REPUBLIC OF COLOMBIA

MINISTRY OF AGRICULTURE

COLOMBIAN AGRICULTURAL INSTITUTE ICA

THE ROLE OF ICA IN THE COLOMBIAN AGRICULTURAL SECTOR

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I. DIAGNOSTIC OF COLOMBIAN AGRICULTURE

1. INTRODUCTION

The section provides a diagnostic of the current situation of Colombian Agriculture and the major features of its development. A perspective on the relative importance of agriculture in the Colombian economy will be provided. Agrarian structure will also be examined, including a discussion of each major subsector, characterised by its principal crop destinations, structural features and development in recent decades. This information is intended to provide the background upon which governmental and ICA objectives and activities are based.

2. RELATIONSHIP BETWEEN AGRICULTURE AND THE ENTIRE ECONOMY

The agricultural sector is the single largest in the Colombian economy, providing about 26% of the gross domestic product, 35% of total employment, 18% of total personal income and 55% of exports in 1975. However it cannot be termed the dominant sector of the economy, in that a substantial part

of the finance, commercial and governmental sectors are based fundamentally on the industrial sector. In addition, the relative importance of agriculture has been declining in recent decades.

(Figure 1-)

Although the agricultural sector has been growing at a rate of approximately 3.4% annually since 1950,and at an increasing rate, it is not keeping pace with other sectors of the economy, which have had an average annual growth rate of 5.7%. The relative share of agriculture in the gross domestic product has declined 12% since 1950. Agricultural exports have been increasing at an annual rate of 1.6% since 1950, but represent a declining share of total exports. Agricultural employment has been increasing at a rate of 1.4% since 1950, but its share in total employment declined about 20% between 1953 and 1973.

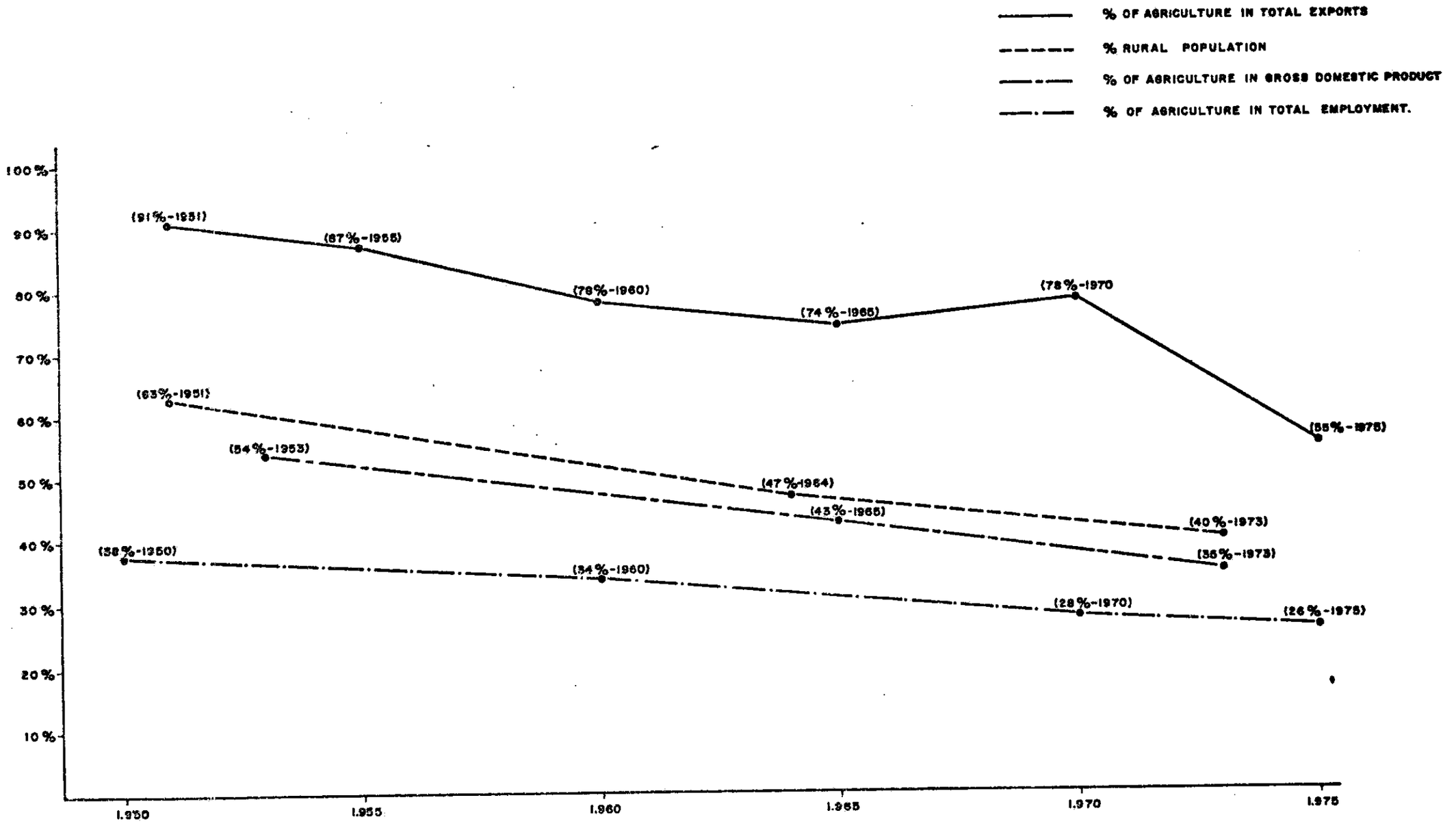
The agricultural growth is only slightly more than the annual population growth rate of 3.2%, implying an essential stagnant food and fiber supply per capita.

However, both income and price elasticity for Colombia's principal agricultural products have traditionally been quite low, resulting in generally adequate food supplies.

FIGURE 1

RELATIVE IMPORTANCE OF AGRICULTURE IN THE COLOMBIAN ECONOMY

SOURCES: DEPARTAMENTO ADMINISTRATIVO NACIONAL DE ESTADISTICA (DANE). CENSOS DE POBLACION DE 1.951, 1.964 Y 1.973 AND - BANCO DE LA REPUBLICA, CUENTAS NACIONALES.



However, it is believed that in recent years food supplies have not kept pace with increased food demand, substantially contributing to Colombia's inflation rate, now in excess of 25%.

The declining importance of the agricultural sector, combined with increased urban employment opportunities and low rural incomes have caused a drastic change in demographic structure in the last 25 years. Urban population has been increasing at an annual rate of 5.4%, and rural population at a rate of 1.3%. Urban population has more than tripled since 1950, resulting in considerable social stress, difficulties in providing basic urban services and increasing urban unemployment.

Rural labor productivity has increased at a rate of approximately 2.0% per year. However, population, migration and income projections for the year 1985, imply that agricultural employment and labor productivity must both increase at a faster rate if the development process is not to be hindered. The World Bank estimates that a 5.5% annual agricultural growth rate should be feasible, and adequate meet demand growth, based on the assumptions of a 2.8% population rate, a 7% annual increase in incomes and an expanding

export market. To meet this target would require an annual employment increase of 2% (up 0.5% from the traditional rate) and an annual labor productivity increase of 3.5% (up 1.5% from the traditional rate).

3. AGRICULTURAL STRUCTURE

3.1. Agricultural Sub sectors

The agricultural sector is composed of several different types of agriculture which can be dassified in the principal subsectors of 1-) Commercial, mechanized crops, 2-) Traditional crops, 3-) Mixed technology crops with both traditional and modern techniques, 4-) Coffe as a special case, 5-) Livestock farming and 6-) Plantation crops (which are relatively unimportant). Each of these subsectors can be characterized by its principal crops and crop destinations, by its structure (land, labor, capital, technology levels, credit, markets), and by its process of development in recent decades. The latter has been very uneven between the subsectors, resulting in a very acute dualism in the agricultural sector. (Figure 2).

3.1.1. Commercial Crops

The almost purely commercial, mechanized crops are those of rice, cotton, sugar, sorghum,barley, soy beans and sesame seeds. Together these crops have constituted

FIGURE 2. Relative importance, production and productivity of principal crops and crop subsectors. 1972.

	% in total crop value	% in total crop area	yield 1/ (metric tons/ha)	Productivity Index	Area Index	Production Index
				1958 = 100		
Commercial crops						
Rice	9	7	3.6	188	141	263
Cotton	9	6	.6	179	311	561
Sugar	4	3	80.9	180	172	310
Sorghum	2	3	2.5	347	679	2.380
Barley	1	2	1.5	89	161	141
Soybeans	2	1	2.0	157	650	1.020
Sesame	1	1	.7	125	108	133
Total	29	23	-	151 2/	208	308 2/
Traditional crops						
Plantains	8	8	4.7	98	112	109
Noncentrifugal sugar	5	8	3.3	135	134	157
Yuca	6	4	6.2	188	137	126
Beans	2	3	0.5	109	103	120
Total	22	23	-	103 2/	119	129 2/
Mixed crops						
Corn	9	22	1.1	116	88	102
Potatoes	8	3	9.3	137	124	156
Wheat	1	2	1.3	142	39	56
Tabacco	1	1	1.4	82	113	95
Total	19	28	-	142 2/	85	119 2/
Coffee	25	22	0.8	102	101	102

1/ 1 metric tons equals 2.204.6 pounds.
1 hectare equals 2.47 acres.

2/ Based on harmonic indexes of production.

SOURCE: Departamento Administrativo Nacional de Estadística (DANE). Boletín Mensual de Estadística No. 276. Bogotá, Julio de 1974.

the most dynamic sector of the agricultural economy. Land devoted to these crops have been increasing at an annual rate of 5.8% since 1950, productivity at 3% a year, and physical production at 8.2% a year. It appears that most of the new commercial lands are replacing lands earlier devoted to pasture. The productivity increases in this sector are especially notable when it is considered that several of the crops have been developed quite recently, and with relatively advanced technology levels from their initiation. It appears that productivity rates have been accelerating since 1965, and land expansion rates decelerating. In 1950 the commercial crops contributed a small fraction of 1% of the value of agricultural exports. But in 1975, they had grown to represent 17% of total export earnings, as well as serve rapidly increasing textile and feed concentrate industries.

The most dynamic of the commercial crops has been that of cotton. Between 1950 and 1972, production increased at an annual rate of 13.5% a year. In 1950 Colombia imported one-half of its cotton. Although cotton demand has been increasing at an annual rate of 8%, by 1972 23% of all direct production was exported. Another 7% was processed and exported as cotton textiles.

Import substitution and then export demand has also given impulse to sugar production. In 1960, when Cuba lost its export rights in North America, Colombian sugar began to figure as a permanent and increasing export commodity. In 1972 20% of total production was exported. In addition, in recent years domestic demand has increased sharply. Per capita consumption increased 86% between 1950 and 1971, to 25 Kg. per capita.

