequences.

F. Participation by women

- 4.32 Rural women play an important role on farms: they participate in the clearing of lands, planting, harvesting, threshing, tending of the harvested crop and the raising of small livestock, though usually without pay. They are at present employed in the grading and packaging of fruit and flowers for export. Rural women participate little in campesino organizations either as members or as operating personnel, and hence in remunerated work. For some years different government and private agencies have been promoting

programs directed at rural women with a view to improving the quality of their lives.

- 4.33 The proposed program, and specifically its technology transfer component, will emphasize training for rural women in production techniques that generate food and income, projects for growing staple grains, vegetables, flowers and medicinal plants organically, which will earn better prices, and the techniques will be demonstrated on MIDA's farms. Conditions have also been included to preclude gender restrictions in requests for awards of public lands.

G. Risks of the Program

- 4.34 The Government of Panama expects to formalize its membership in the WTO in the first quarter of 1996. Despite the progress made, the levels of negotiated tariff protection are still viewed as high, with gradual reduction over 10 years for some products. The high level and the long period for lowering it may impair the effectiveness of the technology generation and transfer activities because farmers will have no incentive to convert to more competitive product lines. However, the agreements reached in December 1995 for disbursement of the second tranche of the economic recovery loan from the World Bank will further open up the economy, which will make it easier to determine the most competitive and promising products on markets. Moreover, the Bank and the executing agency will hold annual meetings to review progress on the basis of reports on gains in the preceding year and the targets set for the next, which will facilitate any needed adjustments.
- 4.35 The technology generation and transfer subprogram entails a gradual withdrawal of MIDA from the execution and financing of extension work, which will be transferred to the private sector. During execution of the program, MIDA's extension workers could experience uncertainty about entering the private sector. Moreover, the private sector's participation in the provision of these services could be delayed either by insufficient supply or the lack of appeal of the technological changes. In regard to financing, though the farmers have expressed willingness to gradually assume the costs, their acceptance will depend on the quality of the services delivered. Any of these circumstances could delay execution of the program. To reduce these risks a heavy component of training for extension workers and the offer of competitive fees are planned. In addition, the program's Consultative Council, on which all the groups involved will be represented, will analyze execution and take corrective steps to ensure progress on schedule.
- 4.36 The limited supply of bank credit for agriculture in Panama, especially for operators of small and medium-sized farms, could dampen the impact of the program by reducing the capability of farmers to adapt technology. This risk could be partially offset by the land titling activity, which would open up greater access to

bank credit, by financing from input suppliers, and by the organization of small farmers into production enterprises and the provision of management training for them. Moreover, the generation of competitive, high-profit product lines will make access to credit more attractive.

PANAMÁ
AGRICULTURAL SERVICES MODERNIZATION PROGRAM
(PN-0032)

LOGICAL FRAMEWORK

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Productivity and quality of farm Panamanian farmers adapted competitive economic system through of the national technological transfer, plant and animal health, tion and land titling services.	A growth rate of the commercial, exporting and domestic consumer goods subsectors higher than in 1995. A positive balance of agricultural exports over imports above the US\$103 million posted in 1994.	Statistics on sector accounts in 2003. Statistics on foreign trade in 2003.	Panamanian farmers give a rapid e response to measures to open up t especially with the export of tropical dities.
Production of traditional, and new agricultural	1. Increased production of 10 high-weight exportable commodities and 16 of intermediate weight. 2. 12% increase in yields per hectare of priority products in TT areas.	Annual reports of IDIAP and the Administrative Committee for Agricultural Research Support. Annual reports of the consulting firm in charge of TT.	The plan for liberalization of the eco been fulfilled.
Income of farmers by reducing diseases and pests; meats, fruits for export meet sanitary are more competitive.	1. Plant and animal losses from diseases and pests are 20% lower from 2003 on. 2. Panama's products of plant and animal origin gain entry to US and European markets without inspection or quarantine by 2001.	Sampling of losses by Departments of Plant and Animal Surveillance. Export records of the Department of Agricultural Quarantine.	Meat, fruit and vegetable prices are competitive.
For the marketing of agricultural known and expanded; inputs of are obtained at lower prices.	Market information system in operation throughout the country. Transfer of responsibilities for and financing of selected activities to the private sector begins in 2000.	Annual reports of IMA through SIPAN.	Farmers are organized and their as have information offices.
ished and using their resources with agroecological conditions.	The area for which titles have been issued reaches 12% of the national requirements by the year 2000.	Annual reports of DINRA.	Willingness of farmers to legalize th widespread.

