

SUPPORTING REPORT [C]
AGRICULTURAL ECONOMY
AND
PROJECT EVALUATION

ANNEX C: AGRICULTURAL ECONOMY AND PROJECT EVALUATION

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C Agricultural Economy

1 National Situation

1.1 Agricultural Administration and Policy

1.1.1 Administration

The Constitution of the Republic of El Salvador came into effect on 20 December 1983. It provides for a republican, democratic and representative form of government, composed of three Powers - Legislative, Executive, and Judicial - which are to operate independently. Voting is a right and duty of all citizens over 19 years of age.

Executive power is held by the President, assisted by the Vice President and the Council of Ministers. The President is selected for a five-year term by universal adult suffrage. Legislative power is vested on Asamblea Nacional - National Assembly - with 84 members elected by universal adult suffrage for a three-year term.

In March and April 1994 presidential, legislative and municipal elections were held. The Alianza Republicana Nacionalista (ARENA) party retained the presidency, and won effective control of the legislative assembly and the vast majority of municipalities. The Frente Farabundo Martí para la Liberación Nacional (FMLN) party came second in both the presidential race and the assembly, but made a poor showing in the municipal elections.

The Ministerio de Agricultura y Ganadería (MAG) is the top responsible institution for agricultural policies. The principal areas of activities are as follows:

- Planning and evaluation of policies
- Investigation, training and extension of technologies related to agriculture, forestry and fishery
- Preparation and dissemination of statistics on agriculture, forestry and fishery
- Regulation of plant and animal health
- Conservation of the environment and natural resources

MAG has a five-level institutional structure (Figure C.1.1): ① the policy decision level which includes the Minister, the Vice-Minister, COAS and CTA, ② the policy advisor level which includes OSPA, OAPA, OAJ and OAI, ③ the support level for policy implementation which covers OGA, OCP and OGDC, ④ the centralized service level which includes DGEA, DGSA, DGRNR and CENDEPESCA, and ⑤ the decentralized service level which covers ENA, CENTA, ISTA, FINATA, BDT and BFA.

The full names of each institution are as follows:

COAS CONSEJO CONSULTIVO AGRARIO SECTORIAL

CTA	(Consultative Council of Agricultural Sector) CONSEJO TÉCNICO ASESOR (Council of Technical Advice)
OSPA	OFICINA SECTORIAL DE PLANIFICACIÓN AGRARIA (Sector Office of Agricultural Planning)
OAPA	UNIDAD DE ANÁLISIS DE POLÍTICAS AGRARIAS (Agricultural Policy Analysis Unit)
OAJ	OFICINA DE ASESORÍA JURÍDICA (Office of Legal Advice)
OAI	OFICINA DE AUDITORIA INTERNA (Office of Internal Audit)
OGA	OFICINA DE GENERAL DE ADMINISTRACIÓN (General Office of Administration)
OCP	OFICINA COORDINADORA DE PROYECTOS (Office of Project Coordination)
OGDC	OFICINA GENERAL DE COMUNICACIONES (General Office of Communications)
DGEA	DIRECCIÓN GENERAL DE ECONOMÍA AGRARIA (General Direction of Agricultural Economy)
DGSVA	DIRECCIÓN GENERAL DE SANIDAD VEGETAL Y ANIMAL (General Direction of Vegetal and Animal Health)
CENDEPESCA	DIRECCIÓN GENERAL DE DESARROLLO PESQUERO (General Direction of Fishery Development)
DGRNR	DIRECCIÓN GENERAL DE RECURSOS NATURALES RENOVABLES (General Direction of Renewable Natural Resources)
ENA	ESCUELA NACIONAL DE AGRICULTURA (National Agricultural School)
CENTA FORESTAL	CENTRO NACIONAL DE TECNOLOGÍA AGROPECUARIA Y (National Center of Agriculture, Stock breeding and Forestry Technology)
ISTA	INSTITUTO SALVADOREÑO DE TRANSFORMACIÓN AGRARIA (Institute of Agricultural Transformation in El Salvador)
FINATA	FINANCIERA NACIONAL DE TIERRAS AGRÍCOLAS (National Finance of Agricultural Lands)
BDT	BANCO DE TIERRAS (Bank of Agricultural Lands)
BFA	BANCO DE FOMENTO AGROPECUARIO (Bank of Promotion of Agriculture and Stock Breeding)

DGRNR is the executing organization of this development survey project. The objectives of DGRNR are to standardize, regulate and direct the conservation, restoration and sustainable development of the national renewable natural resources. The general functions of the organization are as follows:

- To observe the fulfillment of the legal framework and the execution of policies that regulate and direct the conservation and development of renewable natural resources.

- To design and implement the plans, programs and projects that contribute to the sustainable development of renewable natural resources and permit the rehabilitation, adjustment and integrated management of national hydrologic concerns.
- To set up and conserve selected protection areas, to guarantee the permanence and conservation of biological diversity.
- To prepare and diffuse information on renewable natural resources, meteorology and hydrology, in order to support development in relevant fields and agricultural economic activities.
- To promote the execution of programs and projects for the integral and rational use of resources, e.g., water, soil, fauna and flora.
- To direct irrigation and drainage techniques that permit the optimum utilization of renewable natural resources.

1.1.2 Agricultural Policy

The economic and social development plan (1994-1999) is a combination of sectorial national development programs drawn up by each ministry. The plan stipulates that agricultural expansion is the foundation block of rural development. It is the basis for productive and sustainable growth and reduction of rural poverty, and supports the development of other economic sectors.

The long-term objective of the plan is agricultural technical revolution, that is the transformation from a traditional to a dynamic, diversified and modern agriculture, to establish a more globally competitive market.

The objectives of the agricultural sector for 1994 - 1999 are as follows:

- (1) To consolidate the foundations needed for crop diversification and a new agricultural production structure, by introducing profitable and environmentally friendly alternative production systems to improve productivity.
- (2) To reduce rural poverty through improved productivity, employment and income.
- (3) To strengthen the institutional and legal framework of the agricultural public sector.
- (4) To expand irrigated agricultural areas and improve the management of water and soil resources.
- (5) To strengthen the land tenure system and guarantee the legitimacy of the contract to encourage investments in the sector.
- (6) To consider a feasible rural credit system especially beneficial to small scale farmers.

- (7) To help sustain agricultural development with the conservation and protection of natural resources, as well as pursue an agriculture that is free from organic and chemical contamination.

The specific goals of the agricultural development plan (1994-1999) were set as follows:

- To provide technology transfer to 192,000 small and medium scale farmers through the conduct of the EDO program, and to train 25,000 land owners in soil conservation practices.
- To incorporate 76 extension agencies into the EDO program.
- To increase the number of extension agents from 220 in 1994 to 640 in 1999.
- To transfer 3 irrigation districts under the jurisdiction of private irrigation groups.
- To build 12.2 km of drainage and 35.5 km of embankments in the lower basin of Rio Grande de San Miguel, to protect 39,720 ha from flood.
- To implement diverse irrigation projects that would cover 7,235 ha.
- To incorporate 55,000 ha into the sustainable agricultural development program, and to set up 1,000 demonstration plots for the benefit of 18,500 farmers in the Paracentral zone and the Chalatenango Department.
- To additionally incorporate 100,000 ha into the soil conservation, agro-forestry and reforestation programs.
- To eliminate 100 % of quarantined plant and animal diseases, and to detect 100 % of plant and animal products that are introduced into the country and are hazardous to human health.

MAG has three main programs for river basin management during the 1994-1999 period. They are the consolidation project of the Grande River basin in San Miguel, the agricultural development project of lower basin of the Lempa River, and this project.

This project aims to control flooding, deforestation and soil erosion for the conservation of natural resources, and to develop the agricultural structure in the basin to improve productivity and rural standard of living. Thus, it is in accord with the objectives of the development plan of El Salvador.

1.1.3. Economic Policy

In 1989, the Alfredo Cristiani Administration was established. This administration embarked on a new set of structural adjustment policies proposed by the World Bank and IMF. Structural adjustment was the basic concept for the structural adjustment lending (SAL) program proposed by the World Bank in the 1980s to solve the balance of payments problems in developing countries. Structural adjustment asserts that the distribution of resources for development must

depend on the functions of the market, which should be free of government interference and not distorted by an imperfect economic structure.

The structural adjustment policies were basically focused on macro-economic demand stabilization and improvement of economic growth, mainly through curtailment of fiscal and financial budgets, mitigation of restrictions in trade and finance, liberalization of capital dealings, and the privatization and decentralization of the public sector.

Because the structural adjustment policies of the Cristiani Administration were implemented in the period of civil war, it was difficult to deploy the policies in the national level.

After the end of civil war in 1992, the government pursued the implementation of the 1992 peace accord along with economic reconstruction and social stabilization. This involved FMLN reintegration, civilian control, infrastructure reconstruction, economic recovery, reduction of absolute poverty, and promotion of human welfare.

The structural adjustment policies and the peace accord both aim for economic reconstruction and stabilization, with the former emphasizing stability in economic growth and the latter public peace.

After the presidential election in 1994, the Armando Calderón Sol Administration was established. This administration adopted basically the same policies, but attached more importance to structural adjustment policies. Accepting the plan proposed by Finance Minister, Manuel Enrique Hinds, the administration announced a four-point development strategy in January 1995.

Hinds proposed ① rapid trade liberalization, ② modernization of the state through privatization of utilities and the conduct of reforms in public administration, ③ reduction of the fiscal deficit by increasing value-added taxes (VAT) and improving tax collection, and ④ a stable exchange rate (c 8.75 : \$ 1) backed by a currency board. The exchange rate plan was later replaced by a proposal to "dollarise" the economy by replacing the colon with the El Salvador dollar.

Dollarisation, however, encourages rapid expansion in private credit and luxury imports. Given the big interest rate differential with the USA, commercial banks took advantage of the liberalization in capital flow to borrow abroad. The banks encouraged their clients at home to take out fresh loans to finance consumption, particularly of luxuries imported from abroad. As a result the trade deficit surged. The increase in VAT from 10 % to 13 % in July sparked off higher inflation, but did little to reduce consumption growth. As a result, dollarisation has become only a distant goal.

The trade liberalization plan aims to reduce the tariff floor to 1 % in 1996 and the ceiling to 6 % by 1999. Under the plan, the authorities began tariff reductions in April 1995, cutting duties on imports of capital goods from 5 % to 1 %. The plan entails a 20% to 15% cut in tariffs on imported consumer goods between July 31 and November 30 1996, a 15% to 10% reduction in tariffs on imported intermediate goods over the same period, a 5% to zero cut in tariffs on raw material imports, and the further reduction in tariffs on imported capital goods from 1 % to zero on July 31.

The government's implementation of this plan was faced with mounting domestic criticism. The plan has proved unacceptable to many businessmen and producers, particularly to local businessmen, as long as there are no special policies that would help domestic producers become more competitive. The dispute between the private sector and the economic cabinet is continuing and affecting the government's ability to implement its policies.

In mid- February 1996 the Banco Central de Reserva (BCR, the national central bank) made public its monetary and financial program for 1996. Its goals confirm previous indications that authorities would sacrifice growth this year in order to achieve monetary stability and avoid a devaluation of the quasi-fixed exchange rate.

The BCR aim to achieve:

- 5 % GDP growth, compared with an estimated 6 % in 1995;
- inflation of 7-9 %, compared with 11.5 % in 1995, as the broad money supply expands by 13.4 %, compared with an estimated 14.4 % last year;
- a stable exchange rate, effectively fixed at c 8.76 : \$ 1;
- an increase in public-sector current savings to 3.6 % of GDP, from an estimated 3.1 % of GDP in 1995;
- an increase in public investment, pushing the public-sector deficit up from 0.2 % of GDP in 1995 to 0.9 % of GDP this year;
- a stronger and more competitive financial system;
- private-sector credit growth of 19 %, compared with 32 % in 1995, accompanied by public-sector credit contraction of 37 %.
- net international reserves of \$ 1.05 billion in December, compared with \$ 935 million at the end of 1995; and
- progress in public-sector modernization and privatization.

1.1.4 Development Assistance

Many projects were worked over and planned in the period of civil war, but any form of international cooperation was not implemented because donors were anxious about the effects of civil war. The amount of external assistance has increased after the peace accord in 1992.

According to the data provided by donors to UNDP, El Salvador officially received a total of US\$ 4,099,167,832 in external assistance from 1992 to 1996 (Table C.1.1). The amount received in 1993 for economic recovery and infrastructure reconstruction after the civil war, was said to be the highest. Figures in 1995 and 1996 are tentative, because donors could not provide all the relevant data.

45.1 % of the total sum received from 1992 to 1996 was from bilateral assistance, 53.3 % from multilateral assistance, and 1.6 % from NGOs. In the total funds of all period, bilateral cooperation is 39.9 %, multilateral cooperation is 59.3 % and NGO is 0.8 %. USA, Japan, IDB and the World Bank are important sources of foreign assistance to El Salvador.

USA is the largest source of bilateral assistance from 1992 to 1996, covering 63.5 % (US\$ 566 million) of the total bilateral assistance received by El Salvador and 28.6 % of the total amount received by the country in assistance. Japan is the second largest donor, making up 27.2 % (US\$ 243 million) of the bilateral assistance and 12.3 % of the total amount for assistance.

IDB is largest source of multilateral assistance from 1992 to 1996, covering 58.0 % (US\$ 612 million) of the total amount for multilateral assistance and 30.9 % of the total assistance. World Bank is the second largest, making up 17.9 % (US\$ 189 million) and 9.5 %, respectively.

The distribution of bilateral cooperation funds by sector from 1992 to 1996 was as follows: 27.1% for the sector on general development issues (largest sector), 13.1% for the health sector, 8.6% for the human settlements sector, and 6.9% for the transportation sector. Only 1.4% of the funds was allocated for agriculture, forestry and fisheries. The multilateral cooperation funds were distributed as follows: 33.7% for the sector on general development issues (largest sector), 17.9% for the transportation sector, 16.4% for the energy sector. Only 3.4% was appropriated for agriculture, forestry and fisheries. Funds received from NGOs were distributed as follows: 35.2% for the sector on general development issues (largest sector), 17.5% for the sector on social development, 16.4% for the human settlements sector, and 8.0% for agriculture, forestry and fisheries (Table C.1.2).

The sector on general development issues covers infrastructure reconstruction which is the foundation for economic growth and stabilization, an element of the structural adjustment policy.

58.6% of assistance extended to agriculture, forestry and fisheries (Table C.1.3) goes to the supporting services, 23.4% policy formulation and planning, 17.0% crop production and protection, 0.5% fisheries, 0.4% livestock, and 0.1% forestry.

Although the supporting services subsector is indirectly connected to production, it is essential to the efficient and effective operation of systems integral to economic development.

Table C.1.4 shows the official development assistance extended by Japan to El Salvador before the end of 1994. Japan gave a total grant aid of ¥12.402 million and loaned a total of ¥26.059 million. The ODA programs of Japan trained a total of 397 persons. The Japan International Cooperation Agency (JICA) dispatched 46 experts, 86 survey teams and 76 volunteers from JOCV for the conduct of these programs. According to UNDP, Japanese assistance from 1992 to 1995 is estimated to have totaled US\$ 243,000,274 (Table C.1.5).

Japanese assistance is focused on national reconstruction, basic human needs, humanity and environment. The grant aid and loans extended by the Japanese Government were both for the improvement of infrastructure to help the reconstruction policy of El Salvador. Some assistance was also extended for projects relevant to basic human needs, humanity, and environment: the latter provided San Salvador with cars in 1996.

1.2 Socio-Economic Situation

The civil war in El Salvador lasted for 12 years, from 1980 to 1992. It claimed some 75,000 lives, caused social and economic instability, as well as national disintegration. In January of 1992, with the intervention of the United Nations, the civil war ended with the signing of the peace accord at Chapultepec, Mexico.

El Salvador covers a territory of 21,040.2 km². In 1971, the country had a population of 3,554,648 persons, which increased to 5,118,599 in 1992 (Table C.1.6). The population density in 1971 was 169 persons/km², and 243 persons/km² in 1992. The annual population increase rate for 1971-1972 was low at 1.73 % due to massive migration to foreign countries to avoid the risks of civil war. The ratio of urban population to rural population was 90:105 in 1971 and 90:100 in 1992.

The population of San Salvador, the capital city, has been rapidly increasing in recent years. It was estimated at 2,375,744 persons in 1971 and 3,814,014 persons in 1992. El Salvador is the most densely populated country in Central America, with enormous social and political problems.

According to the Inter-American Development Bank (IDB), population growth slowed from an average annual rate of 3.4 % in the 1961-1970 period to 2.3 % in the 1971-1980 period. The civil war has had a considerable effect on the national population, killing over 70,000 people and displacing about a million. The large-scale emigration in the 1980s reduced the population growth rate to 1.5 % in the 1981-1990 period. On the other hand, the World Bank estimates a 2.2% increase in the average annual population growth rate in the 1993-2000 period. ISDEM estimates an average annual population growth rate of 1.73% for the period 1993-2010: a population of 5,871,424 in 2000 and 6,970,018 in 2010 (Table C.1.7).

Although the number of people who migrated abroad during the civil war totaled less than 200,000, at least 1 million El Salvadorans reside and work in the USA, sending money to their families back home. Most of them rely on temporary exemptions from deportation to be able to continue working in the USA. An estimated 160,000 El Salvadorans risk being deported to El Salvador, unless they follow the established procedures to obtain residency permits.

Half of the population live in urban areas and San Salvador has a population of some 1.5 million. About 89 % of the population are mestizos and 10 % are indigenous. In 1992, life expectancy at birth was 65 years, and the infant mortality rate was 46 per 1,000 births.

Literacy rate of the population aged 10 years or older increased from 59.7 % in 1971 to 76.1 % in 1992. It was estimated to be 77 % in 1994. In the same year, only 58 % of the population had access to safe water. The urban-rural divide means that, whereas 78 % of urban dwellers had access to safe water and 60 % to sanitation in 1993, the comparable figures for the rural population were only 16 % and 52 %, respectively.

According to the UNDP, El Salvador ranked second in Central America in per capita GNP in 1991 and 4th in human development index (HDI, 0.543) in 1992 (Table C.1.8). HDI is the new

parameter produced by UNDP to determine social and economic conditions. As a parameter GNP can only indicate economic aspects. HDI is used to determine life expectancy, adult literacy, average number of schooling years, and real per capita GNP based on parity of purchasing power (PPP). 51 % of the population of El Salvador are in absolute poverty, and this ratio ranks the country second in Central America. The country is 75 % rural area, the largest rural area coverage in Central America. Table C.1.8 shows the social condition in El Salvador immediately after the civil war.

Albeit apparent growth in the national economy, social development, especially in the rural area, is sluggish, according to the UNDP report, "Adjustment Toward Peace" (May 1995). The report insists on the necessity of assistance for social stabilization along with the short term guidance in the implementation of the peace accords and the long term conduct of the structural adjustment policies for economic growth.