Rice has not been an important export crop, but has benefited from a strong domestic demand, resulting from a relatively high income elasticity for rice. The 1971 per capita consumption was 23.3 Kg., almost double the 1950 figure. The development of the feed concentrate industry has also been a principal stimulus behind the rice Soy bean and sorghum development of resent decades.

3.1.2. Traditional Crops

In comparison with the commercial, mechanized crops of noncentrifugal sugar, beans, plantains and yuca have been relatively stagnant in resent decades. Between 1950 and 1972, production increased 1% annual and land area 1.2% annually. However, produc-

tivity has not increased, in part because the expansion of traditional crops has occurred on very marginal lands. Land fertility may also have decreased due to soil depletion, erosion and fragmentation of the land.

Because of the relatively tight supply, the relative prices of the traditional crops has been very favorable, and the real value of production has been increasing at a annual rate of 1.9% annually since 1950. However, these commodities have relatively low income and price elasticities. Although plantains, yuca and nonscentrifugal sugar are still among the principal consumption products (with 79 Kg., 53 Kg. and 31 Kg. 1971 per capita consumption), per capita consumption of each has declined since 1950. All of these products are faced with a very unstable market. Supply has been relatively elastic, and demand very inelastic, resulting in very pronounced price fluctuations over the last decades. This has impeded an orderly development of the traditional sector.

3.1.3. Mixed Technology Crops

The crops of corn, potatoes, wheat and tobacco are produced both by traditional technology, small farmers and by larger, commercial farmers. As a group, production has been increasing at a rate of 2.6% a year since 1950, a rate more than double that of traditional crops. Almost all of the increase has been a result of productivity, rather than land area increases. Evidence indicates that the area in commercial farms has been increasing slightly, and the area in traditional farms decreasing.

Relative prices have been unfavorable for the mixed crop subsector. Although production increased 2.6% annual, the real value of production has only increased at a rate of 1%.

Wheat prices have been extremely low, principally because of strong foreign competition from the P.L. 480 wheat imports. As a result domestic wheat production contracted at an average annual rate of 1.2% between 1950 and 1972. In 1975, wheat imports represented 69% of the value of all agricultural imports, and provided 87% of Colombia's domestic consumption needs.

Corn production increased at an annual rate of 1.9% between 1950 and 1972. Although per capita consumption decreased 22% between 1950 and 1972, to a level of 41 Kg. per capita, corn production has received a substantial stimulus from the growing feed concentrate industry.

Tabacco production increased at an annual rate of 3.1% between 1950 and 1972. In the latter year, 55% of production was exported, which represented about 1.5% of the total value of agricultural exports. It is believed that the importation of contraband cigarrettes and tabacco under P.L. 480 have impeded domestic demand, and hence production of this crop.

Potatoes, the most dynamic of the mixed crops, had an annual production increase of 4.9% betwen 1950 and 1972. This crop has benefited from a relatively high income elasticity. Per capita consumption has increased 42% since 1950. In 1971, per capita consumption was 44 Kg.

3.1.4. Coffee

Colombia is the world's second largest producer and exporter of coffee, ant the world's largest grower

of mild arabic coffee. It is also the most important commercial crop in Colombia, accounting for more than 20% of the value of crop production, employing about one-third of the active rural labor force and contributing between40% and 60% of the total exports in recent years. The relative importance of coffee has been declining as other agricultural and industrial sectors are developed.

(Figure 3).

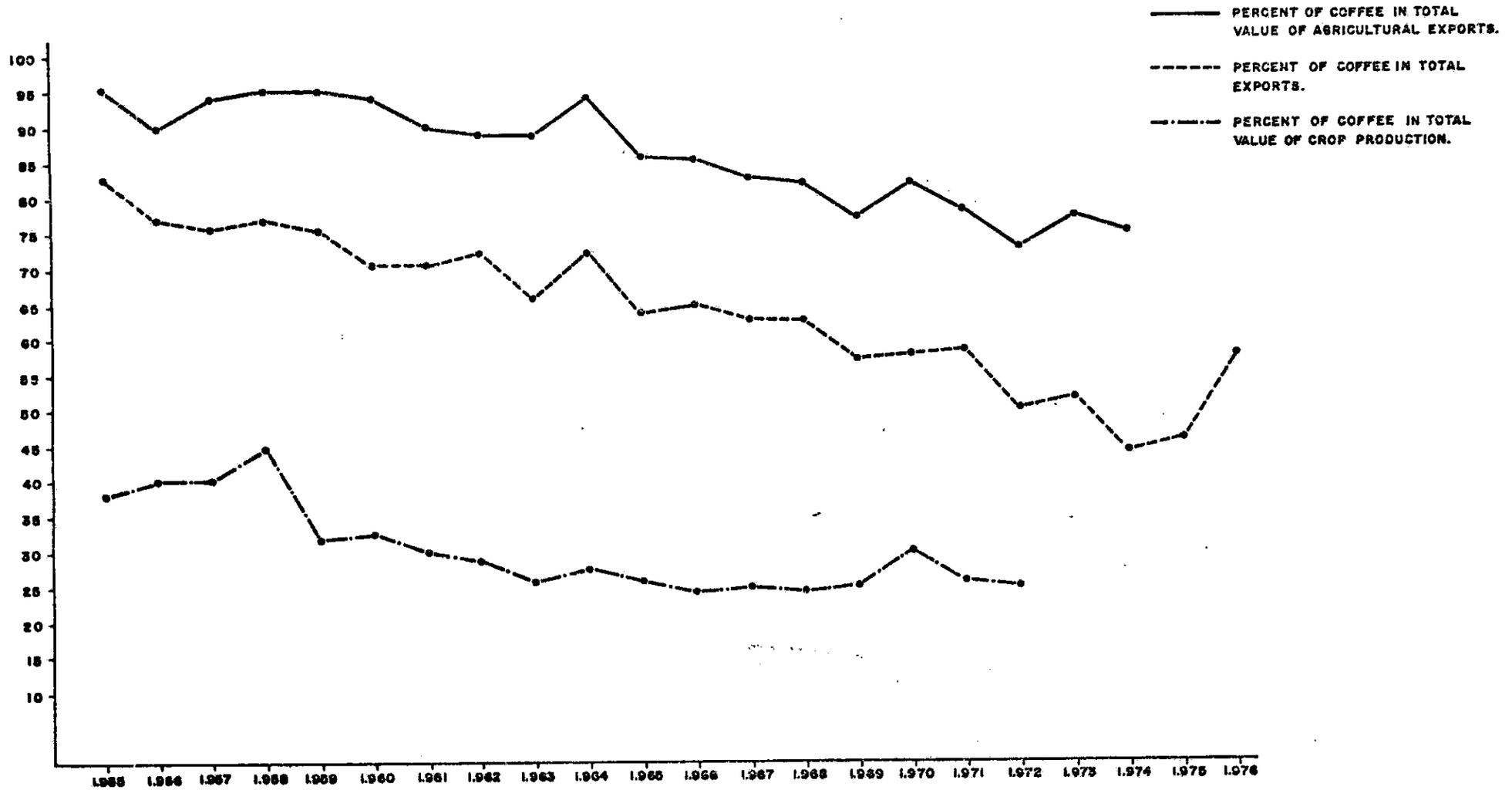
The National Federation of Coffee Growers has broad responsibilities for implementing national coffee policy. It is responsible for developing research and providing credit and technical assistance to producers. It establishes grades and an inspection service, maintains coffee supplies, is the principal marketing steacy, and controls exports. Since 1948, coffee prices have been supported by the Federation which buys coffee from producers at prices fixed in advance. The Federation buys about 75% of all coffee produced.

Between 1950 and 1958 coffee production increased by about 30%, but since then has remained relatively stable, in accord with quotas established by

FIGURE 3

THE RELATIVE IMPORTANCE OF COFFEE IN AGRICULTURAL EXPORTS, TOTAL EXPORTS AND VALUE OF CROP PRODUCTION 1955 - 1976

SOURCE: CALCULATED WITH DATA OF: DEPARTAMENTO NACIONAL DE ESTADISTICAS DANE. BOLETIN NACIONAL DE ESTADISTICAS. No. 276 JULIO, 1.974 AND FEDERACION NACIONAL DE CAFETEROS DE COLOMBIA. ECONOMIA CAFETERA, VOL. 7, No. 2 JULIO 1.977.



the International Coffee Agreement. Hard area in coffee has decreased, and productivity levels increased.

Coffee is essentially a commercial crop. In 1970, 80% of coffee land was found in farms of more than 10 hectares. Because production controls have been implemented through differential pricing based on quality and quality in large part depends on technology levels, very small, traditional farmes have become less competitive. In recent decades coffee lands have been increasingly concentrated in farms of 10 to 100 hectares.

3.1.5. Livestock

Livestock farming is of great importance to the Colombian economy, not only because of the present value of livestock products but because of future prospects as well. The livestock industry contributes around 25% of the value of farm output, or about 7% of total GNP. (ERS, 1973, p. 44)

The major type of livestock in Colombia is that of beef cattle, which contributed 48% of the total value of livestock production in 1971. (Figure 4). Between 1950 and 1971 beef cattle inventoris in-

FIGURE 4. Livestock production performance. 1950-1971.

	Percent value of production			Production
	1950	1960	1971	Index 1950=100
Beef	44.4	49.3	48.2	230
Milk	19.2	18.9	17.2	209
Hogs	13.7	12.0	10.0	155
Eggs	12.3	10.8	13.2	280
Poultry	9.0	8.0	10.5	292
Sheep	0.6	0.5	0.3	106
Wool	0.4	0.2	0.2	124
Goats	0.4	0.3	0.2	129
	100.0	100.0	100.0	

SOURCE: Calculations based on data of Orozco, Ramiro. Colombian Agriculture. (Unpublished).

ventories increased 48% and pasture land increased 33%. Most of the pasture expansion has occurred on previously unutilized land. The increased competition from the commercial sector for traditional pasture lands has increased land prices and forced a more intensive technification of cattle production. In 1950, there were an average of 0.83 head per hectare and in 1971, 0.92. However, productivity rates remain low. Foot and Mouth Disease, Brucellosis and parasites are major problems, and the take-off rate is only 16%. In comparison, the average U.S. take-off rate is 40%.

Beef exports have increased eleven-fold since 1964, and now represent about 6% of the value of all agricultural exports. This increase has been at the expense of domestic consumption, which decreased from 25 Kg. per capita in 1950 to 20 Kg. per capita in 1971.

A considerable part of milk production is from beef cows, and relatively few herds are managed totally for milk production. Price controls have restricted production, resulting in a 1971 per capita consumption of 101 Kgs. down from 108 Kgs. per capita in 1950.

