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Appraisal of the Cordoba 2 Agricultural Development Project Colombia

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COLOMBIA

AN APPRAISAL OF THE CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

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11080 Cordoba 2 Project Area

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

SUMMARY AND CONCLUSIONS

i. This report appraises a project for rehabilitation and completion of the Cordoba 2 Project (40,000 ha) where the Instituto Colombiano de la Reforma Agraria (INCORA), a dependency of the Ministry of Agriculture, has been engaged in drainage development and agrarian reform during the past several years. In 1972 Government adopted a new policy whereby INCORA would be required to rehabilitate and complete 16 existing land development projects before undertaking new projects. The Government requested financial assistance from the Bank for this program and seven projects were selected as suitable for future consideration by the Bank. The project appraised in this report would be the first phase of the program.

ii. Over the last six years, the Bank has made five loans for agricultural development in Colombia, totalling US\$57.4 million (one for colonization, two for credit and two for irrigation and drainage projects). All projects underwent initial difficulties, but overall performance has improved and the projects are progressing moderately well.

iii. In the Cordoba 2 area the project would increase agricultural production through double-cropping under rain-fed conditions by providing improved drainage to reduce inundation of crop land during the wet season and reclaiming about 6,000 ha of permanently flooded land. The project would also include on-farm development (primarily land leveling), improvement of extension services, technical assistance, a development credit fund, the settlement of 1,000 families on reclaimed lands and a program to improve social infrastructure for education, health, village water supply, rural electrification and telephone service. The project would be carried out over a five-year period, 1976-1980, and would benefit about 3,800 farm families.

iv. INCORA would be responsible for implementing the construction, agricultural development and settlement phases of the project. Other Government agencies in the Ministries of Agriculture, Education, Health and Public Works would assist with specialized components through operational agreements with INCORA. The new Government, which took office August 7, 1974, had indicated that INCORA would be reorganized, most likely to place the agrarian reform and land development functions in separate agencies. The organizational structure was discussed with Government during negotiations and assurances were obtained that INCORA would continue to have responsibility for the project as at present.

v. The estimated project cost is US\$35.7 million, with a foreign exchange component of US\$16.9 million, including contingencies and interest during construction. The proposed Bank loan of US\$21.0 million would cover the foreign exchange costs, 90% of the local currency component (US\$2.3 million) of the development credit fund and 70% of total costs for the program to improve social infrastructure (US\$1.3 million). The balance of project costs, equivalent to US\$14.7 million, would be financed by Government. Procurement for project works (US\$12.2 million) and major items of equipment imported by INCORA (US\$2.2 million) would be through international competitive bidding in accordance with Bank guidelines. Consultant services (US\$0.7 million) would be procured through direct negotiations. Procurement of construction contracts and equipment required for the social improvement program and purchases of farm equipment and livestock from development credit funds would be through local competitive bidding procedures, which are satisfactory to the Bank. Under international competitive bidding domestic manufacturers in Colombia would be accorded preferential treatment in bid evaluation in accordance with Bank procedures. The Government would be the borrower and assume the foreign exchange risk.

vi. At full development in 1985 the annual net value of production would be about US\$11.1 million in the project area as compared to US\$2.3 million without the project. It is estimated that the increases in farm income would range from US\$223 for small subsistence farms (1 ha) to US\$2,400 for 10 ha settler farms within community enterprises (Empresas Comunitarias) and US\$4,100 for privately owned farms of 30 ha. It is estimated that with the project 60% of the farm families in the area would have a per capita income above the expected upper limit in 1985 (US\$250) for the poorest 40% of the population in the country, as compared to 14% at present. The project would increase food supply for internal consumption and contribute to improving Colombia's balance of payments since most of the increased production would be for import substitution or export. The economic rate of return over an assumed 40-year project life would be 27%.

vii. With appropriate assurances obtained from Government, the project is suitable for a Bank loan of US\$21.0 million, with a repayment period of 30 years, including a 6-year grace period.

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

I. INTRODUCTION

1.01 The Government of Colombia has requested Bank assistance in financing completion of the existing Cordoba 2 project which is part of a country-wide land development program administered by the Instituto Colombiano de la Reforma Agraria (INCORA). During the past six years the Bank has made five loans for agricultural development in Colombia, totalling US\$57.4 million. Projects which received this financial assistance were Atlantico No. 3 Irrigation (502-CO), Atlantico No. 3 Second Stage (849-CO), Livestock Development (651-CO), Agricultural Credit (624-CO), and Caqueta Land Colonization (739-CO). A Phase II of the Caqueta project has been appraised and will be presented for approval in the near future. These projects have experienced difficulties and progress was slow during the first years of operation but at present all are performing moderately well.

1.02 In September 1972, the Government and INCORA requested Bank assistance for rehabilitation and completion of 16 projects where development for irrigation and drainage, agrarian reform and other improvements have been in progress for several years. This proposal was the result of a new policy adopted by Government whereby INCORA was restricted to completion of on-going projects prior to undertaking new development. The Bank subsequently reached agreement with INCORA on seven projects which would be considered for financial assistance. Cordoba 2 is the first of these projects that was appraised. The agrarian reform program has been reasonably effective in the project area and consequently the project would benefit mostly small farms.

1.03 Feasibility studies for the Cordoba 2 area were completed by Hunting Technical Services, Ltd, England, during 1969-71 and these studies form the basis for the appraisal covered by this report.

II. BACKGROUND

2.01 With gross domestic product (GDP) up by 7.1% in 1972, having averaged 6.4% in real terms annually during the 1967-72 period, Colombia's overall economic performance has been impressive. Much of the credit for achieving this level can be attributed to increased urban construction and to strong agricultural and industrial expansion, rapid growth of non-traditional exports (agricultural exports accounted for about 44% of the value of total exports in 1972), and favorable coffee prices. Continuation of such rapid growth would lay a solid base for the country's longer term economic future,

enhancing the prospects for employment creation and chances for improvement in the distribution of income. A major problem during the next few years, however, will be inflation. Consumer prices increased by 13.5% in 1972, as compared to 7.5% in 1967-70, with food prices among the major contributors. The cost of living index increased 22% in 1973 and a further increase of 27% took place in 1974.

2.02 Colombia's population of about 24 million (1973) is increasing at a rate of 3.2% per year and will reach about 33 million by 1985. In 1970, the labor force was about 6.2 million, of which some 7.4% was unemployed. Data on unemployment are sparse, but available figures indicate an overall rising trend in urban areas. Unemployment and underemployment in both urban and rural sectors, rapid rural-urban migration and inability of the industrial sector to create sufficient new jobs are among the most serious problems facing the country.

2.03 Per capita GDP in 1972 was about US\$400 (in 1970 dollars), but income is distributed unevenly, with the poorest fifth of the population apparently receiving 3% to 4% of total income and the richest fifth about 60%. The upper limit in per capita income for the poorest 40% of the population is about US\$180.

2.04 Although agriculture's direct contribution to GDP dropped from 38% in 1958 to 25% in 1972, the sector still plays a major role in the Colombian economy, accounting for some 43% of the labor force and contributing 73% of the country's merchandise export earnings in 1972. A major weakness of Colombia's agriculture is its inability to meet the demand for products. The wholesale price index of food stuffs has been growing faster than the corresponding total index. However, increasing production for domestic purposes should not be at the expense of expansion of agricultural exports, which are a necessary condition for achievement of the national targets for growth and improved income distribution.

2.05 Another serious problem facing Colombian agriculture is the extreme poverty in many rural regions: at least half of Colombia's 1.6 million rural families exist at a subsistence level. Income distribution in the sector is more skewed than it is at the national level and closely related to the distribution of land. Furthermore, inefficient use of land has been found to be associated with large holdings, hence, the special importance of agrarian reform. •

2.06 The Colombian Government has recognized that the interrelated problems of rural poverty, low agricultural productivity, and rural unemployment cannot be solved without changing the structure of the agricultural sector, and since 1961 the Instituto Colombiano de la Reforma Agraria (INCORA) has been the agency responsible for implementing Government policy in this field (para 5.01). One of INCORA's fundamental objectives has been land acquisition and redistribution. The acquisition of land by INCORA throughout the country has been hindered by political resistance but the new agrarian reform legislation, Law 4 of 1973, provides an opportunity to accelerate the pace of agrarian reform.

III. THE PROJECT AREA

Location and Present Situation

3.01 The Cordoba 2 project area is located in the Department of Cordoba, in the valley of the Rio Sinu and in the vicinity of the city of Monteria. The development area of 40,000 ha is situated in the wide part of the valley on the east bank of the river (Map 11080). Prior to the early 1960's the area was almost totally inundated during the wet season each year and was used for part-time livestock grazing. With completion by INCORA of the main drainage canal and the flood protection dike on the east boundary during 1963 to 1967, use of the land for agricultural purposes accelerated rapidly. Since 1967 INCORA has continued construction of primary and secondary drainage systems and this work has been completed on about one-third of the area. Lands in the area respond rapidly and positively to drainage and full reclamation can be achieved in one to two years. At present about 17,000 ha are cropped under rainfed conditions, mainly cotton (12,000 ha), with 17,000 ha in unimproved pasture and 6,000 ha still in swamp. INCORA has acquired about one-third of the land in the area and settled about 1,000 families in community enterprises (Empresas Comunitarias) on 14,500 ha (Annex 1).

Climate

3.02 Climate in the area is humid tropical, with a mean annual rainfall of 1,138 mm and temperature of 28°C. Normally more than 80% of rainfall occurs during the wet season from May through November, during which time double-cropping with a variety of crops is possible, however, with a certain amount of risk. Supplemental irrigation would provide some benefits but INCORA takes the position that the marginal increases in production would not justify the high cost of irrigation development (Annex 1).

Soils and Topography

3.03 Soils in the area are young alluvium deposited by overflow of the Rio Sinu. Near the river the deposits of coarser material produced loam and sandy loam soils, known as the levee lands, which have reasonably good texture, fertility and drainage characteristics and are suitable for field crops such as cotton, maize, soybeans, sesame and vegetables. The finer alluvium, deposited farther from the river, produced heavy silt and clay loam soils which are fine textured and have poor internal drainage. These basin lands are more subject to flooding and retention of flood water for long periods. These lands are presently used for pasture or unutilized, however, with drainage and leveling a large part of these lands could be cropped, except in the lowest areas, covering about 6,000 ha, which would only be suitable for pasture. Fertility of both the

general soil types is good and response to fertilizers is positive. Topography is very uniform with a total gradient of 10 meters in the 40 km from the south boundary of the project area to north boundary at Cienega Grande. About 70% of the land in the project area has been classified as suitable for rain-fed agriculture (Annex 1).

Population, Employment and Land Tenure

3.04 Total population in the area of influence of the proposed project was about 205,000 for 1973, of which 80,400 (39%) are classified as rural. The overall growth rate is estimated at 2.6% p.a., composed of annual rates of 3.1% and 1.9% for the urban and rural segments respectively. The labor force is estimated to constitute about one third of the population and surveys carried out in 1970 suggest that unemployment and underemployment combined are equivalent to close to half of the labor force in both the urban and rural sectors.

3.05 The project area has an estimated population of 35,000 which depends upon agriculture, almost half of which, or 2,810 families, are farm operators, mainly owners and to a smaller extent tenants under different tenancy arrangements. The land distribution pattern changed rapidly after the project area became an irrigation district in 1961. Since then INCORA has acquired 9,900 ha of land held in excess of 50 ha by a single farm unit and reclaimed 2,300 ha of inundated (cienega) land. These 12,200 ha were subsequently distributed in blocks of about 140 ha to 87 community enterprises farmed by about 1,000 farmers, each with a right to exploit an average of 12 ha. At present about 50% of the area (17,000 ha) is occupied by small farms ranging from 2 ha to 20 ha, representing 91% of all farms in the area (Annex 1).

Agricultural Production

3.06 Due to the relative remoteness of the Cordoba 2 area from major market centers, problems with flooding during the wet season and former land tenure conditions, the project area has been used traditionally for extensive livestock production like most of the Atlantic coast of Colombia. With improved communication, the introduction of cotton in the coastal region and the implementation of a drainage and land reform program over the past two decades, land utilization has become more intensive.

3.07 The value of agricultural production (at farm gate prices) was estimated to be approximately Col\$ 207 million (US\$8 million) in 1973, of which 75% originated from the cash crop subsector (cotton, maize and sorghum), 15% from the livestock subsector and 10% from subsistence crops (yucca, plantains, and tropical fruits). The average net production value per hectare is about Col\$ 1,600 (US\$63). Three distinct farming systems prevail in the area: (a) small semi-subsistence units with a high proportion of land in food crops, some small livestock and some cash crops such as maize; (b) medium to large size commercial crop farms (cotton, sorghum and maize and, in some instances beef cattle); and (c) larger beef cattle farms, sometimes mixed with cash

crops. Production techniques are still rather traditional and yields are low, particularly in the small semi-subsistence farms and in the large live-stock holdings. The medium size commercial crop farms are increasingly using improved inputs and practices for the production of cotton and sorghum. The most serious constraints to realizing the optimum potential are the incomplete drainage systems, leaving 15% of the areas as swamps and leading to intermittent flooding and ponding of the lower lands, and the paucity of technical and financial assistance to farmers, especially to the smaller ones.

Institutional Assistance to Agriculture

3.08 The project area is a public irrigation and drainage district for which INCORA has the overall responsibility. INCORA carries out the construction of project works required for land and water development, land acquisition and settlement, operation and maintenance of project works, and technical, administrative and financial assistance, mainly to the smaller farmers. To this end INCORA maintains a project headquarters in the area staffed with some 30 technicians.

3.09 Agricultural research relevant to the project area is provided by the Instituto Colombiano Agropecuario (ICA) at the Turipana research station located in the project area and at the Palmira station in the southern part of the Cauca Valley. Research is also carried out at the Agricultural Faculty of the National University of Colombia and the Centro Internacional de Agricultura Tropical (CIAT) research stations, both in Palmira. All these stations are well equipped and capable of supporting agricultural development in the project area.

3.10 Agricultural extension assistance to farmers is furnished by INCORA staff, private extensionists, agents from ICA, commodity organizations, agricultural banks and also through demonstration by the research stations. Most of these extension activities consist of credit supervision and extension for farm management and the technical aspects of crop production remains weak in terms of coverage and quality.

3.11 Farmer training is provided for by Servicio Nacional de Aprendizaje (SENA), the national institution for vocational training. It is well experienced in this task and maintains a training center near Monteria in the project area. The program offered includes two to three years practical courses at the stations in handling farm machinery, general agricultural practices and management, in addition to short courses in the field.

3.12 Agricultural credit services are provided by INCORA's credit programs, the Caja de Credito Agrario, Industrial y Minero (Caja Agraria), the Banco Ganadero and the Central de Cooperativas de la Reforma Agraria (CECORA) through the Cooperativa del Sinu. These institutions and major national and regional commercial banks are well represented in the area and are easily accessible to farmers. However, funds for the various credit programs have generally been short of demand and largely restricted to short term crop financing.

Marketing

3.13 Marketing channels in the project area are sufficiently developed to handle both present and future production. National marketing agencies such as the Instituto de Mercadeo Agropecuario (IDEMA) and the Central de Cooperativas de la Reforma Agraria (CECORA) are active in the area, as well as the cotton and livestock federations and processing industries handling specific crops. IDEMA operates two cotton ginneries and a grain storage facility in the area, which are adequate to meet present needs and projected production increases.

Transportation

3.14 The project area is served by main highways which provide access to the larger cities and commercial centers in the region. Monteria, the main center, has good highway connections to Medellin, a major market and industrial center, and to Cartagena and Barranquilla, both important ports on the Atlantic coast.

Existing Social Infrastructure and Services

3.15 Social infrastructure and services in the rural part of the project area with respect to education, health services, water supply, electric power, sewage disposal and communications show serious deficiencies. In the Cordoba 2 area, it is estimated that one third (15,000) of all eligible students, both urban and rural, are not in school for lack of facilities and that a deficit of 500 classrooms exists. A large proportion of the rural population does not receive adequate health care due to an insufficient number of health centers or poor service from existing centers. The two hospitals in Monteria and Cerete require some expansion and additional equipment to properly serve the area. Twenty five villages in the area with a population of 2,500 or less do not have a pure water supply, electric power, sewage disposal or telephone service to the larger cities or towns. These villages contain a majority of the rural population, as the farmers live in villages rather than on their farms.

3.16 A serious problem with schools and health services is the lack of budgetary support from Government for operation and maintenance of existing facilities. Although buildings and staff are available, the schools lack funds for teaching materials and supplies, school lunches, proper maintenance and teacher training. Health centers have a minimum of equipment and very limited funds for medicines and supplies and maintenance, and sanitation is poor.

3.17 Education and public health services are provided without cost to both rural and urban inhabitants by Government. A minimum charge is made for hospital visits, including examinations by doctors, and care, but this charge may be waived depending on the patient's ability to pay. Charges for electric power, water supply and telephone services are only sufficient to cover operation and maintenance costs and are relatively low.

IV. THE PROJECT

Description and Project Works

4.01 The principal objectives of the project are to complete the drainage systems on 40,000 ha and land leveling on 20,000 ha to eliminate both permanent and temporary flooding. Under the project about 6,000 ha of permanently flooded land would be reclaimed and this, together with 7,800 ha of privately owned land on farms in excess of 50 ha to be acquired by INCORA, would be used to settle about 1,000 families on tracts of 12 ha in community enterprises (Empresas Comunitarias). New settlers would be selected within the Cordoba region, where there are many landless families, and in accordance with existing INCORA procedures which are satisfactory. Project works would consist of construction of primary and secondary drains (514 km), a flood protection dike and collector canal (6.8 km), all-weather roads (168 km), culverts, bridges, and other structures (24) fencing (342 km) and rehabilitation and enlargement of the project headquarters buildings (Annex 2). Assurance were obtained from Government during negotiations that: (a) within 18 months of the date of loan effectiveness, a phased program for completion of the existing plans for land acquisition and distribution in the project area would be prepared by INCORA and agreed with the Bank and (b) this program, together with establishment of new settler's organizations, would be carried out according to an agreed timetable during the implementation period of the project.

On-farm Development

4.02 On-farm development would consist of land leveling, construction of tertiary irrigation and drainage canals and on-farm access roads as required. Land leveling is required as a drainage measure to reduce temporary ponding and the 20,000 ha of leveling in this area would be on small farms, both INCORA settlers and privately owned, as on a major part of the larger farms land improvement has already been completed. The amount of leveling required for rain-fed farming would be much less than that normally required for irrigation. On-farm development on the small farms of less than 12 ha would be financed from a development credit fund provided under the project (para 4.03).

Agricultural Development Credit Fund

4.03 The project would include establishment of a development credit fund, under the management of INCORA, to provide medium and long-term credit to small farmers, both INCORA settlers and private farms of less than 12 ha and to Empresas comunitarias. In the past, agricultural credit has been provided mainly for short-term production loans and small farmers have had only a limited source of development credit (Annex 3). In addition INCORA has largely restricted their assistance from their own resources to settlers on small farms, which left small private farms dependent on other sources such as Caja Agraria and Banco Ganadero. These agencies, however, have not

provided sufficient credit, either for production or development, to small private farmers within INCORA projects, and the project funds would meet the needs of both small private farmers with 12 ha or less and INCORA settlers for development credit. Larger farms have better access to credit from public institutions and the Federations or Associations of producers. Further the newly established Fondo Financiero Agropecuario (FFA) would provide an additional source of credit to large farms and it would not be necessary to provide credit funds for either production or development, in the project for these large farms. Normally, INCORA is able to provide adequate production credit to the small farms. The credit funds would be administered under the same terms and conditions as INCORA's existing Planned Credit Program, financed under Bank loan 624-CO, which has provided development credit within certain INCORA projects. However, the Cordoba 2 project was not included under this program and, in any case, funds available under this program would be disbursed by the end of 1975 and consequently adequate development credit could not be available to the project from this source.