SUBPROGRAM 1: TECHNOLOGY GENERATION AND TRANSFER

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
Production of traditional, and new agricultural products.	<ol style="list-style-type: none"> Increased production of 10 high-weight exportable products and of 16 of intermediate weight. 12% increase in yields/hectare of priority products in TT areas. 	<p>Annual reports of IDIAP and the Administrative Committee for Agricultural Research Support.</p> <p>Annual reports of consulting firm in charge of TT.</p>	Plan for liberalization of the economy fulfilled.
Production more, improve the unit costs of competitive products using technology that ensures environmental protection.	<ol style="list-style-type: none"> Range of marketable products broader than in 1995. Productivity indexes (units/ha, labor, foreign exchange utilized) of competitive products improve relative to 1995. Markups of Panamanian products satisfactory (US\$/ton FOB port of export). No expansion of area under cultivation relative to 1995. Reduction of toxic residues in final products. 	<ol style="list-style-type: none"> SIPAN statistics at end of the program. Statistics of MIDA's National Agricultural Policy Directorate at end of program. Statistics of MIDA's National Agricultural Policy Directorate at end of program. Statistics of MIDA's National Agricultural Policy Directorate at end of program. Statistics of residues control laboratory. 	<ol style="list-style-type: none"> Farmers have met challenges supporting participation of agricultural sector in its new economic environment. Technical assistance services have had important impact in meeting demands. Positive changes have taken place in port, road and telephone infrastructures. Expansion of agricultural technology respected and increased awareness of need for environmental management, including in use of pesticides.
Strengthening of IDIAP and DINAC as public entities, operating openly and transparently as unifier of efforts of public entities and as a catalyst for development.	<ol style="list-style-type: none"> Strategic research plan identifying the priority product lines drawn up by IDIAP, and DINAC has developed and adapted technologies for aquaculture. Research support resources have financed at least 100 projects by end of program. 	<ol style="list-style-type: none"> AWP of IDIAP and DINAC. Reports of the specialized entity administering the resources in the Fund. 	<ol style="list-style-type: none"> IDIAP and DINAC have developed capability for research in priority disciplines and product lines. Users have generated demand for research resources.

SUBPROGRAM 1: TECHNOLOGY GENERATION AND TRANSFER

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS																														
and GTAP technology transfer nts and the scheme for financing been institutionalized and set up for technical assistance ation.	<p>2(a) At least the following PATEP groups have been created: 60 in year 1, 120 in year 2, 120 in year 3, 40 in year 4, and 40 in year 5. And at least the following GTAPs set up: 40 in year 1, 40 in year 2, 20 in year 3, and 20 in year 4.</p> <p>2(b) Contributions by farmers for sustainability of PATEP groups relative to total cost of service: 5% in year 2, 10% in year 3, 15% in year 4, and 20% in year 5. Those for GTAPs: 10% in year 1, 30% in year 2, 50% in year 3, 75% in year 4, and 100% in year 5.</p>	<p>2(a) Annual reports of TEU to Technical Secretariat of MIDA and technical assistance contracts.</p> <p>2(b) Receipts issued by technical assistance enterprises.</p>	<p>2(a) Farmers accept services u and GTAP arrangements, are recruited progressively programmed.</p> <p>2(b) Farmers have made good stated willingness to pay f services.</p>																														
trained, consulting services oment acquired, and IDIAP and ctures rehabilitated.	<p>1. US\$7.4 million budgeted for IDIAP and US\$2.3 million for DINAC efficiently utilized.</p> <table><tr><td></td><td><u>1996</u></td><td><u>1997</u></td><td><u>1998</u></td><td><u>1999</u></td><td><u>2000</u></td></tr><tr><td>IDIAP</td><td>1,908</td><td>4,036</td><td>846</td><td>623</td><td>440</td></tr><tr><td>DINAC</td><td>290</td><td>1,477</td><td>296</td><td>163</td><td>117</td></tr></table>		<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	IDIAP	1,908	4,036	846	623	440	DINAC	290	1,477	296	163	117	<p>1. Review of annual budgets of IDIAP and DINAC.</p>	<p>1. Government of Panama has sufficient resources to support institutional strengthening of IDIAP and DINAC.</p>												
	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>																												
IDIAP	1,908	4,036	846	623	440																												
DINAC	290	1,477	296	163	117																												
Support Fund, administered by a d entity, has financed research and has selected the type of ecuting institutions and users in e with criteria of Operating s.	<p>2. US\$3 million budgeted as research support resources and US\$400,000 allocated for its administration properly executed.</p> <table><tr><td></td><td><u>1996</u></td><td><u>1997</u></td><td><u>1998</u></td><td><u>1999</u></td><td><u>2000</u></td></tr><tr><td>Support resources</td><td>300</td><td>675</td><td>675</td><td>675</td><td>675</td></tr><tr><td>Administration</td><td>80</td><td>80</td><td>80</td><td>80</td><td>80</td></tr></table>		<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	Support resources	300	675	675	675	675	Administration	80	80	80	80	80	<p>2. Execution and reports of specialized entity administering research support resources.</p>	<p>2. Substantial dynamism generated demand for research services; resources allocated smoothly.</p>												
	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>																												
Support resources	300	675	675	675	675																												
Administration	80	80	80	80	80																												
and firm contracted to administer assistance activities, TEU set up Technical Secretariat to organize GTAPs, and MIDA's regional s formed to supervise the activities.	<p>3. US\$1.6 million allocated for administration of technical assistance, US\$500,000 for supervision by MIDA, US\$5.1 million for the PATEP groups and US\$1.4 million for the GTAPs executed.</p> <table><tr><td></td><td><u>1996</u></td><td><u>1997</u></td><td><u>1998</u></td><td><u>1999</u></td><td><u>2000</u></td></tr><tr><td>Admin.</td><td>280</td><td>200</td><td>360</td><td>340</td><td>420</td></tr><tr><td>MIDA</td><td>281</td><td>49</td><td>100</td><td>49</td><td>55</td></tr><tr><td>PATEP</td><td>207</td><td>621</td><td>1,242</td><td>1,449</td><td>1,656</td></tr><tr><td>GTAPs</td><td>78</td><td>195</td><td>312</td><td>390</td><td>390</td></tr></table>		<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	Admin.	280	200	360	340	420	MIDA	281	49	100	49	55	PATEP	207	621	1,242	1,449	1,656	GTAPs	78	195	312	390	390	<p>3. Execution and reports of specialized entity administering technical assistance.</p>	<p>3. Sufficient resources being provided to induce MIDA professionals to provide technical assistance enterprises in private sector.</p>
	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>																												
Admin.	280	200	360	340	420																												
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SUBPROGRAM 2: PLANT AND ANIMAL HEALTH