Poultry production has more than doubled since 1950, largely because of the development of a very large, commercial poultry industry. The rapidly expanding feed concentrates industry and beneficial profit margins have been the principal stimuli.

In 1971, poultry and eggs contributed about 14% of the total value of livestock production.

There has been little growth of the hog industry, which in 1971 contributed 10% of livestock production. Also stagnant and relatively unimportant are sheep and goat production.

3.2. Agricultural Resources

3.2.1. Land

The development of each of the major subsectors has been very uneven resulting in a very acute and worsening dualism in the agricultural sector. A principal indicator of the dualism is that of land distribution. (Figure 5) . Seventy-two percent of farms are less than 10 hectares (25 acres), but only cover 6% of total farm land.These farms are largely traditional: they grow traditional crops, under traditional technologies, and

FIGURE 5. Land distribution in Colombia.

Farm size 1/	Percent of farms 1970	Percent of farm land 1970	Percent change 1960-1970	
			No. of farms	Has. of farm land
0-5 Has.	59.5	3.7	- 14.90	- 7.50
5-10 Has.	13.6	3.5	- 5.6	- 6.60
10-20 Has.	10.6	5.2	+ 3.2	1.70
20-50 Has.	8.5	9.8	+ 15.23	15.75
50-200 Has.	6.3	21.8	+ 19.27	18.90
200-1000 Has.	1.8	25.6	+ 19.27	17.92
1000-2500 Has.	0.2	10.9	+ 19.64	20.90
2500 and more Has.	0.1	19.5	+ 40.45	9.40
Total	100.0	100.0	-	-

1/ 1 Hectare equals 2.47 acres.

SOURCE: Calculated from data of: Departamento Administrativo Nacional de Estadística (DANE). Censo Nacional Agropecuario de 1970-1971.

with very little mechanization. A large part of their output is directed to farm family consumption. Their resistance is in part attributable to the fact that the very small farmers are partially insulated from market pressures. Production may be consumed, and purchased production inputs are minimal.

At the other extreme, farms having over 2500 hectares formed a group of less than one percent of total farms, but they occupied about 20% of farm land. It appears that the concentration of land is increasing, and at a faster rate than in previous decades. The number of farms of less than 10 hectares decreased 11% between 1950 and 1970, with a corresponding reduction of farm land of 6%. The number and land area of medium-sized farms, those between 10 and 20 hectares, remained relatively constant. The number and area of farms between 20 and 500 hectares, commercial mixed farms, have expanded, usually absorbing the smaller farms. The new lands in very large farms are principally dedicated to extensive livestock production in the eastern plains.

The predominant land tenure form is that of ownership, which is slightly more common among larger farmers than

among smaller farmers.

Land resources of Colombia are generally of very poor quality. Only 2% of the land is classified as Class I and Class II (such as that of the cornbelt of the U.S.). Forty-eight percent of the land has been classified in Class III through Class VI, which in the U.S. is recommended principally for pasture land. Fifty percent of the land is in Class VII and Class VIII, which according to U.S. standards should be left in its natural state to preserve watersheds. However, in Colombia the majority of the very small, traditional farmers are located on the slopes of the Andes on very poor quality lands. These lands are their means of survival, and intensively cultivated by necessity. Of all the land in farms, 25% is dedicated to crops . However, for farms of less than 10 hectares,this percentage is 62%. Larger farms, which many studies have shown are located on the better quality lands, devoted 64% of their lands to pasture.

Although farm land has been increasing at a rate of approximately 1.3% per year since 1960, the new lands have been largely of very poor quality. There

appears to be little potential for increasing the lands suitable for crops, which implies a necessity for a much more rapid expansion of productivity on the crop land now being exploited. However, the potential for development of extensive livestock production on the poor quality lands of the Eastern Plains appears good, dependant upon an intensive development of adequate infrastructure (transportation, marketing, credit and technology).

3.2.2. Labor

Labor is the abundant resource of Colombian Agriculture, although there are some regional and seasonal scarcities. Estimates of unemployment and under employment in the rural sector vary tremendously. One calculation estimates that 40% of the available work-days of potential workers is not utilized. Direct unemployment is conservatively estimated at 10%. If income distribution is to be made more equitable and rural-urban migration is to be controlled, rural employment must be generated at a faster rate than is now occuring (1.3% per year). The traditional sector is much more labor intensive than the commercial sector, and it is there that the potential for employment expansion appears greatest.

3.2.3 Capital

The low and variable level of agricultural income, especially in the traditional sector, has caused, among other things, a low level of capital accumulation. Small farmers are at a cyclical disadvantage: low income - low investment - low income. Commercial farmers are able to generate a larger net income for reinvestment. Reinvestment in the commercial sector has also been stimulated by higher prices, expansion of credit and other support programs. Fertilizer use has been increasing at an annual rate of 7%. Annually, the majority has been applied to commercial crops and potatoes. More than 85% of the cotton, soybean and sugar acreage is now mechanized. In 1975, a large part of the commercial crop sector used improved seeds. One hundred percent of cotton and sorghum lands, 95% of soybean lands and 55% of rice lands were planted with improved seeds. On the other hand, only a very small percent of the traditional crops were planted with improved seeds.

3.2.4. Credit

In part because of Colombian legislation, credit in the agricultural sector has been increasing substantially. In 1958, only 10% of production was financed

through credit, while in 1971 the figure amounted to 25%. This is lower from the 1966 peak of 35%, reflecting the declining importance of agriculture on the entire economy. Access to credit is determined to a large extent by the capacity to pay according to present resource endowments, rather than by the ability to make an effective and productive use of the credit so as to generate income surplus enabling loan repayment. The result has been that farmers with easy and considerable access to credit (especially commercial bank credit) have been large farmers. There is some evidence, indicating that the concentration of credit is even worse than land concentration. It is estimated that in 1970 about 35% to 40% of small farmers obtained institutional credit, while 70% to 75% of large farmers received institutional credit. Furthermore the percentage of production costs financed with institutional credit are generally higher for commercial crops than for traditional crops.

The Caja Agraria, the governmental agricultural development bank, directs about 62% of total loan funds to small farmers. Supervised credit has approximately tripled since 1970, but yet only reached 2% of

farmers with less than 20 hectares in 1975. The Agricultural Finance Fund, another major source of government credit, has principally served large farmers. For instance it financed 82% of cotton land, 65% of rice land and 87% of soy bean land in 1976. On the other hand, the Fund only financed 3% of traditional bean land, 9% of potatoes land and virtually none of the other traditional crops.

In short, small farmers have little ability to internally generate capital and relatively limited access to capital. Furthermore, in that they are in a precarious financial position they are often unwilling to absorb the risks associated with the use of credit and the adoption of new technologies. Only in recent years has the Colombian government devoted intensive efforts to the generation of technologies pertinent to small farmers. It is hoped that these efforts will close the technology gap between the commercial and traditional sectors.

3.2.5. Marketing

Other implications of the dualism in the agricultural sector pertain to marketing. The commercial sector, including coffee can be characterized by its orderly markets. Demand has been generated

primarily from industrial and export markets, resulting in institutional organization of the markets. Production contracts, quota systems, negociated prices and storage finance are all common in the commercial sector.

Although price rises in commercial and coffee crops have been moderate in comparison with the traditional and mixed crops, the variation of prices has been minimal, leading to orderly development of these crops. (Figure 6) .

On the other hand, the traditional crops can be characterized by their disorderly markets. These crops depend entirely on a generally inelastic domestic demand. Markets are very atomized,domestic transportation is difficult, and price information is hard to obtain. There are many intermediaries in the marketing chain and institutional storage is inadequate. Furthermore several of the products are perishable. These same features also characterize the portion of the mixed crop production (potatoes, tabacco, corn, wheat) that is directly consumed. However, the commercial sector production in these crops

FIGURE 6. Price variation in principal agricultural subsectors. 1972.

	Commercial Crops	Traditional Crops	Mixed Crops	Coffee	Total
Price Index (1958=100)	320	565	478	324	411
Variation price Index (1960-1970)	0.4	3.0	3.5	0.9	1.5
Production Index (1958=100)	368	129	119	105	183

SOURCE: Departamento Administrativo Nacional de Estadística (DANE). Boletín Mensual de Estadística, No. 277. Bogotá, Agosto de 1974.

is largely devoted to industrial and export demands for which markets are more orderly.

Although long-run price rises in the traditional and mixed crops have been very steep, relative to the general price index and to commercial crops, the price variation has been extremely high. The uncertainly related to such variations has been one of the largest impediments to an orderly development of these sectors.

3.3. Rural Welfare

The most obvious effect of the dualism in the agricultural sector pertains to income distribution. (Figure 7). Approximately 93% of employed persons in the agricultural sector earned less than $44/month in 1973, and received only slightly more than one-half of total rural income.

Only about 28% of employed persons in the agricultural sector were farmers with land, and of these only one-third had farms large enough to regularly employ hired labor. Sixty-two percent of employed rural persons were landless laborers, and 10% were family laborers without income.

FIGURE 7. Income distribution of the employed population. 1/ 1973.

Monthly Income 2/	Percent employed population	Percent employed population in agricultural sector
Less than $ 11	25.1	40.2
$ 11 to $ 22	19.0	27.3
$ 22 to $ 44	25.6	25.1
$ 44 to $ 87	17.4	4.7
$ 87 to $ 130	5.5	1.0
$ 130 to $ 174	2.1	0.3
$ 174 to $ 261	2.3	0.6
$ 261 to $ 435	1.7	0.4
$ 435 to $ 870	1.0	0.2
$ 870 and more	0.3	0.1
Total	100.0	100.0

1/ The distribution is calculated excluding the category "no information".

2/ Based on 1973 exchange rate: US$ 1.00= Col.$ 23

SOURCE: Calculated from data of: Departamento Administrativo Nacional de Estadística (DANE). Muestra de Avance del XIV Censo Nacional de Población de 1973.

Not only is the distribution of agricultural income more skewed than the distribution of urban income, but also absolute levels of income are lower. Although agricultural employment contributed 35% of total employment in 1973, the agricultural sector received only 18% of total salaries paid.

The general poverty of the rural sector has grave social implications which are impeding the development not only of the traditional sector, but also of the entire agricultural and national economies. It is estimated that more than 50% of rural pre-school children have some degree of malnutrition, which in turn retards educational productivity and the future human resource potential of the country. The infant mortality rate is 9%. Only 31% of rural children from 5 to 14 years old attend school, and the rural illiteracy rate is 42%. All these welfare indicators demonstrate a more pronounced poverty in the rural areas than in urban areas.

FIGURE 8. Statistical Summary of Colombia.