GDP in recent years was 42,594 million colons in 1991, 49,891 million colons in 1992, 60,523 million colons in 1993, 71,019 million colons in 1994, and 84,011 million colons in 1995 (Table C.1.9). The GNP during these years was respectively 41,449 million colons, 48,940 million colons, 59,472 million colons, 70,113 million colons and 83,172 million colons.

The economy of El Salvador is characterized by huge remittances from abroad and a small domestic savings rate (GDP). The net in remittances from abroad was 5,334 million colons in 1991, 7,564 million colons in 1992, 8,818 million colons in 1993, 11,024 million colons in 1994, and 11,765 million colons in 1995. The domestic savings rate in GNP are 12.9 % in 1991, 15.5 % in 1992, 14.8 % in 1993, 15.7 % in 1994, and 14.1 % in 1995. These figures mainly include remittances of nationals in foreign countries, e.g., USA, and ODA grants. Remittances from abroad are forecast to decrease in the future with the repatriation of some El Salvadorans, or because those who are granted American citizenship get their families to live with them. ODA grants from advanced countries are also forecast to decrease in quantity.

Table C.1.10 shows that the national savings rate in El Salvador was not low during the civil war. However, due to social and economic instability during this period, the domestic savings rate was very low. The same trend prevails at present. The national savings rate in GDP is 11.9 % in 1991, 15.5 % in 1992, 17.1 % in 1993, 18.1 % in 1994, and 16.4 % in 1995 (Table C.1.9). The domestic savings rate in GDP is 2.1 % in 1991, 2.2 % in 1992, 4.5 % in 1993, 15.8 % in 1994, and 3.4 % in 1995. A low domestic savings rate means low domestic investments and difficulties for future economic development.

The GDP growth rate was estimated at 17.1 % in 1992, 21.3 % in 1993, 17.3 % in 1994, and 18.8 % in 1995. The estimated figures are large due to the effect of inflation (about 10%). When the 1990 price rate was used as a constant, the GDP growth rate was calculated at 4.8 % in 1990, 3.6 % in 1991, 7.5 % in 1992, 7.4 % in 1993, 6.0 % in 1994, and 6.1 % in 1995 (Table C.1.11). These figures indicate economic growth after the civil war.

The growth rate of GDP in terms of agricultural contribution is unstable at -0.3 % in 1991, 8.0 % in 1992, -1.4 % in 1993, -2.7 % in 1994, and 5.1 % in 1995. This is attributed to the predominance of rainfed cultivation which is greatly dependent on the climate. The GDP contribution of booming industries, e.g., manufacturing industry, construction, trade and commerce, is very high.

Table C.1.12 shows the per capita GDP. BCR adopts a higher population than the actual 1992 population surveyed. As a result, the per capita GDP calculated by BCR, US\$ 1,615 (1995 price), is smaller than that of the calculation based on the 1992 Census. If a constant price is used to eliminate the effects of inflation, the per capita GDP by BCR for 1995 would result in \$ 943.3. If the calculation by population based on the 1992 Census is to be considered, per capita GDP would be \$ 1,781.7 for 1995 by the current price rate and \$ 1,040.4 by the constant price rate. The use of the current price rate would indicate an adequate growth, defining El Salvador as a middle income country. The results of the calculation using the constant price rate, however, would suggest the need for a bigger economic growth.

The total share of the agricultural, forestry and fisheries sector in GDP has been found to be decreasing from 17.1 % in 1990 to 13.7 % in 1995 (Table C.1.13). Main industries, e.g., manufacturing industry, contribute about 21.2% of the total GDP, while commerce, restaurants and hotels contribute about 20.1%. Although the agricultural, forestry and fisheries industry do not contribute much to the total GDP, they provide about half of the GDP share of the manufacturing and chemical industries in terms of raw materials. The items from 1 to 8 and from 11 to 12 of III in Table C.1.13 belong to the agro-industry, and their respective shares were estimated at 10.1 % in 1990 and 1991, 10.0 % in 1992, 9.5 % in 1993 and 1994, and 9.3 % in 1995. If these are added to the agricultural, forestry and fisheries sector, the share of the sector in GDP would exceed 20 %.

The importance of the agricultural sector was determined based on the comparison between the current price and the constant price in 1962 by UNDP. According to this comparison (Table C.1.14), the share of agriculture in GDP sharply decreased from 35.2 % in 1980 to 19.6 % in 1993 based on the current price rate. Using the 1962 constant price rate, only a small decrease of 0.6 % was detected as a GDP of 36.5 % was calculated for 1980 and 35.9% for 1993. The figures indicate how market price can widely decrease GDP calculated at the current price rate, regardless of insignificant changes in substantial activities.

Agriculture widely contributes to the total export volume. Live animals and by-products made up 3.5 % of the total export volume in 1993, 3.3 % in 1994, and 2.7 % in 1995 (Table C.1.15). Vegetables made up 24.1 % of the total export volume in 1993, 23.3 % in 1994, and 23.2 % in 1995. Foods, beverages and tobaccos made up 8.8 % of the total export volume in 1993, 7.7 % in 1994, and 6.9 % in 1995. These shares totaled 36.4 % in 1993, 34.3 % in 1994, and 32.8 % in 1995. Cotton is also an agricultural product for export, as well as yarn and textile, materials produced from cotton. Conclusively, agricultural related products make up over a third of the exports. Coffee is the most important export, contributing 22.3 % of the total export volume in 1993, 22.0 % in 1994, and 20.3 % in 1995.

In importation, machinery and apparatus contributed 16.0 % of the total import volume in 1993, 15.2 % in 1994 and 15.1 % in 1995 (Table C.1.16). Transportation equipment made up 11.3 % of the total import volume in 1993, 11.1 % in 1994 and 10.9 % in 1995. The share of chemical products in the total import volume was 12.8 % in 1993, 11.7 % in 1994 and 11.4 % in 1995. The import of mineral products also contributed to the total import volume, with 9.6 % in 1993, 8.7 % in 1994 and 8.9 % in 1995. These imports are essential to industrialization and occupy totally about 45 % of the import volume. Some agricultural products were also imported. The importation of live animals, animal products and vegetables contributed 5.3 % of the total import

volume in 1993, 6.4 % in 1994, and 5.2 % in 1995. Fats, animal oil and vegetable oil contributed 2.1 % in 1993, 2.4 % in 1994 and 2.2 % in 1995. The share of imports such as food, beverages and tobaccos in the total import volume was 4.4 % in 1993, 4.5 % in 1994, and 4.3 % in 1995. The total share of these consumption goods in the total import volume was 11.8 % in 1993, 13.3 % in 1994 and 11.7 % in 1995

The importance of agriculture and agro-industry in foreign trade has diminished from 1980 to 1994 (Table C.1.17). The share of agricultural and agro-industrial products in the total export volume plummeted from 72.3 % in 1980 to 36.0 % in 1994. The share of the sectors in the total import volume also nose-dived from 17.7 % in 1980 to 14.6 % in 1994. These consequences indicate a change in the economic structure of the country; El Salvador is developing as an industrial country, and does not aim for a sustainable agriculture. An economy significantly reliant on agriculture would need to be competitive in the world market, stressing production of cash crops as well as the import of agricultural products for consumption.

Table C.1.18 shows the balance of payments of El Salvador. At present, the current accounts are in the red. But the negative balance of current accounts has been decreasing from US\$ - 151.6 million in 1992, US\$ - 82.0 million in 1993, US\$ -17.9 million in 1994, and US\$ -275.6 million in 1995. In contrast, capital accounts are in the black. Surplus in capital accounts was US\$ 211.4 million in 1992, US\$ 251.5 million in 1993, US\$ 161.0 million in 1994, and US\$ 422.2 million in 1995. Because surplus in capital accounts exceeds the deficit in current accounts, the balance of payments are in the black, largely due to remittances from abroad, especially by El Salvadorans in the US, and foreign assistance. Because any future decrease in the two would directly affect capital accounts, it is very important for the government to increase its exportation of merchandise and services to keep the balance of payments in the black.

In accordance with the structural adjustment policy, a floating exchange-rate system was adopted in 1990. The comparison of the real and nominal exchange rate based on the established rate in 1985 (US\$ 1 = 2.5 colones) shows the overvaluation of colones (Table C.1.19). In the first half of 1993, the nominal exchange rate of US\$ 1 was 8.72 colones, while the real exchange rate was 12.26 colones. This overvaluation is the result of positive forecasts on economic growth and the fact that the balance of payment is in the black.

The economically active population also denotes the significance of agriculture. The agricultural industry employs the majority (35.5 %) of the economically active population (over 10 years old) in 1992 (Table C.1.20). Commerce was surveyed to come second, followed by the manufacturing industry.

The revenue of the central government increased from US\$ 507.1 million in 1990 to US\$ 1,089.1 million in 1994, and then decreased to US\$ 1,307.1 millions in 1995 (Table C.1.21). The increase in expenditures was estimated to be larger. Consequently, the central government has a deficit in public budget: US\$ -52.0 million in 1995. However, as a result of the structural adjustment policies, the ratio of deficit to revenues decreased from 27.7 % in 1991 to 3.9 % in 1995.

In main public sectors, expenditures for social services, e.g., education, public works, public health and welfare, are gradually covering a big share of the current budget expenditure (Table C.1.22). On the other hand, expenditures for defense and public security are decreasing in accordance with peace accords. Decrease in expenditures for agriculture and stock raising was

observed during the previous administration. The decreasing tendency continues except for a brief period in 1995 where an increase was observed.

In 1995, the central government had a public debt of US\$ 3,415.4 million (Table C.1.23), about two thirds of which comes from external sources (see Table C.1.24 for the list of external debts). External debt of the public sector was US\$ 2,050.8 million in 1995, while the banking sector owed US\$ 192.1 million in the same year. The total external debt of US\$ 2,242.9 million was 64 % of the credits of current accounts of balance of payments amounting to US\$ 3,498.0 million in 1995, and 1.35 times of the export volume of US\$ 1,661.3 million (14,536.6 million colons) in 1995.

Payments in official capital totaled US\$ 147.4 million in 1995, payments of central bank were US\$ 2.9 million, and payments of bank capital were US\$ 10.2 million (Table C.1.18). In total, US\$ 160.5 million, these payments correspond to 9.7 % of the export volume. Thus, the condition of external debt is not bad.

Consumer price index (CPI) decreased from 19.9 % in 1992, 12.1 % in 1993, 8.9 % in 1994, and increased slightly to 11.4 % in 1995 (Table C.1.25). CPI for food was 5.8 %, clothing, 4.8 %, housing, 22.3 %, and miscellaneous, 13.0 %. Although the CPI for food and clothing is stabilizing, the CPI for housing and miscellaneous is still high.

In April 1990 the daily minimum wage was raised from c 10 to c 11.5 for agricultural workers and from c 18 to c 21 in the capital. Since then minimum wages have been adjusted regularly. However, they have not kept up with inflation and so real wages have continued to decline in the 1990s. In January 1994 minimum wages for the construction sector were set at c 44.29 a day for skilled labor and c 36.89 for unskilled labor. In July 1994 minimum wages for industry, commerce and services were raised to c 35 a day; and in agriculture to c 16 for adults and c 15 for laborers under 16 years old. In Jiboa River basin, agricultural workers get c 25 a day and workers in factories get c 50 a day in 1996.

The number of banks and financiers totals 127 and 91 (Table C.1.26). San Salvador covers over half of this number with 68 banks and 58 financiers. Population (branch) in San Salvador is the smallest at 11,728. The population per branch for San Vicente, La Paz and Cuscatlan in the study area is 45,157, 49,229 and 55,763 persons, respectively, more than 23,156 persons of national average.

Deposit money in El Salvador is concentrated in San Salvador. The total sum of deposits in banks in San Salvador amounts to 67.5 % in June 1995 and 67.2 % in March 1996 (Table C.1.27). The total sum of deposits of financiers in San Salvador amounts to 71.7 % and 73.0 % in 1995 and 1996, respectively. The sum of deposits in the banks and of financiers in San Vicente, La Paz and Cuscatlan is relatively insignificant at less than 2 %. Financial markets in rural areas of El Salvador are not well developed.

Table C.1.28 shows the credits of banks by economic sector. Agriculture, forestry and fisheries had 21 % of the total credits in 1992, 20 % in 1993, 12.8 % in 1994 and 13.4 % in 1995. The majority of the credits in agriculture, forestry and fisheries went to the coffee industry: 12.3 % in 1992, 12.7 % in 1993, 6.8 % in 1994, and 7.0 % in 1995. Sugarcane covered about 2 %.

Without these two products, the percentage covered by agriculture, forestry and fisheries would be insignificant.

Time deposits make up 49.3 % of all deposits in 30 June 1995 and 47.7 % in 30 April 1996 (Table C.1.29). Most significant is the deposit of 180 days which is 20.16 % in 1995 and 20.15 % in 1996. The interest rate in time deposits is high because of the high inflation rate, at about 13 % in 1995 and 14 % in 1996. The interest rate in deposits of over one year is 11 % in 1995 and 13.5 % in 1996.

The interest rate for credits is also high (Table C. 1.30). In September 1995, less than 6 month-credits have an interest rate of about 14-15 %, while credits from half a year to one year have an interest rate totaling 18.89 %. In June 1996, credits for a period of less than 6 months have an interest rate of about 13-14 %, and 18.80% for credits made for a 6 months to a one year term. In conclusion, the financial project analysis states the need to increase the feasible internal rate of return. Credits over a one year term are not available to the general public, because of the possibility of currency devaluation or appreciation due to inflation and the remaining effects of social unrest brought on by the civil war.

A high interest rate was imposed to counter-act inflation and collect internal savings. Nevertheless, the internal savings rate is still low because of social unrest, making it difficult for poor people to repay loans from banks.

Conclusively, El Salvador seeks economic reconstruction and growth through the structural adjustment policies. But economic stabilization, the foundation of economic growth, is still not achieved due to inadequate human resource development and social unrest. The present favorable growth in GDP of El Salvador is mainly brought by industrialization, the structural adjustment policies, and the fact that the capital accounts are in the black -- this is due to remittances from El Salvadorans in the US and foreign assistance. The flow of such capital however is forecast to decrease in the future, that is why it is immensely important that El Salvador acquires capital from internal savings. Accordingly, UNDP recommends the implementation of policies on social stabilization to increase internal savings rate.

1.3 Agriculture

Table C.1.31 shows the land use conditions in Central America in 1993, based on the "FAO Yearbook: Production 1994." El Salvador has the highest population density in Central America (266.3 persons/km²), thereby requiring intensive land utilization. The rate of utilization of farmlands and pastures in El Salvador is also the highest in Central America (64.7 %). Because of the small land area, the distribution of agricultural land per person is smallest (0.13 ha/person) in Central America, as well as farmlands and pastures per economically active person, 1.16 ha/farmer and 0.97 ha/farmer, respectively. Thus, the intensive cultivation of agricultural land is necessary to achieve high productivity. 16.4% of the agricultural land and 21.2% of the arable land are irrigated farmlands, figures that rank the country second to Costa Rica (22.6 % and 42.1 %).

The farmers' search for more effective land use reflects the changes in agricultural land use in El Salvador (Table C.1.32). In fields cultivated with crops, the area planted with annual crops decreased from 30.1 % in 1970 to 28.2 % in 1987, while the area planted with permanent crops

increased from 7.8 % to 9.7 %. In addition, natural pasture decreased from 26.2 % in 1970 to 19.6 % in 1987, while improved pasture increased from 5.5 % to 7.6 %.

With the implementation of agrarian reform, land distribution is changing, as shown in Table C.1.33. Farms over 70 ha made up 0.7 % of the number of farms in 1971 but occupied 38.7 % of the total farm area. This distribution improved somewhat to 1.0 % of the number of farms and 28.4 % of total farm area in 1987.

The change in the structure of agricultural producers is shown in the comparison of agricultural census in 1961, 1971 and the MIPLAN Survey in 1991-1992 (Table C.1.34). The share of the economically active population in the total population is almost same at about 90 %. The share of the economically active population in agriculture has been decreasing from 59.9 % in 1961 to 32.6 % in 1991-1992.

The number of farmers with farmlands measuring one hectare or more and 1 hectare or less is decreasing from 28.5 % in 1961 to 23.4 % in 1991-1992, and from 23.1 to 16.6, respectively. Landless farmers are increasing from 27.6 % to 34.1 %, however, the number of laborers increased from 12.4 % to 13.2 %; the number of families working as laborers increased from 8.4 % to 12.6 %. Unemployed farmers increased from 5.3 to 10.0.

Table C.1.35 shows the agricultural production in recent years and the significant changes in production.

Coffee and sugarcane production peaked at 3,166 thousand quintals and 4,464 thousand quintals in 1992, respectively. These figures decreased, however, to 2,951 thousand quintals and 3,915 thousand quintals, respectively, in 1995. Cotton has decreased from 147 thousand quintals in 1990 to 0 quintal in 1995, due to decline in international price. Maize, sorghum and kidney beans production also remarkably fluctuated. Polished rice peaked to 1,052 thousand quintals in 1993 and then decreased to 711 thousand quintals in 1995 -- fluctuation is mainly attributed to climatic variations. Although the total number of cattle and pigs is decreasing, productions of milk, chicken and eggs are increasing.

Table C.1.36 shows the production, area and yield of main crops by harvesting year. The table indicates that increased coffee production reflects increased yield, and the decrease in the production of cotton is due to the fact that less area is cultivated with cotton. Farmers cultivate sugarcane by contract with sugar mills, whereby production is determined by acreage. Production of maize is highly variable as they are cultivated in rainfed fields. Consequently, maize yield and production increases if weather is good. Fluctuations in the production of beans are caused by changes in harvesting area and yield. Production of rice and sorghum are decreasing mainly due to the decrease in areas cultivated with these crops.

The big problem in the agricultural market of El Salvador is the easy import of foreign products by road transportation. As mentioned above, other Central American countries have more favorable agricultural conditions in addition to a relatively cheaper labor resource. Hence, agricultural products in neighboring Central American countries are much cheaper.

Table C.1.37 shows the comparison of prices of selected products in Central America. The production price of white maize in El Salvador is 10.47 US\$/qq, the highest in Central America. The consumer price is 0.15 US\$/lb., the second highest price next to Nicaragua. Guatemala has

the highest production price and consumer price for red kidney beans, with El Salvador as the second. With polished rice, El Salvador has the third highest production price and the fourth highest consumer price in Central America. Guatemala has the highest prices for live cattle and beef. El Salvador's live cattle and beef prices correspond to those in Honduras; prices for live cattle are the third highest and prices for beef are the second highest.

Table C.1.38 shows self-sufficiency in the production of main agricultural produce. Self-sufficiency in maize was 93.8 % before 1991 and 89.2 % after 1991. Self-sufficiency in rice was 95.1% before 1991 and 84.3% after 1991. Developments in the trading industry by the end of the civil war led to these decreases.

Present average tariffs on agricultural imports is 20 %, but sometimes imported agricultural products are cheaper than domestic products in the market. Reduction of tariffs on consumer goods by 15 % by implementing the trade liberalization policy is forecast to increase agricultural imports.