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<p>farmers' income by reducing losses from diseases and pests of plants and animals; and vegetables slated for export meet standards and become more competitive.</p>	<p>1. Plant and animal losses from diseases and pests decline 20% starting in year 2003.</p> <p>2. Panamanian products of plant and animal origin enter US and European markets without inspection or quarantine by year 2001.</p>	<p>Sampling of losses by Departments of Plant and Animal Surveillance; Records of Exports of Department of Plant and Animal Quarantine.</p>	<p>Prices of meats, fruits and vegetables competitive.</p>
<p>Animal health system improved and in farmers apply proper measures for control of pests and diseases quarantine system functioning of exotic diseases and spread of prevented.</p>	<p>In year 2000 prevalence of bovine brucellosis drops from 0.1% to 0.01%; swine brucellosis from 4% to 1%; equine brucellosis and infectious anemia by 50%. Rabies declines from 50 cases to 2 a year.</p> <p>Campaigns against Medit. fruit fly and tristeza virus of citrus fruits in operation by year 2000 throughout affected area; no outbreaks reported.</p>	<p>Reports of Epidemiological Surveillance Department.</p> <p>Reports of Plant and Animal Surveillance Department.</p>	<p>Buyer countries do not restrict imports to protect their agroindustry or favor other regions.</p>
<p>S</p> <p>Health</p> <p>Epidemiological Surveillance Department improved and functioning efficiently.</p> <p>Primary diagnosis and biological control laboratories expanded, rehabilitated, equipped and in operation (Central, Divisa, David, Las Tablas, Chiriquí); central administration offices upgraded.</p> <p>Animal health campaigns outfitted and operating efficiently.</p>	<p>(i) Agroindustrial plants, laboratories, farmers and professionals involved report animal health problems.</p> <p>(ii) In 1998 laboratories in operation, diagnostic samples increase from 9,400 to 26,300, samples processed by toxic residues laboratory from 135 to 190.</p> <p>(iii) In year 2000 coverage increased to 3,500 farms.</p>	<p>(i) Reports from Epidemiological Surveillance Department.</p> <p>(ii) Annual reports of samples processed by laboratories.</p> <p>(iii) Monthly and yearly reports of samples processed.</p>	<p>(i) No emergencies arise.</p>
<p>Plant Health</p> <p>Plant epidemiological surveillance outfitted and functioning efficiently.</p>	<p>(i) Plant health problems reported by agroindustrial plants, laboratories, farmers and professionals involved.</p>	<p>(i) Reports of Plant Health Surveillance Department.</p>	<p>(i) No emergencies arise.</p>
<p>Plant health diagnostic laboratories built, equipped and in operation (Central, David, Divisa, Metetí and Changuinola); administrative offices upgraded.</p>	<p>(ii) In 1998 plant diagnosis laboratories in operation, diagnoses increase from 4,400 to 8,900 in year 2000.</p>	<p>(ii) Annual reports of samples processed by laboratories.</p>	

SUBPROGRAM 2: PLANT AND ANIMAL HEALTH

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
<p>Laboratory for control of pesticide formulation built, outfitted and in operation.</p> <p>Plant health campaigns equipped and functioning efficiently.</p>	<p>(iii) In 1998 formulations laboratory in operation, analyzing 430 samples.</p> <p>(iv) Coverage of 100% of affected areas by year 2000.</p>	<p>(iii) Annual report of samples processed.</p> <p>(iv) Monthly and yearly reports of Plant Health Campaigns Dept.</p>	
<p>Animal Quarantine</p> <p>Quarantine control posts built and in operation. Quarantine station rehabilitated and posts equipped and in operation.</p>	<p>All posts detecting noncompliance with requirements in 90% of products in 1998 and in 100% in 2000.</p>	<p>Monthly and annual reports of Quarantine Department.</p>	<p>No emergencies arise.</p>
<p>Legal strengthening</p> <p>Animal health laws and regulations in force.</p> <p>Program of sanitary education, public information and coordination with private sector implemented.</p> <p>Agreements signed with institutions involved.</p> <p>Training and technical assistance plan implemented.</p>	<p>(i) Laws on animal and plant health approved in year 1. Methodology and practices standardized.</p> <p>(ii) Material prepared and distributed; 19 associations and farmers involved. Consultative Council and Cattlemen's Committees functioning throughout the country.</p> <p>(iii) Agreements with MINSA, IDIAP, INRENARE, and agricultural universities in effect.</p> <p>(iv) 24 international and 4 local consultants hired; 71 fellowship recipients sent; 160 official and accredited professionals and technicians and 120 quarantine inspectors trained.</p>	<p>(i) Current <i>Gacetas Oficiales</i> and manuals of procedure; consultants' reports.</p> <p>(ii) Records and information on the regions. Minutes of meetings.</p> <p>(iii) Minutes of meetings to review progress under agreements.</p> <p>(iv) Reports of consultants and of operation monitoring. Yearly plans of operation.</p>	<p>(i) New animal and plant health laws approved and in force.</p>