Area	1.138.338 km^2
	439.512 m^2
Population	
1976	24.105.000
1980	26.752.800
Annual Population Growth Rate (%)	
1951-1964	3.2
1970-1976	2.7
Gross Domestic Product (1973 dollars)	
1975 Total	10.8 billion
1975 Per capita	461
GDP Annual Growth Rate (%)	
1960-1975 Total	5.6
1960-1975 Per capita	2.7
Gross Capital Formation (1973 dollars)	
1975	1.7 billion
Exports 1975 (dollars)	1.69 billion
Imports 1975 (dollars)	1.48 billion
International Reserves, Oct. 1976	.89 billion
Public External Debt, Dec. 1975	2.98 billion
Exchange Rate (pesos per dollar)	
Dec. 1975	33.09
Sept. 1976	35.43
Dec. 1977	37.92
Variation of Cost of Living Index (%)	
1976	20.5
Tax Income of Central Government (percent of Gross Domestic Product), 1975	8.8
Percent of 1975 National Budget for:	
Education	16.7
Health	5.0
Agriculture	2.8
Births per thousand habitants, 1974	34.2
Deaths per thousand habitants, 1974	9.4
Infant deaths per thousand live births, 1974	93.8
Expected life, 1972	61.0
Percent literacy, 1974	77.6

SOURCE: Banco Interamericano de Desarrollo. Progreso Económico y Social en América Latina. Informe 1975. Washington, D.C.

II. AGRICULTURAL POLICIES AND INSTRUMENTS

In the Economic Development Plan, the government has identified certain factors strategic in national development, such as export and industrial development and increases in the production and productivity of agricultural products. The principal objectives of the plan are to obtain higher employment rates and a more equitable distribution of income, thereby resolving one of Colombia's most urgent social problems,malnutrition.

It is planned that an improved income distribution will arrise not only from production increases, but also from income redistribution, achieved through tax reform and an increased minimal wage. Social policies complement economic policies, and are focused on food and nutrition programs.

As explained previously, the agricultural sector is dualistic. The traditional sector produces 55% of direct consumption foods and the commercial sector produces the majority of agricultural exports and industrial raw materials. The national goberrment has established appropiate objectives, strategies, budgets and incentives for each sector.

1. Objectives and strategy for the traditional sector.

The principal traditional sector strategy is the Integrated Rural Development Program (DRI), which together with land reform, should increase production and productivity of small farmers, thereby increasing rural income, rural employment and the supply of basic foodstaffs for the urban sector. DRI has been designed to resolve the traditional sector's principal problems of capital and modern technology scarcities and marketing and to improve rural social and physical infrastructure. The program has required an integration of governmental services, and includes several components, each under the responsibility of one or several government agencies.

A. Investigation and Diffusion of Technology .

One strategic instrument of DRI is agricultural investigation of improved production practices to increase productivity. The improved practices must be closely related to traditional production processes in order to increase adaptability. ICA, which is discussed in CHAPTER III, has the responsibility for this component.

B. Credit. The credit component requires an integration of ICA technical innovation and extension services with those of the government's agricultural bank, the Caja Agraria. Loans in this program are made on the basis of productive capacity rather than assets, and are used to finance the increased costs of new technologies. In addition, the Caja Agraria has a line of credit for very small or landless farm families who wish to purchase land.

C. Marketing. Through diverse small farmer organizations, it is hoped to improve the commercialization of products, increase the negotiation powers of small farmers and reduce market instabilities.

D. Physical and Social Infrastructure. Improvements in production and commercialization of agricultural products must be accompanied by improvements in the physical and social infrastructure. The location and construction of roads correspond to product commercialization needs in DRI program areas, and use local labor in construction. - Rural electrification subsidies are distributed

according to economic criteria of potential productive utilization. Health services include emphasis in the provision of drinkable waters (with filters, aqueducts, etc.), in home sanitation improvements (toilets, waste removal,etc.) and in the preventative and group health assistance of non-professional health technicians. Educational efforts include not only the expansion of primary school coverage, but also the training of farmers in improved production techniques and nutritional education.

In order to execute the DRI program the government has obtained a U.S. $80 million loan from the Inberamerican Development Bank, a U.S.$70 million loan from the World Bank and a C.D.$ 20 million loan from the Canadian International Development Agency. The Colombian Government is providing the other one-half of program funds, which will total U.S. $240 million over five years. Of this, 60% will be invested in the credit, investigation and marketing components and 40% will be invested in social and physical infrastructure components. A U.S.$4 million program similar to the DRI program is being implemented by ICA with a U.S.$3 million loan from AID.

2. Objectives in the Commercial Sector.

The principal governmental objectives for the commercial sector are:

A. Increase crop and animal production and productivity, in particular for priority foods of the National Food and Nutrition Plan which are used highly nutritious, processed food production and which are not produced in the traditional sector.

B. Increase livestock exports and the exports of those crops which are potentially competitive in external markets, and substitute imports of agricultural products which can be economically produced within the country.

C. Generate increase rural employment.

D. Promote the processing of high-protein and fortified food products, preferably utilizing domestically developed technologies.

E. Improve food distribution channels.

A major policy tool for achieving these objectives will be through the orientation of credit resources.

3. Instruments for the Execution of Agricultural Policies.

Government policy is executed through the Ministry of Agriculture and a series of relatively autonomous agencies associated with the Ministery of Agriculture . (Figure 9).

The public agricultural establishments are responsible for the following:

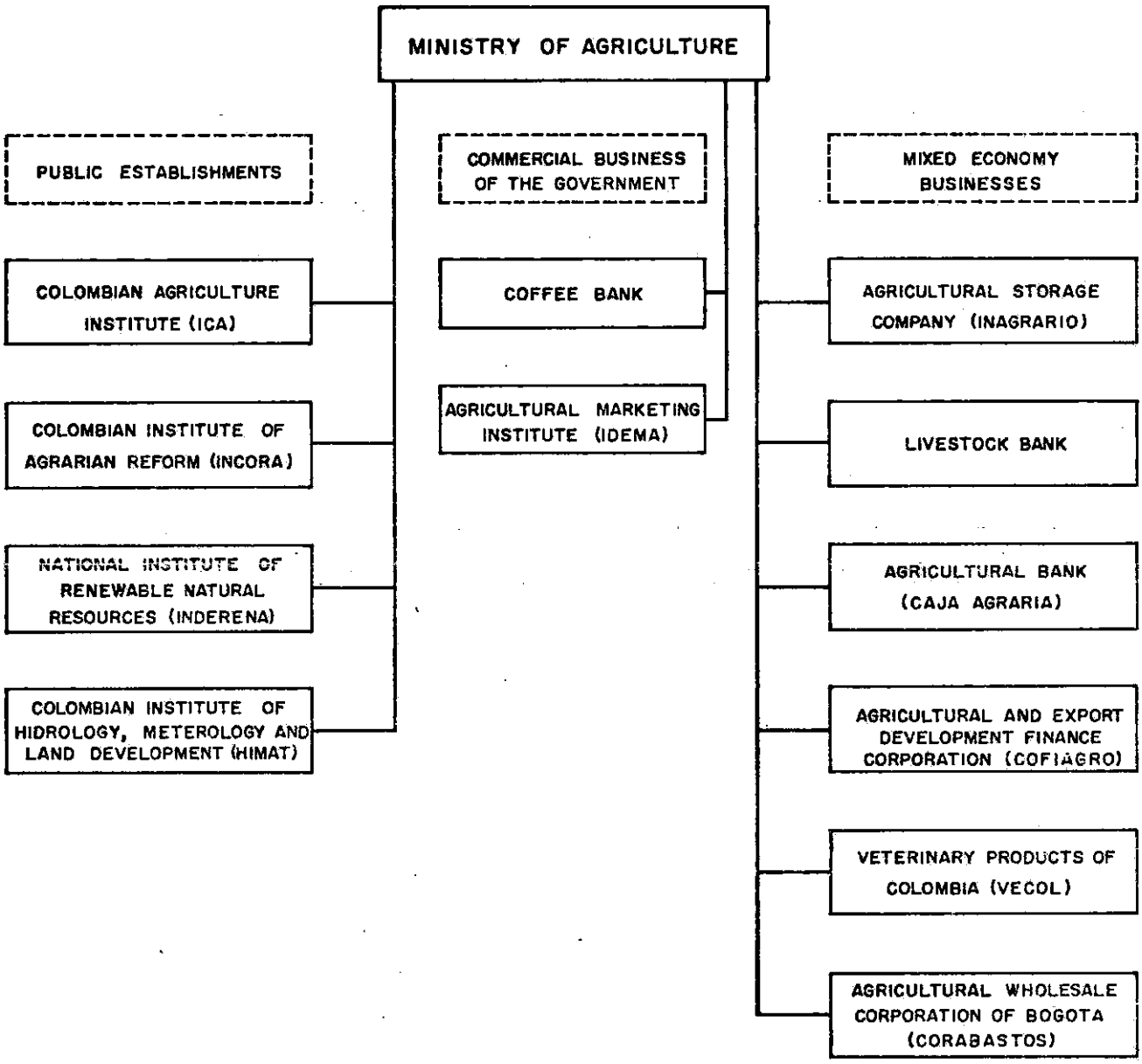
Colombian Agricultural Institute (ICA): Investigation in crops, crop diseases, livestock, veterinary science and agricultural engineering; control and certification of agricultural inputs and of private technical assistance services; seed certification and production; and agricultural extension.

Colombian Institute of Agrarian Reform (INCORA): Purchase and distribution of land, land entitlement and colonization projects.

National Institute of Renewable Natural Resources (INDERENA) : Conservation, management, investigation and development of marine and fresh water fish, rivers,watersheds,subterranean waters, soil,woods, plant and animal wildlife, national parks and natural reserves.

FIGURE 9

THE INSTITUTIONAL AGRICULTURAL SECTOR



Colombian Institute of Hidrology, Meterology and Land Development (HIMAT): Weather stations and foreeasting; hidrology stations and collaboration in hidroelectric and irrigation projects.

III. COLOMBIAN AGRICULTURAL INSTITUTE (ICA).

1. History.

The decade 1940 to 1950, was the initial stage of the development and organization of the agricultural experiment stations, and the application of modern techniques in agricultural research programs. Research remained principally the domain of the Ministry of Agriculture.

The sucess attained through the Mexico-Rockefeller Foundation Program motivated the Colombian Government to invite that Foundation to set up a similar program here. The Program began its activities under the Ministry of Agriculture in 1950, with the Bureau of Special Research. The Bureau consisted of two Rockefeller specialists and three Colombian agronomists, who began work in corn and wheat breeding. By 1955, eleven foreign specialists were working in close collaboration with nearly 40 Colombian agronomists. Research spread to the experimental centers and stations, and later included investigations in the Animal Sciences.

