

**SUPPORTING REPORT B
SOCIO-ECONOMIC STUDY**

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SUPPORTING REPORT B SOCIO-ECONOMIC STUDY

1. GENERAL

The Republic of Honduras is located in the Central American region, and is bounded by the Republic of Guatemala on the West, El Salvador on the South and Nicaragua on the East and Southeast. It has a territorial extension of 112,088 km² and a population of approximately 4.5 million. The country has a coastline of 880 km on the Caribbean Sea to the North and 153 km on the Pacific Ocean to the South.

General speaking, its topography is characterized by ample and fertile valleys surrounded by forest mountains, and provides favorable conditions for agriculture, cattle breeding and forestry under a suitable weather condition.

The Republic of Honduras takes the form of a representative democratic republic. It is operated through three authorities: Legislative, Administrative and Judicial authorities. The national administration is conducted by twelve Ministries (Ministerios or Secretarias).

The Ministry of Communications, Public Works and Transportation (Secretaria de Comunicaciones, Obras Publicas y Transporte; SECOPT), which is in charge of the present study as Honduran counterpart, is divided into Six Bureaus (Direccion General) and one Institute for public services, and supervises some public enterprises of Ferrocarril National de Honduras, Empresa Nacional de Energia Electrica (ENEE) and Empresa Hondurena de Telecomunicaciones (HONDUTEL), etc. (*Fig. B.1.1*).

The Bureau of Public Works (Direccion General Obras Publicas) is administratively composed of seven Departments (Departamentos) which have several Divisions respectively, as illustrated in *Fig. B.1.2*. It has some 400 employees in total in 1993.

The country is administratively divided into 18 Departments under the jurisdiction of the Central Government, and the Governor of each Department is appointed by the Central Government. The Department is further divided into several Municipalities (municipios) which amount to 289 units in the country as a whole. Respective municipalities have a right of self-government, and the head of Municipality is elected by the popular vote. The least unit of community in the Municipality is called Town (Pueblo) or Village (Aldea).

The Study Area extends over four Municipalities of San Pedro Sula, Choloma, La Lima and Puerto Cortes in the Department of Cortes and has an area of 717 km² in total. San Pedro Sula has a population of 326,943 (1988 Census) as the second largest city of Honduras and forms the greatest industrial zone in the country. In the rural area, the agriculture is well-developed, especially on cattle-farming, banana plantations and sugar cane field.

While, this area has been frequently damaged by hurricanes, for example, flood damage caused by the 1974 hurricane is estimated at the amount of Lps. 71 million approximately. The flood protection is therefore recognized to be an essential subject for the economic development and improvement of the social environment in this area.

The present Supporting Report states about a socio-economic situation of the country as a whole and the Study Area, with the aim of clearing a socio-economic position of the present project and of providing some basic data required for a socio-economic evaluation of the project. These descriptions are given in the following Chapters 2 and 3.

2. NATIONAL SOCIO-ECONOMIC BACKGROUND

2.1 Gross Domestic Product (GDP) and Gross National Product (GNP)

The Honduran GDP at current market price amounted to Lps. 16,406 million in 1991 against Lps. 8,128 million in 1987, at an average annual growth rate of 19.2 % during this period. But the real growth rate showed 3.1 % per annum during the same period (*Table B.2.1*).

The agricultural sector, which is the major economic activity of this country, accounted for 21 or 22 % of the total GDP for the period 1987-1991. The manufacturing industrial sector, which follows the agricultural sector, increased from the share of 15 % in 1987 to 17 % in 1991.

The GNP at current price amounted to Lps. 15,274 million in 1991 against Lps. 7,724 million in 1987 at an average annual growth rate of 18.6 % for this period. But, the real average growth was a rate of 3.0 % for the same period.

The per capita GNP at current price amounted to Lps. 3,107 in 1991 on the increase by Lps. 1,316 from the value in 1987, and the average annual growth rate was 14.8 % for

this period. However, the real growth was only a rate of 0.2 % per annum. This growth rate indicates that the average living standard of Honduran people was little improved for the said period.

2.2 External Trade

2.2.1 Export

Honduran exports was US\$ 779.9 million in 1991 on the decrease by US\$ 71.1 million from the 1989 exports. This decrease rate was about 4.3 % per annum on average (see *Table B.2.2*).

The exports of bananas and coffee which have respective shares of approximately 40 % and 20 % of the total exports amounted to US\$ 333.4 million and US\$ 145.9 million in 1991. But those amounts show the decrease of US\$ 18.3 million and US\$ 45.0 million respectively, compared with the 1989 exports, or the average decrease rates of 2.6 % and 12.6 % per annum.

As is obvious from *Table B.2.2*, although about 70 % of the major export commodities was trending toward decrease on the exports, the export of commodities such as petroleum products, frozen meat, shrimp/lobster and detergents were increasing during the same period, especially exports of shrimp/lobster amounted to US\$ 104.6 million in 1991 on the increase by US\$ 32.2 million against the 1989 exports, that is, it corresponded to an increase rate of 20 % per annum on average.

2.2.2 Import

During the period 1989-1991, the average imports of Honduras indicated approximately US\$ 880 million per annum, in a little annual variation. The import commodities can be classified broadly into four categories; (1) consumption goods, (2) prime materials, gas and lubricants, (3) capital assets and construction materials, and (4) others. The share in imports of these commodities accounted for 23 %, 51 %, 25 % and 1 %, on average for the said period, respectively (see *Table B.2.3*). More than 90 % of the total imports were occupied by commodities required for the daily life and the social and economic activities of Honduran people.

2.2.3 Balance of External Trade

As is evident from the discussion above, during the period 1989- 1991, the Honduran

external trade indicated that the imports exceeded the exports every year, and that such a trade deficit was trending toward increase in proportion to decrease in the exports. Actually, the deficit in 1991 amounted to about US\$ 100 million.

2.3 Balance of International Payments

In the international payments of Honduras, the current account, which consists of trade balance, service account and transfer account, indicated a deficit every year during the period 1989- 1991, i.e. its deficit was US\$ 194.3 million in 1989, US\$ 112.4 million in 1990 and US\$ 219.8 million in 1991. These deficits were due mainly to the deficits of trade balance and service account (see *Table B.2.4*).

The deficit of current account in each year was compensated by the capital account, which included an external loan, in order to maintain the balance of international payments. As a result, the external loan of Honduras was being accumulated year by year.

2.4 Government Finance

The financial revenue (or expenditure) of the central government amounted to Lps. 4,643.7 million in 1991 on the increase by Lps. 2,241 million against the 1987 revenue (or expenditure), i.e. the increase rate showed 17.9 % per annum on average for the period 1987-1991. But the real increase was approximately 3 % per annum.

During the said period, more than 80 % of the government revenue were occupied by tax revenue and internal and external debts. For example, in 1991 the tax revenue, internal debt and external debt were Lps. 2,529.3 million (54 %), Lps. 235.2 million (5 %) and Lps. 1,010.3 million (22 %), respectively. Among the revenue, the external debt was considerably being increased in recent years (see *Table B.2.5*).

On the other hand, the government expenditure was mainly composed of current expenditure, capital expenditure (investment) and amortization of public (internal and external) debt which accounted for 58 %, 17 % and 22 % of the total expenditure in 1991, respectively.

Regarding the external debt, the revenue was exceeding the amortization during the said period, for example, the difference between both amounts in 1991 was Lps. 507.8 million.

2.5 Strategy for the Integral Development for the Period 1990-1994

2.5.1 Basic Policy and Objectives

The SECPLAN published a strategy for the National Integral Development for the period from 1990 to 1994, which was prepared by the Honduran Government on November 1990. The main points of the strategy are summarized below:

In view of economic crisis of the country, the government designed an implementation program for economic stabilization and structural adjustment, and cooperation required from the international financial communities. One of the main objectives of the government is to improve the level of economic activity based on a growth strategy of export.

2.5.2 Economic Growth in Recent Years

The Honduran economic performance in recent years was characterized by a slow economic growth and a widespread financial imbalances.

The real GDP scarcely increased at a rate similar to the population growth, i.e. the average real increase in the per capita income was only 0.2 % per annum during the period 1987-1991. Such low increase in the income affected mainly the living conditions of rural inhabitants, thus deepening the poverty conditions.

Due to the low level of domestic savings and the inelastic export supply, the real expenditure of the central government had to be financed with an increasing demand of external resources. This raised the external debt to US\$ 3,301 million (up to June 1990), of which US\$ 3,010 million belonged to the public debt and US\$ 291 million concerned the private debt.

According to a survey which was carried out by the World Bank to classify Honduras as an IDA (International Development Association) country, the per capita GDP reached US\$ 483 in 1989. Honduras is one of the poorest countries in the Western Hemisphere, and the socio-economic indicators are among the lowest in Latin America. Unemployment affected some 350,000 people and 75 % of the population was living in poverty condition.

Recent survey on the income per worker confirmed the uneven income distribution; 40 % of the poorest population received 7.3 % of the total income, while 10 % of the

richest population received 50 % of it.

The agricultural sector, which generated 27 % of the GDP and 75 % of exports, reduced its growth from 4.2 % in 1987 to 1.4 % in 1989. The industrial sector, which accounts for 16 % of the GDP, also declined its growth drastically during 1988-1989.

2.5.3 Economic Perspectives

For the period 1990-1994, an economic recuperation is projected at a growth rate ranging between 3 % and 4 %. Such performance will be due greatly to an expected increase in exports and private investment.

The total amount of financial requirements for the period 1990-1994 will be US\$ 2,489 million, which include grants for the balance of payments, operations to pay-off arrears and repayments.

It is envisaged that current account deficit of the balance of payments will be reduced from 7.7 % of the GDP to 4 % towards 1994, due to gradual improvement in the exchange rate and the increased production in the main traditional and non-traditional export products.

Given the expected effects of the support and promotion policies for export, the exports will increase, in nominal terms, at an average annual rate of 12 %, based on the projection that banana sales will increase by 7 % (4 % increase in export volume and 3 % rise in prices).

The exports of coffee will increase at an average annual rate of 16 %, as a result of the 11 % rise in prices and the 5 % increase in export volume. Besides, it is estimated that the export growth in non-traditional goods will continue.

The import goods are envisaged to increase at an average annual rate of 7.3 % (in CIF), under assumption that oil prices will level off towards US\$ 26 per barrel by 1994.