4.04 The development credit funds would be required for on-farm development, purchase of farm machinery, construction of infrastructure on livestock farms and purchase of breeding stock. The funds for on-farm development, farm machinery and livestock would mainly be required on the 100 new community enterprises to be established in the area. The repayment period on these loans would be 5 years for farm machinery and 12 years for on-farm development, infrastructure and breeding stock. The present interest rate under project 624-CO is 13% with an additional 1% for life insurance (Annex 3). This rate was established in 1969 which, with inflation, would be a negative rate in real terms at present. It would be necessary to increase the rate for the new credit funds to 16% to reflect present Government policy on credit loans to small farms. Since the farmers' incentive to borrow project funds depends largely on other credit terms prevailing in the area, assurances were obtained from Government that the proposed interest rate would be subject to revision if Government's regulations of credit to the agricultural sector are changed. Assurances were also obtained from Government during negotiations that (a) INCORA would maintain a credit department satisfactory to the Bank to administer these credit funds; and (b) INCORA would take the credit risk on loans from the credit funds. INCORA would enter into a Project Administration Agreement with the Caja Agraria providing for the Caja Agraria to act as the banking agent. This agreement would be similar to the existing agreement whereby the Caja Agraria acts as the banking agent for INCORA's Planned Credit Program (624-CO) and would include provision of the same services for the development credit loans. Signing of this agreement would be a condition of effectiveness. A draft of the new agreement was submitted to the Bank during negotiations.

Extension Services

4.05 The project would include organization of an agricultural extension service in the project area. This service would basically be oriented to providing assistance to farmers in farm management planning and improved technology in crop production. Although INCORA provides some technical assistance to settlers under its agrarian reform and credit programs and

the larger farmers receive assistance from technicians employed by Caja Agraria, Banco Ganadero and the Growers' Associations, this is inadequate for the needs of the project (Annex 3). Nearly all of this assistance is oriented to supervision of credit loans and it lacks emphasis on farm planning, improving practices and increasing production. The new service would consolidate all of INCORA's existing assistance programs and complement those of other agencies, in an effort to provide more effective assistance to the farmers.

4.06 The service would be organized as part of the rural development program recently initiated by the Instituto Colombiano Agropecuario (ICA), the Government agency responsible for extension assistance to the country. ICA, together with the Centro Internacional de Agricultura Tropical (CIAT), would recruit and train extension agents and provide technical guidance based on research programs at its stations in the Cordoba 2 area (Turipana) and at Palmira in the Cauca valley. INCORA would supervise and administer the services at the project level and provide funds for staff and operation costs. The signing of an operational agreement between INCORA and ICA providing for the formation and support of these extension services would be a condition of effectiveness of the loan. A draft of this agreement was submitted to the Bank during negotiations.

Consultant Services

4.07 Consultant services would be provided to assist INCORA with land leveling, on which it has had limited experience, and in organizing the extension services and training extension agents (Annex 2). In addition, the project would include a specialist on organization to assist INCORA at headquarters in Bogota to improve the efficiency and effectiveness of the organization, especially as this applies to implementation and management of land development projects. There is also a need to improve INCORA's general accounting procedures and to assist them in setting up a system for assessment and collection of project charges to recover investment as well as operation and maintenance costs (para 5.06). A specialist on fiscal management would be provided for this purpose (Annex 1). The need for the organization and fiscal management specialists was discussed during negotiations. A total of 10 man-years of consultant services would be provided (Annex 5). Training of local staff would constitute an important part of the consultant's assignments. Assurances were obtained from Government during negotiations that consultants would be employed by INCORA in consultation with the Bank and under terms and conditions satisfactory to the Bank.

Improvement of Social Infrastructure

4.08 The project would include improvement and expansion of education, health services, village water supply, rural electrification and telecommunications in rural communities in the project area. The objective of this part of the project is to achieve integrated and balanced development in the rural area where agricultural development is expected to expand rapidly with the project. These improvements would be limited to the rural area, excluding

the larger urban centers within or adjacent to the project area, and the proposed program would cover the minimum or essential needs until about 1985. The program would be concentrated in the 25 villages in the project area with populations less than 2,500 inhabitants and which all lack the essential services. These villages serve as micro-economic growth centers where nearly all of the small farm owners and workers live. Criteria for selection of the villages are presented in Annex 2. The improvements would include construction of 210 new classrooms and rehabilitation of 100 existing schools; construction of six new health centers and rehabilitation of six existing centers; improvement and expansion of the two principal hospitals serving the area; provision of additional equipment, materials and supplies for schools, health centers and hospitals; construction of water supply systems in 11 villages, power connecting lines and distribution systems in four villages, and telecommunication systems for four villages. Further, in order to improve the quality of primary education, the project would support the introduction of an improved curriculum and provide advanced didactic materials to all of the 220 primary schools in the project area.

4.09 These improvements would be carried out by the Ministries of Education, Health, Communications and Public Works, through the several agencies or institutions which have responsibility for specific aspects of the program (Annex 4). INCORA would renew or prepare new operational agreements with these ministries and agencies which would define the responsibilities and operational and budgetary procedures for carrying out the program. INCORA would channel funds allocated in the loan to these agencies to cover costs of the program, and the agreements would include commitments on the part of the agencies for the Government's contribution to cover operation and maintenance costs of new and improved existing facilities as well as construction costs. Assurances were obtained from Government during negotiations that agreements for construction of social infrastructure and budgetary support for the social improvement program, including annual operation and maintenance costs, would be signed within six months of the date of loan effectiveness with the Ministries and agencies responsible for this part of the project.

Cost Estimates

4.10 Cost estimates for major project works are based on estimates in the feasibility report by Hunting Technical Services, Ltd., dated 1971. These estimates were recalculated as of the appraisal date, February 1974, and subsequently updated, by adding a price contingency of 35% to cover inflation, to determine the base cost estimate as of May 1975. Cost estimates for social infrastructure, equipment and consultant services were calculated as of May 1975. Cost estimates for local services for engineering and supervision and extension services were calculated as of February 1974 and subsequently increased by 40% to reflect recent salary increases granted by Government. The agricultural credit component was estimated to cover requirements during the construction period, from early 1976 through 1980 (Chart 9060). Estimates for project works are based on performing the construction by local contractors, as local firms are able to contract the work at a lower price than foreign

firms which have shown little interest in civil works construction in the country. Costs of equipment to be imported are estimated as CIF Colombia, free of duty and taxes as the purchaser would be a Government agency. Physical contingencies are estimated as 10% for civil works. Price contingencies are calculated using the projected rates of inflation, internally for local currency costs and externally for foreign exchange, from 1976 onward. The internal rates for inflation used are 18% in 1976, 16% in 1977, 14% in 1978, 12% in 1979 and 10% in 1980 and thereafter. External rates for civil works are 14% in 1976, 12% from 1977 through 1979 and 10% in 1980 and thereafter; for imported equipment the rates are 10% in 1976, 8% from 1977 through 1979 and 7% in 1980 and thereafter. A cumulative rate of 10% per annum was used for consultant services. Project cost estimates are given in detail in Annex 5 and summarized below:

	<u>Col\$ (million)</u>			<u>US\$ (million)</u>			<u>% Foreign Exchange</u>
	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>	
Major Project Works	179.5	128.8	308.3	7.1	5.1	12.2	42
Social Infrastructure	45.6	-	45.6	1.8	-	1.8	-
Agricultural Credit	64.6	87.2	151.8	2.6	3.4	6.0	57
Equipment	9.0	45.6	54.6	0.4	1.8	2.2	82
Engineering and Supervision	52.7	-	52.7	2.1	-	2.1	-
Extension Services	13.9	-	13.9	0.6	-	0.6	-
Consultant Services	-	17.5	17.5	-	0.7	0.7	100
Base Cost Estimate	365.4	279.1	644.5	14.6	11.0	25.6	43
Physical Contingencies	17.9	12.9	30.8	0.7	0.5	1.2	42
Expected Price Increases	88.7	52.8	141.5	3.5	2.1	5.6	38
Total Expected Cost of Project	472.0	344.8	816.8	18.8	13.6	32.4	42
Interest during Construction	-	83.6	83.6	-	3.3	3.3	100
Grand Total	472.0	428.4	900.4	18.8	16.9	35.7	47

Financing

4.11 Total project costs of US\$35.7 million would be financed by a Bank loan of US\$21.0 million and a Government contribution of US\$14.7 million, to be met by annual budgetary appropriations. The Government would be the borrower and carry the foreign exchange risk. The loan, which would be for a period of 30 years, including a six-year grace period, would cover the estimated foreign exchange expenditures (US\$16.9 million), 90% of the local currency component of the agricultural credit fund (US\$2.3 million) and 70% of the total costs for improvement of social infrastructure (US\$1.3 million).

The loan would amount to 59% of total estimated project costs, including contingencies and interest during the five-year implementation period.

Procurement

4.12 Contracts for construction of major project works, including drainage systems, collector canal, roads, bridges, fencing, and drainage structures, and purchase of major items of imported equipment would be procured through international competitive bidding in accordance with the "Guidelines for Procurement under World Bank Loans and IDA Credits." It is expected that most contracts for these project works would go to local contractors who have the capacity to perform the work and are already working in the area and because the overall value of the contracts would be too low to attract foreign firms. These project works would probably be performed under three or four contracts; with the primary and secondary drainage systems and collector canal (US\$6.5 million) in two contracts and roads, bridges, and fencing (US\$5.6 million) in two. Contracts for on-farm development, except tertiary drainage canals when constructed by the farmers, (US\$3.5 million); for enlarging INCORA's project headquarters building (US\$0.10 million); and for all works for improving social infrastructure (US\$1.8 million) would be awarded on the basis of competitive bidding advertised locally and in accordance with local procedures, which are satisfactory to the Bank. Farm machinery and livestock financed by loans from the agricultural development credit fund (US\$2.5 million) and vehicles, equipment, materials and supplies (US\$1.1 million) for the engineering and extension work and improvement of social infrastructure (Annex 5) would be procured locally by INCORA on the basis of not less than three price quotations. Contracts exceeding US\$50,000 would require the Bank's concurrence prior to award. Consultant services amounting to US\$0.7 million would be procured through direct negotiations. For procurement of equipment, materials and supplies under international competitive bidding, domestic manufacturers in Colombia would be accorded preferential treatment in bid evaluation, limited to 15% of the CIF price of imported goods or the actual tariff application, whichever is lower.

Disbursements

4.13 The Bank loan would be disbursed against 42% of the project works and building cost, 70% of the cost for improvement of social infrastructure, the CIF cost of directly imported equipment, and 80% of imported goods purchased locally, 95% of ex-factory cost of goods and equipment manufactured locally, 100% of the foreign expenditures, 95% of local expenditures for consultant services and 95% of amounts disbursed from the development credit fund. An amount of US\$3.3 million is allocated to capitalize interest during the five-year implementation period and an amount of US\$3.1 million would be unallocated. Any surplus funds remaining in the Bank loan on completion of the project would be cancelled. The estimated schedule of expenditures on the project and a disbursement schedule are presented in Annex 6. Table 4 in Annex 6 also sets forth the categories of items to be financed out of the proceeds of the proposed loan, the allocation of the amounts of the loan to each category and the percentage of expenditures to be financed in each category.

Accounts and Audit

4.14 INCORA would maintain separate accounts for operations financed under the project. Other Government agencies responsible for implementing a component of the project would likewise maintain separate accounts on their operations, and at the end of each fiscal year furnish INCORA certified copies of these accounts. During negotiations assurances were obtained from Government that: (a) INCORA and other Government agencies participating in the project would maintain separate accounts for the project and each project component; (b) certified copies of the accounts of other agencies would be furnished to INCORA at the end of each fiscal year; (c) INCORA's accounts would be audited annually by an independent auditor; and (d) the audited accounts, together with the auditor's report, would be submitted to the Bank within six months of the close of each fiscal year.

Environmental Evaluation

4.15 It is expected that implementation of the proposed project would have little adverse effect on the environment in the project area. In the Cordoba 2 area, completion of the drainage systems would eliminate existing swamps, which should help to control mosquitoes and water-borne diseases; however, there is no evidence of bilharzia in the area.

V. ORGANIZATION AND MANAGEMENT

Project Organization

5.01 The Instituto Colombiano de la Reforma Agraria (INCORA) would be the executing agency for the project and have direct responsibility for implementing the agricultural development phase of the project, including engineering, supervision of construction and supporting services, and to continue with land acquisition and settlement in the project area. INCORA would also act in an advisory capacity to other Government agencies which would participate in the project on implementation of the program for improvement of social infrastructure. INCORA would coordinate and monitor this part of the project and be responsible for fiscal management of loan funds provided for this purpose. Upon completion of the project INCORA would have responsibility to operate and maintain the agricultural project facilities and to insure that adequate technical assistance and supporting services would continue to be available to the farmers (Annex 4). Other ministries and agencies, as relevant, would operate and maintain the facilities providing social services.

5.02 It is expected that, with the new Government, which took office on August 7, 1974, some change in the organizational structure of INCORA would occur at the headquarters level. There are indications that with whatever changes are made at the national level, a land development agency would be maintained. It is essential that this agency not be restricted to construction of irrigation and drainage systems but to also have responsibility to support integrated agricultural and social development within project areas and to provide a range of supporting services. It is expected that this

change would not greatly affect the existing organization at the project level, which is generally satisfactory in the project area. INCORA has proposed that the Project Director have more direct responsibility for all activities related to agricultural development in the project area, as an alternative to the present system which disperses authority over specific activities between the Project Director, the Regional Director and headquarters in Bogota (Chart 9059). INCORA also plans that the Project Director have responsibility for only the project area and not for other areas under INCORA's administration. Assurances were obtained from Government during negotiations that an organization competent to implement and manage the project would be maintained and the Bank would be afforded a reasonable opportunity to comment on any proposed reorganization.

Participation of Other Agencies and Institutions

5.03 Other agencies or institutions which currently participate in agricultural development in the project areas would continue and expand their activities. These would include the Instituto Colombiano Agropecuario (ICA) for research and extension, the Central de Cooperativas de la Reforma Agraria (CECORA) for management of the large cooperatives, the Servicio Nacional de Aprendizaje (SENA) for vocational and farmer training, the Caja de Credito Agrario (Caja Agraria) for agricultural credit and the Instituto de Mercadeo Agropecuario (IDEMA) for processing and marketing (paras 3.08, 3.10 and 3.11).

5.04 The Ministries of Education, Health, ~~Communications~~ and Public Works would be largely responsible for implementing the program for improvement of the social infrastructure through various agencies within these ministries. These would include the Instituto Colombiano de Construcciones Escolares (ICCE) for school construction and supply of education materials, the Servicio Seccional de Salud for the Department of Cordoba for hospitals and health centers, the Instituto Nacional para Programas Especiales de Salud (INPES) for village water supply, the Instituto Colombiano de Energia Electrica (ICEL) for rural electrification, the Empresa Nacional de Telecomunicaciones (TELECOM) for telephone systems and the Fondo Nacional de Caminos Vecinales (Caminos Vecinales) for construction and maintenance of primary roads within the area. However, INCORA may elect to contract the work on roads directly.

Farmers' Organizations

5.05 The participation of the farmers in project management would primarily be through the Junta General de Usuarios (Association of Users) of which all farmers are members. The general association is represented by a board of directors (Junta Directiva de Usuarios) which meets regularly with INCORA management and participates in the Advisory and Coordination Committee. This committee, which acts basically as a coordinating body for activities at the project level, includes local representatives from INCORA, ICA, IDEMA, Caja Agraria, the Users' Association, the CECORA cooperatives and the Growers' Associations. Many farmers are members of the national livestock or cotton growers federations or associations and receive assistance through these organizations. Further, all farmers, upon payment of a membership fee, may become members of the CECORA managed Cooperativa Agropecuaria del Sinu (COAGROSINU) from which they obtain credit for machinery services and other inputs and marketing assistance.

Project Charges

5.06 INCORA is empowered under regulations established by the Governing Board (Junta Directiva) to impose project charges within irrigation and drainage districts for recovery of operation and maintenance costs; all capital investment cost, including past or historic costs as well as new investment; and a valorization tax based on the increase in land value resulting from the construction of land improvements and water control works. These regulations (Acuerdo No. 10 de 1968) derive from the authority granted the Junta Directiva in the original agrarian Reform Law 135 of 1961, and are flexible, leaving it to the Junta Directiva to establish the conditions of cost recovery for each improvement district, within certain limits, taking into account the productivity of the land and the type of agriculture for which the land is used. The regulations provide that all lands benefitted by the improvement works are subject to cost recovery over a period of 10 to 30 years and at a nominal interest rate of 12%, however the regulations do not specify the percentage of costs to be recovered from the districts or from individual farmers. The valorization tax is defined as 25% of the difference between the post-project value of the land and the sum of the pre-project value and investment for works. It is estimated that in the Cordoba 2 project the investment plus pre-project value per ha will about equal the post-project value, with the result that there would be a minimum valorization tax and recovery of costs would basically cover investments in works. The regulations further stipulate that lands acquired and settled by INCORA are exempt from the valorization tax, however, these lands are subject to payment of operation and maintenance cost and recovery of investment.

5.07 The projected land tenure pattern indicates that 84% of all farms in the area would be less than about 12 ha (Annex 1). With this predominance of relatively small farms, 100% recovery of investment with an interest rate equal to the opportunity cost of capital, together with operation and maintenance costs, would impose a heavy burden on the total net income of these farmers and be beyond their ability to pay, especially if some allowance were made to use part of their increased income to improve their farms and standards of living. Government has proposed, therefore, that the recovery be limited to 80% of investment over a period of 20 years at 12% interest. On this basis the percent of project charges, including operation and maintenance, from total net farm income would vary from 68% for livestock enterprises (150 ha) to 29% for mixed farming enterprises (130 ha) and 24% for privately owned farms with average sizes of 1, 6 and 30 ha. The rate for livestock enterprises is clearly beyond the ability of the farmers to pay and it would be necessary to use the flexibility in the regulations to impose rates of recovery of less than 80% for these enterprises, about 80% for the mixed farm enterprises and more than 80%, possibly 100%, for the larger private farms. These rates would be established by the Junta Directiva, taking into account the productivity and value of the land and farm income of the various farm types at full development of the project. This would maintain the percentage of total net farm income required for project charges at about 30% for all types of farms and still provide for recovery of 80% of total investment. This would not include repayment of 100% of development credit loans at 16% interest.

5.08 Assurances were obtained from Government during negotiations that a system of project charges would be progressively introduced, as works are completed and project lands come into full production, at levels sufficient to cover actual operation and maintenance costs and recover not less than 80% of total investment cost over a period of no more than 20 years at 12% interest. These project charges would be reviewed in consultation with the Bank at least every two years to determine the adequacy of the charges and to make the adjustments required to assure the recovery of investment in accordance with the conditions stated above.