The cooperation of the Rockefeller Foundation, which in former years had provided fellowships to professional agronomists from universities and the Ministry of Agriculture, was again extended to the preparation of Colombian

personnel. Young agronomists were sent to the Mexican in-service training program. When they returned after a year or more of training, they were reincorporated into the various research programs of the Ministry of Agriculture. In addition, during the first five years of operation of the Colombian agricultural program, the Foundation granted fellowships for 30 professionals to several U.S. universities who went on to obtain M.S. and Ph.D. degrees.

The impact of this cooperative program on agricultural research led, in 1955, to the creation of the Division of Agricultural Research (D.I.A.), within the Ministry of Agriculture. Greater autonomy was allowed to that Division, thus making possible a more stable, yet flexible, administration and operation of agricultural research. By agreement between the Ministry and the Foundation, the Director of the Bureau of Special Research acted also as Technical Director of the D.I.A. during its first three years of operation.

In 1951, when the Agreement with the Rockefeller Foundation was established, land was acquired to build what is now the National Research Center of Tibaitatá, which absorbed all research functions then existing in the zone. Tibaitatá began activities in 1952, concentrating on wheat, barley, corn and potatoes. In 1955, when it was placed under the

D.I.A., work in Animal Sciences began with dairy cattle, which was followed by other programs in beef cattle, poultry, sheep, animal pathology and swine.

Tibaitatá became the first CENTRO DE INVESTIGACIONES AGROPECUARIAS* in Colombia. Its 550 hectares have been apportioned into approximately equal sections for Agronomy and Animal Sciences. The Center's laboratories are equipped for investigations in Soil Science, Mineral and Animal Nutrition, Plant Pathology, Entomology, Plant and Animal Physiology, Seeds, Basic Biological Sciences, Dairy Science, etc. There are installations for handling cattle, sheep, swine and poultry, as well as greenhouses. I.C.A. has four other similarly equipped centers for investigations of crops in other bio-environments.

Recognizing the importance of maintaining complete seed collections of local crop varieties, the Bureau of Special Research began to collect native Colombian corn, bean, potato, oat, barley, sorghum, and cotton varieties. Now, I.C.A. has 14.607 collections in all, of which 30 percent are Colombian.

The Corn and Wheat breeding programs, which were the first activities of the Bureau, were followed by: Beans in 1951:

* A word meaning "agricultural", but signifying that both crop and animal production are included.

Entomology, Potatoes, Soils, Plant Pathology and Barley, in 1952; Farm Administration in 1954; Animal Sciences and Pastures, 1955; Dairying, Biometry, and Oats, 1957; and Rice, and Animal Pathology, in 1958. This year also marked an important phase in the cooperative program: the foreign management of the D.I.A. was turned over to a Colombian professional who had obtained a Ph.D. degree in the United States through a Foundation fellowship. Thus, one of the original intentions, to transfer leadership of the programs to Colombian personnel, was realized.

The vigorous advance in agricultural research achieved by the Bureau of Special Research of the Rockefeller Foundation and by the D.I.A. high-lighted the lagging of higher agricultural education which was seriously in need of personnel, and physical and economic resources. This disparity indicated the necessity to broaden the influence of scientific investigation in agricultural education. In 1959, The President of the National University and the Minister of Agriculture appointed a commission of Deans of the Agronomy Colleges and technicians of D.I.A. to visit American agricultural colleges, the U.S.D.A. Experiment Station in Beltsville, and the Agricultural College of Puerto Rico. The visit was carried out under the auspices of the Rockefeller and Kellogg Foundations. The Commission proposed in its 1961 report the integration of teaching with research

and agricultural extension under a single administration, and the improvement of the Agronomy Colleges. It specifically recommended the formalization of an agreement between the National University and the Ministry of Agriculture to organize bi-laterally a Graduate School, utilizing the installations of the National Research Center at Tibaitatá.

The Rockefeller, Kellogg and Ford Foundations expressed interest in the establishment of this new agency, and offered their support in organizing it. Colombian authorities elaborated the project, and in June 1962, the President of the Republic officially created the INSTITUTO COLOMBIANO AGROPECUARIO (I.C.A.), as a decentralized public institution, to "promote, coordinate and carry out agricultural research, instruction, and extension", and "to prepare technical personnel for its own service, and that of other entities, and the exercise of the professions related to the agricultural sciences".

2. ICA Functions.

In 1968 ICA was restructured and received the following responsibilities:

A. To promote, coordinate and implement, directly or in colaboration with other entities, biological and physical investigations and socioeconomical studies, with the

objectives of increasing crop and livestock production.

B. To transfer the results of agriculture research and implement studies on extension methods.

C. To train professionals and technicians within ICA.

D. To accomplish the goals of the Ministry of Agriculture in: 1) Prevention, diagnosis and control of diseases and pests, both of crops and livestock. 2) Sanitation control for export in coldstorange houses and meat processing plants. 3) Quality control in the handling, transportation and use of fertilizers, soil conditioners, farm chemicals, feed supplements and drugs. 4) Seed certification. 5) Animal incubation and artificial insemination.

E. To enforce sanitary standards for agricultural exports and imports.

F. To produce certified seeds and promote their use.

G. To promote techniques of egg incubation and artificial insemination.

H. To supervise and to assist private agricultural technical assistance services.

I. To carry on research and technology transferance for the

rural development programs.

J. To give seminars and short courses for the training of agricultural technicans and farmers.

3. Administrative Structure.

ICA's formal structure is presented in Figure 10. The Board of Directors is composed of the heads of several governental and private agencies. The General Manager of ICA is the legal representative of the institution and is responsible for its administration and development.

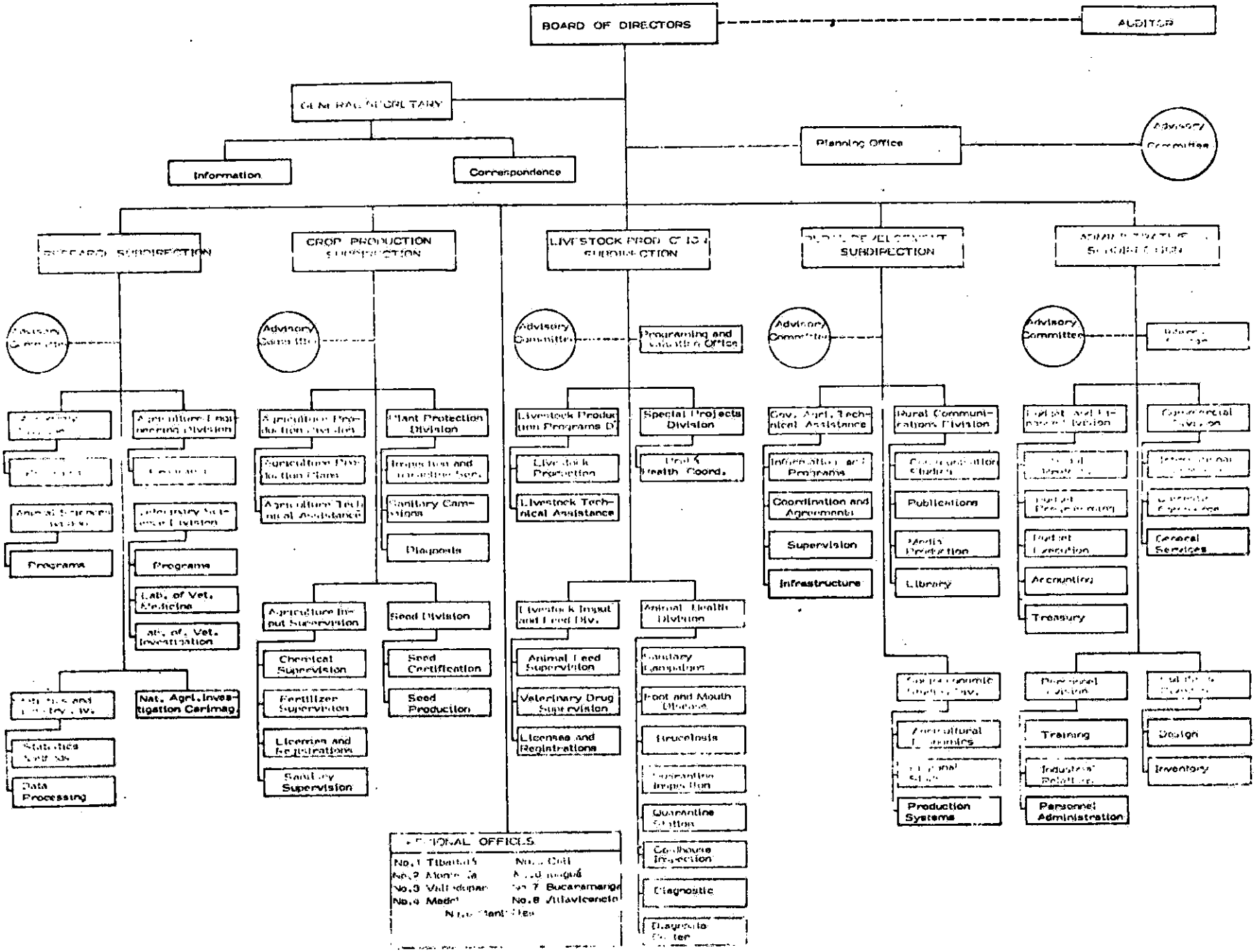
ICA activities are performed by five viceministries, those of Investigation, Crop Production, Livestock Production, Rural Development and Administration. The national structure of ICA is paralleled in the nine regional offices, located in Bogotá, Montería, Valledupar, Medellín, Cali, Ibagué, Bucaramanga, Villavicencio and Manizales (See Map).

4. Investigation.

ICA does research in the following fields:

A. Agronomy: Plant pathology, soils, plant breeding, physiology and cultivation techniques for all principal crops.

B. Animal Sciences: Gametics, nutrition, physiology, grass and forages and production systems for all principal species.


BOARD OF DIRECTORS
AUDITOR
GENERAL SECRETARY
Information
Correspondence
Planning Office
Advisory Committee
CROP PRODUCTION SUBDIRECTION
LIVESTOCK PRODUCTION SUBDIRECTION
SUBDIRECTION
Advisory Committee
Programming and Evaluation Office
Agriculture Engineering Division
Agriculture Production Division
Plant Protection Division
Livestock Production Programs Div.
Special Projects Division
Rural Communications Division
Programs
Lab. of Vet. Medicine
Seed Division
Seed Certification
Seed Production
Livestock Input and Feed Div.
Animal Health Division
Animal Feed Supervision
Veterinary Drug Supervision
Licensee and Registrations
Foot and Mouth Disease
Brucellosis
Quarantine Station
Diagnostic
Publications
Library
Infrastructure
Training
Design
Inventory
Personnel Administration
Production Systems
REGIONAL OFFICES
No.1 Tiburcio
No.2 Montalba
No.3 Valledupar
No.4 Madrid
No.6 Cali
No.7 Bucaramanga
No.8 Villavicencio

C. Veterinarian Sciences: Infectious diseases, epidemiology, parasitology, entomology, pathology and toxicology.

D. Agricultural Engineering: Agricultural machinery and processing equipment, land and water development.

E. Agricultural Economy and Rural Sociology: Regional and sectorial socioeconomic studies and socioeconomic analysis of biophysical investigation.