SUBPROGRAM 2: PLANT AND ANIMAL HEALTH

OBJECTIVES	INDICATORS					MEANS OF VERIFICATION	ASSUMPTIONS
(ii), a(iv), b(ii), b(iii) and c. <u>and expansion of works</u> s of reference for designs. rm (publish announcement, calls for uate proposals, select, and negotiate etailed designs and bidding s for construction works. design and construction of budget. <i>notice of contract for construction.</i> ms. act. nd supervise works.	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	(i) Information from investment budget.	At least three valid bids submitted
	89	916					
(ii), b(ii) and c. <u>le and build small-scale works</u> tails of works etailed designs and calls for bids. qualify firms. act. nd supervise works and nings.	<u>1996</u>	<u>1997</u>	<u>1998</u> 492	<u>1999</u>	<u>2000</u>	Information from investment budget.	At least three valid bids submitted

SUBPROGRAM 2: PLANT AND ANIMAL HEALTH

OBJECTIVES	INDICATORS					MEANS OF VERIFICATION	ASSUMPTIONS
a, b, c and d. <u>of vehicles</u> documents. d approve. quality firms. or and take receipt of vehicles.	<u>1996</u>	<u>1997</u> 794	<u>1998</u> 487	<u>1999</u> 5	<u>2000</u>	Report and investment budget.	Firms present tenders.
a, b, c and d. <u>ion of equipment</u> <u>bidding</u> ent of laboratory equipment and ent of machinery and equipment for office up lists and documents vise lists and budget and qualify firms act firms receipt of and inspect equipment.	<u>1996</u> 129	<u>1997</u>	<u>1998</u> 70	<u>1999</u> 15	<u>2000</u> 1	Information from investment budget	
a, b, c and d <u>of inputs and publications</u> based on public price comparison	<u>1996</u> 249	<u>1997</u> 136	<u>1998</u> 166	<u>1999</u> 158	<u>2000</u> 147	Information from investment budget	Biologicals laboratories prequalifi
n to hire consultants and select o recipients in international on local consultants and conduct n the country.	<u>1996</u> 139	<u>1997</u> 500	<u>1998</u> 147	<u>1999</u> 90	<u>2000</u>		
	49	89	26	51	7		

SUBPROGRAM 2: PLANT AND ANIMAL HEALTH

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
and b: Plant and Animal Health ce: develop systems es sh Department of Animal Health Registry te operations with farmers s nd carry out scheduled plant and health operations te operations with extension workers	Incremental associated costs (US\$ thousands) 1996 1997 1998 1999 2000 a) Animal Health 61 112 196 225 228 b) Plant Health 25 45 99 117 122	Information from investment budget	Organizational structure facilitates of central directives at regional level
control posts integrated operations with ng countries	c) Quarantine 4 20 34 36 42		
Institutional Strengthening and put into effect laws, regulations als operation program Consultative e, Central Operations Coordination onal Coordination Committees professionals strategy for sanitary education and materials. d establish rates to be charged. management control and evaluation	d) Institutional Strengthening 14 15 28 26 31	Information from expenditure budget	Proceeds from performance of se especially those of laboratories, p into their operation and maintenance

SUBPROGRAM 3: Market information

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
for marketing agricultural ified and expanded; inputs of t lower prices.	Market information system operating throughout the country, and responsibilities for and financing transferred to the private sector begun in 2000.	Annual reports of IMA through SIPAN.	The farmers are organized and the associations have information offic
ess to high-quality, reliable ation for decision-making by rate sectors.	No. of users: 2nd year: associations (A) 12; supermarkets (S) 3; government organizations (GOs) 3; others (O) 0. 3rd year: A 20; S 3; GOs 4; O 20. 4th year: A 36; S 3; GOs 6; O 34. 5th year: A 52; S 3; GOs 6; O 60.	Internal records of IMA and verification by technical inspection.	1. SIPAN clients (supermarket exporters, importers, farmer associations and groups) ha expressed demand for trade information. 2. SIPAN team has succeeded to demand with timely, usef information.
S and in operation.	1. SIPAN receives data from domestic sources (regional directorates, MIDA, Comptroller General, among others) and international sources (USDA, REUTER, FTP, etc.) daily. 2. SIPAN processes, consolidates and organizes information in form useful to users. 3. SIPAN releases information through trade organizations and users' associations.	1. Internal records of IMA and verification by technical inspection. 2. SIPAN records and consultants' reports. 3. SIPAN records and consultants' reports.	IMA professionals have been favor disposed toward restructuring and performance.
assistance provided for ent of SIPAN. reassigned and trained, and equipped. t acquired.	US\$670,000 budgeted for market information properly executed. <u>1996</u> <u>1997</u> <u>1998</u> <u>1999</u> <u>2000</u> 257 96 132 87 102	Review of budgets and reports of institution administering resources of agricultural services modernization program.	1. Consultants and specialists in s information services found and 2. Personnel have assimilated trai 3. Appropriate equipment availabl