Capital flows reveal that the balance of payments will require special support from the international financing community for adjustment of the external debt, because that payments' gap will amount to US\$ 150-200 million per annum.

2.5.4 Strategy

1) Global Strategies

The implementation of policies and measures oriented are as follows:

- To increase the exports of traditional goods, providing the use of more efficient technologies.
- To diversify and enlarge the non-traditional export supply, introducing of the productive transformation and integration.
- Taking advantage of the international market opportunities derived from the opening of new markets.
- To use, in priority order of programs and projects, the criteria defined by their social urgency and degree of contribution for modernization and introduction of new technologies in all fields.
- To increase food production under adequate conditions of food security, by means of proper technologies according to availability of the regional productive resources.

These measures will be supported by the efficient and active participation of private sector. The public sector will assume the role of a complementary management agent in the reactivation.

2) Strategy for Agricultural Sector

- To strengthen, modernize and speed up the production of traditional crops by incorporating new technologies and better management of the agricultural market at both national and international levels.
- To liberalize domestic and foreign trades of the basic grains.
- To encourage the diversification in non-traditional export products.
- To strategically orient the development of infrastructure in the support of productive zones.

- To encourage the adoption of suitable organic agricultural technologies to improve the production of small farmers located in the vulnerable rural areas.
- To reconstruct and strengthen the financial system of the agricultural sector.
- To develop a network of refrigeration centers as a national project with public and private investments.

3) Strategy for Industrial Sector

- To strengthen the industrial structure by technical assistance and by encouraging and creating the credit lines.
- To increase agro-industrial and industrial productions by supporting the activity of fields with idle capacity able to produce for the export, and by promoting non-traditional projects oriented to the import-substitution.
- To encourage the training for managers and workers to improve productive administration and efficiency of the industrial enterprises.
- To strengthen the private and public organizations to implement the specific productive development programs directed as the weakest sectors of the manufacturing production.
- To strengthen contribution of the Government to the scientific and technological process of national industrialization.

4) Strategy for Infrastructure

- To improve the operational capacity and efficiency of infrastructure and services on the land transportation.
- To expand the road system to incorporate the new production areas.
- To improve airports, terminals and equipment on the air transportation.
- To improve the operational efficiency of ports, so that the services become attractive to exporters.

- To promote a master plan study for construction and enlargement of rural roads, and also to rehabilitate the roads to encourage the marketing of agricultural and forest products.

- To encourage rehabilitation and reconstruction plans of bridges in the zones affected by the floods, as well as in other productive areas.

- To newly invest in the energy sector to enlarge, improve and install the generation and transmission capacities which will contribute to sustain or promote the economic growth.

- To improve communication system to satisfy the needs of people, and to enlarge the system in the most important 25 cities.

3. SOCIO-ECONOMIC CONDITION IN THE STUDY AREA

3.1 Location and Administration

The Study Area is located in the northern part of Honduras, and extends from 15°24' to 15°48' north latitude and from 87°46' to 88°07' west longitude. It has an area of 717 km².

The Study Area is included in the Department of Cortes and spreads over four Municipalities; San Pedro Sula, Choloma, La Lima and Puerto Cortes (See *Fig. B.3.1*). The Municipality is divided into cities (municipios), towns (Pueblos) and villages (Aldeas) in accordance with a population-scale. San Pedro Sula, the second largest city of Honduras, forms a central area of administration, industry and commerce in the Study Area.

3.2 Population and Housing

3.2.1 Population and Housing Censuses

1) Population Census

(1) National Population

Since 1960, the Republic of Honduras has conducted the population censuses three

times; the 1961, 1974 and 1988 Censuses. According to the censuses, population of the country as a whole amounted to 4,443,721 in 1988 through 2,656,948 in 1974 and 1,884,765 in 1961. The average annual growth rate showed 2.68 % and 3.74 % for the periods 1961-1974 and 1974-1988, respectively. The population growth for the period 1974-1988 is recognized to be a fairly high rate in view of the general trend of other countries in the world (see *Table B.3.1*).

As a result, population density of the country increased from 17 persons/km² in 1961 and 24 persons/km² in 1974 to 40 persons/km² in 1988.

(2) Regional Population

The population of the Department of Cortes, which includes the Study Area, increased from 200,099 in 1961 and 369,616 in 1974 to 662,772 in 1988, at the average annual growth rates of 4.83 % for the period 1961-1974 and 4.26 % for the period 1974-1988. These percentages indicate that the Department of Cortes was an area with higher population growth than the whole country for the said periods (*Table B.3.1*).

Accordingly, the population density increased considerably in 1988 compared with 1961 and 1974, or 51 persons/km² in 1961, 94 persons/km² in 1974 and 168 persons/km² in 1988. In the Censuses 1974 and 1988, the Department of Cortes indicated the highest population density among 18 Departments.

The total population of the four Municipalities of San Pedro Sula, Choloma, La Lima and Puerto Cortes amounted to 500,886 in 1988 through 281,247 in 1974 from 137,988 in 1961. The average annual growth rate showed 5.63 % for the period 1961-1974 and 4.21 % for the period 1974-1988. The population of each municipality is given in *Table B.3.2*.

In this table, the population growth in the Municipality of San Pedro Sula is given as a comparatively low rate of 3.54 % per annum for the period 1974-1988, because the Municipality of La Lima was separated from the Municipality of San Pedro Sula in the census 1988. Concerning the total population of both Municipalities of San Pedro Sula and La Lima, it came to 372,721 in 1988 and the growth rate showed 4.51 % per annum on average for the period 1974-1988.

In 1988, the whole of the said four Municipalities related to the Study Area showed a population density of 268 persons/km² which corresponded to 1.6 times of the average population density of the Department of Cortes. In the same year, the population

densities in two Municipalities of San Pedro Sula and La Lima were 361 persons/km² and 395 persons/km², respectively (*Table B.3.2*).

The population censuses indicate that the Study Area and its surrounding areas were trending toward urbanization rapidly since 1961. In the said four Municipalities, the population in the urban area accounted for 77 % of the total population in 1988 against 66 % in 1974 and 58 % in 1961. These percentage is far higher than figures of the whole country and the Department of Cortes. Especially in the Municipality of San Pedro Sula, the proportion of urban population came to 88 % in 1988 on the rapidly growth since 1961. Details are given in *Table B.3.3*.

2) Housing Censuses

According to the National Housing Censuses, in the four Municipalities of San Pedro Sula, Choloma, La Lima and Puerto Cortes, number of residential houses occupied amounted to 106,302 in 1988 through 54,467 in 1974 from 24,930 in 1961, in nearly proportion to the population. The average number per unit area in 1988 is estimated at 57 houses/km², composed of 77 houses/km² in San Pedro Sula, 29 houses/km² in Choloma, 85 houses/km² in La Lima and 35 houses/km² in Puerto Cortes (see *Table B.3.4*).

The Censuses indicated that the family size per house was trending toward reduction as the whole of country since 1961. The average family size in the said four Municipalities came to 4.71 persons/house in 1988 through 5.16 persons/house in 1974, reducing gradually from 5.54 persons/house in 1961. The average size in 1988 shows smaller figure than those of the whole country and the Department of Cortes. Detail for each Municipality is given in *Table B.3.4*.

3.2.2 Population Projections

1) National Population Projection

According to the population census, the Honduran population amounted to 4,444 thousand in 1988 with the average annual growth rate of 3.74 % during the period from 1974 to 1988.

Taking results of the population censuses in the past into consideration, the SECPLAN made a forecast of Honduran population, assuming that the annual growth rate of population will be 2.5 % in the year 2000 and 1.4 % in 2025. It expects that the the

Honduran population will amount to 6.2 million in 2000 and 10.1 million in 2025.

2) Estimates of Population and Number of Residential Houses in the Study Area

The municipal population shown in *Table B.3.4* is the whole figure of each municipality, not population in the Study Area where is composed of a part of each municipal territory. Therefore with the object of getting a basic data required for analyzing the potential flood damage in the Study Area, the JICA Study Team surveyed the 1992 population together with number of buildings in the Study Area, by means of a questionnaire survey for each community and by using other available data.

According to the said survey result, the 1992 population in the Study Area is estimated at approximately 520,000, composed of 384,000 in the San Pedro Sula area, 101,000 in the Choloma area, 20,000 in the La Lima area and 15,000 in the Puerto Cortes area.

Out of the 1992 population in the Study Area, the urban population is estimated at 467,000 accounting for 90 % of the whole, and the population of 48,000 (9 %) and 5,000 (1 %) distribute in the rural and mountain areas, respectively. Number of buildings in the Study Area is estimated at 107,000 in total, and its regional distribution is nearly proportional to the population distribution. *Table B.3.5* provides a breakdown of the distribution of population together with number of buildings in the Study Area. Furthermore, the Study Team surveyed population and number of buildings by Barrio/Colonia in the Rio Choloma basin during the period 1992-1993, for the purpose of estimating the potential damage caused by flood from Rio Choloma, and the result is given in *Table B.3.6* and *Fig. B.3.2*.

The population in the Rio Choloma basin in 1992 is estimated at about 58,500 in total, composed of 54,500 in the central city area, 3,400 in the highland area and 500 in the lowland area. Buildings distribute in proportion to the population, and its number is estimated at about 13,000 in the Rio Choloma basin.

Apart from the survey by the Study Team, a population projection was carried out on the urban population of the San Pedro Sula Municipality, by the Hydro-Service and Cinsa Consultants in 1991.

The projection was made until 2001 by preparing two Scenarios A and B; the average annual growth in population was assumed to be a low rate of 4.93 % for the Scenario A and a high rate of 6.34 % for the Scenario B. According to this projection, it is expected that the urban population of the San Pedro Sula Municipality will amount

between 520,000 and 620,000 in 2001.

3.3 Land Use

3.3.1 General Situation

The Study Area has an area of 717 km². It is characterized by ample and fertile valley and forest mountains, and provides favorable conditions for agriculture, cattle breeding and forestry. San Pedro Sula, which is the second largest city of Honduras, has expanded on the basis of such favorable condition.

During three months, September through November of 1992, the JICA Study Team surveyed the land use situation in the Study Area conducting field visits and using existing land use maps and aerial photographs. The result is illustrated in *Fig. B.3.3*.