4.1. The Impact of Research.

The following data illustrates some of the economic benefits of I.C.A. achievements. Twenty-one hybrids (16 of corn and 6 of potatoes) and 53 variaties have been produced in Colombia; 85 percent of this material is the result of I.C.A. research. Furthermore, a private seed production industry, that includes 32 producers, has developed with ICA promotion. Their processing plants have collective optimum capacity of 95,360 tons per year, which permits the fulfillment of the current national demand for improved seeds, and leaves a possibility of an excess for export.

Analysis of the total Ministry of Agriculture budget appropriations to the D.I.A. (1950-1963) and I.C.A. (1964-1972), shows that in these 22 years, the combined budgets amounted to $89 million*, of which 64% was allotted to research. The

* Based on 1973 exchange rate: U.S.$ 1.00 = Col. $23.

value of the increment in production using improved seeds, for the period 1967-1972, however, was $668 million. Of the latter total, 14% corresponded to corn. That is, the increase in corn production alone in only five years covered the total budget of the D.I.A. and I.C.A. in 22 years. The total increases of improved varieties, during the same five years, equalled 74 times the total of D.I.A. and I.C.A. budgets.

Advances in Animal and Veterinary Sciences are also notable, although they cannot yet be estimated as in the case of crop production. The cattle industry has had great economic importance in Colombia for many years, but its technological development has been slow. Accomplishments of research in animal management, breeding and nutrition are too recent to have had demonstrable impact on the industry. Nevertheless, significant findings have resulted from veterinary studies of important diseases, such as brucelosis, which causes losses in the national industry at the rate of 10 million dollars each year, and hoof-and-mouth disease, which seriously interferes with the meat exportation trade.

Two opaque corn hybrids, ICA H-208 and ICA H-255, are a worthy contribution to dietary improvement of the Colombian people and other protein-deficient countries.

I.C.A. also works in collaboration with C.I.A.T. and I.R.R.I.

to obtain physiologically efficient dwarf varieties of rice, which have increased production capacity to more than two tons per hectare.

The effects of ICA research on higher agricultural education are notable: improvement of the university professional programs in Agronomy, Animal Husbandry and Veterinary Medicine due to the participation of I.C.A. researchers in professorial functions; a higher quality in undergraduate thesis work, carried out by the students in the I.C.A. experiment stations and centers, with assistance of its specialists and use of its laboratory and field facilities; and in instruction, the substitution of technology and skills developed at the Institute for those of foreign invention. Many of the courses now offered are based essentially on national data, and a great part of the literature consulted is produced in Colombia.

Currently, the Institute offers training courses for professionals, produces technical assistance manuals and other materials, and supports the contribution of its members to agricultural literature through articles published in REVISTA I.C.A. and other prestigious journals. I.C.A. professionals collaborate with several vocational agricultural schools, giving lectures and seminars, and carrying out regional trials. In these trials they demonstrate the latest technological advances developed by the Institute, and

the students actively take part in the demostrations.

The contribution of I.C.A. is not limited to Colombia; many of its specialists have counseled other Latin American countries, some of which have successfully adopted technology generated in Colombia. I.C.A. has been a model for the organization of other national research institutes, for example, I.N.T.A. of Argentina, I.N.I.A.P. of Ecuador, and I.C.T.A. of Guatemala.

The Institute has also contributed to the establishment of Agricultural Institutes, which train auxiliary non-professional technicians for employment in agricultural services. It also facilitates entrance to the university for youth of the rural sector. This opportunity for access to university education for the peasant farmer is considered one of the most important social changes ever to be realized in Colombia.

5. Crop Production Activities

5.1. Functions

The Crop Production Section is responsible for coordinating, supervising and evaluating governmental activities in national crop development. Its responsibilities are 1-) pest and disease control through isolation and import and export controls; 2-) supervision and evaluation of private agricultural technical assistance services; especially those associated with farmers with loans from the Agricultural Finance Fun (FFAP); 3-) seed certification and promotion of the use of improved inputs; 4-) supervision of the production, commercialization and application of crops inputs; and 5-) participation in programming agricultural policies of the government with other public and private entities.

5.2. Activities

5.2.1. Plant Sanitation . The Inspection and Quarantine Services supervises all plant material imports and exports, in accord with both domestic and international agreements. Because of these

efforts, Colombia has avoided the importation of the coffee rust, the coffee berry borer,the Khapra beetle, the Mediterranean fruit fly,the sugar cane smut, etc., which could cause an economic disaster if established in the country.

The Diagnostic Service maintains epidemiological records of diseases, beneficial and harmful insects, weeds, etc. With this information, potential sanitation problems are detected and controlled in early stages of development.

The Sanitation Campaigns are designed to prevent control or erradicate sanitation problems in specific crops. These campaigns include: 1-) Campaign Against Coconut Red Ring, a disease which has caused losses of 60% in small plantations on the Pacific Coast; 2-) Control of Rats, a particular problem on San Andres Island, where public health and tourism are menanced; 3-) Campaign Against Bacterial Wilt, the principal disease of plantains.

The first and very important preventative campaigns is that against the coffee rust. The campign includes quarantine measures, intensive educational efforts and the training of personel in erradication tech-

niques should the coffee rust be introduced. The campaing has served as a model for other projected preventative campaigns and increased public consciousness of sanitary problems and prevention.

5.2.2. Crop Production Plans. In 1966 the national government created the Agricultural Finance Fund (FFAP) for credit for medium and large farmers. To obtain credit the farmers must hire the services of private technical assistants, who in turn are assisted and supervised by ICA. To do this, ICA regularly offers short courses and conferences on 14 different crops, whit emphasis in disease control and farm chemicals. About 60% of the 2.000 private agricultural scientists attend these courses, through which ICA indirectly affects about 1 million hectares of crops, 24,000 farmers and $196 million * of credit.

In addition, ICA annually registers about 5,000 new semipermanent crop projects, with an extension of 45,000 hectares and $260 million * in loans.

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*= Based on 1973 exchange rate U.S.$1.00 = Col.$23

The total area in supervised semipermanent crops is now 120,000 hectares.

5.2.3. Seeds. ICA is responsible for supervision of the production, importation, exportation distribution and quality control of certified seeds, and has registered 178 improved seed varieties, 32 certified seed producers, 78 importers and 20 exporters. During 1977, approximately 55,000 tons of ICA certified see were sold, sufficient for planting 1 million hectares. In 1977, in collaboration with Mississippi State University and the National University of Colombia, ICA presented a training course in seed technology for 110 professional colombians and 11 foreigners.

5.2.4. Crop Inputs. ICA is responsible for enforcing existing legislation for the manufacture, importation, commercialization and application of fertilizers, crop chemicals and beneficial insects. This includes control of 17.500 metric tons of active ingredients of farm chemicals, worth $260 million* . Seventy percent of the chemicals are applied aerially, using 280 airplanes, 300 airports and covering approximately - - - 500,000 hectares. It is estimated that 400,000 metric tons of mixed fertilizers and 200,000 metric tons of

*-Based on 1973 exchange rate U.S.$1.00= Col.$23.

urea are applied annually, together worth $217. million *, for which ICA is responsible. It has also offered 6 formal courses on far chemical management in collaboration with the Ministry of Health, which deal with legislation, toxicity and application techniques.

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*- Based on 1973 exchange rate U.S.$1.00=Col.$23.

6. Livestock Production.

Fulfillment of the plans, programs and projects making up the country's livestock policy is a responsibility handled by ICA mainly through its Livestock Production Submanagement.

To this end, ICA carries out activities in the fields of Animal Health, Control and Supervision of Livestock Inputs, Production Programs, and Special Projects.

6.1. Animal Health Division.

6.1.1. Objectives. These are included in the National Development Plan, and specifically ins involves development of the livestock industry, they may be defined as follows:

1. To increase the country's livestock production and productivity through prevention, control and arradication of the main diseases affecting livestock.

2. To meet the domestic demand for livestock products and byproducts.

3. To facilitate importation and exportation of cattle on the hoof, packaged meat and animal byproducts generally.

6.1.2. Organization. The Animal Health Division operates based on the following organization: 1) Head of the Division; 2) Foot and Mouth Disease Service; 3) Brucellosis Service;

4) Health Campaign Service; 5) Diagnosis Service; 6) Inspection and Quarantine Service; 7) Cold Storage for Exportation Service. There is also an Advisory Committee made up of the Directors of the various Services in the Division together with the Heads of the Divisions of Supervision of Livestock Inputs, Veterinary Sciences and Special Projects. The function of this Committee is to advise the Division and its Director in performing animal health activities throughout the country.

6.1.3. Functions.

A. To establish the procedures necessary for the prevention, control and erradication of infectious, parasitic and toxic diseases affecting domestic animals.

B. To organize, manage and coordinate health campaigns for the prevention, control and erradication of diseases affecting domestic animals.

C. To organize, manage and coordinate the Diagnosis, Inspection and Quarantine, and Cold Storage for Exportation Services.

D. To counsel the Research Submanagement in applied research projects aimed at solving health problems.

E. To participate and cooperate with the other Divisions of

the Livestock Production Submanagement in drawing up plans, programs and projects for animal production.

F. To draw up reports on the country's health situation for distribution within Colombia and abroad.

G. To collaborate with the Ministry of Agriculture and the Ministry of Health in drawing up the Division's standards.

H. To supervise fulfillment of the health programs and standards established.

I. To establish coordination with other entities of the Farm Sector in all Animal Health Programs.

J. Others that may be assigned to it by the Livestock Production Submanagement.

6.2. Division of Livestock Production Programs.

6.2.1. Objectives. The Division of Livestock Production Programs is the unit under the Livestock Production Submanagement in charge of transferring technology generated by the Institute both in Animal Sciences and in Veterinary Sciences. In fulfillment of these functions, it receives and adapts research results and delivers them to the country's commercial producers. The Division's overall objective is to increase Colombia's livestock yield by application, through the Institute, of the production policy issued by the Ministry of Agriculture.

6.2.2. Organization. In order to fulfill its responsibilities, the Division is organized as follows: 1) Division Direction; 2) Livestock Technical Assistance Service; 3) Livestock Production Plans Service.

6.2.3. Functions.

1. To advise the Submanagement in all matters involving technical and administrative aspects of livestock production at ICA and throughout the country.

2. To see to it that the activities carried out by the Divisions of the Livestock Production Submanagement are approached as part of a comprehensive production process aiming to increase production and productivity levels.