SUBPROGRAM 4: LAND TITLING

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS										
Use of land and using resources in agroecological conditions.	Area for which titles have been issued covers 12% of national requirement by the year 2000.	Annual reports of DINRA.	Widespread willingness of owners to title to their lands.										
Land tenure has made it easier for Veraguas province to gain technology, obtain credit, and sustainable investments.	<ol style="list-style-type: none">1. Fewer disputes presented to Conciliation Groups than in 1995.2. Value of agricultural fixed investments higher than in 1995.3. Land market in operation using sales contracts, mortgages, etc., with instruments for ongoing updating of records.	<ol style="list-style-type: none">1. Number of cases pending in DINRA's regional directorate in Veraguas province.2. Financial system's annual statistics on agricultural credit.3. Increase in efficiency of rural title registration.	<ol style="list-style-type: none">1. Social pressure has eased and proportion of persons in rural sector per capita monthly income of B\$100 balboas.2. The country's financial system meets farmers' real demand for investment.3. DINRA and the Registry Office are updating title deeds in other Panamanian provinces.										
Strengthening of Veraguas province modern cartography and cadastral system.	<ol style="list-style-type: none">1. 19 cadastral maps of corregimientos on 236,300 ha prepared in year 2 and 22 such maps on 316,380 ha in year 3.2. DINRA and specialized firms have processed 39,000 farms at cost not higher than B\$15.60 per title for a representative 10-hectare farm by end of year 3 of the program.3. DINRA's technical personnel efficiently trained.4. The GIS has up-to-date maps of Veraguas province, and land transaction records are up to date.	<ol style="list-style-type: none">1. The 41 cadastral maps for each corregimiento in Veraguas province are available in the GIS.2. Information of Public Registry Office.3. Information on budget execution and consultants' reports.4. SIG and Public Registry Office Information.	<ol style="list-style-type: none">1. National government recognizes advantages of rural cadastre and financial mechanism for preparing subsequent phases of national development plan.2. Low-income farmers have access to financing to pay for land (Land Bank).3. DINRA begins work for award of titles in other provinces based on experience acquired in this subprogram.4. Government receives B\$2.5 million income from titles and B\$3.6 million from measurement services in Veraguas province.										
Completion of award of titles for Veraguas province through an efficient system in Veraguas province, including contribution of disputes and reduction of cost of land.	<ol style="list-style-type: none">1. US\$2.9 million budgeted for rural cadastre properly executed.	<ol style="list-style-type: none">1. Review of budgets of land titling subprogram.	<ol style="list-style-type: none">1. Specialized firms have prepared cadastral maps, photographs, geodesics, place names, field boundaries, lists of adjoining lands, and cadastral maps of Veraguas province.										
	<table><tr><td><u>1996</u></td><td><u>1997</u></td><td><u>1998</u></td><td><u>1999</u></td><td><u>2000</u></td></tr><tr><td>631.4</td><td>1,459.8</td><td>800.4</td><td>37.0</td><td></td></tr></table>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	631.4	1,459.8	800.4	37.0			
<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>									
631.4	1,459.8	800.4	37.0										

SUBPROGRAM 4: LAND TITLING

OBJECTIVES	INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS										
and for all identified public land assigned by agrarian reform Conciliation groups working to disputes, and public information to facilitate community on in operation.	<p>2. US\$611,250 allocated for titling of public lands utilized and awards formalized for some 10,000 titles in year 2, and 5,000 disputes settled; 20,000 titles in year 3 and 9,000 disputes settled; 5,000 titles in year 4 and 4,000 disputes settled.</p> <table><tr><td><u>1996</u></td><td><u>1997</u></td><td><u>1998</u></td><td><u>1999</u></td><td><u>2000</u></td></tr><tr><td>430.2</td><td>156.4</td><td>24.5</td><td></td><td></td></tr></table>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	430.2	156.4	24.5			<p>2. Execution and reports of institution administering the agricultural services modernization program, and number of files prepared by DINRA.</p>	<p>2. The community in Veraguas pr supported the land titling and payments for the land and me activities.</p>
<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>									
430.2	156.4	24.5											
g of 8 consultants, 9 training and contracts for cartography and supervised.	<p>3. US\$470,960 budgeted for institutional strengthening executed.</p> <table><tr><td><u>1996</u></td><td><u>1997</u></td><td><u>1998</u></td><td><u>1999</u></td><td><u>2000</u></td></tr><tr><td>187.8</td><td>128.0</td><td>112.3</td><td>42.8</td><td></td></tr></table>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	187.8	128.0	112.3	42.8		<p>3. Bidding operations carried out and contracts signed.</p>	<p>3. DINRA has attained required le institutional training, and speci have attained the technical per indexes proposed.</p>
<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>									
187.8	128.0	112.3	42.8										
equipment for the GIS acquired ements made for receipt of n from consulting firms for n of cadastral maps to y files for presentation, and n for receipt of awards and f titles, and for updating the perating in Veraguas Registry	<p>4. US\$801,104 budgeted for updating the Register utilized.</p> <table><tr><td><u>1996</u></td><td><u>1997</u></td><td><u>1998</u></td><td><u>1999</u></td><td><u>2000</u></td></tr><tr><td>648.5</td><td>116.5</td><td>36.0</td><td></td><td></td></tr></table>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	648.5	116.5	36.0			<p>4. Review of budget of land titling subprogram.</p>	<p>4. Fiscal resources allocated for c and maintenance of the GIS in Registry has received and regi 35,000 files.</p>
<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>									
648.5	116.5	36.0											