A breakdown of the land use by river basin in the Study Area is given in *Table B.3.7*, and the total area of each river basin is summarized as follows:

	unit : square km
1. Chamelecon A1 (lower basin)	25
2. Cuabanos Canal	125
3. Rio Choloma	104
4. Chamelecon A2 (middle basin)	39
5. Rio Blanco/San Roque Canal	186
6. Rio El Sauce	118
7. Rio El Sauce (viejo)/Chotepe Canal	100
8. Chamelecon A3 (upper basin)	11
9. La Lima Airport	9
 Total	 717

The Study Area is broadly composed of two zones; highland and lowland, which are divided by the north-south trunk road, Route CA-5. The present situation of land use is described below.

3.3.2 Highland Zone

The highland zone, where lies the western part in the Study Area, is covered by a tropical rain forests which consist of pine, cedar and wide leaves trees (mahogany, mango, almond, palm, avocado, etc.). These forests extend as far as the southern part (highland of the San Pedro Sula) and function as a natural protection zone for water resources.

In the northern part of the highland, upper reach of the Rio Choloma, traditional crops such as maize, beans and rice are broadly cultivated, and villages and pasture lands are scattered in these crop lands. The area of the whole highland zone is estimated at about 304 km², or 42 % of the Study Area. A detailed land use of the high land zone together with the lowland zone is provided in *Table B.3.8*.

3.3.3 Lowland Zone

In the central area of the lowland zone where lies the eastern part of the Study Area, the predominant use is natural and cultivated pastures for cattle breeding.

The lowland zone along the Rio Chamelecon forms a mixed agricultural land which is composed of small villages and fields of sugar cane, pasture, bananas, maize, rice, various vegetables, brushwood, etc. In addition to such land use, the large-scale plantations of sugar cane and bananas are spread in the southern part of the San Pedro Sula. The area of the whole lowland zone is estimated at about 413 km², or 58 % of the Study Area (*Table B.3.8*).

3.3.4 Urban Area

The major urban areas are located in three cities of San Pedro Sula, Choloma and La Lima. The first two cities spread over both highland and lowland zones, and the La Lima city lies the southern part of the lowland zone. The San Pedro Sula city and its surrounding areas form a large industrial zone as well as commercial and residential zones. *Fig. B. 3.4* and *Table B.3.9* show detailed land use situations of the San Pedro Sula city in 1992.

Each municipal office of San Pedro Sula and Choloma has a urban development scheme. According to these scheme, in the near future it is expected that the urban area in the Study Area will amount to more than 20,000 has., including the La Lima urban area of 950 has. A breakdown of land use by each city is provided in *Table B.3.10*,

and its general view is illustrated in *Fig. B.3.5*.

3.3.5 Choloma Area

It is expected that a high priority will be given to an improvement works of the Rio Choloma, under the result of the Master Plan Study. In consideration of this matter, the land use situation in the Choloma area was surveyed in more detail as shown below:

1) Rio Choloma Basin

The Rio Choloma basin has an area of 104 km² in the whole of highland and lowland. *Fig. B.3.6* and *Table B.3.11* give the present land use of the Rio Choloma basin. In the lowland, the natural and cultivated pastures for cattle breeding accounts for 70 %, the agricultural fields of maize, beans, sugar-cane, vegetables, bananas, fruits, etc. have an area of 9 %, and remaining 21 % is built-up area. Almost all the highland in the Rio Choloma basin are cultivated for agricultural and pasture uses except a little area of forest and brushwood.

2) Choloma City and Its Suburbs

Fig. B.3.7 illustrates a historical development pattern of the built-up area in the Choloma city from 1954 to 1992. According to this figure, the built-up area in 1992 become about eight times as large as that in 1954. The breakdown of land use in the Choloma city in 1992 is provided in *Table B.3.12*.

In 1990, the Choloma municipality and Choloma city were favored by the President Degree 37/87 on a creation of the Export Processing Zone (EPZ) so as to promote the establishment of export industry to attract the overseas investments. During two years of 1990 and 1991, several units were built in the EPZ by the overseas enterprises from Korea, Taiwan, U.S.A., etc.

It is said that one EPZ will create about 350 jobs and 15,000 employees within coming 4 or 5 years. It is expected that such high rate of employment opportunity will produce an extraordinary increase in population in the Choloma city and its suburbs and that as a result it will promote an enlargement of the urban area. *Fig. B.3.8* illustrates an urban development plan of the Choloma city.

Besides, detailed land use, location of public facilities and building density in the Choloma city were surveyed for the purpose of estimating the potential damage caused

by floods of the Rio Choloma, and these general maps are provided in *Figs. B.3.9, B.3.10 and B.3.11*, respectively. It is noted that almost all the central area of the Choloma city are located within the inundation area caused by the 1974 flood.

3.4 Agriculture

Honduras is a traditional agricultural country which labor force of this sector accounts for nearly 50 % of that of the whole industrial sector. The agricultural products are represented by maize, beans, rice, sorghum, coffee, bananas, plantains, sugar cane, african palm, cotton and tobacco. Of these products, three crops of maize, beans and rice are mainly consumed in the country as principal foods of Honduran people. During the period 1987- 1991, productions of these crops increased at the average annual rates of 8.7 %, 15.1 % and 11.0 %, and in 1991 amounted to 12,293, 1,741 and 1,905 quintals, respectively (see *Table B.3.13*).

The country is divided into seven agricultural regions; (1) Southern, (2) West-Central, (3) Northern, (4) Atlantic Coastal, (5) East-Northern, (6) East-Central and (7) Western, and the agricultural statistics are mainly made by Region, not by Department. The Study Area is included in the Northern Region (Region No.3).

In the agricultural year 1992/1993, production of maize in the Northern Region (Region No.3) was estimated at 2,791,870 quintals with the cultivated area of 99,610 manzanas, accordingly the yield came to 28.03 quintals/manzana (1 manzana = 0.7 ha, 1 quintal = 45.36 kg). The cultivated area and production in the Region No.3 accounted for 17 % and 19 % of those in the whole country, respectively (see *Table B.3.14*).

In the said year and Region, the cultivated area and production of beans were 8,170 manzanas and 92,970 quintals which corresponded to 10 % and 11 % of those in the whole country respectively, and as a result the yield came to 11.38 quintals/manzana.

Regarding rice, the cultivated area and production were 6,790 manzanas and 339,280 quintals which corresponded to 33 % and 39 % of those in the whole country respectively, and the yield came to 49.97 quintals/manzana.

On the other hand, bananas, coffee and sugar cane are important as major export goods of Honduras. During the period 1987-1991, the production of coffee and sugar cane in the country increased at the average annual rate of 5.9 % and 4.1 %, and in 1991 amounted to $2,215 \times 10^3$ quintals and $68,896 \times 10^3$ quintals, respectively. While,

during the same period the bananas production was trending toward decrease at the average annual rate of minus 4.5 %, and the 1991 production was $21,142 \times 10^3$ quintals (*Table B.3.13*).

The plantations of bananas and sugar cane are broadly exploited in the Department of Cortes and the Study Area. The bananas plantation in the Department of Cortes has an area of approximately 2,200 ha which correspond to 11 % of the total in the country, and concerning the plantation area the Department of Cortes ranks second following the Department of Colon among Departments. The area of bananas plantation in the Study Area is estimated at about 600 ha.

In 1992, the area of sugar cane plantation is estimated at 6,000 ha in the Department of Cortes and 2,700 ha in the Study Area. The plantation area of the Department of Cortes stands first among the whole Departments.

Apart from the agricultural crops, Honduras has an extensive cattle farming industry which is being operated using the wide pasture. According to statistics, number of cattle which was carved for edibles of Honduran people and for export use as a frozen meat amounted to about 205,000 heads in 1986, and more than 50 % of the meat production in the country were made in three Departments of Cortes, Francisco Morazan and Choluteca. Number of the cattle carved in the Department of Cortes in 1984 and 1986 amounted to 83,400 and 39,500 heads, respectively (see *Table B.3.15*).

Pigs also are an important livestock as edibles for inhabitants. Pork production in the country amounted to 157,200 heads in 1986, including 74,600 heads in the Department of Francisco Morazan and 29,700 heads in the Department of Cortes, i.e. concerning pork production the said two Departments accounted for more than 60 % of the whole country.

3.5 Manufacturing Industry

Honduras produces various industrial goods such as cement, iron bar, textiles, wheat flour, sugar, pasteurized milk, vegetable oil and fats, cigarettes, beer, soft drink, and distilled and other liquors. Almost all of them are consumed in the country, except some quantities of export goods; cement, sugar, etc.

The majority of these goods are manufactured in the San Pedro Sula city and its surrounding areas where are the greatest industrial zone in the country. In 1992,

number of factories in the Municipalities of San Pedro Sula is estimated at about 1,500, according to survey of the JICA Study Team.

During the period 1987-1991, in Honduras the productions of cement, fiber cement plates, wheat flour, vegetable oil and soft drink showed high growth of the average annual rates of 11.3 %, 10.2 %, 7.2 %, 8.5 % and 10.9 %, respectively. While sugar and pasteurized milk were decreasing their productions at the average annual rates of minus 1.7 % and minus 1.4 %, respectively during the same period. Detailed productions of these goods are given in *Table B.3.16*.

3.6 Wholesale, Consumer and Retail Prices

3.6.1 Wholesale Prices

Table B.3.17 shows an average wholesale price index in Tegucigalpa and San Pedro Sula for the period from 1987 to 1992. The wholesale prices indicated remarkable rise during the said period, especially in 1990 and 1991. The average annual rate of price rise was 19.5 % for the domestic goods and 18.9 % for the imported goods for the said period.

Among all commodities, the prices of chemicals in the domestic production showed the highest rise, or the average annual rate of 31.8 % for the same period. On the other hand, in the imported goods, the prices of pharmaceuticals rose at the highest average annual rates of 24.2 %.

3.6.2 Consumer Prices

During the period 1987-1992, the consumer prices also indicated high rise, even though the rate was somewhat lower than that of wholesale prices. As shown in *Table B.3.18*, rise in the mean price of general goods indicated an average annual rate of 15.6 % for the country as a whole and 15.9 % at the market in the San Pedro Sula. Among all goods, food price indicated the highest rise rate, or an average annual rate of 18.5 %.

