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PANAMA
AGRICULTURAL SECTOR
ASSESSMENT

by

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PREFACE

This report examines Panama's agricultural sector -- where it is today, its condition and how it has developed over the last 15 years. This assessment has used principally the review of more than 100 documents, including census statistics, special studies and numerous unpublished reports. The documentation including statistics, has been diffuse and difficult to acquire. Farm and market level economic information is meager. This document provides for the first time a comprehensive source of data on Panama's agricultural sector compiled and tabulated in one location.

Chapter I reviews the role of agriculture in Panama's economy and examines the natural and human resource base. Chapter II describes the structure of the agricultural sector. Chapter III details the production on basic food/feed commodities and export crops. Chapter IV analyzes economic policies, agricultural performance and resource use. Chapters V and VI offer conclusions and recommendations.

Many persons contributed to the evaluation of this report. Several need to be singled out for their special contribution. The strong encouragement and major support by Ron Levin, Mission Director, and David Schaer, Chief of the Office of Agriculture contributed to the completion of this document in a timely fashion. Other USAID staff provided valuable feedback during earlier draft stages. Consultant Millie Konan synthesized complex sections of the analysis and edited the final draft. Nila de Cnu, Martha M. de Angulo and Viodelda Villalaz typed manuscripts and tables and kept track of the many changes in the document. To each of these persons I extend a special note of appreciation.

This report was prepared while on assignment with USAID/Panama from Oregon State University. However, the views and interpretations expressed in this report are those of the author and should not be attributed to USAID/Paraná.

The work of compiling and understanding complex agricultural activities is never really finished. The author welcomes comments on this report and insights into the unfolding changes in Panama's agricultural sector.

EXECUTIVE SUMMARY

1. Background

Panama's economy is dominated by its service sector which generates 69 percent of Gross Domestic Product (GDP). The agricultural sector (including agro-industry) ranks second, with a contribution of 16.9 percent of GDP.

In addition to providing adequate food for the nation, Panamanian agriculture produces a surplus that contributes almost 70 percent of merchandise exports and employs more than 30 percent of the total labor force. Fifty percent of the total population lives in rural areas.

The performance of agricultural sector has declined from an average growth of 5.6 percent during the 1960s to only 1.7 percent during the 1970s. GDP grew at an average of 6.0 percent during the 1960s and 4.5 percent during the 1970s. Since 1980, agriculture and the rest of the private sector have experienced little annual growth. Agriculture's relative contribution to GDP has declined from 30 percent in 1960 to 16.9 percent in 1984. Policies emphasizing import substitution, direct state production and extensive development of rural infrastructure influenced this decline.

Panama has important natural resources. Although much of its land is mountaineous, Panama has areas of high quality soils and extensive pastures. Climate is tropical with heavy rainfall 7-8 months of the year. Use of ocean resources is increasing. Fresh water fish are abundant. Shrimp mariculture is growing rapidly. Mineral exploration has been limited. Hydro-electric plants are beginning to harness the more than 300 rivers that drain into the Atlantic and Pacific oceans.

Panama's 2.14 million people enjoy levels of health and nutrition comparable to many industrial economies. Of the 561,000 persons employed in 1983, twenty-eight percent were employed in agriculture. Primary education is universal, but secondary and higher education are readily available only in urban communities.

2. Structure of Agricultural Sector

Ninety percent of all farms in Panama are less than 50 hectares in size. More than 75 percent farms are highly diversified, producing both annual and permanent crops. Between 1950 and 1980, land in pasture for livestock doubled and land in annual crops increased by 50 percent.

The smallest farms (less than 10 hectares) are highly diversified, producing annual crops of rice, corn and yucca, and permanent crops of bananas, plantain, avocado, oranges and coconut. Most small farms also have chickens and some livestock. Farming is labor-intensive, with little or no use of fertilizer, improved seeds or chemicals. Private livestock producers usually have farms of 10-50 hectares, with both improved and unimproved pasture and some brush/forest land. Many have dual purpose cattle for milk and meat. Average herd size is 42 head.

Large private commercial farms produce primarily sugar and bananas for export, with heavy use of fertilizers, chemicals and machinery.

In 1980, there were 206 asentamientos (state-owned land) and 25 agricultural cooperatives (privately-owned land). These collective farms employ a mix of traditional and capital intensive practices and provide employment for about 7,200 families. Asentamientos are not producing well and are generally viewed as a costly social experiment.

Other state production activities include a state banana plantation, four sugar mills, a citrus plantation and concentrate plant; and a capital-intensive state farm producing rice, cattle and timber. The state also operates a seed company, a machinery services enterprise, a crop insurance company and an agricultural development bank.

Agro-industry is made up largely of private firms that appear to have considerable political influence and concentration of power. Agricultural processing firms employ about one-third (10,000) of all employees in the industrial sector and contribute 45 percent of the value added (90 million dollars).

3. Agricultural Production, Profitability and Potential

Dominant domestic commodities produced include basic food crops (rice, maize, beans), livestock, fish, horticultural crops and tropical fruits. Maize, the staple crop of Panama, is increasingly being replaced by root and tuber crops and rice.

Major agricultural exports, in order of value, are bananas, shrimp, sugar, coffee, fish meal, fruit extracts, hides and beef. Bananas are the most important export commodity, accounting for about 25 percent of the value of all exports and nearly 20 percent of agriculture's share of GDP.

4. Analysis

The agricultural policies of the 1970s included import substitution, direct state production, land reform and extensive development of rural social infrastructure. The use of external financing and deficit spending to implement these policies led Panama's public debt to grow to 92 percent of GDP (1983).

Import substitution policies were successful in increasing domestic production of most crops identified and have brought very modest employment increases, but at high public sector cost from market interference and loss of productivity. Domestic production costs are high. Market price signals are distorted, resulting in surplus production of some commodities and deficient production of others. Economic incentives to adopt output stimulating, cost reducing technology are absent. Labor is priced above its true market value and capital is priced below its true market value.

Direct state production activities transferred resources from consumers to producers at high public cost. Land reform through asentamientos has been very costly, with few increases in production. Social infrastructure development provided positive benefits for the rural population, but agriculture still doesn't have the capacity to increase production. Secondary and vocational agriculture training reach less than half of the rural areas.

Agricultural technology generation/transfer capability is meager. Agricultural research is new and limited to a few pilot areas. Agricultural extension is non-functional. The natural resource base is threatened by extractive practices, soil erosion and other environmental issues.

When the World Bank instituted structural adjustment restrictions, political forces within Panama resisted at first, but changes are now being implemented. By passing an agricultural incentives law (1986) the GOP set the stage for a freeing of the domestic market. Also, under terms of a new structural adjustment loan (1986), the GOP agreed to undertake numerous actions to deregulate agriculture and to divest itself of four state-run agricultural enterprises.

In August 1986, the GOP announced the sale of two state-run agricultural enterprises (Las Cabras Sugarmill and ENDEMA), and issued a time-phased schedule for reducing tariffs on numerous agricultural products over the next five years. The first reductions occurred on August 1, 1986. Further divestitures are anticipated.

5. Conclusions

Agricultural performance is low. Production increases historically have come from land expansion, a choice no longer available. Crop yields are very low. Internal technology generation/transfer capacity is in infancy. Agricultural policies of the 1970's discouraged productivity increases. Low agriculture productivity and high windfall rents in the service sector during the 1970's caused heavy outmigration of labor and capital from the rural sector thus widening the already large income disparity between rural and urban sectors.

Agricultural production potential is high. Crops yield increasing potential has not yet been tapped. Commodities strongly influenced by high income and taste preferences in domestic and international markets and which have strong competitive advantage capability in production offer the greatest potential. This appears to include intensive fruit/vegetable crops, shrimp and livestock.

6. Recommendations:

To tap the production potential of the agricultural sector a number of necessary conditions are advanced as recommendations. These are:

1. Develop a free and open market environment with maximum competitive potential shielded from political and economic power influences. Establishment of "market rules" and systematic process of protective tariff reductions over time are essential components.
2. Strengthen and expand public sector agricultural technology generation/transfer capacity with special emphasis upon extension and development of relatively labor using technology.
3. Strengthen human resource capacity at all levels in agriculture.

4. Develop institutional capacity to conserve, use and manage natural resources, both public and private, through sound policy and implementation programs.

Broadening of the development base to include agriculture will provide positive income distribution effects, enhance internal terms of trade for agriculture and enhance employment in agriculture thereby relieving unemployment and wage increase pressures in the remainder of the economy.

ACRONYMS

AID/W	United States Agency for International Development/Washington, D.C.
APFM	Agricultural Policy Formulation & Management Project
BAYANO	Bayano Development Corporation
BDA	Banco de Desarrollo Agropecuario (Agricultural Development Bank)
BDC	Bayano Development Corporation
BID	Banco Interamericano de Desarrollo (Inter-American Development Bank)
BNP	Banco Nacional de Panama (National Bank of Panama)
CALV	Corporación Azucarera La Victoria (La Victoria Sugar Corporation)
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza (Center for Tropical Agriculture Research and Training, Turrialba, Costa Rica)
CIAT	Centro Internacional de Agricultura Tropical (International Center for Tropical Agriculture, Palmira, Colombia)
CIMMYT	Centro Internacional de Mejora de Maíz y Trigo (International Center for Improvement of Maize and Wheat, El Batan, Mexico)
CIP	Centro Internacional de Papas (International Potato Center, Lima, Peru)
CITRICOS	Cítricos de Chiriquí (Chiriqui Citrus Company)
CNS	Comité Nacional de Semillas (National Seed Committee)
COAGRO	Federación de Cooperativas Agropecuarias (Federation of Agricultural Cooperatives)
COAPRIA	Corporación Agropecuaria para Desarrollo Integral de Rio Hato (Agricultural Corporation for Integrated Development of Rio Hato)

COBANA	Corporación Bananera del Atlántico (Atlantic Banana Corporation)
COBAPA	Corporación Bananera del Pacífico (Pacific Banana Corporation)
CODEIBO	Corporación Desarrollo Integral de Bocas del Toro (Integrated Development Corporation of Bocas del Toro)
COFINA	Corporación Financiera Nacional (National Finance Corporation)
CONAC	Confederación Nacional de Asentamientos Campesinos (National Confederation of Asentamiento Farmers)
DEC	Dirección de Estadística y Censo (Statistics and Census Directorate, Controller General)
DNPS	Dirección Nacional de Planificación Sectorial (National Directorate of Sectoral Planning)
ENASEM	Empresa Nacional de Semillas (National Seed Enterprise)
ENDEMA	Empresa Nacional de Maquinaria Agrícola (National Agricultural Machinery Enterprise)
ESF	Economic Support Fund
FEDPA	Federación de Cooperativas de Ahorro y Crédito de Panamá (National Federation of Credit Unions)
FAUP	Facultad de Agronomía Universidad de Panama (University of Panama Faculty of Agronomy)
FI DA	Fondo Internacional para Desarrollo Agropecuario (International Fund for Agricultural Development)
GDP	Gross Domestic Product
GOP	Government of Panama (Gobierno de Panamá)
IBRD	International Bank for Reconstruction and Development (The World Bank)

ICO	International Coffee Organization
IDIAP	Instituto de Investigaciones Agropecuarias (Agriculture Research Institute)
IDRC	International Development Research Corporation, Canada
IMA	Instituto de Mercadeo Agropecuario (Institute of Agricultural Marketing)
INA	Instituto Nacional de Agricultura (National Agricultural Institute)
IMF	International Monetary Fund
IPACCCP	Instituto Panameño Autónomo de Cooperativas (Autonomous Institute of Panamanian Cooperatives)
IRRI	International Rice Research Institute, Los Baños, Philippines
ISA	Instituto de Seguro Agropecuario (Agricultural Insurance Institute)
MICI	Ministerio de Comercio e Industrias (Ministry of Commerce and Industry)
MIDA	Ministerio de Desarrollo Agropecuario (Ministry of Agricultural Development)
MIPPE	Ministerio de Planificación y Política Económica (Ministry of Planning and Economic Policy)
MCE	Ministerio de Educación (Ministry of Education)
MS	Master of Science Degree
NBC	National Banking Commission
OIT	Organización Internacional del Trabajo (International Labor Organization)
OPG	Operational Program Grant
ORP	Oficina de Regulación de Precios (Price Regulation Office, Ministry of Commerce & Industry)
PANAJURU	Patronato Nacional de la Juventud Rural (National Foundation for Rural Youth)

PhD Doctor of Philosophy Degree

RENARE Dirección Nacional de Recursos Naturales Renovables
(National Institute for the Conservation of Natural Resources)

SAL Structural Adjustment Loan

SENEACRO Servicio Nacional de Extension Agropecuario
(National Agricultural Extension Service)

USAID/P U.S. Agency for International Development/Panama Mission

MEASURES

c.i.f. value of cargo + insurance + freight

cwt hundredweight (100 pounds)

F.O.B. value of cargo only (freight on board)

ha hectare (2.471 acres)

MT metric ton (2,240 pounds)

QQ quintal (hundredweight = 100 pounds)

US\$ 1 B/.1 (the US Dollar is accepted as currency where
US\$ 1 = 1 Balboa)

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PANAMA AGRICULTURAL SECTOR ASSESSMENT

I. BACKGROUND

Panama's geographical location has contributed significantly to its present condition. Even before the completion of the Panama Canal in 1914, Panama served as a major international trade route between the Atlantic and Pacific oceans. Over the years, human and capital resources have become concentrated in the service sectors associated with international trade. Panama's service sector generates 69 percent of Gross Domestic Product (GDP), the largest proportion for any developing country in the world. Included in the service sector are the government and its defense forces, domestic and off-shore banking from 128 banks, the Canal and its support activities, the Colon Free Zone (a major wholesale center) and the oil pipeline in Chiriquí province (for transfer of crude oil from tankers too large to transit the canal).

International market forces and internal government policies have played significant roles in shaping Panama's agricultural sector. This chapter assesses the role of agriculture in the Panamanian economy and provides a descriptive overview of Panama's resources.

A. The Role of Agriculture in the Economy

1. Current Contribution

The agricultural sector, including agro-industry, contributed 16.9 percent of Panama's total GDP in 1984. The production activities of crop, livestock, forestry, hunting and fishing in the national account contributed 13.1 percent of total GDP (469.5 million dollars). Agro-industry, including the provision of agricultural inputs, the marketing of agricultural products and food, and the processing of meat, tobacco and hides, contributed 3.8 percent.

Agriculture contributes to the Panamanian economy by providing: (1) adequate food supplies for the nation; (2) a production surplus that contributes significantly to foreign exchange earnings; (3) employment for more than 30 percent of the economy's total labor force; (4) consumer demand from the 50 percent of total population that live in rural areas.

The volume of self-produced and consumed food is significant. Panama's population is healthy, well-fed, and enjoys a long life. Acute malnutrition is very low and is linked to eating habits rather than production deficiencies. Chronic malnutrition appears to be limited to isolated rural areas.

Agriculture produces a substantial surplus. In 1984, agriculture contributed 85 percent of merchandise exports, with a value of almost 218 million dollars. See Annex Table 2.

The major agricultural exports (in rank order — bananas, shrimp, sugar coffee, hides and cocoa) account for more than 70 percent of total exports. Food imports have been 44 to 46 percent of agricultural exports for the past decade. Food imports include wheat and temperate climate fruits that cannot be grown in Panama. See Annex Table 18.

Agriculture is the largest single source of private sector jobs and entrepreneurs. One-half of Panama's population resides in rural areas. Approximately 650,000 persons in farm families depend on agriculture for both food and income needs. In addition, 400,000 persons depend on agriculture for family food needs and off-farm work for cash income. Among those dependent on agriculture, per capita income is considerably lower than the national average. Wages in the dominant traditional component are about 40 percent of the national average. Enhancing agricultural productivity and increasing their incomes could lead to a significant consumer demand for industrial goods.

2. Recent Trends

The performance of the agricultural sector has declined from an average growth of 5.6 percent during the 1960s to only 1.7 percent during the 1970s. GDP grew at an average of 6.0 percent during the 1960s and 4.5 percent during the 1970s. Since 1980, agriculture and the rest of the private sector have experienced little annual growth. Agriculture's relative contribution to GDP has declined from 30 percent in 1960 to 16.9 percent in 1984.

Internal government policies have influenced this decline (see Table 1). Agricultural policy legislation introduced in 1970 initiated major changes, including fixed prices, import controls, direct state production, land reform and extensive social and economic reforms in the rural areas. Large economic losses occurred from the Government of Panama's (GOP) role as producer, processor and marketing intermediary of agricultural products. Private sector capital investment in agricultural production/marketing was minimal. Heavy rural to urban migration resulted in very high urban unemployment.

Public sector capital investment was financed with external loans from suppliers, commercial banks, the World Bank and the Inter-American Development Bank (IDB). The oil crisis of the 1970s and the subsequent worldwide recession halted the growth of the international trade service sectors. By 1983, Panama's public debt was US\$4.0 billion, or 92 percent of GDP, a level exceeded only by Israel among all the nations of the world. External debt service exceeded 35 percent of public revenues. The World Bank instituted structural adjustment restrictions and USAID assisted with an ESF grant.

Although the total external debt continued to rise through 1985, the deficit in the current account dropped from a high of 538 million dollars in 1982 to 315 million in 1983 and 211 million in 1985. Lowering of world oil prices has been a major factor in reducing the deficit level because Panama has no petroleum resources of its own.

TABLE 1
BRIEF CHRONOLOGY OF POLICIES
AFFECTING AGRICULTURAL SECTOR IN PANAMA

1960s	Agricultural pricing policies initiated to regulate resource use and income distribution.
1968	Military coup - General Torrijos assumes leadership of Panama
1970s	<p>Major agricultural policy legislation (1970) emphasizes:</p> <p>(1) Import substitution - fixed farmer support prices, fixed consumer ceiling prices, import controls through quotas and high protective tariffs;</p> <p>(2) Direct state production - creation of <u>asentamientos</u>, collectivized farm settlements; (3) Land reform (greater state ownership); (4) Extensive development of rural social infrastructure - schools, health facilities, potable water, roads.</p> <p>Agricultural training expanded - development of agricultural faculty at the University of Panama and creation of seven vocational agricultural high schools.</p> <p>External financing and deficit spending used to implement policy changes. Public spending in agricultural sector reaches all time high by end of 1970s.</p>
1983	March: GOP responds to initial structural adjustments loan from World Bank by closing state-owned Felipillo Sugar Mill, removing farm price support of potatoes and removing consumer ceiling prices on potatoes and premium quality coffee. Response was minimal and was implemented very slowly. (November: Presidential election - Dr. Nicolas Ardito Barletta becomes President).
1984	Farm price support of rice was reduced from 14 to 13 cents a pound.
1985	September: National Legislative Assembly rejects terms of a second World Bank loan. Dr. Barletta removed from office and replaced by Vice President Delvalle.
1986	<p>March: Agricultural incentive law passed - sets the stage to free domestic market from price controls and to reduce the protective barriers from foreign competition.</p> <p>August: Terms of a new structural adjustment loan are made public. Included are numerous actions to deregulate agriculture.</p>

The World Bank stated categorically that, for renewed growth, Panama requires an open economy growth strategy that emphasizes agriculture and industry, is geared towards exports, fueled by labor intensive private investment and supported by well-planned and frugal public sector fiscal policy. Political forces within Panama resisted these changes.

In November 1984, Dr. Nicolas Ardito Barletta was elected President of Panama in the first presidential election since the military coup of 1968. He was never able to develop a viable coalition. Although the terms of a second World Bank structural adjustment loan were ratified in May 1985 by the Presidential Cabinet, they were rejected by the National Legislative Assembly in September. On Saturday, December 28, 1985, Dr. Barletta was removed by the National Guard and replaced by Vice President Delvalle.

President Delvalle succeeded in passing an agricultural incentive law in March 1986. This new law sets the stage for a freeing of the domestic market from restrictive price controls and a reduction in the protective barriers from foreign competition. In August 1986, the terms of a new structural adjustment loan were made public. Included are numerous actions to deregulate agriculture. In addition, the GOP will divest itself of two sugarmills, the Chiriqui Citrus Company and the National Agricultural Machinery Enterprise. Details are presented in Chapter IV.

B. Natural Resources

1. Geography and Climate

Panama is a narrow isthmus, 480 miles in length and 37 to 110 miles wide. A central range of highlands has elevations of 3000 to 5000 feet. Both coasts have narrow plains cut by numerous small rivers that run to the sea.

Panama's climate is tropical, with high temperature and humidity year-round. Daytime and nighttime temperature variations rarely exceed 10 degrees Fahrenheit.

Rainfall rather than changes in temperature determine the seasons. The dry season extends from December to April in parts of the Pacific slope and for shorter periods on the Atlantic slope. During the rainy season (May to November) the Pacific coast averages 60 to 100 inches of rainfall and the Atlantic coast receives up to 200 inches of rainfall.

2. Land/Soils/Topography

The total land area is about 7.7 million hectares. In 1980, approximately 2.2 million hectares (29 percent of land area) were being used for agricultural purposes. Most of the land is hilly or mountainous. Only about one percent of the land area is level. This land is in the alluvial plain in Chiriqui where mechanized farming is employed extensively. About 22,000 hectares were irrigated in 1980, primarily in the Azuero peninsula, for crop production during the dry season.

Table 2 presents the percent of agricultural land allocated to various uses. (Details by province are presented in Annex Table 6).

TABLE 2
TOTAL LAND USE IN PANAMA, BY TYPE OF USE, 1980

Land Use	Hectares	Percent of Total Land
<u>Agriculture</u>		
Annual crops	239,700	3.1
Permanent crops	117,700	1.5
Fallow land	194,500	2.5
Pasture land (introduced)	1,016,900	13.2
Pasture land (native)	279,300	3.6
Brush/forest land	353,200	4.6
Other Land use	52,400	.7
SUB-TOTAL	2,253,900	29.2
<u>Forest</u>		
Commercial	3,373,100	43.8
Limited commercial	1,079,200	14.0
Park	1,002,000	13.0
SUB-TOTAL	5,454,300	70.8
GRAND TOTAL	7,708,200	100.0

NOTE: Data for agriculture categories are elaborated in Annex Tables 5 and 6. Data for forest categories are estimated. Urban land use is not calculated in the census.

Very high quality soils, volcanic in nature, are located in the highlands around Mount Baru in Chiriqui, El Valle in Cocolé Province and Cerro Alto in Panama province. In these areas, intensive vegetable, dairy and fruit production flourish on small farms. Yield potential is five to seven times greater than currently exists, but soils are fragile and erosion prone. Throughout Panama, soil degradation and erosion are serious problems. Conservation practices are not in common use and conservation policies have not been initiated.

Land use potential was estimated by three separate sources in the 1970s (see ISTI reference). Two studies used the USDA-SCS soil classification criteria for determining land use potential (based on modern land use in the U.S.). The third incorporated physical and economic criteria based on tropical environments. Estimates from these studies suggest that limited capacity exists for expanding agricultural land without major capital investment. To increase agricultural production, Panama will have to intensify land use and initiate measures to reduce soil losses.

3. Development Regions:

Panama is divided into four geographical regions for development planning purposes: western, central, metropolitan and eastern. The western region contains Chiriqui and Bocas del Toro provinces. Chiriqui produces approximately 60 percent of all domestically-consumed production, nearly all of Panama's horticultural production and half of all rice, coffee, sorghum and bananas. Plantation production of bananas is centered in Bocas del Toro. Regional development has focused on completion of the transisthmian oil pipeline, hydroelectric power development in the Taribe and Changuinola rivers, and construction of the copper mine at Cerro Colorado (now terminated for financial and environmental reasons).

The central region contains Los Santos and Herrera provinces (in the Azuero peninsula) and Veraguas and Cocolé provinces. Nearly 50 percent of the country's farmers live in these areas, the heartland for livestock and subsistence crop production. Regional emphasis has been on rural road development, reforestation in several watersheds and urban/industrial development in Chitré and Los Santos.

The metropolitan region contains the populated portion of Panama and Colon provinces straddling the Panama Canal. About 25 percent of the country's farmers are concentrated in this small region. Many are employed part or full time in the urban centers. Development emphasis has been on highway and secondary road construction, the establishment of several national parks, reforestation and park protection in the Canal watershed and development of a tourist center in the Gulf of San Miguel.

The eastern region includes the vast undeveloped Darien province. Development plans include a network of regional roads to connect several communities with the Panamerican highway, establishment of three areas for intensive agricultural use and exploitation of forest resources.

4. Ocean

Fishing accounts for 10 percent of agricultural income. During the 1970s, the value of sales increased from 10 million to 50 million dollars. The dominant ocean resources being utilized are herring, anchovies, shrimp and lobster.

The largest catches are anchovies and herring for fish meal, oil and local consumption. Fish meal is a ranking export. Most of the shrimp catch (from a deep sea fleet of more than 275 boats) is exported to North America. In 1983, shrimp exports were US \$51 million, the second ranking export by value.

Fresh water fish are abundant. Trout are found in the cooler mountain streams. Bass, catfish and other sport fish abound in the warmer waters of the canal and Gatun lake.

Estuaries containing mangroves serve as the breeding ground for many species of fish, shrimp and lobster. USAID has sponsored studies to assess

the mangroves and their fish and shrimp larvae populations. Limited efforts have been made to manage coastal shrimp resources. Shrimp mariculture in salt water ponds was initiated in 1974 and is growing rapidly.

5. Minerals

Limited exploration for mineral resources has occurred. Salt, construction materials, ferrous sand, bauxite, phosphates and non-ferrous metals (including copper) have been discovered. Solar salt is produced in tidal lowlands at Los Santos. Limestone, clay and gravel are extracted for the construction industry. An adequate amount of cement is produced for the country.

Small amounts of manganese are mined. Two very large copper deposits have been discovered in Chiriquí province but have not been developed because of capital investment requirements, a depressed international copper market and environmental concerns. Most agricultural fertilizers are imported. Panamanian limestone is more expensive than that imported from Costa Rica.

6. Energy

Energy resources have been a major constraint to industrial development. Panama has no oil. Until the 1950s, firewood supplied half the country's energy requirements. From then, until the 1970s, Panama depended almost exclusively on imported oil for commercial energy. By 1979, 11 hydroelectric plants were in operation and by 1984, hydroelectric power provided 10 percent of the country's primary energy. About 80 percent of the urban population and 40 percent of the rural population have electricity. Firewood continues to supply energy to non-electrified rural areas.

7. Water Resources

More than 300 rivers drain into either the Atlantic or Pacific oceans. Only one river, the Río Tuira in Darien province, is navigable. Rio Bayano in Chepo, the second largest river, is the site of a major hydroelectric project.

Adequate rainfall precludes the need for irrigation generally. Limited irrigation is being tried in the Azuero peninsula to overcome the extended five-month dry season and permit a second crop. Supplemental irrigation is also being used in high rainfall areas on valuable intensive crops in Chiriquí.

8. Wildlife and National Parks

The tropical climate, oceans and streams, mountains and forest canopy provide excellent habitat for wildlife. Three of the four major migration routes for birds between the Americas pass through Panama.

Historically, wildlife and forest products were used by indigenous Indian tribes for food, clothing and shelter. Very little is known concerning the extent of depredation of these resources from loss of habitat and use for commercial purposes. No internal controls exist on freshwater fishing. Hunting was prohibited in 1980 due to inability to control bag limits.

Development of national parks was initiated in 1968 on forest lands in the Canal Zone. Beginning in 1980, about 500,000 hectares of natural forest were set aside in the Darien to serve as a buffer against spread of hoof and mouth disease. About one million hectares have been set aside to date. At least six more parks have been proposed.

B. Human Resources

1. Population/Employment

In 1984, the population of Panama was estimated at 2.14 million. Average annual population growth is 2.3 percent, down from 2.9 percent in the 1960s. In the rural sector, annual population growth is 2.5 percent, reflecting a slightly higher crude birth rate but a comparable crude death rate to that found in the urban areas. Population is nearly equally divided between rural and urban (living in communities with more than 1,500 people). See Annex Table 3 for distribution of rural and urban population by province. Major population centers include Panama City/San Miguelito (est. 700,000), Colon (125,000), David (90,000), Santiago (80,000) and Chitre/Los Santos (40,000).

In 1983, 561,000 persons were reported as employed in Panama. Approximately twenty-eight percent were employed in agriculture. Official unemployment was 9.4 percent, visible underemployment 2.3 percent and disguised unemployment 4.7 percent, for a total of 16.4 percent. Overall agricultural underemployment is 1.1 percent. Visible and disguised underemployment are reported higher in the non-metropolitan areas surrounding the regional population centers.

2. Education

Education received considerable emphasis during the social reforms of the 1970s. Schools offering primary education are now available to all but the most isolated rural communities. School attendance is compulsory through age fifteen, or through six grades of primary school. Standard primary curriculum includes general studies in Spanish, science, mathematics, social studies, religion and some practical study in agriculture, hygiene, manual arts and home economics. In 1983, 335,000 students were enrolled in primary school.

Secondary and higher education are readily available only in the urban communities. Approximately 175,000 students are enrolled in 320 secondary schools. The secondary school curriculum is divided into a three-year lower cycle containing Spanish, social studies, religion and art/music, and a three-year upper cycle providing the choice of university preparatory courses in arts and sciences or terminal vocational/technical training for immediate employment. Vocational agricultural lower cycle technical training is provided in seven rural secondary schools and upper cycle training in one agricultural technical institute. Education is free at public primary and secondary schools and cost is nominal at the university.

Three universities provide training to the B.A./B.S. level for 45,000 students. The University of Panama, founded in 1935, has a main campus in Panama City and five regional campuses with total enrollment of 34,000

students. The technical (engineering) university in Panama City has 6,000 students. Santa Maria La Antigua, a private university also located in Panama City, has 5,000 students.

The University of Panama has ten faculties: Agronomy; Architecture; Business Administration/Accounting; Dentistry; Economics; Law/Political Science; Medicine; Natural Sciences/Pharmacy; Philosophy/Letters/Education; Public Administration. Since 1980, M.S. degrees are offered in mathematics and entomology. Student/faculty ratios are high (over 20:1), full-time faculty are in a minority (about 4 percent) and research/extension/public service activities are of very limited importance relative to classroom instruction.

Agricultural research, teaching and extension are managed by separate public institutions. University-level agricultural instruction is the responsibility of the University of Panama Faculty of Agronomy, located in David, the regional capital in Chiriqui province. Agricultural research is the responsibility of the Agriculture Research Institute (IDIAP), chartered as an autonomous unit of the GOP in 1975. In 1984, the National Agricultural Extension Service (SENEAGRO), a division of the Ministry of Agricultural Development (MIDA), was assigned responsibility for agricultural extension.

3. Health/Nutrition/Food Consumption

Social indicators show Panama as an upper middle-income country with health and nutrition indicators comparable to many industrial economies. Malnutrition is not a major problem. In most of Panama, the tropical environment, coupled with adequate subsistence production from small farmers, provides an ample and varied supply of food.

Rice is an important staple in rural diets, but it is complemented with vegetables/fruit, poultry/eggs, oils and fish. Urban diets are dominated by beef, poultry/eggs, vegetables/fruit and supplemented by milk, rice and bread. A recent nutritional study (Franklin) indicates that acute nutritional deficiencies are uncommon. Chronic nutritional problems do exist in isolated rural areas, especially diversified small farms in the maize and rice producing regions of Veraguas and Cocolé provinces.

Changes in patterns of food consumption during the ten-year period from 1973 through 1982 are presented in Annex Tables 1 and 18. Major increases appear for meat, fish and seafood consumption. The level of fruit consumption is one of the highest in the world.