This is one of the conditions that would naturally result from a free market system. It is difficult for the government to adopt the policy of self-sufficiency in El Salvador, as this would cost the country a lot. Therefore, El Salvador aggressively promoted an agricultural policy that aimed to minimize economic losses and promote cash crops cultivation to become a competitive adversary in the world market.

Consequently, non-traditional agricultural products are increasing in El Salvador (Table C.1.39). The rates of non-traditional agricultural products in the added values of the agricultural sector increased from 7.67 % in 1989 to 9.75 % in 1993. Table C.1.40 shows the increase in areas cultivated with non-traditional agricultural products in recent years, while Table C.1.41 shows the share of agricultural produce in total exports without Maquila. The total share of agricultural and agro-industrial products in total exports decreased from 84.4 % in 1986 to 54.9 % in 1994. Particularly, traditional agricultural exports decreased from 77.6 % in 1986 to 37.5 % in 1994. In contrast, non-traditional exports increased from 6.8 5 % in 1994 to 17.4 % in 1994. With institutional, technological and financial support, this trend is forecast to progress in the future.

The agricultural industry of El Salvador is faced with significant problems: distribution of insignificant land acreage, the necessity of intensive cultivation for increased production, the necessity of soil conservation for farmlands in slopes, a large number of landless farmers, agricultural products priced higher than other Central American countries, inefficient domestic market information diffusion system, and the need to develop non-traditional agricultural products.

Although agriculture is an important economic sector, the government does not pay sufficient consideration to agriculture. Government support is particularly necessary to cope with the aforementioned problems. Expenditures appropriated for agriculture and stock raising, however, were decreasing due to the implementation of the structural adjustment policies and is not therefore enough to meet the demands of the farmers. The budget of MAG in 1995 was 52.6 % more than the 1994 budget. In 1996, however, it was -8.5 % less than 1995 (Table C.1.42). Likewise, the 1995 budget of DGRNR was -23.4 % of 1994, and in 1996 it was -21.7 % the 1995 budget.

According to the budget bill released in October 1996 (Table C.1.43), the total budget will increase from 14,815.1 million colones in 1996 to 15,302.4 million colones in 1997, with an annual change rate of 3.3 %. On the other hand, the budget of MAG for 1997 will be 314.4 million colones and the annual change rate will be -10.9 %. Accordingly, only 2.4% and 2.1% of the national budget in 1996 and 1997, respectively, were appropriated for MAG.

Regardless of the significant contribution of agriculture, forestry and fisheries to the GDP -- 13.7 % of 1995 GDP -- the budget appropriation only underscores the fact that the government is not that concerned with the sector. Since agro-industry widely occupied 11.3 % of the GDP in 1995, the total share of agriculture in the GDP was about 25 %. Agricultural related exports were 32.8 % of the total export volume in 1995. As already stated, agriculture represents 35.5% of the economically active population in 1992.

75% of the rural population is in absolute poverty, and the main livelihood in these areas is agricultural. Agriculture has a huge influence on the rural way of living and developments in this sector would remarkably contribute to the stabilization of social conditions in the rural area.

Because El Salvador covers a small territory, slopes are also being cultivated by small scale farmers. Most slopes need soil conservation measures. It is therefore necessary to promote the extension of adequate agricultural techniques to farmers in the mountain area cultivating in slopes, for environmental conservation. The decrease in the agricultural budget therefore is a unfavorable in view of these conditions.

The new MAG minister appointed in the autumn of 1996 indicates the possibility of improving the position of agriculture in governmental budgets. Changes can only materialize, however, if the government reviews its structural adjustment policies.

1.4 Agrarian Reform

The government has implemented agrarian reform in order to impartially distribute farmlands. The organizations assigned for the implementation of agrarian reform are as follows:

ISTA (Salvadoran Institute for Agrarian Reform):

This organization is responsible for the requisition of lands; temporary management of requisitioned lands before transfer; planning of transfer of lands; guidance in agricultural techniques after land transfer; and promotion of the organization of agricultural cooperatives.

FINATA (National Finance of Agricultural Lands):

This organization is responsible for offering of lands expropriated by the Ministry of Justice to farmers for agricultural use; payment of compensation money for former landowners; financial support to farmers for the acquisition of agricultural lands.

BDT (Bank of Lands):

This organization is responsible for giving financial support to small and medium scale farmers for the acquisition of farmlands for crop production, livestock farming, or forestry.

The agrarian reform laws are as follows:

- Decree 154 in 1980 stipulates the transfer of large scale agricultural lands to small and medium scale landowners by the expropriation of 500 ha or more.
- Decree 207 in 1980 stipulates the transfer of agricultural lands under 7 ha to tenant farmers.
- Decree 842 in 1981 stipulates the distribution of existing national lands held by ISTA.
- Decree 839 in 1987 stipulates the right of landless farmers to negotiate with landowners concerning the purchase of lands.

The direct beneficiaries of decrees 154 and 842 totaled 36,558 persons (199,496 ha: 5.5 ha/person) in the period 1988-1989 (Table C.1.44). The direct beneficiaries of decree 207 totaled 42,562 persons (62,504 ha: 1.5 ha/person). The direct beneficiaries of decree 839 totaled 2,283 persons (5,701 ha: 2.5 ha/person). The total direct number of beneficiaries was 81,403 persons (267,701 ha: 3.3 ha/person).

The total number of beneficiaries of Decree 154, including family members, is 193,758 persons, Decree 207, 842, 259,629 persons, and Decree 839, 467,314 persons (Table C.1.45).

ISTA has promoted the organization of cooperatives in order to maintain large-scale traditional cash crop farming in lands to be transferred to small and medium scale farmers, after the transfer. A cooperative is an organization of farmers jointly working towards better production. There are 92 cooperatives in Region I (Table C.1.46). These cooperatives cover a total area of 60,445 ha, 75 % of the lands transferred by agrarian reform in Region I. In Region II, there are 83 cooperatives covering 47,565 ha, 50 % of lands transferred by agrarian reform in the region. In region III, there are 72 cooperatives covering 30,179 ha, 80 % of the lands transferred by agrarian reform in the region. In region IV, there are 81 cooperatives covering 61,296 ha, 77 % of the lands transferred by agrarian reform in the region. In total, there are 328 cooperatives managing 199,486 ha of land, that is 75 % of the total number of lands transferred by agrarian reform in the study area.

In 1988-1989 period, 30.3% (60,469 ha) of the areas managed by the agricultural cooperatives in the study area was cultivated collectively (Table C.1.47). Individually operated farmlands totaled 29,649 ha (14.9%), while pastures measured 44,808 ha (22.5%). Forests covered 23,737 ha (11.9%) and areas not suitable for farming totaled 9,498 ha (4.8%). Infrastructure covered about 631 ha (5.8%), while uncultivated farmlands totaled 19,694 ha (9.9%).

Total cooperative areas had decreased from 214,049 ha within the 1984-1985 period to 199,46 ha in the 1988-1989 period. While cooperative farmlands, pastures and forests tend to decrease in area, individual farmlands to increase.

Individually operated farmlands within areas managed by the agricultural cooperative totaled 24,946 ha: 8,202 ha in region I, 6,927 ha in region II, 4,428 ha in region III, 5,389 ha in region IV (Table C.1.48). Individual farmlands outside of the agricultural cooperatives jurisdiction totaled 5,911 ha: 660 ha in region I, 1,426 ha in region II, 506 ha in region III, and 3,319 ha in region IV. Individual farmlands outside of the cooperatives' jurisdiction made up 7% of farmlands individually operated in Region I and 38 % in Region IV.

Agricultural cooperative members increased from 34,149 in 1987-1988 to 36,558 in 1988-1989 (Table C.1.49). Female associates made up 12% of the membership at 4,272. While some of the

members have withdrawn from the organization, there are also some farmers applying for membership.

Of the 328 agricultural cooperatives in the study area, 95 manage less than 245 ha, 97 from 245 to 500 ha, 85 from 500 to 1,000 ha, 35 from 1,000 to 2,000 ha, and 16 more than 2,000 ha (Table C.1.50). 192 of these cooperatives (59%) manage lands under 500 ha.

108 of these agricultural cooperatives have less than 51 members, 107 have 51 to 100 members, 75 have 101 to 200 members, 25 have 201 to 400 members, and 13 have more than 401 members (Table C.1.51). The number of agricultural cooperatives having less than 101 totaled 215 (66 %). 94 of the organizations have an income of less than c 100,000, 100 with c 100,000 to 500,000, 52 with c 500,000 to 1,000,000, 57 with c 1 million to c 3 million, and 25 with more than c 3 million (Table C.1.52). Only 194 (59%) of the cooperatives had incomes of less than c 500,000.

Table C.1.53 shows the regional distribution of agricultural cooperatives by main agricultural activities. 79 of these cooperatives were into livestock farming (24 %). 69 were into crop farming and livestock farming (21 %), 55 were into coffee production (17 %), 48 were producing sugarcane (14 %), and 44 were into cereal production (13 %).

The total number of irrigated areas in the areas under the jurisdiction of agricultural cooperatives increased from 7,743 ha in the 1987-1988 period to 8,033 ha in the 1988-1989 period (Table C.1.54). Irrigated individual farmlands and pasture increased from 138 ha (0.5 %) to 251 ha (0.8 %) and from 4,820 ha (10.4 %) to 5,455 ha (12.2 %), respectively. Irrigated cooperative farmlands, however, had decreased from 2,785 ha (4.6 %) to 2,327 ha (3.8 %).

About half of the agricultural cooperatives received technical assistance from ISTA. The extension office cannot directly extend support to the cooperatives because the objectives of the former do not include the latter. The technical assistance extended by ISTA is focused on the cultivation of traditional cash crops like coffee and sugarcane. The cooperatives are granted loans by ISTA for the purchase of lands from FINATA or BDT, or by banks and financiers for the purchase of agricultural inputs.

The new land reform policy aims to abolish ISTA next year, in view of the fact that land reform on its own will bring forth good results. Along with the plan, new decrees will be made as to whether cooperatives should repay 30 % of the debts to obtain lands till the time limit, or should be granted a 70% exemption from the debts.

2 Local Conditions

2.1 Local Authority

El Salvador has 14 Departments and 262 municipalities. The Governors of the Departments are appointed by the central government.

The municipalities exist as local self-governing bodies. The municipal council is made up of a mayor, trustee, and two or more councilors. The population of a municipality decides the number of councilors required and any resident over 21 years old is eligible to be a council member. Municipal election is implemented every three years.

In March and April 1994, presidential, legislative and municipal elections were held. The ARENA party retained the presidency and won effective control of the legislative assembly and the vast majority of municipal elections. The FMLN came second in both the presidential race and the assembly.

The cooperation and participation of municipal governments in the conduct of local projects is a necessity.

The study area partly covers 4 Departments: La Paz, Cuscatlan, San Vicente and San Salvador. The municipalities in each Department are as follows:

LA PAZ

El Rosario	Jerusalén *	Mercedes La Ceiba *
Paraíso de Osario *	San Antonio Masahuat *	San Emigdio *
San Francisco Chinameca	San Juan Nonualco	San Juan Tepezontes *
San Luis	San Miguel Tepezontes *	San Pedro Masahuat
San Pedro Nonualco	Santa María Ostuma	Santiago Nonualco
Tapalhuaca		

CUSCATLAN

Cojutepeque	Candelaria *	El Carmen
San Cristóbal *	San Pedro Perulapan	San Rafael Cedros
San Ramón *	Santa Cruz Analquito *	Santa Cruz Michapa

SAN VICENTE

Guadalupe	Santo Domingo	Tepetitan
Verapaz		

SAN SALVADOR

Ilopango	San Marcos	San Martín
Santiago Texacuangos	Santo Tomas	Soyapango

Eleven of the above municipalities with asterisks are wholly included in the study area (seven in La Paz and four in Cuscatlan). The rest of the municipalities partly make up the basin of Jiboa River.

There are three types of maps showing municipal boundaries: the administrative map in 1990, images of municipal boundaries used in the 1992 Census, and the 1995 municipal administrative map. These maps differ from each other. IGN (National Geographic Institute) said the correct municipal boundaries were decided during the Mayors' Convention in 1995. Figure C.2.1 shows the municipal boundaries according to the administrative map by IGN, based on the 1995 convention.

The areas covered by the 1992 Census are different from the areas outlined in the map of municipal boundaries (IGN, 1995). Table C.2.1 shows the areas in the Jiboa River basin by municipality and by sub-area according to the administrative map in 1995.

The Jiboa River basin covers a total area of 605.59 km², and 535.11 km² without Ilopango Lake. La Paz Department occupies 297.69 km² of the basin, Cuscatlan 123.87 km², San Vicente 49.41 km², and San Salvador 64.14 km².

Municipalities have cantons (sub-divisions) and Table C.2.2 shows the names of cantons in the three model project areas mentioned in chapter 6 of the main report. San Cristóbal has 7 cantons, San Antonio Masahuat 6, and San Pedro Masahuat 18. The borderlines of the cantons of most municipalities are not fixed; some municipalities are ignorant of the correct number of cantons, and cantons do not have effective administrative functions. This is mainly attributed to an inefficient land administration system: inadequate and inefficient government land registration system.

To counter-act this inefficiency, a land administration project has been recently carried out with the support of the World Bank (1996-2002). The government created CNR (*Centro Nacional de Registros*) in December 1994 by executive decree, merging RPRH (*Registro de la Propiedad Raíz e Hipotecas*), RSI (*Registro Social de Inmuebles*), and IGN (*Instituto Geográfico Nacional*) to institutionalize national land registry. A pilot project was implemented in the department of Sonsonate for two years. Only 40% of the properties in the department are registered, and just less than a third have cadastral references. The same may be said of the whole country. Accordingly, CNR intends to efficiently complete a national land registry and cadastral references.

Because of the absence of land cadasters, land taxes cannot be imposed. Therefore, the success of this project will lead to the enforcement of fixed property taxation, which is forecast to be strongly opposed by landowners. This project is will also provide the country with data necessary for the establishment of a land holding system and determination of social strata based on land holding conditions. These data in turn shall also be very useful to local administrations and MAG.

2.2 Population

The total population of the 35 municipalities occupying the Jiboa River basin was 327,874 in 1971 and 795,927 in 1992 (Table C.2.3). The total annual population growth rate of these municipalities in 21 years, from 1971 to 1992, was 2.23 %. This figure was higher than the national growth rate of 1.73 % for the same period.

The contribution of the department of La Paz to the annual population growth rate in the basin was 1.30%. Cuscatlan made up 2.16 %, San Vicente 1.45 %, and San Salvador 5.32 %. As the capital city, the urbanization of San Salvador was carried out, attracting massive migrants from areas significantly affected by the civil war. The rise in annual population growth rate in the basin may be attributed to the influx of migrants to San Salvador.

There were also some municipalities with a population growth rate smaller than the national level. The national census conducted to determine the population growth rate in 21 years, 1971-1992, indicates eleven municipalities with growth rates under one percent. San Juan Nonualco and San Juan Tepezontea had an annual population rate of decrease of - 0.79% and -0.04%, respectively.

The total population density of the areas relevant to the study, according to the 1992 census, was 673.9 persons/km², more than twice the national population density of 243.3 persons/km². Of the departments in the basin, San Salvador has the highest population density at 2,684.3 persons/km². Cuscatlan, because of Cojutepeque and El Carmen, is second with 482.4 persons/km², followed by San Vicente with 293.1 persons/km², and La Paz with 208.6 persons/km². Twenty-four municipalities have population densities higher than the national average, while eleven municipalities have population densities lower than the national average. Generally speaking, the Jiboa River basin area is relatively densely populated.

Table C.2.4 shows the forecast population of the municipalities in this study, according to ISDEM (Instituto Salvadoreño de Desarrollo Municipal). ISDEM estimates a 1.73% annual increase rate in the population, based on the national growth rate calculated from the intra-census (21 years). The national population in 2000 is estimated at 5,871,4242 persons and 6,970,018 persons in 2010. The total population of the municipalities in the study in 2000 and 2010 is estimated at 909,107 persons and 1,079,209 persons, respectively.

Table C.2.5 shows the estimated population of the Jiboa River basin. The estimation was conducted by multiplying the total population by total area of the respective municipalities within the basin. The population in the Jiboa River basin was estimated at 301,252 persons in 1992, and 322,644 persons in 1996. Future population estimates arrive at 345,557 persons in 2000, 376,502 persons in 2005, and 410,213 persons in 2010.

In 1996, the population of La Paz made up 20.2% of the total basin population at 65,139 persons, Cuscatlan, with 78,377 persons made up 24.3%, and San Vicente, with 14,363 persons made up 4.4%. The department of San Salvador, with 164,765 persons, made up the majority of the basin population at 51.1%.

In 1992, the urban population and the rural population made up 50.4% and 49.6%, respectively, of the national population. Table C.2.6 shows the urban and rural population by gender of the related municipalities. The urban population makes up 67.1% of the total project area, while the rural population makes up the remaining 32.9%. The urbanization of San Salvador significantly contributed to the project area's predominantly urban structure. In the other three departments, however, the rural population exceeds the urban population. The rural population predominates the population in La Paz at 69.6%, Cuscatlan at 59.6%, and San Vicente at 58.7%.

The municipalities are mainly rural: 7 of the municipalities is less than 40% rural, 9 less than 60%, 14 less than 80%, and 5 over 80%.

In 1992, the national population was 48.6% male and 51.4% female. In the 35 municipalities, men made up 48.1% of the total population, while women made up 51.9%. Men made up 48.1% of the study area population, 47.5% of the urban area, and 49.4 % of the rural area. At 53.9%, however, the male population in Mercedes La Ceiba and Santa Maria Ostuma exceed the female population (50.3%). Women in the urban area were observed to make up 52.5% of the population, a figure lower than the national average of 52.7 %. On the contrary, the female population in the rural area was 50.5 %, slightly higher than the national average of 50.1 %.

In terms of age composition, younger age groups occupy the majority of the population, while the older age groups make up a small portion of the population (Table C.2.7). 25.3% of the national population is made up of people aged between 0-9 years old, while 23.9% of the total population of the municipalities of the departments covered by this study is made up of 10-19 year olds; people under 21 years old make up 49.2%. This population distribution is mainly attributed to the effects of the civil war and the present social development programs carried out by the government. The male population between the ages 0-9 exceeds the female population. The number of 10-19 year old males exceed the females of the same age only in La Paz, San Vicente, urban San Vicente, and in all rural areas.

Average age was determined by first getting the median of each age group and multiplying it with the population of each age group, and then dividing it with the total population. In 1992, the total municipal population in the basin had an average male age of 24.3 years old and an average female age of 25.8 years old. These are smaller than the national average ages of 25.4 years old for males and 27.0 years old for females. In urban areas nationwide, the average male age and female age were 25.7 years old and 27.7 years old, respectively. In the Jiboa River basin, the average urban male and female ages were 24.6 years old and 26.4 years old, respectively. In rural areas nationwide, the average male and female ages were 23.6 years old and 24.1 years old, respectively. In the Jiboa River basin, the average rural male and female ages were 23.6 years old and 24.5 years old, respectively.