**SUBPROGRAM I: TECHNOLOGY GENERATION AND TRANSFER
LOGICAL FRAMEWORK**

BREAKDOWN OF INDICATORS OF AIM

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		Year 0	Year 1	Year 2	Year 3	Year 4
Production of traditional, and new agricultural	1. Increased production of high- and intermediate-weight products.	H=6 I=3	6 3	7 6	8 10	9 12
	2. 12% increase in yields/hectare of priority products in TT areas.	0	0	3	3	3
Greater diversification of and higher yields and to reduce internationally competitive technology that provides sustainability.	1. The range of marketable products is broader than in 1995.	9	9	13	18	21
	2. Productivity indexes of competitive products have improved relative to 1995(%). Crops: Rice Corn Coffee Onions Indust. tomatoes* Plantains** Cantaloupe* Watermelon* Cassava** Yam** Dasheen Animal Products: Meat Milk Aquaculture: Artemia salina Shrimp* Tilapia	2,520 1,380 550 11,700 14,500 7,700 14,800 26,300 4,380 3,800 3100 450 4 0 510 2,100	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00 1.50 1.25 1.25 2.50 5.00 2.00 2.00 3.75 3.75 5.00 2.50 15.00 3.75 18.75 12.50	1.00 1.50 1.25 1.25 2.50 5.00 2.00 2.00 3.75 3.75 5.00 2.50 15.00 3.75 18.75 12.50	1.00 1.50 1.25 1.25 2.50 5.00 2.00 2.00 3.75 3.75 5.00 2.50 15.00 3.75 18.75 12.50
	3. Export volumes of leading products have increased (%)					
	Beef Other fish chilled or frozen Fresh, chilled or frozen shrimp, fresh lobster, condensed milk and cream Fresh bananas Cut flowers and buds Fresh tropical fruits Unroasted coffee Beet and cane sugar	11,543 14,251 42,581 148,705 1,129 13,530 7,208 17,134	0 0 0 0 0 0 0 0	5 5 5 5 10 5 5 5	10 15 10 5 15 10 5 5	10 15 10 5 20 15 5 5

**SUBPROGRAM I: TECHNOLOGY GENERATION AND TRANSFER
LOGICAL FRAMEWORK**

BREAKDOWN OF INDICATORS OF COMPONENTS

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		Year 0	Year 1	Year 2	Year 3	Year 4
DINAC strengthened to technology considered govern- erty and resources in support n operating openly and ely, as unifier of efforts of private entities and as obtaining resources.	1.a The Strategic Research Plan drawn up by IDIAP and investments called for carried out (US\$ thousands)	IDIAP DINAC	1,488 290	4,018 1,477	846 295	623 163
	1.b Resources in support of research have financed at least 100 projects by end of program.		10	15	30	25
TAP technology transfer with financing system are d and the enterprises set up assistance are in operation.	2.a PATEP groups and GTAPs set up.	PATEP GTAP	60 40	120 40	120 20	40 20
	2.b Farmers' contributions to guarantee sustainability of PATEP groups, as percentage of total cost of the service, come to:			5	10	15
	For support of GTAP groups come to:		10	30	50	75

**SUBPROGRAM 2: PLANT AND ANIMAL HEALTH
LOGICAL FRAMEWORK**

BREAKDOWN OF INDICATORS OF AIM

OBJECTIVES	INDICATORS	CUMULATIVE GOALS					
		Year 0	Year 1	Year 2	Year 3	Year 4	
Farmers' income by reducing diseases and pests of plants meats, fruits and vegetables at sanitary standards and is enhanced.	Plant and animal losses from diseases and pests decline 20% from 2003 on:			2%	4%	8%	
	Panamanian products of plant and animal origin enter US and European markets without inspection or quarantine by 2001. International inspection National inspection	100%	100%	100%	50% 50%	100%	