C. Infrastructure

1. Transportation and Communications

Transportation at the narrow point of the isthmus has been important to Panama since the sixteenth century. The Panama Canal, completed in 1914, continues to be an important, though declining source of revenue (8 percent of GDP in 1982). A major study is being initiated jointly by Panamanian, U.S. and Japanese governments to determine the efficacy of alternative sea level or third lane locks to meet future international shipping needs.

A railroad, 76 kilometers long, crosses the isthmus between Panama City and Colon. Two additional, unconnected railroad systems exist in the country. In Chiriqui province, the GOP operates a railroad between La Concepcion and Puerto Armuelles. A third rail line is in Bocas del Toro province and extends into Costa Rica. About 100 kilometers of this railroad are operational.

In 1980, Panama has more than 8,300 kilometers of roads -- 2,600 kilometers paved, 3,000 kilometers graveled and 2,700 kilometers of dirt feeder roads. The Inter-American highway extends from the Costa Rican border to Chepo, east of Panama City. From Chepo to Yaviza, the highway is graveled. No road extends beyond Yaviza to link Panama and Colombia. USAID has supported the expansion of gravel and dirt rural access roads in the interior. Road construction and maintenance costs are high because of the mountainous terrain.

Air transportation is important because of the mountainous terrain and isolation of many areas. Eight major airports exist and about two dozen unimproved airstrips dot the countryside. Two airports are located near Panama City. One airport serves international traffic. The other serves as the hub for government and private airlines.

Four ports near the canal, two on the Pacific side and two on the Atlantic side, provide nearly all of the commercial sea trade port services for Panama. Almirante on the Atlantic side and Puerto Armuelles on the Pacific side are the major ports for banana exports. Five major ports serve local areas.

Telecommunications, both external and internal, are well developed. Internal telephone service has expanded into rural areas wherever electric service is provided. About 40 percent of the rural population have access to telephones. Both energy and telecommunication facilities are state owned. Numerous radio and television stations exist in Panama City. Satellite relay stations provide good service to the major cities in the interior.

2. Industry

In addition to agro-industry, Panama has industrial activities in construction and in the utilities of electricity, gas and water. More than 60 percent of manufacturing has concentrated near the major cities.

To meet import substitution objectives during the 1970s, the state became an active producer, processor, regulator, input and services supplier, and policy formulator of both agricultural and manufactured goods. Although private foreign investment is now being encouraged, new activity has been limited by the international recession, high labor wage rates, high energy and transportation costs and uncertainty of future government activities.

3. Financial/Banking

Panama's monetary system involves no central bank and uses the U.S. dollar as its medium of exchange. This obviates the usual third world country problems of monetary balance payments, provides monetary and price stability, and assures credit standing for international transactions. Favorable banking laws have led to the establishment of 128 banks. Most are commercial banks, making short-term loans.

Off-shore banking (transactions between parties outside the country) has been encouraged since the 1970s. The state has imposed few operational restrictions and has left foreign profits untaxed. The banks are required to maintain offices in Panama to create employment and encourage employee spending.

In 1980, both domestic and off-shore banking activities provided employment for more than 8,000 persons and contributed 8 percent to GDP. Banking services to the agricultural sector are provided by the state, principally as short-term credit at subsidized interest rates.

4. Foreign Trade

Panama imports consumer goods for the high income urban population, crude oil for energy and some food items which the country does not produce (e.g. wheat for flour). More than 80 percent of total exports are agricultural products, including bananas, sugar, shrimp, hides and coffee. Major export markets are in the western hemisphere.

The Colon Free Zone is an area where goods from foreign countries are landed, stored, repacked and forwarded exempt from customs duties. Colon is the largest free port in the western hemisphere, providing direct and indirect employment to more than 20,000 workers. Service earnings from the free zone accounted for seven percent of GDP in 1980.

II. STRUCTURE OF AGRICULTURAL SECTOR

A. Employment

In 1982, Panama's agricultural sector employed more than 157,000 persons, or 28 percent of the total employed population. Eighty-five percent of the employment is dispersed throughout the country; the remaining 15 percent is located around areas of urban concentration. Table 3 presents the occupational categories for persons employed in the agricultural sector. More than half (55 percent) are self-employed farmers. Twenty-one percent are employed by agro-industry.

TABLE 3
NUMBER AND PERCENT OF PERSONS EMPLOYED IN AGRICULTURAL SECTOR
BY OCCUPATIONAL CATEGORY, 1982

Categories	Number	Percent
Self-employed farmer	86,483	55
Farmer exchange labor	27,363	17
Employed by agro-industry	33,119	21
Employed by cooperatives, asentamientos and state farms	5,624	4
Hired laborers	4,856	3
TOTAL	<u>157,445</u>	<u>100</u>

Ninety-five percent of the population reported as employed in agriculture are men. Excluded from the statistics are non-wage exchange labor, self-employed labor by men, women and children in field activity and labor utilization of women in non-field activities, such as child rearing, household activities and artisan work.

In metropolitan area, the median salary for all occupations is 372 Balboas monthly; the median salary for agricultural workers is about 170 Balboas monthly. See Annex Table 47. For the rest of the country, the median salary is 317 Balboas monthly for all occupations and 142 Balboas monthly for agricultural workers. Field labor is highly seasonal and wages are about 5 Balboas daily or 50 cents/hour. Farm family income from farm and non-farm sources is not reported.

Overall agricultural unemployment is 1.1 percent (2.7 percent in urban areas). Underemployment is estimated at 3.2 percent. (Given the conceptual difficulty of defining employment in the agricultural sector where most persons are self-employed, employment figures are not wholly reliable).

B. Farm Size and Land Use

The 1980 agricultural census shows approximately 102,000 farm units (greater than 0.5 hectares in size) producing agricultural crops and livestock products on 2.25 million hectares of land. Table 4 shows that farm land ownership is skewed. Eight percent of farmland is divided among 63 percent of the farms 0.5 to 9.9 hectares in size. Farms of 10 to 49.9 hectares account for 27 percent of all farms and 26 percent of all agricultural land. Larger farms of 50 hectares or more are 10 percent of farms, but have 66 percent of the farmland.

TABLE 4
NUMBER AND PERCENT OF FARMS AND FARMLAND BY FARM SIZE,
0.5 HECTARES AND LARGER, 1980

Farm Size (ha.)	Number	Percent of Farms	Hectares	Percent of Farmland
0.5 - 2.9	39,502	39	47,508	2
3.0 - 9.9	24,833	24	128,325	6
10.0 - 49.9	27,709	27	585,746	26
50.0 - 199.9	8,635	8	721,444	32
200.0 or more	1,490	2	770,941	34
TOTAL	102,109	100	2,253,967	100

Approximately 50,000 farms of 0.5 hectares or less are no longer classified as "farms" because 97 percent of owners depend on off-farm work as their primary source of income. Annex Table 4 presents some data for these very small "farms". The level of family income and farm contribution is not known. Three percent of these farmers depend on the farm as their sole source of income.

More than 75 percent of all farms are highly diversified, producing both annual and permanent crops. Table 5 describes changes in agricultural land use from 1950 to 1980. Land in annual crops has increased 54 percent; land in permanent crops has increased 44 percent. Land in pasture for livestock (following the traditional slash and burn process of farm colonization on new lands) has increased steadily from 567,000 hectares in 1950 to 1,296,000 hectares in 1980, a 129 percent increase. During the past 30 years, agricultural land has nearly doubled with three-fourths of the increase being in pasture land and the remaining in annual cropland. Agricultural land use patterns, 1950 - 1980, are presented in Annex Table 5; agricultural land use by province is shown in Annex Table 6.

TABLE 5
CHANGES IN AGRICULTURAL LAND USE, 1950 - 1980,
BY TYPE OF LAND USE

Type of Land Use	No. of Hectares		Percent Change
	1950	1980	
Annual crops	156	240	+ 54
Permanent crops	82	118	+ 44
Fallow land	214	195	- 9
Pasture land	567	1296	+129
Brush/forest land and other use	158	406	+156
TOTAL	<u>1180</u>	<u>2254</u>	+ 91

C. Farm Organization

1. Distribution of Farmland

Thirty-four percent of land was titled in 1981. Table 6 presents the distribution of land by type of farm organization. More than 80 percent of all farmland is owned by single proprietors. Government, communal and cooperative farms make up less than 10 percent of farmland. A review of Annex Table 4 shows virtually no distributional changes between size categories since 1970.

TABLE 6
DISTRIBUTION OF FARMLAND BY TYPE OF FARM ORGANIZATION, 1980

Type of Farm Organization	Percent
Single Proprietor	83
Incorporated Farms	8
Government Farms	5
Asentamiento, communal farms	3
Cooperative farms	1
TOTAL	<u>100</u>
(No. of hectares)	(2.25 million)

Table 7 examines the type of farm organization among large farms (200 hectares or more). Seventy-six percent of hectares are held by single proprietors or incorporated groups. The remainder is primarily in public organizations — government and asentamiento farms. Further details are provided in Annex Table 7.

TABLE 7
DISTRIBUTION OF FARMLAND BY TYPE OF FARM ORGANIZATION
FOR LARGE FARMS, 1980

Type of Large Farm	No. of Farm Units	Percent of Hectares
Single Proprietors	1,180	54
Incorporated farms	168	22
Government farms	26	16
Asentamientos	108	6
Cooperative farms	5	1
Other	3	1
TOTAL	1,400	100

2. Private Farms: Crop and Livestock Production

Large quantities of bananas, rice and sugar cane are produced on private and corporate farms (greater than 200 hectares) that use capital intensive technology and agricultural chemicals. Smaller quantities of these and many other crops are produced on small farm units averaging less than 10 hectares in size. Small farms are highly diversified, producing annual crops of rice, corn and yucca, and permanent crops of bananas, plantain, avocado, oranges and coconut. Most small farms have chickens and 80 percent have some livestock.

Crop farmers usually own and farm their own contiguous untitled land parcel. Fewer than 10 percent use fertilizer. Ninety percent use hand labor as the dominant energy source; eight percent use animal traction. Nine percent use machinery primarily for land preparation. Horses are used on half of the farms, primarily for transport.

Data show that livestock producers have larger farms, usually 10 to 50 hectares, with both improved and unimproved pasture and some brush/forest land. Many have dual purpose cattle for milk and meat. Average herd size is 42 head. Other livestock include horses (primarily for herding and transport), mules or burros, hogs, chickens, ducks, geese and turkeys. Table 8 describes the distribution of different types of livestock in Panama. Livestock producers usually own and farm their own untitled land.

The most important components of agricultural production by value are shown in Annex Table 10. Bananas, followed by rice and sugar cane dominate crop production. Beef and milk production dominate livestock production.

TABLE 8
DISTRIBUTION OF LIVESTOCK, BY TYPE

Type of Livestock	No. of Farms (000s)	No. of Head (000s)	No. per Farm
Cows	34	1,425	42
Horses	43	125	3
Mules/Burros	2	3	2
Hogs	37	220	6
Chickens	119	6,000	50
Ducks/Geese	17	110	7
Turkeys	6	20	3

3. Asentamientos and Cooperatives

In 1980, there were 206 asentamientos (108 were more than 200 hectares in size) and 25 agricultural cooperatives. Both cooperatives and asentamientos pool purchasing and marketing activities, but cooperative land remains in private ownership while asentamiento land is owned by the state. Asentamientos and cooperatives embrace about 7,200 families (35,000 people) and three percent of agricultural land (about 70,000 hectares).

Asentamientos were formed in the early 1970s to provide employment for 5,000 landless farm workers, to improve land distribution and to expand the government's sphere of influence in rural areas. Most land was obtained from tax default auctions (59 percent) and from legal expropriations (21 percent) and is of poor quality. Less than one-third is suitable for farming or cattle raising.

Numerous resources were allocated to assist asentamientos, including credit services of the Agricultural Development Bank (EDA), machinery services for land preparation and harvesting (especially for rice) from ENDEVA, a special rural housing program, long-term farm management training, and research/extension services from the Agricultural Research Institute (IDIAP), Panama's public research institution. In addition, the Ministry of Agricultural Development has concentrated considerable resources on asentamientos (40 percent of its total budget of US \$19 million in 1979).

Asentamientos have been a costly social experiment. In 1981, more than six million dollars of uncollectable EDA debt were written off. Since the late 1970s, EDA has extended less credit and asentamientos have cultivated less land. From 1978 to 1983, seeded hectareage of rice declined 36 percent and area cropped in corn and sorghum dropped by 45 percent.

4. Other Public Sector Activities in Production

Other public sector activities in production include a state banana plantation, a citrus plantation and concentrate plant, and a capital-intensive state farm (producing rice, cattle, timber). COBANA, the state banana plantation, is one of two plantations that were taken over by the government in 1977 to save worker jobs. The two private firms were on the verge of bankruptcy. COBANA has 325 employees and is located in Bocas del Toro Province. (The second plantation, COBAPA, has closed its operations because of an outbreak of Black Sigatoka disease, a fungus).

The Chiriqui Citrus Company (CITRICOS) was taken over by the state in 1975, to avoid worker layoffs. The company was abandoned by Ludwig Enterprises after 15 years of chronic losses relating to variety and disease problems. CITRICOS currently consists of a 2,000 hectare plantation and a concentrate plant. Since 1983, it has been operating at a small profit. The firm employs 125 permanent workers in the plant, 525 in the plantation and administration, and 200 seasonal workers for harvest.

CITRICOS' principal product is orange juice concentrate. Annual production is about 140,000 gallons or about 35 percent of plant capacity. Unit processing costs are about \$8.20 per gallon, compared to about US \$6.00 per gallon in Florida. Orange groves are being expanded to increase plant utilization for both domestic and export markets. Export to the United States was initiated in 1984. Modernization of juicing equipment and installation of container (tetrapak) filling equipment is underway.

A third public sector activity in production is the Bayano Development Corporation (BAYANO), created in 1975 to produce rice, cattle and timber and to protect the watershed of the Bayano hydroelectric reservoir (in Panama province). BAYANO is a capital intensive state farm, with 500 employees. Heavy emphasis has been placed upon provision of social services. Operating subsidies in excess of one million dollars per year have been paid by GOP to continue operation.

D. Agro-Industry

Agro-industry is made up largely of private firms that appear to have considerable political influence and concentration of power. This section presents information on agro-industrial processing firms (both public and private) and on private firms providing agricultural inputs. No information is available on agricultural intermediary firms that transport, broker and market agricultural products.

1. Processing Firms

In terms of dollar value, the processing of agricultural and forestry products comprises 42 percent of all industrial manufacturing. Food and meat processing are 22 percent of the total. See Annex Table 13.

Table 9 outlines the distribution of small, medium and large firms in Panama's industrial sector, and the distribution of employees in these firms. More than half of the firms have fewer than 30 employees, but altogether the manufacturing industry provides employment for almost 30,000 persons.

TABLE 9
DISTRIBUTION OF INDUSTRIAL FIRMS AND EMPLOYEES, 1979

Firm Size	Percent of Firms	Percent of Employees
Large (100 or more)	13	51
Medium (30-100 employees)	29	32
Small (5-30 employees)	58	17
TOTAL	<u>100</u>	<u>100</u>
(Number)	(615)	(29,948)

Approximately half (312) of all firms are directly involved in agro-industrial activities. Agricultural processing firms employ about one-third (10,000) of all employees in the industrial sector and contribute 45 percent of the value added (90 million dollars). Table 10 describes the agro-industry firms that process farm production into intermediate and final products for consumption.

Only the largest industrial firms use capital intensive methods. Included in this category are sugar refining, tobacco and fruit/vegetable processing. Each is either a state enterprise or is under strong state control. Most of the firms are involved in local and national markets, but the larger firms do more exporting.

Sugar refining ranks second only to beverage manufacturing in value added. Six sugar mills (four state and two private) meet domestic needs and export the remainder. State sugar mills were initiated in the early 1970s to expand employment, promote exports for foreign exchange and break the private sector sugar monopoly. The mills have been receiving about 29 cents per pound in the controlled local market, compared to about 21 cents in the U.S. quota market (1984). In 1985, world price for crude sugar dropped to about three cents per pound.

Tobacco is controlled by two large firms. Both domestic and imported tobacco are used for production of cigars and cigarettes. In 1982, 245 metric tons of manufactured tobacco were imported and 453 metric tons of leaf were exported.

Seven large firms are involved in fruit and vegetable processing. Considerable excess capacity exists, especially for canning. Most of the processing is in canned form for local consumption. In 1982, approximately 4,500 metric tons were exported, almost all in the form of canned banana puree for baby food. A nearly equal amount was imported, half in the form of processed/brined vegetables and the other half as fruit puree and pulp extract for mixing.

TABLE 10
DESCRIPTION OF AGRICULTURAL PROCESSING FIRMS, 1979

Size and Type of Firm	Number of Firms	Number of Employees	Value Added (000 dollars)
Large			
Sugar refining	6	1,801	19,244
Tobacco products	2	457	13,453
Fruit/vegetable canning/processing	7	260	1,077
Medium			
Beverages	29	1,067	24,410
Milk/Milk products	14	1,113	5,983
Meat packing plants	16	1,120	4,693
Oil & fat processors	4	412	2,793
Chocolate & confectionaries	5	131	825
Small			
Bakeries	137	1,953	7,803
Millers	41	881	3,937
Livestock feed	13	236	1,242
Other food products	38	747	5,258
TOTAL	312	10,178	90,718

The beverage industry, both alcoholic and non-alcoholic, produces the greatest value added. It has experienced considerable growth in recent years because of a growing and unrestrained domestic market. Except for rum, beverages are produced for the local market. In 1982, 150 metric tons of rum were exported.

Milk processing is dominated by two firms. Nestle produces canned milk and Estrella Azul supplies most pasteurized milk to Panama City. Imports include milk for infants, and cheese.

The 16 meat packing plants produce fresh and processed meat largely for local market. The three plants that process carcass beef for export were closed for sanitary reasons in 1982. In 1985, one plant (Ganaderos de Chiriqui) reopened under USDA meat import standards and shipped 118,000 pounds of carcass meat to the United States during the first two quarters of that year. USDA records indicate no further shipments through February 1986.

Two of the four oil and fat processors dominate the local market. Nearly all fats and oils are imported, primarily soybean oil for cooking and margarine.

Five confectioner firms produce solely for the local market. High-priced domestic raw sugar is the primary input.

Bakeries comprise the largest number of agro-industrial firms (137), employing nearly 2,000 persons. The firms are small, averaging 14 employees. Bakeries produce solely for the local market and depend totally upon imported grains (mostly wheat) for their flour.

Forty-one small milling plants mill flour for the 137 bakeries and prepare some mixed feed for livestock and poultry. In 1982, 56,000 metric tons of wheat were imported and 41,000 metric tons were milled into flour for bread. The Austin study for the World Bank indicates that 83 storage granaries exist of which 25 are major processors and five are aggressive competitors, primarily in rice milling. The marketing margins allowed by ORP appear to provide considerable windfall profits to the most efficient millers. Data on employment by rice millers were not available and therefore were not included in Table 10.

The small livestock feed firms utilize local and imported grains. In 1981, approximately 20,000 metric tons were imported, primarily for poultry.

The 38 firms classified as "other" are small. They produce a wide variety of products, including extracts, essence, colorings, chocolate powder, sauces, tea and salt. In 1982, imports for this group exceeded exports by three to one. Salt was the major import commodity.

Recent surveys (A.D. Little and Cuervo) with industrial firms indicate that the primary factors limiting expansion are: (1) high unit production costs due to high cost energy (electricity); (2) high cost of imported intermediate products used in processing because of tariffs; (3) high labor costs because of the labor code and lack of skilled labor; (4) lack of markets, both domestic and external; (5) lack of raw materials because of import restrictions; and (6) excessive government price and import/export controls. Training needs most frequently cited were technical skills, management, marketing, supervision, maintenance and quality control.

2. Private Firms Providing Agricultural Inputs

Most of the purchased agricultural inputs used by commercial farmers are imported. In 1981, Panama imported nearly 58 million dollars worth of agricultural inputs. See Annex Table 14. The dominant components were commercial fertilizers (32 percent of value), agricultural chemicals (29 percent), livestock feed (16 percent), tractors and tractor parts (11 percent) and agricultural machinery (10 percent).

In 1983, imports of agricultural inputs dropped by more than 20 million dollars to a level of 37 million dollars. Major reductions took place in fertilizer and feed imports. Chemical pesticide imports increased and account for 50 percent of the total value imported in 1983.

Private firms that are major competitors in providing specific agricultural inputs to farmer producers are listed in Table 11.

Private companies are the major suppliers of externally-generated chemicals, pharmaceuticals, fertilizers and machinery used in production agriculture. Modern poultry technology and some beef and dairy breed improvement have also been imported by private firms for use on commercial farms. Among the inputs identified in Table 11, agricultural credit is one of the most important private sector activities. Private banks accounted for 85 percent (US \$240 million) of total agricultural lending in 1984.

TABLE 11
NUMBER OF PRIVATE FIRMS PROVIDING AGRICULTURAL INPUTS
TO FARMERS, BY TYPE OF INPUT PROVIDED

Type of Input	Number of Major Competing Firms
Equipment/machinery/ agro-chemicals	18
Animal feed	15
Saw wood/lumber	14
Agricultural credit	13
Irrigation pumps	10
Fertilizer	8
Plastic bags/bottles	8
Carton boxes	5
Baby chicks	5
Coffee mills	3
Machinery for processing rice	3
Cement	2

Little information is available on the cost of specific inputs at the farm gate. A cursory analysis of fertilizer, the dominant commercial input, indicates that nitrogen fertilizer is much more expensive in Panama than in the United States. Consequently, fertilizer is a capital resource that Panamanian farmers can only use profitably with high value crops.

Private companies are also the primary distributors of improved seed varieties obtained from sources in the United States, Western Europe and the International Agricultural Research Centers.

A few multinational firms are involved in the generation of agricultural technology. Nestlé has improved the processing and disease resistant qualities of industrial tomatoes. The Chiriqui Land Company is generating and transferring biotechnology for its banana operations. Ralston-Purina is perfecting its shrimp mariculture technology for operations in Panama. Further details are presented in Chapter III.

No information is available on the nature and composition of the fishing and forestry components of agro-industry.

3. Other Private Sector Activities

Agricultural cooperatives are a part of the private sector, but they receive financial support and operate under controls of the state. The agricultural cooperative movement in Panama increased from 31 farmer members in 1972 to 10,000 in 1981. By 1985, the number of cooperatives exceeded 100.

The umbrella national organization is La Federacion de Cooperativas Agropecuarias (COAGRO). Lack of resources and management capability have limited federation growth. COAGRO suffers from cash flow problems as a result of accumulated delinquent accounts receivable and undercapitalization.

The Autonomous Institute of Panamanian Cooperatives (IPACCOOP) provides financial and technical support to cooperatives. IPACCOOP is an autonomous public corporation, staffed with 152 persons. USAID is providing support to cooperative activity.

The private sector is also actively involved in agricultural youth education programs. PANAJURU, a non-profit private voluntary organization, is responsible for the Heifer Project and 4-H clubs (called 4-S in Panama). PANAJURU is supported by USAID and the Kellogg Foundation).

E. Public Sector Activities

1. Agricultural Inputs

The state provides a number of agricultural inputs, including improved seeds, machinery, crop insurance and credit.

Seeds. Four state institutions in Panama conduct adaptive crop research and support the multiplication and distribution of seeds. The four institutions are: Agricultural Research Institute (IDIAP), the University of Panama Faculty of Agronomy (FAUP), the National Seed Corporation (ENASEM), and the National Seed Committee (CNS).

IDIAP and FAUP take genetic seed stock available from external sources and test it in laboratory and field trials for suitability and adaptability to Panama. If suitable seed is registered, ENASEM and private firms manage the multiplication process. (All basic research on crops is conducted outside Panama by International Agricultural Research Centers, major universities, governments and major corporations.)

ENASEM was founded in 1975 as a department within the Ministry of Agricultural Development (MIDA). In 1978, it became a semi-autonomous public corporation. ENASEM has three processing plants, located in Panama, Divisa and Alanje, with a total of 57 employees.

ENASEM produces registered and certified seeds, processes such seed and distributes it to farmers. Private seed companies also market certified seed. CNS maintains quality through inspection of seeds in the field and at processing centers. CNS was established in 1978.

Certified seed production is confined to rice, maize, sorghum, beans and potatoes. ENASEM was formed to serve the rice industry and 90 percent of its seed sales are rice. Altogether, ENASEM supplies about 20 percent of the certified seed for rice, maize, sorghum and beans. Private firms, import traders, mills and commercial producers supply 80 percent. All certified potato rootstock is handled by import traders, mills and commercial producers. Annex Table 23 presents details.

Farmer adoption of certified seeds is low. Most adoptions have been with rice, and then largely by mechanized rice producers. Less than 50 percent of rice seed used is certified. The state has announced closure of ENASEM as a state enterprise.

Machinery. National Agricultural Machinery Enterprise (ENDEMA) was formed in 1978 to provide mechanization for the rice industry. In 1982, the firm had 800 employees and harvested 60 percent of the country's 40,000 hectares of mechanized rice farms. In 1985, the number of employees was reduced to less than 600. ENDEMA has been heavily subsidized. The state has announced closure of ENDEMA as a state enterprise.

Crop Insurance. In 1975, the Agricultural Insurance Institute (ISA) was created to provide insurance against crop failure for specified crops. In 1980, ISA was providing insurance on 140,000 hectares of cropland, about 90 percent of new crop loans insurance. Insurance coverage has expanded to include vehicles and livestock; coverage was about six million dollars in 1982. In 1983, ISA employed 54 persons.

Credit. The state provides agricultural credit through the operation of public sector development banks and through interest rate subsidies to private banks. The development banks are the Agricultural Development Bank (BDA), the National Bank of Panama (BNP) and the Credit Union Bank (FEDPA), a national federation of credit unions. These banks provided 40 million dollars of credit in 1984, about 15 percent of total agricultural credit. Private banks, the predominant credit source, provide 85 percent of all agricultural credit. (In the late 1970s, when emphasis was on increasing production from state enterprise and asentamientos, state credit reached 30 percent of total) Annex Table 43 present details.

BDA was established in 1973 to provide crop finance, development credit and technical assistance to small and medium sized farmers and organized farmer groups. Technical assistance consists of provision of "recommended" farming practices as a condition for loans. MIDA uses BDA to pursue planning objectives by directing resources into what MIDA deems priority areas. Through the 1970s, this meant credit for basic food crops and state enterprises operating in the agricultural sector.

In 1984, BDA's share of total loans to the agricultural sector was less than 10 percent. Loans totalling more than 25 million dollars were made to 5,200 clients (an average of \$4800 per client nearly equally divided between crop and livestock loans). About 90 percent of BDA's loans range from a few hundred to a few thousand dollars. Large loans are made only for livestock, with a limit of 30,000 dollars and 12 year pay back.

Interest rates to farmers have increased over time and currently vary

between 9 and 11 percent. Agricultural cooperatives are currently charged 7 percent; asentamientos are charged 8 to 9 percent; small private farmers are charged 10.25 percent. The variation in interest rates charged is determined by the rate BDA pays to external credit sources (BID, IBRD, USAID, private banks).

Until recently, BDA required a substantial operating subsidy from the central government; through 1982, BDA received more than 31 million dollars in capital contributions. BDA services are provided through 9 regional offices and 32 branch banks, employing 842 persons, 220 of whom are agricultural technical staff.

The National Bank of Panama (BNP) operates as a commercial bank, development bank and government bank. It was established in 1904. In 1983, BNP loaned about 15 million dollars to 1020 clients in the agricultural sector (an average of nearly \$15,000 per client). Of the total, 60 percent was destined for livestock producers, 18 percent for grain production, 9 percent for horticultural crops, 5 percent for hogs, 5 percent for coffee, 2 percent for tree fruits and 1 percent for poultry. In 1984, the agricultural loan portfolio reached 79 million dollars divided among 5500 producers. Interest and pay back terms vary depending upon the terms BNP receives from its creditors.

The Credit Union Bank (FEDPA) provides credit to 105 credit unions, some of which are agricultural. Approximately 142 loans totalling 8.7 million dollars are outstanding. Loans to member cooperatives are currently at 10.5 percent interest. Local cooperatives loan money to individual members at 14 to 15 percent interest.

The state has intervened substantially in the control of interest rates for agriculture. In 1980, legislation established a one percent interest subsidy transfer from non-agricultural loans, to underwrite loan financing in the agricultural sector. This transfer is administered by the National Banking Commission (NEC).

NEC is also authorized to set commercial interest rates. Since April 12, 1985, they have been set at 13.25 percent, a level near the international market rate. NEC sets all agricultural loans with a preferential rate of 10.25 percent, currently three percentage points below the "market" rate. NEC reimburses banks for the three percent difference. The effect of this on private bank lending in agriculture has not been assessed. Data presented in Annex Table 43 suggest that the effect may be positive, to the extent that private banks are supporting already profitable and expanding livestock and fishing activities.

External donors providing major donor loan support for agricultural credit are the World Bank, the Inter-American Development Bank (BID) and the Agency for International Development. The World Bank is providing a 21.7 million dollar loan for livestock improvement. Terms are 10-11 percent interest, a five-year grace period and a 7-12 year pay back. The World Bank is also loaning 19 million dollars for tropical crops (coffee, sugar, bananas, oil palm). Terms are 12-14 percent interest and an 8-13 year pay back period. BID is providing an aquaculture improvement loan of 13.2 million with 14 percent interest rate, three-year grace period and 10 years to repay. BID has

also funded the Agricultural Development Bank to provide short-term credit to small and medium sized producers of crops and livestock. Annex Table 46 presents additional details on all the above-mentioned projects and shows planned expenditures through 1990.

2. Technology Generation and Transfer

Public sector involvement in agricultural technology generation and transfer was initiated in 1928, when the first major effort was made to train "agricultural agents." Today, several institutions carry out the complex activities. The Ministry of Agricultural Development (MIDA) is responsible for numerous functions, including regulation and control, policy development and coordination of administration, research and extension. The Agriculture Research Institute (IDIAP) is responsible for agricultural research. The University of Panama Faculty of Agronomy (FAUP) handles agricultural training at the university level. Other institutions provide vocational training and non-degree short courses.

Ministry of Agricultural Development (MIDA). MIDA is a large and complex organization with numerous public service functions, including regulatory/control, policy, production, management, training, research and advisory services. MIDA's 1985 budget is 24 million dollars, almost four percent of the gross value of agricultural production.

MIDA is responsible for five program areas: (1) agricultural extension (SENEAGRO); (2) plant/animal regulation and sanitation; (3) agrarian reform; (4) natural resources (RENARE); and (5) aquaculture. MIDA is also responsible for seven support service functions, including legal services, sectorial planning, internal audit, public relations, business affairs, finance and institutional development.

In addition, MIDA has eight regional management units and has indirect responsibilities for six semi-autonomous public sector service institutions (IMA, IDIAP, ENDEMA, ENASEM, ISA, EDA) and seven public sector production enterprises (BANANO, BAYANO, CALV, CODEIBO, COBANA, COAPRHA, CITRICOS).

In the late 1970s, MIDA was decentralized. Central offices were moved to the field, with headquarters in Santiago and operational authority was transferred to Regional Directors. The process was not effective and Ministry headquarters returned to Panama City. Regional Directors now have little control. The Minister of Agriculture appoints and has direct authority over the eight Regional Directors (one for each province, excluding Darien and Bocas del Toro). The Regional Directors have responsibility for coordinating administration, research, and extension, but have limited authority and budget.