VI. PRODUCTION, FARM INCOME, MARKET PROSPECTS, PRICES AND PROCESSING

6.01 Area Cultivated. In the Cordoba 2 area, the project would increase the net usable area from 34,000 ha to 40,000 ha. This expansion would be mainly used for livestock but a large area of existing pasture lands (17,000 ha) would be converted to various field crops. The cropping intensity would rise from 100% to 129% (Annex 7). Comparative data on the present and projected cropping patterns and on production are as follows:

	Cropped Area (ha)		Production (m ton)			Incremental Net Value of Production (Col\$ million)	
	Present (1973)	Projected (1985)	Present (1973)	w/o project 1985	w/project 1985		
Cotton	11,400	20,000	13,680	14,820	44,000	29,180	132.5
Maize	2,800	7,000	4,200	4,760	22,400	17,640	23.2
Sorghum	800	4,500	1,600	1,760	14,400	12,640	14.5
Soybeans	-	8,500	-	-	14,450	14,450	31.2
Sesame	-	1,300	-	-	910	910	3.4
Subsistence	2,000	2,000	n.a.	n.a.	n.a.	n.a.	8.0
Pasture	17,000	8,200	1,685	1,685	1,430	(-255)	6.9
	34,000	51,500	21,165	23,025	97,590	74,565	219.7

6.02 Yields. Without the project, yields in the project area are expected to increase 10% by 1985. With the project, yields at full development would increase 45% to 88%, depending on the crop. Estimated yields at present, without the project, and with the project -- are presented in Annex 7. Yield estimates with the project are based on current yields in well-managed farms under good drainage conditions. They are 50% to 60% of the level achieved under research conditions and are considered realistic.

6.03 Production. Overall production in the project area would increase from about 21,165 tons to about 97,590 tons. Annex 7 details by crop, with and without the project, the production costs, the net value of production and the increment attributed to the project. It shows a net annual production value of Col\$ 278.6 million with the project, Col\$ 58.9 million without the project, and an incremental net value of Col\$219.7 million. The value without the project assumes a one percent annual increase over the next 10 years, until 1985, which would occur with gradual improvement under present conditions.

6.04 Farm Income. The impact of the project on its beneficiaries has been analyzed for five farm types considered to be representative of the area. Small farms are assumed to grow traditional crops, mainly for subsistence, and on these farms, family labor (part-time only) would suffice for the non-mechanized operations; medium and cooperatively operated farms would employ hired labor. Assuming an average of six persons per farm family the per capita income would after project charges increase from US\$11 to US\$49 on subsistence farms, US\$67 to US\$247 on small farms, US\$527 to US\$1,202 on medium sized farms and US\$53 to US\$437 on Empresas Comunitarias (10-12 ha farms). A detailed analysis of representative farm budgets is given in Annex 7 and summarized below:

<u>Farm Type</u>	<u>Subsistence</u>	<u>Small</u>	<u>Medium</u>	<u>Empresas</u> <u>(Crops)</u>	<u>Comunitarias</u> <u>(Livestock)</u>
Size of Farms (ha)	0-5	5-10	10-50	-	-
Number of Farms by Size	1076	334	399	146	41
Representative Farm Size (ha)	1	6	30	130 /1	150 /1
Area in Each Size (ha)	800	2,000	12,100	19,000	6,100
Percent in Each Size	2	5	30	48	15
	----- Col\$ -----				
Estimated Net Farm Income w/Project (1985)	7,400	37,500	182,500	689,600	141,800
Incremental Farm Income	5,700	27,500	102,500	602,600	141,800
US\$ Equivalent	243	1,087	4,051	23,818	5,605

/1 10 to 12 farms in each cooperative enterprise.

Market Prospects, Prices and Processing

6.05 Market Prospects. None of the project's commodities appears to face market constraint. The national demand and supply projections indicate deficits in all products. In cotton fibers, the shortage reflects an inability to meet the forecasted external demand, but cotton fibers would continue to be an important export commodity. Beef is also primarily an

export commodity and projected to continue as such. For all the other commodities, the deficits imply import in the future. Consequently, the project's production, except cotton fibers and beef, should be regarded as import substitutes (Annex 8).

6.06 Prices. It is expected also that the price situation for the project's commodities would be favorable. In the domestic market, prices are expected to be high as a result of inadequate supply. International prices for exported beef are expected to increase slightly from 1979 onwards. Real prices of cotton fibers are expected to increase at the beginning of 1975, when domestic and export prices would be maintained at the same level and then to decrease to the level of 1972 by the early 1980s (Annex 8).

6.07 Processing. It is expected that processing of the incremental production of the project would be handled easily considering the existing or potential capacity of public and private enterprises operating in the area. With an increase in the acreage in soybeans and the production of other oilseeds, processing facilities would be modified or expanded to handle the increased production. CECORA would give more attention to the marketing and processing of products grown by small farmers and the marketing channel for grains would be improved (Annex 8).

VII. BENEFIT AND JUSTIFICATION

7.01 The project is located in a prime agricultural area where soils, climate and water supply are favorable to high production. The project presently has a significant production level and completion of the existing works would permit an expansion and more intensive use of the land.

7.02 At full development, about 10 years after the beginning of construction, the annual net value of production from the project (expressed in 1974 prices) would be Col\$ 278.6 million (US\$11.1 million), compared to Col\$ 58.9 million (US\$2.3 million) under future conditions without the project. This analysis is based on a shadow exchange rate 15% higher than the official rate for the value of exported production, to offset export subsidies and controls and higher taxes on imports. A shadow rate for labor was also used due to the actual rate paid in the Cordoba area being lower than the official minimum rate (Annex 9). The useful life of the project would be almost indefinite, but for the analysis of economic rates of return it has been assumed at 40 years. Over this period the economic rates of return for the agricultural development sector, but excluding the social improvement program, would be 27%. To measure the project's sensitivity to deviations, several alternatives have been considered: (a) construction period extended by one year, investment costs increased by 10% and incremental benefits delayed by one year; (b) benefits decreased by 25%; (c) benefits increased by 25%; and combined (a) and (b) tests. None of these alternatives would result in an internal rate of return of less than 15%. Annex 9 gives further details on the project economic evaluation.

7.03 The Cordoba 2 area would be developed for rainfed farming by providing mainly drainage and on-farm development, which would increase the production potential significantly, but below the maximum level that could be achieved with irrigation. However, the drainage systems have been planned to meet the requirements of irrigation, which could be introduced in the future as the final stage in the course of the agricultural development of the area, after the dry-farming possibilities would have been fully achieved and the farmers had gained sufficient experience to obtain the full benefits of irrigation.

7.04 About 3,800 farmers would benefit from the project, 2,000 of which would be INCORA settlers and the rest private owners. All INCORA settlers, as well as the majority of the private owners with less than 12 ha, are considered small farmers for the purposes of this appraisal. It is estimated that with the project 60% of the farm families in the area would have a per capita income above the upper limit (US\$250) for the poorest 40% of the population in the country, as compared to 14% at present.

7.05 The project would require about 7,700 man-years of employment annually compared to the existing demand is about 3,800 man-years. There is a surplus of farm workers in the project area and adjacent cities sufficient to meet the increased requirements with the project. The project would, in fact, help to relieve problems of unemployment and underemployment.

7.06 Since most of the project products are either for export or for use as import substitute for which deficiencies are expected in the future, the projects would make a valuable contribution to Colombia's balance of payments.

7.07 Additional employment and value added which would result from crop marketing and processing and other related commercial activities, as well as secondary benefits due to acceleration of the general economic activity in the region as a result of the project's construction, were not quantified and consequently have not been included in the economic analysis.

7.08 The most serious risks for implementation of the project and bringing it into full production would be the time required to develop the unutilized lands and complete the settlement program. These are critical factors in achieving the projects objectives. The vagaries of the rainfall distribution in any given year can also have a significant effect on production.

7.09 The program to improve social infrastructure and services would contribute to better living standards for an estimated 35,000 rural inhabitants and through land reform provide 1,000 landless families with farms.

VIII. RECOMMENDATIONS

8.01 During negotiations, INCORA submitted draft operational agreements to the Bank providing for the participation of Caja Agraria and ICA in the project (paras 4.04 and 4.06).

8.02 During negotiations the following assurances were obtained from Government:

- (a) on the basis of existing plans, INCORA would prepare a phased program, within 18 months of the date of loan effectiveness, for completion of land acquisition and distribution in the project area, to be agreed with the Bank, and this program would be carried out, together with establishment of new settler's organizations, according to an agreed timetable during the implementation period of the project (para 4.01);
- (b) interest rates on development credit loans would be subject to revision by the Borrower and the Bank if Government's regulations of credit to the agricultural sector are changed; and INCORA would maintain a credit department satisfactory to the Bank to administer the development credit funds and would take the credit risk on loans from the credit funds (4.04);
- (c) consultants to assist with on-farm development, formation of extension services, organizational improvements and fiscal management would be employed by INCORA in consultation with the Bank and under terms and conditions satisfactory to the Bank (para 4.07);
- (d) agreements would be renewed or signed with the Ministries of Education, Health, Communications and Public Works for construction of social infrastructure and budgetary support for the social improvement program including operation and maintenance costs, within six months of the date of project effectiveness. This would include agreements with agencies responsible for specific components of the program, i.e., ICCE, INPES, Servicios Seccionales, ICEL, TELECOM and Caminos Vecinales (para 4.09);
- (e) INCORA and other agencies responsible for the several components of the project would maintain separate accounts for each component and certified copies of the accounts of other agencies would be furnished to INCORA at the end of each fiscal year; the INCORA accounts would be audited annually by an independent auditor, and the audited accounts, together with the auditor's report, would be submitted to the Bank within six months of the close each fiscal year (para 4.14);

- (f) an organization competent to implement and manage the project would be maintained and the Bank would be afforded a reasonable opportunity to comment on any proposed reorganization (para 5.02); and
- (g) a system of project charges would be progressively introduced, as works are completed and project lands come into full production, at levels sufficient to cover actual operation and maintenance costs and recover 80% of the capital investment in project works over a period of 20 years at an interest rate of not less than 12% per annum. These project charges would be reviewed in consultation with the Bank at intervals of once every two years to determine the adequacy of the charges and to make necessary adjustments to assure the recovery of investment cost under the conditions stated above (para 5.08).

8.03 Conditions of loan effectiveness would be:

- (a) the signing of a Project Administration Agreement between INCORA and the Caja Agraria to provide for the Caja Agraria to act as the banking agent for development credit loans under the project, in the same manner as under the existing agreement for INCORA's Planned Credit Program financed under Bank loan 624-CO (para 4.04); and
- (b) the signing of an operational agreement between INCORA and ICA providing for the formation and technical and financial support of an extension service in each of the project areas (para 4.06).

8.04 With appropriate assurances, the proposed project would be suitable for a Bank loan of US\$21.0 million with a repayment period of 30 years, including a six-year grace period.

COLOMBIA

CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

The Project Area

Soils and Land Classification

1. Except for a small area near El Cerrito, the project area is covered by young alluvial deposits brought in by the Rio Sinu. A semi-detailed soil survey was carried out by Hunting Technical Services Ltd. in 1969, using 1:20,000 aerial photography and previous soil surveys covering 30,000 ha of higher (levee) lands and 23,000 ha of lower lands (basin or cienega). Lands were classified by Hunting for irrigation farming but in early 1974 they were reclassified by INCORA for dry-farming conditions using U.S. Department of Agriculture land use capability classification standards.

2. On the basis of soil characteristics and drainage, the lands in the project area were classified as follows:

<u>Land Capability Class</u>	<u>Hectares</u>	<u>Percent of Area</u>
I	6,812	15
II	21,772	48
III	4,505	10
IV	10,444	23
VI	1,656	3
VII	<u>204</u>	<u>1</u>
TOTAL	45,393	100

The 40,000 ha proposed for development in the project constitute a part of the 45,393 ha classified by INCORA.

- (a) Class I Lands: High lands, suitable for dry-farming of a wide range of crops. Slightly undulated, deep, well-drained soils, easy to work. Good water holding capacity. Soils have good fertility level. These lands require ordinary management practices to maintain their productivity.
- (b) Class II Lands: High lands, suitable for dry-farming of a wide range of crops but with some limitations because of soil characteristics. They are heavy textured in the upper horizon which makes land preparation difficult. In some cases, they have drainage deficiencies. These soils also have good water holding capacity and good fertility level, but require control of excess moisture.

- (c) Class III Lands: A complex of levee and basin lands associated with former swamps. Lands suitable for dry-farming but with severe limitations due to heavy textured soils and poor drainage conditions. PH values vary from 4 to 5 in the topsoil and from 3 to 4 in the sub-soil. These soils require special management practices such as sub-soiling, deep plowing, appropriate fertilizing, liming and intensive artificial drainage. Under appropriate management, these lands can be moderately productive.
- (d) Class IV Lands: Basin lands with severe restrictions for dry-farming due to clay-soils (difficult to work when wet) and very poor drainage conditions. Land use is restricted to permanent pastures under special management practices such as: fertilizing, liming and artificial drainage.
- (e) Class VI Lands: Basin lands of low productivity. Heavy soils with very poor drainage, unsuitable for dry-farming but suitable with severe restrictions for permanent pastures.
- (f) Class VII Lands: Non-arable lands due to very steep slopes and broken relief.

Land Use and Tenure Patterns

3. It is estimated that, with the project, land use and tenure patterns would undergo considerable change during the 10-year period preceding full development, i.e., in 1985. Completion of the drainage system would accelerate the conversion of land traditionally used for intermittent livestock grazing to double-cropping for a variety of crops. A major benefit of the change from pastures to field crops would be the increased intensity of land use and higher production value. It is estimated that about one third of the area is presently under-utilized as unimproved or intermittent pasture. This conversion began in 1967 with construction of the main flood protection canal and dike on the east boundary of the area and the main drain through the area, with the result that at present about 17,000 ha out of the total of 40,000 ha are used for crops, mainly cotton. With the project, the cropped area is estimated to increase to about 32,000 ha, which would cover the higher, better drained and more fertile levee lands (Class I and II) and a part of the complex of levee and basin lands (Class III). The balance of about 8,000 ha is low basin land which would largely be restricted to use as pastures. Some 6,000 ha of these lands are almost permanently inundated (ciénegas) and would be reclaimed with drainage and land leveling.

4. The application of Agrarian Reform Law No. 4 of 1973, which limits individual land holdings to 50 ha and prohibits deeding excess land to members of the same family, would also have an important effect on land use and the tenure pattern. The biggest change would be in privately owned livestock farms, now covering about 9,200 ha, where some 7,800 ha would be subject to acquisition by INCORA to be distributed to settlers in tracts of 10 ha to

15 ha per family. This new land under INCORA control, together with the 6,000 ha of reclaimed cienega land would permit the formation of about 100 new Empresas Comunitarias (Annex 4) of which 60 would be mixed farming enterprises on both levee and basin lands with some livestock, and 40 almost entirely livestock located on former cienega lands. The remaining lands in livestock retained by private owners (1,400 ha) would most likely be converted to cotton, as a livestock operation on 50 ha would not be an economic enterprise. With these changes the area controlled by INCORA would increase from about 43% at present to about 62% and the number of INCORA settlers on farms of 10 ha to 15 ha from about 1,000 to about 2,000. An additional 1,560 private owners on farms less than 20 ha and about 240 private owners with farms of 20 ha to 50 ha would also benefit from the project, which would bring the total number of farmers to be benefitted to slightly more than 3,800. Tables 1 and 2 show the existing and proposed situation regarding land use and tenure in the project area.

Rainfall and Crop Water Requirements

5. Cordoba 2 Area. The area is situated in the Inter-tropical Convergence Zone, which is the zone of meeting near the thermal equator of the trade winds of the two hemispheres. Convergence of these air currents is the major rain producing mechanism in the area. Mean annual rainfall, as recorded in Cerete over the 50-year period 1918 to 1956 is 1,138 mm, with the highest annual total of 1,573 mm in 1959 and the lowest, 664 mm in 1948. There are two distinct periods, a wet season from mid-April through November and a dry season during December to April. The mean monthly averages during the 50-year period are presented in Table 3. A statistical analysis of rainfall reliability, taking into account the wide variation from the mean in the highest and lowest monthly totals, and the estimated evaporation from data obtained at the Turipana Research Station in the area, indicates that rainfall would always be sufficient to support crop growth during the period May through November. This seven month period, however, is not long enough to mature two crops unless residual soil moisture would permit some extension of the cropping season into April and December-January. With two cropping seasons, mid-April to the end of July and September through February, there could be problems of adequate soil moisture at the beginning of the first season in April and at the end of the second season in December-January. The first constraint could occur in April when there is a 50% probability that rainfall would be less than 50 mm or an amount sufficient to replenish soil moisture after the dry season to germinate the first crop. If planting is delayed until May, when sufficient moisture is assured a problem of timing occurs. A May planting of maize or soybeans with a vegetative cycle of 130 to 150 days, brings the harvest in late August or early September. This allows a minimum of time to plant the second crop before the end of September, which also is the wettest month, in order not to prolong the growing season too far into the dry season beginning in December, when soil moisture depletes rapidly and yield losses due to moisture stress could occur.

6. This combination of sufficient available moisture over a period of only seven months would restrict the amount of double-cropping that could be achieved in the area to an estimated intensity of 129%. At present, the major crop is cotton which occupies about 12,000 ha and is estimated to increase to 20,000 ha at full development. Cotton is planted between mid-August and the end of September, usually taking advantage of a short dry season in late July and early August for land preparation. Since cotton is a deep rooted crop and not very sensitive to moisture stress it can withstand the depletion of soil moisture in December and January and be ready for harvest during the dry season. Cotton growers normally do not take the risk of delayed planting in September and double-crop cotton with other crops. Other crops such as maize, soybeans, sorghum, sesame and vegetable, which have a shorter growing season, could be double-cropped, particularly in years when rainfall in late April permitted planting of the first crop such that harvest of the second crop could occur no later than December. The probability studies indicate that total rainfall during the first cropping season would always be more than the cumulative evapotranspiration for these crops and the real problem would be the soil moisture available in April to germinate the first crop. The low rainfall in December would be more effective than in April since residual soil moisture following the wet season would be at a higher level.

7. In view of the conditions described above, it may be seen that supplemental irrigation could provide some benefit by extending the season for double-cropping and the problem of timing would not exist. It would eliminate the risk of starting the first crop in April and the deficiency in soil moisture available to the second crop in December and January, which in most years causes some reduction in potential yields. However, a study of the incremental benefits to be gained with irrigation indicates that the high cost would not be justified.

COLOMBIA

CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Present and Projected Land Use

<u>Land Use</u>	<u>Present</u>		<u>Projected</u>	
	<u>INCORA</u>	<u>PRIVATE</u>	<u>INCORA</u>	<u>PRIVATE</u>
	----- ha -----			
Field Crops	3,500	13,500	16,900	14,900
Pasture	7,800	9,200	8,200	-
Unutilized	<u>6,000</u>	<u>-</u>	<u>-</u>	<u>-</u>
Total	<u>17,300</u>	<u>22,700</u>	<u>25,100</u>	<u>14,900</u>

April 1975

COLOMBIA

CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Present and Projected Land Distribution

	<u>Present</u>				<u>Projected</u>				
	<u>Farms</u>		<u>Area</u>		<u>Farms</u>		<u>Area</u>		
	<u>number</u>	<u>percent</u>	<u>hectares</u>	<u>percent</u>	<u>number</u>	<u>percent</u>	<u>hectares (gross)</u>	<u>hectares (net)</u>	<u>percent</u>
less than 3	1,076	38.3	812	2.3	1,076	28.1	812	812	2.0
3 - 5	152	5.5	627	1.8	152	4.0	627	627	1.6
5 - 10	182	6.4	1,353	3.9	182	4.8	1,353	1,353	3.4
10 - 20	1,156 ^{1/}	41.1	14,510	41.6	2,172 ^{2/}	56.8	28,686	27,458	68.6
20 - 50	158	5.7	5,500	15.8	243	6.3	9,900	9,750	24.4
more than 50	85	3.0	12,076	34.6	-	-	-	-	-
TOTAL :	2,809	100.0	34,878	100.0	3,825	100.0	41,378	40,000	100.0

^{1/} Of which 1,001 are INCORA settlers with a total of 12,203 ha. These lands are managed in 87 community enterprises with an average of 140 ha each, comprising about 12 settlers.