SUBPROGRAM 2: PLANT AND ANIMAL HEALTH
BREAKDOWN OF INDICATORS OF PURPOSE

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		Year 0	Year 1	Year 2	Year 3	Year 4
Animal health system improved Farmers efficiently apply measures for treatment and diseases; quarantine properly; entry of exotic spread of existing ones	In year 2000: prevalence of bovine brucellosis drops from 0.1% to 0.01% that of swine brucellosis from 4% to 1% that of equine brucellosis and infectious anemia reduced 50% rabies declines from 50 to 2 cases a year Campaigns against Medit. fruit fly and tristeza virus of citrus fruits in operation by year 2000 throughout affected area, no outbreaks reported (inspections of traps).	0.1% 4.0% - 50 2,982	0.1% 4.0% 10.0% 50 3,982	0.08% 3.00% 20.00% 30 28,680	0.05% 3.00% 20.00% 10 28,680	0.03% 2.00% 40.00% 5 28,680
Animal health Epidemiological Surveillance department equipped and functioning efficiently. Veterinary diagnosis and biological control laboratories expanded, reconditioned, equipped and in operation (Central, Divisa, David, Las Tablas, Santiago); central administrative offices upgraded. Animal health campaigns equipped and operating formally. Plant health Plant epidemiological surveillance equipped and operating efficiently. Plant health diagnostic laboratories built, equipped and in operation (Central, David, Divisa, Metetí and Nanguinola); administrative offices upgraded.	(i) Animal health problems reported by industrial plants, laboratories, farmers and professionals involved (information gathering) (ii) Laboratories in operation in 1998: No. of diagnostic samples Income from services (US\$ thousands) No. of toxic residue samples Income from residue analysis (US\$ thousands) (iii) 3,500 farms covered by year 2000. (i) Agroindustrial plants, laboratories, farmers and professionals involved report problems (information gathering). (ii) In 1998 plant health diagnostic laboratories in operation and number of diagnoses increasing from 4,400 to 8,900 by year 2000. No. of pesticide samples Income from services (US\$ thousands)	20% 9,400 50.4 80 5.4 2,000 4,400 0	20% 14,200 101.4 80 24.0 2,900 5,200 47.8	20% 19,100 310.0 160 96.0 3,400 6,400 57.3	50% 20,900 340.0 190 114.0 3,500 7,600 69.4	80% 23,500 385.7 190 114.0 3,500 8,700 82.1

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		Year 0	Year 1	Year 2	Year 3	Year 4
Pesticide formulation control laboratory built, equipped and operation	(iii) Formulations laboratory in operation, analyzing 430 samples in 1998					
	No. of pesticide samples	-	-	-	430	430
	Income from service (US\$ thousands)	-	-	-	28.5	28.5
Plant health campaigns equipped and operating efficiently.	(iv) 100% of affected areas covered by year 2000.	15%	15%	80%	100%	100%
Quarantine						
Quarantine control posts built and quarantine station and inspection posts in operation.	All posts detecting noncompliance with requirements in 90% of products in 1998 and in 100% in year 2000.	70%	80%	80	90%	100%
	Income from quarantine inspections, licenses, incinerations (US\$ thousands)	393.0	460.0	667.0	672.0	672.0
I Strengthening						
Law laws and regulations in force.	(i) Laws on plant and animal health approved in year 1. Methodology and practices standardized (manuals of procedure)	-	50%	80%	100%	100%
Program of sanitary education, public information and coordination with private sector implemented.	(ii) Material prepared and distributed; 19 associations and farmers involved. Consultative Council and Cattleman's Committees operating throughout the country.	-	19	-	-	-
Agreements signed with institutions involved.	(iii) Agreements with MINSA, IEA, IDIAP, INRENARE, agricultural universities in effect (Agreements)	-	3	1	-	-
Training and technical assistance plan carried out.	(iv) 24 international and 4 local consultants hired	-	6	16	5	1
	71 fellowship recipients sent out	-	29	23	9	10
	160 professionals and technicians trained	-	75	250	65	183
	120 quarantine inspectors trained	-		60	60	

**SUBPROGRAM 3: MARKET INFORMATION
LOGICAL FRAMEWORK
BREAKDOWN OF INDICATORS OF AIM**

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		Year 0	Year 1	Year 2	Year 3	Year 4
Expand opportunities for cultural products; to obtain quality at lower prices.	A market information system is in operation throughout the country. Transfer of responsibilities for and financing of activities selected to the private sector as from year 2000 (coverage).		30%	60%	90%	100%

BREAKDOWN OF INDICATORS OF PURPOSE

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		Year 0	Year 1	Year 2	Year 3	Year 4
Access to reliable, high-quality information for decision-making by private sectors.	Number of users: Associations Supermarkets Government agencies Others			12 3 3 0	20 3 4 20	36 3 6 34

BREAKDOWN OF INDICATORS OF COMPONENTS

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		Year 0	Year 1	Year 2	Year 3	Year 4
System in operation.	1. SIPAN receives daily data from domestic sources (regional directorates, MIDA, Office of Comptroller General, among others) and international sources (USDA, REUTER, FTP, etc.) (% coverage). 2. SIPAN processes, consolidates and organizes information in form useful for users (% of information). 3. SIPAN releases information through trade organizations and users' associations (% of users).		50% 30% 20%	100% 60% 50%	100% 90% 90%	100% 100% 100%

**SUBPROGRAM 4: LAND TITLING
LOGICAL FRAMEWORK
BREAKDOWN OF INDICATORS OF AIM**

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		Year 0	Year 1	Year 2	Year 3	Year 4
settled in and using resources with agroecological	Area for which titles have been issued amounts to 12% of national requirement by year 2000.			236,304	316,373	

**SUBPROGRAM 4: LAND TITLING
BREAKDOWN OF INDICATORS OF PURPOSE**

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		Year 0	Year 1	Year 2	Year 3	Year 4
d tenure has made it easier s in Veraguas province to technology, make use of rease their sustainable	1. Fewer disputes and litigations presented to Concilia- tion Groups than in 1995.			5,000	9,000	4,000
	2. Value of agricultural fixed investment is higher than in 1995.			5%	10%	15%
	3. Land market in operation using sales contracts, mortgages, etc., with instruments for ongoing updating of records.			10,000	20,000	5,000