MIDA is in a stage of transition. It has its fourth minister in two years. All public institutions in the agricultural sector have been officially brought under the Minister's administrative control. An organizational chart for 1984 (see Annex Table 39) shows the interrelationships. Major components of the technology generation and transfer system include DNPS (for sectorial planning), SENEAGRO (for extension) and IDIAP (for agricultural research). These units are to work through the regional directors in reaching farmers.

In June 1985, MIDA had 4,598 employees. Less than 500 were working with farmers in some capacity. Only 200 had technical or vocational training in addition to secondary school training. A total of 107 employees (2.3 percent) had university degrees. Four persons were trained to the M.S. level and one at the Ph.D. level. Fields of specialization are detailed in Annex Table 16.

Extension (SENEAGRO). SENEAGRO is not yet functional. MIDA assumed responsibility (and IDIAP lost responsibility) for agricultural extension in 1984. SENEAGRO was designed as a small policy advisory unit to establish extension policy, train MIDA staff and develop training materials. Plans called for MIDA staff assigned to regional offices to provide extension activities to farmers. But MIDA seems ill-equipped to perform this new role because it has few employees trained in technical agriculture and it has a poor performance record. Continuing controversy in identifying appropriate public sector roles for MIDA and operational jurisdiction for SENEAGRO (between central and regional offices) adds uncertainty.

USAID's Agricultural Technology Transfer Project is testing alternative technology transfer methodologies in Chiriqui, Veraguas, and Los Santos provinces. The objective is to identify cost-effective approaches for disseminating improved technologies. For Project details, see Annex Table 46.

Agricultural Research Institute (IDIAP). IDIAP was founded in 1975 as an autonomous public research institution with its own budget allocation, administration and technical personnel. Prior to 1975, essentially no public agricultural research was carried out in Panama.

IDIAP is controlled through its Board of Directors comprised of the Minister of MIDA, the General Manager of the Agricultural Development Bank (BDA) and the Dean of the University of Panama Faculty of Agronomy. An advisory council provides overall policy coordination and integration of research activities.

IDIAP operates from a central office in Panama City and three regional offices. In the Western Region, IDIAP's main office in David and its eight field stations are responsible for Bocas del Toro and Chiriqui provinces. In the Central Region, the main office in Santiago and eleven field stations are responsible for Veraguas, Cocolé, Los Santos and Herrera provinces. The Eastern Region, with a main office in Panama City and seven field stations, is responsible for Panama, Colon, and Darien provinces and for the San Blas territory.

IDIAP has focussed geographically on the three most populous and important agricultural areas -- Chiriqui and Veraguas Provinces and the Azuero Peninsula. Within these three regions, IDIAP has concentrated on eight priority districts -- adapting and disseminating agricultural technology to small and medium sized farmers. Through a number of organizations, IDIAP obtained significant outside support and enhanced access to externally generated scientific knowledge. Current priorities include program consolidation, staff upgrading, commodity specialization and institutional linking.

Out of a total staff of 461 employees, IDIAP has 168 (36 percent) technical/professional personnel, 132 of whom have degrees (90 B.S., 33 M.S.,

9 Ph.D.). In terms of program emphasis, 50 percent are assigned to crop production, 45 percent to livestock and 5 percent to special problems. Disciplinary skills are concentrated in the physical and biological sciences. The staff includes 18 social scientists, but none is working on farm management and marketing issues. Major fields of specialization are summarized in Annex Table 16.

IDIAP's 1984 expenditures were 2.4 million dollars, two-thirds for operating and one-third for capital expenditures. Considerable outside support is required to meet total budget needs.

Until 1963, program policies focused almost entirely on adaptive research on basic food crops of rice, maize, sorghum and beans. Since then, adaptive research has been expanded to include tomatoes and potatoes. Also, research was initiated to screen and validate new technologies for sorghum, poroto, beans, peppers, squash, cassava, yams, otc, livestock, fruits and vegetables.

IDIAP is the recipient of a USAID-funded project (1979-87) on "Agricultural Technology Development". The project establishes a farming system approach focussed on small farmers and emphasizing applied research at the farm level, rather than station research. For details see Annex Table 46. No mechanism exists for linking IDIAP's research with the SEKEAGRO/MIDA extension program.

The University of Parana Faculty of Agronomy (FAUP). FAUP was established in 1959 to provide university-level agricultural instruction. Major emphasis is on plant and soil sciences. FAUP enrolls about 770 students divided among five divisions: Agronomy (124), Biology (230), Zoology (115), Agricultural Development (49) and Home Economics (201). In 1983, FAUP had 60 faculty members — 44 full-time and 16 part-time appointments. Only two or three are social scientists. At the end of a five-year program, the Ingeniero Agronomo degree is conferred. In 1983, FAUP initiated an M.S. program in entomology.

Research associated with training (agronomic trials and plant breeding) was initiated at Tocumen station in 1962 and has expanded to David in Chiriqui province where the campus was moved in 1978. (The Home Economics Faculty located in Parana City). Facilities and program support were provided by the Inter-American Development Bank, the International Development Research Corporation (IDRC) and USAID. FAUP also owns a farm facility which provides income from the sale of commercial agricultural products.

Internal discussions are nearing completion to restructure the Faculty and change the name to Faculty of Agricultural Sciences. Under the new structure, the Faculty would have a School of Agricultural Development (with departments of farm management and extension), a School of Crop Science (with departments of soils, agricultural engineering, plant protection, agronomy and natural resources) and a School of Animal Science (with departments of veterinary medicine, livestock production and breeding/livestock improvement). FAUP recognizes a need to strengthen animal science, entomology and agricultural economics.

Some research is conducted in association with the instructional program. Until recently, all students were required to prepare a thesis linked with

station research. Graduation rates of 40 percent are low by U.S. standards and are attributed largely to the fifth year thesis requirement.

Through USAID's project on "Education for Rural Development", the options have been expanded to include a work/study program providing actual professional work experiences in agribusiness and government, a field practicum in production of crops and livestock under actual farm conditions, or 200 hours of work as a research assistant with the Faculty. The purpose of the field practicum is to link the university with farmers and to provide hands-on experience to the students, most of whom are from urban areas and have little practical experience with farming.

An agreement exists for collaboration between FAUP and IDIAP. The FAUP Dean is a member of IDIAP's governing board. A number of IDIAP's senior researchers teach part-time at FAUP. No formal joint programs such as joint appointments or joint budget exist.

Vocational Agricultural Training. The National Agricultural Institute (INA) is a public training institute under MIDA jurisdiction. INA facilities, located at Divisa, include a main training center, soils and dairy laboratories, aquaculture facilities, dormitories for 40 students, a milk processing plant, a meat processing plant, 600-700 head of beef cattle and a dairy herd of 200 cows. Nearby is an IDIAP soils laboratory, an ENASEM seed production enterprise, an IDIAP-operated food processing plant and one of four MIDA-run regional training centers.

INA has 25 faculty members, 15 of whom are full-time. Present student enrollment is about 150. The curriculum is a three-year upper cycle program equivalent for the last three years of high school in the United States.

Seven vocational agriculture high schools, supported by the Ministry of Education, are located at Chepo, Los Santos, La Pintada, Baru, Capira, Veraguas and San Blas. The seven schools enroll 400-500 students annually. The curriculum is a three-year lower cycle terminal program in vocational/technical training equivalent to junior high-school in the United States.

3. Pricing Policies

The new agricultural incentive law (March 1986) sets the stage for a freeing of the domestic market from price controls and represents a major shift in direction. Pricing policies have been used extensively since the early 1960s as a means of regulating resource use and income distribution within the rural sector and between rural and urban sectors. Major policy changes are being made in response to the World Bank's structural adjustment program (see chapter IV, section A2). Through the Agricultural Policy Formulation and Management Project, USAID/Panama is assisting the GOP to develop the institutional capacities needed in a free market system. (Project details are presented in Annex Table 46).

Price controls are currently maintained on all important agricultural products consumed domestically, except potatoes and fresh vegetables. (Controls on potatoes were lifted in 1983.) Marketing margins are fixed by the state at all stages of the marketing chain. The principal state agencies involved are Product Commissions established by the Ministry of Agriculture

(MIDA), the Agricultural Marketing Institute (IMA) and the Price Regulation Office (ORP). Prices are negotiated annually with representatives of the large producers, asentamientos and the state corporations, and are based on production cost data estimated by MIDA. Neither the dominant body of small private producers nor consumer groups is represented.

Agricultural Marketing Institute (IMA). IMA was created in 1975 as an autonomous state corporation from the former marketing directorate of MIDA. IMA currently employs 1092 persons, of whom 10 percent are trained to the B.S. level.

IMA establishes annual support prices at the farm level for specified crops. IMA buys surplus production and stores it for later sale. The crops currently include rice, maize, sorghum, beans, onions and coffee. In addition, IMA has a support price on salt, beef and Grade A milk. Support prices for these commodities from 1975 through 1984 are presented in Annex Table 17. IMA administers a chicken processing plant, a modern meat packing plant, the national marketing of hides and skins, and the export control of nearly 45 percent (by value) of all agricultural exports. See Annex Table 19.

IMA is the sole importer of maize, sorghum, beans, onions, potatoes and edible oils and handles their distribution directly or by allocation to private traders. In conjunction with the Price Regulation Office (ORP), IMA controls import quotas for a large number of food products, especially basic foodstuffs. Annex Table 20 identifies imports controlled by IMA for 1983; the controlled imports represent about one-half of all food imports. Annex Table 21 presents the import tariffs imposed on selected food products that were freed from quotas in March 1984.

IMA's farm price support and production purchase program has sustained net losses every year since 1975, with an accumulated loss through 1983 of 27 million dollars. Annex Table 22 shows rice and maize purchases by IMA from 1971 through 1983. Nearly 16 million dollars of loss occurred during IMA's first four years of operation when it purchased more than 100,000 metric tons of rice from producers at high support prices.

Self-sufficiency now exists in rice. Large surpluses were harvested in 1983 and 1984. The surpluses have overtaxed IMA's storage capacity, forcing sale of rice on the world market at substantial financial loss to IMA. By mid 1984, IMA's accumulated rice stocks and those in private granaries totalled 75,000 metric tons, 40 percent of Parama's yearly output. In the second half of 1984, stocks were reduced through concessionary sales to poultry producers.

Prior to 1983, IMA's losses were met by transfers by the central government. Since then, the GOP transfers have been inadequate so IMA has resorted to short-term borrowings from commercial banks, with most of the assets being crop inventory valued at farm support prices. Costa Rica has similar policies on basic food grains and reports similar surplus production problems. Some informal buying of lower-priced Costa Rican rice is occurring in the Paramarian market.

As the sole importer of food products, IMA operates a food import monopoly. In this capacity, IMA buys food products at low world market prices

and, through its fee and margin structure, resells internally at high domestic prices. Corn and sorghum are the dominant food import components. Although IMA has gained significantly from this phase of its operations, the gain has not covered the losses from the farm price support and purchase program. As an institution, IMA has a strong vested self-interest in maintaining import controls because it gains significantly from its import monopoly. Neither producer nor consumer interests are represented in IMA's operation.

The Price Regulation Office (ORP). ORP is a unit of the Ministry of Commerce and Industry (MICI). ORP monitors and controls the price of processed food commodities at the retail/consumer level, especially those found in urban supermarkets, including hams, frozen foods, fresh apples, pears and grapes, and canned and concentrate products. ORP monitors the supply and demand of fruits and vegetables. ORP controls the consumer "ceiling" price of rice, beans, lentils, plantain, onions, yams, beef, chicken, raw milk, eggs and fresh fish. Annex Table 24 presents the consumer prices of selected items that are subject to price control. ORP also has authority to set farm input supply prices. In 1983, ORP employed 329 persons.

The Product Commissions. Product commissions are appointed by MIDA and are dependent on MIDA authority to issue cabinet decrees. Commission members include representatives of influential producer groups, the National Association of Asentamiento Farmers (CONAC), processors, MIDA, IMA, ORP and IDIAP. Currently, they set the "established market" producer prices of approximately 32 agricultural products, using cost of production information developed by MIDA. Annex Tables 35 through 38 present the 1985 cost of production calculations for irrigated rice, semi-mechanized corn, traditional labor-intensive corn and mechanized sorghum.

Product commissions provide a political mechanism that supports the self-interest of a limited number of producer/marketing groups. No consideration appears to be given to the interest of consumers or small and medium-sized farms, or to the benefits of open price in resource allocation.

4. Agricultural Information

Agricultural statistics are collected and reported primarily by the Statistics and Census Directorate (DEC) in the Controller General's Office and the Agricultural Marketing Institute (IMA). A decennial census and a continuous program of area surveys are used to collect information.

DEC conducts the decennial census to obtain an enumeration of agricultural operations, a frame for selecting samples for continuous surveys and a base for projection estimates between censuses. The first census was conducted in 1950; subsequent censuses were in 1961, 1971, 1981.

The current sample design and program for crop and livestock estimates were established in 1971. A dual frame (area and list) probability sampling method is used. One sampling frame consists of land area samples (segments). The second frame is a population list of large operators from the census. Segments are stratified, based on their importance in the production of major grains and livestock. Systematic sampling is used with the largest operations often selected. To avoid duplication between the two frames, large operators are removed from area segments.

Data are collected by personal enumeration, are summarized and expanded separately for the two frames and then combined to provide an estimate for the census universe. All data are computer processed.

The DEC continuous survey provides: (1) production estimates for eight major crops (rice, corn, beans, coffee, sugar cane, tobacco, potatoes and onions) and for cattle, hogs and chickens; (2) stocks and disposition estimates for rice, corn, sorghum, coffee and dairy products and for the slaughter of cattle and hogs in the marketing chain; (3) prices paid by producers for agricultural inputs and prices received by producers for about 30 products sold; (4) wholesale and retail prices on 100 agricultural commodities. Many fruit, vegetable and other crops are not included in the survey because they are not central to the GOP import substitution program. Information on these crops is available only in an aggregated form from the census. Further details of the DEC continuous survey program and area surveys are included in Annex Table 45.

Data are not published on a timely basis. Preliminary 1981 census data became available two years after collection. The final report was published in 1985. With continuous surveys, there is a two or three month lag for crop and livestock data and a one month lag for price data. The reliability of the census as the base for survey estimates is unknown. Collecting information through activity-specific surveys appears very expensive; expansion of surveys to include a wider range of activities in a single enumeration is needed.

Special studies are conducted by IMA, MIPPE, DNPS, IDIAP and other agencies. Included are cost of production estimates, agribusiness activity and external donor participation. No general information on a whole-farm basis is generated. Information concerning the distribution and use of agricultural information is sketchy. Whether publications are available for general use, including use by farmers, is not known. Distribution appears to be very limited. Mass media dissemination of market information is unknown.

III. AGRICULTURAL PRODUCTION, PROFITABILITY AND POTENTIAL

A. Basic Food/Feed Commodities

1. Maize

Maize is the staple crop of Panama, important in the diets of rural subsistence households, but increasingly being replaced by root and tuber crops and rice. Since the 1960s, high support prices have encouraged subsistence farmers to market more maize for livestock (mostly poultry) feed. Since 1975, Agricultural Marketing Institute (IMA) purchases have averaged 12 percent of production.

Maize area planted has declined from a high of 83,000 hectares in 1976 to 76,000 hectares in 1983. Traditional labor-intensive practices dominate. Machine planting occurs on only seven percent of the land. Yields average about one ton per hectare on small farms. Area, production and yield data for 1970 through 1984 are presented in Annex Table 26.

2. Sorghum

Sorghum is produced on approximately 15,000 hectares, primarily for livestock feed. Production is mechanized. IMA buys about 40 percent of the sorghum crop. No statistics are available on sorghum.

3. Cowpeas and Kidney Beans

Cowpeas and kidney beans (porotos) are important in rural subsistence diets, but meats are rapidly replacing them. Attempts to increase production through support price increases have not been successful. Yields have stayed essentially static at about 500 to 600 pounds per hectare. IMA purchases five to ten percent of total annual production and imports up to 60,000 quintales annually. Area, production and yield data are presented in Annex Table 27.

4. Rice

Rice is the dominant domestic grain crop for food consumption. During the early 1970s, high support prices and subsidized inputs encouraged rice hectarage to expand, primarily on the large mechanized farms in Cocolé and Chiriquí provinces. By the mid 1970s, surpluses developed. Since IMA has limited storage capacity, rice area planted declined from a high of 122,000 hectares in 1976 and has now stabilized at approximately 100,000 hectares.

On large farms, yields are approximately 2.4 tons per hectare; on small farms, yields are about 1.0 ton per hectare. In 1984, rice production declined because of unfavorable weather and reductions in area planted. Reduced acreage is a direct response to a 1983 reduction in support prices and the decision by IMA to limit rice purchases to farms that had a rice hectarage of less than 25 hectares and had reduced total hectarage planted by 20 percent. Area, production and yield data are presented in Annex Table 25.

5. Vegetable Oils

Essentially all vegetable oil is imported as crude soybean oil and refined by two plants in Panama City. IMA provides an import license with no restrictions. Marketing margins are controlled by ORP. Retail prices are slightly lower than in the United States.

A palm oil production scheme was initiated in 1979 with World Bank support. The project calls for development of 3,000 hectares of palms and a producers' cooperative processing plant with capacity of 10 tons of fruit per hour. Approximately 2,500 hectares of palms have been planted, but no progress has been made on the processing plant.

6. Milk

Milk production averages about 90 million liters annually. In 1983, imports provided an additional 68 million liters. One firm (Nestle) produces the canned milk and another (Estrella Azul) supplies all Panama City's fresh pasteurized milk and most yogurt and ice cream.

At the farm level, a dual structure of production exists. Around Panama City and Chiriqui, a few dozen purebred dairy herds produce actual or potential grade A milk. On thousands of dual purpose ranches in the central provinces, herds provide industrial grade milk. For small producers, milk is an important source of regular cash income.

7. Potatoes

In Chiriqui province, approximately 200 small highland farmers grow potatoes on 1,000 hectares of land. Major yield increases have occurred. A West German technical and financial assistance program has responsibility for assisting with the development of government technical assistance services for seed procurement, credit, two producer cooperatives and storage facilities.

In March 1983, potatoes became the first and only foodstuff in the domestic market to be freed from government price and supply control. However, a high tariff was imposed on all imported fresh and starchy root vegetables, thus providing a marketing oligopoly for the producer cooperatives.

8. Onions

Onions are produced on about 300 hectares by about 140 growers in the highlands of Chiriqui province and 135 growers in Herrera, Los Santos and Coclé provinces. Onion producers are expanding production throughout the fall rainy season in response to favorable prices and a USAID-supported project which includes research for improving the production and drying of onions during the rainy season.

Onions are supported and stored by IMA for sale during the rainy season when production historically has been low. The 1984 support price was 13.5 cents per pound, 50 percent higher than in 1979. Most of the production is marketed through commercial channels. IMA bought about 30,000 cwt. both in 1981 and 1982 and imported more than 100,000 cwt. in each of those years to supply a portion of the market during the rainy season.

B. Export Commodities

1. Bananas

Bananas have been Panama's most important export commodity for several decades. Since 1970, the export value has ranged from 60 to 70 million dollars annually. Bananas account for about one-fourth the value of all exports and nearly 20 percent of agriculture's share of GDP. From 1970 to 1983, exports ranged from 500,000 to 685,000 metric tons annually. Export trends are presented in Annex Tables 11 and 12. Production is highly commercialized and in recent years has been about one million metric tons per year.

Until 1976, United Fruit (now United Brands) operated 43,000 hectares of banana plantations. At that time, the GOP initiated a banana export tax and United Brands (UB) sold all its lands to the GOP. Since then, UB (now called Chiriqui Land Co.) contracts with private growers and leases land back from state enterprises for production. Chiriqui Land Company production accounts for 75 percent of all banana exports. Yields on Chiriqui managed land are considerably higher than on private and state farms.

Banana production, especially on small farms, is being seriously affected by Black Sigatoka, a fungus. Expensive fungicide is required to provide control.

2. Sugarcane

Most sugarcane production is concentrated in Veraguas, Cocle, Chiriqui and Herrera provinces. Panama's less than ideal climate results in a low cane sugar content that contributes to high refining costs. Consequently, Panama is not in a strong competitive position for sugar production.

In 1984, La Victoria Sugar Corporation harvested 16 thousand hectares and produced 86 thousand metric tons of sugarcane. Approximately 1900 metric tons are produced by the private sector.

During the 1970s when world market prices for sugar were high, the GOP encouraged rapid growth of the sugar industry. The GOP built four sugar mills to process raw sugar for export. Since 1980, when world prices peaked at 30 cents a pound, sugar prices have dropped to a low of 2.5 cents a pound in May 1985. Exports peaked in 1979, at 135 million pounds (one-third of total production). By 1983, the area planted to sugarcane had declined to about 48,000 hectares.

3. Coffee

Chiriqui has about half of the 22,000 hectares devoted to coffee production. Yields are low, averaging 700 pounds per hectare. As a member of the International Coffee Organization (ICO), Panama had an export quota of 8.4 million pounds in 1984. This represents about half of total production; the remaining half is consumed domestically. Almost 90 percent of the export quota is filled by the sale of green beans to the United States. In 1984, 23 private roasters were allocated quotas based on the volume of their domestic purchase. Four roasters were allocated 60 percent of the volume.

In the domestic market, the price of coffee has been fixed at the same price since 1972 (except for premium grade which was decontrolled in 1983). Producers receive one dollar per pound and processors can retail at \$1.26 per pound. Six movement permits are required of roasters to move coffee from Chiriqui to Central markets. The permit system was initiated by the GOP with control by the National Guard to restrict smuggling from Costa Rica. The system is purported to delay market movements and increase processing costs.

4. Cacao

The export development of cacao has received considerable support from external donors. Production is about 800,000 pounds from 1,200 subsistence farmers in the Bocas del Toro/Changuinola area on the Atlantic side. In 1981, private investors built an eight million pound capacity plant near Colon. A World Bank loan is promoting planting of 2,500 hectares of new trees.

World market prices will influence whether strong production expansion occurs in this crop. Factors to overcome are: investment costs of \$9,000 per hectare for planting; a five-year growing period for production to commence; and a fungus (*monilia*) infestation.

5. Livestock

Livestock account for more than one-third of the value of all agricultural production. Major components are beef and milk; other components are eggs, broilers and pork.

Cattle raising exists throughout Panama, with greatest concentration in Chiriqui, Los Santos and Veraguas provinces. More than 80 percent of Panama's cattle are in herds of fewer than 50 head on farms of 10-50 hectares. Approximately 5,000 ranches (15 percent of all ranches) produce both meat and milk with dual purpose cattle. Most cattle are grass fed because grains are supported at high prices and are too costly to serve as livestock feed. Carrying capacity is about one head per hectare. Together, cattle and milk account for about 17 percent (beef - 14 percent; milk - 3 percent) of the total value of agricultural production. Since 1979, official consumer price has been constant at \$.40 per pound and official consumer price has been fixed at \$1.55 per pound. The more desirable cuts of beef cost a fraction of the U.S. equivalent.

From 1970 to 1983 Panama exported 7000 to 30,000 head of beef annually. During 1983, exports have been low because the three firms processing beef for export were closed for sanitary reasons. One plant reopened in 1985 and shipped 118,000 pounds of carcass meat to the U.S. during the first two quarters of 1985. Several firms process carcass beef for domestic markets.

Domestic consumer demand is high. Per capita meat consumption is 54 pounds per person, third only to Argentina and Uruguay. Numerous technologies are available to improve pasture management, but have not been implemented on a widespread basis. Developing grades and standards could provide incentives to produce higher quality beef. Milk production also shows potential for change. Initiating sanitation measures and storing milk in the shade could upgrade milk production.

oiler and egg production have increased rapidly, more than doubling since 1970. Panama is essentially self-sufficient in broilers and eggs, but imports some pork products.

6. Shrimp

Shrimp is the number two export product, second only to bananas. In both 1983 and 1984, the value of shrimp exports exceeded 50 million dollars. Marine catch shrimp is reported to have remained static for several years at 5,000 to 7,000 metric tons annually. This appears to be the biological limit. Mangrove shrimp production and shrimp farming (mariculture) in salt water ponds offers major growth potential.

In 1974, Agromarina, a subsidiary of Ralston-Purina, established a hatchery and 34 hectares of ponds in Aguadulce. Since then, 4,000 to 5,000 hectares of ponds have been built by approximately 12 local companies with expansion potential to about 15,000 Hectares on unused salt flats. About 2,300 hectares of shrimp ponds are now in production. In 1984, farm shrimp accounted for about 20 percent of shrimp exports.

A project of the Inter-American Development Bank (IDB) supports the development of a post-larvae breeding and hatchery station at Punta Chame, to be run by the Aquaculture Directorate of the Ministry of Agricultural Development (MIDA). Several technical requirements for breeding larvae artificially have yet to be resolved. Expansion of mangrove shrimp production through natural propagation does not face a larvae limitation.

7. Tropical Fruit and Horticultural Crops

Panama has appropriate climate and soils for tropical fruit and vegetable production. Significant quantities of both temperate and tropical fruits and vegetables are produced for domestic markets. Horticultural crops (excluding industrial tomatoes) are produced on approximately 2,400 hectares (see Annex Table 8).

Although harvest seasons are countercyclical with those of California and Florida, Panama's exports of tropical fruits and vegetables are small (except for bananas). In 1983, the United States imported 3,000 cwt. of melons. Recently, exports of fruit juices, plantains and some vegetables were initiated. Although the quality was generally good, exporting has not been as profitable as expected because of shipping and marketing practices.

Export demand for horticultural crops and tropical fruits is strong and increasing. Panama has export potential of papaya, mango, pineapple and maracuya. The U.S. processing industry is looking for winter supplies of fresh sweet corn, cauliflower, brussel sprouts, peas and beans. Panama's ability to supply this market has not been assessed. Some non-traditional commodities, such as vanilla, macadamia nuts and cashews may also have potential.

8. Industrial Tomatoes

In Cocolé and Los Santos provinces, tomatoes are produced on irrigated land during the dry seasons. The tomatoes are processed into paste, juice

concentrate, sauces, catsup and whole tomatoes. In 1983, production was nearly 27,000 MT with yields averaging 70,000 pounds per hectare.

The production of industrial tomatoes developed with government support and protection to both producers and the Nestle processing company. IMA has a total ban on tomato imports. Nestle provides technical assistance to the small growers (about 600 with an average of three hectares each). The Agricultural Development Bank (BDA) provides credit. GOP encourages Nestle to pay the growers high prices under specific production quota limits. In 1984, prices were seven or eight cents per pound, compared to three cents per pound in California. Under the current pricing regime, producers have strong interest in quota expansion.

IV. ANALYSIS

A. Economic Policies

Panama's economic policies of the 1970s emphasized: (1) concentration of human and capital resources in the international trade component of the service sector; (2) expansion of public sector investment through major external financing; (3) protection of the industrial and agricultural sectors from external competitive market forces; (4) strict internal market controls for agricultural production and marketing activities. The state provided 80 percent of all new jobs created during the 1970s. Major increases in enrollment in secondary schools and universities reduced pressure on the labor market.

For agriculture and agro-industry, these social and economic reform policies represented a clear demarkation from the historical open-market orientation. The change to heavy government involvement and market control grew out of concern for the growing disparity between rural and urban sector incomes, growing unemployment problems, and increased market concentration in agricultural production and marketing activities.

The agricultural policies of the 1970s emphasized: (1) import substitution to protect against foreign competition and provide self-sufficiency in domestic production of basic food crops; (2) formation of seven public corporations to produce bananas, sugar, and citrus products and to control three major regional development activities; (3) provision of communal land holdings for 5000 landless peasants; (4) extensive development of rural social infrastructure through provision of roads, electricity, water, telephone, primary education and health services; (5) formation of public corporations to provide seed, machinery and crop insurance inputs; (6) formation of an autonomous agricultural research institution; (7) formation of a public regulatory body to control production, distribution and importation of agricultural goods.

For the rural sector, the economic consequences of these policies have been mixed. The impact of infrastructure development has been positive, but import substitution, state production and land reform have had negative effects. Import substitution expanded production acreage of several basic food crops, but stifled market competition and provided no incentives to increase productivity. Enterprises established to carry out direct state production were inefficient, emphasizing social reforms rather than production efficiency and transferring resources from consumers to producers at high public cost. Land reform settlements were intended to slow rural migration, but many units were located on low quality land, provided employment for only a fraction of the labor available, and generated extremely low family income. On the macroeconomic side, terms of trade for agriculture, relative to other sectors, declined rapidly as evidenced by heavy migration of labor and capital from agriculture.

Overall, the economic policies of the 1970s brought a worsening of income distribution between the rural and urban sectors, created a public sector that could not be sustained, and increased the cost of food to consumers. This section analyzes the impact of import substitution policy in depth, discusses proposed changes to a "free" market orientation and examines anticipated market response.

1. Import Substitution

Import substitution policies focused on encouraging production (self-sufficiency) of basic food grains and other selected crops through direct government price controls at producer and retail levels, regulation of import and export activity, and control of marketing activities at all stages of the marketing chain. The purpose was to enhance domestic employment and foster increased domestic production by infant industries that might otherwise be unable to compete against international firms. Commodities protected were rice, corn, beans, sorghum, poultry, potatoes, onions and industrial tomato products.

Import substitution policy increased the production of all the stated commodities except corn and beans. Increased production of rice was substantial. By shielding the domestic market from import of lower-priced food products available on the world market, import substitution policy has encouraged producers with high unit costs to enter the market. Table 12 illustrates the degree of market protection by examining the ratio of producer prices in Panama to those in the United States.

The ratio is calculated using constant agricultural price (1980=100) received in Panama (shown in Annex Table 41) divided by the price received in the United States (shown in Annex Table 42). Ratios in Table 12 show that corn, sorghum, potatoes, tomatoes and broilers receive high levels of price protection. The ratio for rice shows that prices in Panama were competitive in the early 1970s, but increased to a level higher than that in the United States by 1983. Ratios for beef and tobacco show that relative prices for these commodities are lower than in the United States. These two commodities may have a strong comparative advantage potential for Panama in United States and world markets. (High support price for tobacco production in the United States contributes to Panama's advantage in U. S. markets).

TABLE 12
RATIO OF PRODUCER PRICES IN PANAMA
TO PRODUCER PRICES IN THE UNITED STATES,
FOR SELECTED CROPS AND YEARS

Product	1970-73	1975-78	1980-83
Corn	1.95	1.95	2.40
Sorghum	3.24	2.75	2.41
Rice	.71	1.05	1.33
Potatoes	2.24	2.76	3.54
Tomatoes	5.89	5.53	9.04
Tobacco	.61	.60	.78
Beef	.53	.61	.64
Milk	1.39	1.22	1.14
Eggs	-	1.01	1.66
Broilers	-	1.48	2.30

The policy measures used for import substitution have different economic consequences for producers, processors and consumer groups. Consequences are summarized below.