While the average female age is usually higher than its male counterpart, the urban average age is higher than the rural average age. These trends are particularly common in the study areas. Because of the convenience infrastructure has granted to urban way of living, the average age in the urban area is higher than the rural area.

The average urban ages in the Jiboa River basin are slightly lower than the national average, mainly due to inadequate amenities. Although the average rural male age in the Jiboa River basin is similar to the average national male age, the average rural female age is higher than its national counterpart. This is probably because conditions in the urban area are more favorable to women than in the rural. Also, urban areas concerned are less damaged by the civil war and are in proximity to the Capital. Any outbreak in diseases or injuries in the area requiring treatment can be coped with immediately due to its closeness and relatively good access to the Capital.

Table C.2.8 shows how literacy has improved in the departments according to the 1971 and 1992 Census. The literacy rate of ten years old and over nationwide increased from 59.7 % in 1971 to

76.1 % in 1992, showing a 15% increment. San Salvador was surveyed with a high literacy rate of 82.8 % in 1971, and only a 6.3 % increase was observed for 1992.

Table C.2.9 shows literacy rates of five years old and over by Department and by urban and rural area. Some figures suggest that males are more literate than females and that urban literacy is higher than rural literacy. In 1992, male literacy in the urban area was 86.8 % nationwide, while female literacy was only 82.3 %. Male literacy was 59.5 % in rural areas nationwide, while female literacy was only 57.5 %. The literacy rate (men: 91.4 %, women: 87.1 %) in the urban areas of San Salvador, however, exceeded the national average. The rural areas of San Vicente showed a male literacy rate slightly lower than the national average at 59.4%. The male and female literacy rates of other rural areas were better than the national average.

Table C.2.10 shows the estimated population in 1996 by sub-basin and municipality based on the literacy rates; these factors are indicated by departments and sub-basin in Table C.2.12. Table C.2.11 shows the literacy rate by departments and sub-basin. San Salvador has 51.2 % of the basin population, occupying 12.0 % of the basin area. Cuscatlan has 24.3 % of the basin population on 23.2 % of the basin area, while La Paz covers 20.2 % of the basin population on 55.6 % of the basin area, and San Vicente 4.3% of the basin population on 9.2 % of the basin area. La Paz and San Vicente have a small population density of 218.8 persons/km² and 282.5 persons/km², respectively. On the other hand, San Salvador is very densely populated with 2,568.8 persons/km².

On sub-basins, sub-basin A has 65.6% of the basin population occupying 28.6% of the basin area, sub-basin B has 13.3% of the population on 13.9% of the basin area, sub-basin C has 10.1 of the basin population on 24.5% of the basin area, sub-basin D has 4.0% of the basin population on 10.66% of the basin area, and sub-basin E has 6.9% of the basin population on 22.3% of the basin area. Sub-basin A, which mainly covers the San Salvador department, has the highest population density at 1,382 person/km². Sub-basin B, covering the area along the Pan American Highway, has the second highest population density at 576.7 persons/ km².

2.3 Economically Active Population

Because data on the economic conditions of the study area is scarce, this section elaborates on the economically active population (EAP) aged over 10 years old according to the 1992 census.

The economically active population (EAP) makes up 46.2% of the El Salvador population, while non-EAP makes up 53.8%; 5.9% of the EAP are unemployed. The EAP is 69.3% male and 25.1% female. The non-EAP is 30.7% male and 74.9% female. 6.4 % of the economically active male population are unemployed, as opposed to the 4.46% unemployed economically active female population (Table C.2.14).

The economically active female population in San Salvador is higher than the national figure at 28.0 % and the highest in the basin; San Vicente has 16.3% and Cuscatlan 20.7%. The male EAP and non-EAP in the basin are almost equal to the surveyed national figures.

71.3% of the national male non-EAP are students (Table C.2.15). Housewives and students made up 67.6% and 27.0 %, respectively, of the national female non-EAP. Most housewives in farm households, however, help occasionally in the farming activities of their husbands.

Many of the EAP over 10 years old in the four departments were surveyed to be either primary or secondary school dropouts or have never been to school (Table C.2.16). In the four departments, 44.4% of the total male EAP were either primary or secondary school dropouts, while 7.9% have never been to school. Agricultural male EAP made up 49.9% of the primary or secondary school male EAP dropouts, and 18.5% of the percentage of those never been to school.

40.9% of the total female EAP in the four departments were either primary or secondary school dropouts, while 8.9% have never been to school. 46.7% of the agricultural female EAP were either primary or secondary school dropouts, while 24.6% make up the percentage of those never been to school. The figures indicate that the education level of the agricultural EAP is lower than the total EAP, and that women have less educational opportunities than men.

Table C.2.17 shows the EAP by industry in the municipalities in the Jiboa River basin. 54.5% of the EAP in the municipalities in La Paz Department were in agriculture, 10.7% in commerce, and 10.1% in the industrial sector. In Cuscatlan, 38.1% of the EAP were in agriculture, 16.2% in the manufacturing industry, and 15.4% in commerce. Cuscatlan Department has industrial and commercial places along the Pan-American Highway. The EAP in agriculture in San Vicente was the highest of the four Departments at 69.6%. Although the average number of EAP in agriculture in the department of San Salvador was only 5.0%, 24.7% of this figure was made up by the municipality of Santiago Texacuangos. San Salvador had the highest EAP in the manufacturing industry at 28.2%, followed by commerce with 20.7%.

With the exclusion of San Salvador, agriculture is the key industry in the Jiboa River basin. The average rate of agricultural EAP in related areas was only 18.5% and lower than the national average rate of 35.4%. This was because San Salvador Department had an extremely low rate of agricultural EAP, 5.0%. Agriculture was predominant in La Paz, Cuscatlan and San Vicente, while industry and commerce dominated the economic activities in San Salvador. In the Jiboa River basin, six municipalities had an agricultural EAP of under 20%, three municipalities under 40%, thirteen municipalities under 60%, and another thirteen municipalities under 80%. The areas covered by the study have an overwhelming number of municipalities in which agriculture is the key industry. EAP in fisheries totals 546 in the entire area covered by the study. Half of this figure may be engaged in fisheries in Ilopango lake.

The majority of the agricultural EAP is distributed in rural areas (Table C.2.18). The agricultural EAP is 73.4% of the male population and 19.7% of the female population in La Paz. It is 75.5% of the male population and 14.8% of the female population in Cuscatlan, and 89.3% of the male population and 25.6% of the female population in San Vicente. In San Salvador, it makes up 35.3% of the male population and 6.2% of the female population. In total, the agricultural EAP makes up 58.9% of the male population and 10.9% of the female population. With the exclusion of San Salvador, almost all rural male EAP were in agriculture. As for the total female EAP in the four departments, 20% were in commerce. In Cuscatlan and San Salvador, 30% of the female EAP were in the industrial sector.

According to the calculation based on the 1992 census, the EAP in Jiboa River basin in 1992 was 97,567 persons. The estimated EAP in 1996 was 104,496 persons (Table C.2.19). These figures

reflect the size of the total basin population, and because sub-basin A makes up the majority of the basin population, it has the highest EAP, 73,812 persons.

The estimated 1992 agricultural EAP in the Jiboa River basin was 23,868: 10,204 in La Paz, 7,868 in Cuscatlan, 2,244 in San Vicente, and 3,551 in San Salvador (Table C.2.20). In 1996, it totaled 25,562: 10,929 in La Paz, 8,427 in Cuscatlan, 2,403 in San Vicente, and 3,803 in San Salvador. In the same year, the agricultural EAP distribution by sub-basin was: 8,787 in sub-basin A, 5,469 in sub-basin B, 5,704 in sub-basin C, 1,965 in sub-basin D, and 3,626 in sub-basin E.

Table C.2.21 shows the classification of the agricultural EAP. Half of the total male EAP in agriculture is made up of farmers and the remaining half by unskilled workers. The unskilled female laborers make up 70% of the total agricultural EAP.

According to the calculation based on the 1992 census, the number of farmers in the agricultural EAP in the basin in 1992 totaled 11,178: 4,714 in La Paz, 3,855 in Cuscatlan, 1,100 in San Vicente, and 1,509 in San Salvador (Table C.2.22). Unskilled laborers population in 1992 totaled 11,893: 5,326 in La Paz, 3,934 in Cuscatlan, 1,124 in San Vicente, and 1,509 persons in San Salvador. In 1996, farmers made up 11,971 of the agricultural EAP in the basin: 5,049 in La Paz, 4,129 in Cuscatlan, 1,177 in San Vicente, and 1,616 in San Salvador (Table C.2.22). Unskilled laborers made up 12,739 of the agricultural EAP in 1996: 5,705 in La Paz, 4,214 in Cuscatlan, 1,204 in San Vicente, and 1,616 in San Salvador. Half of the total agricultural EAP in the basin is made up of farmers, while unskilled laborers made up the remaining 50%.

Table C.2.23 classifies the agricultural EAP into public and private employees and laborers (referred to as "employees"), patron and employers (referred to as "employers"), family members (no salary), independent laborers, domestics, agricultural cooperative members, and others. Employees refer to permanent laborers and tenant farmers. Employers refer to farmers with large farmlands. Independent laborers refer to farmers with small or medium scale farmlands and landless farmers. The farmers and skilled laborers under the independent laborers category refer to landless farmers and temporary (seasonal) laborers.

In the Jiboa River basin, independent laborers made up 84.9% of the total agricultural EAP, while employers made up 0.3%, employees 6.2%, and cooperative members 6.5% (Table C.2.24). The number of employees in San Salvador is higher than any of the other Departments. On the other hand, La Paz had the highest number of cooperative members in the basin. There are municipal data with respect to EAP by industries, but non on agricultural EAP by sub-groups. Accordingly, these estimates may be different from the actual conditions.

2.4 Agriculture

The agricultural statistics of MAG mainly cover the national and regional level. Data on departments only refer to certain agricultural products; the statistics do not include general data on municipalities and departments.

There are no data on agriculture in the local areas within the Jiboa River basin. This section uses agricultural statistics and the proportion of the basin in the region and explains the general agricultural conditions in the basin. Jiboa River basin occupies 2.6% of the national land area,

covering 7.2% of San Salvador, 16.4% of Cuscatlan, 3.5% of agricultural region II including San Salvador and Cuscatlan, 24.3% of La Paz, 4.1% of San Vicente, and 9.9% of agricultural region III including La Paz and San Vicente (Table C.2.25). These figures are estimates and probably differ from the data acquired from field surveys.

Table C.2.26 shows the 1994-1995 main crop production data in the basin. Maize cultivation in the basin occupies 10,736 Mz, 2.4% of the total area used for maize cultivation nationwide. With a yield of 27.1 qq/Mz (1.167 times the national average), the basin produces 290,762 quintals of maize, that is 2.8% of the national production. Bean cultivation occupies 3.04% of the land area in the basin and makes up 2.91 % of the national production. The yield per Mz, however, is slightly lower than the national average. Only a small area in the basin is appropriated for sorghum cultivation, hence production is also low; the yield however equals the national average.

Rice cultivation in the basin occupies a wide area, 15.1% of the basin, and production makes up 16.1% of the national production; yield/Mz is slightly higher than the national average. La Paz and San Vicente produces cotton. The area cultivated with cotton in these departments is very small because La Paz is only 11.6% of the national land area. Although production is small, the yield (36qq/Mz) is higher than the national average (23.5 qq/Mz).

Farmers in the basin sell their sugarcane products to a sugar mill. In 1993-1994, a contract with the mill covers 7,912 Mz, 12.0 % of the area cultivated with sugarcane nationwide. The total production in the basin was 553,855 st, 15.5% of the national production, and the yield/Mz at 70.0 t/Mz, was higher than the national average of 53.95 st/Mz. The factory produced 1,116,470 qq of sugar between 1993-1994, 15.9 % of the national sugar production. The sugar production from sugarcane is 10.08 % in the basin, a little higher than the national average (9.86 %). Farmers in Jiboa River basin also cultivate various fruits and vegetables in addition to these main crops. However, there are no data on these activities.

In 1994, the number of slaughtered cattle in Jiboa River basin was 8,065 heads, 4.99% of the number of cattle slaughtered (161,772) nationwide (Table C.2.28). The number of slaughtered pigs in the basin is 4,543 heads, 3.38 % of the national figure of 134,488 heads (Table C.2.29). The number of poultry for egg production in the basin is 412,266 doves, 9.13 % of national the figure of 4,517,898 doves (Table C.2.30). Poultry for meat production in the basin is made up of 134,784 doves, 3.6 % of the national figure of 3,744,643 doves (Table C.2.31). These show that livestock farming is thriving in the basin.

C3 Project Evaluation

C 3.1 Benefits

The major objective of the economic evaluation of the projects is to verify the economic viability of the projects, by assessing the overall impact of the project on the national economy. The method of economic evaluation of projects is the cost-benefit analysis that employs the economic internal rate of return (EIRR) as a criterion to judge the economic viability. This method is a general way of economic evaluation as used by world bank, JICA and USAID. The economic evaluation uses the results of the cost evaluation in Chapter 8 of the main report and the estimated benefits in this section. The next section calculates and compares the EIRR of projects and prioritizes them in terms of national economy. EIRR is only a standard comparison of economic viability.

This section estimates the benefit of each plan using the cost estimates in Chapter 8. The benefits of the project are assessed in the context of national economy rather than as a project entity. Individual evaluation of benefits uses a generally simplified method at almost the same degree, because there are relatively detailed data with respect to some projects, but are only general data for other projects.

This section considers only the master plan and model projects, for which costs estimates have already been considered. When the description of facilities and equipment in Chapters 5 and 7 is different then the estimation of benefits is based on the preconditions adopted by the cost estimation.

C3.1.1 Master Plan

(1) Flood Control Plan

Repair of stream and plan of construction of facilities of countermeasure for flood are included in the flood control plan. The flood control plan aims to eliminate damage from floods. Flood damages agricultural production and roads and brings loss of labor during periods of flood.

According to section of flood control of "Progress Report 11," agricultural land which is damaged by floods almost every year, is 840 ha. Agricultural land which is damaged every 20 years, is 2,060 ha. If flooding is controlled, the farmland can produce crops in rotation, for example, maize, tomato, and other vegetables. Floods damage only the production of maize in the rainy season. The yield of maize, planted in 1996, is 4,500 colones/mz (5,625 colones/ha). This includes production costs, but most costs are suffered by the national economy. The total is 4,725,000 colones in the area damaged by floods every year and 11,587,000 colones in land damaged in one year in 20 years. This report assumes a big flood will come by 2010.

As described in the section about floods in this report, inundated houses number 89 and evacuated houses number 21. There are some flood damages to houses but the costs of these damages are not available. The labor loss seems to include the cost of repairing the house, because people suffering from flood damage repair the houses by themselves.

The total cost of damage to roads by floods is estimated to be 4,905,000 colones in this report. The repair cost of minor damages to rural roads is 105,000 colones, the average length is 18 km and the total is 1,890,000 colones. The repair cost of major damage to rural roads is 350,000 colones, the average length is 3 km and the total is 1,050,000 colones. The repair cost of minor damage to farm roads is 45,000 colones, the average length is 17 km and the total is 765,000 colones. The repair cost of minor damage to farm roads is 150,000 colones, the average length is 8 km and the total is 1,200,000 colones.

There are an average of 89 inundated houses with an average of 2 laborers in each house. The period of time lost, when laborers can not work due to floods, is one week including the days to repair the house. Salary of agricultural laborers is 25 colones per day. Total loss of labor was 31,150 colones in 1996 and it increases at a rate of 1.73 % per year based on the rate of population increase.

Further, outflow of toilets or sewerage by flood brings about intestinal infection. The rate of contraction of intestinal infection is 5.9 % and intestinal parasites is 5.6 % in Cuscatlan department, according to "Diagnostico de Salud del Departamento de Cuscatlan (Septiembre de 1995, Ministerio de Salud Publica y Asistencia Social)". Intestinal diseases occupy 11.5 % in total. This rate in the Jiboa River basin is supposed to be the same as Cuscatlan department. Outflow of toilets or sewerage is not the only cause of intestinal infection, as some persons do not go to the hospital when they have a stomach-ache and are counted in the medical statistics. Thus, this report adopts the rate of contraction as the rate of disease by flood.

The patients are estimated 1,498 persons, because the population in block D was 13,031 persons in 1996. If adult patients are half and they can not work for about 3 days, laborers are 749 persons and loss of labor is 2,247 person-days. The loss of labor by disease was 56,175 colones in 1996, based on the salary of agricultural labor of 25 colones per day. The cost of medicine is 22,470 colones, based on the cost of medicine for stomach of about 15 colones.

Intestinal infection is a major cause of death. The number of patients with intestinal infection in Cuscatlan was 8,583 persons and number of deaths by intestinal infection was 53 persons. The rate of death by intestinal infection is 0.006 % of patients of intestinal infection. If patient of intestinal infection is 769 persons, that is 5.9 % of 13,031 persons, 0.006 % of 769 persons is under 1. Thus, this report assumes nobody dies by the contamination of sewerage brought from flood.

The benefit from improvement of hygiene by the flood control is 78,645 colones total in 1996. It will increase by 1.73 % per year based on the rate of population increase.

Table C.3.1.1 shows the estimation of benefits from the flood control plan. First, each benefit of agriculture, roads, labor and health are totaled, then it is converted to the extended price of the annual benefit.

The domestic price usually has a gap from the international price and it is necessary to convert it to international basis. The general formula is that the SCF (standard conversion factor) = (importation of CIF + exportation of FOB) / [(importation of CIF + tax for imports) + (exportation of FOB - tax for exports + subsidy for exports)]. Each date is shown in table C.3.1.2. There are no subsidies for exports in El Salvador. Further, the government repeals the taxes for exports from the point of view of promotion of exportation by the structural adjustment policy. The SCF of El Salvador is 0.96. The

total gross benefit is converted to an extended price with the SCF using the exchange rate of US\$ 1.0 = 8.7 colones. The extended price of annual benefits will be used in the analysis of cost and benefit in next section

(2) Afforestation Plan

Afforestation technology development plan and afforestation extension plan are included in the afforestation plan. Objective area is block A1. Total proposed area of the plantation in the master plan is 15,000 ha and it includes 7,500 ha in planted forest and 7,500 ha in agroforestry. The density of trees in the planted forest is two times of that of agroforestry (2:1). If the total area is converted to planted forest, it is 11,250 ha. The proposed area of the plantation in block A is 2,573 ha. If it is converted to planted forest, the area of the plantation in block A is 1930 ha. Block A includes block A1 and block A2. The area of block A1 (134.57 km²) is 7.2 times of block A2 (18.68 km²). Area of the plantation in block A1 is 1,695 ha.