3.6.3 Retail Prices

Table B.3.19 gives retail prices of general foods in Tegucigalpa and San Pedro Sula for the period from 1987 to 1991. Although the difference between both prices in Tegucigalpa and San Pedro Sula was little about all foods, but rise in the prices

themselves was considerable. During the said period, the average annual rise rate was 20 % or more for red beans, corn grain, rice, beef loin, pork loin, pasteurized milk, eggs, potato, tomato, plantain and tomato paste, especially over 40 % for tomato.

3.7 Wage

The Government has controlled the minimum wage to ensure a living standard of workers since 1981. According to a minimum wage by industrial sector as of July 1991, both sectors of agriculture (including forestry and fishery) and construction indicated the lowest minimum wage, ranging Lps. 9.25 to Lps. 12.35 per day and Lps. 9.20 to Lps. 12.40 per day, respectively.

On the other hand, the highest minimum wage was given in the metallic mining sector, ranging from Lps. 13.90 to Lps. 18.40 per day, i.e. this sector indicated the high wage by about 50 % compared with agriculture and construction sectors (see *Table B.3.20*).

TABLES

TABLE B.2.1 GROSS DOMESTIC PRODUCT (GDP) AND GROSS NATIONAL PRODUCT (GNP), 1987-1991

Unit : Million Lempiras

Items	1987	1988	1989	1990	1991	Average Annual Growth Rate (%) 1987- 1991
Contribution of each sector to GDP						
Agriculture, Forestry & fishery	1,518	1,630	1,951	2,503	3,262	21.1
Mining & Quarrying	105	115	158	194	269	26.5
Manufacturing Industry	1,055	1,230	1,389	1,823	2,424	23.1
Construction	311	343	464	574	623	19.0
Electricity, Gas & Water	236	242	276	353	476	19.2
Transportation & Communications	509	560	648	703	770	10.9
Wholesale & Retail	952	1,019	1,089	1,289	1,857	18.2
Banking, Insurance & Real Estate	487	554	712	826	1,145	24.1
Dwelling Property	612	670	721	790	906	10.3
Public Administration & Defence	439	472	773	814	1,050	24.4
Other Services	964	1,062	1,075	1,290	1,507	11.8
GDP at constant factor cost (1978 = 100)	7,183	7,897	9,256	11,159	14,289	18.8
GDP at market prices	8,128	8,913	10,334	12,540	16,406	19.2
GDP at market prices in real terms	4,674	4,896	5,161	5,165	5,281	3.1
Net factor payments from abroad	(404)	(466)	(622)	(947)	(1,132)	
GNP	7,724	8,447	9,712	11,593	15,274	18.6
Per capita GNP (in Lempiras)	1,791	1,895	2,109	2,437	3,107	14.8
Per capita real GNP (in lempiras)	1,024	1,033	1,051	1,019	1,015	(0.2)

Source : Honduras en Cifras, 1987-1989 y 1989-1991, Banco Central de Honduras
 Note : Figures in parenthesis () mean a negative.

TABLE B.2.2 EXPORTS OF HONDURAS (FOB), 1989-1991

Unit : Million of US\$

Commodities	1989	1990	1991	Average Annual Growth Rate (%) 1989-1991
Bananas	351.7	366.3	333.4	(2.64)
Coffee	190.9	180.9	145.9	(12.58)
Wood	25.4	16.1	14.9	(23.41)
Lead & zinc	66.5	37.9	33.6	(28.92)
Silver	8.1	4.0	4.0	(29.73)
Petroleum products	2.1	4.0	4.5	46.39
Frozen meat	19.8	24.8	29.3	21.65
Shrimp & lobster	72.4	72.8	104.6	20.20
Sugar	10.2	11.4	8.8	(7.12)
Tobacco	3.8	1.9	2.4	(20.53)
Cotton	1.0	-	0.1	(68.38)
Detergents	1.6	2.3	4.2	62.02
Resin	2.1	1.1	1.6	(12.71)
Canned fruits	5.1	2.3	0.1	(86.00)
Cement	6.0	0.9	1.5	(50.00)
Others	84.3	85.7	91.0	3.90
Total	851.0	812.4	779.9	(4.27)

Source : Honduras en Cifras, 1989-1991,
 Banco Central de Honduras
 Note : Figures in parenthesis () mean a negative.

TABLE B.2.3 IMPORTS OF HONDURAS (CIF), 1989-1991

Unit : Million of US\$

Commodities	1989	1991	1991	Average Annual Growth Rate (%) 1989-1991
1. Consumption goods	204.8	196.9	200.8	(0.98)
2. Prime materials, gas & lubricants	450.4	446.8	453.2	0.31
3. Capital assets & construction materials	213.2	221.7	222.2	2.09
4. Others	3.7	15	3.6	(1.36)
Total	872.1	880.4	879.8	0.44

Source : Honduras en Cifras, 1989-1991, Banco Central de Honduras
 Note : Figures in parenthesis () mean a negative.

TABLE B.2.4 BLANCE OF INTERNATIONAL PAYMENTS, 1989-1991

Unit : Million of US\$

Items	1989	1990	1991
1. Trade balance	48.5	(21.9)	(55.6)
(1) Exports	883.4	847.8	807.9
(2) Imports	834.9	869.7	863.5
2. Service account	(314.8)	(323.6)	(322.1)
3. Transfer account	72.0	233.1	157.9
4. Current account	(194.3)	(112.4)	(219.8)
5. Capital account	257.6	217.7	142.4
6. Errors & Omissions	(65.0)	(67.6)	105.4
7. Balance of Payments	(1.7)	37.7	28.0

Source : Banco Central de Honduras
 Note : Figures in parenthesis () mean a negative.

TABLE B.2.5 REVENUE AND EXPENDITURE OF THE CENTRAL GOVERNMENT, 1987-1991

Unit : Million Lempiras

Particulars	1987	1988	1989	1990	1991	Average Annual Growth Rate (%) 1987-1991
Revenue	2,402.7	2,754.5	2,995.7	3,471.9	4,643.7	17.9
Current revenue	1,327.6	1,439.6	1,532.4	2,061.5	2,911.2	21.7
Tax revenue	1,122.5	1,183.2	1,295.8	1,852.9	2,529.3	22.5
Income tax	298.1	340.8	366.6	430.7	623.6	20.3
Tax on property	10.3	12.1	14.4	15.6	20.0	18.0
Tax on production, domestic trade and transaction	370.0	415.6	459.0	690.2	956.0	26.8
Import duties	348.8	347.9	389.0	497.9	691.1	18.6
Export duties	94.3	65.3	65.7	217.3	237.1	25.9
Other taxes	1.0	1.5	1.1	1.2	1.5	10.7
Non-tax revenue	33.4	34.9	16.4	23.2	81.7	25.1
Transfers	46.7	63.8	64.6	59.9	186.1	41.3
Other revenue	125.0	157.7	155.6	125.5	114.1	(2.3)
Capital revenue	1,134.0	1,496.1	1,486.5	1,300.0	1,410.0	5.6
Internal debt	740.7	935.6	1,126.1	352.6	235.2	(24.9)
External debt	287.1	442.3	298.2	867.5	1,010.3	37.0
Transfers	106.2	118.2	62.2	79.9	164.5	11.6
Other revenue	(58.9)	(181.2)	(23.2)	110.4	322.5	-
Expenditure	2,402.7	2,754.5	2,995.7	3,471.9	4,643.7	17.9
Current expenditure	1,507.4	1,650.7	1,873.6	2,244.2	2,693.9	15.6
Consumption	1,326.9	1,480.0	1,669.6	1,968.8	2,294.7	14.7
Current transfers	180.5	170.7	204.0	275.4	399.2	21.9
Capital expenditure	357.6	417.7	407.0	824.0	780.7	21.6
Direct investment	273.6	309.0	332.7	273.5	512.8	17.0
Indirect investment	84.0	108.7	74.3	550.5	267.9	33.6
Pre-investment	0.0	0.0	0.0	0.0	0.0	-
Net lending	92.6	37.2	2.0	(43.7)	146.9	12.2
Amortization of public debt	445.1	648.9	713.1	447.4	1,022.2	23.1
Internal	377.0	526.0	608.1	309.7	519.7	8.4
External	68.1	122.9	105.0	137.7	502.5	64.8

Source : Banco Central de Honduras
 Note : Figures in parenthesis () mean a negative.

TABLE B.3.1 AREA AND POPULATION OF HONDURAS

Administrative Unit	Area (km ²)	Census Population			Annual Population Growth Rate (%)		Population Density (persons/km ²)		
		1961	1974	1988	1961-1974	1974-1988	1961	1974	1988
Honduras	112,088	1,884,765	2,656,948	4,443,721	2.68	3.74	16.8	23.7	39.6
Department									
1. Atlantida	4,251	92,914	148,285	238,741	3.66	3.46	21.9	34.9	56.2
2. Colon	8,875	41,904	77,750	149,677	4.87	4.79	4.7	8.8	16.9
3. Comayagua	5,196	96,442	136,619	239,859	2.72	4.10	18.6	26.3	46.2
4. Copan	3,203	126,183	151,859	219,455	1.43	2.66	39.4	47.4	68.5
5. Cortes	3,954	200,099	369,616	662,772	4.83	4.26	50.6	93.5	167.6
6. Choluteca	4,211	149,175	193,336	295,484	2.01	3.08	35.4	45.9	70.2
7. El Paraiso	7,218	106,823	140,793	254,295	2.15	4.31	14.8	19.5	35.2
8. Francisco Morazan	7,946	284,428	453,597	828,274	3.66	4.39	35.8	57.1	104.2
9. Gracias a Dios	16,630	10,905	20,738	34,970	5.07	3.80	0.7	1.2	2.1
10. Intibuca	3,072	73,138	81,815	124,681	0.87	3.06	23.8	26.6	40.6
11. Islas de la Bahia	261	8,961	13,194	22,062	3.02	3.74	34.3	50.6	84.5
12. La Pas	2,331	60,600	66,046	105,927	0.66	3.43	26.0	28.3	45.4
13. Lempira	4,290	111,546	127,782	177,055	1.05	2.36	26.0	29.8	41.3
14. Ocotepeque	1,680	52,540	51,038	74,276	(0.22)	2.72	31.3	30.4	44.2
15. Olancho	24,351	110,744	151,436	283,852	2.44	4.59	4.5	6.2	11.7
16. Santa Barbara	5,115	146,909	186,106	278,868	1.84	2.93	28.7	36.4	54.5
17. Valle	1,565	80,907	91,901	119,965	0.98	1.92	51.7	58.7	76.7
18. Yoro	7,939	130,547	195,037	333,508	3.14	3.91	16.4	24.6	42.0