1. Farmer support (floor) prices and consumer ceiling prices on major food commodities create artificial price signals that fail to reflect the relative scarcity or abundance of commodities and fail to reflect changes in consumer tastes and preferences over time. For example, consumers are shifting away from basic food grains and roots/tubers and toward more meat, poultry, fish, milk, fruits and vegetables, as shown in Annex Tables 1 and 18. This increase in consumer demand, with pressure for higher prices, is not reflected in consumer prices.
2. Import subsidies for capital intensive machinery price such technology below its true market value, while Panama's wage laws and labor code price labor above its true market value. In rice production, "cheap" machinery capital and "expensive" labor encouraged extensive adoption of machine technology. Artificially high rice support prices accelerated the adjustment. The consequence was adoption of high cost inappropriate technology, excessive loss of labor from agriculture, inability to attract private capital investment from external sources, and the likelihood of domestic capital being transferred to external sources. Further elaboration of this phenomenon is provided later in this chapter.
3. Where production was profitable, as with rice, high guaranteed prices provided incentives for producers and processors to enter the market. The result in such cases was high cost food borne directly by high food prices and indirectly through government subsidies.
4. Guaranteed prices for producers and processors provided no economic incentive to search for and adopt cost-reducing, output-stimulating technology. Further, it precluded inducement by technology-generating institutions to develop and extend such technology.
5. Import restrictions shielded the domestic market from import of lower-priced food products available on the world market. As a consequence, the relatively expensive production of domestic food was encouraged and high consumer food costs maintained.
6. Export restrictions and exclusive licensing arrangements appear to have discriminated against the sale of some Panamanian products in the international markets. For example, Panama appears to have a comparative advantage in beef, bananas and coffee, but this advantage has been constrained.
7. Government control of imports, exclusive licensing authority and fixed marketing margins in the processing and retail pricing of foods has resulted in monopoly activities by public and private institutions and high food cost to consumers.
8. High cost public industries were created with only modest employment effects. Expansionary wage laws were used to capture a portion of the artificial producer surplus for wage earners.

Limitations of Food Self-Sufficiency Policy. The basic argument in support of import substitution policy is that domestic production of agricultural products, especially basic food crops (rice, corn, beans) must be adequate to meet domestic consumption needs. Review of Panama's agricultural performance shows overall agricultural production to be far in excess of domestic need. Agricultural exports have consistently exceeded \$200 million dollars per year since 1980. In the case of basic food crops, sales of basic food grains indicate a clear and consistent producer surplus. The dominant small farmer produces enough to meet farm family consumption needs and a surplus for sale in local markets. The family consumption component, not recorded in the national account, represents a conservative 270 million dollars (157,000 rural families x 5 members/family x \$1 per day/person value) unreported annual contribution by agriculture to the economy. In addition, non-farm rural dwellers are likely to be producing some non-reported food for home consumption. Malnutrition exists only in isolated areas further indicating that national nutritional needs are met. Panama has more than adequate capacity to meet domestic food needs.

The real question is not whether Panama has food self-sufficiency capacity but rather what should the mix of production be. Market economies allow price signals to reflect relative scarcity between producer supply and consumer demand. In Panama such signals have been distorted by GOP price policies which favored an erroneously perceived need for increased production of basic food crops rather than consumer demand preferences. The consequence is that Panama imports a considerable amount of foodstuffs. Imports have risen from about 50 million dollars annually in 1974 to 100 million dollars in 1984. See Annex Table 18. The increase reflects farmer production responses to the economic policies of the 1970's which are inconsistent with general consumer demand, especially that from the urban sector.

The high income urban sector is willing to pay the economic price, even at higher priced imports, to satiate its taste and preferences for specific commodities. This creates a strong and diverse demand pull. Annex tables 1 and 18 are consistent in showing strong and increasing demand for meat and meat products, fruit and vegetables, refined sugar products, beverages/extracts, prepared sauces and nuts. Meat and meat products are the only category where demand is being met by domestic production. (Policies have not favored meat exportation.) Note further that imports of cereals, largely in a processed/prepared form have increased at a rate slightly higher than annual population growth. The demand for cereals has changed from unprocessed to processed grain products which are not produced in sufficient quantities domestically. Imports would be even higher except for the relative decline in demand for cereals in the diet as tastes and preferences shift to other food and non-food products.

Complete food self-sufficiency for all major food items is rarely a realistic objective for a country. The United States, while generally self-sufficient in food, is a major importer of tropical fruits simply because it is cheaper to import fruits from countries specializing in fruit production than to build expensive artificial tropical environments to produce tropical fruits domestically. Similarly, it is more efficient and profitable for Panama to produce those commodities for which it has a comparative economic advantage and trade these in international markets for commodities that it cannot produce competitively itself.

Limitations of Farm Support Price Policy. Production cost estimates are used as the basis for establishing official farm level support prices. This procedure has been used since the 1960s and continues in force. Operating cost estimates are established for each crop under price support. A normal (typical) yield is used for each crop, based on past production levels. A desired or targeted return to all resources is chosen and included as a legitimate production cost. The support price selected is that price which assures achievement of the targeted level of resource return. The process is expressed in simple equation form as follows:

$$\begin{array}{l} \text{Targeted} \\ \text{Resource} = (\text{Selected Yield}) \quad (\text{Targeted Price}) - \text{Operating Cost} \\ \text{Return} \end{array}$$

Production costs for irrigated rice, semi-mechanized maize, traditional maize and mechanized sorghum are shown in Annex Tables 35, 36 and 38, as examples of the process used.

The support price chosen provides a resource return proxy signal to farmers of the profitability of that crop relative to other crop and livestock enterprises. For rice, the return was so high that it became the most profitable crop to grow. A study by Espinosa for Chiriqui province in 1982 indicated that with a price of 13 dollars/quintal, the return per hectare ranged from \$250 to \$550 per hectare depending on the type of technology used and the type of farm. Such returns for rice are very high by world standards. Many producers, including high cost producers, were encouraged to grow rice. Ultimately, rice surpluses resulted. Where price supports were set low, relative to alternative farm enterprise choices available to farmers, no economic inducement existed to increase production. This appears to be the case with beans and corn.

This support price system provided no incentive to improve economic efficiency through search and adoption of unit cost-reducing technology. In an open market, such incentives exist and farmers are encouraged to adopt cost-reducing technologies and change enterprises in order to be competitive.

Relative efficiency in combining farm resources is masked by using farm price levels based on cost of production estimates. A comparison of semi-mechanized maize (Annex Table 36) and traditional maize (Annex Table 37) illustrates this. Both tables show comparable unit production costs of 10.5 cents per pound. However, their relative resource use is markedly different. With semi-mechanized maize, labor accounts for 11 percent of total cost; with traditional maize, hand labor accounts for 38 percent of total cost. Also, production estimates use standard or "usual" custom rates for purchases of machinery, fertilizer and chemicals. Such costs are arbitrary and do not reflect the wide variety of conditions under which farmers produce crops.

In the calculations, farm operator and family labor are imputed as a cash wage. In reality, they are not; they are a residual return to labor/management. Table 13 looks at the two maize production cases in this context and presents a striking comparison. Subtracting unpaid operator and family labor of \$70 from production cost for semi-mechanized maize gives a resource return of 42 percent. For traditional maize, the calculations show an average return of 93 percent. In addition, because operator and family labor is a residual return to farm resources rather than a cash wage the potential exists to more effectively utilize such labor. A careful look at farm seasonal labor may show opportunities for complementary, supplementary and multiple enterprise activities and for technologies to ease labor constraints at specific times of the year.

TABLE 13
COMPARISON OF RESOURCE RETURN
FOR SEMI-MECHANIZED AND TRADITIONAL MAIZE PRODUCTION

	Maize Production	
	Semi-mechanized	Traditional
Gross income	\$787	\$420
Cash costs (excluding operator labor)	- \$553	- \$217
Return over cash costs	<u>\$234</u>	<u>\$202</u>
Average return to cash resources	$\frac{234}{552} = 42\%$	$\frac{202}{217} = 93\%$

The farm support price system is used by ORP as the basis for establishing consumer ceiling prices. The margin of return for participants in the marketing chain is established by negotiated agreement and added on to the support price in determining the consumer price. See Annex Table 44. This system provides no incentive in the marketing chain to enhance efficiency through cost-reducing technology.

Market Concentration. Import substitution and price stability policies provide extensive protection from import competition and create an ideal environment for monopolies to be established through political influence. Annex Table 40 shows agricultural production and marketing activities where actual or potential market concentration exists. Most market concentration has occurred at the intermediate processing stage of the food chain. Exclusive licensing and pricing mechanisms have been provided to protect infant industries.

Market concentration in agricultural processing and marketing is shared by both private and public sectors. The public sector activities, initiated in

the 1970s, appear to be attempts to exert parallel control in areas not covered by the private sector (and not regulatory constraints against market concentration by the private sector).

The relatively small size of the domestic Panamanian market has been used as a justification for direct market control by the public sector. Limited entry and operations also exist in public sector utilities. Regulations are needed to ensure that both private and public firms serve the public as well as their own profit motivation.

2. Terms of Trade Deterioration - The Macro-Perspective

Panama's economy is unusual in that it does not have a monetary authority nor is there an exchange rate. Thus monetary inflation relative to the dollar does not occur, as the dollar is the medium of exchange. Structural inflation, however, can and does occur. Such inflation is internal but is influenced largely by external forces. The labor policies of the Zone, combined with public sector employment since 1970, have given rise to structural distortions, in the form of windfall rents to the external market oriented service sector. At the same time, industry and agriculture have been highly protected thus prevented from capturing potential internal and externally induced rents. Hence, the terms of trade favored the service sector drawing labor and capital resources away from industry and agriculture. (Harberger, Norton).

The Canal Zone's wage rates increased by 173 percent from 1973 to 1982, while domestic wages increased 99 percent. The consumer price index increased by only 90 percent during the same period. The consequence is that Panama has become a relatively high-cost economy in terms of relative labor costs, and is losing economic opportunities to world competition. Although an exchange rate does not exist explicitly, it does exist implicitly in the sense of the structure of internal prices vs. external prices. The result is a reduced ability to compete in world markets.

An overvalued exchange rate is associated with a high wage rate relative to goods prices, or, a high price of services (non-tradeables) relative to goods (tradeables). This is the case in Panama, and it has operated to the detriment of profit margins in agriculture. Recent studies in other developing countries (Mexico, Colombia, Nigeria) have shown that agriculture is especially sensitive to distortions in the exchange rate; the domestic terms of trade between agriculture and non-agriculture decline (from agriculture's viewpoint) when the exchange rate is overvalued. In Panama, the result is that farm-gate prices have increased more slowly than the producer prices of industrial goods.

Thus, from an international viewpoint, Panama's commodities appear "too high" in cost, while from the domestic producers' viewpoint they appear "too low". Thus, in the absence of cost-reducing and output-increasing technology incentives, producers resist strongly the suggestion of reducing protection rates in the sector.

Remedial measures are conceivable, even though the exchange rate may not be altered explicitly. One measure, partly implemented already, consists of a

set of import tariffs and equivalent export subsidies. To implement this measure more correctly: 1) the tariff and subsidy rates should be made approximately uniform; and 2) their magnitude should be scaled so that it corresponds to target values. The targets for protection need to be established via careful analysis, but as a starting point they may correspond approximately to an estimate of the degree of overvaluation. For these calculations, care should be taken to define import tariffs so that they include the implicit tariffs associated with any remaining import quotas, and export subsidies should be defined net of export taxes.

A second remedial approach to bringing about an implicit devaluation is to adjust domestic prices and wages. Domestic food prices need to rise relative to wages. But both domestic prices and wages need to fall relative to their international values. Over time, this can be achieved by holding domestic prices and wages constant while international prices slowly rise. If prices and wages continue to rise and the external disequilibrium is not corrected, then there is no choice but for the burden of adjustment to be borne by the labor market, in the form of increasing unemployment. That is what has been occurring in Panama.

The situation of Panama indicates why principles of free trade and removal of protection cannot be applied in their pure form, without some modification and supporting policies.

There are two other qualifications to the application of free trade principles in Panama (or in Panamanian agriculture) in the current circumstances. Both these qualifications can be removed, or weakened, by decisive policies.

The first qualification is that the true rates of nominal protection are not what they seem to be, because trade policies are not applied consistently: 1) exceptions have been made to both import quotas and tariffs so that producers cannot be certain of the apparent degree of protection; 2) enforcement of regulations against contraband imports from Costa Rica is irregular; 3) ad hoc export quotas sometimes are imposed on exporters with little warning, disrupting export trading relationships. If Panama is to develop a trade-oriented economy in the goods sector as well as in the service sector, these inconsistencies in trade policies need to be eliminated rigorously, and the plan needs well-established and strictly-observed rules of the game. Examples of importation in excess of quotas and without tariffs have concerned rice and onions; in those cases the imported products were sold cheaply on the domestic market, and at such an inopportune time, that domestic producers' rate of protection was meaningless. Allowing imports on special "Contracts of the Nation", without paying duties, is destructive to any established policy as producer price expectations and risk bearing benefits are destroyed and government credibility weakened. The most notable examples of ad hoc export quotas have occurred in the cases of coffee and beef, and they also have been damaged. The outstanding example of irregular protection rates across goods is the very high rate of protection to sugar, which does not have a comparative advantage in Panama, and therefore that implicit subsidy works in the direction of encouraging resource misallocation.

The second qualification to free trade principles is market concentration which restricts competition. This issue was treated in the previous section.

The long-term solution to the severely deteriorated terms of trade for agriculture is through the development and adoption of output stimulating, cost-reducing and relatively labor-using technology with corresponding elimination of import tariff and export subsidies, a topic treated in the next section.

B. Performance of the Agricultural Sector

The existence of an open and competitive market is a necessary but not sufficient condition for the development of Panama's agricultural sector. Economically viable opportunities to increase production per unit of land, reduce unit production costs and more effectively utilize relatively low-priced labor must be available to farmers on a continuing basis. Such opportunities come from the production and distribution of new production technology which is profitable for farmers to use, emphasizes use of the relatively more abundant and cheaper resources while conserving on the more scarce and costly resources, and which over time results in the decline in real price of food.

Agriculture's contribution to date has come from a very low level of technology use. Production increases to date have come almost entirely from expansion of the land base. This is to say that agricultural policies have treated land as essentially a free good with increased production coming by bringing more land into production. This policy simply extracts the production inherently possible from the natural fertility of the soil. No attempt is made to improve the regenerative capacity of the land. With exception of the Darien, further land expansion is no longer possible.

Most land is highly underutilized, producing far below its productive potential. Repressive agricultural policies of the 1970s have provided scant economic encouragement to generate and adopt yield improving technology. Average agricultural yields are low, even by Central American standards. Corn yields are 58 percent less, sorghum yields 30 percent less and cacao yields 49 percent less than those found elsewhere in Latin America. The use of known off-the-shelf technologies available from outside for transfer into Panama can increase crop yields on productive upland volcanic soils by 3 to 5 times and on lowland soils by 2 to 3 times. Some off-the shelf technology has been transferred by the private sector and adapted to specific circumstances, but no nationwide mechanism for technology generation, testing, adaptation and transfer is in place. Few improved technologies have been adequately tested, adapted and disseminated in Panama. The institutional capacity to generate and transfer economically viable agricultural technologies to Panamanian farmers is weak.

1. Technology Generation and Transfer

Agricultural technology generation and transfer can be characterized worldwide by three distinct phases. These are material, design, and capacity transfer phases. Phase one, material transfer, is the quickest and least expensive phase and the one which all countries choose initially. It simply involves the importation or transfer from other countries of new materials such as seeds, plants, animals, machines and techniques. Material transfer characterizes Panama's state of technology generation/transfer. Material

transfer activities are largely through the private sector with provision of chemicals, pharmaceuticals, fertilizers, machinery and new seed varieties. Local testing and adaptation is neither institutionalized nor systematized with the burden of responsibility resting largely with trial and error testing by individual farmers and marketing entities. Widespread and lasting technology benefits do not occur with the material transfer stage.

The second or design phase is the next progressive step. The design phase involves transfer of designs, such as blueprints and books, and development of an orderly institutional system to test and propagate plant materials and to modify and adapt machinery and tools to meet local resource conditions. Some elements of this phase are institutionalized through both the private and public sectors. In the private sector, systematic testing and adaptation of externally-generated technology is occurring with shrimp, industrial tomatoes, bananas, poultry, and dairy production. Such activities occur where there is adequate risk capital, continuing access to technical knowledge and adequate market potential to justify technology generation/transfer by the private sector. These private sector activities reach less than 5 percent of Panama's farmers, however. This is an important factor in the justification of public sector agricultural research and extension institutions. Public institutions are expected to distribute both the burden of long-term technology development and the benefits from such development over a long period of time to a broader public. Specific elements of public sector technology generation/transfer are analyzed in more detail below.

The third phase, the capacity transfer phase, is the most expensive, but with the highest potential payoff over time. In this phase, internal institutional capacity is developed to generate and test locally-adaptable technology. Panama does not have capacity transfer capability at this time. Furthermore, there are persuasive economic arguments, given Panama's small size, that costly primary research will need to continue from sources external to Panama. The public sector will need to bear the major responsibility for applying or adapting this research as few private firms, other than multinationals, have transfer capabilities. Those that do should be encouraged in areas where their technology base will be useful for the development of Panama's agriculture. Careful guidelines must be laid down to ensure that beneficiaries are clearly defined, gains are distributed and market concentration excesses do not result.

Agricultural Research. Panama's Agricultural Research Institute (IDIAP) is ten years old and has only recently developed a critical mass of scientific skill in specific physical and biological science areas. Initially, the focus was on asentamientos and large farms on six food crops viewed by the Ministry of Agricultural Development (MIDA) as high priority. The effort was directed to less than 10 percent of all farmers. In 1980, USAID initiated the Agricultural Technology Development project to provide support to IDIAP in redirecting and broadening its research activities using a farming systems approach. Since 1983, research plans have expanded to include approximately 20 crop and livestock activities and diversified farms. IDIAP is being evaluated to assess the future scope and direction of its programs.

IDIAP is undergoing the growing pains of a very young research organization. Issues or limitations affecting its performance include the following:

transfer simple technologies, ie technologies which do not carry with them major information/knowledge components for adoption to occur. For more complex technologies, as are emerging in Parama, a formal extension structure is needed to provide relevant and essential information which accompanies the technology to achieve adoption.

2. Agricultural Training

Although primary education is universal in Parama, education beyond that point is limited, especially for the rural population. Few of the 320 secondary schools are in rural areas. Eight agricultural technical schools have a combined enrollment of approximately 700 students, most of whom are from urban areas and have little practical on-farm experience. Rural youth often lack funds for tuition.

The structure of the educational system permits very few rural students to reach the university. The faculty of Agronomy enrolls about 500 students in agriculture, but has only a 40 percent graduation rate.

Anticipated changes to a more open market oriented agriculture require a strengthening of human resources in production economics, farm management, agribusiness management, agricultural marketing, policy and environmental economics. Until 1983, no staff in MIDA, FALP and IDIAP had training and experience in the economics of agriculture. At the present time, training and experience in agricultural economics is limited to three personnel in MIDA, four in FALP and fourteen in IDIAP.

Technical and economic knowledge is needed to assist agro-industry in both domestic and foreign markets. Divestiture of public enterprises will require economic and technical feasibility, training, regulatory and market competition analysis capability by the private sector. Pilot efforts in production, processing, shipping and brokering of crops for export will also require trained personnel.

C. Distributional Issues

Achievements in rural social infrastructure (education, health, electricity, telephone, rural roads) during the 1970's were extensive and felt in nearly all but the most isolated areas. However, agriculture and agro-industry remain ill-prepared technically to increase productivity as discussed in the previous section. Thus, educationally speaking, the rural sector is lacking significantly in its capacity to utilize needed technology development and capture the producer surplus from technology adoption.

Land reform settlements (asentamientos, cooperatives, development corporations) have turned out to be economically, socially and politically disappointing. Many of the units are not economically viable because of low quantity and quality of land, provide employment for only a fraction of the labor time available and generate extremely low family income. While they were intended to slow rural migration to the city through increased income and resource security, such objectives were not achieved. First, reform settlement involved a very small portion of the labor force in the agricultural sector (less than 10,000 farmers). Second, capital and labor resources were attracted into the urban areas by strong economic signals from the service sector. Third, enactment of minimum wage rates coupled with

1. Lack of a clear vision that farmers and agri-business firms are or should be primary clientele groups and that their voice be heard in the direction and focus of technology generation/transfer activities.
2. Research priorities are dominated by political mandate. This should be changed to prioritize research by technical and economic criteria including market potential for which Panama has economic advantage. Areas where high market demand potential exist in domestic and export markets are suggested.
3. Priority research thrusts should be limited to assure that a critical mass of physical, biological and social science researchers are teamed to advance effectively the required research.
4. Very limited institutional capacity exists to conduct economic analysis by IDIAP, MIDA/DNPS and FAUP. Such analysis is fundamental to agricultural policy planning as policies shift from a highly controlled to an open market economy. Economic analysis is also fundamental to the conduct of research and extension activities. Farm management research is just beginning. It needs to include farm level enterprise and whole farm analysis to (1) assess the relative opportunity costs within and among farm enterprises; (2) determine activities with greater comparative advantage; (3) evaluate resource use constraints during the year; (4) assess the economic payoff of technology interventions through economic performance criteria to expedite the screening and validation of new technologies. Additional farm level research must include assessment of the economic efficiency of alternative input mixes (land labor, capital and management) and to identify adaptive technology that are output stimulating, cost reducing and labor using in their impact. No Agricultural marketing analysis has yet been done nor is there yet institutional capacity to do so. This is a major deficiency as market rules, regulations, import and export regulations, market structures and information on export markets all require major marketing analysis.
5. Research and extension activities are not linked. This is unfortunate as the successful extension programs world-wide are those which are linked directly to research activity, ie technology generation and transfer are viewed, administered and institutionalized as joint and co-equal activities.

Agricultural Extension. The reorganization of MIDA in 1984 removed the mandate of IDIAP to conduct extension activities. In its place was formed a new unit within MIDA called the National Agricultural Extension Service (SENEAGRO) to conduct all agricultural technology transfer activities. SENEAGRO was intended to be a small unit that established extension policy, trained MIDA staff and developed training materials. It has essentially no technical staff and faces continuing budget and jurisdictional controversy between central and regional offices. To date SENEAGRO has not been functional. Consequently no public sector technology transfer mechanism exists to link research with the farmer user. Experience from the third world countries demonstrate that formal extension activities are not required to

repressive market controls in agriculture simply did not provide terms of trade which fostered increased productivity of labor resources in agriculture necessary for labor retention.

The consequence of existing policies, from an income distribution standpoint, shows a decided worsening of income earnings for those who chose to stay in agriculture. See Annex Table 47.

In the employed labor force, wage earnings in agriculture are approximately half the monthly average wage of \$317. For the traditional component of agriculture, comprising two-thirds of all agriculture, the average monthly wage rate is about \$140 or 44 percent of the average. Direct hired farmer labor is about \$125/month (\$5/day or 50 cents/hour) or 40 percent of the average. While agricultural wages are low relative to wage earnings in the rest of Panama, they are high relative to other Central American countries which produce similar agricultural commodities. Wage rates there are about \$2 per day or 40 percent of the farm level wage in Panama.

With exception of Guatemala, Panama has a higher percentage of its farmers as traditional farmers (65 percent) which receive no wage for themselves or their family members. Table 14 shows this situation. It is this resource which clearly is operating at the margin, largely has been untapped and carries positive income distribution effects if mobilized.

TABLE 14
Labor Force Segmentation and Distribution of Economically Active Population as a Percent of Total Employment, 1970 and 1980

<u>COMPONENT</u>	<u>1970</u>	<u>1980</u>
Labor Force Segmentation		
Non-Agriculture	59	69
Modern <u>1/</u>	49	61
Informal <u>2/</u>	10	8
Agriculture	41	31
Modern <u>1/</u>	9	11
Informal <u>2/</u>	32	20
	<u>100</u>	<u>100</u>
Distribution of Economically Active Population		
Agriculture	40	31
Industry	9	11
Commerce	11	13
Services	28	32
Other	12	13
Total Work Force Salaried		57

1/ The modern sector is comprised of workers receiving specified wage or salary remuneration.

2/ The informal sector is comprised of workers who are self-employed and unpaid family members.

SOURCE: Programa Regional del Empleo para America Latina y el Caribe (PREALC). Cambio y Polarización Ocupacional En Centroamerica, 1986. (International Labor Organization).

As a resource, farm operator and family labor is underutilized (as evidenced by low returns in agriculture) and low cost (receive only the residual producer surplus) relative to other resources.

To effectively utilize this resource and provide a producer surplus which benefits increased labor productivity, major emphasis upon yield enhancing technology for agriculture is necessary. As a further condition it will also require that such technology be relatively labor using and capital saving in nature.

D. Natural Resources Management

Panama's natural resource base is limited. Since few lands remain for agricultural colonization, agriculture will have to increase yields through intensification measures. At the same time, competition for existing resources, common property (third-party) conflicts and environmental degradation are increasing. Clear signals are needed to define how resources are to be used and conserved. Institutional mechanisms which do not exist must be established to implement and enforce resource policies that meet desired social goals. Such goals are not yet well defined in Panama. Preoccupation is with acceleration of economic activity for immediate or short-term gain to meet rapidly rising aspiration levels and external pressures for a more open market economy. Public concern for quality of life issues is little noted.

Panama has little capacity to identify and address environmental issues. FENARE was established in 1973 as a functional unit of MIDA, to manage and direct use of Panama's publically-owned natural resources. Significant funding for institutional development became available in 1980, after the funding of the USAID Watershed Management Project. USAID's Natural Resources Management Project is helping Panama to improve land use and to develop and implement policies to appropriately manage natural resources. FENARE has made considerable progress in hiring and training field staff, setting up forest guard stations, delineating boundaries of forest preserves, establishing nurseries and initiating a reforestation program.

Planned activity for FENARE represents largely a containment policy of identifying, demarking and protecting public lands before private encroachment destroys them. The intent is largely a holding action until society decides how to use such lands. No institutional capacity is in place or is planned to answer the "how" to question. This will require assessing technical, physical, environmental, social and economic factors affecting current or future resource use, estimate the magnitude of affects, identify alternative policy measures, assess requirements for policy implementation and make recommendations for policy action. Special interest politization serves today as the only alternative.

E. Recent and Proposed Changes to "Free" Market

In 1983, the GOP agreed to reduce government spending and bring its fiscal

crisis under control, in accordance with an initial structural adjustment loan (SAL I) from the World Bank. Conditions for receiving the loan included an agreement to establish policies that would: (1) enhance market competition; (2) reduce the public sector role to supporting functions; (3) deregulate prices; (4) eliminate direct production activities by the state; and (5) provide assurances of policy continuity by the state to encourage private investment.

In compliance with SAL I, the GOP closed the state-owned Felipillo Sugar Mill, removed domestic farm support and consumer ceiling prices on potatoes, removed the consumer ceiling price on first quality coffee, changed from import quotas to tariff protection for 25 food commodities (See Annex Table 21), introduced a less costly grade of pasteurized milk (to give small producers better access to market), reduced the producers' support price of rice from 14 cents to 13 cents a pound and restricted production credit for rice to the more efficient farms. The 13 cents price for rice growers was initiated for the 1984 season. The structure for accommodating Grade B milk in the market is not yet in place.

Overall, the measures taken by the GOP in response to SAL I were minimal. Farm price supports were removed on one crop and reduced one cent on another. Eight other crops under farm price support were untouched. The one cent price reduction on rice still leaves domestic rice prices three to four cents per pound above world market prices. Consumer price ceilings were removed on two of eleven major food commodities. Import restrictions were changed from quotas to tariffs on the 25 food commodities subject to import substitution policy. In most cases, the current rates are more protectionist than the earlier quotas. The Office of Price Regulation (ORP) continued to fix ceiling prices on consumer food products and farm input supplies (creating uncertainty for industry), and provide for greater levels of subsidized farm and agribusiness credit without specifying who pays the cost.

In May 1985, a second structural adjustment loan (SAL II) was negotiated with the World Bank. Disagreements over the proposed policies led the Assembly to reject the terms of SAL II in September 1985. In October, President Barletta was replaced by Vice-President Delvalle. The rejection of SAL II, while not extracting Panama from its fiscal crisis, bought time for the government to develop a working coalition among political parties and reformulate policy.

In March 1986, the Assembly passed three incentive laws: The Labor, Industrial and the Agricultural Incentive Laws. The Agricultural Incentive Law set the stage for freeing of the domestic market from price controls and for a reduction in the barriers protecting Panamanian agriculture from foreign competition. Operational components are being developed through MIDA's first ever 5 Year Plan. A draft Plan is under review and public dialogue. Final revision and approval by The Assembly is expected in the fall.

In August 1986, terms of a new and agreed upon structural adjustment loan (SAL II) from the World Bank were made public. Many of the deregulatory components for agriculture are similar to those proposed in SAL I. However, the 1986 terms move Panama further towards an open competitive economy. The 1986 terms directly applicable to agriculture are:

1. Rice. Eliminate price controls and reduce the import duty to \$18.00 per cwt. and later to \$14.00 per cwt.
2. Maize. End government price support for production, eliminate import quotas to allow free importation with a duty of \$5.10 per cwt. that will be reduced to \$4.20 per cwt. at a later date.
3. Sorghum. Suspend government purchases, eliminate the import quota, reduce the import tariff to \$4.80 per cwt. that later will be reduced to \$4.20 per cwt.
4. Onions. Suspend government purchases, eliminate import quotas, establish a tariff of \$4.00 per cwt.
5. Beans. Suspend government purchases and establish an ad-valorem tariff of 20 percent
6. Salt. Suspend purchasing by official entities and liquidate government inventories; terminate GOP production subsidies and market activities, including EDA and ENP financing of salt inventories.
7. Beef. End export quotas and eliminate price controls on all cuts of beef. In addition, the GOP will help the livestock industry to establish a grading system for beef.
8. Eliminate consumer price controls on the following products: rice, sugar, coffee, beef, pork, chicken, live animals, prepared cereals, flour, juices, fresh and dry vegetables, maize, butter, margarine, mayonnaise, honey, fish, cheese, salt, canned tomatoes, yogurt and later to remove price controls on edible oils, eggs and milk.
9. End IMA purchasing in domestic and foreign markets and restrict IMA activities to the warehousing of products, the distribution of price and market information and the establishment of quality standards. IMA market interventions will occur only in exceptional circumstances, ie national emergency. IMA will no longer maintain product inventories, receive transfers of capital from the National Treasury; nor increase net borrowings. The system of crop pledging will be abandoned. With the exception of commodities that remain subject to quotas, IMA will permit the unrestricted import of all commodities, subject to specified tariffs levels.
10. The GOP will refrain from increasing import tariffs or establishing new import quotas. Regulations adopted by the Ministry of Commerce and Industry to protect domestic industry against dumping will also be applied toward agricultural enterprises.
11. The GOP will sell the Las Cabras Sugarmill, The Alanje Sugarmill, CITRICOS and ENDEMA and will reduce the number of public sector employees by 2 percent in 1986. Further divestitures are anticipated among the state enterprises, several of which are in the agricultural sector.

Several actions have been taken by the GOP in response to the SAL II agreement.

The GOP announced the planned sale of four public sector enterprises—The Las Cabras Sugarmill, ENDEMA (agricultural machinery), The Contadora hotel and Aeroperlas, (an airline); transfer of ENASEM to IDIAP; and rental for one year of the IMA silos.

The GOP announced by resolution from ORP, during June and July 1986, the freeing of consumer prices on the following products: rice, sugar, coffee, pork, chicken, prepared cereals, flour, juices, fresh vegetables, corn, butter, margarine, mayonnaise, fresh fish, sardines, cheese, salt, canned tomatoes, lard, dried beans and pulses and evaporated/pasteurized/baby/powdered milk. No public pronouncement of this act has yet been made however. Consumer price controls on vinegar, honey and yogurt were lifted in 1984. Additionally the GOP announced lifting of the export quotas on beef and elimination of import quotas on butter, margarine, onions, lentiles, dyes and tints, beans, whole corn, sorghum, rice and tallow.

The GOP also officially announced a time phased schedule for reducing tariffs in five equal segments. The first reductions on numerous agricultural products took place August 1, 1986. Subsequent reductions are scheduled for November 1987, February 1989, May 1990 and August 1991. Complete schedule of tariff reduction by product is shown in Annex Table 48.