Production of round wood was 146,000 m³/104,000 ha (1.4 m³/ha) in 1991 according to FAO. The estimated average weight of round wood is 500 kg /m³. Thus, the weight of round wood produced is 700 kg /ha. Weight of round wood produced in block A1 is estimated to be 1,186,500 kg. The estimated price of round wood is 2 colones/kg. Thus, income from round wood in block A1 was 2,373,000 colones.

Production of fuel wood was 4,520,000 m³/104,000 ha (43.4 m³/ha) in 1991 according to FAO. Production of fuel wood in block A1 is 36,781,500 kg, because the weight of fuel wood produced is 21.7 t/ha. The price of fuel wood is 200 colones/m³ or 0.29 colones/kg in 1996. Thus, income from fuel wood in block A1 was 10,666,635 colones.

The period of the plantation of 15 years is proposed. Start of the plantation is the second year of the project. The year of the first harvest of round wood is 11 years after planting which is the 12th year. The increase of income from round wood production from 11 to 26 years after planting is 158,200 colones every year. The year of the first harvest of fuel wood is 6 years after planting and it is the 7th year. The increase of income from fuel wood production from 6 to 21 years after planting is 711,109 colones every year. Table C.3.1.3 shows the benefit of plantations. Total of the annual benefits is US\$ 9,025,000 for 20 project years and US\$ 17,396,000 for 25 project years.

(3) Soil Conservation Plan

The soil conservation plan includes the soil conservation technology development plan, soil conservation technology extension plan and erosion control work plan.

The quantity of soil erosion in arable land and pasture is estimated at 180 t/ha per year. The soil conservation plan will reduce the loss of soil by erosion. The measures proposed by the soil conservation plan seems to reduce the quantity to 90 t/ha/year. The conserved quantity of soil is 1,825,000 in block A1, and 4,984,000 t/year in the basin excluding block A1, and the total is 6,809,000 t/year. In the Jiboa River basin, there are 11,365.2 ha of arable lands and pastures with a slope of over 10 degrees. The objective area is 5,964.9 ha of arable land in dry season with a slope of over 10 degrees. If the soil conservation plan can reduce soil erosion in the area, lost soil is 536.841 t.

The benefit of soil conservation is estimated as the cost of replacing the lost soil. The cost of soil depends on soil condition and it is from 300 to 500 colones per the truck of 8 t. The price of soil averages 400 colones/truck or 50 colones/t. If 536,841 t of soil is artificially replaced, the cost is estimated at 26,842,050 colones. Table C.3.1.4 shows the estimated benefit of the soil conservation plan.

(4) Meteorological & Hydrologic Observation System Plan

Integrated water management aims to secure water for irrigation, to improve the quality of river water for drinking water, to prevent contamination of the source from sightseeing, and to provide information of floods to prevent the flooding of houses. The prevention of loss due to pollution of river water seems to be a major benefit of the measures of environmental conservation.

River water in block A, C and D are not suitable as drinking or agricultural water because the water of Ilopango Lake includes unacceptable concentrations of boron and arsenic.

It can be used for irrigation in blocks B and E. Arable land in block B is 1,793 ha, arable land in block E is 3,627 ha and the total is 5,420 ha. The rate of irrigated lands among arable lands in El Salvador is 21.2 %. Thus the total irrigated land in blocks B and E is estimated at 1,149 ha, where it is possible to implement double cropping. If river water is contaminated, double cropping and production in the dry season is impossible. Yield of maize, planted in 1996, is 4,500 colones/mz (5,625 colones/ha). The income lost by water contamination is 6,463,125 colones.

According to the 1992 census, the rate of river water as a source of drinking water is 18.7 % in Cuscatlan, including mainly block B. The rate of river water as a source of drinking water is 11.4 % in La Paz, including block E. If river water becomes contaminated, it will not be suitable as drinking water. The cost of water varies; people pay 6 colones per drum along the Pan American highway, people pay 50 colones per 5 gallon bottle of water in the supermarket and the cost of piped water is about 50 colones/month per family. Families in the rural area seem to use 1.5 barrels per day of water.

The Population was 43,003 persons in block B in 1996 and 22,376 persons in block E. People using river water was 8,042 persons in block B and 2,551 persons in block E. If family size is estimated as 5 persons, and the family uses a drum of water per day and pays 6 colones, the total water charge is 4,638,420 colones per year if river water becomes contaminated. It increases at 1.73 % per year based on the rate of population increase.

The Jiboa River basin includes Ilopango Lake and is also an area of sightseeing. If the watershed becomes contaminated, sightseers will not come. Hotels and restaurants which are the main activity of sightseeing, bring in 1,547,900,000 colones and 3.2 % of the GDP in 1995. The Jiboa River basin has 605.59 km² which is 2.88 % of the national area, and El Salvador has 21,040 km² in total. It is estimated to get 44,579,500 colones from hotels and restaurants.

The meteorological and hydrologic observation system plan in the master plan will implement also the monitoring of groundwater conditions. The main uses of groundwater are groundwater irrigation and

drinking water. The benefit for groundwater irrigation uses the figure of the groundwater irrigation plan in master plan as mentioned later.

Some people use wells as a source of drinking water. There were 75,925 persons using wells in the Jiboa River basin in 1996. If this is converted to the number of families with an average of 5 persons, there were 15,185 families. Water vendors sell water at 6 colones/drum along the Pan American highway. A family uses one drum of water per a day. If groundwater becomes contaminated, 15,185 families pay 33,255,150 colones for buying water. It increases also at 1.73 % per year based on the rate of population increase.

This value will be lost, if the watershed becomes contaminated. This section assumes that the agricultural surface water in the basin will be contaminated after 50 years to the degree that people can not use it for agriculture. The drinking surface water will be contaminated after 40 years to the degree that people can not use it for drinking. The watershed will be contaminated after 50 years to the degree that it can not attract sightseers. The agricultural groundwater water in the basin will be contaminated after 200 years to the degree that people can not use it for agriculture. The drinking groundwater will be contaminated after 150 years to the degree that people can not use it for drinking. And the pollution is assumed to go forward gradually to a certain degree.

On the other hand, the meteorological and hydrologic observation system plan is an indirect part of environmental conservation measures and it provides only the environmental information and education. Environmental conservation of water needs such direct physical measures as water quality improvement beyond the scope of this plan. Thus the effect of this plan is assumed to be 10 % of lost value for agricultural and drinking water, and sightseeing by pollution.

Further, if people can get correct information about floods, they can handle difficult situations more easily regarding damage to the house by flood and transfer furniture to avoid damage by flood. If they can get information before the flood, it decreases the period of time that laborers cannot work due to flood and which includes time to repair the house, from a week to 4 days. Flooded houses average 89 and there are an average of 2 laborers in each house. The salary of an agricultural laborer is 25 colones per day. The total cost of labor loss is 13,350 colones and it increases at 1.73 % per year based on the rate of population increase. Table C.3.1.5 shows the benefits of the Integrated Water Management Plan.

(5) Swine Production Development Plan

The proposed area is the San Francisco Cooperative. The projected annual sales is 200 heads and the price was 1,320 colones per head in 1996. Thus, the annual gross income is 264,000 colones. The start of the project is the 1st year and the start of income is the 2nd year. C.3.1.6 shows the benefit.

(6) Poultry Farming Development Plan

The proposed area is the Cooperative 30 de Octubre. The projected annual sales is 3,200 doves and the price was 30 colones per dove in 1996. Thus, the annual gross income is 96,000 colones. The start of the project is the 1st year and the start of income is the 2nd year. C.3.1.7 shows the benefit.

(7) Inland Fishery Plan

The proposed area of the pond is 2,000 m², the depth is 1.2 m and the depth of water is 1 m. The volume of water is 20,000 m³. The average number of fish is 330 per 100 m³ (3.3 fish/m³), yielding a total of 66,000 fish per pond. The fish are marketed twice a year and 90% are sold (10% spoil rate). The total fish sold is 118,800. The price is 45 colones for 10 fish or 4.5 colones/fish. Thus, the annual income from fish sales is 475,200 colones. The start of the project is the 2nd year and the start of income is the 3rd year. Table C.3.1.8 shows the benefit.

(8) Animal Health Plan

The animal health plan aims at improving the health of cattle, pigs and poultry in the lower basin, especially in block D. This will decrease the incidence of disease and increase the weight of livestock. The estimation of benefits uses only the latter, because there are no detailed data regarding the incidence of disease of livestock. The number of cattle was estimated at 4,570 heads in block D in 1996, poultry at 18,281 doves and there were no pigs, according to the interim report.

The average weight of cattle in El Salvador was 167 kg/head in 1993 and 171 kg/head in 1994, according to "FAO yearbook: production 1994." These are 79.5 % and 80.7 % of world average for the same years, respectively. If the animal health plan is implemented, the weight of cattle in El Salvador can increase about 25 %, or 42 kg, becoming the same as the world average. The average price of live cattle was 3.83 colones/lb. or 10.27 colones/kg in 1994, according to "Anuario de Estadísticas Agropecuarias 1994-1995." Thus the increased benefit is 431 colones/head or 1,971,224 colones in block D.

Because there are no data regarding the weight of poultry, and improved farming methods are already being implemented by private companies and the extension office, the rate of improvement is assumed as 12.5% of half of cattle. The price of poultry was 30 colones/dove in 1996, the price of improved poultry is estimated as 33.75 colones/dove. Therefore the benefit is 3.75 colones/dove which is 68,554 colones in block D. The total benefit from cattle and poultry is 2,039,778 colones. Table C.3.1.9 shows benefit of animal health improvement plan.

(9) Hillside Agriculture Plan

The target area is 200 m² of arable land in the Cooperativa 30 de Octubre in El Socorro. Existing gross income from maize is 3,375 colones/m² and planned gross income of maize is 4,500 colones/m². The benefit from improved cultivation is 1,125 colones/m². Thus, the total benefit in El Socorro is 225,000 colones.

Soil erosion of arable land is estimated at 180 t/ha and the proposed soil conservation plan will reduce it to 90 t/ha. Since there is 0.8 ha in each m², the estimated reduction of soil erosion in El Socorro is 14,400 t. The price of soil is 50 colones/t. so the cost of replacing lost soil in El Socorro is 720,000 colones. Thus, the total benefit is 945,000 colones. The start of the project is the 1st year and the start of income is the 2nd year. C.3.1 .10 shows the benefit.

(10) Ground Water Irrigation and Drainage Plan

This plan consists of the ground water irrigation plan, drainage improvement plan and rural roads improvement plan.

The proposed areas of this plan are the northwestern foot of San Vicente Volcano (660 ha), the central part of San Pedro Masahuat (655 ha) and the southern part of San Pedro Masahuat (785 ha). After construction, double cropping will be possible on a total of 2,110 ha.

For simplification of discussion we assume maize cultivation in the rainy season. As discussed earlier, gross income from maize is 3,375 colones/mz, planned income is 4,500 colones/mz, and the difference is 1,407 colones/ha. The total increase to the national economy is 2,968,770 colones.

Suppose that farmers in these irrigated areas cultivate tomatoes in the dry season. Gross income from tomatoes is 36,000 colones/mz (45,000 colones/ha). The total increase to the national economy from this irrigation project is 94,950,000 colones in the dry season. Thus, the total increase to the national economy is 97,918,770 colones. Table C.3.1.11 shows the benefits from the irrigation and drainage facility plan.

(11) Multipurpose Community Houses Plan

The multipurpose community house is used for meetings of farmer's organizations, women's organizations, sport clubs, temporary school for children's supplementary class or adult literacy, temporary medical clinic and others.

The benefit of the farmer's organization is derived from the resultant increased production of agriculture, forestry and livestock farming.

The farming improvement plan proposes two types of cropping patterns, the existing pattern in non-irrigated areas, and crop rotation with three crops per year in irrigated areas. There are 14,219.4 ha of arable lands in the Jiboa River basin. There are 5,049.2 ha of arable lands with a slope of less than 5 %. The rate of irrigated land in arable land in El Salvador is 21.2 %. If the arable lands with a slope of less than 5 % in the Jiboa River basin are irrigated to same extent as the national rate, 21.2 % of 5,049.2 ha is 1,070 ha.

For simplification of discussion all areas are assumed to cultivate maize in the rainy season. As discussed earlier, gross income of maize is 3,375 colones/mz, planned income is 4,500 colones/mz, and the difference is 1,407 colones/ha. The increase to the national economy from improved cultivation is estimated at 20,006,695 colones in the Jiboa River basin.

This section assumes that rotation of maize and vegetables is implemented in irrigated areas and the dry season crop in irrigated areas is tomatoes for simplification of discussion. Yield of tomatoes without irrigation is 24,000 colones/mz and tomato with irrigation is 36,000 colones/mz. The difference is 12,000 colones/mz, or 15,000 colones/ha. The increase to the national economy from

cultivation of irrigated areas in the dry season is estimated at 12,840,000 colones in the Jiboa River basin. The total increase is 32,846,695 colones per year.

The increased income from afforestation was discussed earlier. The community house relates only to livestock farming of the animal health plan in block D, because the other proposed plans are implemented by each cooperative.

Table C.3.1.12 shows the potential benefit of community houses for farmer's organizations. Farmer's organization contributes to the increase in production. If there are community houses, farmer's organizations can do their activities, but they must be convenient for the meeting of farmer's organizations. Thus it is assumed that community houses contribute to the increased production from the farmer's organizations and the contribution is 0.5 % of the increased production.

Women's organizations contribute also to the improvement of production, but this contribution is included in the activities from the farmer's organizations. In addition to production, women's organizations grapple with improving living conditions or the promotion of cottage industries. It is difficult to estimate the benefit of the improvement of living conditions. One of main activities in the improvement of living conditions is promoting of use of improved cooking stoves. This can lead to a 20 % reduction in the use of fuel woods.

Total quantity of domestic fuel woods in El Salvador is 3.9 million m³, the efficiency of fuel woods in domestic energy is 54.6 %, and the national population was 5,482,104 in 1996. Thus the quantity of fuel woods used was 1.3 m³/person/year. The rate of using fuel woods for domestic energy is 77.7 % in La Paz, 72.1 % in Cuscatlan, 76.9 % in San Vicente and 19.8 % in San Salvador. The population of the Jiboa River basin was estimated at 150,479 in 1996. The quantity of fuel woods used in the Jiboa River basin is estimated at 195,623 m³/year. The price of fuel wood is about 200 colones/m³ so the total price is 39,124,540 colones. If women's organizations promote the use of improved cooking stoves and they economize 20 % of domestic fuel wood, the effect is 7,824,908 colones/year and it increases at 1.73 % per year based on the rate of population increase.

There were 42,897 housewives in the Jiboa River basin in 1996 (Table C.3.1.13). If 10 % of them participate in the promotion of cottage industries by women's groups, they get 5 colones/day for working one day per week in the cottage industry, and the total increased income is 1,115,400 colones. It increases also at 1.73 % per year based on the rate of population increase.

Table C.3.1.14 shows the potential benefit of community houses for women's organization. If there are community houses, women's organization can do their activities. If there are community houses, but, they are convenient for the meeting of women's organization. Thus it is supposed that community houses contribute the increased production by women's organization and the contribution is 0.5 % of the benefit.

Table C.3.1.15 shows the potential benefit of community houses. Community houses are proposed in 41 cantons in the departments of La Paz, Cuscatlan and San Vicente in the Jiboa River basin. There are 63,357 persons in the 41 cantons which is 43 % of the population the departments of La Paz, Cuscatlan and San Vicente in the Jiboa River basin. Thus, the benefit is 43 % of the total benefit from farmer's and women's organizations. The cost of usage of the community house seems is included in the benefit.

(12) Rural Water Supply Plan

Proposed number of rural water supply facilities is 18,670 and each facility will be constructed in the individual family's house. If the average number of family members is 5 persons, the recipients are 93,300 persons. The rate of contraction of intestinal infection is estimated at 5.9 % in the Jiboa River basin, intestinal parasite is 5.6 %, and total is 11.5 %. This figure includes the rate of contraction of intestinal diseases by other causes, but some persons do not go to the hospital and are not registered to the medical statistics. Thus, the potential patients are estimated to be 10,730 persons. If adult patients are half and they can not work for about 3 days, loss of labor is 16,095 person-days. At 25 colones per day (8 hours of agricultural labor) this amounts to 402,375 colones in 1996. The cost of medicine for the stomach is about 15 colones, therefore the total cost of medicine is 160,950 colones. The total is 563,325 colones. These will increase at 1.73 % per year based on the rate of population increase.

Statistically nobody seems to die by intestinal infection because the rate of death by intestinal infection is 0.006 % and 0.006 % of 5.9 % of 67,000 persons is less than 1 person.

Also, the rural water supply reduces the time needed for drawing water. The average time to draw water is from 1 to 1.5 hours per day. Recipient families are 13,400. Assuming that 1 hour per day can be conserved during the rainy season (180 days), the total time is 2,412,000 hours/year. Based on an agricultural salary of 25 colones per 8 hours, this corresponds to 7,537,500 colones per year. This will increase at 1.73 % per year based on the rate of population increase. Table C.3.1.16 shows the benefits of the rural water supply plan.

(13) Rural Lavatories Construction Plan

Construction of lavatories contributes mainly to the prevention of intestinal infection and intestinal parasite. The total rate of contraction of intestinal infection and intestinal parasite is estimated at 11.5 % in the Jiboa River basin, which is the same rate as Cuscatlan department in 1995. If there are no sanitary lavatories, the sewage contaminates water and agricultural crops. Then the people must drink boiled or purchased water and must not eat raw vegetables. People living in the urban area of San Salvador have a high rate of access to a clean water supply system and can buy raw vegetables in the markets. The potential sufferers of contaminated water are people in the rural areas around San Salvador (24,880 persons) and people of the other three departments (157,879 persons). Thus, the potential patients are estimated at 21,017 persons based on the rate of 11.5 % of 182,759 persons. The cost of medicine is about 15 colones per person and the total cost of medicine is 315,255 colones. If adult patients are half and they can not work for about 3 days, loss of labor is 31,525 person-days, or 788,125 colones, based on the agricultural salary of 25 colones per day. Total benefit is 1,103,380 colones and it will increase at 1.73 % per year based on the rate of population increase.

Intestinal infection is a major cause of death. The rate of death from intestinal infection is 0.006 %. If there are 10,783 patients with intestinal infections which is 5.9 % of 182,759 persons, the number of dead is estimated at 0.6 people, which is less than 1. Thus, this report assumes nobody dies from the contamination of water from sewage.

The Jiboa River basin includes Ilopango lake and is also an area of sightseeing. Non sanitary toilets decrease the value of sightseeing. Hotels and restaurants are the main economic activity for sightseeing, and they generate 1,547,900,000 colones which was 3.2 % of the GDP in 1995. The area of the Jiboa River basin has 605.59 km² which is 2.88 % of the national area, because El Salvador has 21,040 km² in total. Therefore it is estimated that the Jiboa River basin generates 44,579,500 colones from hotels and restaurants. Table C.3.1.17 shows benefit of lavatories.

(14) Rural Roads Consolidation Plan

Rural road improvement plan proposes to repair the third class roads (83.4 km), rural roads A (42.6 km) and rural roads B (148.0 km). It promotes commutation, commerce and transportation.