Source : Censo Nacional de Poblacion y Vivienda, 1961, 1974 y 1988, Direccion General de Estadistica y Censos

TABLE B.3.2 AREA AND POPULATION OF DEPARTMENT AND MUNICIPALITIES RELATED TO THE STUDY AREA

Department and Municipalities	Area (km ²)	Census Population			Annual Population Growth Rate (%)		Population Density (persons/km ²)		
		1961	1974	1988	1961-1974	1974-1988	1961	1974	
Department of Cortes	3,954	200,099	369,616	662,772	4.83	4.26	50.6	93.5	167.6
Municipi. related to Study Area	1,871	137,988	281,247	500,886	5.63	4.21	73.8	150.3	267.7
San Pedro Sula	905	95,464	200,881	326,943	5.89	3.54	105.5	222.0	361.3
Choloma	459	13,566	36,258	66,802	7.86	4.46	29.6	79.0	145.5
La Lima	116	-	-	45,778	-	-	-	-	394.6
Puerto Cortes	391	28,958	44,108	61,363	3.29	2.39	74.1	112.8	156.9
Other Municipalities	2,083	62,111	88,369	161,886	2.75	4.42	29.8	42.4	77.7
Omoo	383	9,782	13,946	22,539	2.77	3.49	25.5	36.4	58.8
Pimienta	61	2,557	3,877	6,414	3.25	3.66	41.9	63.6	105.1
Potrerrillos	88	5,036	9,097	12,267	4.65	2.16	57.2	103.4	139.4
San Antonio de Cortes	227	7,247	9,697	16,018	2.27	3.65	31.9	42.7	70.6
San Francisco de Yojoa	97	4,877	6,422	10,655	2.14	3.68	50.3	66.2	109.8
San Manuel	139	7,087	8,761	17,157	1.64	4.92	51.0	63.0	123.4
Santa Cruz de Yojoa	726	14,575	21,238	42,668	2.94	5.11	20.1	29.3	58.8
Villanueva	362	10,950	15,331	34,168	2.62	5.89	30.2	42.4	94.4

Source : Poblacion y Vivienda por Departamento y Municipio, Censo 1961, 1974 y 1988, Secretaria de Planificacion, Coordinacion y Presupuesto

TABLE B.3.3 (1/2) CENSUS POPULATION OF URBAN AND RURAL AREAS
IN THE DEPARTMENT CORTES

Department and Municipalities	1961			1974			1980		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Honduras	573,542	1,311,223	1,884,765	989,617	1,667,331	2,656,948	1,893,339	2,550,382	4,443,721
Dep. Cortes	94,474	105,625	200,099	208,083	161,533	369,616	425,813	236,959	662,772
Munici. related to Study Area	80,280	57,708	137,988	185,969	95,278	281,247	306,693	114,193	500,886
San Pedro Sula	58,632	36,832	95,464	150,991	49,890	200,881	287,350	39,593	326,943
Choloma	4,600	8,966	13,566	9,161	27,097	36,258	39,054	27,748	66,802
La Lima							28,703	17,075	45,778
Puerto Cortes	17,048	11,910	28,958	25,817	18,291	44,108	31,586	29,777	61,363
Other Municipalities	14,194	47,917	62,111	22,114	66,255	88,369	39,120	122,766	161,886
Omoo	904	8,878	9,782	1,308	12,638	13,946	1,392	21,147	22,539
Pimienta	1,605	952	2,557	1,708	2,169	3,877	3,290	3,124	6,414
Potrerrillos	2,895	2,141	5,036	5,405	3,692	9,097	8,913	3,354	12,267
San Antonio de Cortes	1,710	5,537	7,247	2,352	7,345	9,697	3,259	12,759	16,018
San Francisco de Yojoa	750	4,127	4,877	945	5,477	6,422	1,578	9,077	10,655
San Manuel	1,164	5,923	7,087	2,208	6,553	8,761	3,563	13,594	17,157
Santa Cruz de Yojoa	1,210	13,365	14,575	1,848	19,390	21,238	5,144	37,524	42,668
Villanueva	3,956	6,994	10,950	6,340	8,991	15,331	11,981	22,187	34,168

TABLE B.3.3 (2/2) CENSUS POPULATION OF URBAN AND RURAL AREAS
IN THE DEPARTMENT CORTES

Department and Municipalities	Population Distribution of Urban and Rural Areas						Average Annual Growth Rate (%)					
	1961		1974		1980		1961-1974			1974-1980		
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Total	Urban	Rural	Total
Honduras	30.4	69.6	37.2	62.8	42.6	57.4	4.29	1.87	2.68	4.74	3.08	3.74
Dep. Cortes	47.2	52.8	56.3	43.7	64.2	35.8	6.26	3.32	4.83	5.25	2.77	4.26
Munici. related to Study Area	58.2	41.8	66.1	33.9	77.2	22.8	6.68	3.93	5.63	5.37	1.30	4.21
San Pedro Sula	61.4	38.6	75.2	24.8	87.9	12.1	7.55	2.36	5.89	4.70	(1.64)	3.54
Choloma	33.9	66.1	25.3	74.7	58.5	41.5	5.44	8.88	7.86	10.91	0.17	4.46
La Lima					62.7	37.3						
Puerto Cortes	58.9	41.1	58.5	41.5	51.5	48.5	3.24	3.36	3.29	1.45	3.54	2.39
Other Municipalities	22.9	77.1	25.0	75.0	24.2	75.8	3.47	2.52	2.75	4.16	4.50	4.42
Omoo	9.2	90.8	9.4	90.6	6.2	93.8	2.88	2.75	2.77	0.45	3.75	3.49
Pimienta	62.8	37.2	44.1	55.9	51.3	48.7	0.48	6.54	3.25	4.79	2.64	3.66
Potrerrillos	57.5	42.5	59.4	40.6	72.7	27.3	4.92	4.28	4.65	3.64	(0.68)	2.16
San Antonio de Cortes	23.6	76.4	24.3	75.7	20.3	79.7	2.48	2.20	2.27	2.36	4.02	3.65
San Francisco de Yojoa	15.4	84.6	14.7	85.3	14.8	85.2	1.79	2.20	2.14	3.73	3.67	3.68
San Manuel	16.4	83.6	25.2	74.8	20.8	79.2	5.05	0.78	1.64	3.48	5.35	4.92
Santa Cruz de Yojoa	8.3	91.7	8.7	91.3	12.1	87.9	3.31	2.90	2.94	7.59	4.83	5.11
Villanueva	36.1	63.9	41.4	58.6	35.1	64.9	3.69	1.95	2.62	4.65	6.66	5.89

Source : Poblacion y Vivienda por Departamento y Municipio, Censo 1961, 1974 y 1980.
Secretaria de Planificacion, Coordinacion y Presupuesto
Note : Figures in parenthesis () mean a negative.

TABLE B.3.4 POPULATION, NUMBER OF RESIDENTIAL HOUSES AND AVERAGE FAMILY SIZE IN THE DEPARTMENT CORTES

Department and Municipalities	Area (km ²)	Population			Total Number of Houses(*)			Family Size (persons/house)			Average Number of Houses per km ²		
		1961	1974	1988	1961	1974	1988	1961	1974	1988	1961	1974	1988
Honduras	112,088	1,884,765	2,656,948	4,443,721	325,492	526,566	906,698	5.79	5.05	4.90	2.90	4.70	8.09
Dep. Cortes	3,954	200,099	369,616	662,772	35,968	72,475	139,905	5.56	5.10	4.74	9.10	18.33	35.38
Municip. related to Study Area	1,871	137,988	281,247	500,886	24,930	54,467	106,302	5.54	5.16	4.71	13.32	29.11	56.82
San Pedro Sula	905	95,464	200,881	326,943	16,752	38,254	69,526	5.70	5.25	4.70	18.51	42.27	76.82
Choloma	459	13,566	36,258	66,802	2,638	7,099	13,204	5.14	5.11	5.06	5.75	15.47	28.77
La Lina	116	-	-	45,778	-	-	9,872	-	-	4.64	-	-	85.10
Puerto Cortes	391	28,958	44,108	61,363	5,540	9,114	13,700	5.23	4.84	4.48	14.17	23.31	35.04
Other Municipalities	2,083	62,111	88,369	161,886	11,038	18,008	33,603	5.63	4.91	4.82	5.30	8.65	16.13
Omoa	383	9,782	13,946	22,539	1,957	2,972	4,940	5.00	4.69	4.56	5.11	7.76	12.90
Pimienta	61	2,557	3,877	6,414	479	784	1,237	5.34	4.95	5.19	7.85	12.85	20.28
Potrerrillos	88	5,036	9,097	12,267	953	1,834	2,453	5.28	4.96	5.00	10.83	20.84	27.88
San Antonio de Cortes	227	7,247	9,697	16,018	1,281	2,043	3,244	5.66	4.75	4.94	5.64	9.00	14.29
San Francisco de Yojoa	97	4,877	6,422	10,655	828	1,450	2,122	5.89	4.31	5.02	8.54	15.36	21.88
San Manuel	139	7,087	8,761	17,157	1,184	1,571	3,437	5.99	5.58	4.93	8.52	11.30	25.01
Santa Cruz de Yojoa	726	14,575	21,238	42,668	2,475	4,315	8,542	5.89	4.92	5.00	3.41	5.94	11.77
Villanueva	362	10,950	15,331	34,168	1,881	2,999	7,588	5.82	5.11	4.50	5.20	8.28	20.96

Source : Poblacion y Vivienda por Departamento y Municipio, Censo 1961, 1974 y 1988, Secretaria de Planificacion, Coordinacion y Presupuesto
 Note : (*) Collective buildings are not included in number of houses.