As of the end of August 1986, the GOP had not announced publically the reduction or elimination on any producer price support on agricultural products.

F. Anticipated Market Response

There is general agreement that a major reorientation in agricultural policy is needed for Panama to tap the production potential of its agricultural sector. Farmers the world over will change rapidly if there is economic incentive to do so. That Panamanian farmers will change is clearly demonstrated in the portions of the market that are relatively free from price and competition controls — shrimp, industrial tomato and fresh fruit and vegetable production.

Implementation of the terms of SAL II will begin to free the market and will allow marketprice signals to reflect market supply conditions by producers and market demand conditions by consumers if the market is allowed to remain competitive. The return to an open and competitive domestic market with gradual increased international competition is expected to produce a number of economic changes. They are enumerated below.

1. Rice is domestically priced 40-50 percent above world market prices. Open market pricing will reduce the price to a level near the world price. In response, high cost producers will shift to other crops and production of rice will be reduced. More efficient producers will seek alternative means to increase profits, primarily unit cost reducing technology. As a result, yields per hectare will increase over time causing the retail price of rice to decline. Consumer purchasing power will increase as less income is required to purchase a given quantity of rice for family needs. This economic issue of increased consumer purchasing power is fundamental as it serves as an important alternative to increased wage rates.
2. Maize and sorghum are basic food crops declining in relative importance as consumers shift to increased bread (from imported wheat) and meat consumption. While the domestic price of maize and sorghum is nearly 2.5 times the world price, farmers have not responded with increased production apparently because other crops are more profitable to grow. Open market pricing would reduce the market price substantially of maize and sorghum as food grains and lead to their use as feed crops for livestock. In the short term, the major demand for such feed grains will be from hog, broiler and egg producers because their products have strong consumer demand. Feed costs are a dominant cost component of these products. Reduced price of feed will increase production initially and later, lead to lower consumer prices for these products.
3. The domestic market currently prices beef considerably below the international market price. A freeing of beef prices will bring an initial price increase to the world price level (with adjustments for quality and freight rates). Access to the international market and a price incentive will increase beef production and encourage improvements in production efficiency. A short-term result will be some shift by high income consumers from beef to chicken and eggs. In the long term, higher incomes will generate greater demand for red meats. Low-income wage earners will experience minimal consumer effects as their diets are dominated by basic food grains.
4. Initially, a freeing of consumer prices will bring increases in price of foods having strong consumer preferences and for which domestic supplies are not adequate. This is expected to include milk and milk products, fish/crustacean/mollusks, and some fruits and vegetables such as onions. Production shifts and processing improvements will favor these commodities. Since farm production of these commodities is labor and land use intensive, employment and technology generation/adoption activities will be enhanced. These effects are already occurring with potatoes, a crop that was freed from producer and consumer price controls in 1982.
5. Over time, the relative price of food will gradually decline as production responds to consumer demand. In effect, this amounts to an increase in "real" income, without a direct manipulation of wages.
6. Production increases will occur more rapidly for crop/livestock enterprises having strong consumer demand "pull" in domestic and international markets and higher comparative advantage: (a) shrimp farming (mariculture) for export; (b) cattle production on the poorer quality foothill lands to provide

milk for domestic markets and beef for both domestic and export markets; (c) temperate zone fruit and vegetable crops for export into U.S. winter markets; and (d) continuous tropical fruit and vegetable production in the central provinces for both domestic and export markets.

7. Productivity and competition will be stimulated by the divestiture of inefficient subsidized state enterprises. Many of these public corporations are operating in areas where private enterprise could flourish.

8. An open market orientation will greatly reduce the need for state production and market control activities, but will increase the need for regulatory and market information activities. Regulatory needs include the establishment of product quality grades and standards, health and safety standards in use of chemicals and other dangerous activities, market power (monopoly) limitations and resolution of common property conflicts.

V. CONCLUSIONS

A. Agricultural Sector Performance is Low

1. Production increases to date have come from land expansion, an alternative no longer available.
2. Crop yields are low, even by Central American standards.
3. Introduction and adoption of yield increasing (land intensification) technology has been very limited.
4. Institutionalization of technology generation/transfer processes is in infancy.
5. Agricultural policies of the 1970's did not encourage productivity increases. Rather, costly and inefficient state production, protected domestic production from competitive market forces, distorted input markets favoring inappropriate capital intensive technology, strict market controls which eliminated market supply and demand signals and market power concentration through political means all served to constrain production and limit windfall rents to a few.
6. Low productivity in agriculture and high rents in the service sector, induced by external markets forces and massive government spending, attracted heavy out flow of labor and capital resource from the rural to the urban sector during the 1970's.
7. The income gap between agriculture and the rest of the economy widened during the 1970's.

B. Agricultural Potential Is Rich

1. Yield increasing (land intensification) potential is high but has been tapped only to a very limited degree in banana, industrial tomato, poultry and dairy production. While historic production levels have been low they have been more than adequate to meet domestic demand. Much of future production increases will have to be for external markets, as is a substantial portion already.
2. Transfer and adaptation of known and available off-the-shelf technology is capable of increasing crop yields by 3 to 5 times on upland soils and 2 to 3 times on lowland soils. This is especially so for high income and land/labor intensive fruit/vegetable crops which have strong domestic and international demand. Natural mangrove and artificial salt pond production of shrimp have major production potential which could be expanded significantly on unused tidal lands. The livestock sub-sector has current capacity to export 20,000 head which is not being tapped.

3. Major institutional strengthening of technology generation/transfer processes, largely in the public sector, will be required as a necessary condition to utilize technology potential. Refocusing of research priorities, establishment of an operational technology transfer (extension) component having direct and permanent linkage with farmer/agro-industry clientele and intensification of agricultural training at farm, vocational, technical and professional levels are necessary elements. Special emphasis upon economic training is essential.
4. The existence of an open and competitive market is a necessary condition for the activation of agricultural potential and spreading the benefits of development to a broader public. Movement in this direction will not be endorsed universally. Those who have benefited from existing policies also have strong political influence. Establishment of carefully designed open-market "operating rules" will be required to move economic decisions from the political arena to the marketplace without simply changing the location of economic power.
5. Beginning with the late 1970's a downturn in world markets but with high and relatively rigid wages of the service sector reduced its ability to compete in world markets. Reduction of prices and wages in Panama, relative to their international values, is necessary to regain such markets without increased unemployment.

Tapping of agriculture potential can have important macro-economic implications which tilt the terms of trade toward agriculture thus stemming the flow of labor and attracting capital resources. As increased income to the dominant private farmers will be in earnings rather than wages, upward pressure upon wage increases will be minimized.

6. Over time as income increasing benefits accrue to agriculture from improved technology they will be expressed as higher returns to land. As this occurs, the need for a more efficient and definitive land titling system than exists will be required so that those who farm such land capture such benefits.

The Natural Resource Base is limited, fragile, and Subjected to Increasing Use Pressures

1. Competition for existing resources, common property conflicts and environmental degradation are increasing.
2. Public lands encroachment and traditional land expansion practices continues.
3. Institutionalization of a public lands containment policy is being implemented. Land use policy is in infancy.

VI. RECOMMENDATIONS

This assessment of Panama's agricultural resources, production, infrastructure and institutions draws three major recommendations. First, to tap the production potential of its agricultural sector, Panama needs to undertake a major reorientation in agricultural policy to develop a free market system. Second, to increase agricultural productivity, Panama needs to invest in technology generation and transfer activities and in a strengthening of human resources in agriculture. Third, to protect Panama's natural resource base, actions are needed to develop the institutional capacity to manage the use and conservation of natural resources. Specific recommendations in each area follow.

Agricultural Policy Development

1. Free first from internal and external market controls those crop and livestock activities which can be identified as having greatest potential for operating competitively in domestic and export markets. It is suggested that commodities which meet the criteria of having strong income induced demand in domestic and international markets and are labor and biological resources use intensive have the greatest potential. Fruit/vegetable, shrimp and livestock production appear to meet those criteria and deserve serious evaluation.
2. Conduct major policy studies to measure the economic effects of "freeing" the market (from support prices at the producer level, ceiling prices at the consumer level, import/export controls and tariffs, licensing agreements) and the requirements for generating competitive capacity. A special component must be the rate and extent to which tariff barriers are reduced over time as offset for economic gains made from improved competitive production capacity through adoption of cost and price reducing technology.
3. Develop carefully designed and clearly specified "operating rules" for the conduct of an open and competitive market for agriculture and industry to reduce political and economic power influences which limit benefits to a narrow public. Market rules for conduct of the state enterprise divestiture process and limits to market power concentration are special cases requiring attention..
4. Strengthen the information generation and distribution system for farmers, market groups, policy makers and political decisions makers.
5. Assess ways to internalize public costs (schools, roads, health services, natural resource uses, land use and environmental controls) so that beneficiaries of public goods at local levels become responsible for bearing a portion of the costs. Mechanisms for transferring responsibility and budgets from the central government to greater local control should be part of such agreement.

B. Technology Generation and Transfer

1. Strengthen public sector activities in technology generation and transfer, with major focus on small/medium farmers producing for both domestic and external markets. Develop the public sector capacity to screen and validate technologies on a continuing basis at the farm level and with active feedback from farmer and agro-industry clientele groups.
2. Redirect research toward technology which is relatively more labor/biological using and less capital and land using.
3. Redirect public sector research and initiate private sector research in agricultural marketing for both domestic and export markets. Strengthen capacity of both sectors to identify and evaluate domestic and export market potentials, barriers to entry, technical requirements and linkage requirements from producer to consumer.
4. Support export promotion and financing activities for agroindustry.
5. Develop public sector economic research capacity at the farm level to:
(a) identify comparative advantage opportunities in domestic and international markets; (b) assess relative opportunity costs in diversified farm enterprises; (c) farm resource utilization to assess potential for intensification.
6. Provide high school, university and adult education training to strengthen the social capacity to understand and conduct business in an open market economy.
7. Expand the capacity to train personnel in agroindustry, extension, research and public sector agencies. Economic skills needed in agriculture are: production economics, farm management, agricultural marketing, international economics and marine economics.

C. Natural Resources Management

1. Strengthen public programs that conserve and manage public lands.
2. Promote private sector investment in the managed development of natural resources on private lands.
3. Develop the institutional capacity to manage public and private natural resources through sound policy and implementation activities.
4. Promote public awareness of emerging environmental issues and participation in natural resource conservation and management.
5. Initiate policy dialogue on economic measures for resolving private and social conflict in land use causing soil erosion and resource degradation.

CHAPTER I. BACKGROUND

- Aldenman, Harold. "The Effort of Income and Food Price changes on the Acquisition of Food by Low Income Households". IFPRM, March 1985.
- American University. Panama, A Country Study. Area Handbook Series. U.S. Government Printing Office. 1981.
- Atlee, Charles B. "Final Report on Vegetable Production in Chiriqui" AIT Project, September 1985.
- Banco Interamericano de Desarrollo. Informe Económico de Panamá. Diciembre 1984.
- Cunningham, Charles G. et. al. "Earth and Water Resources and Hazards in Central America". U.S. Dept. of Interior Geological Survey Circular 925, 1984.
- D'Croz Luis and Juan Del Rosario. "Assessment of the Population of Fish and Shrimp Larvae in the Mangrove Swamps of Chame and Aguadulce, Republic of Panama". February 1985.
- Dirección de Estadística y Censo, Contraloría General. "Panamá en Cifras Años 1980-1984". (Marzo 1986).
- Dirección de Estadística y Censo, Contraloría General. "Situación Económica Hoja de Balance de Alimentos: Años 1979-1982". Sección 352, Consumo. Estadística Panameña. (Febrero 1984).
- Dirección de Estadística y Censo, Contraloría General. "Situación Cultural Educación: Año 1983", Sección 511, Educación, Estadística Panameña. (Abril 1985).
- EPAL/UN. "Estudio Económico de América Latina, Panamá 1982".
- Franklin, David, Marielouise Harrell and Cutberto Pavillon. "Nutritional Functional Classification Study of Panama". Food Policy, pp. 63-74, Feb. 1985.
- Franklin, David, Eric Shearer and G. Arcia. "The Consumption Effects of Agricultural Policies in Panama". RTI. North Carolina, Jan. 1984.
- Heckadon Moreno, Stanley. Quando se Acaban Los Montes. Impretex, S. A. 1983.
- Heckadon Moreno, Stanley y Jaime Espinosa González, Editores. Agonía de la Naturaleza. Impretex, S. A. 1985.
- Heckadon Moreno, Stanley y Alberto McKay, Editores. Colonización y Destrucción de Bosques en Panamá. Impretex, S. A. 1984.
- Hintermeister, Alberto. "Panama: Estabilidad del Empleo Agrícola". PREALC, Oficina Internacional del Trabajo, 1986.

- International Institute for Environment and Development (IIED). "Natural Resources and Economic Development in Central America, a Regional Environmental Profile". February 1985.
- International Labor Organization. Regional Employment Programme for Latin America and the Caribbean (PREALC). Employment in Latin America. 1978. Praeger Press.
- International Monetary Fund (IMF). "Panama - Staff Report for the 1985 article IV Consultation and Request for a Stand - by Arrangement". June 17, 1985.
- Inforpress Centroamericana. "Pasos Generales de la Evolución Reciente de la Economía Panameña". 4 de julio de 1985.
- ISTI, Inc. "Panama, Perfil Ambiental del País: Un Estudio de Campo". 1980.
- Jones, Emil. "Forest Resource Policy Issues". Funded by UN for MIDA/RENARE. Nov. 1984.
- Lebrija, Eduardo et. al. "Proyecto del Plan Nacional de Desarrollo Forestal de Panamá (Parte II)", Documento de Trabajo No. 13, Fundado por MIDA/RENARE/FAO.
- Looney, Robert. "The Economic Development of Panama; the Impact of World Inflation on an Open Economy" 1976.
- Oficina Internacional del Trabajo (OIT), PREALC. "Panama: Segmentación del Mercado de Trabajo - Información Estadística Básica". 1984.
- Oficina Internacional del Trabajo (OIT), PREALC. "Panamá: Situación y Perspectivas del Empleo Femenino". Marzo 1984.
- Oficina Internacional del Trabajo (OIT), PREALC. "Producción de Alimentos Básicos y Empleo en el Istmo Centroamericano". 1983
- Oficina Internacional del Trabajo (OIT), PREALC. "Programas Especiales de Empleo en Panamá, 1978-1984". June 1985.
- Oficina Internacional del Trabajo (OIT), PREALC. "Reseña de los Documentos Publicados por el PREALC Sobre El Empleo en Panamá, 1978-84". Noviembre 1984.
- USAID/Panama. "CDSS Strategy Statement for FY 1986".
- U.S. Embassy/Panama. "Panama Economic Report", May 1985.
- World Bank. World Development Report 1983.

CHAPTER II. STRUCTURE OF AGRICULTURAL SECTOR

- Arthur D. Little International, Inc., "Estudio Integral del Sector Industrial de Panamá; Tomo 1. "La Estrategia de Desarrollo Industrial", Informe Preparado por el Ministerio de Comercio e Industrias. Febrero de 1984.
- Austin James, Eric Shearer and David Flood. "Structural Adjustment in the Agricultural Sector of Panama". Prepared for the World Bank. April 1984.
- Banco Interamericano de Desarrollo. Informe Sobre el Sector Agropecuario de Panamá. Enero de 1982.
- Chapman, Guillermo O., Jr. "Papel del Sector Agropecuario en el Futuro Económico de Panamá".
- Comisión de Reforma Agraria. "Uso de la Información Producida por el Catastro Rural de Tierras y Aguas". Septiembre 1966.
- CPIA/IDIAP "Directorio de Unidades de Información Agrícola en Panamá". Octubre 1981.
- Cuarvo, Amalia G. "The Panama Survey of Employer-Based Training: Summary of Findings". S & T/Office of Education, USAID. 1985.
- Departamento de Planificación, Dirección General de Planificación y Administración. "Estudios Sectoriales: Sector Agropecuario, Diagnóstico 1960 - 1968. 3 Volúmenes. Junio 1970.
- Díez, Rafael. "Report of Program Management". AET Associates. March 1984.
- Dirección de Estadísticas y Censo, Contraloría General. Censos Nacionales de 1980, Cuarto Censo Nacional Agropecuario. Mayo 1981.
- Dirección de Estadística y Censo, Contraloría General. Panamá en Cifras, Años 1980 - 1984. (Marzo 1986).
- Dirección de Estadística y Censo, Contraloría General. Estadística Panameña:
- Sección 221 - Movimiento de Población.
 - "Situación Demográfica, Estadísticas Vitales: Año 1982". (Marzo 1985).
 - Secciones 321, 323, 324, 325, 314 - Industria.
 - "Situación Económica, Industria: Año 1983". (Diciembre 1984).
 - Sección 342 - Cuentas Nacionales
 - "Situación Económica, Cuentas Nacionales: Años 1980 - 82" (Junio 1984)
 - Secciones 343, 344 - Finanzas Públicas, Banca, Seguros y Registro Mercantil.
 - "Situación Económica, Hacienda Pública y Finanzas: Año 1983" (Febrero 1985).

Sección 351 - Precios

- "Situación Económica, Índice de Precios al Por Mayor y al Consumidor: Tercer Trimestre de 1984" (Febrero 1985).
- "Situación Económica, Precios Recibidos por el Productor Agropecuario: Mayo y Junio de 1984" (Septiembre 1984).

Sección 441 - Trabajo y Salarios.

- "Situación Social, Estadísticas del Trabajo: Año 1982" (Agosto 1984).

Dirección Nacional de Planificación Sectorial, MIDA. "Plan Trienal de Desarrollo Agropecuario, 1976 - 80", Santiago de Veraguas, 1979.

Dirección Nacional de Producción Pecuaria, MIDA. "Análisis de la Problema Gacenera en la República de Panamá (Un Enfoque no Tradicional)". Diciembre, 1982.

Economic Research Service, USDA. "World Indices of Agricultural and Food Production, 1971 - 1981". Statistical Bulletin 689. August 1982.

French, James R. "Status and Recommendations of Agricultural Information Systems in Panama". March 1984.

Heckadon Moreno, Stanley. "Los Asentamientos Campesinos, Una Experiencia Panameña en Reforma Agraria". MIPPE. Abril 1973.

IDIAP. "Bibliografía Agropecuaria de Panamá". 1983.

IDIAP. "Informe Anual". Diciembre 1981.

IDIAP. "Informe Anual". Diciembre 1983.

Management Analysis Center (MAC). Conducted a Series of Phase I Management Studies Published in October 1984 of:

- Asentamientos (State Communal Farms)
- BDA (Banco de Desarrollo Agropecuario)
- CALV (Corporación Azucarera La Victoria)
- Citricos de Chiriquí
- COBANA (Corporación Bananera del Atlántico)
- ENASEM (Empresa Nacional de Semillas)
- ENDEMA (Empresa Nacional de Maquinaria Agrícola)
- IMA (Instituto de Mercadeo Agropecuario)
- ISA (Instituto de Seguro Agropecuario)
- Management Control
- Summary of Recommendations

Merrill, William, Lehman Fletcher, et al. Panama's Economic Development: The Role of Agriculture. ISJ Press. 1975.

Ministerio de Planificación y Política Económica. "Interpretación, Perspectivas y Políticas de Desarrollo Agropecuario (Borrador para Discusión) 1980.

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- Ministerio de Planificación y Política Económica. "Perspectivas para el Desarrollo Agropecuario en Panamá: Resumen". MIPPE/MIDA/FAO/USAID. Agosto 1975.
- Ministerio de Planificación y Política Económica. "Plan Nacional de Desarrollo 1976 - 1980; Objetivos, Políticas y Metas Sectoriales, Panamá", Vol. No. 2, 1976.
- Nilsestnen, Wayne, James Walker and Kenneth Swanberg. "Agricultural Research Priorities Implementation Plan". August 1983.
- Pray, Carl. "Agricultural Research in Panama: The Roles of ENASEM and IDIAP". University of Minnesota. September 1984.
- ROCAP. "Project Implementation Document - Regional Agricultural Higher Education". December 1984.
- Rutgers University and ISNAR. "Agricultural Technology Management Systems in Latin America, a Progress Report", May 1985.
- Rutgers University. "Quarterly Report No. 10 for Agricultural Technology Development Project"; Report Period Oct. 1 - December 31, 1984. (March 1985).
- Rutgers University. "Report of the Agricultural Training Needs Study Team". May 9, 1983.
- Schweigert, Thomas, Randy Stringer, Jean Sussman and William C. Thiesenhusen. "The State of the Agrarian Reform Asentamientos in Panama". Management Analysis Center. September 1984.
- Simmons, Richard F. "Private Sector Study for Agriculture in Panama". February/March 1984.
- University of Delaware. "Final Report: Education for Rural Development Project". USAID/Panama. December 1984.
- Ugarte, Tomás. "Panama Agricultural Statistical Profile". USAID/Panama. 1985.
- Walter, W. H. "Trip Report on Agricultural Information Systems in Panama" Prepared for USAID/Panama, December 1985.
- Warnken, Philip and Alfredo Bernal. "A Frame of Reference for the Institutional Strengthening of DNPS". 1981.
- World Bank. Panama: Structural Change and Growth Prospects, 1985.

CHAPTER III. AGRICULTURAL PRODUCTION
PROFITABILITY AND POTENTIAL

Banco Interamericano de Desarrollo. Informe Económico de Panamá. Diciembre 1984.

Dirección de Estadística y Censo, Contraloría General. Estadística Panameña.

Sección 312 - Producción Agropecuaria.

- "Situación Económica, Producción Pecuaria: Año 1983" (Abril 1984)
- "Situación Económica, Superficie Sembrada y Cosecha de Café, Tabaco y Caña de Azúcar: Año Agrícola 1983/84". (Febrero 1985).
- "Situación Económica, Superficie Sembrada y Cosecha de Arroz, Maíz y Frijol de Bejuco: Año Agrícola 1983/84". (Febrero 1985).

Shearer, Eric. 'Current Policy Problems of the Agricultura Sector in Panama' For the World Bank. March 1983.

World Bank. Panama: Structural Change and Growth Prospects. 1985.

CHAPTER IV. ANALYSIS

- Arcia, Gustavo. "A Practical Frame of Reference for Agricultural Policy Analysis". RTI. March 1983.
- Austin, James. Eric Shearer and David Flood "Structural Adjustment in the Agricultural Sector of Panama". Prepared for the World Bank, April, 1984.
- Barrios, Javier. "El Sistema de Cuotas en Panamá: Descripción, Evaluación y Efectividad". Ministerio de Planificación y Política Económica (MIPPE). 1984.
- Butelman, Andrea and Pedro Videla. "The Labor Code and its Effects on Wages and Employment". MIPPE 1983.
- Buttari, Juan J. "A Policy Approach to the Employment Problem in Developing Countries". February 1985.
- Douglas, Herman Carter and Daniel Wisecarver. "Second Report to USAID/Panama on a Program of Technical Assistance to MIPPE". June 1983.
- Espinosa, Amancio. "Informe sobre Producción Agropecuaria en la Provincia de Chiriquí. USAID/Panama. 1982.
- Harberger, Arnold C. "Panama's Fiscal and International Debt Crises: One Problem or two?". MIPPE. 1983.
- Hayami, Yuyiro and Vernon W. Ruttan. Agricultural Development an International Perspective. Johns Hopkins Press. 1971.
- Inter-American Development Bank (IDB). Economic and Social Progress in Latin America, Economic Integration. 1984 Report.
- International Labor Organization (PREALC). Beyond the Crisis. 1985.
- International Monetary Fund (IMF). "Panama -- Staff Report for the 1985 Article IV Consultation and Request for a Stand-by Arrangement". June 17, 1985.
- Jones, Emil. "Forest Resource Policy Issues". November 1984.
- Kelly Harrison Associates. "Exporting Non-Traditional Products from Central America and Panama". November 1984.
- Mannion, Harold J. "Assessment of Panama's Agribusiness Potential in the Processing Marketing Sector". ATMA Associates. June 1984.
- MIDA. "Basic Food Plan, Executive Summary" Republic of Panama. February 1984.
- MIDA. "Plan Quinquenal de Desarrollo Agropecuario, 1987 - 1991". (Borrador 20 de Junio 1986)

61

- Minnesota, University of, Dept. of Agricultural and Applied Economics.
"Las Políticas de Precios y Comercio Internacional en el Sector
Agropecuario en Panamá: 1970-1983. MIPPE. May 1984.
- Norton, Roger. "A Review of Panama's Draft Five-Year Agricultural Plan"
USAID/Panama, July 1986.
- Pcu, Pedro. "Empleo, Inversión y Crecimiento Económico en Panama Durante La
Decada de Los Setenta". MIPPE 1985.
- Pray, Carl. "Private Agricultural Research in Asia". Food Policy, May 1983.
- Reca, Julius G. "Panama: A Report on the Economics of the Beef Cattle Sector"
World Bank Mimeo. October 1982.
- ROMCO Consulting Corporation. "Cane/Energy Systems Assessment Program".
September 1985.
- Saida, Nasser. "Public Debt", Expenditures and Revenues, Panama 1956-1983:
Assessment and Policy Recommendations" MIPPE, 1983.
- Shearer, Eric. "Current Policy Problems of the Agricultural Sector in
Panama". For the World Bank. March 1983.
- Shearer, Eric B. y Gustavo Tejada Mora. "Una Evaluación General del Sector
Agropecuario de Panamá. Diciembre 1980.
- Sjaastad, Larry A. "Report to USAID/Panama on Technical Assistance to MIPPE".
April 1983.
- Sjaastad, Larry A. "Commercial Policy for Panama in the 1980's. MIPPE. 1983.
- Spiranger, Dan. "The Labor Market in Panama: An Analysis of the Employment
Impact of the Labor Code". MIPPE. 1983.
- Strasma, John. "Institutional Analysis and Policy Formulation". Univ. of
Wisconsin, March 1984.
- Strasma, John. "Land Taxation, Rural Cadastres, Ownership Records and Surveys
in Relation to the Integrated Rural Development Program". 1977.
- Truitt, George A., Harold J. Mannion and Arnoldo V. Villafuente. "Assessment
of Agribusiness Potential in Panama". Abt. Associates, Inc. July 1984.
- Van Haeften, Roberta. "An Analysis of the Panamanian Agricultural Price
Policy Systems". ERS/USDA. April 1975.
- World Bank. Panama: Structural Change and Growth Prospect, 1985.

ANNEX TABLES

NOTE:

Data presented are the most up-to-date figures available at time of publication, but they should be interpreted with caution. Statistics for recent years are typically first published as estimates and are revised later as data become available.

ANNEX TABLE 1
 AVERAGE PER CAPITA FOOD CONSUMPTION
 IN PANAMA, 1973 AND 1982

<u>FOOD COMPONENT</u>	<u>Consumption/Person (Kgs.)</u>		<u>PERCENT CHANGE</u>
	<u>1973</u>	<u>1982</u>	
<u>Cereals</u>			
Corn	20.5	21.2	
Corn products	1.0	2.4	
Wheat	24.2	21.1	
Wheat products	3.6	0.6	
Rice	56.6	55.9	
Sub-Total	<u>105.9</u>	<u>101.2</u>	-4.4
<u>Root and Tubers</u>			
Potatoes	7.0	7.0	
Yucca	18.3	12.6	
Ñame	9.0	4.9	
Otoe	4.6	1.4	
Sub-Total	<u>38.9</u>	<u>25.9</u>	-33.4
<u>Sugar</u>			
Cane sugar	25.4	29.2	
Panela	1.3	0.9	
Molasses	1.9	1.2	
Sub-Total	<u>28.6</u>	<u>31.3</u>	9.4
<u>Legumes</u>			
Beans	2.9	2.9	
Guandú	1.0	1.2	
Coconut	3.8	8.4	
Sub-Total	<u>12.7</u>	<u>12.5</u>	-1.6

<u>Vegetables</u>			
Onion	3.4	3.9	
Green pepper	0.6	0.5	
Cabbage	1.7	0.6	
Tomato	7.6	9.7	
Carrots	1.3	0.6	
Lettuce	0.6	0.5	
Cucumber	-	0.5	
Beets	-	0.0	
Sub-Total	<u>14.2</u>	<u>16.3</u>	14.8
<u>Fruits</u>			
Pineapple	3.4	3.0	
Platano (plantain)	45.0	28.4	
Banana	23.5	22.0	
Avocado	1.3	0.9	
Oranges	26.7	22.4	
Cantaloupe	-	0.5	
Watermelon	-	0.9	
Sub-Total	<u>99.9</u>	<u>78.1</u>	-21.8
<u>Meat</u>			
Beef	21.4	24.7	
Pork	2.4	3.5	
Chicken	5.4	10.0	
Meat by-products	3.4	11.5	
Sub-Total	<u>32.6</u>	<u>49.7</u>	52.5
<u>Fish/seafood</u>			
Fresh fish	8.3	10.3	
Shrimp/shell fish	0.6	0.4	
Sub-Total	<u>8.9</u>	<u>10.7</u>	20.2
<u>Milk/Milk Products</u>			
Fresh raw milk	10.1	8.0	
Fresh pasteurized milk	15.6	18.5	
Condensed/evaporated/powdered	8.7	7.8	
Cheese	0.2	1.3	
Sub-Total	<u>34.6</u>	<u>35.6</u>	2.9

Other

Coffee	1.7	2.0	
Cocoa	0.1	0.8	
Eggs	7.6	7.8	
Sub-Total	<u>9.4</u>	<u>10.6</u>	12.8

Source: Dirección de Estadística y Censo, Contraloría General.
"Situación Económica, Hoja de Balance de Alimentos: Años 1979-82".
Estadística Panameña Sección 352 Consumo. (Febrero 1984)

ANNEX TABLE 2

VALUE OF MERCHANDISE EXPORTS FROM PANAMA, 1979 - 1984

	<u>1970</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	1985 (
	(thousands of Dollars)							
<u>Agricultural</u>								
Bananas		65.7	61.6	69.2	66.0	75.0	74.6	78.1
Shrimp		45.0	43.7	42.7	52.9	51.4	49.2	59.1
Sugar		26.1	65.8	52.6	23.7	41.3	37.1	27.3
Coffee		9.5	10.1	13.5	12.1	15.2	12.0	15.5
Fish Meal		7.0	10.1	4.3	1.6	5.5	2.7	6.4
Hides		5.2	2.0	2.4	5.1	3.7	6.9	1.5
Meat (Beef)		1.5	3.1	5.1	9.4	4.1	.2	-
Puré of Banana		2.5	2.2	3.7	2.2	3.1	2.3	2.6
Condensed Milk		3.3	6.5	5.9	2.3	2.8	2.4	2.7
Fruit Extract		2.1	1.3	1.1	1.4	2.1	2.4	1.0
Tobacco		1.7	1.4	2.2	2.3	2.1	1.9	-
Molasses		4.0	3.9	2.5	1.8	1.2	1.3	-
Cocoa		3.9	2.1	.1	-	.2	4.2	.2
Other Fish Oil		1.4	4.7	1.3	.3	.9	1.3	1.8
Value Sub-Total		189.8	237.2	223.8	203.7	234.2	218.3	196.2
Percent Sub-Total		64.4	67.1	70.0	65.7	77.1	85.2	90.2
<u>Non-Agricultural</u>								
Refined Oil Products		72.4	81.8	58.4	70.1	35.8	5.3	20.0
Other Manufacturing Products		16.9	16.1	19.3	14.6	21.4	19.0	N/A
Clothing		8.6	10.4	14.0	17.3	7.6	9.3	N/A
Boxes (cartons)		1.7	2.8	1.2	1.5	1.2	.9	.3
Rum		3.8	3.0	2.0	2.5	2.3	1.9	-
Prepared Mustard/Mayonnaise		1.5	2.1	.7	.5	1.1	1.6	.9
Value Sub-Total		104.9	116.2	95.6	106.5	69.4	38.0	21.2
Percent Sub-Total		35.6	32.9	30.0	34.3	22.9	14.8	9.8
GRAND TOTAL		294.7	353.4	319.4	310.2	303.6	256.3	217.4

Source: Dirección de Estadística y Censo, Contraloría General. Panamá en Cifras, años 1980-1984. Marzo 1986; Agricultural Statistics, Revised August 1986.