The regular commuters of the economically active population (EAP) are mainly EAP in industry and commerce. The regular users of roads in the non-EAP are mainly students. Table C.3.1.18 shows these figures in the main 15 municipalities, where the repair of third class roads is proposed. The estimated EAP in these municipalities in 1996 was 58,966 persons. The estimated EAP in industry in these municipalities in 1996 was 11,902 persons. The estimated EAP in commerce in these municipalities in 1996 was 9,125 persons. The students in these municipalities in 1996 was 40,456 persons. Total users was 61,483 persons. They pay an average of 5 colones for one-way and 10 colones for round trip. They go to work and school five days per week, but students have a long vacation. EAP in industry and commerce go to work about 250 days per year and students go to school about 200 days per year. EAP in industry and commerce pay 52,567,500 colones and students pay 80,912,000 colones. The total is 133,479,500 colones.

GDP of commerce in El Salvador was 8,311,300,000 colones in 1995 and transportation was 2,690,600,000 colones. The area of the Jiboa River basin is 2.88 % of the national area. The GDP of commerce in the Jiboa River basin is estimated at 239,365,544 colones and transportation is 77,489,280 colones, if the rate of GDP is the same as the rate of the Jiboa river basin.

The improvement of roads will increase the speed of cars traveling on them. For example, drivers will increase the speed from 50 km/h to 60 km/h. This report assumes that the speed will increase 20 % from existing average speed from the improvement of roads. Table C.3.1.19 shows the potential benefit of the rural road improvement plan.

(15) Agricultural Technical Extension

The intensification plan of agricultural technical extension includes the intensification plan of agricultural improvement extension offices and the plan of promotion and extension of projects in DGRNR. Because the main activity of the agricultural improvement extension office is support for agricultural production, it is assumed that the contribution is 10 % of the increased agricultural production. The estimation of increased agricultural production is discussed above in the benefit of farmer's organizations.

Because the main activity of DGRNR is the direction of conservation, restoration and sustainable development of natural resources, it is assumed that the rate of contribution of afforestation and soil conservation is 10 % of the total estimated benefits.

The extension office also supports inland fisheries and production of livestock. It is assumed that the contribution is 5 % of the benefit of each these activities. In this case, the benefit of inland fisheries, swine production and poultry farming is 22 times that of the proposed plan because the extension office will extend these activities to other municipalities. There are 22 municipalities with an area over 50 % of the Jiboa River basin. The others belong partly to the Jiboa River basin with under 50 % of the municipal area.

DGRNR is responsible for the guidance of irrigation and drainage and the extension office is responsible for the guidance of agricultural production in irrigated areas. However, if the proposed irrigation plan will be not implemented, there will be no irrigated areas for farmers to start agricultural production. Thus, the contribution rate for increased production in irrigated areas is assumed as 5 %. Table C.3.1.20 shows the benefit of the intensification plan of agricultural improvement extension office.

(16) Improved Distribution of Agricultural Products

The benefit of improved marketing is selling during the period with high prices through the storage in during the period with low prices, and appropriate information.

Table C.3.1.21 shows the differences between high and low prices of the main crops. The difference between high and low price of maize is 48.3 colones/ql. The difference between high and low price of frijol is 128 colones/ql. The difference between high and low price of macula is 61.6 colones/ql. The difference between high and low price of rice is 20 colones.

The estimated volume of production in the Jiboa River basin for maize is 290,762 ql, frijol is 38,884 ql, macula is 93,760 ql, and rice is 225,870 ql. It is assumed that increased rate of storage is 5 % in this project for. The benefit from storage is 1,465,699 colones in total.

C3.1.2 Model Project

Some projects in the model project are the same as the plans in the master plan. They are the afforestation model project, the swine production model project, the poultry farming model project, the inland fishery model project, the animal health model project, the model project of agriculture in slope and the agricultural products distribution improvement model project. These are not mentioned in this section.

(1) Soil Conservation Model Project

This project includes the soil conservation technology development model project and the soil conservation technology extension model project. The objective area is block A1. Existing soil erosion in arable land in block A1 is about 180 t/ha. The estimated reduction of soil erosion by the project is 90 t/ha. The area of arable land, pasture and fallow land in block A 1 is 4,315.1 ha and arable land is 1,683 ha. Reduction of soil erosion through this project would amount to 151,470 t in arable land.

It is assumed that the benefit of soil conservation is the cost of replacing lost soil. It is a negative benefit. This project does not make new benefit like agricultural production, but prevents the loss like environmental conservation. The price of soil is from 300 colones to 500 colones for an 8 t. truck, or about 50 colones/t. Thus, the cost of replacing lost soil in arable lands of block A1 is 7,573,500 colones. Table C.3.1.22 shows the potential benefit.

(2) Meteorological and Hydrologic Observation System Model Project

The difference between master plan and model project of meteorological and hydrologic observation system is that the master plan includes monitoring of groundwater, but model project does not include monitoring of groundwater. The benefit of the model project is the total benefit of the master plan minus the benefit of monitoring of groundwater. The benefit of this model project is shown already in table C.3.1.5.

(3) Ground Water Irrigation Model Project

The objective area is 120 ha in El Carmen and San Pedro Masahuat. The benefit of the project is increased production of maize in the rainy season and new production of vegetables in the dry season.

Current gross income of maize is 3,375 colones/mz and planned gross income of maize is 4,500 colones/mz. The effect of improved cultivation is 1,125 colones/mz (1,407 colones/ha). The benefit of maize production in the rainy season is 168,840 colones. Gross income from tomatoes is 36,000 colones/mz (45,000 colones/ha) in El Salvador. The benefit from tomato production in the dry season in El Carmen is 5,400,000 colones. The total benefit is 5,568,840 colones. Table C.3.1.23 shows the benefit details and the total is US\$ 9,340,000 in 90 project years.

(4) Agricultural Technical Extension

The intensification plan of agricultural technical extension in master plan aims to improve the production of agriculture, forestry and livestock in the Jiboa River basin. There are 9 extension offices in the Jiboa River basin. The objective area of the model project of agricultural technical extension is the area of 3 selected extension offices. Thus, it is assumed that the benefit of the model project is one third of the benefit of the master plan. Table C.3.1.24 shows the benefit.

C.3.2 Economic Evaluation

C.3.2.1 Methodology

Cost estimations present costs of facilities and equipment from destination of payments in chapter 8. According to them, Consultant fee and contingency are calculated in accordance with a certain rate. In that case, domestic payments are converted to the extended price. The reason and method discussed earlier. The period of economic evaluation is 20 years.

It is assumed in the cost estimation of the master plan and model project that the costs of land and operation and maintenance cost is not necessary, because existing facilities or land are used or existing staffs can operate and maintain them. Low cost of operation and maintenance is adopted as the basic strategy in the project design. If they are necessary in economic evaluation, however, this section estimates them, based on local conditions.

The calculations of economic internal rate of return (EIRR) of the master plan are shown from table C.3.2.1 to table C.3.2.32. Tables with odd numbers show the cost composition of each master plan. Tables with even numbers show the cash flow of each master plan for 20 years

The calculations of EIRR of model project are shown from table C.3.2.33 to table C.3.2.40. Tables with uneven number in last order show the costs composition of each master plan. Tables with even number in last order show the cash flow of each master plan during 20 years. Some model projects which are not calculated because their model projects are the same as the master plan.

C.3.2.2 EIRR

Table C.3.2.41 shows the results of each calculation of EIRR of the master plan in a 20 year period. The EIRR shows only the opportunity cost of capital. The EIRR is used as a comparison among the many plans and projects. Naturally, some plans with relatively higher EIRR are good plans.

Projects with an EIRR of over 10% are generally considered appropriate in view of its economic impact. Those with an EIRR of under 10 % are inferior plans. Although fuelwood and timber production are the only afforestation benefits underscored, the afforestation plan shall have a significant impact on the environment.

Table C.3.2.42 shows the EIRR of model projects in a 20 year period.

C.3.2.3 Income per Recipient

There is another type of economic evaluation, that is comparison of total income per recipient at present value. Some master plans and model projects are excluded in the analysis of comparison of total income per recipient, because they are not economically sound and their EIRR is under 0 %. The calculation of present value adopts EIRR of 6 % as the discount rate. Some master plans and model projects are excluded, because they have very low EIRRs.

Table C.3.2.43 shows net cash flows of master plans and table C.3.2.44 shows present value of future income of master plans at the discount rate of 6 % for 20 years. Table 3.2.45 shows net cash flows of the model project and table C.3.2.46 shows present value of future income of the model project at the discount rate of 6 % for 20 years.

Table C.3.2.47 shows total income per recipient of the master plan at the present value of 6 % for 20 years. Greatest income per recipient is the hillside agriculture master plan, second is the groundwater irrigation master plan, third is the inland fishery master plan and fourth is the swine production master plan. These have high total incomes of over US\$ 500, and are superior master plans in terms of income per recipient.

Table C.3.2.48 shows total income per recipient of the model project at the present value of 6 % for 20 years. Greatest income per recipient is the groundwater irrigation model project, second is hillside agriculture model project, third is the inland fishery master plan and fourth is the swine production master plan. These have high total income of over US\$ 500, and are superior model projects in terms of income per recipient.

C.3.2.4 Economic Recommendations

Based on the results of the economic evaluation, the master plans and model projects considered as excellent should be implemented. Social instability still prevails in El Salvador, especially in rural areas, as an aftermath of the 12 year civil war. Since the rural areas are mainly into farming, the development of agriculture is perceived to promote social development and stability. Accordingly, the conduct of ordinary master plans and model projects should also be given importance.

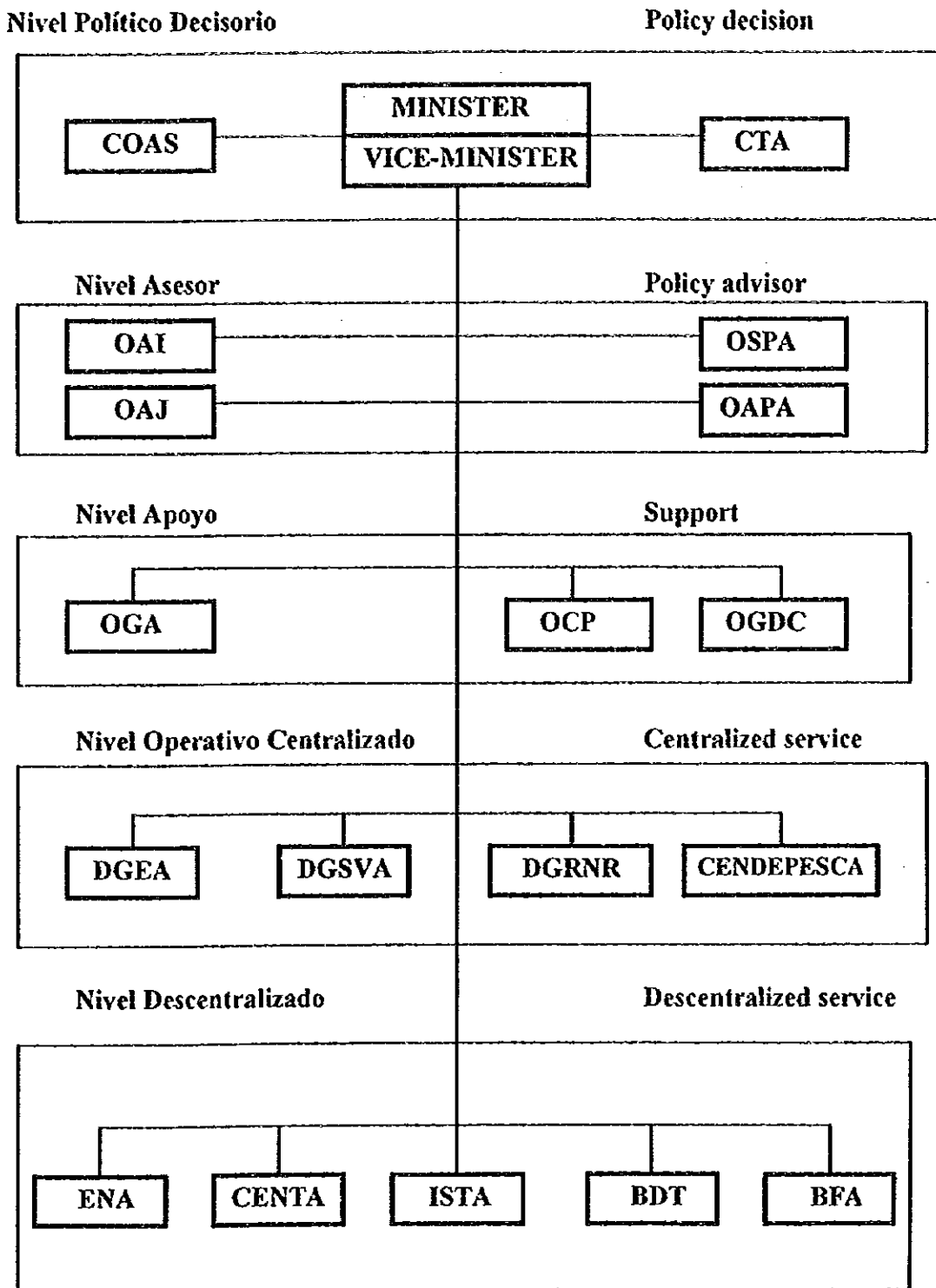


Figure 1.1. Organization chart of MAG
 Figura 1.1. Organigrama del MAG

Table C.1.1 Sum of Technical & Financial Cooperation : Source of Funds (1/4)
 Cuadro C.1.1 Suma de Cooperación Técnica y Financiera : Fuente de Financiamiento (1/4)

	1992	1993	1994	1995	1996	1992-96	ALL/TODOS
BILATERAL	265,784,517	319,798,842	187,952,532	68,463,031	50,247,704	892,246,626	1,636,362,648
MULTILATERAL	115,844,840	227,747,063	210,720,066	239,659,426	262,150,692	1,056,122,087	2,430,378,275
NGO/ONG	8,930,216	5,030,036	6,709,822	5,711,541	4,871,438	31,253,053	32,426,909
TOTAL	390,559,573	552,575,941	405,382,420	313,833,998	317,269,834	1,979,621,766	4,099,167,832

Table C.1.1 Sum of Technical & Financial Cooperation : NGO (2/4)
 Cuadro C.1.1 Suma de Cooperación Técnica y Financiera : ONG (2/4)

	1992	1993	1994	1995	1996	TOTAL
CRS	4,041,225	4,056,185	3,322,010	3,631,541	2,971,438	18,022,399
DIAGONIA:						
SUE			1,500,000	2,000,000	1,900,000	5,400,000
MSF	81,000	460,000	177,000	80,000		798,000 (2)
ONG:ESPANA	4,807,991	513,851	1,710,812			7,032,654
TOTAL	8,930,216	5,030,036	6,709,822	5,711,541	4,871,438	31,253,053
						32,426,909

Note : (1) Only total cost of the project has been reported.

(2) Given that the information received does not include the total cost of the project.
 The total 1992-1996 is considered as is.

Table C.1.1 Sum of Technical & Financial Cooperation : Bilateral Donor (3/4)
 Cuadro C.1.1 Suma de Cooperación Técnica y Financiera : Cooperante Bilateral (3/4)

	(US\$)									
	1992	1993	1994	1995	1996	1992-96	TOTAL	ALL/TODOS		
AUSTRALIA	10,000					10,000		10,000	(2)	
BELGIUM								1,429,000	(1)	
CANADA	3,629,825	951,651	518,518	1,481,481	3,703,704	10,285,179		30,099,994		
CHILE		14,200				14,200		14,200	(2)	
DENMARK	2,664,822	3,478,267	300,000			6,443,089		6,443,089	(2)	
FRANCE	169,492	657,384	635,430			1,462,306		2,176,898		
GERMANY								234,812,000	(1)	
ITALY								136,346,155	(1)	
JAPAN	13593798	114,007,000	115,183,926	215,550		243,000,274		243,333,274		
KOREA	150,000	150,000	150,000	150,000		600,000		600,000	(2)	
NETHERLANDS P. BAJOS	200,000	16,291,000	3,427,000	1,310,000	114,000	21,342,000		26,388,000		
NORWAY	4,149,350	1,841,353	672,093			6,662,796		7,385,299		
SPAIN	2,687,156	4,641,031	2,580,606	326,000		10,234,793		17,633,849		
SWEDEN	6,263,600	6,544,698	1,100,000	1,700,000	1,700,000	17,308,298		18,973,199		
SWITZERLAND	164,474	847,258	7,517,959			8,529,691		8,529,691	(2)	
USA	232,102,000	170,375,000	55,867,000	63,280,000	44,730,000	566,354,000		902,188,000		
TOTAL	265,784,517	319,798,842	187,952,532	68,463,031	50,247,704	892,246,626		1,636,362,648		

Note : (1) Only total cost of the project has been reported.

(2) Given that the information received does not include the total cost of the project.
 The total 1992-1996 is considered as is.

Table C.1.1 Sum of Technical & Financial Cooperation : Multilateral Donor (4/4)
Cuadro C.1.1 Suma de Cooperación Técnica y Financiera : Cooperante Multilateral (4/4)

	(US\$)						TOTAL	
	1992	1993	1994	1995	1996	1992-96	ALL/TODOS	
CABEI	12,414,300	24,938,600	33,441,300	59,608,700	475,000	130,877,900	184,963,900	
EEC							244,645,403 (1)	
FAO	127,276	314,163	434,098	207,000		1,082,537	1,230,000	
IAEA	185,895	157,534	199,490	485,620	128,000	1,156,539	1,156,539	
ICITI		77,500	100,000	85,000		262,500	262,500 (2)	
IDB	65,901,100	110,014,700	123,831,000	152,025,600	160,281,700	612,054,100	1,419,376,200	
IFAD		1,246,000	2,875,974	3,585,482	3,438,066	11,145,522	17,562,944	
IICA							408,000 (1)	
ILO	23,942	42,582	49,201			115,725	115,725 (2)	
IMF		34,816,700				34,816,700	34,816,700 (2)	
IOM		221,100	328,000	805,000	805,000	2,159,100	2,159,100	
OIRSA							50,000 (1)	
PAHO/WHO/OPS/OMS	1,474,095	1,644,331	1,689,050	1,466,050	1,315,255	7,588,781	7,597,781	
UNDP	2,400,060	2,541,290	1,715,627	855,053		7,512,030	11,780,421	
UNESCO	83,500	126,750				210,250	224,750	
UNFPA	651,350	693,942	1,088,961	539,557	217,671	3,191,481	4,024,412	
UNICEF	1,086,300	1,782,400	1,547,800	1,087,400	990,000	6,493,900	6,503,900	
UNIFEM		49,471	119,565	108,964		278,000	278,000 (2)	
WFP	22,857,022	8,300,000	1,300,000	9,900,000	5,800,000	48,157,022	70,022,000	
WORLD BANK	8,640,000	40,780,000	42,000,000	8,900,000	88,700,000	189,020,000	423,200,000	
B. MUNDIAL								
TOTAL	115,844,840	227,747,063	210,720,066	239,659,426	262,150,692	1,056,122,087	2,430,378,275	

Note : (1) Only total cost of the project has been reported.