^{2/} Of which 2,016 are expected to be INCORA settlers with a total of 26,379 ha. They would be managed in some 187 community enterprises with an average of about 140 ha each, comprising about 12 settlers.

April 1975

CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECTMonthly Rainfall Data

Month	Mean (50 years)	Highest annual total (1959)	Lowest annual total (1948)
----- mm -----			
January	11.1	0	0
February	9.7	0	0
March	19.5	3	10
April	75.1	115	7
May	152.6	113	62
June	146.0	227	125
July	148.4	189	111
August	167.5	290	87
September	155.3	314	136
October	137.7	152	84
November	84.9	170	18
December	30.2	0	24
Total	1,138.0	1,573	664

Estimated American Class "A" Pan Evaporation Based on Turipana Data

Month	1966	1967	Tentative long-term value
----- mm -----			
January	121	135	130
February	132	143	140
March	165	194	189
April	147	148	150
May	122	158	140
June	119	133	125
July	120	144	130
August	115	156	130
September	110	135	125
October	113	117	115
November	97	119	110
December	112	129	120

COLOMBIA

CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

The Project

Project Works

1. INCORA started construction of drainage systems, flood protection works and farm roads in the area in 1963 in an effort to reclaim about 50,000 ha for agricultural production. Prior to that time the area was occupied by permanent swamps or inundated during the wet season each year, and was mainly used for part-time livestock grazing. Completion of the flood protection dike and collector canal at the base of the foothills of the east boundary of the area and the main drainage canal through the center of the area (Map 11080) relieved the most serious flooding, and development of the area for field crops accelerated rapidly. At present about half the area is cultivated under rain fed conditions, with the balance still in unimproved pasture, which now is used throughout the year, and about 6,000 ha are still in swamps. INCORA has also completed the irrigation and drainage works for an area of 7,000 ha adjacent to the Rio Sinu and the city of Monteria which is known as Stage I but which does not form part of the proposed project. Further, about 30% of the primary and secondary drainage canals have been completed or are under construction (Zones 2 and 3) within the 40,000 ha comprising the project area. Irrigation development would not be provided under the proposed project but could be considered for a future stage of development. Works to be completed under the project would be as follows:

- (a) construction of 128 km of primary drains;
- (b) construction of 386 km of secondary drains;
- (c) construction of the south collector canal and protection dike;
6.8 km
- (d) construction of 24 culverts, syphons, bridges and other structures;
- (e) construction of 168 km of all-weather farm roads;
- (f) construction of 342 km of fencing along drainage canals and roads; and
- (g) rehabilitation of an existing building and construction of an extension to enlarge project headquarters.

On-farm Development

2. On-farm development would consist of tertiary drainage systems for 40,000 ha and land leveling on 20,000 ha to improve drainage and eliminate temporary ponding. The land leveling would be to the degree required for rain fed farming practices, which would not be the same as required for irrigation. On small farms up to 12 ha, this work would be performed with development credit fund provided in the project for both INCORA settlers and private owners. Due to INCORA's policy to restrict their direct financial assistance to small farms and settlers, farms larger than 12 ha up to 50 ha would be required to perform this work by means of their own resources or medium-term credit loans obtained from public institutions such as Caja Agraria or the Fondo Financiero Agropecuario (Annex 3). INCORA would assist the small farms on surveys and planning for the on-farm works, organize farmers into groups to facilitate the letting of contracts of a size that would justify the purchase of suitable equipment by the contractors, select contractors and negotiate contracts, help prepare loan applications, and supervise execution of the work. Most of the work on leveling would be required on small farms as the medium sized farms, especially those in cotton, are in reasonably good condition for drainage and rain fed farming.

Improvement of Social Infrastructure

3. General. Under Law 135 of 1961, as amended by Law 4 of 1973, INCORA has a direct responsibility to improve economic and social conditions in rural areas, together with the other main objectives of reorganizing the agrarian structure and increasing agricultural productivity through land development. With this concept in mind, INCORA accepted the proposal to include a component in the project for improving the social infrastructure in the project area. It was agreed that this program would include the improvement, expansion and new construction of primary schools, hospitals and health centers, village water supply systems, rural electrification systems and telecommunications. The program was envisaged basically as a means to meet the most critical deficits existing in the rural areas for these services and to help social development keep pace with the accelerated agricultural development which is expected with the project. An inventory of total social needs in both urban and rural areas projected over the next two decades revealed that this was far beyond the scope of a program that could be included in the project, both from the standpoint of cost and time required for execution. The proposed program would, therefore, be restricted to the most critical and essential needs for the short term, say to 1980, and to the rural area of the projects. With the exception of some aid to existing hospitals, no assistance would be provided for improvement of social facilities in the larger towns and cities within or adjacent to the project areas. While a great need exists in these urban areas and they do provide services to the rural population, assistance to improve urban services would not conform with INCORA's official policy of improving the living standards of the rural population and, as noted above, the cost, even on the short term, would be prohibitive. The overall magnitude of the problem in education is illustrated by the situation in both urban and rural areas in the Cordoba 2 area. With 30,000 children in school, it is

estimated that an additional 15,000 are not in school, mainly for lack of facilities, and there is a current deficit of 500 classrooms. It is further estimated that student population would increase 7,000 by 1980 and an additional 200 rooms would be needed.

4. The various elements of the program would be implemented by the Ministry responsible, i.e., the Ministries of Health, Education and Public Works, under operational agreements with INCORA (Annex 4). It is proposed that 70% of the total costs for the social improvement program be reimbursed from the Bank loan as Government budgetary appropriations at present cannot begin to meet the needs of the whole country for social development programs and for operational support of these facilities. This would also allow the Ministries to increase the allocation of funds for operation and maintenance, which is currently unsatisfactory and deficient. The situation relative to operational support of schools and health centers is critical and the agreements with INCORA must commit Government to provide additional funds and support for both the existing and new facilities to be constructed.

5. Education. In Colombia, participation in primary education is apparently very high (99%), but 30% of the students are overaged, resulting in a real participation rate of 70%. Drop-out rates are high and opportunities in rural areas are limited, most of the rural schools having no more than the third grade. The Government is expanding primary education in rural areas by adding classrooms to existing schools and constructing new primary schools. Teachers are inadequately trained and teaching materials are in short supply, but student participation rate is very high. With an enrollment rate of growth of 7.5% the deficit of classrooms is becoming a serious constraint.

6. The project would provide for expanding and improving the education facilities in the project area to cope with the increasing demand for primary education. Although the project would influence both urban and rural areas, the education component of the project would concentrate on the rural areas only. With this program, the lack of education opportunities in this area would be less a limiting factor for agricultural development than at present. The project would provide for constructing, furnishing and equipping 120 new classrooms which would be sufficient to increase the student enrollment from 12,400 in 1973 to 14,100 in 1980. In addition, 90 existing classrooms would be replaced and 100 existing classrooms would be improved. The pertinent data are presented in Table 1.

7. The most critical deficiency of primary education is its low quality, in terms of the unsatisfactory curriculum currently applied, the lack of didactic materials and the low qualifications of teachers. Therefore, the project would support the introduction in all primary schools of the project area of an improved curriculum, and provide sets of advanced teaching materials to all 220 schools. As a complementary effort, the Ministry of Education will organize a special in-service teacher training program, without cost to the project. Further, the project would support the nonformal education program of Accion Cultural Popular (ACPO), a private, nonprofit organization that promotes non-formal rural education through multi-media action. The project would provide

two sets of ACPO's Biblioteca del Campesino, consisting of 27 basic textbooks for adult functional literacy training, to each of the 220 primary schools in the project areas. ACPO's complementary effort will consist of special actions to promote participation in its nonformal education programs. The education component of the project would be carried out by the Instituto Colombiano de Construcciones Escolares (ICCE), the school construction agency of the Ministry of Education. To this end, an agreement would be signed between INCORA and the Ministry of Education, establishing (i) terms and conditions for carrying out the project; and (ii) appropriate budgetary allocations in the Ministry of Education to staff, operate and maintain the project schools.

8. Expansion and improvement of primary education in the urban areas would be carried out by the corresponding institutions under supervision and coordination of the Ministry of Education. Education facilities at secondary and higher levels, including agricultural schools and training centers, appear to be adequate in the project area.

9. Secondary schools in towns adjacent to the project area such as Monteria, San Pelayo, San Carlos, Cerete and Cienaga de Oro may become central education units of the "Concentraciones de Desarrollo Rural," a new approach being initiated by the Ministry of Education whereby a central education complex, at the higher level, provides technical and administrative support to secondary and primary schools within a given area. Under this plan the project schools would become satellite schools under the main administrative center.

10. Health Services. Health services in Colombia are organized and directed by a central office in each department, comprising hospitals, health centers (permanent medical attention) and health posts (permanent nurse attention and medical visits once a week). In Colombia, 20% of the population is unable to obtain adequate health services and in the project area 10% of the population are not adequately served. More health centers and posts are required, as well as expansion and improvement of the hospitals in Monteria and Cerete.

11. In the Cordoba 2 area, the project would provide for constructing and equipping two new health centers and four new health posts, and improving three existing health centers and three health posts. In addition, two hospitals in Monteria and Cerete would be improved. The total cost of the health component of the project is estimated at Col\$ 6.6 million.

12. The health component of the project would be carried out by the National Health Fund (Fondo Nacional Hospitalario), under the Ministry of Health through the Departmental offices in Monteria. To this purpose, an agreement would be signed between INCORA and the Ministry of Health, establishing: (i) terms and conditions for carrying out the health component of the project; and (ii) appropriate budgetary allocations in the Ministry of Health to staff, operate and maintain the project health facilities.

13. Water Supply, Rural Electrification and Telecommunications. Most of the 25 rural communities in the Cordoba 2 area with less than 2,500 inhabitants, classified as villages, lack a potable water supply system, a sewage system, electric power and telephones. These villages were assigned first priority by Government for improvement of the above mentioned services. Once again, in consideration of the funds and time required to provide such services to all the villages, it was agreed that some order of priority should be applied to select a reasonable number of villages that could be included in the project. The main criteria was a minimum population size which gave higher priority to the larger villages which serve as micro-economic growth centers. Further, some villages were excluded as being too small to justify the infrastructure cost to serve a limited number of people. On this basis, 13 villages were selected. A priority was also established for types of infrastructure to be provided in these villages.

- (a) Water supply was given first priority because of the health implications;
- (b) Power was assigned second priority due to its importance for both cultural and economic development; and
- (c) Telephones are a critical need in some villages which have no means of communication with major centers.

14. The program agreed upon for providing water supply, power and telephone systems under the project in the Cordoba 2 area is presented below.

	<u>Community</u>	<u>Water Supply</u>	<u>Power</u>	<u>Telephones</u>
1.	Cedro	X	X	X
2.	Rabolargo		X	X
3.	Berastequi			X
4.	El Obligado	X	X	X
5.	El Cerrito	X		
6.	Cotorra	X		
7.	Las Balsas	X	X	
8.	El Higal	X		
9.	Los Guamos	X		
10.	Pelayito	X		
11.	Sabanal	X		
12.	Los Mimbres	X		
13.	San Carlos	X		

15. The estimated cost for this program would be Col\$ 12.2 million, or about US\$480,000, less contingencies. Power supply in the area is limited, with only one generating plant at Chinu with a capacity of 29,200 kw. However, Government is working with IDB on a program to make more power available by an interconnection with the primary power grid in the country. There would be enough capacity at present to serve the proposed expansion of the system

in the area. The proposed water supply systems would be drilled wells with pumps, elevated tanks and pipe distribution lines to strategic points in the village. House service would not be provided. Telephone service would consist of lines connecting to the main existing system and one or two public stations in the village. Power would include transmission lines to the village, transformers as required, service on the main streets, with some street lights, and drop lines and switch boxes for each residence, but no wiring within the house.

16. Existing rate schedules for power and telephone services to the low income rural population cover operation and maintenance cost and there is no provision to recover investment costs. It is assumed that the same conditions would apply to the new water supply systems. The justification, therefore, for this program must be on the basis of income distribution and improving living standards of the poor rural families.

Consultant Services

17. Consultants would be provided during the implementation period of the project for specific activities where INCORA has not had previous experience or qualified staff. These activities are on-farm development, more specifically land leveling, and organization of an extension service and training of extension agents. In view of the importance of these activities in carrying out the project, a consultant in each of the two categories would be provided.

18. With the change in Government, as a result of recent elections, it is very likely that there would be a change in the organizational structure of INCORA. As the present structure has evolved over a period of years without the benefit of long-term planning, but more in response to political circumstances and needs at the time, there is an opportunity to restructure the organization, particularly that part dealing with land development, in a rational way to make the organization more efficient and effective. It is proposed that a specialist in organization and management be provided to assist INCORA at headquarters level with this task. Further, with completion of the drainage works and other infrastructure under the project, INCORA would be in a position to impose a system of project charges for recovery of operation and maintenance and investment costs. The procedure and rate schedule to be applied for the proposed project would be complicated since the recovery of investment would depend on the services provided and the benefits which would accrue to different categories of farmers. It is proposed that a specialist in fiscal management be provided to assist INCORA in establishing suitable rate schedules and to improve general accounting procedures for Bank-assisted projects. The specialists in organization and fiscal management would be assigned to headquarters in Bogota.

19. The scheduled duration and estimated cost of consultants to be provided are presented in Annex 5. The terms of reference would be as follows:

- (i) Irrigation Engineer - to assist with on-farm development as this relates specifically to land leveling and lay out of the tertiary drainage systems. For land leveling, to assist in determining the type and amount of leveling needed, depending on soils, terrain and crops to be grown; to determine the appropriate scale and intensity of field surveys for calculations of earth moving quantities; and to assist in preparing specifications and contracts for this work. The consultant would also provide training to extension agents and farmers on suitable water conservation practices for various crops and soil conditions;
- (ii) Agronomist, Extension Specialist - to assist in organizing an extension service and to develop programs and methodology for training extension agents and farmers on improved agricultural practices and farm management planning; to develop the capabilities of extension agents in specific fields of agriculture and technical assistance; and to encourage closer cooperation between ICA and CIAT with the extension service with the main objective of obtaining more effective transfer of research data to actual practice.
- (iii) Specialist in Organization and Management - to assist in organizing the land development activities of INCORA to effectively carry out the planning and implementation of land development programs and projects;
- (iv) Specialist in Fiscal Management - to assist in establishing suitable rate schedules and systems for project charges for the proposed project and to improve INCORA's general accounting system as this applies to Bank assisted projects.

COLOMBIACORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECTEducation and Health ServicesPrimary Education Facilities to be ProvidedCapacity Needs in Project Area

Student Enrollment, 1973	12,400
Existing Classrooms, 1973	187
Student Enrollment, 1980	14,100
Required Classrooms, 1980	352
Deficit in Classrooms, 1980	165

Facilities to be Provided

<u>Didactic Materials for all Primary Schools</u>	
- number of sets	220
- cost (Col\$ '000)	1,500
<u>Construction of New Classrooms</u>	
- number of classrooms	120
- cost (Col\$ '000)	12,960
<u>Replacement of Existing Classrooms</u>	
- number of classrooms	90
- cost (Col\$ '000)	9,480
<u>Repair of Existing Classrooms</u>	
- number of classrooms	100
- cost (Col\$ '000)	2,760
<u>Sets of Adult Learning Materials:</u>	
"Biblioteca del Campesino"	
- number of sets	440
- cost (Col\$ '000)	<u>108</u>
Total Cost (Col\$ '000)	26,808

Health Facilities to be Provided

Hospitals	= Improvement (N ^o)	2
	- Cost (Col\$ '000)	3,240
Health Centers	= New (N ^o)	2
	- Improvement (N ^o)	3
	- Cost (Col\$ '000)	2,694
Health Posts	- New (N ^o)	4
	- Improvement (N ^o)	3
	- Cost (Col\$ '000)	<u>708</u>
Total Cost (Col\$ '000)		6,642
Cost of Education and Health Facilities (Col\$ '000)		33,450

COLOMBIACORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECTAgricultural Supporting ServicesAgricultural Extension ServiceGeneral

1. The main responsibility for agricultural research and extension in Colombia lies with the Instituto Colombiano Agropecuario (ICA) but budgetary constraints and scarcity of qualified extension personnel have led ICA to limit its activity largely to research. It is only since 1973 that ICA has made a serious effort to intensify its extension activities through the organization of a Rural Development Program. The concept of this program is wider than agricultural extension, including also the promotion of rural organizations, home economics, family planning and youth activities. The program is administered by ICA's Rural Development Division which has nine regional offices. It is extended through regionally defined projects of which there are about 20 operational, but none of these are located in the project area.

2. In the project area, ICA operates an experiment station (Turipana) for both crop and livestock production. Its extension activity for the four departments of the Atlantic coast region consists of five technicians supervising some 200 private extensionists, who provide technical assistance to farmers using credit loans from Government sources. These private extensionists are hired as consultants and paid from the credit loans to the farmers. ICA also employs 16 livestock technicians for the department of Cordoba. In addition ICA promotes the adoption of new farming techniques and varieties through occasional field days on demonstration plots in the area. It also is presently organizing a rural development project for the lower Sinu valley aiming at the provision of integrated technical and social assistance to the farm population. Some assistance to farmers in the Cordoba 2 area is also provided by INCORA's credit supervisors (16), Caja Agraria's technicians (4), Banco Ganadero's livestock specialists (2) and by the Cotton Growers' Association. Nearly all of this assistance is oriented to supervision of credit loans and does not provide adequate assistance to farmers on farm management planning and specific problems of crop production.

3. The various forms of technical assistance available to the farmers in the project area from different sources is inadequate for the projected change in farming systems and production techniques, mainly because of a lack of coordination between the institutions providing the service, its lack of emphasis on improving farming practices and increasing productivity, its low density and because it bypasses by and large

the small farmer. The project would therefore include provision for establishing an extension service exclusively for the project area and tailored especially to its needs.

4. The primary objective of this new service would be to consolidate and coordinate the services now being provided and develop a comprehensive program for farm management and technical assistance to the farmers, with the supervision of the fiscal aspects of credit loans as a secondary responsibility. During the development period, the service would consist of:

- (a) a service chief who would have overall responsibility for the organization, administration and operation of the service. He would be an agronomist or agricultural economist with special training and experience in agricultural extension;
- (b) a group of five professionals, one each for:
 - i. agronomy;
 - ii. farm planning and management;
 - iii. animal husbandry;
 - iv. farmers organization and marketing;
 - v. social services; and
- (c) a group of 20 specialized technicians, including most of the existing staff, of which five would assist the agronomist, five the farm planner, five the social service specialist, two the animal husbandry, two the farmers organization and one the marketing specialists.

A consultant would be provided for three years to assist the service chief in setting up the service and establish an adequate working program and methodology (Annex 2). The service chief and the five professionals including the technicians for farmers organization and marketing would be stationed at project headquarters, while the remaining technicians would be outposted in five suitable locations in the project area.