ANNEX TABLE 3
 URBAN AND RURAL POPULATION BY PROVINCE,
 1970 and 1980
 (Population in "000's)

PROVINCE	1 9 7 0									1 9 8 0						
	TOTAL	R U R A L		U R B A N		D I S T ' N B Y P R O V I N C E			TOTAL	R U R A L		U R B A N		D I S T ' N B Y P R O V I N C E		
		No.	%	No.	%	Total	Rural	Urban		No.	%	No.	%	Total	Rural	Urban
Bocas del Toro	44	29	65.9	15	34.1	3.1	3.9	2.2	54	37	68.6	17	31.4	3.0	4.0	1.9
Coclé	118	92	78.0	26	22.0	8.3	12.3	3.9	140	104	74.3	36	25.7	7.7	11.2	4.0
Colón	134	65	48.5	69	51.5	9.4	8.7	10.2	166	93	56.1	73	43.9	9.1	10.0	8.2
Chiriquí	236	175	74.3	61	25.7	16.6	23.4	9.0	283	197	68.4	91	31.6	15.8	21.2	10.2
Darién	23	21	91.3	2	8.7	1.7	2.8	0.3	26	24	92.3	2	7.7	1.5	2.6	0.2
Herrera	73	50	68.5	23	31.5	5.2	6.7	3.4	82	50	61.0	32	39.0	4.5	5.4	3.6
Los Santos	72	64	88.9	8	11.1	5.1	8.6	1.2	70	60	85.8	10	14.2	3.9	6.5	1.2
Panamá	577	121	21.0	456	79.0	40.4	16.2	67.2	830	220	26.5	610	73.5	45.4	23.7	67.8
Veraguas	152	133	87.5	19	12.5	10.7	17.8	2.8	173	143	82.7	30	17.3	9.5	15.4	3.4
TOTAL	1428	749	52.5	679	47.5	100.0	100.0	100.0	1830	930	50.8	900	49.2	100.0	100.0	100.0

Source: Reported by BID in Informe Sobre El Sector Agropecuario de Panamá January 1982 and based on information provided by Contraloría General.

ANNEX TABLE 4
NUMBER OF FARMS BY SIZE DISTRIBUTION,
1970 AND 1980

1970									
Size (Ha.)	Number of Farms	Percent		No. Ha.	Percent of Farmland		Farm Population	No. Family Members at Home	Percent farmers depending on Farming as sole source for Family living
		of grand total	of .5 and over		of grand total	of .5 and over			
Less than 0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0.5 to 2.9	31035		33.8	40076		1.9			
3.0 to 9.9	24091		26.2	125618		6.0	N/A	N/A	N/A
10.0 to 49.9	28317	N/A	30.8	597529	N/A	28.5			N/A
50.0 to 199.9	7446		8.0	615701		29.4			
200 or more	1172		0.9	717766		34.2			
GRAND TOTAL		100			100				
TOTAL .5 and over	92061	-	100	2096680	-	100			
1980									
Less than 0.5	51025	33.3	-	4590	.2	-	247042	4.84	3
0.5 to 2.9	39502	25.8	38.7	47508	2.1	2.1	195458	4.95	32
3.0 to 9.9	24013	16.2	24.3	128325	5.7	5.7	130582	5.26	58
10.0 to 49.9	27709	18.1	27.1	585746	25.9	26.0	146302	4.34	67
50.0 to 199.9	8635	5.6	8.4	721444	32.0	32.0	43255	5.01	73
200 or more	1490	1.0	1.5	770941	34.1	34.2	5997	4.02	75
GRAND TOTAL	153194	100	-	2258557	100	-	769646	-	-
TOTAL .5 and over	192169	-	100	2253967	-	100	521594	-	-

Source: Dirección de Estadística y Censo, Contratoría General. Unpublished computer printouts and Summary Sheets from 1970 and 1980 Agricultural Census.

ANNEX TABLE 5
 AGRICULTURAL LAND USE IN PANAMA,
 1950 to 1980

Agricultural Land Use	1950		1960			1970			1980		
	No. Ha. (000's)	Percent of Agr. Land	No. Ha. (000's)	Percent of Agr. Land	% change from previous decade	No. Ha. (000's)	Percent of Agr. Land	% change from previous decade	No. Ha. (000's)	Percent of Agr. Land	% change from previous decade
Annual Crops	155.9	13.2	194.0	10.5	24.4	196.1	9.3	1.1	239.7	10.6	22.2
Permanent Crops	82.2	7.3	158.9	8.6	93.3	134.8	6.4	- 15.2	117.7	5.2	- 12.7
Fallow Land	213.7	18.1	223.6	12.1	4.6	217.4	10.4	- 2.8	194.5	8.6	- 10.6
Pasture Land	566.8	48.0	837.1	45.3	47.7	1140.8	54.4	36.3	1296.2	57.5	13.6
Brush/forest land and other Land use	158.2	13.4	434.3	23.5	174.5	408.9	19.5	- 5.8	405.6	22.1	- .8
TOTAL	1180.8	100	1847.9	100.0	56.5	2098.0	100	13.5	2253.9	100	7.4

Source: Contraloría General de la República, Dirección de Estadística y Censo. From 1980 Agricultural Census unpublished computer printout sheets.

ANNEX TABLE 6
 AGRICULTURAL LAND USE BY PROVINCE,
 IN HECTARES, 1980

<u>Land Use</u>	<u>Total</u>	<u>Bocas Del Toro</u>	<u>Cocle</u>	<u>Colon</u>	<u>Chiriqui</u>	<u>Darien</u>	<u>Herrera</u>	<u>Los Santos</u>	<u>Panama</u>	<u>Veraguas</u>
Annual Crops	239748	1782	40053	9638	52146	8993	24341	24394	30282	48117
Grain/Legumes (rice, corn, sorghum, beans, guandú)	104,880	898	22693	6444	51661	8135	16666	24373	18351	35747
Roots/Tubers (potatoes, yuca, ñame, otae)	13,123	67	1174	2409	2920	606	2081	353	1669	1751
Horticultural crops	3092	-	540	41	555	44	377	1139	268	111
Sugar cane	54061	10	13747	46	6392	76	12127	1070	7898	12694
Unaccounted Hectareage ^{1/}	(+ 15408)	(-807)	(-1899)	(-698)	(+9382)	(-42)	(+6910)	(+2541)	(-2097)	(+2106)
Permanent Crops ^{2/}	117744	12614	14789	11995	32222	3846	5931	5114	16449	15533
Industrial crops (tobacco)	1461	-	12	3	1076	9	2	297	58	4
Fallow Land	194563	4995	24564	18968	20353	17068	10050	7545	39235	15783
Pasture Land (improved)	1,016,925	12197	74662	40613	227,266	19223	89070	200767	133272	219154
Pasture Land (native)	279356	4570	40232	9302	55275	3718	25235	30610	42390	68023
Brush/forest Land	353220	13410	25672	27033	21710	49522	13871	17730	84036	100233
Other Land Use	52409	1688	8628	3081	8732	1835	1827	1580	17867	7189
TOTAL	2,253,967	51253	228602	120232	417705	104906	169977	207721	363532	510032
Percent of Total	100	2.3	10.2	5.3	18.5	4.7	7.5	12.8	16.1	22.6

^{1/} Hectareage specified in 1980 census of annual crops and the subtotal for grain, root crop, horticultural crop, and sugar cane components do not total exactly. This category specifies the magnitude and direction of error.

^{2/} Includes pineapple, sugar cane, banana, platano, coffee, cocoa, avocado, oranges, coconut, palm oil and a number of other native fruits such as mango, papaya, miracuya, guayaba and marañón. The specific number of hectares grown are not specified in the 1980 census. Rather they are specified in terms of number of farms producing (see annex table 8) and number of plants grown.

Source: Contraloría General de la República, Dirección de Estadística y Censo. From 1980 Agricultural Census Unpublished Computer Printout Sheets.

ANNEX TABLE 7
CHARACTERISTICS OF FARMS,
MORE THAN 200 HA. IN SIZE, 1980

Item	Total	Bocas del Toro	Cocle	Colon	Chiriqui	Darien	Herrera	Los Santos	Panama	Veraguas
<u>No. of farms</u>	1420	33	102	80	331	111	83	218	221	311
<u>Average Size</u>	517	706	606	482	478	407	406	334	659	607
<u>Farm Organization (Hectares)</u>										
Single Propr.	419000	10523	24491	20265	87318	40744	19170	68435	58837	89215
Corporate	171318	14403	29780	7007	57013	3926	9457	3656	24295	21781
Cooperative	7658	-	1683	5975	-	-	-	-	-	-
Asentamiento	48626	-	3192	4565	4697	530	-	-	-	-
State/local/School farm	123637	1002	2427	727	9306	-	3683	684	12488	18786
Other	697	-	247	-	-	-	1390	-	50124	58661
<u>Farm Organization (Number)</u>										
Single Propr.	1180	27	71	56	238	108	58	210	175	237
Corporate	168	4	16	9	70	1	10	6	27	25
Cooperatives	5	-	3	2	-	-	-	-	-	-
Asentamiento	108	-	9	11	13	2	-	-	-	-
State/local/school farm	26	2	2	2	10	-	13	2	15	43
Other	3	-	1	-	-	-	2	-	4	4
<u>Average Size (Hectares)</u>										
Single Propr.	355	390	345	262	367	377	330	326	336	376
Corporate	1020	3600	1861	778	814	3926	946	609	900	871
Cooperatives	1532	-	561	2988	-	-	-	-	-	-
Asentamiento	450	-	355	415	361	265	-	-	-	-
State/local/school farm	4755	501	1213	364	931	-	283	342	833	437
Other	232	-	247	-	-	-	695	-	12531	14665
<u>Agr. Land Use (Hectares)</u>										
Annual Crops	66209	143	14919	287	19053	778	5971	2338	10312	12377
Permanent Crops	22132	6925	154	1206	11417	176	406	339	901	608
Fallow land	44128	2406	2520	3536	4473	5716	941	1823	16196	6516
Pasture - improved	374080	6094	23310	19662	94868	12930	17960	54553	47739	94972
- native	84094	2654	13284	1979	19313	1635	4737	4970	18100	17416
Brush/forest	153215	6789	2630	10319	5557	22930	3209	8532	37600	55652
Other	27054	916	4266	1548	3652	1037	479	229	12896	1350
TOTAL	770941	25928	61820	38539	158335	45200	33702	72776	143744	188894
<u>Agr. Land Use (Percent)</u>										
Annual Crops	8.6	.6	24.2	.7	12.0	1.7	17.7	3.2	7.2	6.6
Permanent Crops	2.9	26.7	.2	3.1	7.2	1.1	1.2	.5	.5	.3
Fallow land	5.7	9.3	4.1	9.2	2.8	12.6	2.8	2.5	11.3	3.4
Pasture - improved	48.5	23.5	37.7	51.0	59.9	28.6	53.3	75.0	33.2	50.3
- native	10.9	10.2	21.5	5.1	12.2	3.6	14.1	6.8	12.6	9.2
Brush/forest	19.9	26.2	4.2	26.8	3.5	50.7	9.5	11.7	26.2	29.5
Other	3.5	3.5	8.1	4.1	2.4	1.7	1.4	.3	8.9	.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Contraloría General de la República, Dirección de Estadística y Censo. From 1980 Agricultural C...

ANEXO TABLA 8
LAND USE BY CROP, 1975 AND 1980

<u>Crop</u>	<u>Hectares in 1975</u>	<u>Hectares in 1980</u>	<u>No. of Farms Producing in 1980</u>
<u>Grains and legumes</u>			
Rice	115,370	100,720	60,634
Corn	74,320	58,217	75,669
Sorghum	7,844	10,013	682
Beans	16,590	13,302	26,221
Guandú	<u>2,500</u>	<u>2,628</u>	23,737
Sub-Total	216,624	184,880	
<u>Roots and Tubers</u>			
Potatoes	405	963	400
Yuca	4,385	7,127	55,594
Ñame	2,012	3,083	20,683
Otoe	<u>1,209</u>	<u>1,950</u>	8,658
Sub-Total	8,011	13,123	
<u>Horticultural Crops</u>			
Tomato	1,836	1,729	2,176
Onion	277	274	422
Green onion	67	46	454
Cabbage	80	65	305
Carrots	61	32	162
Lettuce	64	45	227
Cantaloupe		119	299
Other	<u>405</u>	<u>782</u>	2,013
Sub-Total	2,790	3,092	
<u>Industrial Crops</u>			
Tobacco	350	1,461	502
<u>Permanent Crops</u>			
Pineapple	2,065		29,433
Sugar cane	38,270	54,061	14,988
Banana	40,220		66,781
Plátano	10,300		57,447
Café	21,770		35,268
Cocoa	4,000		7,922
Avocado	2,868		60,112
Oranges	5,673		84,933
Coconut	3,322		71,791
Palm oil	720		
Other fruit	<u>3,081</u>		34,578
Sub-Total	132,309	154,844	
GRAND TOTAL	360,584	357,400	

Source: Contraloría General de la República de Panamá, Censos Nacionales de 1980: Cuarto Censo Nacional Agropecuario. Mayo de 1981

ANNEX TABLE 9
GROSS VALUE OF AGRICULTURAL PRODUCTION
IN CURRENT DOLLARS, 1970 - 1984 ^{a/}
(Thousands of Dollars)

COMMODITY	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983 ^{b/}	1984 ^{c/}
Crops	135,817	131,989	149,347	157,102	183,234	213,058	214,489	246,126	251,896	258,939	274,236	326,325	303,563	309,058	302,432
Rice	15,743	16,405	15,085	19,869	26,787	35,262	27,794	37,731	33,058	35,577	40,381	56,697	49,576	55,477	45,692
Corn	5,852	5,789	4,894	6,462	9,162	12,359	12,323	15,675	13,320	13,942	13,018	14,980	17,190	19,707	19,985
Beans	969	985	997	1,210	2,432	2,818	1,333	1,791	1,698	1,995	2,039	2,179	1,423	2,027	1,826
Banana	65,254	67,584	69,407	68,713	55,917	66,782	68,996	74,592	80,693	77,171	73,879	80,902	79,098	85,076	85,852
Sugar Cane	5,763	7,350	8,360	8,826	22,208	24,596	30,447	34,536	29,119	26,417	37,557	46,548	38,241	33,293	29,832
Coffee	4,864	5,942	6,047	5,068	7,030	7,614	7,655	9,315	14,451	15,485	19,818	23,738	16,393	19,602	18,492
Others	37,372	40,934	44,557	46,954	59,698	63,627	65,941	72,486	79,557	88,352	87,544	101,281	101,632	93,876	100,753
Livestock	54,302	62,737	70,298	76,757	83,691	91,982	104,728	108,821	127,374	150,767	160,923	181,907	194,612	220,527	229,547
Beef	21,956	27,405	30,843	32,686	36,164	39,064	41,676	43,427	50,123	65,127	62,496	74,849	90,213	82,563	84,303
Pork	5,176	2,706	4,773	6,661	5,669	6,104	7,330	8,980	8,802	9,945	11,525	11,916	10,590	10,132	11,326
Other	27,170	32,626	34,682	37,410	41,858	46,814	55,722	56,416	68,449	75,695	86,902	95,142	93,809	127,832	133,918
Forestry	6,269	6,233	6,892	8,449	8,198	7,954	8,376	10,499	10,801	11,896	13,125	12,932	15,023	19,359	20,228
Fisheries	9,033	11,982	13,544	18,882	15,036	21,428	31,587	31,590	30,033	41,828	64,965	59,319	66,132	68,542	65,153
Fish	1,737	2,077	2,409	3,831	3,039	4,175	6,093	7,213	5,546	9,299	12,474	9,560	8,021	10,364	9,653
Shrimp	7,288	9,881	10,833	14,210	11,845	17,053	24,116	22,814	23,369	31,433	47,267	46,070	56,969	55,927	53,856
Other	8	24	302	841	152	200	1,378	1,563	1,118	1,096	5,224	3,689	1,142	2,251	1,644
TOTAL	205,421	225,931	240,081	261,190	290,159	334,422	359,190	397,038	420,104	463,430	513,249	580,483	579,330	617,486	617,360

a/ The data are tabulated for preparation of Gross Internal Product calculations. Volume of physical production should not be calculated from this data.

b/ Revised

c/ Preliminary

Source: Contraloría General de la República, Dirección de Estadística y Censo, August 14, 1985.

ANNEX TABLE 10
GROSS VALUE OF AGRICULTURAL PRODUCTION
AT 1970 PRICES (1970 = 100) , 1970 - 1984 a/
(Thousands of Dollars)

COMMODITY	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983 ^{b/}	1984 ^{c/}
Crops	135,817	143,628	140,707	140,671	135,992	144,958	145,700	157,133	161,905	158,553	151,676	163,980	155,746	164,252	161,645
Rice	15,743	16,343	15,028	19,462	21,413	22,187	17,000	22,350	19,494	19,272	20,482	23,428	21,166	23,938	20,029
Corn	5,852	5,610	4,601	5,685	6,159	6,765	6,638	8,271	6,690	6,567	5,597	5,908	6,423	7,121	6,749
Beans	969	971	917	1,028	1,191	1,234	969	1,185	959	1,095	1,118	982	583	969	852
Banana	65,254	67,374	65,539	60,823	49,158	55,837	58,699	60,922	68,449	63,538	57,087	63,219	62,715	70,385	71,198
Sugar Cane	5,763	7,350	8,360	8,826	10,582	11,926	14,714	16,888	16,104	14,695	12,692	15,878	12,908	12,941	11,865
Coffee	4,864	5,817	6,008	4,963	4,885	5,222	5,371	5,630	6,958	7,200	8,483	9,737	6,778	7,370	8,986
Others	37,372	40,163	40,254	39,831	42,604	41,787	41,994	41,807	43,251	46,106	46,217	44,028	45,173	41,528	41,966
Livestock	54,302	60,921	63,514	62,991	61,098	63,285	70,855	71,810	76,088	75,362	75,545	80,730	83,553	90,726	94,539
Beef	21,956	26,304	25,093	23,420	23,455	24,157	25,756	25,826	24,006	23,727	20,092	24,775	30,057	26,822	27,686
Pork	5,176	2,629	4,625	6,396	4,942	5,143	5,925	6,978	6,623	5,956	8,823	8,513	6,592	7,237	8,077
Other	27,170	31,988	33,796	33,170	32,701	33,986	39,174	39,006	45,459	45,679	47,220	47,442	46,894	56,667	58,776
Poultry	6,269	6,251	6,157	7,055	6,425	6,350	6,021	6,381	6,498	6,673	6,813	6,606	6,890	8,375	8,593
Fisheries	9,033	9,053	8,351	9,086	8,141	8,661	11,143	11,609	9,908	11,260	13,848	13,013	12,732	12,903	12,253
Fish	1,737	2,017	1,988	2,429	2,137	2,382	3,500	4,146	2,966	3,451	4,509	3,629	2,810	3,659	3,385
Shrimp	7,288	7,026	6,253	6,199	5,938	6,177	7,099	7,014	6,695	7,630	8,510	8,800	9,363	8,402	8,126
Others	8	10	110	458	66	102	544	449	247	179	829	504	559	842	742
TOTAL	205,421	219,853	218,729	219,806	211,656	223,255	233,749	246,936	254,399	251,848	247,912	264,329	258,921	276,256	277,030

a/ The data are tabulated for preparation of Gross Internal Product calculations. Values of physical production should not be calculated from this data.
b/ Revised
c/ Preliminary

Source: Contraloría General de la República, Dirección de Estadística y Censo, August 14, 1985.

ANNEX TABLE 11
Bananas: Panama's Exports, Share of World and U.S. Markets,
and Prices, 1970 - to 1985

Year	Exports (100 MT)	Share of World Exports (Percent)	Share of US Imports a/ (percent)	Real Panama Export Price b/ (\$/ton)	Real World Market Price (\$/ton)	Real US Import Price d/ (\$/ton)
1970	601	10.1	32.6	200	186	222
1971	623	9.6	32.5	196	173	198
1972	684	9.9	35.3	192	176	194
1973	555	8.0	28.4	197	175	187
1974	472	7.2	23.0	154	170	170
1975	496	7.6	25.2	167	194	180
1976	524	7.9	24.1	157	194	191
1977	547	8.3	25.1	155	196	200
1978	562	8.0	24.4	156	199	195
1979	565	8.0	23.5	132	190	190
1980	505	7.3	20.8	122	184	177
1981	573	8.3	22.6	113	182	194
1982	524	7.5	19.7	n.a.	n.a.	n.a.
1983						
1984						
1985						

a/ Panama's exports of bananas divided by U.S. Imports.

b/ Value of Panama exports divided by Panama tonnage, deflated by Panama CPI, 1980 - 100.

c/ Value of World exports divided by World tonnage, deflated by U.S. CPI, 1980 - 100.

d/ Value of U.S. Imports divided by tonnage and deflated by the U.S. CPI, 1980 - 100.

Source: United Nations, FAO, Trade Yearbook, respective years.

ANNEX TABLE 12
 BANANA EXPORTS BY PRODUCER, 1975 - 83
 (million boxes of 40 to 42 lbs.)

	1975	1976	1977	1978	1979	1980	1981	1982	1983
Pacific:	<u>14.1</u>	<u>14.8</u>	<u>18.1</u>	<u>20.3</u>	<u>15.6</u>	<u>11.1</u>	<u>13.5</u>	<u>12.9</u>	<u>16.7</u>
COBAPA	0.2	0.9	2.4	2.9	1.1	0.8	0.9	n.a.	n.
Independent Prod.	3.1	2.9	4.0	4.5	4.4	4.2	3.9	4.4	5.9
Chiriqui Land Co.	10.8	11.0	11.7	12.9	10.1	6.1	8.7	8.5	10.7
Atlantic:	<u>13.5</u>	<u>14.1</u>	<u>13.4</u>	<u>14.7</u>	<u>15.3</u>	<u>16.5</u>	<u>16.7</u>	<u>18.2</u>	<u>19.1</u>
COBANA	0.6	0.7	0.8	0.8	1.0	1.0	0.8	0.8	1.7
Independent Prod.	1.2	1.4	1.4	1.6	1.8	1.4	1.9	2.2	2.3
Chiriqui Land Co.	11.7	12.0	11.2	12.3	12.5	14.1	14.0	15.2	15.1
TOTAL	<u>27.6</u>	<u>28.9</u>	<u>31.5</u>	<u>35.0</u>	<u>30.9</u>	<u>27.6</u>	<u>30.2</u>	<u>31.1</u>	<u>36.0</u>

Source: Weekly Reports of Chiriqui Land Co.

ANNEX TABLE 13

COMPONENTS OF THE MANUFACTURING INDUSTRY IN PANAMA, 1983

<u>Item</u>	<u>1 9 8 3</u>		<u>1984 (P)</u>
	<u>Value (000 Dollars)</u>	<u>Percent</u>	<u>Value (000 Dollars)</u>
<u>Agricultural Products:</u>			
Food Processing	81.1	21.6	76.4
Meat Processing	16.7	4.4	17.0
Tobacco Processing	25.0	6.7	11.3
Hide/Leather Processing, except shoes	3.0	.8	95.6
Sub-Total	125.8	33.5	189.3
<u>Forestry Products:</u>			
Lumber Production	7.4	2.0	N/A
Wood Furniture Manufacturing	8.8	2.3	N/A
Paper/Paper Product Manufacture	15.3	4.1	N/A
Sub-Total	31.5	8.4	N/A
<u>Other Manufacturing:</u>			
Alcoholic Beverages	32.8	8.7	23.5
Textiles and Clothing	34.7	9.2	36.6
Shoes	7.1	1.9	-
Printed Material	11.2	3.0	5.4
Chemical	29.5	7.9	10.7
Refining Oil Products	33.3	8.9	4.8
Manufacturing Rubber, Plastic, Procelain and Glass Products	12.7	3.4	5.3
Mineral Manufacturing	30.3	8.1	8.1
Basic Metal Production	6.3	1.7	0.4
Manufacturing of Metal Products	13.7	3.6	5.9
Machinery Electrical and Transport Manufactures	5.0	1.3	2.9
Scientific Equipment and Other Manufacturing	1.7	.4	3.2
Sub-Total	218.3	58.1	116.8
TOTAL	375.6	100.0	-
MANUFACTURING CONTRIBUTION TO GDP		9.3	-

Source: Dirección de Estadística y Censo, Contraloría General, Estadística Panameña. "Situación Económica, Industria: Año 1983". Diciembre 1984; Sección de Censos Económicos, 1985.

ANNEX TABLE 14
AGRICULTURAL INPUTS IMPORTED, 1981

<u>Agricultural Input</u>	<u>1981 VALUE</u>		<u>1983 VALUE</u>	
	<u>F. O. B. 1/</u>	<u>C. I. F. 1/</u>	<u>C. I. F. 1/</u>	<u>C. I. F. 1/</u>
Manufactured Fertilizers	15,652,808	18,430,717	9,930,991	3,907,052
Nitrogen	5,185,579		309,495	840,498
Phosphorus	1,405,773			4,873,946
Potash	226,213			
Mixed (NPK)	8,875,243			
Insecticides fungicides for Agr.	15,372,251	16,622,763	18,219,786	
Insecticides fungicides for Agr. livestock	334,761	368,400	269,262	
Agr. Machinery to prepare plant and cultivate the soil	917,683	1,054,368	597,559	
Agr. Machinery to harvest and process crops	4,282,976	4,716,484	2,735,762	
Milk processing equip.	9,387	10,265		
Livestock feed	7,894,516	9,207,601	957,441	
Medicine for veterinary use	215,915	246,945	327,735	
Hand tools for Agr.	393,891	423,898	450,503	
Michetes	302,812	331,967	417,903	
Tractors	3,235,491	3,531,536	1,234,504	
Parts for tractors	2,786,886	3,038,389	1,465,712	
	<u>51,393,803</u>	<u>57,983,333</u>	<u>36,607,158</u>	

Source: Dirección de Estadística y Censo. "Situación Económica Anuario de Comercio Exterior: Año 1981 y Año 1983 Preliminar". Sección 331, Comercio (Ajusto 1984 y Diciembre 1984).

1/ FOB = Value of cargo and freight (freight on board)
 CIF = Value of cargo plus insurance plus freight

ANNEX TABLE 15
PUBLIC EMPLOYEES IN THE
AGRICULTURAL SECTOR 1985

<u>U N I T</u>	<u>No. of Employees</u>
<u>State Production Entities</u>	
Cooperativas/Asentamientos/State Farms	5,624
Banana plantations (COBANA)	366
Citrus Production/Processing (CITRICOS)	650
Bayano Development Corp (EDC)	501
Sugar Mills (CALV)	2,947
CODEIBO	6
	<hr/>
SUB-TOTAL	10,094
<u>Agriculture Input Entities</u>	
Seed Production (ETASEM)	57
Machinery (FNDEMA)	579
Crop Insurance (ISA)	54
Agriculture Cooperatives (COAGRO and IPACCOOP)	143
Credit (BDA)	842
(BNP)	<u>2,687</u>
SUB-TOTAL	4,362
<u>Regulation/Pricing/Policy</u>	
Marketing (IMA)	1,092
Retail (ORP)	329
SUB-TOTAL	<u>1,421</u>
<u>Technical Assistance</u>	
Research (IDIAP)	461
Teaching-7 MOE Vocational Agriculture Schools	50
FAUP	60
INA	25
Extension/Regulation/Mgt (MIDA)	<u>4,598</u>
SUB-TOTAL	5,194
GRAND TOTAL	21,071

1/ Includes 3,474 employed by decree and 1,124 by contract.

- Sources:
- (1) Management Analysis Center (MAC) studies completed in 1984 on selected public enterprises for GOP by World Bank support.
 - (2) Dirección de Estadística y Censo, Contraloría General. Estadística Panameña (Sección 441-Trabajo y Salarios) Situación Social, Estadísticas del Trabajo: Año 1982. Agosto 1984.
 - (3) Rutgers University. "Report of the Agricultural Training Needs Study Team". May 9, 1983.
 - (4) Computer Printout Sheets of Personnel Employed at IDIAP, September 1985.
 - (5) National Banking Commission, June 1985.
 - (6) Internal MIDA Documentation, June 1985.

ANNEX TABLE 16
SUMMARY OF DEGREE LEVEL PERSONNEL BY AGRICULTURAL INSTITUTION,
DEGREE AND MAJOR FIELD OF SPECIALIZATION, 1983

Institution	Degree	Social Science	Plant Science	Animal Science	Crop Protection	Soils and Engineering	Economics	Plan & Admin.	Ecology	Forestry	Total
IDIAP <u>a/</u>	Ph.D	1	2	2	7	1	-	-	-	-	13
	M.S.	2	8	5	3	4	4	3	-	-	29
	BS	2	28	17	1	4	10	9	-	1	81
		5	48	24	11	9	14	12	-	1	123
FAUP <u>b/</u>	Ph.D	2	1	4	3	3	1	-	1	-	15
	M.S.	11	2	2	4	2	2	7	4	1	35
	BS	3	12	11	6	2	1	1	-	1	37
		16	15	17	13	7	4	8	5	2	87
MIDA <u>c/</u>	Ph.D	-	-	-	-	-	-	-	-	-	-
	M.S.	-	2	-	-	-	-	-	-	-	-
	BS	-	174	95	-	5	-	-	-	31	2
		-	176	95	-	5	-	-	-	31	307
Total	Ph.D	3	3	6	10	4	1	-	1	-	28
	M.S.	13	12	7	7	6	6	10	4	1	66
	BS	5	224	123	7	11	11	10	-	33	423
		21	239	136	24	21	18	20	5	34	517

a/ Personnel on Study leave included.

b/ The Faculty of Agriculture had 14 people on study leave in 1983, all pursuing M.S. degrees.

c/ Data limited to general fields of agricultural sciences.

Source: Rutgers University. "Report of the Agricultural Training Needs Study Team". May 9, 1983.

ANNEX TABLE 17
 MINIMUM PRODUCER SUPPORT PRICES FOR CROPS AND LIVESTOCK PRODUCTS
 CONTROLLED BY IMA, 1975 - 84
 (Dollars per unit)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Salt (100 lb.)					2.00	2.90	3.15	3.15	3.30	3.30	3.30
<u>Crops (100 lb) a/</u>											
Rice	10.00	10.50	10.50	10.00	10.25	14.00	14.00	14.00	13.00	13.00	13.00
Corn	8.50	8.50	8.50	8.50	9.00	10.80	11.25	11.25	11.25	11.25	11.25
Beans (frijol)	22.50	15.00	15.00	15.00	15.00	15.00	20.00	20.00	20.00	25.00	25.00
Kidney Beans (porotos)	45.00	45.00	45.00	45.00	46.50	46.50	46.50	46.50	47.00	50.00	50.00
Sorghum	7.50	7.50	7.50	7.50	8.25	10.00	10.25	10.25	10.25	10.25	10.25
Potatoes	11.00	11.40	14.00	14.00	14.50	18.50	18.50	18.50	c/	c/	c/
Onions	15.50	13.00	13.00	13.00	13.00	16.00	17.00	18.50	19.50	19.50	19.50
Coffee											
High quality	n.a	n.a	n.a	n.a	100.00	100.00	100.00	100.00	c/	c/	c/
Low quality	n.a	n.a	n.a	n.a	75.00	75.00	75.00	75.00	75.00	75.00	75.00
Cowpeas (frijol de bejuco)	n.a	n.a	n.a	12.50	12.50	16.00	16.00	16.00	16.00	16.00	16.00
Plantain					2.00	2.20	2.30	2.30	2.30	d/	d/
<u>Livestock products</u>											
Beef (lb) b/	0.2	0.25	0.25	0.30	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Milk, grade A (liter)	0.22	0.24	0.24	0.24	0.24	0.28	0.30	0.35	0.37	0.37	0.37

a/ Prices effective at the beginning of the crop year (October 1 for most crops).

b/ For live animals weighting 900 pounds or more.

c/ Freed of Price Controls by Resolution of MIDA N° AIP-27 March, 1983.

d/ Chiriqui \$3/qfl.; Darien \$2.50/qfl.