(2) Given that the information received does not include the total cost of the project. The total 1992-1996 is considered as is.

Source : UNDP, Technical & Financial Cooperation with El Salvador as Reported by Donors (1992-1996), July 1995.

Table C.1.2 Donors by Sectors in 1992-1996 : Bilateral (1/6)
Cuadro C.1.2 FUENTES POR SECTOR PARA EL PERIODO 1992-1996 : Bilateral (1/6)

	POLITICAL AFFAIRS/ ASUNTOS POLITICOS	GENERAL DEVELOPMENT ISSUES/ ASUNTOS DE DESARROLLO GENERAL	GENERAL STATISTICS/ ESTADISTICAS GENERALES	NATURAL RESOURCES/ RECURSOS NATURALES	ENERGY/ ENERGIA	AGRICULTURE, FORESTRY & FISHERIES/ AGRICULTURA, SILVICULTURA Y PESQUERIA	INDUSTRY/ INDUSTRIA	TRANSPORT/ TRANSPORTE	COMMUNICA- TIONS & IN- FORMATION/ COMUNICA- CIONES E IN- FORMACION	TRADE & DEVELOPMENT / COMERCIO Y DESARROLLO
CANADA		7,618,333								
CHILE						4,900				
DENMARK		2,892,898				123,660				
FRANCE		1,110,748				18,692				
JAPAN		21,748,000		75,360,000		12,819,149		113,169,574	900,000	
KOREA		60,000								
P. BAJOS	117,000	5,432,000		630,000		1,366,000				
NETHERLANDS										
NORWAY	1,558,317									
SPAIN	96,288	2,188,224		449,688		833,331	158,237		88,000	66,858
SWEDEN	4,626,398									
SUECIA	76,868					325,586				
SUIZA		7,183,908								
SWITZERLAND										
USA	14,750,000	394,151,000				7,700,000	18,000,000			8,500,000
EEUU	21,224,871	442,925,111		76,439,688		23,191,318	18,158,237	113,169,574	121,858	8,566,858
TOTAL	1.3%	27.1%		4.7%		1.4%	1.1%	6.9%	0.0%	0.5%

Table C.1.2 Donors by Sectors in 1992-1996 : Bilateral (2/6)
 Cuadro C.1.2 FUENTES POR SECTOR PARA EL PERIODO 1992-1996 : Bilateral (2/6)

	HUMAN POPULATION / POBLACION	HUMAN SETTLEMENTS/ ASENTAMIENTOS HUMANOS	HEALTH / SALUD	EDUCATION/ EDUCACION	EMPLOYMENT / EMPLEO	HUMANITARIAN ASSISTANCE/ ASISTENCIA HUMANITARIA	SOCIAL DEVELOPMENT / DESARROLLO SOCIAL	CULTURE/ CULTURA	SCIENCE & TECHNOLOGY / CIENCIA Y TECNOLOGIA	ENVIRONMENT / MEDIO AMBIENTE	TOTAL
AUSTRALIA							10,000				10,000
AUSTRALIA											1,429,000
BELGIUM							2,666,846				30,099,994
CANADA											14,200
CHILE		460,824	9,300	361,237			2,523,057		81,413		6,443,089
DENMARK		9,346					1,009,140				2,176,698
FRANCE		25,187,500	28,972	3,125,000			45,249,500				234,812,000
GERMANY	5,562,500	108,246,312	62,750,000	2,048,221		23,000,000			4,000,000		136,346,155
ITALY		1,818,000		665,000			10,710,768	380,000			243,333,274
JAPAN	49,993		5,712,790								600,000
KOREA		600,000	5,760,000	665,000		3,547,000	2,673,000			1,217,000	26,388,000
NETHERLANDS		1,866,814	122,000	58,000	9,150	899,000	2,695,018			99,000	7,385,299
NORWAY		2,606,630	589,908	4,724,128	86,000	30,742	404,608	103,462		140,000	17,633,849
SPAIN			8,000,000			2,163,700	4,183,101				18,973,199
SWEDEN		24,425					918,904				8,529,691
SWITZERLAND											
USA	5,812,493	140,819,851	214,321,970	73,146,586	18,595,150	30,695,442	76,443,562	483,462	16,081,413	23,456,000	1,636,362,648
TOTAL	0.3%	8.6%	13.1%	4.5%	1.1%	1.9%	4.7%	0.0%	1.0%	1.4%	100.0%

Table C.1.2 Donors by Sectors in 1992-1996 : Multilateral (3/6)
 Cuadro C.1.2 FUENTES POR SECTOR PARA EL PERIODO 1992-1996 : Multilateral (3/6)

	POLITICAL AFFAIRS/ ASUNTOS POLITICOS	GENERAL DEVELOPMENT ISSUES/ ASUNTOS DE DESARROLLO GENERAL	GENERAL STATISTICS/ ESTADISTICAS GENERALES	NATURAL RESOURCES/ RECURSOS NATURALES	ENERGY/ ENERGIA	AGRICULTURE, FORESTRY & FISHERIES/ AGRICULTURA, SILVICULTURA Y PESQUERIA	INDUSTRY/ INDUSTRIA	TRANSPORT/ TRANSPORTE	COMMUNICATIONS & INFORMATION/ COMUNICACIONES E INFORMACION	TRADE & DEVELOPMENT / COMERCIO Y DESARROLLO
CABEI		55,761,200		1,788,400	28,259,000		15,611,100	39,169,200		14,833,135
EEC	2,543,031	44,293,451			989,691	19,101,031	10,688,660			
FAO						1,230,000				
IAEA					688,618	101,181				
ICATI						35,000	15,000			
IDB		392,797,500		201,105,000	358,438,700	10,875,000	28,220,000	395,000,000	5,579,000	
IFAD						9,000,000				
IICA		134,000				188,000			106,000	
ILO		11,032				1,000				
IMF		34,816,700								
IOM		200,000								
OIRSA										
PAHO/WHO/OPS/OMS		178,000		911,225		50,000				
UNDP	119,742	7,253,009		136,340		1,687,708	255,224			391,285
UNESCO		40,000								
UNFPA			1,003,442							
UNICEF		334,500	216,900							
WFP		10,400,000								
WORLD BANK		273,500,000								
B. MUNDIAL		819,719,392	1,220,342	203,940,965	397,376,009	82,248,920	54,789,984	434,169,200	5,685,000	15,224,420
TOTAL	2,662,773	819,719,392	1,220,342	203,940,965	397,376,009	82,248,920	54,789,984	434,169,200	5,685,000	15,224,420
	0.1%	33.7%	0.1%	8.4%	16.4%	3.4%	2.3%	17.9%	0.2%	0.6%

Table C.1.2 Donors by Sectors in 1992-1996 : Multilateral (4/6)
Cuadro C.1.2 FUENTES POR SECTOR PARA EL PERIODO 1992-1996 : Multilateral (4/6)

	POPULATION / POBLACION	HUMAN SETTLEMENTS/ ASENTAMIENTOS HUMANOS	HEALTH / SALUD	EDUCATION/ EDUCACION	EMPLOYMENT / EMPLEO	SOCIAL DEVELOPMENT / DESARROLLO SOCIAL	CULTURE/ CULTURA	SCIENCE & TECHNOLOGY / CIENCIA Y TECNOLOGIA	ENVIRONMENT / MEDIO AMBIENTE	TOTAL
CABEI			45,900,000	475,000						184,963,900
EEC		1,345,260	72,710,856	11,285,054	15,670,103	9,675,095	41,510,036			244,645,403
FAO						116,642				1,230,000
IAEA			250,098							1,156,539
ICITI			43,000					90,000	79,500	262,500
IDB		6,237,000		17,338,000		3,186,000	600,000			1,419,376,200
IFAD						8,562,944				17,562,944
IICA					20,250	74,693	8,750			408,000
ILO										115,725
IMF										34,816,700
IOM		901,100		200,000		858,000				2,159,100
OIRSA										50,000
PAHO/WHO/OPS/OMS		125,900	5,660,956	731,800		296,759		415,435		7,597,781
UNDP				300,000		260,500				11,780,421
UNESCO		664,419		64,500			57,250	15,000		224,750
UNFPA						653,924				4,024,412
UNICEF		2,367,046	2,627,500	517,400		2,807,600				6,503,900
UNIFEM						278,000				278,000
WFP		8,422,000	45,200,000	6,000,000						70,022,000
WORLD BANK						65,000,000				423,200,000
B. MUNDIAL						79,096,237	57,250	105,000	519,935	2,430,378,275
TOTAL	3,393,946	16,668,679	172,382,410	70,632,004	15,744,796	54,741,013	57,250	105,000	519,935	2,430,378,275
	0.1%	0.7%	7.1%	2.9%	0.6%	3.3%	0.0%	0.0%	0.0%	100.0%

Table C.1.2 Donors by Sectors in 1992-1996 : NGOs (5/6)
Cuadro C.1.2 FUENTES POR SECTOR PARA EL PERIODO 1992-1996 : ONGs (5/6)

	GENERAL DEVELOPMENT ISSUES/ ASUNTOS DE DESARROLLO GENERAL	GENERAL STATISTICS/ ESTADÍSTICAS GENERALES	NATURAL RESOURCES/ RECURSOS NATURALES	ENERGY/ ENERGIA	AGRICULTURE FORESTRY & FISHERIES/ AGRICULTURA SILVICULTURA Y PISCICULTURA	INDUSTRY/ INDUSTRIA	TRANSPORT/ TRANSPORTE	COMMUNICATIONS & INFORMATION/ COMUNICACIONES E INFORMACION	TRADE & DEVELOPMENT / COMERCIO Y DESARROLLO
CRS	11,259,343		2,945,126		1,972,013	1,537,018			
NGO: SPAIN	157,741				634,961	294,074			
TOTAL	11,417,084		2,945,126		2,606,974	1,831,092			114,444
	35.2%		9.1%		8.0%	5.6%			0.4%

Table C.1.2 Donors by Sectors in 1992-1996 : NGOs (6/6)
Cuadro C.1.2 FUENTES POR SECTOR PARA EL PERIODO 1992-1996 : ONGs (6/6)

	HUMAN SETTLEMENTS/ ASENTAMIENTOS HUMANOS	HEALTH / SALUD	EDUCATION/ EDUCACION	EMPLOYMENT / EMPLEO	HUMANITARIAN ASSISTANCE/ ASISTENCIA HUMANITARIA	SOCIAL DEVELOPMENT / DESARROLLO SOCIAL	CULTURE/ CULTURA	SCIENCE & TECHNOLOGY / CIENCIA Y TECNOLOGIA	TOTAL
CRS					19,942	165,009			18,322,256
DIAKONIA:		423,805							
SWEDEN						5,400,000			5,400,000
DWF		513,000			285,000				798,000
NGO: SPAIN	3,609,696	142,963	858,222	1,130,894	843,152	122,508			7,906,653
TOTAL	3,609,696	1,079,768	858,222	1,130,894	1,148,094	5,687,515			32,426,909
	11.1%	3.3%	2.6%	3.5%	3.5%	17.5%			100.0%

Source : UNDP, Technical & Financial Cooperation with El Salvador as Reported by Donors (1992-1996), July 1995.

Table C.1.3 TECHNICAL & FINANCIAL COOPERATION PROJECTS IN AGRICULTURE, FORESTRY & FISHERIES (1992-1996) (1/7)
Cuadro C.1.3 PROYECTOS DE COOPERACION TECNICA Y FINANCIERA EN AGRICULTURA, SILVICULTURA Y PESQUERIA (1992-1996) (1/7)

SUBSECTOR: POLICIES & PLANNING / POLITICAS Y PLANIFICACION	SOURCE/ FUENTE	EXECUTING AGENCY/ AGENCIA DE EJECUCION	TYPE/ TIPO*	LOCATION UBICACION	TOTAL COST/ COSTO TOTAL	
					92-96	ALL/ TODOS
TERMINATED PROJECTS/PROYECTOS TERMINADOS						
AGRICULTURAL & RURAL DEVELOPMENT NATIONAL POLICY/ POLITICA NACIONAL DE DESARROLLO AGRICOLA Y RURAL	FAO FAO	GOVERNMENT GOBIERNO	T	NATIONAL NACIONAL	250,000	250,000
AGROFORESTRY SUPPORT FOR LOW-INCOME COMMUNITIES/ APOYO AGROFORESTAL A COMUNIDADES D/ESCASO RECURS.	UNDP PNUD	FAO FAO	TF	NATIONAL NACIONAL	183,998	1,314,899
RURAL ENTERPRISE DEVELOPMENT II/ DESARROLLO DE EMPRESAS RURALES II	USA EEUU	NGO ONG	TF	NATIONAL NACIONAL	2,000,000	6,500,000
AGRICULTURAL SECTOR REFORM & INVESTMENT (PRISA I)/ REFORMA E INVERSION AL SECTOR AGRICOLA (PRISA I)	UNDP PNUD	GOVERNMENT GOBIERNO	TF	NATIONAL NACIONAL	-	-
MASTERPLAN FOR FARMING DEVELOPMENT/ PLAN MAESTRO DE DESARROLLO AGROPECUARIO	FAO FAO	NOT AVAILABLE NO DISPONIBLE	T	CHALATENANGO CHALATENANGO	210,000	210,000
SUPPORT TO PLANIFICATION SECTOR MAG./ APOYO AL SECTOR PLANIFICACION MAG.	CHILE CHILE	NOT AVAILABLE NO DISPONIBLE	-	-	4,900	-
AGRICULTURAL TECHNIQUE APS/ TECNICA AGRICOLA EL SALVADOR APS	SWITZERLAND SUIZA	NOT AVAILABLE NO DISPONIBLE	T	NATIONAL NACIONAL	20,394	-
RURAL DEVELOPMENT/ DESARROLLO RURAL	ILO OIT	MULTILATERAL	T	NATIONAL NACIONAL	1,000	-
DRI III LA CALIFORNIA/ DRI III LA CALIFORNIA	SPAIN ESPANA	NOT AVAILABLE NO DISPONIBLE	F	USULUTAN USULUTAN	17,375	17,375
TRAINING FOR FARMING COOPERATIVES/ CAPACITACION PARA COOPERATIVAS AGROPECUARIAS	SPAIN ESPANA	NOT AVAILABLE NO DISPONIBLE	F	NATIONAL NACIONAL	7,425	7,425
DRI III CALIFORNIA COOPERATIVE/ DRI III COOPERATIVA CALIFORNIA	SPAIN ESPANA	NOT AVAILABLE NO DISPONIBLE	F	USULUTAN USULUTAN	46,404	46,404
SUB-TOTAL					2,741,496	8,346,103

* T = TECHNICAL/TECNICA F = FINANCIAL/FINANCIERA

Table C.1.3 TECHNICAL & FINANCIAL COOPERATION PROJECTS IN AGRICULTURE, FORESTRY & FISHERIES (1992-1996) (2/7)
Cuadro C.1.3 PROYECTOS DE COOPERACION TECNICA Y FINANCIERA EN AGRICULTURA, SILVICULTURA Y PESQUERIA (1992-1996) (2/7)

SUBSECTOR: POLICIES & PLANNING / POLITICAS Y PLANIFICACION		EXECUTING AGENCY/ AGENCIA DE EJECUCION		SOURCE/ FUENTE		LOCATION/ UBICACION	TOTAL COST/ COSTO TOTAL 92-96 ALL/ TODOS
<i>PROJECTS IN EXECUTION/ PROYECTOS EN EJECUCION</i>							
TRAINING FOR PRODUCTIVITY COMPETITIVENESS/ CAPACITACION PARA PRODUCTIVIDAD COMPETITIVA	NGO ONG	USA EEUU	NATIONAL NACIONAL	TF			5,700,000 19,000,000
CREDIT & TECH-ASSIST-F/PRODUCT DIVERSIFICATION/ CREDITOS Y ASISTENCIA TECNICA P/DIVERSIFIC. CULTIVO	NGO ONG	CRS CRS	NATIONAL NACIONAL	TF			1,677,470 1,677,470
DEVELOPMENT OF SUSTAINABLE AGRICULTURE - CORINTO/ DESARROLLO DE LA AGRICULTURA SOSTENIBLE- CORINTO	NGO ONG	CRS CRS	MORAZAN MORAZAN	TF			164,725 164,725
SUPPORT FOR THE IFAD LOAN/ APOYO PRESTAMO FIDA	GOVERNMENT GOBIERNO	UNDP PNUD	UPPER-CENTRAL PARACENTRAL	TF			149,460 240,016
NATIONAL TECHNICAL ASSISTANCE UNIT FOR AGRIC/ UNIDAD NACIONAL ASISTENCIA TECNICA AGRICOLA (RUTA)	GOVERNMENT GOBIERNO	UNDP PNUD	NATIONAL NACIONAL	TF			125,076 132,793
AGRICULTURAL DEVELOPMENT FOR SMALL PRODUCERS/ DESARROLLO AGRICOLA PARA PEQUEÑOS PRODUCTORES	MULTILATERAL	IFAD FIDA	S. VICEN., CABANAS S. VICEN., CABANAS	T			7,145,000 9,000,000
SUSTAINABLE AGRICULTURE PROJECT IN HILLSIDE ZONES/ PROYECTO AGRICULTURA SOSTENIBLE EN ZONAS DE LADERA	MULTILATERAL	NETHERLANDS P. BAJOS	CABANAS CABANAS	T			560,000 4,200,000
AGRICULTURAL SECTOR REFORM & INVESTMENT (PRISA II)/ REFORMA E INVERSION AL SECTOR AGRICOLA (PRISA II)	NOT AVAILABLE NO DISPONIBLE	UNDP PNUD	NATIONAL NACIONAL	-			- -
AGRICULTURAL AND FORESTRY DEVELOPMENT/ DESARROLLO AGROPECUARIO Y FORESTAL	GOVERNMENT GOBIERNO	EEC CEE	CUSCAT., CABANAS CUSCAT., CABANAS	TF			- 2,608,186
EL SALVADOR PRECODEPA AP3/ PRECODEPA EL SALVADOR AP3	NOT AVAILABLE NO DISPONIBLE	SWITZERLAND SUIZA	NATIONAL NACIONAL	T			29,227 -
AGRIC. CREDIT PROG. WOMEN, PRODUCTION & ORGANIZATION/ PROG. CREDITO AGRICOLA MUJER, PRODUCCION Y ORGANIZ.	NGO ONG	NETHERLANDS P. BAJOS	NATIONAL NACIONAL	T			806,000 1,060,000
SUPPRT TO AGRARIAN REFORM PHASE II/ APOYO REFORMA AGRARIA FASE II	GOVERNMENT GOBIERNO	EEC CEE	USULUTAN USULUTAN	TF			- 16,494,845
SUB-TOTAL							16,356,938
							54,576,035