5. It is planned that the service would be part of and organized along the lines of ICA's Rural Development Program. The staff required for the service would be hired by ICA. After adequate training, especially in agricultural extension to be arranged by ICA in cooperation with the Centro Internacional de Agricultura Tropical (CIAT), the staff would be seconded to INCORA and incorporated into INCORA's project organization as part of the agricultural services section for extension and technical assistance. The chief of the extension team would report to the head of the section and orient the activities of the service fully to the project's needs. ICA would actively support the project by making available the results of

various research programs and provide backstopping of extension personnel on matters of extension methodology. An operational agreement would be entered into by INCORA and ICA which would formalize the terms and responsibility of each agency in establishing the extension service and in carrying out this plan. The extension and technical assistance program would be financed by INCORA. Funds of Col\$ 13.9 million (US\$0.5 million) would be included in the project to cover the cost of this service during the five-year construction period (Annex 5). INCORA would have responsibility for continuing this service after the construction period to the end of the project development phase (year 10).

6. The Centro Internacional de Agricultura Tropical (CIAT) at Palmira has offered to conduct special courses for the training of extension agents for this project as well as other INCORA projects in Colombia. These courses would establish a close relation between research and technical assistance at the farm level, in both general and specific aspects of agricultural production, which would make the work of the extension services more useful to the farmers. ICA and INCORA would collaborate with CIAT in planning and financing these courses and arrange for extension staff from the project to participate.

Agricultural Production Credit

7. Institutional credit to farmers in the project area is provided mainly by the Caja Agraria and INCORA. Other less important sources include the Banco Ganadero, the Cotton Grower Association (FEDERALGODON), suppliers of agricultural inputs including the regional Cooperativas Agropecuarias administered by the Central de Cooperativas de la Reforma Agraria (CECORA) and a few private banks. Although the project areas are well served with banking facilities of various banking agencies, the existing lending programs do not fully cover production credit requirements of all farmers and medium and short-term development credit for small farms is virtually not available.

8. The Caja Agraria serves the project area through a main office in Monteria, two sub-offices in Cerete and Lorica and agencies in Cienega del Oro, San Pelayo and San Carlos. This bank provides credit for crops, livestock fattening and breeding, agricultural machinery, irrigation and drainage facilities, rural housing and electrification. In addition to its own resources the Caja Agraria works with funds provided by IDB for agricultural machinery, IBRD for livestock (651-CO) and the Fondo Financiero Agropecuario (FAA) 1/

1/ The FFA established by Law 5 of 1973 aims at directing substantially larger financial resources to agriculture by a forced investment regime under which the commercial banks are required to invest 15% of their placements in 8% agricultural development bonds issued by the Central Bank and administered by FFA. These funds are then relent to financial institutions, including Caja Agraria, for making loans to agriculture.

for a wide range of agricultural production and investments. Interest rates charged vary in accordance with the size of the farm and terms between 12% and 14% p.a. for loans financed with Caja Agraria's own resources and 10% to 15% for loans from FFA funds. The Caja Agraria which operates under its own law rather than legislation pertaining to commercial banks has traditionally concentrated its lending on larger farms and its operational regulations and policy orientation have limited its capacity to adjust its lending to the conditions and needs of small farms, especially within INCORA irrigation and drainage districts.

9. INCORA operates its credit program from the project headquarters located in the project area. Its lending is primarily directed towards INCORA settlers and small private farmers. In the Cordoba 2 area the program is limited to the USAID financed Supervised Credit Scheme since the IBRD financed Planned Credit Program (624-CO) does not include this area, and a former joint INCORA-Banco Ganadero Credit Program for livestock fattening and breeding came to an end as a result of shortages of funds and a change of policy by the Banco Ganadero. Shortages of funds for the Supervised Credit Program caused INCORA to restrict its lending mainly to short-term crop financing for INCORA settlers, and to a large extent, only to supplement Caja Agraria loans financed from FFA which generally covers only about half to three quarters of the production cost.

10. Banco Ganadero provides credits only to the livestock industry in the Cordoba 2 area. It maintains offices in Monteria and Lorica and offers credit lines for breeding, including the purchase of stock, pasture improvements and livestock installations. In addition to its own and FFA resources, it works with funds from USAID and IDB, mainly for breeding and investments. Loans outstanding in the region, as recorded in the Monteria office in 1973, amounted to Col\$45.0 million (US\$1.8 million), of which probably half were loans to farmers in the Cordoba 2 area. Interest rates vary according to the type of loan between 11% and 14% p.a. This credit program, together with Caja Agraria's credit line for livestock, adequately covers the industry's needs. However, small farmers, INCORA settlers and community enterprises have had difficulties in obtaining credit for livestock development after the joint INCORA-Banco Ganadero Livestock Credit Program was phased out as the policy and operational regulations of the Banco Ganadero prevented these groups from using these services.

11. Other sources of credit include the Cotton Growers' Association, the Cooperativa Agropecuaria del Sinu (COAGROSINU) suppliers of agricultural inputs, and private banks, such as, Banco de Colombia, Banco de Bogota, Banco del Oriente, Banco Cafetero and others. The combined lending of these institutions is limited and interest rates are higher than the one charged by official agricultural credit institutions reaching up to 20% p.a., if all fees and charges are accounted for.

12. Credit requirements in the project area would increase considerably with implementation of the project. Incremental short-term credit needs of

farmers are estimated to increase to about Col\$ 130 million ^{1/} at full development. Medium and long-term credit required by the farmers to finance that part of the on-farm investment to be about Col\$161 million (US\$6.4 million).

13. The principal objective of the new FFA program is to increase the supply of credit funds for agriculture and INCORA has received assurances that this would be the major source for short-term lending within their districts. This would improve the availability of production credit funds as required to meet the increased needs of the project, with increased production.

Agricultural Development Credit

14. The project would include development credit funds for medium and long-term loans to small farms, generally up to 12 ha, both privately owned and INCORA settlers, for on-farm development, farm machinery and livestock development. With about 3,400 out of 3,800 farms in the project area classified in this small farm category, it is essential that funds be available for the purposes noted above in order to fully achieve the production potential of the project. This would be especially true for the 1,000 new settlers to carry out farm improvements and achieve reasonable levels of production during the early part of the development period. The new Government has taken the position that on-farm works within INCORA districts should be financed with credit loans rather than by direct investment, for both small and large (20 to 50 ha) farms. Since medium and long-term development loans are not available to small farms, it is necessary to provide such funds in the project, if it is to succeed. Large farms, which to a great degree have already been developed and own machinery, mainly require production loans and are able to obtain development financing from public or private sources.

15. In addition to on-farm development, medium and long-term credit would be required to finance agricultural machinery, mainly tractors and plows, and livestock development, both infrastructure and breeding stock, for the existing 87 Empresas Comunitarias and the 100 new ones which would be established in the project area. INCORA would not have adequate resources to assist these empresas in obtaining the necessary livestock and machinery to begin farming operations.

16. The agricultural credit funds provided under the project for medium and long-term loans would be administered by INCORA through its existing credit department under the same procedures as the existing Credit Loan 624-CO, with the Caja Agraria acting as the banking agent under a Project Administration Agreement, which would provide for transfer of these funds to INCORA by Government and for the Caja Agraria to be responsible for fiscal management and granting of loans, upon recommendation by

^{1/} 50% of aggregate variable production costs, excluding labor, in 1974 prices.

INCORA, keeping of accounts, fulfill legal requirements and follow-up on loan repayment by the farmers. INCORA would assist the farmers and empresas on surveys and planning for on-farm development, organize farmers into groups for reasonable sized contracts, negotiate contracts, assist with loan applications and supervise implementation of the work. INCORA would bear the financial risk and loans would be administered under the same terms and conditions as the existing Planned Credit Program (Loan 624-CO) with a repayment period of not less than five years for machinery and equipment and not more than 12 years for on-farm development and livestock development, with two or three year grace periods depending on local conditions. The interest rate would be set in accordance with Government policy on credit loans to small farms. This could require an increase, due to inflation, from the present rate of 14% under the Planned Credit Program (624-CO) to 16%, which could still be a negative rate but within a reasonable limit that small farms could afford and would accept. An estimate of the amounts required for the several purposes of the credit fund is presented below:

<u>Item</u>	<u>Estimated Cost</u> <u>---Col\$'000---</u>
(a) On-farm development	88,550
(b) Farm machinery	37,950
(c) Infrastructure and breeding stock for livestock farms	<u>25,300</u>
Total	151,800
US\$'000 equivalent	6,000

Farmers' Training

17. The Servicio Nacional de Aprendizaje (SENA) is responsible for vocational training including the field of agriculture. It is well experienced in this task and maintains a training center in the Cordoba 2 area where about 200 young people are trained each year in the use of agricultural machinery, general agricultural practices and the administration of community enterprises in two to three year courses. In addition SENA operates courses in crop and livestock production techniques. INCORA would, on the basis of the existing agreement with SENA, prepare farmers' training programs for the project area to be implemented by SENA. These programs would be coordinated with the work of the extension service and the special assistance provided to settlers by INCORA (para 4).

Marketing Services

18. With increased production the existing marketing system, as described in Annex 8, would require improvements in the project area in order to improve the price structure for small farmers and to facilitate the change from subsistence to commercial agriculture by INCORA settlers and small private farmers. INCORA would therefore cause the Cooperativa Agropecuaria del Sinu and the Instituto de Mercadeo Agropecuario (IDEMA), to make appropriate arrangements to intensify their services in the project area.

Machinery Services

19. Agricultural machinery available in the Cordoba 2 area is adequate to meet present needs. With the project the area under crops is expected to increase from some 17,000 ha to about 32,000 ha at full development, and the acquisition of additional farm machinery would be necessary. Since the major part of the additional area will be managed in community enterprises, which would be large enough to fully utilize machinery, the project would include the provision of credit funds for the purchase of farm machinery by community enterprises and small private farmers. The funds provided for this purpose would be sufficient to meet incremental needs of these enterprises and private farmers accruing over the first five-year period of the project.

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Organization and Management

Project Management

1. The Instituto Colombiano de la Reforma Agraria (INCORA) would be responsible for implementation and management of the agricultural development phase of the project and act in an advisory capacity to other agencies to facilitate and coordinate implementation of the program for improvement of social infrastructure and services within the project area. INCORA is an autonomous government institution under the Ministry of Agriculture, on which it depends for financial support through annual appropriations. Its board of directors is constituted to reflect broad political parity, comprising 16 members representing several Government agencies involved in agricultural development, farmers' associations and cooperatives, the Catholic Church, and the Military Services. The Minister of Agriculture is chairman of the board. The chief executive of INCORA is the General Manager who is appointed by the President of the Republic. At headquarters in Bogota the organization is structured in four main departments: Administration, Legal Affairs, Engineering, and Agricultural Development. There is also an office for general planning and one for technical studies.

2. With the creation of INCORA under Agrarian Reform Law 135 in 1961, the main objective were to achieve a more equitable land distribution pattern and improve tenurial conditions for small farmers and landless families in rural areas, increase utilization of unused lands, increase agricultural productivity, and raise the standard of living of the rural population by providing technical, economic and social assistance. Strong political resistance to land reform, i.e., breaking up large holdings for small farm settlement, has forced INCORA to diversify its operations more into colonization on undeveloped public domain; land reclamation, irrigation and drainage in areas predominately under private ownership; issuance of land titles; providing technical assistance and credit to small farmers; and organizing small farmers into communal farm groups (Empresas Comunitarias). At present INCORA has 35 projects, of which 16 are land development projects with infrastructural works serving about 150,000 ha. Most of these projects require rehabilitation and completion, and extension of the arable area is possible in certain projects. Within these areas INCORA has had some success in enforcing the new Agrarian Reform Laws No. 1 of 1968 and No. 4 of 1973, whereby private owners are required to reduce individual holdings to a maximum of 50 ha by selling excess land to INCORA or other private operators. As a consequence the land tenure pattern in most of these projects has become more equitable in recent years and INCORA has acquired varying

amounts of land in each project area for settlement. While INCORA has not been able to promote a significant and widespread change in the socially and economically undesirable land tenure situation throughout the country, it has become the only institution in the country capable of executing large land development projects and providing assistance for small farmers.

3. It is possible that the organization and structure of INCORA would undergo some important changes under the new Government that took office on August 7, 1974. However, that is not expected to adversely affect the implementation of land development projects, which the new President strongly supports, or INCORA's existing organizational structure at the project level. It is anticipated that these changes would primarily relate to the agrarian reform and land development functions of INCORA at the headquarters level. The proposed organization at the project level would basically be the same as at present, with some expansion and realignment of responsibilities. It is proposed that the Project Director have more authority and control over all activities pertaining to agricultural development. This would include the sections for Administration, Settlers' Organization, Irrigation District, Engineering and Construction and Agricultural Services (Chart 9059). The future of the Legal Section will depend on the reorganization of INCORA at the headquarters level but for the present it is shown under the supervision of the Project Director. The Project Director should be responsible only for a specific project and reside in the area. In Cordoba 2 the Project Director operates basically under the direction of headquarters in Bogota but also under the general supervision of a newly established regional office in Barranquilla, which is of doubtful effectiveness. The role of these new regional offices is admittedly mainly political and whether they continue under the new Government remains to be determined. More authority should be assigned to the Project Directors for all activities at the project level. Under the proposed project all sections at the project level would need to be strengthened to meet their increased responsibilities. This would be especially true for the Irrigation District, the Engineering and Construction Section and the Agricultural Services Section where a new Extension Service would be created (Annex 3).

Participation of Other Ministries and Institutions in the Project

4. • Ministries and institutions participating in the project for the program to improve social infrastructure and services would include the Ministry of Education and the Instituto Colombiano de Construcciones Escolares (ICCE) for schools; the Ministry of Health and the Servicio Seccional de Salud for the Department of Cordoba for health centers, and the Instituto Nacional para Programas Especiales de Salud (INPES) for village water supply; the Ministry of Public Works and the Instituto Colombiano de Energia Electrica (ICEL) for rural electrification, and the Fondo Nacional de Caminos Vecinales (Caminos Vecinales) for roads; and the Ministry of Communications and the Empresa Nacional de Telecomunicaciones (TELECOM)

for telephones. These agencies would operate independently for planning and implementation of their part of the program and they all have offices and representatives in or near the project area and are in a position to supervise the program. INCORA, as the executing agency with overall responsibility for the project and the channel for loan financing, would monitor the progress and quality of the work and certify claims for reimbursement for satisfactory completion. This would be achieved through operational agreements between INCORA and the participating ministries and institutions which would define the specific responsibilities of each in carrying out the program, including the counterpart contribution of each ministry or institution to the program. Further, local representatives of these ministries and institutions would become members of the Advisory and Coordination Committee at the project level, which is presently functioning for the agricultural development phase of the project. Currently members include representatives from INCORA, ICA, IDEMA, Caja Agraria, the Growers' Associations, the Water Users Association and the CECORA supported cooperative, namely the Cooperativa Agropecuaria del Sinu (COAGROSINU).

5. In addition INCORA would enter into or update existing operating agreements with the Instituto Colombiano Agropecuario (ICA) for providing extension services, with the Servicio Nacional de Aprendizaje (SENA) for farmer training, with the Caja de Credito Agrario, Industrial y Minero (Caja Agraria) for acting as the banking agent to channel credit funds to farmers and with the Centro Internacional de Agricultura Tropical (CIAT) for the training of extension agents. The participation of the agencies noted above in the project is shown graphically on Chart 9059.

Farmers' Organizations

6. The basic agrarian reform law (Law 135 of 1961) provides for the creation of irrigation districts (Distritos de Riego) in each of the areas administered by INCORA for land improvement through construction of drainage, irrigation and flood control works, and implementation of an agrarian reform program. These districts, under the direct management of INCORA, are primarily charged with operation and maintenance of the project works and administration of the use of water and the systems, by both INCORA settlers and private owners. Regulations for creation of these districts include the establishment of an association of users (Junta General de Usuarios) representing all farmers, both settlers and private owners, which acts as an advisory and policy making body in consultation with INCORA for administration and management of the project. The general association is represented by a Board of Directors (Junta Directiva de Usuarios) which meets regularly with INCORA management and the Advisory and Coordination Committee. These associations are empowered to act only as advisors and in consultation with INCORA, but lack any real authority to make decisions affecting project management. This control over all activities by INCORA may be justified during the implementation period for construction and

agrarian reform but with completion of these activities and the projects, INCORA would initiate a program to gradually transfer more responsibility for management to the associations.

7. Laws 135 of 1961 and 4 of 1973 both provide for INCORA to promote the establishment of communal enterprises among new settlers with the objective of joint management and exploitation of the land assigned to them. According to the form of enterprise chosen by the members, they may or may not receive titles to specific areas of land and manage part or all of the farm operations jointly. In the Cordoba 2 area, there are about 87 of these enterprises which consist of 10 to 12 families, each with rights to farm 10 ha to 15 ha, forming a contiguous block of 100 ha to 150 ha of cooperatively managed land. With the project 100 new enterprises, involving about 1,000 families, would be created.

8. INCORA and the Central de Cooperativas de la Reforma Agraria (CECORA), an agency closely associated with INCORA, provide managerial and technical assistance to the empresas and to the large cooperatives managed by CECORA. This cooperative serves all farmers in the project area who elect to become members and provides credit, machinery services and serves as a channel for the purchase of inputs and marketing of produce. This cooperative has been established by CECORA particularly to serve settlers in the project area but all farmers in the area may use the cooperative by paying a membership fee.

9. Other farmers' organizations which provide assistance and services to the farmers are the associations or federations for the promotion of specific commercial crops. In the project area the most active are the Federacion Nacional de Algodoneros (cotton growers) and the Federacion Colombiana de Ganaderos (cattle growers). Members of these organizations are primarily private owners with larger farms growing commercial crops.