Source: Agricultural Marketing Institute (IMA).

ANNEX TABLE 10
 TOTAL AGRICULTURAL PRODUCTS EXPRESSED AS CIF VALUE IN DOLLARS
 1974 - 1984
 (Thousands of Dollars)

ITEM	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1974 Percent of Total	1984 Percent of Total	Percent Change From 1974
FOOD PRODUCTS	54914.7	60091.4	58359.6	63530.6	67326.5	80982.6	107519.8	107960.8	108847.0	114876.0	99890.1	56.9	71.2	81.8
Meat and Meat Products	7807.1	7434.9	8929.7	8762.9	9209.2	11757.0	14326.0	12818.7	14464.8	16388.9	8776.1	8.1	6.3	12.4
Milk/Milk Products, Butter, Eggs & Honey	10991.6	11046.5	9171.7	10579.3	10199.0	11841.0	20333.2	12857.9	15527.3	18164.4	15068.8	11.4	10.7	37.8
Fish, Crustacean, Mollusks	2412.8	3026.0	2766.2	2836.0	3995.3	5489.1	6137.7	6539.9	7490.5	9023.5	8980.2	2.5	6.4	267.6
Cereal Grains & Feed/ Feed Products Prepared from Grains	11849.0	19490.9	16653.4	18137.7	15881.6	22483.8	28206.6	31137.5	30991.5	27968.9	27733.9	19.3	19.8	48.6
Fruit and Vegetables	10649.5	11693.2	14652.2	16870.0	20392.2	23622.0	26881.7	26873.3	28028.4	29735.2	25787.9	11.0	10.4	142.2
Sugar & Sugar Products	745.5	3796.8	1418.5	1418.9	1564.8	1812.0	2390.1	2225.7	2880.0	2749.6	2007.6	.8	2.0	276.6
Coffee, Tea, Cocoa & Extracts	2545.8	2158.6	3055.5	3190.4	3614.8	4240.4	5070.9	5250.6	5576.2	6709.8	6651.5	2.6	4.7	161.3
Sauces, Mustard, Mayonnaise	1073.5	1478.2	1706.3	1723.6	2454.7	2640.1	3465.4	3841.8	3532.3	3750.1	3661.6	1.1	2.6	241.1
Nuts	8.9	1.1	16.1	11.8	14.9	142.2	404.5	249.4	346.0	895.6	422.5	-	.3	4647.2
LIVE ANIMALS/BREEDING STOCK	169.2	104.1	103.0	253.9	197.8	282.9	97.6	220.6	249.1	245.3	242.1	.2	.2	43.1
ANIMAL FEEDS	4196.0	2931.1	3761.1	4091.3	4436.5	6257.1	8234.4	9297.3	7918.4	11209.9	11756.6	4.3	8.4	180.2
TOBACCO	2254.9	1990.7	2270.2	1801.6	2102.1	2643.0	2750.6	2539.4	2513.4	1995.0	1567.4	2.3	1.1	- 30.5
UNACED PRODUCTS	2855.7	2835.2	1673.1	2995.2	3792.8	4927.0	4522.1	6876.9	5594.0	3237.1	4224.6	3.0	3.0	47.9
FURS/OILS FROM ANIMAL/ VEGETABLE	10635.8	10149.7	11245.6	11692.7	8721.0	2143.8	19024.8	13847.5	13541.2	15000.7	14729.8	14.1	10.5	8.1
HIDES/LEATHER	77.5	26.3	828.2	37.7	57.9	902.0	285.4	125.9	73.7	62.9	180.9	-	.5	4.4
MANUFACTURED LEAD PRODUCTS	2417.4	1402.7	1362.3	3541.7	1419.4	2113.3	2400.1	2472.5	2795.1	2544.2	2193.9	2.4	1.5	- 5.3
MACHINERY PARTS	16192.0	16815.3	16438.5	10475.1	14497.3	10912.8	14801.3	19875.5	14603.9	6490.4	5005.4	16.8	4.0	- 65.4
TOTAL	96424.2	96307.5	94471.8	98776.8	102552.1	131541.5	15936.1	158894.4	156135.8	155661.5	140290.8	100.0	100.0	45.2

Source: Contraloría General de la República, DIF, Computar Printed Sheets 1974-1984, August 1986.

ANNEX TABLE 19
 EXPORTS OF PRINCIPAL AGRICULTURAL PRODUCTS
 CONTROLLED BY IMA, 1983 - 1985

	1 9 8 3		1 9 8 4		1 9 8 5 (P)	
	QUANTITY NET (MT)	VALUE FOB (\$000)	QUANTITY NET (MT)	VALUE FOB (\$000)	QUANTITY NET (MT)	VALUE FOB (\$000)
Rice, paddy and milled	10,290	2,550	204	62	-	-
Cacao, butter and powder	669	2,006	815	3,721	395	1,472
Melons	412	183	1,039	470	3,487	1,762
Green plantains	547	100	17	5	-	-
Bananas	36,172	69,450	-	-	-	-
Hides (raw salted & tanned) and leather (finished & semi-finished)	3,917	4,343	3,610	7,141	n/a	n/a
Cattle, live	2,825	3,471	339	830	243	1,772
Beef carcasses	968	1,831	260	469	-	-
Beef, boneless	897	2,052	414	983	53	385
Coffee	5,592	15,576	4,569	12,851	1,873	4,784
TOTAL		91,315		26,532		10,175
Percent of Total Agr. Exports		39.0		12.1		5.2

Source: Agricultural Marketing Institute (IMA) and Centraloría General de la República, DEI., Computer Printout Sheets 1984-1984, August 1986.

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ANNEX TABLE 20
IMPORTS OF PRINCIPAL AGRICULTURAL PRODUCTS
CONTROLLED BY IMA, 1983 - 1984

	1 9 8 3			1 9 8 4		
	QUANTITY (MT)	V A L U E		QUANTITY (MT)	V A L U E	
		FOB (\$'000)	CF (\$'000)		FOB (\$'000)	CF (\$'000)
Wheat	73,970	13,240	14,978	8,676	1,561	1,739
Maize	37,971	5,260	6,052	16,513	2,671	3,057
Soybean meal	12,359	3,399	4,074	13,189	3,684	4,402
Ingredient for feed preparation	1,774	986	1,206	757	853	1,054
Kidney beans	1,231	749	862	-	-	-
Cowpeas	93	82	94	148	134	154
Onions	1,181	161	323	3,790	537	989
Crude soybean oil	23,497	13,060	14,030	-	-	-
Crude coconut oil	649	461	517	191	199	213
Refined soybean oil	207	139	170	-	-	-
Other Edible oil	433	533	616	254	531	570
Fish meal	560	254	296	-	-	-
Dried skim milk	2,500	2,111	2,517	3,114	2,340	2,889
Dried whole milk	1,841	3,054	3,443	1,996	3,066	3,412
Butterfat	1,815	4,152	4,551	1,302	2,686	3,043
Cottage cheese	1,533	2,537	3,137	1,680	2,352	2,896
Frozen meat	27	223	234	-	-	-
Tallow	1,517	716	876	1,094	656	775
Cacao powder	466	924	1,065	-	-	-
Cacao beans	370	785	837	245	544	571
Maize gluten	3,306	1,486	1,748	4,023	1,330	1,672
Hand tools	n.a.	515	630	72	382	452
Farm mach. & spares	n.a.	865	1,065	1,074	1,188	1,446
Fertilizer	11,366	1,627	2,018	11,817	1,839	2,127
Herbicide & pesticide	339	860	979	335	677	805
TOTAL		\$58,184	\$66,318		\$27,290	\$32,266
Percent of total Agr. Imports			43			23

Source: Agricultural Marketing Institute (IMA).

ANNEX TABLE 21
IMPORT DUTIES SPECIFIED FOR SELECTED FOOD PRODUCTS
FREED FROM QUOTAS, AS OF MARCH, 1983

PRODUCT	IMPORT DUTY	
	Ad valorem %	Specific (\$ per gross kg)
Beef, fresh, frozen or chilled	n.a.	2.50
Pork, fresh, frozen or chilled	n.a.	2.50
Poultry, fresh, frozen or chilled	n.a.	.50
Hams, dried, salted, etc.	n.a.	4.00
Pork, other, prepared	82	4.50
Sausages, etc., not canned	n.a.	3.50
Bacon & ham, canned	n.a.	4.00
Deviled ham	3	0.10
Yogurt	70	1.25
Condensed milk	95	3.00
Cheese, proc. American type	35	1.16
Fresh eggs	n.a.	1.25 per doz.
Wheat	25	0.05
Wheat flour	45	0.40
Pastas	88	1.00
Oranges & tangerines	150	1.50
Fresh plantains	150	1.50
Fresh coconuts	n.a.	0.40
Grated coconuts, edible	n.a.	1.25
Jams, jellies, etc.	66-97	1.00-1.10
Fruit juices and nectars	75	0.80
Starchy root vegetables	75	0.75
Various fresh vegetables	n.a.	1.25
Potato chips	76	1.95
Mustard & Mayonnaise	56-73	0.90-1.22
Corn (for popping & corn flakes)	20	0.15
Olive oil	20	0.25

Source: Ministry of Commerce and Industry and IMA

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ANNEX TABLE 22

RICE AND CORN PURCHASES BY IMA, 1971 - 83 a/
(Thousands of Quintales)

	RICE			CORN		
	Total Sales	IMA Purchases	IMA Purchases as Percent of Total Sales	Total Sales	IMA Purchases	IMA Purchases as Percent of Total Sales
1971/72	2,038.4	134.0	6.6	387.5	102.4	26.4
1972/73	2,020.8	111.0	5.5	244.4	152.9	62.6
1973/74	2,479.9	491.6	19.8	326.2	81.1	24.9
1974/75	2,976.8	725.8	24.4	405.7	144.8	35.7
1975/76	2,795.4	1,218.2	43.6	485.9	257.5	53.0
1976/77	2,179.6	156.5	7.2	563.3	123.4	21.9
1977/78	2,705.9	361.8	13.4	661.5	258.6	39.1
1978/79	2,560.5	395.2	15.4	578.2	133.3	23.1
1979/80	2,418.5	421.9	17.4	549.5	154.4	28.1
1980/81	2,926.7	283.1	9.7	541.5	141.5	26.1
1981/82	3,136.6	760.2	24.2	500.4	165.8	33.1
1982/83	3,201.3	609.2	19.0	600.0	174.5	27.2
1983/84 b/	3,105.3	375.3	12.1	750.0	174.5	23.2

a/ Years ended June 30.

b/ Estimates.

Source: Agricultural Marketing Institute (IMA).

ANNEX TABLE 23

PRODUCTION AND DISTRIBUTION OF CERTIFIED SEED, 1982

F I R M S	R I C E		M A I Z E		S O R G H U M		B E A N S		P O T A T O E S	
	qj	percent	qj	percent	qj	percent	qj	percent	qj	percent
ENASEM a/	30,000	20	850	17	1,000 b/	15	200	20	0	-
PRIVATE FIRMS	45,000	30	-	-	-	-	-	-	-	-
TRADERS	-	-	4,000 b/	80	5,000 b/	85	-	-	20,000 b/	60
MILLS & COMMERCIAL PRODUCERS	75,000	50	-	-	-	-	800	80	15,000	40
T O T A L	150,000	100	5,000	100	6,000	100	1,000	100	35,000	100

a/ National Seed Company.

b/ Imported Seed.

Source: National Seed Company (ENASEM).

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ANNEX TABLE 24
 CONSUMER PRICES OF SELECTED ITEMS SUBJECT
 TO PRICE CONTROL, 1977 - 1985
 (Dollars per unit)

Product	Unit	1977	1978	1979	1980	1981	1982	1983	1984	1985
Rice	1 lb.	0.23	0.22	0.22	0.32	0.32	0.32	0.32	0.32	0.32
Sugar	1 lb.	0.20	0.20	0.20	0.24	0.24	0.31	0.31	0.31	0.31
Coffee	1 lb.	0.90	0.90	1.36	1.36	1.36	1.36	1.36	1.36	1.36
Onions	1 lb.	0.18	0.18	0.18	0.23	0.23	0.23	0.28	0.30	0.33
Potatoes	1 lb.	0.19	0.19	0.23	0.25	0.25	0.25	0.31	0.40	0.38
Eggs	1 each	0.09	0.09	0.09	0.11	0.11	0.11	0.11	n.a.	n.a.
Milk	quart	0.37	0.37	0.37	0.43	0.46	0.46	0.53	0.53	0.53
Beef	1 lb.	1.25	1.25	1.55	1.55	1.55	1.55	1.55	1.55	1.55
Bread	18 oz.	0.34	0.34	0.34	0.42	0.44	0.44	0.44	0.44	0.44
Flour	2 lbs.	0.45	0.45	0.45	0.59	0.60	0.60	0.66	n.a.	n.a.
Cooking oil	1 gal.	3.85	3.85	5.01	5.54	5.54	5.54	5.54	6.00	6.00
Cement	94 lbs.	3.01	3.03	3.08	4.53 ^{a/}	5.12 ^{a/}	5.12 ^{a/}	5.12 ^{a/}	n.a.	n.a.
Chicken	1 lb.	0.79	0.79	0.79	0.94	0.98	0.98	0.98	0.96	0.96
Fish	1 lb.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.87	0.88

^{a/} Includes 5 percent value-added tax.

Source: Price Regulation Board (PRB).

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ANNEX TABLE 25
RICE PRODUCTION INDICATORS, 1970 - 1984 a/

Item	Unit	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Total area <u>b/</u>	000 ha.	93.1	95.6	105.2	105.3	112.2	115.4	122.4	110.0	99.0	97.8	100.7	104.2	106.1	106.5	98.9
Area machine planted	000 ha.	n.d.	n.d.	n.d.	47.5	50.9	52.3	48.0	42.5	41.2	n.d.	n.d.	n.d.	n.d.	43.2	n.d.
Yield <u>c/</u>	qt/ha.	31.0	31.4	26.2	33.9	35.0	35.3	26.0	37.3	36.1	35.4	37.3	41.2	40.9	41.3	38.9
Production	000/qq.	2891.5	3002.1	2760.6	3573.3	3932.4	4074.9	3184.9	4104.7	3579.9	3487.6	3762.1	4302.5	3887.0	4396.3	3849.1
Support Price:	B/qq.	6.0	6.0	6.0	6.75	10.0	10.0	10.5	10.5	10.0	10.25	14.00	14.00	14.00	13.00	13.00
Producer Price Official	B/qq.	5.63	5.86	5.84	5.88	6.98	8.92	9.07	9.49	8.98 <u>e/</u>	9.16	10.60	11.18	10.59	10.75	
Consumer price	B/lb.	n.d.	n.d.	n.d.	0.16	0.23	0.20	0.23	0.23	0.22	0.22	0.32	0.32	0.32	0.32	0.32
Value of Production <u>d/</u>	000B	16279	17592	16122	21081	27448	36348	28887	38954	32148	31946	39878	48102	41163	47260	
Index of farm price received	1971=100	96.1	100.0	100.3	102.9	121.1	153.0	157.6	164.5	153.2	156.3	180.9	190.8	180.7	183.4	
Imports <u>f/</u>	000/qq.	2.6	772.1	191.2	13.8	4.2	2.1	.9	.4	.4	1.0	1.6	4.7	4.1	1.4	1.3
IMA Farm purchases	000/qq.	135.0	134.0	111.0	491.6	725.8	1218.2	156.5	361.8	395.2	409.8	283.1	760.2	609.2	375.3	
IMA purchases % of total prod'n.	-	-	-	5.5	19.8	24.4	43.6	7.2	13.4	15.4	15.8	7.5	17.7	15.7	8.5	

a/ Production statistics were obtained from Contraloría General published reports. Production is estimated from an annual sample survey of 5,000 farmers, including 700 specialized farms.

b/ The area indicated represents the total year for rice. Rice is planted twice per year. The first planting is the principal one.

c/ A metric ton equals 22 quintales. A quintal equals 45.4 kilograms.

d/ Calculated as total annual production x producer price.

e/ Pricing at farm and market level reported separately beginning in 1978; farm gate price used for producer price calculations from 1978 to present.

f/ Since 1974 virtually all imports were improved seed for planting.

Source: Contraloría General de la República and IMA.

ANNEX TABLE 26
MAIZE PRODUCTION INDICATORS, 1970 - 1984 a/

Item	Unit	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Total Area b/	000 Ha.	64.9	63.1	65.7	67.6	75.5	74.3	83.2	82.8	68.6	69.6	58.2	60.4	72.3	81.1	70.1
Area machine planted	000 Ha.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	5.5	4.0	3.9	n.d.	n.d.	n.d.	n.d.	5.8	n.d.
Yield c/	qg/Ha.	19.2	18.9	14.9	17.9	17.3	19.3	17.0	21.2	20.7	20.1	20.4	20.8	20.1	20.1	22.2
Production	000 qfl.	1243.8	1192.2	977.7	1209.0	1306.7	1437.7	1410.3	1757.0	1421.8	1395.9	1189.3	1256.0	1454.8	1631.1	1556.2
Producer Support Price	B/qfl.	4.25	4.25	4.5	6.0	8.5	8.5	8.5	8.5	8.5	9.0	10.80	11.25	11.25	11.25	11.25
Market Price	B/qfl.	4.4	4.78	4.75	5.02	6.66	8.05	8.12	8.13	7.30e/	7.74	9.32	9.61	10.05	10.01	
Official Consumer Price	B/lb.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.12	0.12	0.12	0.12	-	-	-	-	-
Value of Production d/	000 B	4573	5699	4644	6064	8715	11573	11452	14284	10493	10004	11064	12070	14621	16327	
Index of farm price received (1971 = 100)		92.1	100.0	99.2	108.0	142.5	171.7	173.7	177.7	154.4	151.9	195.0	201.0	210.2	209.4	
Imports f/	000/qfl.	112.6	312.9	465.5	637.2	624.5	354.8	136.6	83.9	1.3	549.5	853.3	582.3	731.8	654.5	318.1
FA Farm Purchases	000/qfl.	58.5	102.4	152.9	81.1	144.8	257.5	123.4	258.6	133.3	151.4	166.1	165.7	163.2	163.2	
FA purchases % of Total Production		-	-	-	-	-	-	17.9	8.7	14.7	7.4	14.0	13.2	12.0	10.8	

a/ Production statistics were obtained from Centraloria General published reports. Production is estimated from an annual sample survey of 5000 farmers, including 700 specialized farms.

b/ The area indicated represents the total year for maize. Maize is planted twice per year. The first planting is the principal one.

c/ A metric ton equals 22 quintales. A quintal equals 45.4 kilograms.

d/ Calculated as total annual production x producer price.

e/ Pricing at farm and market level reported separately beginning in 1978; farm gate price used for producer price calculations.

f/ FA is sole importer

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ANNEX TABLE 27
BEAN (FRIJOL) PRODUCTION INDICATORS, 1970 - 1984 a/ b/

Item	Unit	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Total Area	000 Ha.	13.6	12.0	10.3	12.1	16.1	16.6	15.6	14.8	11.8	11.0	9.5	9.3	3.7	10.3	9.8
Area machine planted	000 Ha.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.7	0.7	n.d.	n.d.	n.d.	n.d.	.8	n.d.
Yield c/	qt/Ha.	5.4	6.1	6.7	6.4	5.6	5.6	4.7	6.0	6.1	7.5	5.7	7.9	5.0	7.1	6.5
Production	000 qt.	72.7	72.9	68.8	77.1	89.4	92.5	72.7	88.9	72.0	81.9	54.6	73.7	43.7	72.7	63.9
Support Price	B/qt.	10.0	10.6	10.75	17.5	30.6	22.5	15.0	15.0	15.0	15.0	15.0	20.00	20.00	20.00	25.00
Producer Price Official	B/qt.	11.1	10.89	11.84	13.01	20.64	22.63	14.92	16.22	14.47 ^{e/}	14.82	19.93	18.10	19.64	16.72	-
Consumer Price	B/Ha.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.22	0.22	0.23	0.22	-	-	-	-	-
Value of Production d/	000 B	807	794	815	1003	1845	2093	1085	1442	1042	1214	1088	1334	858	1216	-
Index of farm price received	1971 = 100	101.9	100.0	107.8	118.5	188.0	206.1	136.1	147.7	132.9	136.1	183.0	166.2	180.3	153.5	-
Imports f/	000 qt.	61.6	66.0	50.6	30.8	72.6	48.4	52.8	38.9	46.9	59.6	30.5	21.3	18.3	16.0	14.7
IMA Farm Purchases	000 qt.	2.2	6.6	1.7	8.8	46.9	18.7	16.3	4.9	.9	1.4	-	-	-	-	-
IMA Purchases % Total Prod'n.		3.0	9.1	2.4	11.4	52.5	20.2	22.4	5.5	1.2	1.7	-	-	-	-	-

a/ Production statistics were obtained from Centraloria General published reports. Production is estimated from an annual sample survey of 5,000 farmers, including 700 specialized farms.

b/ Copmas (frijol de buena) represent about 75 per cent of total bean production. The remainder are frijoles chiricanos.

c/ A metric ton equals 22 quintales. A quintal equals 45.4 kilograms.

d/ Calculated as total annual production x producer price.

e/ Pricing at farm and market level reported separately beginning in 1978; farm gate price used for producer price calculations from 1978 to present.

f/ IMA is sole importer.

Source: Centraloria General de la República and IMA.

ANNEX TABLE 2B
SUGAR CANE PRODUCTION INDICATORS, 1970 - 1984 ^{a/}

Item	Unit	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Total Area	000 Ha.	24.1	28.4	29.5	31.2	34.5	41.3	52.3	57.6	51.0	49.8	54.1	52.8	50.6	47.2	43.9
Yield	MT/Ha. ^{b/}	42.2	41.7	45.8	45.9	50.0	46.6	45.8	47.8	51.5	47.9	36.1	49.7	41.4	45.2	41.5
Production	000 MT	1015.3	1184.3	1353.7	1433.2	1722.7	1924.6	2396.3	2756.9	2626.5	2387.0	2062.2	2590.5	2093.9	2134.6	1820.5
Producer Price: <u>c/</u>	B/MT												39.7	43.7	38.6	46.4
Value of Prod'n	000 B												102759	91581	82292	84533
Index of Farm Price Received	1971 = 100															
Exports	000 MT											130.3	97.1	107.0	120.0	126.9
Exports-Value	000 B						49,429	26,427	21,880	20,359	26,134	65,810	52,611	23,677	41,309	33302
IBW Purchases	000 MT	1.5	2.1	1.0	1.4	2.8	1.8	.9	.9	.4	.9	-	-	-	-	-
IBW Purchases % Total Prod'n.		.1	.1	.1	.1	.1	.1	-	-	-	-	-	-	-	-	-

^{a/} Production statistics were obtained from Centraloria General published reports. Sample survey size not specified.

^{b/} A metric ton equals 22 quintales. A quintal equals 45.4 kilograms.

^{c/} Official statistics not collected

Source: Centraloria General de la Republica and IBW.

ANNEX TABLE 29
POTATO PRODUCTION INDICATORS, 1970 - 1984 a/ b/

Item	Unit	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Total Area	Hectares	553.0	n.d	n.d	n.d	n.d	n.d	871.0	971.0	746.0	853.0	1273	1138	982	944	943
Yield	qt/ha. c/	249.0	n.d	n.d	n.d	n.d	n.d	279.3	245.2	273.9	305.4	288.0	378.0	369.0	351.0	357.0
Production	000 qt	138.0	264.5	284.9	276.5	361.0	192.0	243.3	238.1	204.3	260.5	366.0	430.4	381.8	360.9	338.8
Support Price	B/qt	n.d	n.d	7.5	8.25	10.38	11.0	11.4	14.0	14.0	14.5	18.50	18.50	18.50	a/	a/
Producer Price d/	B/qt	6.87	6.74	7.22	7.79	8.92	9.82	10.28	12.28	11.90	14.27	19.75	18.92	16.81	20.54	-
Official Consumer Price	B/qt	n.d	n.d	n.d	12.0	16.0	16.0	17.0	19.0	19.0	23.0	25.0	25.0	25.0	50.0	40.0
Value of Production e/	000 B	948	1783	2057	2154	3220	1885	2501	2924	2431	3717	7228	8143	6418	7413	
Index of farm price received	1971 = 100	101.9	100.0	107.1	115.6	132.3	145.7	152.5	182.2	176.6	211.7	293.0	280.7	249.9	304.7	-
Imports f/	000 qt	-	-	-	-	-	-	-	-	-	.2	4.3	47.0	17.5	4.4	-
IMA Farm Purchases	000 qt	12.0	5.2	10.2	10.2	57.1	26.6	18.7	30.2	9.6	2.5	5.3	13.7	26.1	1.8	0.7
IMA Purchases	% Total Prod'n	8.7	2.0	3.6	3.7	15.8	13.9	7.7	12.7	4.7	1.0	1.4	3.2	6.8	.5	.2

a/ Freed of domestic producer price controls by Resolution of MIDA No. AIP-27, March, 1983.

b/ Production statistics were obtained from Contraloría General published reports through 1979 using area frame sample surveys. Since 1980 the data source is IMA in which a complete enumeration of the some 210 producers is taken.

c/ A metric ton equals 22 quintales. A quintal equals 45.4 kilograms.

d/ Price in the marketplace, not at farm gate. Farm price data not collected after 1979.

e/ Calculated as total annual production x producer price.

f/ IMA is sole importer.

ANNEX TABLE 30
INDUSTRIAL TOWARD PRODUCTION INDICATORS, 1970 - 1984 ^{a/}

Item	Unit	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Total Area	Hectares	2237.0	n.d.	n.d.	n.d.	n.d.	n.d.	1091.0	1060.0	1139.0	1193.0	878	746	722	528	916
Yield	qt/ha. ^{b/}	181.0	n.d.	n.d.	n.d.	n.d.	n.d.	383.0	421.0	352.0	562.0	580.9	536	467	599.6	571.7
Production	000 qt	404.8	530.2	594.0	653.1	566.0	660.6	419.1	446.4	560.6	671.0	594.4	769.5	442.2	672.4	524.0
Producer Price ^{c/}	B/qt	11.0	11.0	12.0	13.0	14.0	17.0	17.0	19.0	13.0	18.0 ^{e/}	22.0	21.0	20.0	15.0	
Consumer Price	B/qt	14.0	16.0	17.0	18.0	22.0	26.0	26.0	29.0	29.0	36.0	-	-	-	-	-
Value of Production ^{d/}	000 B	4453	5832	7128	8490	7934	11332	7108	8482	7288	12078	13077	16100	8844	10086	
Index of farm price received	1971 = 100	100.0	100.0	103.6	110.7	153.6	171.0	153.6	171.0	175.0	214.3	227.3	272.7	281.8	263.6	
Imports ^{f/}	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

^{a/} Production statistics were obtained from Contraloría General published reports. Their means for data acquisition is unknown.

^{b/} A metric ton equals 22 quintales. A quintal equals 45.4 kilograms.

^{c/} Price at the farmgate.

^{d/} Calculated as total annual production x producer price.

^{e/} Pricing at farm and market level reported separately beginning in 1978; farm gate price used for producer price calculations from 1978 to present.

^{f/} Import of industrial tonates prohibited.

Source: Contraloría General de la República.

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ANNEX TABLE 31
ONION PRODUCTION INDICATORS, 1970 - 1984 ^{a/}

Item	Unit	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
Total Area	Hectares	484.0	n.d	339.0	283.0	267.0	280.0	240.0	246.0	184.0	204.0	234.0	243.0	262.0	336.7	363
Yield	qt/Ha. ^{b/}	155.6	n.d	168.0	166.0	276.0	291.0	315.0	302.0	343.0	329.0	367.0	364.0	303.0	354.0	363
Production	000 qt	77.2	70.5	57.1	46.9	73.8	81.4	75.5	74.3	63.1	67.1	85.9	86.0	100.4	119.3	131
Support Price	B/qt	7.5	7.5	8.0	9.3	11.5	13.2	13.5	13.0	13.0	13.0	16.0	17.0	18.5	19.5	19
Producer Price ^{c/}	B/qt	n.d	n.d	n.d	n.d	n.d	n.d	n.d	n.d	14.0	10.0	19.0	20.0	16.0	12.0	
Consumer Price	B/qt	n.d	n.d	n.d	14.0	16.0	18.0	18.0	18.0	18.0	18.0	23.0	23.0	23.0	28.0	30
Value of Production ^{d/}	000 B	579	529	457	438	849	1074	1019	966	883	671	1632	1720	1606	1397	
Index of farm price received 1971 = 100		100.0	100.0	107.1	115.6	132.3	145.7	152.5	182.2	186.7	133.3	253.3	266.7	213.3	160.0	
Imports ^{e/}	000 qt	81.4	51.0	50.6	82.8	65.7	61.5	59.4	75.8	38.7	115.2	83.5	110.0	115.9	104.6	115.
IMA Farm Purchases	000 qt	33.6	45.3	21.9	31.8	61.1	40.1	19.7	19.9	9.8	19.6	23.3	28.2	30.0	17.8	29.
IMA Purchases % total Prod'n		43.5	64.3	38.4	67.8	82.8	49.3	26.1	26.8	15.5	29.2	27.1	32.8	29.9	14.9	22.

^{a/} Production statistics were obtained from Cantaloría General published reports through 1979 using area frame sample surveys. Since 1980 the data source is IMA in which a complete enumeration of nearly 300 producers is taken.

^{b/} A metric ton equals 22 quintales. A quintal equals 45.4 kilograms.

^{c/} No producer price data available prior to 1978. Farm gate price used for producer price from 1978 to present.

^{d/} Calculated as total annual production x producer price. From 1970 through 1977 the producer support price is used as the producer price.

^{e/} IMA is the sole importer.