TABLE B.3.5 ESTIMATES OF POPULATION AND NUMBER OF BUILDINGS IN THE STUDY AREA IN 1992

Municipalities	Population				Number of Buildings			
	Urban	Rural	Mountain	Total	Urban	Rural	Mountain	Total
San Pedro Sula	378,632	2,506	2,420	383,558	79,957	480	484	80,921
Choloma	68,819	29,833	2,870	101,522	15,149	4,325	574	20,048
La Lina	19,927	0	0	19,927	4,429	0	0	4,429
Puerto Cortes	0	15,288	0	15,288	0	1,721	0	1,721
Total	467,378	47,627	5,290	520,295	99,535	6,526	1,058	107,119

TABLE B.3.6 POPULATION AND NUMBER OF BUILDINGS IN RIO CHOLOMA BASIN IN 1992

(1) Central Area			(2) Highland Area			(3) Lowland Area		
Barrio/ Colonia	Population	Number of Buildings	Name of Aldea	Population	Number of Buildings	Name of Aldea	Population	Number of Buildings
PURBLO NUEVO	500	111	ZONE A	419	93	ZONE H	536	98
CONCEPCION	3,128	695	Buenos Aires	35	7	Hac. Boquitas	7	4
LA PRIMAVERA	2,160	480	San Marcos Maja	95	30	Boquitas Morale	175	18
SAN ANTONIO	558	124	Qda. California	29	4	Finca Santa Kie	6	2
LA RUBI	936	208	San Isidro La U	260	52	Sta. Clara	6	3
GUYAHAL	527	117	ZONE B	335	67	Hac. La Esperan	5	1
ARRIBA	288	64	El Tamarindo	65	13	Granja Harrose	25	4
EL BANCO	441	98	Agua Blanca	75	15	Hac. Santa Hart	13	3
EL CENTRO	1,175	261	Las Marias	50	10	Hac. Eterna	12	3
ARAJO	1,089	242	El Rio	30	6	Hac. Guerin	8	2
LOS COCOS	1,440	320	El Chorreron	115	23	Hac. Dox/Acocia	15	2
LA CURBA	302	67	ZONE C	219	53	Hac. Citronela	5	1
LOS PROFESIONAL	756	168	Hac. Buena Vist	10	2	H. Bejucoles	30	5
CANADA	7,772	1,727	El Portillo	80	14	Hac. La Mora	30	5
SANTA FE	5,279	1,173	Nuevo Portillo	110	32	Finca Dulce Car	7	3
LA MORA	8,316	1,848	Represa	5	1	Villa Manuelita	10	3
CHAPAGRO	3,357	746	Hogar Manantial	7	3	Finca Cristal	16	3
BELLA VISTA	1,152	256	Corro Los Oling	7	1	Villa Karla	8	3
LAS LONAS	1,440	320	ZONE D	195	54	Hac. Los Casteñ	35	7
LOS LEONES	1,220	271	Ocotillo Occide	150	45	Hac. La Maripo	4	1
SAN ANTONIO	480	73	San José Occide	15	3	Hac. Medina	28	3
11 DE ABRIL	941	209	Buena Vista	25	5	City Jardin	50	10
MISSISSIPI	1,080	240	Cerro de Los Ca	5	1	Lomas De Conejo	19	3
19 DE SEPTIEMBRE	2,700	600	ZONE E	1562	514	Hac. Caterina	12	7
CARE	1,697	377	Hacienda Nisapar	4	2	Hac. San Rafael	10	2
LOS ALMENDROS	837	186	La Nueva Jutosa	1500	500	TOTAL	536	98
SAN FRANCISCO	2,498	555	Los Cabros	29	7			
MUNICIPAL	1,098	244	Hac. Bobadilla	11	2			
CEDEÑ	1,310	291	Cerro Will	18	3			
CHIF	0	0	ZONE F	718	104			
INDELBA	0	0	Hac. Gomez(Casa	5	1			
ZIP	0	0	Kokland	180	18			
SOS	0	0	Hac. Casanova	7	2			
Total	54,477	12,071	Finca San Ramón	24	5			
			Rancho Betty	5	2			
			El Berresal	400	55			
			Hac. Choloma Ar	0	0			
			Hac. El Porveni	0	0			
			Finca El Eden	0	0			
			Cerro El Tigre	0	0			
			Cerro La Gloria	7	1			
			Miramelinda	38	9			
			Hac. La Querenc	30	5			
			Hac. Zarzal	20	4			
			Granja Cerdo	4	2			
			Total	3448	885			

TABLE B.3.7 LAND USE BY RIVER BASIN IN THE STUDY AREA IN 1992

Unit : Sq. km

Classification	Chame- lacon (lower)	Cuebanos Canal	Rio Choloma	Chame- lacon & Sanroque (middle)	Rio Blanco Canal	Rio El Sauce	Rio El Sauce & Chotepe Canal	Chame- lacon (upper)	La Lima Airport	Total
Banana	0	3	0	5	1	2	3	0	1	15
Corn/Rice	0	3	0	1	0	0	2	2	0	8
Vegetable *)	1	0	0	4	3	0	13	3	0	24
Other crops	6	7	0	10	10	4	0	0	0	37
Cultivated pasture	2	24	5	9	32	31	7	1	0	111
Natural pasture	2	45	14	6	46	6	18	2	0	139
Mountain area **)	9	29	61	0	31	6	3	0	0	139
Brushwood	0	5	6	0	21	7	2	1	0	42
Forest	4	5	9	0	26	46	10	0	0	100
Built-up area	1	1	8	2	7	7	41	2	7	76
Water bodies	0	3	2	2	9	9	1	0	0	26
Total	25	125	105	39	186	118	100	11	8	717

Note : *) includes citrus and sugar-cane
 **) includes agricultural and pasture lands

TABLE B.3.8 LAND USE IN THE STUDY AREA IN 1992

Unit : Sq. km

Classification	1)	2)	Total	Share (%)
	Highland	Lowland		
Banana	0	15	15	2
Corn/Rice	0	8	8	1
Vegetable *)	0	24	24	3
Other crops	0	30	38	5
Cultivated pasture	4	106	110	16
Natural pasture	0	139	139	19
Mountain area **)	139	0	139	19
Brushwood	38	4	42	6
Forest	99	1	100	14
Built-up area	21	55	76	11
Water bodies	3	23	26	4
Total	304	413	717	100

Note : 1) Western part of the Study Area
 2) Eastern part of the Study Area
 *) includes citrus and sugar-cane
 **) includes agricultural and pasture lands

TABLE B.3.9 LAND USE IN THE SAN PEDRO SULA CITY IN 1992

Unit : Sq. km

Land Use	Zone				Total Area	Share (%)
	North-West	North-East	South-West	South-East		
Residential	657	281	289	581	1,808	37
Commercial	44	45	98	72	259	5
Industrial	9	18	88	33	148	3
Institutional	76	33	55	40	204	4
Forest 1)	120	0	0	420	540	11
Water Bodies 2)	102	54	0	0	156	3
Open Space 3)	502	381	791	161	1,835	37
Total	1,510	812	1,321	1,307	4,950	100

Note : 1) includes agricultural and pasture lands in the mountainous area
 2) consists of rivers, canals, lakes and lagoons
 3) includes agricultural and pasture lands

TABLE B.3.10 LAND USE OF URBAN AREAS IN THE STUDY AREA IN 1992

(1) San Pedro Sula Urban Area Unit : hectare

Zone	Built-up Area	Under Construction	Development Scheme	Urban Use (Sub-Total)	Mountainous Area	Agricultural Land	Total
North-West 1)	1,030	110	0	1,140	860	12	2,012
North-East 2)	562	21	0	583	0	5,837	6,420
South-West 3)	914	0	0	914	1,180	159	2,253
South-East 4)	1,692	624	0	2,316	0	3,499	5,815
Total	4,198	755	0	4,953	2,040	9,507	16,500

Note : 1) includes each western part of Universidad, Blanco and Fesitranh
 2) includes each eastern part of Universidad, Blanco, Fesitranh and Carmen
 3) includes the western part of Chamelecon
 4) includes each eastern part of Chamelecon, Calpules and Santa Marta

(2) Choloma Urban Area Unit : hectare

Zone	Built-up Area	Under Construction	Development Scheme	Urban Use (Sub-Total)	Mountainous Area	Agricultural Land	Total
West	270	0	410	680	250	650	1,580
East	350	20	530	900	0	1,540	2,440
Total	620	20	940	1,580	250	2,190	4,020

(3) La Lima Urban Area Unit : hectare

Zone	Built-up Area	Under Construction	Development Scheme	Urban Use (Sub-Total)	Mountainous Area	Agricultural Land	Total
Old Lima	144	0	0	144	0	112	256
North Lima	78	51	0	129	0	565	694
Total	222	51	0	273	0	677	950

TABLE B.3.11 LAND USE IN THE RIO CHOLOMA
BASIN IN 1992

Land Use	Area (ha)	Share (%)
Maize	394	3.8
Rice	6	0.1
Beans	208	2.0
Sugar cane	86	0.8
Banana	31	0.3
Vegetables	64	0.6
Fruits	114	1.1
Other crops *)	260	2.5
Reformed pasture	1,789	17.2
Natural pasture	5,470	52.6
Brushwood	928	8.9
Forest	603	5.8
River/Lake	83	0.8
Built-up area	364	3.5
Total	10,400	100

Note : *) includes cardamon, coffee, cacao, coconuts, yuca and fallow

TABLE B.3.12 LAND USE IN THE CHOLOMA
CITY IN 1992

Land Use	Area (ha)	Share (%)
Residential	250	62
Commercial	10	2
Industrial	40	10
Public facilities	5	1
Open space	22	6
Roads	30	8
Agricultural	43	11
Total	400	100

TABLE B.3.13 MAJOR AGRICULTURAL PRODUCTION
OF HONDURAS, 1987-1991

Unit : Thousand quintals

Products	Production					Average Annual Growth Rate (%) 1987-1991
	1987	1988	1989	1990	1991	
Maize	8,798	9,522	10,980	12,381	12,293	8.72
Beans	992	511	1,306	1,366	1,741	15.10
Rice	1,256	1,046	1,450	1,418	1,905	10.98
Sorghum	800	1,019	1,221	1,532	1,848	23.28
Coffee	1,761	2,069	2,179	2,604	2,215	5.90
Bananas	25,362	24,399	23,738	22,733	21,142	(4.45)
Plantains	3,475	3,524	3,396	3,577	3,909	2.99
Sugar cane	58,620	55,201	59,944	63,753	68,896	4.12
African palm	6,471	6,925	7,288	7,482	8,305	6.44
Cotton	177	187	96	100	30	(35.84)
Tobacco	94	106	104	113	99	1.30

Source : Honduras en Cifras, 1987-1989, 1988-1990 y 1989-1991, Banco Central de Honduras

Note : Figures in parenthesis () mean a negative.