3. To design and propose projects aimed at correcting the various factors that limit animal production and to present to the Institute's Directors, production alternatives that may guarantee maintenance of productivity levels for economically important animal species in the different production areas.

4. To collaborate with the Ministry of Agriculture in all matters involving livestock programming.

6.3. Division of Supervision of Livestock Inputs.

6.3.1. Objectives: The Division of Supervision of Livestock

Inputs is a technical regulatory unit in charge of all activities involving technical assistance, rules and official control, distribution, application and consumption of biological products for veterinary use, animal feed concentrates and raw materials, semen and breeding and incubation of fowl products.

It also carries out advisory and educational activities about livestock products, geared to users, producers, importers and distributors.

6.3.2. Organization. The Division of Supervision of Livestock Inputs is made up as follows: 1) Service of Supervision of Animal Feed and Genetic Material; 2) Service of Supervision of Drugs and Biological Products for Veterinary Use; 3) National Service of Licenses and Registration of Livestock Inputs; 4) National Drug and Biological Products Control Laboratory. The Division also has the services of the Laboratory for Analysis of Agrochemical Products and Animal Feed.

6.3.3. Functions.

1. To propose necessary standards involving quality, handling, transportation, application and use of livestock inputs.

2. To control licenses and permits for importation, production, marketing and application of livestock inputs.

3. To collaborate and coordinate with the Ministry of Agri-

culture, the Colombian Institute of Technical Standards ICONTEC, the Ministry of Health and other public and private entities in matters regarding preparation of rules and policies on livestock inputs.

4. To counsel the Foreign Trade Institute INCOMEX and other government agencies in matters regarding importation and exportation o livestock inputs.

5. To coordinate with the programming and evaluation office, the implementation of studies on marketing of livestock inputs.

6. In coordination with public and private agencies, to promote educational campaigns on the quality and adequate use of livestock inputs.

7. To coordinate with the Research Submanagement, performance of experimental work aimed at attaining efficient supervision of livestock inputs.

8. To counsel the Institute's National and Regional Directors in matters regarding livestock inputs.

9. To coordinate meetings of the Industry's Advisory Boards.

6.4. ICA-USDA Agreement.

ICA-USDA Project is a technical cooperation program between

ICA and the U.S. Department of Agriculture for the eradication and control of Foot and Mouth Disease (FMD) in the areas adjacent to the Colombian-Panamanian border, for the purpose of maintaining free of the disease the Northwest area of the Department of Chocó and to accelerate control measures in order to eradicate the disease in the Urabá Zone (Department of Antioquia).

In order to comply with the objectives set forth, ICA is carrying out in Area I, Chocó, different programs on sanitary vigilance, epizootiology and investigation. In Area II, Urabá, located in the Northwest region of Antioquia, ICA is running sanitary and investigation programs.

AREA I - ACTIVITIES - CHOCO.

Sanitary activities are carried out through a system of epidemiological vigilance with frequent censuses, identifying all cattle and ranches and sacrifice of animals in case of outbreaks of FMD. The program controls internal movements of animals, prohibits the introduction of animals coming from contaminated areas, investigates the status of healthy carriers and the role of wildlife species in the transmission of FMD, assists in cattle replacement in the zone, through an artificial insemination reproduction program and maintains a program of information and education sanitary activities.

AREA II - ACTIVITIES - URABA REGION OF ANTIOQUIA

Periodic FMD vaccination is compulsory. The program controls of all vesicular outbreaks through establishment of quarantines and sanitary measures, applies vaccine tests and develops education programs among the community. Activities in both areas are carried out through legal implementation, training of personnel, epidemiological studies, control regarding handling and application of vaccine, diagnostic services and technical assistance for other diseases of the cattle population.

AREA I - ACCOMPLISHMENTS - CHOCO

Epidemilogical vigilance is carried out through semi-monthly and monthly inspections of all ranches. Nine control posts for vigilance, movement and disinfection have been established, thus permitting full control of all susceptible animals entering the area.

A study regarding incidence of VIA Antigen was carried out, as well as several other tests on OP virus isolation, all of them with negative results. Thirty-five serum samples have been taken from wild pigs, with negative VIA results.

In order to solve the need for breeders, 39 bulls have been brought in and five artificial insemination posts have been established at Unguia, Santa María, Gilgal, Balboa and Acandi.

AREA II - ACCOMPLISHMENTS - URABA REGION OF ANTIOQUIA

Vaccination is carried out three times a year in an effort to vaccinate 100% of all bovines, reaching during 1976 84%, 90% and 92% of the cattle population.

Movement control is exercised through the issuance of an official license to vaccinated animals still under an immunity period. Five fixed control posts and four mobile units have been established.

As far the public information and education campaign is concerned, there is a well-equipped audiovisual mobile unit, which is trying to reach quite a good number of persons and places.

In order to carry out all activities in an adequate manner, the Project holds a total of 218 officials, 19 offices, 7 control posts, 1 Administrative Center, 1 Diagnostic Center, 20 radios, 16 vehicles, several boats and animals which facilitate transportation. Financial execution as of October 31, 1977 came up to 160 million pesos, or approximately US$ 5 million, largely provided by the U.S.D.A.

7. Rural Development.

7.1. History.

Agricultural extension, in spite of its importance, has been the least developed component of agricultural infrastructure in Colombia. In 1954 it was begun with the Colombo-American Technical Service of the Point IV Program of the United States. The Program was structured according to the North American system, with ten sectional offices created in the course of a four year period. In 1958, the Extension Division was created to cover 17 agricultural zones, and in 1960 it was transferred to the Ministry of Agriculture.

Although for several years there were strong efforts to make this an efficient and useful service to the farmers, it is believed that the results obtained did not, in general, correspond to the effort expended. The economic, social and cultural conditions of the Colombian peasant farmer render inoperative such an extension system, conceived to work in another country that has great resources and complete infrastructure, among farmers of superior economic and cultural level, and directed specifically toward increased production. What now most interests Colombia, deficient in resources for agricultural exploitation, is the social amelioration

of the peasant farmer and his integration into national life, for which the extension service as introduced was ineffective.

In 1967 the Extension Service was transferred from the Ministry of Agriculture to the I.C.A. Despite the lack of specialized personnel, in 1968, I.C.A. activated this service under the name of Rural Extension.

When the Agronomy and Veterinary Colleges finally included courses related to extension activities in their curricula in 1954, the students accepted them without enthusiasm, considering such activities to be of scientific and academic inferiority. However, the Kellogg Foundation participated actively in Extension development, and under its auspices, in 1970, eight I.C.A. professionals went abroad for advanced studies in agricultural extension. That same year, 16 Institute professionals attended an Extension training program at the University of New Mexico. The climax of efforts dedicated to Extension was the opening of the Communications Center at Tibaitatá, which was finished in 1973.

The Extension System as such had little success in reaching the Colombian rural sector, where the majority of the peasants practice traditional agriculture on very small farm plots. This failure forced I.C.A. to find a more viable approach, centered in the Rural Development Projects.

Essentially, a Rural Development Project is an intensive effort of government farmers and homemakers to make efficient use of available resources --human, physical and economic-- in a determined region, in order to improve the standard of living. Private industry and government agencies specialized in agrarian reform, marketing, credit, physical infrastructure, education, public health, etc., effectively support this effort, through an integration of services.

In order to fortify the Rural Development Projects, ICA has received financial support from several international agencies. Canadá is providing financial and technical assistance through the International Development Research Center (I.D.R.C.) and the Canadian International Development Agency (CIDA). The Ford Foundation has provided funds for economic research, several scholarships for advanced degrees,abroad and short and long-term consultative services. There are approximately 30 Peace Corps Volunteers working with ICA in investigation and rural development.

Rural Development activities are now largely centered in the Integrated Rural Development Projects (DRI), which are receiving financial support from the World Bank, CIDA and the National Government, as mentioned in Chapter II. Furthermore, A.I.D. is providing $3 million for three experimental development projects which have the objective of exploring

new methodologies of technological transferance. Map 1 shows the location of the 41 Development Projects of ICA which are currently functioning.

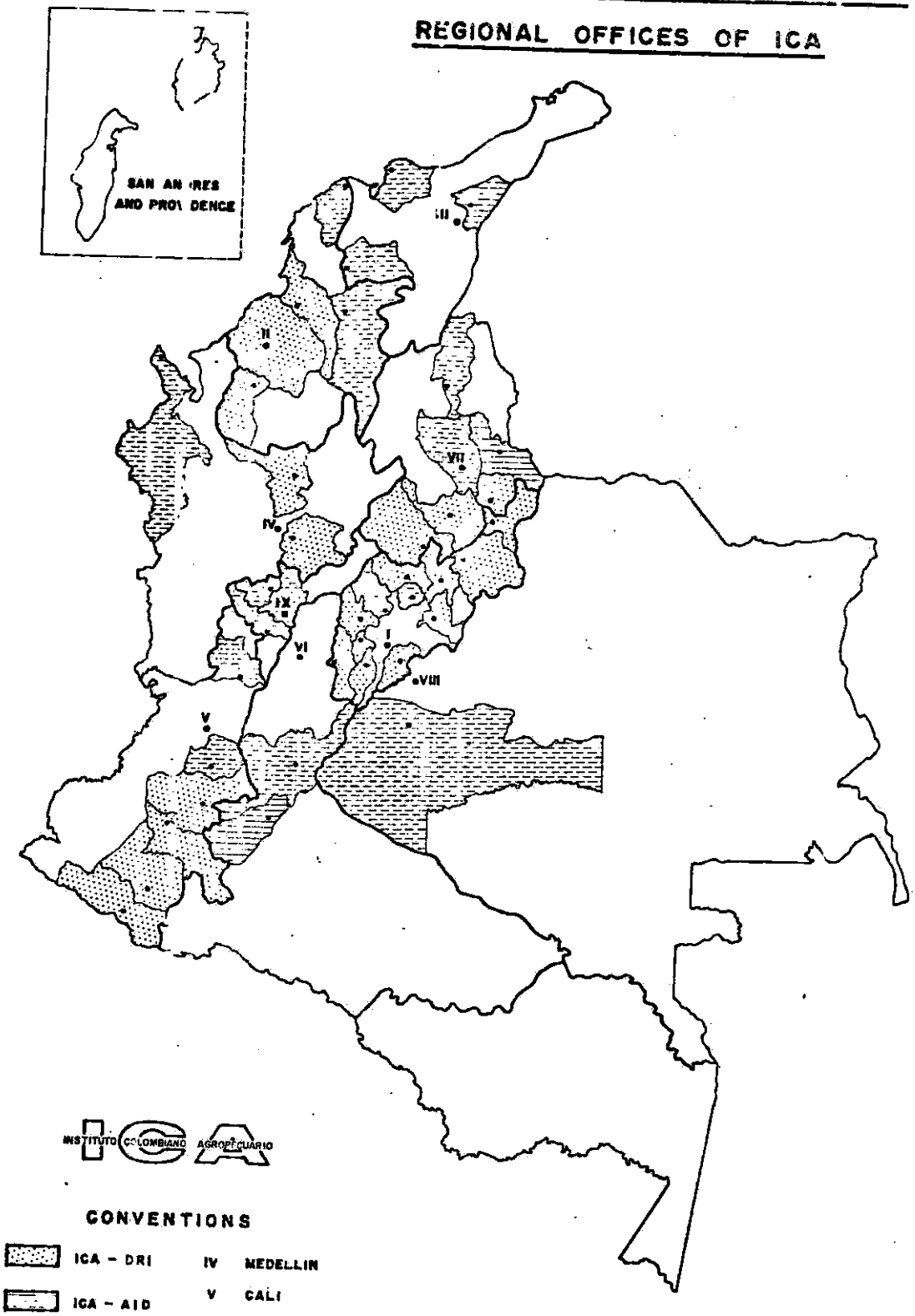
7.2. Activities.