ANNEX TABLE 32
CATTLE PRODUCTION INDICATORS, 1970 - 1984

Item	Unit	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Total Numbers	000 Head	1187.7	1299.9	1281.9	1312.2	1442.8	1547.9	1661.2	1871.9	1895.0	1436.7	1404.9	1426.0	1456.3	1457.8	1451.8	1453.1
Marketed	000 Head	173.2	181.6	201.8	194.8	206.6	222.4	241.1	239.7	216.3	196.5	214.9	238.7	236.6	276.5	284.1	295.0
Meat Prod'n	000 MT	34.4	39.6	44.6	39.7	42.7	45.9	45.2	45.3	41.4	39.6	41.0	45.4	55.1	51.8	53.5	55.1
Official Producer Price	B/lb. live wt.	.145	.145	.145	.212	.315	.25	.25	.25	.30	.40	.40	.40	.40	.40	.40	.40
Value/ha ^{a/}		102	107	113	152	178.6	182	165	166.6	202.5	284	269.2	268.4	281	264.3	265.7	
Official Consumer Price	B/lb	--	--	--	--	1.15	1.25	1.25	1.25	1.25	1.55	1.55	1.55	1.55	1.55	1.55	1.55
Value of Production	000B	17666	20180	22803	29609	36699	40477	39781	39934	43800	55006	57851	64067	77725	73079	75485	
Export Fresh/ Frozen beef	MT	2,138	1,200	2,428	986	1,208	1,219	3,380	1,051	276	646	1,348	2,227	4,492	3,662	670	
Export beef c/	No. Head	14,571	8,178	16,547	6,789	8,233	8,308	21,808	7,164	1,888	4,403	9,187	15,181	30,613	24,958	4,567	
Milk Prod'n.	million Hrs.	71.0	71.8	69.7	63.5	61.7	70.3	72.8	83.4	90.6	90.7	91.2	89.6	89.8	94.4	84.9	
Value of Production	000 B	8520	8896	8364	8890	9840	11951	13104	15016	15102	14512	15504	15232	15266	18980	19527	
Milk Import	million Hrs.	71.0	71.8	69.7	63.5	61.7	70.3	72.8	83.4	90.6	90.7	91.2	89.6	89.8	94.4	84.9	
Consumer Price (Grade A)	B/quart.	-	-	-	-	-	-	0.36	0.36	0.36	0.36	0.42	0.46	0.46	0.53	0.53	0.53
Producer Support price (Grade A)	B/liter	-	0.16	0.16	0.18	0.21	0.22	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Producer Price	B/ltr	.12	.12	.12	.14	.16	.17	.18	.19	.17	.16	.17	.17	.17	.20	.23	

a/ Estimated as meat production - number of head x 1.6 (conversion rate) x producer price/psmd.

b/ Estimated as value/head at farm gate x number of head marketed.

c/ Estimated using conversion factor of 323.4 lbs/ounces used in calculation of the number of head exported.

Source: Estadística y Censos, Contraloría General de la República,
Plan Alimentario Básico, IEPIS/MIDA, Panama, 1984.

ANNEX TABLE 33
 HOG PRODUCTION INDICATORS, 1970 - 1984

Item	Unit	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Total Numbers	(000) Head	195.3	151.7	153.9	187.5	175.0	166.1	179.0	201.7	234.0	189.9	211.5	217.6	205.7	197.0	195.0	207.6
Number Marketed	(000) Head	81.4	70.2	65.0	82.3	85.6	87.2	85.9	96.4	103.7	105.1	120.7	32.5	130.0	123.1	143.8	155.8
Prodn. of Meat	(000) MT	3.6	3.1	2.9	3.6	3.8	3.9	3.8	4.3	4.6	4.7	8.0	8.8	8.6	8.1		
Producer Price																	
Value of Prodn.	(000)B																
Pork Imported	(000) MT	.2	.1	.3	.2	.2	.2	-	.2	.3	.2	.3	.3	.2	.3	.4	

Source: Contraloría General de la República and IFA.

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ANNEX TABLE 34
 POULTRY PRODUCTION INDICATORS, 1970 - 1984

Item	Unit	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984 (P)
Total Numbers	000 Head	2929.0	3794.0	3699.0	3706.0	3802.0	3704.0	4277.0	4422.0	4872.0	4913.0	4706.8	6004.4	4544.6	5702.0	6004.0
Laying hens	000 Head	n.d.	n.d.	n.d.	n.d.	926.7	n.d.	1130.9	n.d.	1219.0	1113.6	1390.4	1389.6	1195.1	1778.7	n.d.
Prod'n of Meat	000 MF	n.d.	n.d.	n.d.	n.d.	n.d.	7.8	n.d.	n.d.	11.5	n.d.	19.0	21.7	20.1	22.2	20.8
Value of Prod'n	000 B	9372	n.d.	n.d.	n.d.	n.d.	12037	n.d.	n.d.	17747	n.d.	31834	44969	42097	45027	n.d.
Prod'n of Eggs	million	133.6	184.8	227.7	253.2	215.6	239.3	279.2	256.4	307.7	295.4	283.9	293.8	347.4	365.9	224.7
Producer Price Live Birds	B/lb.	n.d.	n.d.	n.d.	n.d.	.47	.48	.49	.49	.49	.55	.59	.62	.62	.62	.66
Eggs	dozen	.54	.56	.59	.60	.70	.72	.72	.72	.84	.91	.96	.96	.96	.96	.96
Value of Egg Prod'n	000 B	6012	8624	11195	12660	12397	14358	16519	15598	16923	16423	18217	21545	24318	24393	17976

Source: Contraloría General de la República and IMA, except for producer price of live birds and eggs which were provided by GILHO MELO, S.A.

ANEXA TABLE 33
 COST OF PRODUCTION CALCULATIONS - 1985
 1 HECTARE OF IRRIGATED RICE (*Oriza sativa*)

Description	Unit Price	Rate/Ha.	Cost
<u>Custom Machine Services</u>			
Plow 81-90 HP	17.50	1.5 hrs.	43.75
Harrow 81-90 HP	20.00	3.0 hrs.	60.00
Plant & fertilize	18.50	1.0 hr.	18.50
Herbicide & insecticide application	12.00	1 time	12.00
Fungicide application	12.00	2 times	24.00
Combine	60.00	1.5 hrs.	90.00
Land leveling	17.00	0.25 hrs.	4.25
Marking and diking	17.00		17.00
SUB-TOTAL			394.50 (36%)
<u>Materials</u>			
Seed	28.50	2.75 qq	78.38
Complete fertilizer (15-30-8)	17.04	4.0 qq	68.16
Urea 46% N	13.50	3.0 qq	40.50
Herbicide			
propanil	10.27	3.0 gal.	30.81
hormonal 2-4-D	1.90	1.0 lt.	1.90
Insecticide			
Decis	10.10	250 cc	10.10
Sistemín	10.70	1.0 lt.	10.70
Fungicide			
Mancozeb	4.85	4 kg.	19.40
Benlaty	12.04	0.75 lbs.	9.03
SUB-TOTAL			263.98 (33%)
<u>Labor</u>			
Seed & fertilize	5.00	0.5 day	2.50
Apply urea	5.00	1.0 day	5.00
Apply herbicide & insecticide	5.00	0.5 day	2.50
Apply fungicide	5.00	0.5 day	2.50
Manual weeding	5.00	2.0 days	10.00
Irrigate	5.00	4.0 days	20.00
Harvest	5.00	2.0 days	10.00
SUB-TOTAL			52.50 (6%)
<u>Other Costs</u>			
Transport of inputs and grain	0.70	107.5 qq.	75.25
Sacks, twine & needles	0.30	100 sacks	30.00
Crop insurance	21.00	1 ha.	21.00
Unforeseen expenses	5%	-	37.11
Interest	9%	7 mo.	40.35
SUB-TOTAL			203.72 (25%)
GRAND-TOTAL			819.69

Estimated yield = 100 qq/ha.
 Growth Period = 120 days
 Farm Price = B/.11.00
 Gross Income = \$1100
 Return above total cost = \$1100 - 819.69 = 280.31

Average relative returns = $\frac{\text{return above total costs}}{\text{total costs}} = \frac{280.31}{819.69} = 34\%$

Unit Production cost:

- where all cash costs are covered = $\frac{819.69}{10,000} = 8.2$ cent/lb.

- where cash costs & 34% return is covered = $\frac{1,100}{10,000} = 11$ cents/lb.

Note: Land rent not included in production cost calculations.

ANNEX TABLE 36
 COST OF PRODUCTION CALCULATIONS - 1985
 FOR 1 HECTARE OF SEMI - MECHANIZED MAIZ (Zea-mays)

<u>Description</u>	<u>Unit Price</u>	<u>Rate/Ha.</u>	<u>Cost</u>
<u>Custom Machine Services</u>			
Plow 71-80 HP	15.50	2.5 hrs.	38.75
Harrow 71-80 HP	18.00	3.0 hrs.	54.00
Herbicide application 71-80 HP	16.75	0.5 hrs.	8.38
Plant & fertilize	17.00	1.0 hrs.	17.00
Shelling	0.35	75 qq.	26.00
Sub-Total			144.13 (23%)
<u>Materials</u>			
Hybrid seed	1.10	40.0 lbs.	44.00
Complete fertilizer 10-30-10	19.00	5.0 qq.	95.00
Urea 46 % N	13.50	2.5 qq.	33.75
Herbicide - Gasaprin 80	6.50	2.5 kg.	16.25
Insecticide - Decis	10.10	250 cc.	10.10
Sub-Total			199.10 (32%)
<u>Labor</u>			
Plant & fertilize	5.00	0.5 day	2.50
Apply herbicide	5.00	0.5 day	2.50
Apply insecticide	5.00	1.0 day	5.00
Apply urea	5.00	1.0 day	5.00
Harvest	5.00	11.0 day	55.00
Sub-Total			70.00 (11%)
<u>Other costs</u>			
Transport of inputs & grain	0.70	83 qq.	53.00
Sacks, twine & needles	-	-	20.00
Crop insurance	23.10	1 ha.	23.10
Land Rent	50.00	1 ha.	50.00
Unforeseen expenses	5%		28.22
Interest	9%	7 mo.	30.68
Sub-Total			210.00 (34%)
GRAND TOTAL			623.23

Estimated yield = 75 qq/ha.
 Growth period = 120 days
 Farm price = B/.10.50/qq.
 Gross Income = 75 X 10.50 = \$787.50
 Return Above Total Cost = \$787.50 - 623.23 = \$164.27

Average relative returns = $\frac{\text{return above total costs}}{\text{total costs}} = \frac{164.27}{623.23} = 26\%$

Unit production cost - where all cash costs are covered = $\frac{623.23}{7500} = 8.3 \text{ ¢ lb.}$
 - where cash costs & 26% returns are covered = $\frac{787.50}{7500} = 10.5 \text{ ¢ lb.}$

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ANNEX TABLE 37
 COST OF PRODUCTION CALCULATIONS-1985
 1 HECTARE OF MAIZ (ZEA MAIZ) PRODUCED WITH TRADITIONAL
 LABOR INTENSIVE METHOD INCLUDING STICK PLANTING (A CHUZO)

<u>Description</u>	<u>Unit Price</u>	<u>Rate</u>	<u>Cost</u>
<u>Preplanting</u>			
Brush clearing	5.00	8 days	40.00
Cut branches for firewood	5.00	2 days	10.00
Sub-Total			<u>50.00</u> (14%)
<u>Materials</u>			
Hybrid seed (T-7423 X 7728)	0.50	40 lbs.	20.00
Complete fertilizer (15-30-8)	17.04	3 qq.	51.12
Herbicide Gramaxone (2 appl.)	5.02	2 lts.	10.04
Insecticide - Decis	10.10	2.50 cc.	10.10
Sub-Total			<u>91.26</u> (26%)
<u>Labor</u>			
Plant & fertilize by cruzo	5.00/day	9 days	45.00
Herbicide application (2 appl.)	5.00/day	6 days	30.00
Insecticide application	5.00/day	3 days	15.00
harvest	5.00/day	3 days	15.00
Sub-Total			<u>130.00</u> (38%)
<u>Other Costs</u>			
Transport of inputs	-	-	5.00
Transport of harvested grain	0.70	40.00	28.00
Sacks, twine & needles	5.00	-	15.74
Interest	9.00	7 mo.	17.11
Sub-Total			<u>75.35</u> (22%)
Grand-Total			<u>347.61</u>

Estimated Yield	=	40 qq.
Grown Period	=	120 days
Farm Price	=	B/.10.50/qq
Gross Income	=	\$420
Return above total cost	=	\$72.39
Average relative return	=	$\frac{\text{return above total costs}}{\text{total costs}} = \frac{72.39}{347.61} = 20.8\%$

Unit production cost - where all cash costs are paid (excl. family labor) = $\frac{167.61}{4000} = 4.1 \text{ ¢/lb.}$
 - where cash costs + unpaid family labor are paid = $\frac{347.61}{4000} = 8.7 \text{ ¢/lb.}$
 - where cash costs + family labor + 20.8% returns are paid = $\frac{420}{4000} = 10.5 \text{ ¢/lb.}$

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ANNEX TABLE 38
 COST OF PRODUCTION CALCULATIONS- 1985
 FOR 1 HECTARE OF MECHANIZED SORGHUM

<u>Description</u>	<u>Unit Price</u>	<u>Rate</u>	<u>Cost</u>
<u>Custom Machine Services</u>			
Soil preparation	18	5 hrs.	90.00
Plant and fertilize	18	1 hr.	18.00
Herbicide application	17	1 hr.	17.00
Aerial fumigation	12	1 hr.	12.00
Combine	57	1 hr.	57.00
Sub-Total			<u>194.00</u> (36%)
<u>Material</u>			
Seed	0.80	35 lbs.	28.00
Complete fertilizer	15.00	4 qq.	60.00
Urea - 46% N	15.00	2 qq.	30.00
Herbicide gasaprin	8.00	2.5 qq.	20.00
Insecticide (2 applic.)	11.00	2 liters	22.00
Sub-Total			<u>160.00</u> (29%)
<u>Labor</u>			
Plant and fertilize	5.00/day	0.5 day	2.50
Herbicide application	5.00/day	.5 day	2.50
Insecticide application	5.00/day	.5 day	2.50
Urea application	5.00/day	1.0 day	5.00
Harvest	5.00/day	2.0 day	10.00
Sub-Total			<u>22.50</u> (4%)
<u>Other costs</u>			
Transport of inputs			5.00
Transport of harvested grain	0.70	70 qqs.	49.00
Sacks, twine & needles	-		20.00
Crop insurance	-		29.40
Land rent	-		40.00
Unforeseen expenses	5%		26.00
Sub-Total			<u>109.40</u> (31%)
Grand Total			545.90

Estimated Yield = 70 qq/ha.
 Farm price = B/.9.00
 Gross income = \$630.00
 Return above total cost = \$630 - 545.90 = \$84.10

Average relative return = $\frac{\text{return above total cost}}{\text{total cost}} = \frac{\$84.10}{545.90} = 15\%$

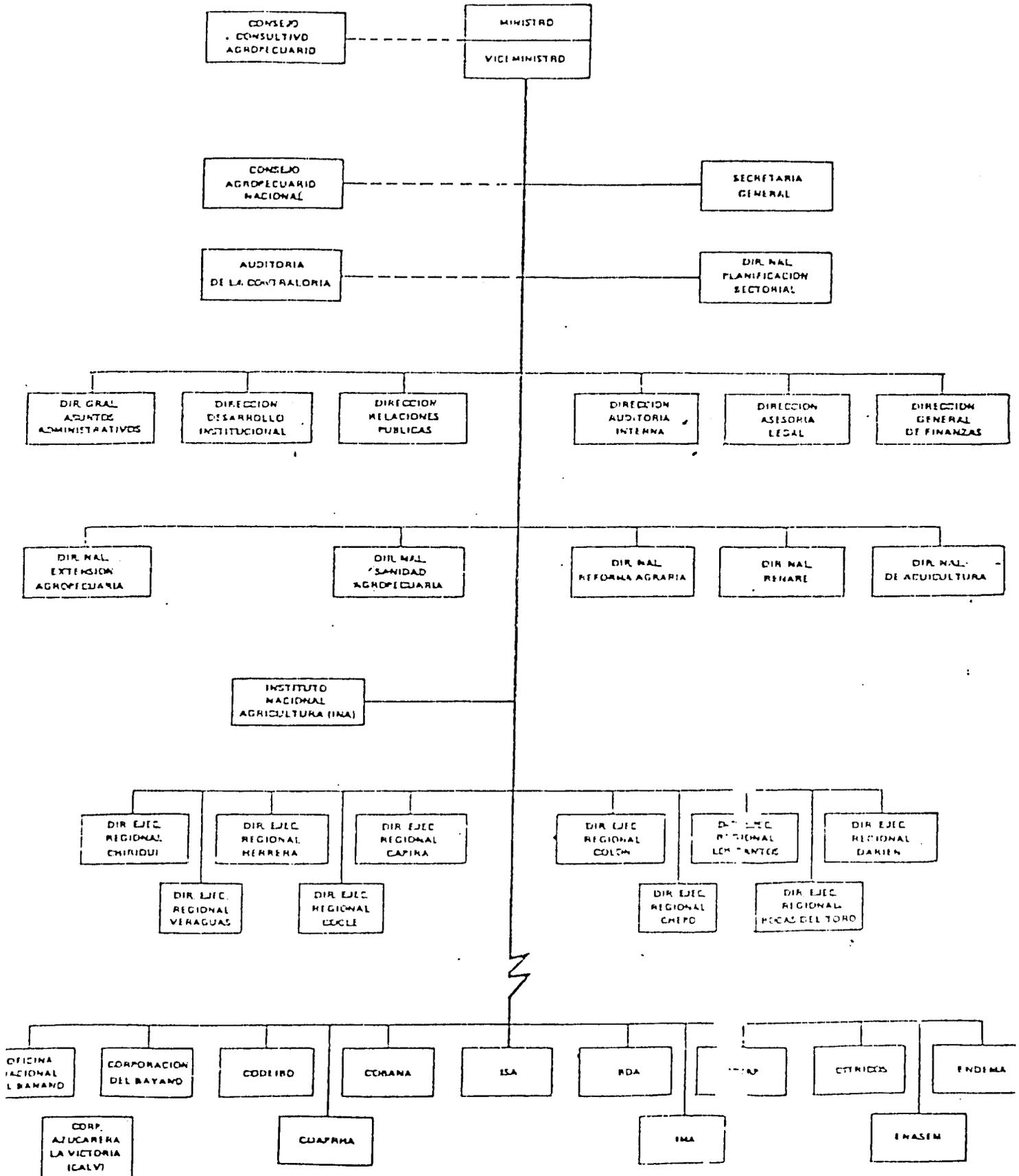
Unit production cost -- where all cash costs are covered = $\frac{545.90}{7000} = 7.8 \text{ ¢ lb.}$

- where cash costs + 15% returns are covered = $\frac{630}{7000} = 9 \text{ ¢ lb.}$

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ANNEX TABLE 39

ORGANIZATIONAL CHART FOR MINISTRY OF AGRICULTURAL DEVELOPMENT (MIDA),
FEBRUARY 1984



ANNEX TABLE 41
 REAL PRODUCER PRICES OF MAJOR AGRICULTURAL PRODUCTS IN PANAMA: 1970 - 1983; 1980 = 100

Year	Consumer	Banana \$/Cluster	Rice \$/lb.	Maiz \$/lb.	Sorghum \$/lb.	Beef \$/lb.	Chicken \$/lb.	Eggs \$/doz.	Milk \$/lb.	Potatoes \$/lb.	Indust.	Coffee \$/lb.	Tobacco \$/lb.
	Price Index 1980= 100										Tomatoes \$/lb.		
1970	50.8	-	.111	.087	-	.324	-	-	.137	-	-	-	-
1971	51.8	1.51	.113	.092	.179	.318	-	-	.135	.130	.212	6.78	.976
1972	54.6	1.45	.107	.087	.160	.357	-	-	.128	.132	.220	6.24	.901
1973	58.3	1.34	.101	.086	.149	.336	-	-	.140	.134	.223	6.12	.966
1974	68.1	1.26	.102	.098	.139	.338	.562	.749	.137	.131	.206	7.21	1.100
1975	71.8	1.33	.124	.112	.152	.334	.535	.711	.138	.137	.237	6.68	1.010
1976	74.7	1.34	.121	.109	.142	.328	.495	.723	.140	.138	.228	6.57	.952
1977	78.1	1.42	.122	.104	.132	.320	.521	.691	.141	.157	.243	7.43	.885
1978	81.4	1.70	.120	.112	.123	.369	.500	.903	.150	.146	.245	8.88	1.010
1979	87.9	1.52	.112	.107	.118	.427	.583	.981	.139	.162	.273	8.58	.820
1980	100.0	1.52	.109	.102	.104	.400	.590	.960	.128	.198	.250	7.97	.764
1981	107.3	1.51	.131	.105	.098	.373	.607	.895	.130	.176	.280	7.42	.885
1982	111.9	1.54	.119	.109	.077	.357	.582	.858	.119	.150	.262	6.74	1.020
1983	114.3	1.46	.120	.115	.072	.350	1.030	.585	.840	.180	.249	7.30	1.050

Source: 1970-81, Situación Económica "Precios Recibidos por el Productor Agropecuario", 1981; 1982-83, Unpublished data from Situación Económica, Contraloría General. Producer prices on chickens and eggs obtained from Grupo Melo, S.A.

ANNEX TABLE 42
 REAL PRODUCER PRICES OF MAJOR AGRICULTURAL
 PRODUCTS IN THE U.S. : 1970 - 1983; 1980 = 100

Year	Consumer Price Index 1980 = 100	Miz c/lb.	Sorghum c/lb.	Rice c/lb.	Beef c/lb.	Chicken c/lb.	Eggs c/doz.	Milk c/lb.	Potatoes c/lb.	Tomatoes c/lb.	Sugar Cane \$/ton.	Tobacco \$/ton.
1970	47.1	.050	.043	.110	.574	.289	.830	.096	.047	.036	29.49	1.55
1971	49.1	.039	.038	.109	.598	.281	.640	.095	.039	.036	24.95	1.60
1972	50.8	.055	.048	.132	.653	.278	.603	.094	.059	.035	25.03	1.63
1973	54.0	.084	.071	.256	.778	.444	.972	.104	.091	.039	36.81	1.67
1974	59.8	.090	.083	.187	.647	.359	.890	.119	.067	.054	38.01	1.81
1975	65.3	.069	.064	.128	.604	.403	.802	.113	.069	.048	30.62	1.57
1976	69.9	.055	.052	.100	.513	.337	.834	.119	.051	.041	19.60	1.61
1977	73.6	.049	.044	.129	.499	.321	.755	.115	.048	.044	25.13	1.61
1978	79.2	.051	.045	.103	.606	.332	.659	.116	.043	.041	24.49	1.67
1979	88.1	.051	.047	.119	.716	.295	.662	.121	.039	.038	29.51	1.60
1980	100.0	.056	.053	.128	.622	.277	.563	.115	.066	.031	31.50	1.52
1981	110.4	.040	.038	.087	.542	.258	.572	.111	.049	.029	22.37	1.50
1982	115.5	.037	.035	.074	.494	.248	.545	.120	.039	.031	22.94	1.35
1983	119.9	.045	.041	.070	.465	.248	.467	.115	.047	.028		1.22

Source: 1970 - 81: USDA, Agricultural Statistics; 1982-83: Agricultural Prices.

ANNEX TABLE 43
 AGRICULTURAL CREDIT IN PANAMA FROM
 PUBLIC AND PRIVATE SOURCES, 1975 - 1984
 (Thousands of Dollars)

YEAR	OFFICIAL BANKS					PRIVATE BANKS			Grand Total		
	TOTAL		Crops	Livestock	Fishing	TOTAL		Crops		Livestock	Fishing
	\$	%	\$	\$	\$	\$	%	\$		\$	\$
1975	23,042	15.4	5,677	17,355	100	126,286	84.6	69,232	48,450	8,554	149,328
1980	57,965	31.6	27,447	30,518	-0-	125,223	68.4	70,254	44,418	10,551	183,188
1983	33,440	13.4	15,614	16,181	1,642	216,993	86.6	139,489	61,709	15,715	250,433
1984	40,219	14.3	18,472	19,686	2,061	240,715	85.7	139,087	74,458	27,170	280,934

Source: National Banking Commission / June 27, 1985 and personal communication with Tomas Ugarte.

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ANNEX TABLE 44
 MARKETING COST FOR MILLING & PROCESSING
100 Pounds of Finished Rice, 1983 - 84

156 Pounds of Rice in the hull at \$14.00/lbs.		\$21.84
Milling Costs (remove 40.6 lbs. hulls, cracks & middlings)		
Cleaning and Drying	0.904	
Storage	1.710	
Hulling	1.103	
Administrative Cost	0.799	
Transport	<u>0.600</u>	
	5.11	<u>5.11</u>
		26.95
Value of germ - 14 pounds at 8 cents/lb.		(1.12)
Arrocillo 1.4 pounds at 8 cents/lb.		<u>(0.11)</u>
Cost of 100 Hulled Rice		25.72
Return to Miller (7%)		<u>1.80</u>
Sale Price to Wholesaler		27.52
Return to Wholesaler (7%)		<u>1.93</u>
Sale Price to Retailer		29.45
Return to Retailer (8.66%)		<u>2.55</u>
Fixed Retail Price to the Consumer		32.00

Source: Selected Millers in Cocle Province, Panama.

TABLE 46. EXTERNAL DONOR SUPPORT TO AGRICULTURE PROJECTS IN EXECUTION, 1986.
(MILLIONS OF DOLLARS)

DESCRIPTION	SOURCE	YEARS	PERIOD OF EXECUTION	AMOUNT			EXTENDED TO 1985	PLANNED EXPENDITURES					
				EXTERNAL	INTERNAL	TOTAL		1985	1986	1987	1988	1989	1990
<u>POLICY</u>													
AGR. POLICY FORM. /MGT.	USAID	5	7/84 - 9/89	5.0	3.05	8.05	0	.8	1.4	1.4	1.4	1.4	1.4
<u>TECHNOLOGY</u>													
IRRIGATION	BID	5	10/82 - 6/87	8.7	4.7	13.4	6.5	2.3	2.3	2.3			
COFFEE/CACAO	WB	8	1980 - 87	8.4	6.38	14.78							
SEED IMPROVEMENT (HIASIM)	BID	4	7/84 - 1/88	7.0	2.0	9.0	6.4	.9	.9	.9			
TECH DEVELOP (IDIAP)	USAID	8	12/79 - 12/87	7.4	6.0	13.4	2.3	3.7	3.7	3.7			
AGR. COOP. MKING.	USAID	5	7/84 - 7/89	8.2	4.49	12.69	8.2	.9	.9	.9			
PAH OIL, PROIN	WB			10.6	12.6	23.2							
AQUACULTURE	BID	5	5/83 - 2/88	13.2	7.0	20.2	10.5	3.2	3.2	3.2	.9		
ANIMAL HEALTH	BID	5	5/81 - 5/86	9.8	5.3	15.1	5.0						
AGR. TECH. TRANSFER	USAID	5	8/84 - 9/89	7.5	6.3	13.84	6.6						
<u>NATURAL RESOURCES</u>													
WATERSHED MGT.	USAID	5	3/79 - 7/84	10.0	6.8	16.8	1.6	-	-	-	-	-	-
FORESTRY DEVELOP.	UNEP	6	2/80 - 8/85	1.0	3.03	4.03							
<u>OTHER</u>													
RURAL DEVELOP (GJAYMI)	FAO	5	6/84 - 7/89	4.85	2.42	7.27	1.4	1.4	1.4	1.4	1.4	1.4	.27
AGR. CREDIT - V (BWA)	BID	3	6/82 - 12/85	29.5	15.79	45.29	.02						
AGR. CREDIT - VI (BDA)	BID	9	4/85 - 4/89	28.5	15.4	43.9	28.5	3.8	3.8	3.8	3.8	3.8	.2
LIVESTOCK CREDIT	BID	5	4/81 - 3/86	10.4	16.5	16.9	.6						

Annex Table 47. - Monthly Average Wage in Panama
by Sector and Segmentation, August 1985
(Balboas)

C O M P O N E N T	TOTAL	U R B A N			R U R A L			PRIVATE	PUBLIC
		TOTAL	MODERN	INFORMAL	TOTAL	MODERN	TRADITIONAL		
			a/	b/		a/	b/		
SECTOR	317	372	484	289	200	280	168	286	374
AGRICULTURE	176	307	416	264	142	176	139	167	252
MINING	250	266	480	133	243	183	271	236	277
INDUSTRY	291	331	517	278	212	240	201	299	237
SERVICES	294	320	453	244	207	284	181	282	413
CONSTRUCTION	304	358	478	249	231	242	222	305	304
COMMERCE	311	341	647	278	199	326	187	314	227
GOVERNMENT	344	363	365	120	272	272	-	120	345
TRANSPORT	364	403	479	326	245	320	218	338	410
ELECTRICITY	454	521	521	-	294	294	-	-	454
FINANCE	480	509	559	454	294	319	258	519	410
CANAL AREA	735	751	751	-	600	620	-	120	345
<u>TYPE OF WORK</u>									
FARMER	136	210	210	209	126	136	125	135	137
LABORER (casual)	215	230	260	220	196	186	200	211	220
SERVICE WORKER	235	256	293	209	188	224	154	190	254
GENERAL LABOR	273	306	401	290	201	243	197	260	258
SKILLED LABOR	303	338	494	255	238	258	227	246	304
EMPLOYEES	321	332	318	346	243	236	252	337	292
TRANSPORT	327	354	412	308	276	293	267	293	281
SALESPERSON	338	371	450	367	199	130	201	334	206
PROFESSIONAL	541	577	577	-	369	369	-	552	525
MANAGEMENT	640	696	696	-	399	399	-	698	523
<u>EDUCATIONAL LEVEL</u>									
NO SCHOOLING	142	179	246	197	128	131	128		
PRIMARY 1-3 GRADES	165	193	282	209	149	197	137		
PRIMARY 3-6 GRADES	200	226	302	233	170	224	162		
SECONDARY 1-3 GRADES	249	260	330	251	217	260	212		
SECONDARY 3-6 GRADES	350	370	430	303	262	301	224		
UNIVERSITY 1-3 GRADES	445	456	473	425	348	386	244		
UNIVERSITY 3-6 GRADES	736	757	768	665	539	553	354		

a/ Modern segment - comprised of workers receiving specified wage or salary remuneration.

b/ Informal and traditional segments - comprised of workers who are self-employed and unpaid family members.

Source: Oficina Internacional del Trabajo, August 1986.

Annex Table 4B. Schedule of Planned Tariff Reductions
for Agricultural and Industrial Commodities,
1986 - 1991

Tariff Schedule	Commodities
Reduce to 90% Ad-Valorem over CIF <u>1/</u>	Pork products (bacon, ham, lard), tomatoes, canned products (cooked beef, cooked ham, ham, bacon, prepared hams, tomatoes), coffee, tomato paste/soup/sauce, prepared chicken products, beans/peas, beer, rum, cigarettes, lumber products, building materials (blocks, sheet metal, floor and wall tile)
Reduce to 60% Ad-Valorem over CIF <u>1/</u>	Meat/meat products, fish/crustacean/mollusks, milk/milk products, eggs, natural honey, edible animal products, fruit/fruit rinds/melons, coffee/tea/yerba mate, small grain flour, prepared meat/ fish/crustacean/mollusk products, sugar/confectionary products, cacao/prepared chocolate products, prepared flour products, prepared fruit/vegetable products, prepared diverse food products, prepared beverages/vinegars, manufactured products of wood/cement/metal, glass/glass products, cast iron/steel products, copper, nickel, aluminum, pharmaceuticals, tints/dyes/coloring products, oils for perfumes/cosmetics, soaps/waxes, explosives/inflammables, paper/cartons/paper products, writing/graphic art materials, rugs/tapestries, cording/padding/textiles, chemical products, resins/plastics, leather products, wax/wood products, clothing/textile products, shoes, hats, umbrellas, animal feeds, mineral oil/waxes, zinc, metal products, electric/electronic equipment, vehicles/tractors, furniture, brushes/brushes

1/ Reduce in 5 equal installments, beginning August 1, 1986, over a 5 year period. Subsequent adjustments will occur Nov. 1, 1987, Feb. 1, 1989, May 1, 1990 and Aug. 1, 1991.