TABLE B.3.14 CULTIVATED AREAS AND PRODUCTION OF BASIC AGRICULTURAL CROPS BY REGION, 1990/91-1992/93

Region	Cultivated Area (Manza.)			Production (Quintales)			Yield (Quint./Manza.)		
	1990/91	1991/92	1992/93(*)	1990/91	1991/92	1992/93(*)	1990/91	1991/92	1992/93(*)
1. Southern	26,430	22,330	60,240	340,620	180,070	665,250	12.89	8.06	11.04
2. West-Central	9,460	10,190	94,740	168,240	137,570	1,776,830	17.78	13.50	18.75
3. Northern	31,630	48,870	99,610	662,430	1,071,870	2,791,870	20.94	21.93	28.03
4. Atlantic Coastal	23,190	18,300	26,370	644,760	480,410	996,150	27.80	26.25	37.78
5. East-Northern	5,530	6,470	89,910	172,000	167,360	3,134,960	31.10	25.87	34.87
6. East-Central	5,590	15,530	122,510	54,740	181,030	3,126,430	9.79	11.66	25.52
7. Western	9,430	11,450	92,130	195,760	209,400	1,875,090	20.76	18.29	20.35
Total	111,260	133,140	585,510	2,238,550	2,427,710	14,366,580	20.12	18.23	24.54

Region	Cultivated Area (Manza.)			Production (Quintales)			Yield (Quint./Manza.)		
	1990/91	1991/92	1992/93(*)	1990/91	1991/92	1992/93(*)	1990/91	1991/92	1992/93(*)
1. Southern	4,240	3,390	4,410	36,030	14,210	13,190	8.50	4.19	2.99
2. West-Central	7,610	9,090	15,790	86,100	85,760	123,550	11.31	9.43	7.82
3. Northern	8,810	5,300	8,170	125,680	63,040	92,970	14.27	11.89	11.38
4. Atlantic Coastal	1,270	560	1,660	17,370	6,650	25,270	13.68	11.88	15.22
5. East-Northern	25,680	33,800	19,740	324,370	441,450	274,700	12.63	13.06	13.92
6. East-Central	33,130	44,640	24,850	403,900	497,240	272,990	12.19	11.14	10.99
7. Western	13,870	9,400	7,200	160,560	99,080	51,040	11.58	10.54	7.09
Total	94,610	106,180	81,820	1,154,010	1,207,430	853,710	12.20	11.37	10.43

Region	Cultivated Area (Manza.)			Production (Quintales)			Yield (Quint./Manza.)		
	1990/91	1991/92	1992/93(*)	1990/91	1991/92	1992/93(*)	1990/91	1991/92	1992/93(*)
1. Southern	70	40	370	1,470	580	3,600	21.00	14.50	9.73
2. West-Central	320	340	3,190	17,830	11,950	131,710	55.72	35.18	41.29
3. Northern	1,750	1,710	6,790	109,510	74,850	339,280	62.58	43.77	49.97
4. Atlantic Coastal	1,070	750	3,870	66,970	40,710	173,260	62.59	54.28	44.77
5. East-Northern	30	420	3,090	1,060	25,390	142,470	35.33	60.45	46.11
6. East-Central	-	-	810	-	-	11,350	-	-	14.01
7. Western	40	40	2,210	930	660	60,410	23.25	16.50	27.33
Total	3,280	3,300	20,330	197,770	154,150	862,080	60.30	46.71	42.40

Source : Encuesta de Granos Basicos, Agosto 1991, SECPLAN
Encuesta Agricola Nacional de Propositos Multiples, Diciembre 1992, SECPLAN
Note : (*) estimates

TABLE B.3.15 NUMBER OF CATTLES AND PIGS CARVED BY DEPARTMENT

Department	Cattle			Pig		
	1984	1986	Annual Growth Rate (%)	1984	1986	Annual Growth Rate (%)
Honduras	239,416	205,333	(7.39)	137,264	157,228	7.03
Departament						
1. Atlantida	8,741	8,917	1.00	9,446	7,552	(10.59)
2. Colon	5,471	1,802	(42.61)	2,143	2,192	1.14
3. Comayagua	8,326	10,459	12.08	3,303	5,288	26.53
4. Copan	3,964	4,109	1.81	2,904	1,478	(28.66)
5. Cortes	83,397	39,466	(31.21)	20,997	29,679	18.90
6. Choluteca	27,984	21,724	(11.89)	6,454	4,352	(17.88)
7. El Paraiso	5,273	5,311	0.36	3,948	3,316	(8.35)
8. Francisco Morazan	58,626	53,863	(4.15)	59,529	74,605	11.95
9. Gracias a Dios	250	544	47.51	142	177	11.65
10. Intibuca	2,227	2,646	9.00	1,092	1,373	12.13
11. Islas de la Bahia	506	354	(16.36)	153	118	(12.18)
12. La Paz	3,602	3,408	(2.73)	1,505	1,853	16.96
13. Lempira	2,396	2,170	(4.83)	1,390	1,608	16.24
14. Ocotepeque	1,423	1,038	(14.59)	968	581	(22.53)
15. Olancho	9,359	27,544	71.55	1,931	1,497	(11.95)
16. Santa Barbara	4,906	6,089	11.41	4,158	6,037	20.49
17. Valle	3,338	2,716	(9.80)	3,986	3,470	(6.70)
18. Yoro	9,627	13,173	16.98	13,420	12,052	(5.23)

Source : Anuario Estadístico, 1984 y 1986, Secretaria de Planificación y Presupuesto
Note : Figures in parenthesis () mean a negative.

TABLE B.3.16 PRINCIPAL INDUSTRIAL PRODUCTION OF HONDURAS, 1987-1991

Products	Unit	Production					Average Annual Growth Rate (%) 1987-1991
		1987	1988	1989	1990	1991	
Cement	Bag of 42.5 kg	10,616	13,178	15,265	16,416	16,307	11.33
Fiber cement plates	Sq. meter	3,204	3,676	4,032	4,588	4,717	10.15
Iron bar	Kg	16,599	21,608	19,737	23,544	20,077	4.87
Textiles	Yard	18,134	20,131	19,962	16,708	19,148	1.37
Wheat flour	Quintal	1,641	1,787	1,802	1,798	2,167	7.20
Sugar cane	Quintal	4,121	3,729	4,130	4,015	3,853	(1.67)
Pasteurized milk	Liter	53,477	58,602	58,237	59,113	50,653	(1.35)
Vegetable oil	Pound	15,174	18,506	22,336	24,921	21,037	8.51
Vegetable fats	Pound	77,308	79,822	79,714	98,781	94,812	5.23
Cigarettes	Box of 20 pieces	104,565	115,961	127,990	134,489	126,407	4.86
Matches	Box of 50 pieces	62,141	65,337	72,823	69,576	61,494	(0.76)
Beer	Bottle of 12 oz.	153,377	173,451	187,934	203,659	188,982	5.36
Soft drink	Bottle of 12 oz.	586,704	681,066	693,634	675,572	887,160	10.89
Distilled liquor	Liter	1,684	1,892	2,046	2,077	2,287	7.95
Other liquor	Liter	4,219	4,435	4,427	4,627	5,308	5.91

Source : Honduras en Cifras, 1987-1989, 1988-1990 y 1989-1991, Banco Central de Honduras
 Note : Figures in parenthesis () mean a negative.

TABLE B.3.17 WHOLESALE PRICE INDEX, 1987-1992 (BASE YEAR 1978=100)

Goods	1987	1988	1989	1990	1991	1992	Average Annual Rise Rate (%) 1987-1992
Domestic goods	166.0	173.6	197.7	252.5	358.9	404.7	19.5
Agriculture & livestock	154.7	162.5	189.5	245.0	359.1	386.7	20.1
Agricultural products	138.6	144.6	168.4	219.4	317.5	275.6	14.7
Livestock	148.8	158.7	177.0	240.7	364.3	378.4	20.5
Others	187.9	195.3	239.9	290.5	415.1	568.7	24.8
Industrial products	174.2	181.6	203.6	257.9	358.8	417.7	19.1
Food	152.7	157.1	173.6	216.5	307.9	352.0	18.2
Beverage & tobacco	227.0	228.9	242.6	290.2	385.0	498.1	17.0
Construction materials	155.2	165.4	193.0	251.7	297.9	303.6	14.4
Textiles	164.0	186.1	213.8	226.6	372.6	457.1	22.8
Clothing	142.6	151.7	173.6	247.4	333.9	369.5	21.0
Chemicals	137.7	139.5	211.5	223.7	342.4	546.8	31.8
Petroleum derivatives	211.6	211.6	211.6	356.0	506.3	479.1	17.8
Others	176.5	211.7	241.4	287.1	384.7	404.3	18.0
Imported goods	179.3	194.9	248.0	329.3	404.3	425.5	18.9
Industrial products	179.3	194.9	248.0	329.3	404.3	425.5	18.9
Food	155.4	163.9	232.6	300.0	381.3	424.0	22.2
Beverages	228.8	231.2	272.3	439.4	517.0	612.0	21.7
Textiles	220.2	224.9	230.1	251.6	314.0	321.2	7.8
Chemicals	189.6	217.1	277.7	410.8	477.3	474.9	20.2
Pharmaceuticals	139.7	142.1	143.8	186.6	323.3	412.4	24.2
Others	174.5	195.4	282.5	358.9	418.0	422.0	19.3
General index	170.4	180.6	214.2	277.7	373.8	411.5	19.3

Source : Honduras en Cifras, 1987-1989 y 1989-1991, Banco Central de Honduras
 Índice de Precios al por Mayor, Enero 1992, Banco Central de Honduras

TABLE B.3.18 CONSUMER PRICE INDEX, 1987-1992 (BASE YEAR 1987=100)