Figure 11 shows the sequence and relationship of each component of a rural development project.

7.2.1. Diagnostic. The first stage in the Projects is the elaboration of a diagnostic for the identification of principal problems and for the programming of applied investigation and work strategies. Follow-up diagnostics are completed each semester for program activity evaluation and adjustment.

7.2.2. Applied Investigation. Within each District field tests are conducted of first-approximation recommendations, to adjust them to local physical and economic conditions. Technical recommendations are continuously refined as the follow-up diagnostics identify principal problem.

RURAL DEVELOPMENT PROYECTS AND REGIONAL OFFICES OF ICA



INSTITUTO COLOMBIANO AGROPECUARIO

CONVENTIONS

- ICA – DRI
- ICA – AID
- ICA

I	BOGOTA	IV	MEDELLIN
II	MONTERIA	V	CALI
III	VALLEDUPAR	VI	IBAGUE
		VII	BUCARAMANGA
		VIII	VILLAVICENCIO
		IX	MANIZALES

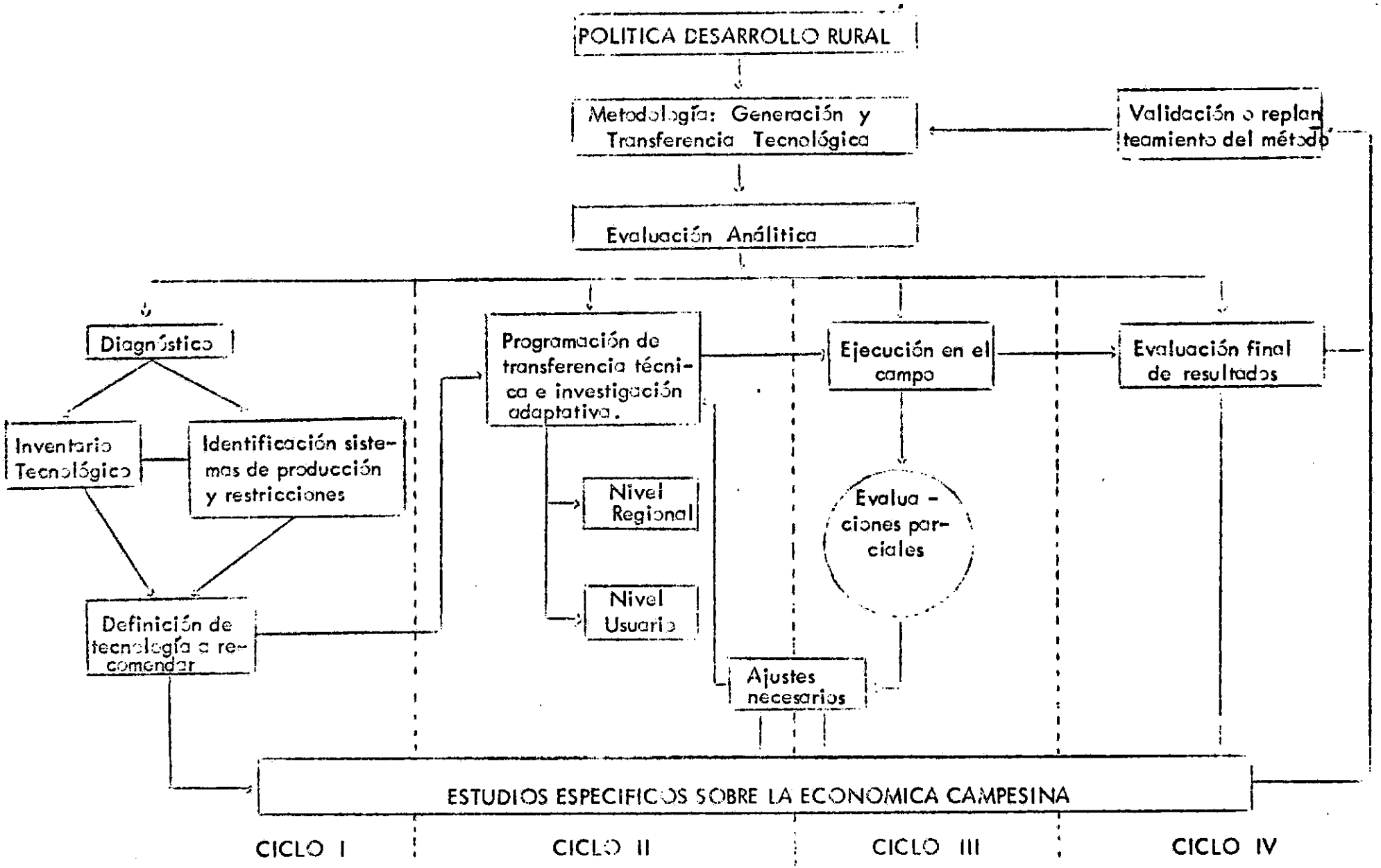


FIGURA 11 Esquema para evaluación del componente tecnológico en programas de Desarrollo Rural.

7.2.3. Agricultural Production Projects. ICA promotes the formation of small groups of torget farmers to participate in the design and implementation of production projects, and to help identify principal technological, financial and marketing problems which occur during implementation. Production Projects include the programming of the area to be dedicated to each crop and animal specie and the techniques to be employed in the production process.

7.2.4. Social Projects. Small groups of torget farmers and their spouses are also used to develop, implement and adjust social projects. These activities include the Nutrition Program, composed of Nutrition Education and Home Garden Production; the Infrastructure Program, which includes promotion of the use of toilets, filters, waste removal, kitchen sanitation, etc.; and the Co-ordination Program which identifies principal social and infrastructural problems outside the domain of ICA, and suggests and coordinates activities for their solution with other entities, such as the Ministries of Health and Education, the Rural Road Construction agency, etc.

7.2.5. Rural Communication, Extension and Technological Transference. These activities have the principal objective of promoting the use of technologies and activities outlined in the Agricultural Production and Social Projects. Demonstrations, model plots, extension agent visits, group meetings,

radio, newspapers billboards, posters and pamphets are all used.

7.2.6. Evaluation. Project activities are continuously evaluated to assure that the Adaptive Investigation, the Production Projects, the Social Projects and the Extension Programs are all pertinent to the resource, physical and social restrictions faced by small farm families. Partial adoption rate analysis and special studies help indicate where adoption bottlenecks are occuring. The evaluation activities are cyclical : evaluation, adjustment, evaluation, leading to a refinement of the methodology of Rural Development.

The Divisions of Socioeconomic Studies, Rural Communications and Governmental Technical Assistance coordinate, supervise and assist the personal of regional and local offices in implementing these activities.

7.3. 1978 Program.

For 1978, the Integrated Rural Development Project Programs will provide technical assistance for 39.000 small farm families. Ninety percent of these will receive supervised credit. About 1500 field investigations will be conducted. Extension activities will include 1760 field demonstrations, 1400 hours of radio programming, 120 slide show sets, 45.000 posters, among other activities. In order to execute the

Rural Development Projects, approximately 1380 field personnel will be used, of which 16% have university degrees.

8. Project ICA - Interamerican Development Bank

At the present time ICA is in the final stage in the execution of Loan 303 SF/00, conceded by the Interamerican Development Bank on September 30, 1971.

8.1. Description of the Project.

The project calls for the control of diseases affecting crop and livestock production and for the collection and dissemination of technical knowledge through research and extension in the agriculture and livestock field. The objectives of the project are attained through the implementation of two subprojects:

(a) Animal Health Subproject:

This subproject includes the control of foot-and-mouth disease and the control and ultimate eradication of brucellosis. It constitutes an intensification and systematization of the first stage of a broad Colombian program of animal health. In this first stage, foot-and-mouth disease control activities were carried out on a massive, intensive and systematic scale in the entire Atlantic coast region, while

work in the rest of the country centers around the areas with the largest livestock population. The brucellosis control work covers the entire country. Starting in the fourth year of implementation of the first stage, ICA extended the organized foot-and-mouth disease control campaign to the entire country on the basis of the experience gained in the first stage. This subproject complements the ICA-U.S.D.A. Project.

(b) Agriculture and Livestock Research and Extension Subproject: This subproject calls for an expansion of ICA's research and experimentation in various regions of the country in order to develop more advanced technology and improved agricultural inputs; it also calls for fostering the use of such inputs and technology by strengthening the extension and technical assistance services provided to farmers. For these purposes, the subproject includes: (i) Construction and expansion of physical facilities in the research and experiment stations; (ii) Establishment and equipping of new extension agencies and improvement of existing ones; (iii) Provision of vehicles, machinery, equipment and breeding stock for research and experiment stations and for seed certification, input-testing, plant-health services and extension activities, and (iv) Enlargement of professional and technical staffs,

as well as training and specialization of such staff in the country.

8.2. Cost of the Project.

The cost of the project is estimated at the equivalent of US$ 45.400.000, discriminated as follows:

	Source	US $	%
a.	IDB	19.800.000	43.6
b.	ICA	25.600.000	56.4
	TOTAL	45.400.000	100.0

8.3. State of the Project.

As mentioned previously, the funds of the Loan have given ICA the opportunity of purchasing equipment, machinery and vehicles, and building Diagnostic and Research Centers. The Institute has built or improved its physical facilities in 15 research and experiment stations. About 80% of activities of this type are completed. The purchasing of laboratory equipment, agricultural machinery and vehicles according to the program, has been totally executed.

In the Animal Health Subproject, the construction and equiping of the National Laboratory of Vaccine Control and the construction of 5 Diagnostic Centers are completed. Seven Centers are in construction and three additional Centers

are planned, in order to have a Control Structure covering the entire Country.

Eighty percent of total IDB funds and 100% of ICA funds have been spent. The final date for execution of the Project is September 30th, 1978.