SUBPROGRAM 4: LAND TITLING

BREAKDOWN OF INDICATORS OF COMPONENTS

OBJECTIVES	INDICATORS	CUMULATIVE GOALS				
		Year 0	Year 1	Year 2	Year 3	Year 4
stre Veraguas province by modern system of y and cadastre	1. 19 cadastral maps of corregimientos prepared covering 236,300 ha in year 2 and 22 cadastral maps of corregimientos covering 316,380 ha in year 3.			19	22	
pleted award of titles for s with efficient system in province, including contribution nt of disputes and reduction of er lands.	2a. DINRA and specialized firms processed 39,000 farms at cost not higher than B\$21.90/ha based on the cost of a representative 10-hectare farm by end of year 3 of the program.	B\$48.30/ha	B\$48.30/ha	B\$21.90/ha	B\$21.90/ha	
	2b. Titles being processed more efficiently.	365	365	45	45	
U supervised training of of the Directorate, and or cartography and cadastre y specialized firms.	3. Technical personnel of DINRA trained efficiently (persons participating)	0	130	60	20	
operating in MIDA, and titling s properly registered, and used in Veraguas Provincial fice.	4. Up-to-date maps for Veraguas province are on hand in the GIS, and land transaction records are up to date.			19	22	

ANNUAL WORK PLAN

The annual work plan must cover, *inter alia*, the following:

- a. the investments to be made under the program;
- b. the working mechanism for recovery of the costs of the services performed by the diagnostic and control laboratories of the DNSA and DNSV, and the use made of them, including the updating of rates;
- c. reassignment of the personnel of the IMA, DNSA and DNSV in accordance with the programming, including their classification, placement and budget; placement of the personnel of IDIAP, Animal and Plant Health Directorates, DINRA, and the CCU;
- d. the timetable for calls for bids and construction of the works for IDIAP, DINAC, the DNSA and the DNSV;
- e. the timetable for calls for bids and procurement of equipment and vehicles, including a budget and maintenance plan;
- f. contracting of the consulting firms and specialized agencies to administer the resources of the program, administer the research support resources, execute the technology transfer, and be in charge of the cadastre and titling;
- g. the timetables for hiring the consultants and their terms of reference; the timetables awarding fellowships and the conduct of courses in the country;
- h. the approval and entry into force of the manual of procedures of (i) the Department of Animal Health Products Control; and (ii) the Pesticides Control Department, including the adoption of standards of behavior and for their distribution and use;
- i. approval and entry into force of the organizational regulations and procedures of: (i) the central and regional veterinary diagnosis laboratories; (ii) the central and regional plant health diagnosis laboratories; (iii) the toxic residues laboratory; (iv) the pesticide formulations control laboratory; and (v) the agricultural quarantine posts and the livestock quarantine station;
- j. approval and entry into force of the system for the accreditation of professionals for service in animal and plant health, and plant and animal inputs;
- k. the formation of committees of farmers to take over the administration of the area laboratories and later of the regional laboratories

and formalization of DNSV operations with IDIAP and the Seed Committee for sanitary control of seeds;

- l. plans for upgrading of IDIAP and DINAC; research products and priorities; a programming system responsive to the needs of the farmers; technological packages delivered and feedback; products researched, and periodic evaluations;
- m. planning of the use of the research support resources; a list of priority products; possible beneficiaries; demand for resources and participating agencies; amounts of beneficiaries' contributions; proposal for continued financing of new resources for maintenance of the research system, for presentation in the first 24 months of execution;
- n. planning for execution of the technology transfer under the consulting firm, specifying the training courses for the professionals who will join the technology transfer plan, the number of professionals expected to be hired, specifying those let go from MIDA and those in the private sector, the groups organized, the areas of action, the level of the cofinancing provided by the farmers, the products in demand, the areas in which consulting services are to be contracted, the proposal for the financing of technology transfer to continue the system upon completion of the first stage, for presentation in the first 24 months of execution;
- o. the plans for upgrading the DNSA and DNSV, the plans for plant and animal health campaigns, surveillance, inspection and quarantine, and environmental protection, and their monitoring and evaluation; also implementation of the accreditation system;
- p. IMA's plans for SIPAN, participation of those involved, coverage of the statistical information on prices, markets, fairs, organizations, etc.; incorporation of international price and market information in SIPAN's network;
- q. the work plans of DINRA, technology and systems to be adopted, including putting into effect the rules for the official use of the GPS for boundary tracing and the manual of procedures for the teams; the progress of the work assigned to the firm, implementation of the systems, sustainability of the operations, the response of the farm owners and the plan for expansion when the execution period is done.
- r. the work plans of the environmental unit, monitoring of possible environmental impacts, methodology for performance of the EIA and level of coordination with INRENARE;
- s. degree of compliance with the agreements to be signed by MIDA under the program with MINSA, IEA, INRENARE (plant and animal health), and the Ministry of the Treasury (land titling).

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PROPOSED RESOLUTION

PANAMA. LOAN CONTRACT No. ____/OC-PN.
PROGRAM FOR THE MODERNIZATION OF AGRICULTURAL SERVICES

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 República de Panamá, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a Program for the Modernization of Agricultural Services. Such financing will be for the amount of up to US\$33,600,000, or its equivalent in other currencies, except that of Panamá, which are part 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.