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Cost Estimates

Item	Local			Foreign		
	Local	Foreign	Total	Local	Foreign	Total
	Col\$ '000	Col\$ '000	'000	US\$ '000	US\$ '000	'000
<u>Major Project Works</u>						
Primary and Secondary Drainage Systems and Collector Canal	86,448	77,593	164,041	3,416	3,067	6,483
Roads and Bridges	68,974	46,504	115,478	2,726	1,838	4,564
Fencing and Other Structures	22,235	3,990	26,225	879	158	1,037
Buildings	1,820	726	2,546	72	29	101
Sub-total	179,477	128,813	308,290	7,094	5,091	12,185
<u>Social Infrastructure</u>						
Schools	26,808	-	26,808	1,060	-	1,060
Health Centers	6,642	-	6,642	262	-	262
Village Water Supply	10,400	-	10,400	411	-	411
Rural Electrification	1,560	-	1,560	62	-	62
Telecommunications	260	-	260	10	-	10
Sub-total	45,670	-	45,670	1,805	-	1,805
<u>Agricultural Credit</u>	64,595	87,205	151,800	2,553	3,447	6,000
<u>Equipment</u>						
Agricultural Development	2,200	30,816	33,016	87	1,218	1,305
Social Infrastructure	6,780	14,775	21,555	268	584	852
<u>Engineering and Supervision</u>	52,745	-	52,745	2,085	-	2,085
<u>Extension Services</u>	13,930	-	13,930	550	-	550
<u>Consultant Services</u>	-	17,500	17,500	-	692	692
<u>Base Cost Estimate</u>	365,397	279,109	644,506	14,442	11,032	25,474
<u>Physical Contingencies</u>	17,946	12,880	30,826	709	509	1,218
<u>Expected Price Increases</u>	88,749	52,806	141,555	3,508	2,087	5,595
<u>Total Expected Cost of Project</u>	472,092	344,795	816,887	18,659	13,628	32,287
<u>Interest During Construction</u>	-	83,590	83,590	-	3,304	3,304
Grand Total	472,092	428,385	900,477	18,659	16,932	35,591

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Local Staff Requirements and Estimated Cost During Construction Period

	<u>Calendar Year</u>					<u>Total Estimated Cost - Col\$'000</u>
	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	
	<u>man-years</u>					
<u>1. Engineering and Supervision</u>						
Chief Engineer	1	1	1	1	1	1,025
Design Engineers	2	2	2	2	2	1,435
Field Engineers	2	2	2	2	2	1,435
Administrative Ass't.	1	1	1	1	1	720
Ass't. Engineers, Design	2	4	4	4	4	2,000
Ass't. Engineers, Field	4	6	6	6	6	3,100
Agronomist, soils	1	1	1	1	1	720
Inspectors, Construction	4	6	6	6	6	2,575
Survey Parties (number)	8	12	12	12	12	19,260
Draftsmen	2	4	4	4	4	1,240
Laboratory Technicians	2	2	2	2	2	1,010
Ass't Agronomists, soils	2	2	2	2	2	860
Laboratory Assistants	2	2	2	2	2	600
Secretaries	2	2	2	2	2	575
Drivers	6	8	10	10	10	2,050
Guards-Laborers	<u>10</u>	<u>20</u>	<u>30</u>	<u>30</u>	<u>30</u>	<u>4,140</u>
Sub-total	6,210	8,800	9,245	9,245	9,245	42,745
<u>Operational Costs</u>						
for vehicle operation, office maintenance, ma- terials and supplies and local support costs for consultants	<u>2,000</u>	<u>2,000</u>	<u>2,000</u>	<u>2,000</u>	<u>2,000</u>	<u>10,000</u>
Total	8,210	10,800	11,245	11,245	11,245	52,745 =====
<u>2. Extension Services</u>						
Chief Agronomist	1	1	1	1	1	860
Agronomists	2	5	5	5	5	2,160
Technicians	8	12	20	20	20	6,900
Secretaries	<u>1</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>510</u>
Sub-total	1,205	2,035	2,730	2,730	2,730	11,430

	<u>Calendar Year</u>					<u>Total Estimated Cost - Col\$'000</u>
	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	

----- man-years -----

Operational Costs

For vehicle operation, office expense, materials and supplies and local support costs for consultants

	<u>250</u>	<u>375</u>	<u>625</u>	<u>625</u>	<u>625</u>	<u>2,500</u>
Total	1,455	2,410	3,355	3,355	3,355	13,930 =====

3. Operation and Maintenance

Project Engineer	1	1	1	1	1	1,010
Assistant Engineer	1	1	1	1	1	730
Administrative Ass't.	1	1	1	1	1	730
Accountant	1	1	1	1	1	575
Account Collectors	2	3	4	4	4	1,435
Maintenance Foreman	1	1	1	1	1	500
Machinery Operators	4	6	10	12	12	3,160
Mechanics	1	2	2	2	2	650
Mechanics Helper	1	2	2	2	2	430
Drivers	4	6	6	8	10	1,440
Survey Party (number)	-	-	1	1	2	1,375
Secretaries	2	2	2	2	2	575
Laborers and Guards	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>30</u>	<u>3,095</u>
Sub-total	1,910	2,340	3,405	3,640	4,410	15,705

Operational Costs

For equipment and vehicle operation, office maintenance, materials and supplies.

	<u>2,500</u>	<u>2,675</u>	<u>4,360</u>	<u>4,500</u>	<u>6,540</u>	<u>20,575</u>
Total	4,410	5,015	7,765	8,140	10,950	36,280

4. Consultant Services

Irrigation Engineer, Specialist On-farm Development	1	1	1			5,250
Agronomist, Specialist on Extension Organization and Training and Farm Management Planning	1	1	1			5,250

	<u>1976</u>	<u>Calendar Year</u>			<u>1980</u>	<u>Total Estimated Cost - Col\$'000</u>
		<u>1977</u>	<u>1978</u>	<u>1979</u>		
	<u>----- man-years -----</u>					
Specialist On Organi- zation and Management (INCORA Headquarters)	-	1	1	-		3,500
Specialist On Fiscal Management (INCORA Headquarters)	<u>-</u>	<u>1</u>	<u>1</u>	<u>---</u>		<u>3,500</u>
Total	-	7,000	7,000	3,500		17,500

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

List of Equipment

	<u>Number</u>	<u>Estimated Cost - US\$'000</u>
1. <u>Engineering and Supervision</u>		
Vehicles, station wagon, 4-wheel drive	20	120
Motorcycles	10	10
Engineering and technical equipment	Lot	40
Office equipment	Lot	15
Laboratory equipment	<u>Lot</u>	<u>20</u>
Sub-total		205
2. <u>Extension Service</u>		
Vehicles, station wagon, 4-wheel drive	10	60
Motorcycles	16	16
Technical and field testing equipment	<u>Lot</u>	<u>15</u>
Sub-total		91
3. <u>Operation and Maintenance</u>		
Draglines, 3/4 cu. yd., 40 ft boom	3	300
Graders, self-propelled, wheel type, 100 hp, 12 ft blade	2	100
Loader, wheel type, 1 cu. yd.	1	50
Excavator, track type, 1/2 cu. yd.	1	90
Roller, drum type, self-propelled	1	15
Tractors, 75 hp, track type, with angle dozer	3	180
Trucks, dump, 6 cu. yd.	4	100
Trucks, stake body, 4 ton cap.	2	20
Vehicles, 4-wheel drive station wagons pickups and mini-busses	8	60
Motorcycles	4	4
Shop and servicing equipment, including fuel and oil storage, pumps, welding machine, compressor, lubrication equipment and tools	Lot	50
Spare parts	<u>Lot</u>	<u>40</u>
Sub-total		1,009

	<u>Number</u>		<u>Estimated Cost - US\$'000</u>
4. <u>Improvement of Social Infrastructure</u>			
Equipment, vehicles, materials and supplies:	Lot		852
	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
Schools	52	52	80
Health Centers	78	310	296
Village Water Supply	117	180	178
Rural Electrification	16	26	32
Telecommunications	<u>5</u>	<u>16</u>	<u>16</u>
Sub-total	268	584	852
Grand Total for Equipment			<u><u>2,157</u></u>

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Estimated Schedule of Expenditures

Calendar Years

	1976			1977			1978			1979			1980			1981			TOTAL		
	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total
----- Col \$ '000 -----																					
Project Works																					
Primary and Secondary																					
Drainage Systems	5,450	4,888	10,338	27,912	22,783	50,695	24,323	21,938	46,261	23,405	21,912	45,317	5,358	6,072	11,430	-	-	-	86,448	77,593	164,041
Roads and Bridges	11,243	6,605	17,848	21,383	13,323	34,706	16,674	12,191	28,865	16,674	12,191	28,865	3,000	2,194	5,194	-	-	-	68,974	46,504	115,478
Fencing and Other																					
Structures	660	266	926	2,671	1,064	3,735	4,716	1,064	5,780	6,761	1,064	7,825	7,427	532	7,959	-	-	-	22,235	3,990	26,225
Buildings	-	-	-	910	363	1,273	910	363	1,273	-	-	-	-	-	-	-	-	-	1,820	726	2,546
Sub-total	17,353	11,759	29,112	52,876	37,533	90,409	46,623	35,556	82,179	46,840	35,167	82,007	15,785	8,798	24,583	-	-	-	179,477	128,813	308,290
Social Infrastructure																					
Schools	-	-	-	6,000	-	6,000	7,000	-	7,000	7,808	-	7,808	6,000	-	6,000	-	-	-	26,808	-	26,808
Health Centers	-	-	-	1,600	-	1,600	1,842	-	1,842	1,600	-	1,600	1,600	-	1,600	-	-	-	6,642	-	6,642
Village Water Supply	-	-	-	2,600	-	2,600	2,600	-	2,600	2,600	-	2,600	2,600	-	2,600	-	-	-	10,400	-	10,400
Rural Electrification	-	-	-	-	-	-	520	-	520	520	-	520	520	-	520	-	-	-	1,560	-	1,560
Telecommunications	-	-	-	-	-	-	-	-	-	130	-	130	130	-	130	-	-	-	260	-	260
Sub-total	-	-	-	10,200	-	10,200	11,962	-	11,962	12,658	-	12,658	10,850	-	10,850	-	-	-	45,670	-	45,670
Agricultural Credit	6,795	14,705	21,500	14,500	24,500	39,000	14,500	25,000	39,500	13,000	12,000	25,000	15,800	11,000	26,800	-	-	-	64,595	87,205	151,800
Equipment																					
Agricultural Development	600	7,984	8,584	800	12,736	13,536	800	10,096	10,896	-	-	-	-	-	-	-	-	-	2,200	30,816	33,016
Social Infrastructure	-	-	-	1,356	2,955	4,311	2,712	5,910	8,622	2,712	5,910	8,622	-	-	-	-	-	-	6,780	14,775	21,555
Engineering and Supervision	8,210	-	8,210	10,800	-	10,800	11,245	-	11,245	11,245	-	11,245	11,245	-	11,245	-	-	-	52,745	-	52,745
Extension Services	1,455	-	1,455	2,410	-	2,410	3,355	-	3,355	3,355	-	3,355	3,355	-	3,355	-	-	-	13,930	-	13,930
Consultant Services	-	-	-	-	7,000	7,000	-	7,000	7,000	-	3,500	3,500	-	-	-	-	-	-	-	17,500	17,500
Base Cost Estimate	34,413	34,448	68,861	92,942	84,724	177,666	91,137	83,562	174,759	89,810	56,577	146,387	57,035	19,798	76,833	-	-	-	365,397	279,109	644,506
Physical Contingencies	1,735	1,176	2,911	5,287	3,753	9,040	4,662	3,555	8,217	4,684	3,516	8,200	1,578	880	2,458	-	-	-	17,946	12,880	30,826
Expected Price Increases	2,484	1,222	3,706	18,655	11,102	29,757	23,177	16,998	40,175	27,658	18,646	46,304	16,775	4,838	21,613	-	-	-	88,749	52,806	141,555
Total Expected Cost of Project	38,632	36,846	75,478	116,884	99,579	216,463	119,036	104,115	223,151	122,152	78,739	200,891	75,388	25,516	100,904	-	-	-	472,092	344,795	816,887
Interest During Construction	-	-	-	-	2,443	2,443	-	11,131	11,131	-	21,689	21,689	-	30,795	30,795	-	17,532	17,532	-	83,590	83,590
Grand Total	38,632	36,846	75,478	116,884	102,022	218,906	119,036	115,246	234,282	122,152	100,428	222,580	75,388	56,311	131,699	-	17,532	17,532	472,092	428,385	900,477

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Estimated Schedule of Disbursements

<u>IBRD Fiscal Year and Semester</u>	<u>Cumulative Disbursements at End of Semester^{1/}</u>
	US\$ '000
<u>1976</u>	
June 30, 1976	-
<u>1977</u>	
December 31, 1976	632
June 30, 1977	1,667
<u>1978</u>	
December 31, 1977	4,068
June 30, 1978	6,647
<u>1979</u>	
December 31, 1978	9,377
June 30, 1979	12,243
<u>1980</u>	
December 31, 1979	14,717
June 30, 1980	17,277
<u>1981</u>	
December 31, 1980	18,916
June 30, 1981	21,000

^{1/} Based on Estimated Schedule of Expenditures (Annex 6, Table 1), with a six month lag from expenditure to disbursement.

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COLOMBIACORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECTProposed Withdrawal of the Proceeds of the Loan

<u>Category</u>	<u>Amount of the Loan Allocated (Expressed in Dollar Equivalent)</u>	<u>% of Expenditures to Financed</u>
I Major Project Works	5,100,000	42%, representing the estimated foreign exchange component.
II Social Infrastructure	1,300,000	70%
III Consultant Services	700,000	100% foreign expenditures or 95% local expenditures
IV Equipment, Vehicles and Supplies	1,800,000	
a) Directly imported		100% foreign (CIF)
b) Imported goods purchased locally		80% (representing the estimated foreign exchange component).
c) Goods manufactured locally		95% of ex-factory prices.
V Agriculture Credit	5,700,000	95% of amounts disbursed.
VI Interest and other charges on the loan accrued on or before November 30, 1980	3,300,000	Amounts due
VII Unallocated	<u>3,100,000</u>	
Total	21,000,000	

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Agricultural Production and Farm Budgets

A. Agricultural Production

Land Use, Cropping Pattern

1. Table 1 shows the existing and proposed cropping pattern in the Cordoba 2 area. During 1973 there were 22,600 ha utilized in the first semester and 30,400 ha in the second semester. Permanent pasture covered 50% of the utilized areas and cotton, a second semester crop, covered 34% of the area. The remaining land was used for maize (8%), sorghum (2%), and subsistence and minor crops (6%), mainly sesame, soybeans, yams, cassava, and plantains. Cotton, with an annual net production value of about Col\$ 38.3 million, is the most important cash crop; it also has the highest net production value per ha. The cotton cropped area is therefore expected to increase substantially with the project. Other crops (maize, sorghum, and especially soybeans and sesame) are also expected to increase, replacing most of the area currently under pasture, which at present has a very low production value. In the future, the pasture areas will probably be limited to poor class lands that are unsuited for cultivation. Thus, at full development of the project, assuming 51,500 ha of double cropped area, the cropping pattern would comprise cotton (39%), maize, sorghum, soybeans and sesame (41%), subsistence crops (4%) and pasture (16%).

Cropping Intensity

2. The cropping intensity was 100% in 1973, 39% during the first semester and 61% during the second. Cotton was planted in fallow lands and no double-cropping was practiced except in the areas with subsistence and minor crops. With the project, under improved drainage conditions and intensified farming practices, double cropping would be possible for rotations such as maize, sorghum/soybeans and maize/sorghum/sesame. Double cropping comprising cotton would be difficult to achieve because the deadline for planting cotton is September 30. This means that the preceding crops (maize or sorghum) ought to be planted as early as mid-April, when sufficient moisture is not always available. ICA has developed a new maize hybrid variety of short vegetative cycle (90-100 days) which could be planted in early May and harvested in time for planting cotton, but this new variety still has to be adapted and introduced. Based on this possibility and considering early rains in certain years, double cropping on 8.5% of the cotton area is estimated as an average. Thus, at project full development, the annual cropping

intensity would increase to 129%, 42% in the first semester and 87% in the second (Table 1).

Mechanization

3. Although information on the quantity of farm machinery within the Cordoba 2 area was not available, it appears to be sufficient for the present needs. Farm machinery is in the hands of private farms, INCORA settler groups and contractors. Most of the small farmers prepare the lands and harvest the crops through custom hire work provided by machinery owners. At project full development, however, farm machinery requirements would increase substantially because of the cropped area expansion. Cotton and soybeans being the principal crops, the peak period for machinery use is in August and September during the final stages of land preparation and planting. With an increase of 8,600 ha of cotton and 9,800 ha of soybeans and sesame, additional tractor requirements in September would be about 250 units. At present, there are no adequate repair and servicing facilities in the project area; maintenance of equipment is usually carried out on the farm by the tractor drivers. However, with increased cropping intensity and consequent introduction of new machinery in the future, better servicing facilities are expected to become available in Monteria and Cerete, and perhaps in San Carlos, San Pelayo and Cienega de Oro.

Land Preparation

4. The project would provide land leveling on about 20,000 ha. In general, farmers have their land disc-plowed once and harrowed two or three times before planting. With the project, land preparation would include deep-plowing every year and subsoiling once every three years.

Crop Varieties

5. The proposed cropping patterns include the following crops, most of them currently cultivated in the project areas.

Cotton. The Delta Pine 16 variety (short staple cotton) is used on 95% of the existing cotton area. It has a vegetative cycle of 150 days and a harvesting period of about 45 days. Because of insect attacks, the planting period of cotton is limited to 45 days, from mid-August to the end of September.

Maize. Various hybrid varieties produced by ICA are common in the project area, especially H-207, H-209 and H-154. They have long vegetative cycles of 120-130 days and produce high yields, but frequently farmers let them degenerate through in-breeding; hence the average yields are low. ICA is now propagating a new variety (V-106) which has a short vegetative cycle (90-100 days) which gives slightly lower yields. Other new hybrid varieties are being developed and would be available in the coming years.

Sorghum. Various varieties (Nataima, Tolima, Motilonia, Cesar) are cultivated in the project area with good results, but new high yielding varieties, i.e., Sabana 2 and Pioneer, are now being introduced. Sorghum culture is similar to maize although sorghum varieties have shorter vegetative cycles (110-120 days) and are more resistant to insects and drought.

Soybeans. This is a relatively new crop which has introduced in 1968. Since then, however, the soybean area has not expanded much due to poor drainage and seed storage problems. ICA is experimenting with new soybean varieties in the project area.

Sesame. Low yield varieties (Criolla, Calzado, Chino Rojo) are common in Cordoba 2. They are planted in small areas because of poor drainage, lodging and dehiscence problems. ICA has produced and will soon distribute new higher yielding varieties (SMG-169; SMG-167 and SMG-150) which are expected to be more widely used on properly drained lands.

Seed Quality

6. Seed of good quality (cotton, maize) or acceptable quality (sorghum, soybeans, sesame) are adequately supplied to the farmers by the Caja Agraria and other public and private organizations, i.e., FEDERALGODON and IDEMA (cotton); ICA and FENALCE (maize); PROCAL (sorghum), the cooperatives, and private firms (soybean and bean). The increased demand for improved seeds with the project would be adequately supplied by the above-mentioned organizations.

Pest and Disease Control

7. Fungicide treatment of seeds is currently a generalized practice. Fusarium could be a threat to soybeans but it can well be controlled by using resistant varieties and avoiding continuous planting of legumes in the same land. Insect attacks could become more severe during project implementation, especially on cotton, tomatoes and maize, requiring more intense treatment. The present average of 12 insecticide treatments on cotton would probably increase to 20-24 in the future. Pest control practices are well developed and a wide range of insecticides is available.

Fertilizers

8. All fertilizers are readily available in the project area. Urea is commonly used as nitrogenous fertilizer. The use of mixed fertilizers with nitrogen, phosphate and potash ingredients is less common. With the project, the demand for nitrogenous and mixed fertilizers would increase substantially due to the expansion of cropped area and to obtain the high yields which would be expected. Research and extension would play a significant role in this respect. In any case, no shortage of fertilizers is anticipated.

Farm Labor

9. Although most operations are mechanized, labor is still required for weeding, thinning, harvesting and assisting with other mechanized operations. Maize is usually harvested with a combine, but in small farms it is harvested by hand. At project full development, the labor requirements per crop are estimated as follows:

	<u>Man-days/ha</u>
Cotton	86
Maize	27 (39 if harvested by hand)
Sorghum	18
Soybeans	24
Sesame	38
Pasture	10

The annual labor requirements under the proposed cropping pattern would be about 2.4 million man-days, or a 100% increase over the estimated 1.2 million man-days currently used. The highest labor demand would occur in February when cotton is harvested, 535,000 man-days (22% of total) or 20,600 laborers. There is sufficient unused manpower available in both areas to supply the additional labor required.