Table C.1.3 TECHNICAL & FINANCIAL COOPERATION PROJECTS IN AGRICULTURE, FORESTRY & FISHERIES (1992-1996) (3/7)
 Cuadro C.1.3 PROYECTOS DE COOPERACION TECNICA Y FINANCIERA EN AGRICULTURA, SILVICULTURA Y PESQUERIA (1992-1996) (3/7)

SUBSECTOR: POLICIES & PLANNING / POLITICAS Y PLANIFICACION						
	SOURCE/ FUENTE	EXECUTING AGENCY/ EJECUCION	TYPE/ TIPO*	LOCATION UBICACION	92-96 COSTO TOTAL	TOTAL COST/ COSTO TOTAL ALL/ TODOS
<i>PROJECTS FOR APPROVAL/PROYECTOS EN APROBACION</i>						
AGRICULTURAL PROJECT/ PROYECTO DE AGRICULTURA	FRANCE FRANCIA	NOT AVAILABLE NO DISPONIBLE	-	-	18,692	-
<i>PROJECTS IN FORMULATION/PROYECTOS EN FORMULACION</i>						
ANALYSIS SITUATION/PERSPECTIVES AGRICULTURE SECTOR/ ANALISIS DE SITUACION/PERSPECTIVAS S. AGROPECUARIO	IICA IICA	MULTILATERAL	TF	NATIONAL NACIONAL	-	18,000
TOTAL					19,117,146	629,401,328
SUBSECTOR: CROP PRODUCTION & PROTECTION / PRODUCCION Y PROTECCION DE LOS CULTIVOS						
	SOURCE/ FUENTE	EXECUTING AGENCY/ EJECUCION	TYPE/ TIPO*	LOCATION UBICACION	92-96 COSTO TOTAL	TOTAL COST/ COSTO TOTAL ALL/ TODOS
<i>TERMINATED PROJECTS/PROYECTOS TERMINADOS</i>						
PROMOTION OF BASIC GRAINS PRODUCTION/ FOMENTO A LA PRODUCCION DE GRANOS BASICOS	JAPAN JAPON	NOT AVAILABLE NO DISPONIBLE	F	NATIONAL NACIONAL	12,745,000	-
INTENSIVE RICE PRODUCTION BY FLOODING/ PRODUCCION INTENSIVA DE ARROZ POR INUNDACION	JAPAN JAPON	NOT AVAILABLE NO DISPONIBLE	F	SAN MIGUEL SAN MIGUEL	55,580	55,580
SUGAR CANE PRODUCTION-CIUDELA GUILLERMO UNGO/ PRODUCCION DE CANA AZUCAR-CIUDELA GUILLERMO UNGO	NGO:SPAIN ONG:ESPAÑA	NGO ONG	TF	GUAZAPA GUAZAPA	62,000	62,000
RENEWAL AND MANAGEMENT OF 8TH.OF COFFEE USULUTAN/ MANEJO Y RENOVACION DE 8TH.DE CAFETALES USULUTAN	NGO:SPAIN ONG:ESPAÑA	NGO ONG	TF	USULUTAN USULUTAN	205,049	205,049
SUPPORT TO GRAIN PROD. AND CONCENTRATED FOOD PLANT/ APOYO PROD.GRANOS/ CONSTRUC.FABRICA DE CONCENTRADO	NGO:SPAIN ONG:ESPAÑA	NGO ONG	TF	CUSCATLAN CUSCATLAN	245,319	245,319
SUB-TOTAL					13,312,948	567,948

Table C.1.3 TECHNICAL & FINANCIAL COOPERATION PROJECTS IN AGRICULTURE, FORESTRY & FISHERIES (1992-1996) (4/7)
Cuadro C.1.3 PROYECTOS DE COOPERACION TECNICA Y FINANCIERA EN AGRICULTURA, SILVICULTURA Y PESQUERIA (1992-1996) (4/7)

SUBSECTOR: CROP PRODUCTION & PROTECTION / PRODUCCION Y PROTECCION DE LOS CULTIVOS		EXECUTING AGENCY/ AGENCIA DE EJECUCION	SOURCE/ FUENTE	TYPE/ TIPO*	LOCATION/ UBICACION	TOTAL COST/ COSTO TOTAL ALL/ TODOS
<i>PROJECTS IN EXECUTION/ PROYECTOS EN EJECUCION</i>						
INTEGRATED VEGETABLE PROTECTION/ PROTECCION VEGETAL INTEGRADA	GERMANY ALEMANIA	GOVERNMENT GOBIERNO	T	NATIONAL NACIONAL	-	6,125,000
RESTRUCTURE OF SEED CERTIFICATION AGENCY/ REESTRUCTURACION DEL ORG.CERTIFICADOR DE SEMILLAS	FAO	NOT AVAILABLE NO DISPONIBLE	T	NATIONAL NACIONAL	175,000	175,000
SUSTAINABLE AGRICULTURE IN SLOPED ZONES/ AGRICULTURA SOSTENIBLE EN ZONAS DE LADERA	FAO	NOT AVAILABLE NO DISPONIBLE	T	CABANJUSULMOR. CABANJUSULMOR.	-	-
EL SALVADOR POST-HARVEST AP7/ POSTCOSECHA EL SALVADOR AP7	SWITZERLAND SUIZA	NOT AVAILABLE NO DISPONIBLE	T	NATIONAL NACIONAL	275,965	-
LOCAL PRODUCTION, COMMUNITY SEGUNDO MONTES/ PRODUCCION LOCAL, COMUNIDAD SEGUNDO MONTES	DENMARK DINAMARCA	NOT AVAILABLE NO DISPONIBLE	TF	MORAZAN MORAZAN	123,660	-
SUB-TOTAL						574,625
<i>PROJECTS IN FORMULATION/ PROYECTOS EN FORMULACION</i>						
NEGOTIATION OF WATER FOR IRRIGATION/ GESTION DE AGUAS PARA AGRICULTURA BAJO RIEGO	FAO	NOT AVAILABLE NO DISPONIBLE	T	NATIONAL NACIONAL	-	-
TOTAL						13,887,573

Table C.1.3 TECHNICAL & FINANCIAL COOPERATION PROJECTS IN AGRICULTURE, FORESTRY & FISHERIES (1992-1996) (5/7)
Cuadro C.1.3 PROYECTOS DE COOPERACION TECNICA Y FINANCIERA EN AGRICULTURA, SILVICULTURA Y PESQUERIA (1992-1996) (5/7)

SUBSECTOR: LIVESTOCK & LIVESTOCK PRODUCTS/ GANADERIA Y PRODUCTOS DE LA GANADERIA							TOTAL COST/
	SOURCE/ FUENTE	EXECUTING AGENCY/ AGENCIA DE EJECUCION	TYPE/ TIPO*	LOCATION UBICACION	92-96	ALL/ TODOS	COSTO TOTAL
<i>TERMINATED PROJECTS/PROYECTOS TERMINADOS</i>							
TRAINING IN OPERATION OF SLAUGHTERHOUSE EQUIP./ CAPACITACION PARA LA OPERACION DE MATADERO MODULAR	FAO FAO	GOVERNMENT GOBIERNO	T	NAT/SONSONATE NAT/SONSONATE	120,000	120,000	120,000
SLAUGHTER HOUSE/ MATADERO MODULAR	SPAIN ESPANA	NOT AVAILABLE NO DISPONIBLE	F	SONSONATE SONSONATE	20,000	20,000	20,000
PORK PRODUCTION IN COOP. STO. TOMAS SNLUIS TALPA/ PRODUCCION PORCINA EN COOP. STO. TOMAS SNLUIS TALPA	SPAIN ESPANA	NOT AVAILABLE NO DISPONIBLE	F	LA PAZ LA PAZ	1,949	1,949	1,949
HENS PROJECT COOP. STO. TOMAS SNLUIS TALPA/ PRO. GALLINAS PONEPRAS COOP. STO. TOMAS SNLUIS TALPA	SPAIN ESPANA	NOT AVAILABLE NO DISPONIBLE	F	LA PAZ LA PAZ	14,223	14,223	14,223
SUB-TOTAL							156,172
<i>PROJECTS IN EXECUTION/ PROYECTOS EN EJECUCION</i>							
MUTATION BREEDING TECHNIQUES/ TECNICAS DE MUTACIONES FITOGENETICAS	IAEA OIEA	MULTILATERAL	T	SAN SALVADOR SAN SALVADOR	101,181	101,181	101,181
CONSTRUCTION OF MUNICIPAL SLAUGHTER HOUSE/ CONSTRUCCION MATADERO MUNICIPAL	SPAIN ESPANA	NOT AVAILABLE NO DISPONIBLE	F	SUCHITOTO SUCHITOTO	63,073	63,073	63,073
SUB-TOTAL							164,254
<i>PROJECTS IN FORMULATION/PROYECTOS EN FORMULACION</i>							
POLICY FOR DEVELOPMENT OF DAIRY & LIVESTOCK SECTOR/ POLITICA PARA DESARROLLO SECTOR CARNIGO Y LECHERO	FAO FAO	NOT AVAILABLE NO DISPONIBLE	T	NATIONAL NACIONAL	-	120,000	120,000
TOTAL							440,426

Table C.1.3 TECHNICAL & FINANCIAL COOPERATION PROJECTS IN AGRICULTURE, FORESTRY & FISHERIES (1992-1996) (6/7)
Cuadro C.1.3 PROYECTOS DE COOPERACION TECNICA Y FINANCIERA EN AGRICULTURA, SILVICULTURA Y PESQUERIA (1992-1996) (6/7)

SUBSECTOR: SUPPORT SERVICES/ SERVICIOS DE APOYO	SOURCE/ FUENTE	EXECUTING AGENCY/ AGENCIA DE EJECUCION	TYPE/ TIPO*	LOCATION UBICACION	TOTAL COST/ COSTO TOTAL	
					92-96	ALL/ TODOS
TERMINATED PROJECTS/PROYECTOS TERMINADOS						
AGRICULTURAL IRRIGATION DEVELOPMENT IN ATIACCYO/ FOMENTO DE LA AGRICULTURA DE REGADIO EN ATIACCYO	GERMANY ALEMANIA	GOVERNMENT GOBIERNO	T	LA LIBERI.,CHALAT. LA LIBERI.,CHALAT.	-	4,562,500
CONTROL OF AFRICAN BEES/ CONTROL Y MANEJO DE ABEJAS AFRICANIZADAS	FAO FAO	GOVERNMENT GOBIERNO	T	NATIONAL NACIONAL	67,537	95,000
RURAL DEVELOPMENT: REINSERTION OF EX-COMBATANTS/ DESARROLLO RURAL: REINSECCION DE EXCOMBATIENTES	SPAIN ESPAÑA	NOT AVAILABLE NO DISPONIBLE	F	USULUTAN USULUTAN	585,839	585,839
SUB-TOTAL					653,376	5,243,339
PROJECTS IN EXECUTION/ PROYECTOS EN EJECUCION						
TECHNICAL ASSISTANCE & TRAINING ROYAL ROAD ASISTENCIA TECNICA Y CAPACITACION CALLE REAL	CRS CRS	NGO ONG	TF	SAN SALVADOR SAN SALVADOR	129,818	129,818
IRRIGATION DEVELOPMENT LEMPA-ACAHUAPA/ PROYECT DESARROLLO DE RIEGO LEMPA-ACAHUAPA	IDB BID	NOT AVAILABLE NO DISPONIBLE	T	SAN SALVADOR SAN SALVADOR	7,048,000	10,875,000
RURAL TECHNOLOGY TRANSFER/ TRANSFERENCIA TECNOLOGIA RURAL	ICAITI ICAITI	NOT AVAILABLE NO DISPONIBLE	T	NATIONAL NACIONAL	35,000	-
AGRICULTURE & LIVESTOCK SANITATION/ SANIDAD AGROPECUARIA	IICA IICA	MULTILATERAL	TF	NATIONAL NACIONAL	-	150,000
QUALITY CONTROL LAB. FOR PESTICIDES, FERTILIZERS, ETC./ LAB.CONTROL CALIDAD PLAGUICIDAS, FERTILIZANTES, ETC.	OIRSA OIRSA	MULTILATERAL	TF	SAN SALVADOR SAN SALVADOR	-	50,000
SUB-TOTAL					7,212,818	11,204,818
PROJECTS IN FORMULATION/PROYECTOS EN FORMULACION						
LAND AND AGRICULTURAL SERVICES/ SERVICIOS PARA LA TIERRA Y AGRICOLAS	WORLD BANK B. MUNDIAL	GOVERNMENT GOBIERNO	TF	NATIONAL NACIONAL	40,000,000	40,000,000
TOTAL					47,866,194	56,449,157

Table C.1.3 TECHNICAL & FINANCIAL COOPERATION PROJECTS IN AGRICULTURE, FORESTRY & FISHERIES (1992-1996) (7/7)
Cuadro C.1.3 PROYECTOS DE COOPERACION TECNICA Y FINANCIERA EN AGRICULTURA, SILVICULTURA Y PESQUERIA (1992-1996) (7/7)

SUBSECTOR: FISHERIES/ PESQUERIAS				EXECUTING	TYPE/ LOCATION	TOTAL COST/
SOURCE/ FUENTE	AGENCY/ AGENCIA DE EJECUCION	TIPO*	UBICACION	92-96	ALL/ TODOS	
<i>TERMINATED PROJECTS/PROYECTOS TERMINADOS</i>						
NGO.SPAIN	NGO ONG	TF	SAN MIGUEL	122,593	122,593	
ONG.ESPAÑA	ONG ONG		SAN MIGUEL			
<i>PROYECTOS EN EJECUCION/ PROYECTOS EN EJECUCION</i>						
FAO	NOT AVAILABLE	T	NATIONAL	260,000	260,000	
FAO	NO DISPONIBLE		NACIONAL			
TOTAL				382,593	382,593	
<i>SUBSECTOR: FORESTRY/ SILVICULTURA</i>						
SOURCE/ FUENTE	AGENCY/ AGENCIA DE EJECUCION	TIPO*	UBICACION	92-96	ALL/ TODOS	
<i>TERMINATED PROJECTS/PROYECTOS TERMINADOS</i>						
JAPAN	NOT AVAILABLE	F	AHUACHAPAN	18,569	-	
JAPAN	NO DISPONIBLE		AHUACHAPAN			
SPAIN	NOT AVAILABLE	F	CHALATENANGO	77,043	77,043	
ESPAÑA	NO DISPONIBLE		CHALATENANGO			
SUB-TOTAL				95,612	77,043	
<i>PROYECTOS EN FORMULACION/PROYECTOS EN FORMULACION</i>						
FAO	NOT AVAILABLE	T	NATIONAL	-	-	
FAO	NO DISPONIBLE		NACIONAL			
TOTAL				95,612	77,043	

Source : UNDP, Technical & Financial Cooperation with El Salvador as Reported by Donors (1992-1996), July 1995.

Table C.1.4 Japanese ODA to EL Salvador (End of December, 1994) (1/2)

1. Grant Aid

Date	Name of Project	Expenses Millions of Yen
General Grant Aid		
10.4.85	Improvement of nourishment	150
8.1.86	Reinforcement of public transportation in metropolitan area	400
26.2.87	Restoration of damage by earthquake	270
25.3.88	Restoration of San Salvador	500
1.11.88	Equipment supply for the cleaning of the metropolitan area	565
15.12.89	Improvement of emergency system	246
18.4.90	Improvement of housing of the low income residents	180
12.7.90	Operation & transference equipment project of the port Acajutla	419
11.6.91	Offer of sound & lighting equipments to national theater	50
30.7.91	Improvement of medical equipment at key hospitals	407
11.12.91	Assistance to the education of Jabon school	4
11.6.92	Equipments for making video program for the national TV station of education & culture	50
1.7.92	Construction and rehabilitation equipment for roads	710
1.10.92	Instruments to the national symphony orchestra	47
19.3.93	The improvement of medical equipment at key hospitals	656
23.7.93	Improvement of housing of the low income residents	200
23.7.93	Reconstruction of bridge on the main national highways	850
23.7.93	Sports equipments to the department of sports	50
16.8.94	Reconstruction of bridge on the main national highways in east area	532
20.12.94	Printing equipment for textbooks to the national printing house	50
	Subtotal	6,336
Foods Assistance of KR		
2.12.86	Wheat grown in USA	400
21.9.87	Wheat grown in USA	350
	Subtotal	750
Assistance for the Increase of Food Supply		
11.3.83	Fertilizer	300
8.12.88	Fertilizer, agricultural machines	300
15.12.88	Chemicals, agricultural machines	300
17.10.90	Fertilizer	250
30.7.91	Fertilizer, chemicals, agricultural machines	300
16.6.92	Fertilizer, chemicals, agricultural machines	400
31.5.93	Fertilizer, chemicals, agricultural machines	500
19.9.94	Fertilizer	500
	Subtotal	2,850
Grant Aid of Non-Projects		
12.3.92	Installation of communal water supply in Teuicho village	39
13.3.92	Purchase of general commodities	500
19.3.93	Purchase of general commodities	900
20.12.94	Purchase of general commodities	1,000
	Subtotal	2,439

Table C.1.4 Continued (2/2)

Date	Name of Project	Expenses Millions of Yen
Grant Aid for Grassroots		
16.10.90	Offer of micro-buses for disabled persons	4
16.11.92	Guidance of increased production of rice in paddy fields	7
24.2.94	Conservation of the national park of El Imposible	2
9.3.94	Assistance to Association of peace & democracy in El Salvador	6
27.12.94	Assistance to training of midwives in the association of rural women in San Salvador	5
27.12.94	Offer of wheelchair for sports for disabled	3
	Subtotal	27
	Total	12,402

2. Loan

A. Exchange of Note

Date	Name of Project	Interest Rate	Period years	Expenses Millions of Yen
Loan by Japanese Yen				
19.10.74	Construction of new international airports	4.5	20(7)	5,700
19.3.93	Installation of water supply & drainage in small & medium sized towns	3.0	30(10)	1,210
19.3.93	Rapid consolidation in power sector	3.0	30(10)	8,817
21.4.94	Consolidation of roads	3.0	30(10)	10,332
Relief of debt				
26.10.91	Reschedule	4.5	20(10)	1,625

B. Contract of Loan

Date	Name of Project	Expenses Millions of Yen
Loan of Japanese Yen		
27.2.75	Construction of the Cuskatlan new international airport	5,700 Completed
19.3.93	Installation of water supply & drainage in small & medium sized towns	1,210
19.3.93	Rapid consolidation in power sector	8,817
24.5.94	Consolidation of roads	10,332
	Total	26,059

3. Technical Cooperation (End of March in 1994)

	Organization	Total number of persons	Main sphere
Participants in training programs	JICA	270	transportation, social infrastructure communication, broadcast
	UNIDO	2	industry
	AOTS	123	textile, automobile
	ILO	2	---
Dispatches of Staffs	JICA	46	development plan
	JICA	86	transportation, industry
	JOCV	79	human resources

Source : Ministry of commerce in Japan, Present conditions & problems of economic cooperation, 1995.