Yields, Production

10. At the level of current agricultural practices in the project area, yields are assumed to increase 10% by 1985, without the project. With the project, due to drainage, land leveling and improved farming (better seeds, intensive fertilizing, more effective pest control, etc.) yields would increase by 45% to 88% depending on the crop. Estimated yields at present, without the project and with the project are summarized below:

	<u>Present</u> (1973)	<u>Without Project</u> (1985)	<u>With Project</u> (1985)
	----- (ton/ha) -----		
Cotton	1.2	1.3	2.2
Maize	1.5	1.7	3.2
Sorghum	2.0	2.2	3.2
Soybeans	1.0	1.1	1.7
Sesame	0.5	0.6	0.7

11. As a result of increased yields and due to the expansion of the cropped area, the overall production would increase by 1985 from 23,000 tons to about 97,600 tons, an increase of 350%. The net annual production value would increase from Col\$ 58.9 million without the project to Col\$ 278.6 million with the project, an incremental value of Col\$ 219.7 million or 373%. Yields and production levels are shown in Table 3.

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Present and Proposed Cropping Patterns

	<u>Cropping Pattern 1973</u>				<u>Proposed Cropping Pattern at Project Full Development</u>			
	<u>Semester I</u>	<u>Semester II</u>	<u>Total</u>	<u>%</u>	<u>Semester I</u>	<u>Semester II</u>	<u>Total</u>	<u>%</u>
	--(ha)--				--(ha)--			
<u>Annual Crops</u>								
Cotton	-	11,400	11,400	34	-	20,000	20,000	39
Maize	2,800	-	2,800	8	7,000	-	7,000	14
Sorghum	800	-	800	2	4,500	-	4,500	8
Soybeans	-	-	-		-	8,500	8,500	16
Sesame	-	-	-		-	1,300	1,300	3
<u>Permanent Crops</u>								
Subsistence Crops	2,000	(2,000)	2,000	6	2,000	(2,000)	2,000	4
<u>Pasture</u>	<u>17,000</u>	<u>(17,000)</u>	<u>17,000</u>	<u>50</u>	<u>8,200</u>	<u>(8,200)</u>	<u>8,200</u>	<u>16</u>
Total	22,600	30,400	34,000	100	21,700	40,000	51,500	100
Cropping Intensity	39%	61%	100%		42%	87%	129%	

ANNEX
7
Table 1

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

	<u>Costs of Production</u>					
	<u>Cotton</u>	<u>Maize (hand harvesting)</u>	<u>Maize (Combine) harvesting</u>	<u>Sorghum</u> (Col.\$/ha)	<u>Soybeans</u>	<u>Sesame</u>
<u>Without Project</u>						
Seeds	200	300	300	150	-	-
Fertilizers	650	-	-	-	-	-
Pesticides & Herbicides ^{1/}	4,100	500	500	500	-	-
Harvesting & Marketing	2,550	700	1,000	1,100	-	-
Machinery	1,400	1,100	1,100	1,100	-	-
Labor	<u>1,000</u>	<u>1,000</u>	<u>700</u>	<u>450</u>	-	-
Total	9,900	3,600	3,600	3,300	-	-
<u>With Project</u>						
Seeds	200	300	300	150	900	150
Fertilizers	2,000	1,200	1,200	1,200	800	650
Pesticides & Herbicides ^{1/}	4,800	700	700	700	1,100	700
Harvesting & Marketing	4,300	1,700	2,000	1,650	800	200
Machinery	1,600	1,300	1,300	1,300	1,300	1,300
Labor	<u>1,000</u>	<u>1,000</u>	<u>700</u>	<u>500</u>	<u>600</u>	<u>1,000</u>
Total	13,900	6,200	6,200	5,500	5,500	4,000

Note: Livestock costs are estimated as follows:

Without Project: Col.\$ 1,650/ha, including purchase of steers.

With Project: 130 ha existing farms with 23 ha pasture - Col. \$30,100 per farm.

130 ha new farms with 23 ha pasture - Col. \$30,600 per farm.

150 ha new farms with 120 ha pasture - Col. \$282,500 per farm.

^{1/} Includes application.

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Cropping Pattern, Production, Farmgate Prices, Production Costs and Incremental Value of Production

	<u>Cotton</u>	<u>Maize</u>	<u>Sorghum</u>	<u>Soybeans</u>	<u>Sesame</u>	<u>Subsistence</u>	<u>Pasture</u>	<u>TOTAL</u>
<u>Without Project</u>								
Area (ha)	11,400	2,800	800	-	-	2,000	17,000	34,000
Yields (kg/ha)	1,300	1,700	2,200	-	-	n.a.	99 ^{1/}	-
Production (ton)	14,820	4,760	1,760	-	-	n.a.	1,685	23,025
Prices (Col.\$/ton)	10,200	3,200	2,900	-	-	n.a.	20,000	-
Gross Value of Production (Col. \$'000)	151,200	15,200	5,100	-	-	21,700 ^{2/}	33,700	226,900
Cost of Production (Col.\$/ha) ^{3/}	9,900	3,600	3,300	-	-	n.a.	1,650	-
Cost of Production (Col. \$'000)	112,900	10,100	2,600	-	-	14,400 ^{2/}	28,000	168,000
Net Value of Production (Col. \$'000)	<u>38,300</u>	<u>5,100</u>	<u>2,500</u>	-	-	<u>7,300</u>	<u>5,700</u>	<u>58,900</u>
<u>With Project</u>								
Area (ha)	20,000	7,000	4,500	8,500	1,300	2,000	8,200 ^{1/}	51,500
Yields (kg./ha)	2,200	3,200	3,200	1,700	700	n.a.	174 ^{1/}	-
Production (ton)	44,000	22,400	14,400	14,450	910	n.a.	1,430	97,590
Prices (Col. \$/ton)	10,200	3,200	2,900	5,400	9,500	n.a.	20,000	-
Gross Value of Production (Col. \$'000)	448,800	71,700	41,800	78,000	8,600	38,700 ^{4/}	28,600 ^{5/}	716,200
Cost of Production (Col. \$/ha) ^{3/}	13,900	6,200	5,500	5,500	4,000	n.a.	n.a. ^{5/}	-
Cost of Production (Col. \$'000)	278,000	43,400	24,800	46,800	5,200	23,400 ^{4/}	16,000 ^{5/}	437,600
Net Value of Production (Col. \$'000)	<u>170,800</u>	<u>28,300</u>	<u>17,000</u>	<u>31,200</u>	<u>3,400</u>	<u>15,300</u>	<u>12,600</u>	<u>278,600</u>
Incremental Production (ton)	29,180	17,640	12,640	14,450	910	n.a.	(-255)	74,565
Incremental Net Value of Production (Col.\$'000)	132,500	23,200	14,500	31,200	3,400	8,000	6,900	219,700

^{1/} Beef and milk production expressed in terms of beef.

^{2/} Estimate Based on Maize (double-cropping)

^{3/} Excludes Technical Assistance, Interest and Project Charges

^{4/} Estimate Based on Maize and Sesame (double cropping)

^{5/} Based on: 87 Existing and 59 new farms (130 ha. each with 20% Pasture), and 41 new farms (150 ha. each, with 80% pasture)

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COLOMBIACORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT1 ha Farm Budget (Subsistence)

<u>Crop</u>	<u>Area</u> (ha)	<u>Yield</u> (ton/ha)	<u>Price</u> (Col.\$/ton)	<u>GVP</u> ^{1/} ----- (Col.\$/ha)	<u>Inputs</u> ^{2/} ----- (Col.\$/ha)	<u>Gross Benefit</u> ----- Total Col.\$)
Subsistence Crops ^{3/}	1.0	n.a.	n.a.	19,300	9,000	10,300
TOTAL	: 1.0					
CROPPED AREA:	1.0					
					Cropping Intensity:	100%

	<u>Col.\$</u>	<u>Col.\$</u>
Gross Farm Benefit		10,300
Less:		
- Hired Labor		--
- Family Labor (1/6 of available labor)		2,700
- Interest		
Net Farm Benefits		7,600
Project Charges		
- Operation & Maintenance		274
Net Farm Income		7,326
Estimated Present Income		1,700
Incremental Net Income		5.626

^{1/} Gross value of production^{2/} Production costs, excluding labor costs^{3/} Estimate based on maize and sesame (double cropping)

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

<u>Crop</u>	<u>6-ha Farm Budget</u>						<u>Gross Benefit</u> (Total Col.\$)
	<u>Area</u> (ha)	<u>Yield</u> (ton/ha)	<u>Price</u> (Col.\$/ton)	<u>GVP</u> ^{1/} -----	<u>Inputs</u> ^{2/} (Col.\$/ha)		
Cotton	3.0	2.2	10,200	22,400	12,900	9,500	28,500
Maize	(2.5)	3.2	3,200	10,200	5,200	5,000	12,500
Soybeans	1.5	1.7	5,400	9,200	4,900	4,300	6,500
Sesame	1.0	0.7	9,500	6,700	3,000	3,700	3,700
Subsistence Crops ^{3/}	<u>0.5</u>	-	-	18,400	9,100	9,300	<u>4,700</u>
TOTAL	6.0						55,900
CROPPED AREA	8.5			Cropping Intensity: 142%			

	<u>Col.\$</u>	<u>Col.\$</u>
Gross Farm Benefit		55,900
Less		
- Hired Labor	1,800	
- Family Labor	5,600	
- Interest	<u>4,700</u>	<u>12,100</u>
Net Farm Benefits		43,800
Project Charges:		
- Operation & Maintenance	1,644	
- Repayment of Development Credit	<u>4,692</u>	<u>6,336</u>
Net Farm Income		<u>37,464</u>
Estimated Present Income		<u>10,000</u>
Incremental Net Income		<u>27,464</u>

- ^{1/} Gross Value of Production
^{2/} Production Costs, excluding labor costs
^{3/} Estimate based on maize & sesame (double cropping)

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

30 ha Farm Budget

<u>Crop</u>	<u>Area</u> (ha)	<u>Yield</u> (ton/ha)	<u>Price</u> (Col.\$/ton)	<u>GVP</u> ^{1/} -----	<u>Inputs</u> ^{2/} (Col.\$/ha)-----	<u>Gross Benefit</u> ----- (Total Col.\$)	
Cotton	20	2.2	10,200	22,400	12,900	9,500	190,000
Maize	(7)	3.2	3,200	10,200	5,500	4,700	32,900
Sorghum	(5)	3.2	2,900	9,300	5,000	4,300	21,500
Soybeans	10	1.7	5,400	9,200	4,900	4,300	43,000
TOTAL	30						287,400

CROPPED AREA: 42 Cropping Intensity: 140%

	<u>Col.\$</u>	<u>Col.\$</u>
Gross Farm Benefit		287,400
Less:		
- Hired Labor ^{3/}	33,400	
- Family Labor ^{3/}	-	
- Interest	<u>25,900</u>	<u>59,300</u>
Net Farm Benefits		228,100
Project Charges		
- Operation & Maintenance	8,220	
- Investment Recovery (100%)	<u>37,400</u>	<u>45,620</u>
Net Farm Income		182,480
Estimated Present Income		<u>80,000</u>
Incremental		
Incremental Net Income		102,480

- ^{1/} Gross value of production
^{2/} Production costs, excluding labor costs
^{3/} Family labor in management

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CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

130 ha Farm Budget

<u>Crop</u>	<u>Area</u> (ha)	<u>Yield</u> (ton/ha)	<u>Price</u> (Col.\$/ton)	<u>GVP</u> ^{1/} -----	<u>Inputs</u> ^{2/} (Col.\$/ha)-----	<u>Gross Benefit</u> (Total Col.\$)
Cotton	67	2.2	10,200	22,400	12,900	9,500
Maize	(21)	3.2	3,200	10,200	5,500	4,700
Sorghum	(17)	3.2	2,900	9,300	5,000	4,300
Soybeans	28	1.7	5,400	9,200	4,900	4,300
Sesame	7	0.7	9,500	6,700	3,000	3,700
Subsistence Crops ^{3/}	5			18,600	9,800	8,800
Pasture	<u>23</u>			<u>3,000</u>	<u>1,000</u>	<u>2,000</u>
TOTAL	130					1,044,600
CROPPED AREA	168					Cropping Intensity: 129%
					<u>Col.\$</u>	<u>Col.\$</u>
Gross Farm Benefit						1,044,600
Less:						
- Hired Labor					97,800	
- Family Labor					29,300	
- Interest					90,600	
Net Farm Benefits						<u>217,700</u>
Project Charges						
- Operation & Maintenance					35,620	
- Repayment of Development Credit					<u>101,660</u>	<u>137,280</u>
Net Farm Income						689,620
Estimated Present Income						87,000
Incremental Net Income						602,620

- ^{1/} Gross Value of Production
^{2/} Production costs, excluding labor costs
^{3/} Estimate based on maize and sesame (double cropping)

April 1975

COLOMBIA

CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

150 ha Farm Budget

<u>Crop</u>	<u>Area</u> (ha)	<u>Yield</u> (ton/ha)	<u>Price</u> (Col.\$/ton)	<u>GVP</u> ^{1/} ----- (Col.\$/ha)	<u>Inputs</u> ^{2/} ----- (Col.\$/ha)	<u>Gross Benefit</u> (Total Col.\$)	
Cotton	22	2.2	10,200	22,400	12,900	9,500	209,000
Maize	(7)	3.2	3,200	10,200	5,500	4,700	32,900
Soybeans	5	1.7	5,400	9,200	4,900	4,300	21,500
Subsistence Crops ^{3/}	5			18,600	9,800	8,800	44,000
Pasture	<u>118</u>			3,900	2,200	1,700	<u>200,600</u>
TOTAL	150						508,000
CROPPED AREA	157			Cropping Intensity: 105%	Col.\$		Col.\$
Gross Farm Benefit							508,000
Less:							
- Hired Labor					4,500		
- Family Labor					48,400		
- Interest					45,900		
							98,800
Net Farm Benefits							<u>409,200</u>
Project Charges:							
- Operation and Maintenance					41,100		
- Repayment of Development Credit					<u>226,350</u>		<u>267,450</u>
Net Farm Income							<u>141,750</u>
Estimated Present Income -- None (new)							
Incremental Net Income							141,750

-
- 1/ Gross Value of Production
2/ Production costs, excluding labor costs
3/ Estimate based on maize and sesame (double cropping)

COLOMBIA

CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Markets, Marketing and Prices

A. Markets

1. The project would reduce output of beef and increase output of other crops, including cotton, maize, sorghum, sesame and soybeans. As may be seen in the last column of Table 1, which relates the estimated production at full development to the 1985 projected national demand, none of these commodities appears to face a market constraint. The table also compares the projected 1985 national demand production which indicates production deficits in all the products, except sesame, for which the projections show marginal surpluses. However, considering that a general shortage of oils and oilseeds is expected and that sesame is a substitute for oilseeds, apparently no surpluses of sesame would actually occur. In cotton fibers, the shortage reflects an inability to meet the forecasted external demand (some 117,000 tons in 1985), but cotton fibers would continue to be an important export commodity. Beef is also primarily an export commodity and projected to continue as such. For all the other commodities, the projected demand deals only with the domestic market, and as a result, the deficits imply imports in the future. Consequently, the project's production, except cotton fibers and beef, should be regarded as import substitutes and, as such, it is more economically advantageous.

B. Marketing

General

2. At present, the marketing systems in the project area are sufficiently developed. The road networks within the project area and the highways to the relevant outlets for the project's products are at a satisfactory level. The national marketing organizations are active in the area, and the basic infrastructure, including grain storage, ginneries and processing factories, meet actual needs, except for soybeans for which there are no processing facilities in the project area. It is expected that the incremental production of the project would be handled easily, considering the existing or potential capacity of public and private enterprises operating in the area. However, more attention would be given to the marketing of products grown by small farmers and improvements would be made in the organization of the marketing channel for grains.

3. Cotton. Seed cotton is delivered at the farmers' expense to the ginnery owned by the Instituto Mercadeo Agropecuario (IDEMA), the national marketing agency. The farmer, however, is not involved in any business transaction with the ginnery since he deals only with one of the two cotton producers' federations, 1/ which, in turn, deals with IDEMA and carries out the further marketing of the processed material. The export of fibers is handled directly by the federations, and domestic sales of fibers to the textile industry are made through DIAGONAL, 2/ a private company. Seeds are sold by the federations to GRASAS S.A., or transported to Cartagena where the federation operates its own oil extraction facilities. The federations also take care of input supply, credit, extension and organizing services for air spraying.

4. Maize. Some 70% of the maize production in the area is sold at the field, either to wholesalers or to intermediaries, who carry out the further marketing, mostly for direct human consumption in the region or for the processing industries in Medellin. IDEMA also buys about 20% of the regional production, according to its official policy. The purchasing is done at IDEMA's facilities to which the farmer delivers his product. The balance of maize production, some 10%, is sold by the Cooperativa Agropecuaria del Sinu para. 13). The cooperative is involved in handling sales and transportation arrangements for its members.

5. Sorghum. The outlet of sorghum is the concentrate industries, mainly PURINA, a private company which operates plants in Cartagena and Medellin. Part of the production is sold through IDEMA or the cooperative to the industries. Transportation from the farm is provided by trucking companies or intermediaries if the farmers are dealing independently with them, or it is organized by the cooperative if the farmer is selling through that channel.

6. Grains. In the case of the grains, small farmers suffer from inadequate credit and the disadvantages associated with having only small quantities to market. Intermediaries and wholesalers take further advantage of the situation by offering low prices for the crops or short-term credit at a 10% monthly rate of interest, one or two months before harvesting. This practice, however, would be eliminated by the cooperative becoming more actively involved in marketing operations, including supplying marketing credit and organizing efficient sales, collections and transportation services for small farmers.

7. Oilseeds. At the present time, the production of soybeans and sesame in the area is marginal. Small quantities of sesame are bought for processing by GRASAS, S.A., but with the projected increase in the production of soybeans, which are now transported to Buga in the Cauca Valley near Cali, new processing facilities would be established in the area.

1/ Federacion Nacional de Algodoneros (National Federation of Cotton Growers) and CORAL, a coastal federation.

2/ Distribuidora de Algodon Nacional.

8. Livestock. Approximately two-thirds of cattle produced in the Cordoba area are hauled to the Medellin cattle market where they are sold for local consumption or shipped to other consumption centers, mainly in the Cauca Valley. Some 30% are trucked to Barranquilla and sold to INTEGRAL, an export slaughterhouse. The balance is bought by butchers and consumed locally. Cattle are sold at the farmgate only if they are bought by local butchers or if the lot of cattle to be sold is too small for hiring a truck. Otherwise the sale price is fixed on the cattle market in Medellin or Baranquilla and the truckers work on a commission basis.

9. Milk. All the additional milk expected to be produced by the project would be for on-farm consumption and not enter commercial channels.

10. Ginneries. There are two cotton ginneries in the project area (Mocari and Cerete), with a total capacity of about 480 tons per day, working three shifts. Since this is hardly sufficient to meet present requirements, it would be increased in line with incremental regional production.

11. Grain Storage. The main storage installations in the area are operated by IDEMA. Total storage volume is 32,000 tons, 21,000 tons of which is in silos. These facilities, which serve the regional storage requirements for maize, sorghum and rice, are not fully utilized. There are also storehouses and storage facilities on a smaller scale in the region.

12. Oilseed Processing. The GRASAS, S.A. processing plant at Cerete, with a capacity of 120 tons a day, is equipped to process cotton seeds and sesame only. Therefore, to justify modifications to enable it to also handle soybeans, a minimal annual supply of 12,000 tons of oilseed, including cotton seed, would be required. However, because the cotton federations prefer to keep on processing the cotton seeds in their own plant in Cartagena, the greatest part of the supply would be soybeans. Thus, expansion of the existing plant to handle the additional production of soybeans from about 6,000 ha would be carried out (Annex 7).

13. The Cooperative. The Cooperativa Agropecuaria del Sinu (COAGROSINU) is affiliated with the Central de Cooperativas Agropecuarias (CECORA), a federation of cooperatives organized under the general management of INCORA for settlers. There are 925 members in the Cordoba 2 area and they use the services of the cooperative primarily to market their crops and to obtain supplies of farm inputs. Marketing operations in 1973 included some 750 tons of maize, 900 tons of sorghum, 200 tons of sesame and 2,700 tons of rice (mainly from the irrigated areas of Cordoba 1) for a total value of about Col\$ 11 million. The cooperative operates closely with the existing INCORA project management and it is expected that with the project it would participate more actively in the marketing operations, especially in the essential area of marketing services to small farmers.

C. Prices

Prices for the Economic Analysis

14. All production from the project would be either for export or import substitute commodities. Projections of the international commodity prices, furnished by the Economics Department of the Bank, were used as the basis for the calculation of the farmgate prices for the project. After calculating the equivalent FOB or CIF prices, allowances were made for local port expenses, transportation costs and processing costs in order to arrive at the economic farmgate prices.

Prices for Financial Analysis

15. Farmgate prices in Colombia are influenced by Government policies such as minimum support prices, export subsidies, and import and export controls. For this reason, international prices cannot serve as a basis for farmgate price calculations to estimate the net farm income. Under the assumption that basic Government policies are not going to be changed drastically in the future, actual farmgate prices were used for all products except cotton. The world market price was used for cotton fibers since the differential between domestic and export prices, whereby domestic prices were maintained at a lower level in the past, would be eliminated by 1975 and the same price would apply to both markets. Economic and financial farmgate prices are presented in Table 2.

COLOMBIA

CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Comparison of the Estimated Current National Production,
Projected Demand and Supply and the Project's Production

	Estimated National Production <u>1974</u> ^{1/}	Projected National Production <u>1985</u> ^{2/}	Projected National Demand <u>1985</u> ^{2/}	Projected National Surpluses or Deficiencies <u>1985</u> ^{3/}	Cordoba 2 Production at Full Development	Cordoba 2 Production as a Percentage of the Projected National Demand 1985
	----- '000 metric tons -----					<u>%</u>
Cotton (fibers)	105	205	238 ^{4/}	(33)	15.4	6.5
Cotton (seeds)	253	346	408	(62)	26.0	6.4
Corn	806	913	1,296	(383)	22.4	1.2
Sorghum	411	543	591	(48)	14.4	2.4
Soybeans	133	195	216	(21)	14.4	6.7
Sesame	36	43 ^{5/}	41 ^{5/}	2	0.9	2.2
Beef (Carcass)	586 ^{6/}	1,000 ^{6/}	925 ^{6/} ^{7/}	75 ^{6/}	12.1	1.3

^{1/} Source: Programas Agricolas 1974, Ministerio de Agricultura.

^{2/} Source: INCORA (the feasibility study).

^{3/} The difference between the national production and demand in 1985.

^{4/} Including export demand of 117,000.

^{5/} Mission estimation.

^{6/} Mission estimation based on information from USAID, and DANE.

^{7/} Including export demand.

COLOMBIA

CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Producer's Prices^{1/}

	<u>Economic Analysis</u> ^{2/}							<u>Financial Analysis</u> ^{3/}
	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1985</u>	
	Col\$/metric ton							
Cotton	13,000	14,000	11,400	11,550	11,600	11,900	12,150	10,200
Maize	4,300	4,200	4,100	3,950	3,850	3,700	3,800	3,200
Sorghum	4,200	4,000	3,900	3,750	3,600	3,450	3,500	2,900
Soybeans	5,100	5,100	5,200	5,450	5,750	6,100	6,600	5,400
Sesame	10,300	9,500	8,900	9,200	9,800	9,900	11,300	9,500
Beef ^{4/}	5,550	5,450	5,400	5,500	5,650	5,800	6,450	4,000

^{1/} At the first destination gate (factory, storage facilities, etc.)

^{2/} Producer's prices for the economic analysis were calculated on the basis of the forecasted international prices in 1974 constant terms which were furnished by the Commodities and Export Projections Division.

^{3/} Prices based on actual prices in 1972, 1973 and the beginning of 1974.

^{4/} Price of 24-36 month steer at the farm-gate.

April 1975

COLOMBIA

CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Economic Analysis

1. The rates of return from the project to the economy has been calculated on the following assumptions:

(a) Time Base. All prices and costs are in 1974 constant terms.

(b) Agricultural Output Prices. All the project products are regarded as either export or import substitute commodities. After calculating the equivalent FOB or CIF prices based on projections of the international commodity prices, allowances were made for local processing, marketing and transportation costs in order to arrive at the economic farmgate prices.

(c) Exchange Rate. In view of the present negative balance of payment situation which is expected to continue in the foreseeable future as well as the Government policy to subsidize exports and to impose controls combined with high taxes on imports, which results in an effective exchange rate higher than the official one, it was decided to use a shadow exchange rate 15% higher than the official rate. This adjustment offsets the existing export subsidy and is considered conservative. Consequently, an exchange rate of Col\$ 28.75 instead of Col\$ 25.3 (the prevailing rate at the time the project was appraised) per US\$ has been used to convert foreign currency into local currency equivalent in the computation of costs and benefits for the purpose of the economic analysis.

(d) Labor Costs. Considerable unemployment exists in the Colombian rural sector. This situation is especially serious in the Cordoba 2 area and is not expected to change very much in the future. Consequently, a shadow price of Col\$ 15 per day, in comparison to the official minimum salary of Col\$ 25 per day, has been used in the computation of the agricultural labor costs in the economic analysis.

(e) Development Schedule. Physical construction would be completed in five years. Agricultural benefits would start to accrue one year after the beginning of the construction due to the improvement of extension and other agricultural services. Full development would be reached by the 10th year after the beginning of construction due to the combined effect of the physical works and the improved agricultural services.

(f) Project Costs. The investment and their timings are as shown in Annexes 5 and 6. To obtain the economic investment cost, the items of agricultural machinery, social infrastructure and price contingencies have been excluded. However, agricultural machinery costs are implicitly included in the

farm production costs. The shadow exchange rate has been used to convert the foreign component of project costs into local currency. Incremental operational and maintenance costs corresponding to the developed and rehabilitated areas have been included in the calculations.

(g) Project Life. In the economic analysis the project life has been taken as 40 years.

(h) Project Benefits. These have been calculated considering the economic farmgate prices, shadow exchange rate, labor costs, and the development schedule mentioned above. Project economic benefits are assessed as the increments over the benefits obtainable without the project. Only direct benefits and their corresponding costs were considered.

Economic Rate of Return and Sensitivity Analysis

2. Calculated on the basis of the assumptions detailed in paragraph 1, the economic rate of return is estimated to be 27%. The cost and benefit streams involved in the calculation are shown in Table 1.

3. To test the sensitivity of these results to variations in the basic assumptions, the following tests were made:

<u>Assumption</u>	<u>Rate of Return</u>
(a) Construction period extended by one year, investment costs increased by 10% and full development reached one year later	23%
(b) Benefits decreased by 25%	17%
(c) Benefits increased by 25%	45%
(d) Combined (a) and (b)	15%

4. These tests indicate that, within a reasonable range of circumstances, the risk of not achieving an acceptable rate of return for the proposed project is low. Assumptions (b) and (d) are unlikely to happen since the estimated costs and price assumptions are conservative.

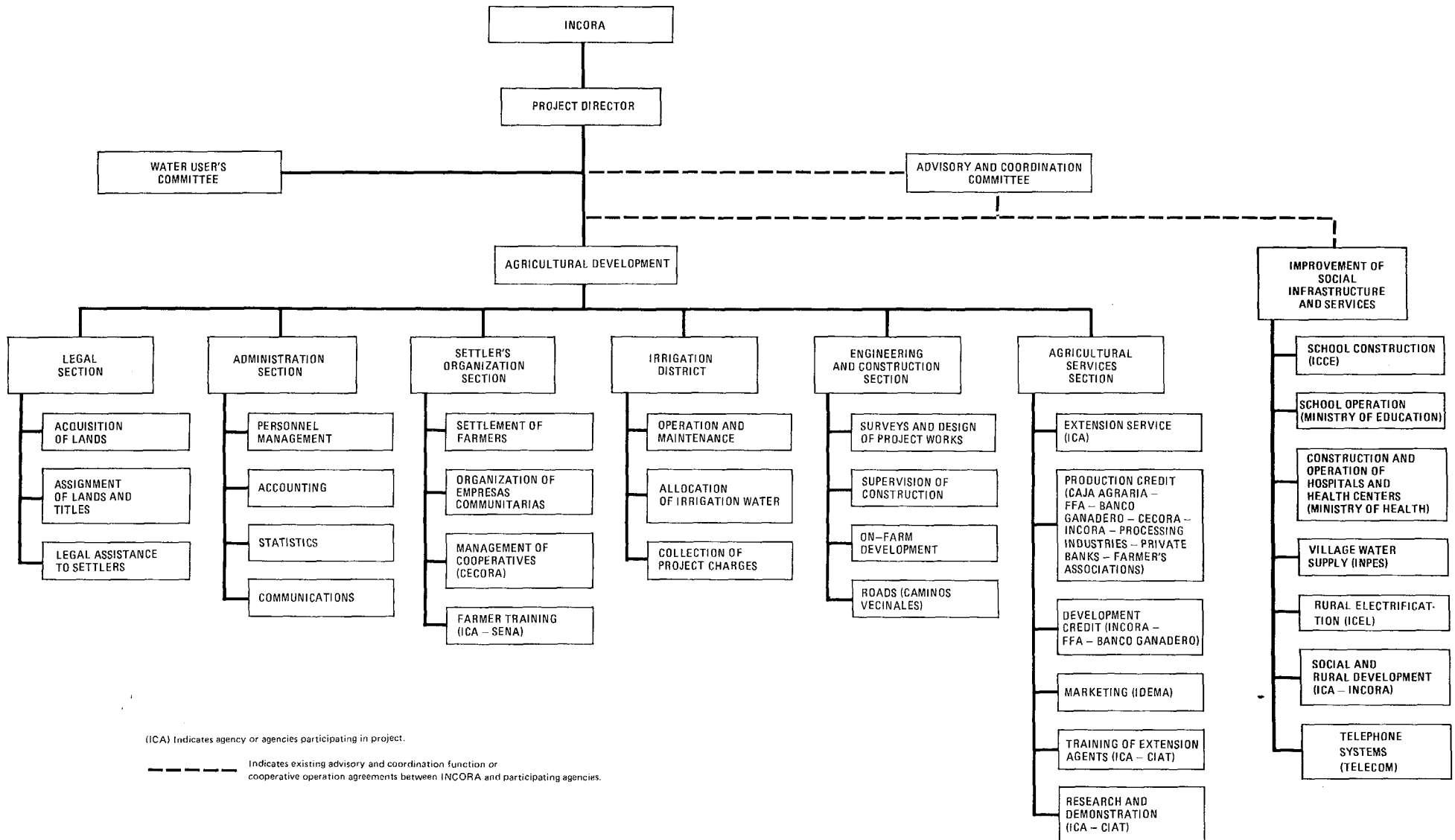
COLOMBIA

CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT

Cost and Benefit Streams
(Col\$ million)

	1	2	3	4	5	6	7	8	9	10	11	12-40
	-----Project Years-----											
<u>Without Project</u>												
O & M Costs	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Production												
Net Value	117.0	132.8	95.3	100.4	103.7	111.5	116.6	120.0	124.6	126.8	126.8	126.8
<u>With Project</u>												
Investments	43.7	125.2	125.5	130.0	72.4	17.5	-	-	-	-	-	-
Agric. Devp't												
Credit	16.2	29.3	29.6	18.6	20.1	-	-	-	-	-	-	-
O & M Costs	4.4	5.0	7.8	8.1	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9
Production												
Net Value	114.6	169.7	147.2	190.8	194.9	236.4	275.9	314.1	352.5	393.6	394.3	394.4
Incremental Stream	(65.9)	(121.8)	(110.2)	(65.5)	(11.4)	97.3	149.2	184.0	217.8	256.7	257.4	257.5

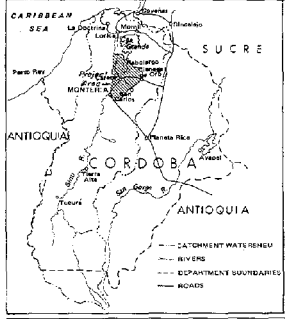
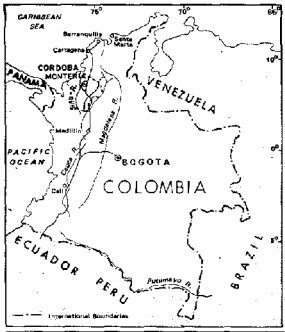
COLOMBIA
CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT
PROPOSED PROJECT ORGANIZATION



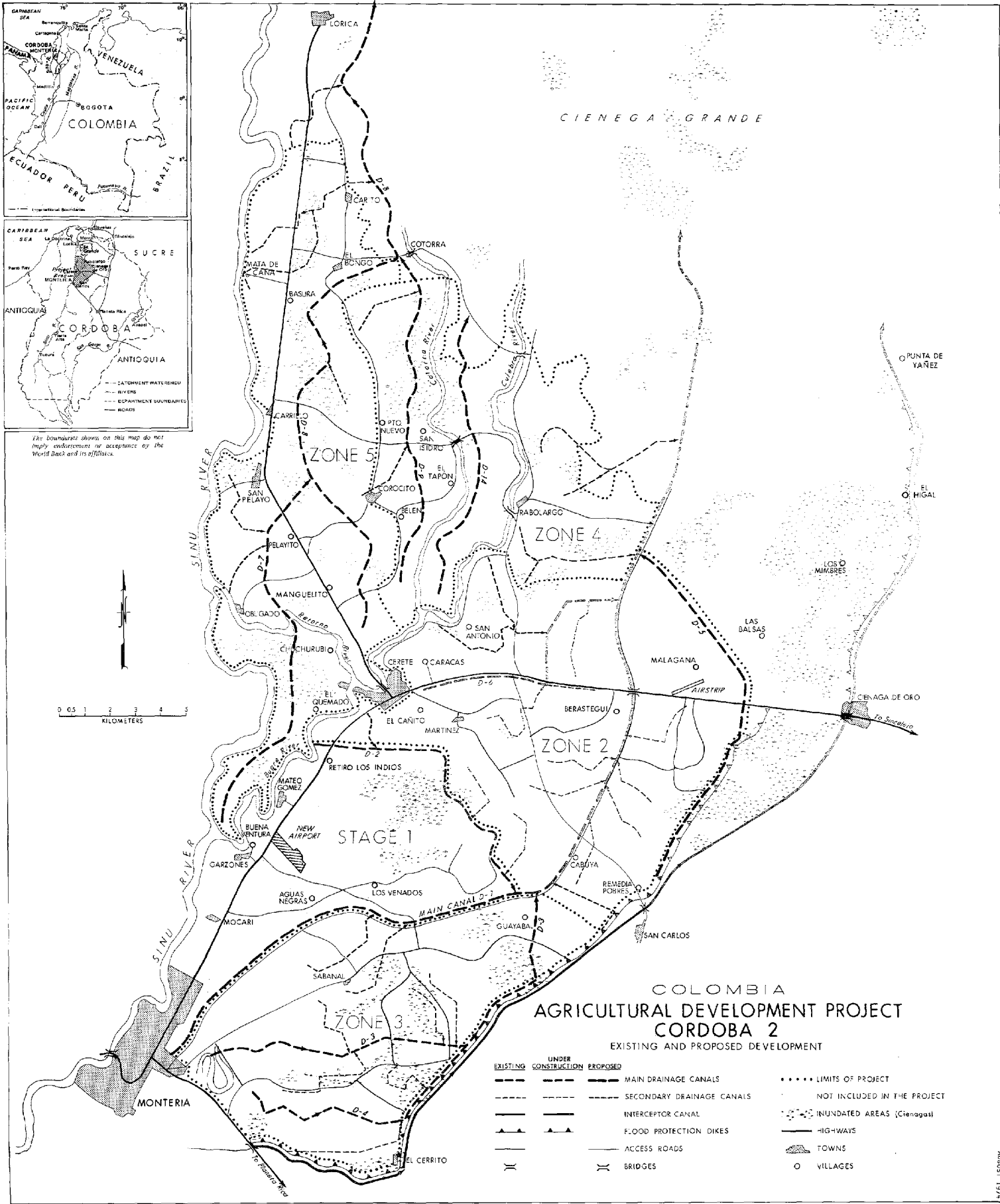
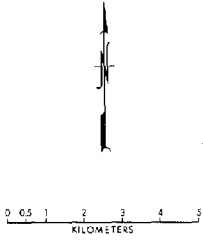
(ICA) Indicates agency or agencies participating in project.
 - - - - - Indicates existing advisory and coordination function or cooperative operation agreements between INCORA and participating agencies.

COLOMBIA
CORDOBA 2 AGRICULTURAL DEVELOPMENT PROJECT
CONSTRUCTION AND DEVELOPMENT SCHEDULE

	ITEM OF WORK	ZONE	CALENDAR YEAR				
			1976	1977	1978	1979	1980
Project Works	Primary Drainage Systems	2	██████████	██████████			
		3					
		4		██████████	██████████		
		5			██████████	██████████	██████████
	Secondary Drainage Systems	2	██████████	██████████	██████████		
		3		██████████	██████████		
		4			██████████	██████████	
		5				██████████	██████████
	Collector Canal and Dike	3	██████████	██████████	██████████		
	Roads – Type A	2	██████████	██████████			
		3		██████████	██████████		
		4		██████████	██████████		
5				██████████	██████████		
Roads – Type B	2		██████████	██████████	██████████		
	3		██████████	██████████	██████████		
	4			██████████	██████████	██████████	
	5				██████████	██████████	
On-Farm Development	2		██████████	██████████	██████████	██████████	
	3			██████████	██████████	██████████	
	4			██████████	██████████	██████████	
	5				██████████	██████████	
Fences and Structures	All		██████████	██████████	██████████	██████████	
Improvement of Social Infrastructure	All		██████████	██████████	██████████	██████████	
Services	Engineering and Supervision	All	██████████	██████████	██████████	██████████	
	Consultant Services	All		██████████	██████████	██████████	
	Extension Services	All	██████████	██████████	██████████	██████████	
	Agricultural Credit	All		██████████	██████████	██████████	



The boundaries shown on this map do not imply endorsement or acceptance by the World Bank and its affiliates.



COLOMBIA
 AGRICULTURAL DEVELOPMENT PROJECT
 CORDOBA 2
 EXISTING AND PROPOSED DEVELOPMENT

EXISTING	UNDER CONSTRUCTION	PROPOSED	
			MAIN DRAINAGE CANALS
			SECONDARY DRAINAGE CANALS
			INTERCEPTOR CANAL
			FLOOD PROTECTION DIKES
			ACCESS ROADS
			BRIDGES
			LIMITS OF PROJECT
			NOT INCLUDED IN THE PROJECT
			INUNDATED AREAS (Cienegast)
			HIGHWAYS
			TOWNS
			VILLAGES