Items	1987	1988	1989	1990	1991	1992	Average Annual Rise Rate (%) 1987-1992
General Index	197.8	206.7	227.0	280.0	375.1	408.0	15.6
by city							
Tegucigalpa & Comayagua	196.4	203.9	224.7	270.1	360.4	399.3	15.2
San Pedro Sula y Ceiba	200.9	211.1	231.5	284.6	384.1	419.4	15.9
Choluteca	186.6	195.2	214.8	268.3	367.2	400.5	16.5
Danli	200.6	211.1	228.2	279.0	379.1	406.6	15.2
Santa Rosa de Copan	186.4	198.1	214.9	261.3	359.1	403.1	16.7
by sector							
Food	167.0	179.5	201.9	255.5	367.2	390.1	18.5
Housing	221.3	229.2	245.2	279.7	345.2	373.3	11.0
Clothing	242.6	246.2	275.9	356.3	506.7	560.3	18.2
Health care	197.3	203.6	215.2	271.6	391.6	432.1	17.0
Personal care	182.5	189.8	219.2	278.9	343.0	364.0	14.8
Beverages and tobacco	247.1	248.9	268.6	361.0	451.9	565.6	18.0
Transportation	169.5	170.5	175.4	253.2	290.4	303.8	12.4
Education & recreation	215.6	224.0	247.1	303.7	378.7	436.2	15.1

Source : Honduras en Cifras, 1987-1989 y 1989-1991, Banco Central de Honduras
Indice de Precios al Consumidor, 1990-1992, Banco Central de Honduras

TABLE B.3.19 RETAIL PRICE OF GENERAL FOODS IN TEGUCIGALPA AND SAN PEDRO SULA, 1987-1991

Unit : Lempiras

Products	Unit	1987		1988		1989		1990		1991		Average Annual Rise Rate (%) 1989-1991	
		Teguci-galpa	San pedro Sula	Teguci-galpa	San pedro Sula	Teguci-galpa	San pedro Sula	Teguci-galpa	San pedro Sula	Teguci-galpa	San pedro Sula	Teguci-galpa	San pedro Sula
Red beans	lb	0.82	0.56	1.32	1.27	1.27	1.10	1.44	1.29	2.11	1.85	26.7	34.8
Corn grain	lb	0.27	0.27	0.25	0.27	0.34	0.36	0.40	0.39	0.65	0.67	24.6	25.5
Rice	lb	0.92	0.84	0.94	0.86	1.03	0.95	1.27	1.23	2.24	2.17	24.9	26.8
Spaghetti	1/2 lb	0.55	0.55	0.55	0.55	0.66	0.66	0.92	0.94	1.07	1.09	18.1	18.6
Beef loin	lb	3.22	3.20	3.33	3.23	3.67	3.85	5.06	5.22	7.90	8.10	25.2	26.1
Pork loin	lb	3.78	3.50	3.88	3.68	4.13	4.12	5.33	5.51	8.23	7.85	21.5	22.4
Chicken meat	lb	2.23	2.17	2.27	2.26	2.63	2.45	3.39	3.33	4.51	4.68	19.3	21.2
Fresh fish	lb	2.45	2.71	2.81	2.76	2.84	3.03	3.33	3.53	4.70	5.01	17.7	16.6
Pasteurized milk	lit	0.90	0.90	0.91	0.91	1.15	1.15	1.35	1.35	2.18	2.16	24.8	24.5
Butter	lb	4.03	3.72	4.07	3.73	4.35	4.12	5.06	4.79	6.72	7.00	13.6	17.1
White cheese	lb	3.34	3.08	3.44	3.09	3.84	3.53	4.71	4.41	6.90	7.00	19.9	22.8
Vegetable fat	lb	1.37	1.37	1.37	1.37	1.51	1.50	1.78	1.74	2.60	2.64	17.4	17.8
Eggs	dozen	2.06	1.94	2.42	2.39	2.52	2.50	3.62	3.67	4.80	5.16	23.6	27.7
Potato	lb	0.69	0.66	0.81	0.74	0.69	0.71	0.97	0.94	1.44	1.41	20.2	20.9
Tomato	lb	0.48	0.48	0.61	0.58	0.61	0.60	1.17	1.23	1.88	2.14	40.7	45.3
Cabbage	lb	0.39	0.31	0.47	0.48	0.38	0.39	0.46	0.39	0.57	0.57	10.0	16.4
Onion	lb	1.53	1.10	1.67	1.29	1.55	1.36	1.73	1.55	2.52	2.41	13.3	21.7
Orange	each	0.11	0.10	0.13	0.12	0.13	0.12	0.15	0.14	0.26	0.19	15.1	17.4
Plantain	each	0.16	0.15	0.19	0.16	0.24	0.24	0.29	0.28	0.44	0.42	28.8	29.4
Coffee	lb	2.10	2.11	2.10	2.11	2.10	2.11	2.72	2.71	3.53	3.60	13.9	14.3
Sugar	lb	0.55	0.55	0.58	0.57	0.59	0.58	0.68	0.67	0.89	0.85	12.8	11.5
Tomato paste	6 oz	1.02	1.02	1.02	1.02	1.04	1.03	1.62	1.55	2.23	2.27	21.6	22.1

Source : Banco Central de Honduras

TABLE B.3.20 MINIMUM WAGE BY INDUSTRIAL SECTOR AND BY NUMBER OF EMPLOYEES IN TEGUCIGALPA AND SAN PEDRO SULA, JULY 1991

Unit : Lempiras/day

Industrial Sectors	Number of Employees		
	1 to 5	6 to 15	16 or more
Agriculture, forestry & fishery	9.25	10.85	12.35
Metallic mining	13.90	16.10	18.40
Non-metallic mining	12.30	13.30	14.50
Manufacturing industries	10.70	13.10	15.30
Construction	9.20	10.25	12.40
Commerce	10.80	12.95	15.85
Transportation, storage & communications	13.10	14.50	15.90
Financial activities	13.20	14.55	15.95
Social and communal services	11.85	12.75	14.50

Source : Information from SECPLAN

FIGURES

Minister

Vice Minister of Public Works

Direction of Sectorial Planning

Technical Advisory

Internal Auditing

General Administration

Attorney General

Legal Advisory

Personnel

Public Relations

Vice Minister of Communications and Transport

General Direction of Road

Road Conservation and Airports

General Direction of Public Works

General Direction of Civil Aeronautics

National Geographic Institute

General Direction of Post Office

General Direction of Transportation

Empresa Nacional Energia Electrica

Ferrocarril Nacional

Empresa Hondureña de Telecomunicaciones

Fondo Social De La Vivienda

Registro de Propiedades

Empresa Nacional Portuaria

Instituto de Antropologia e Historia

Fondo Hondureño de Preinversion

FIG.B.1.1 ORGANIZATION CHART OF SECOPT



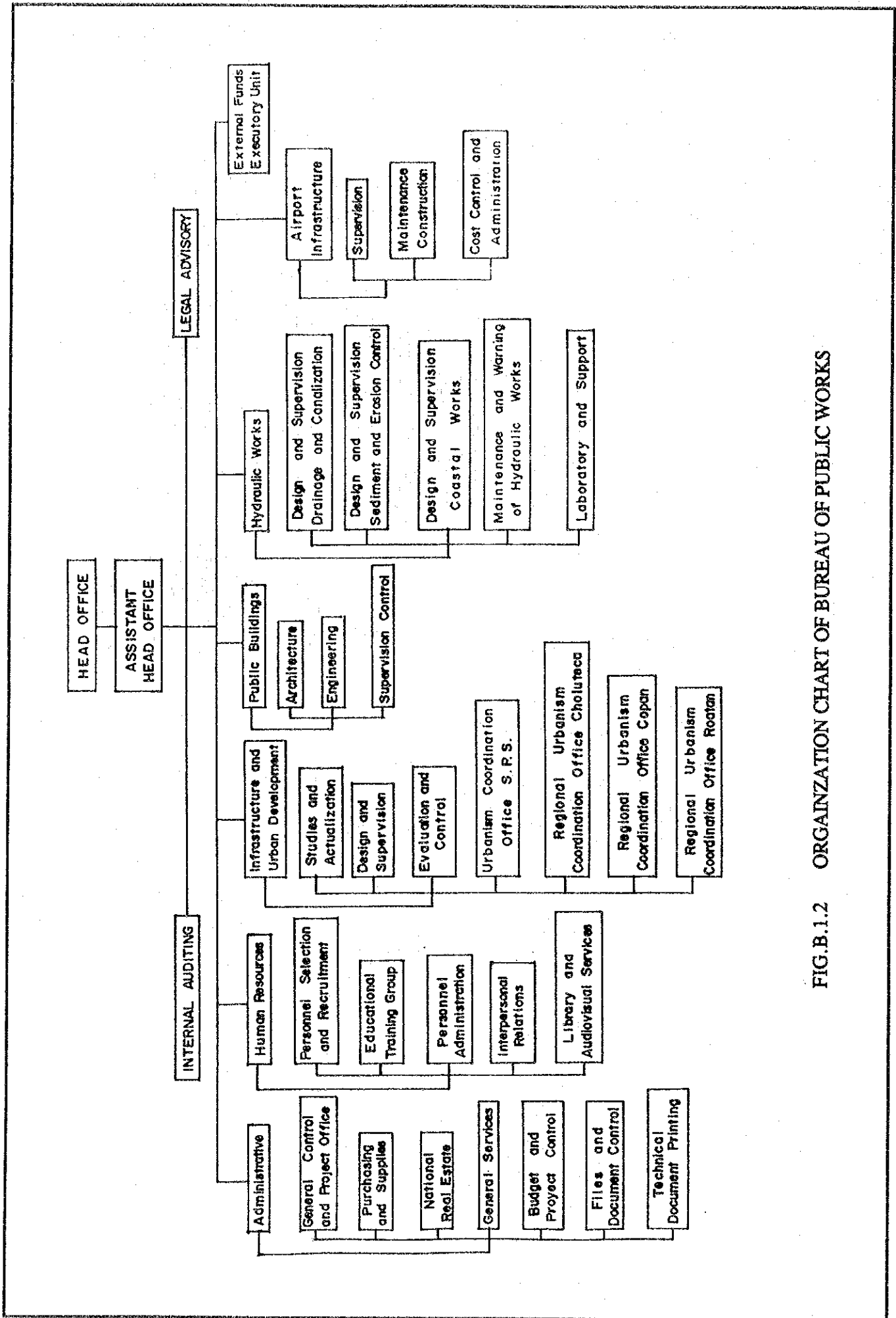


FIG.B.1.2 ORGANIZATION CHART OF BUREAU OF PUBLIC WORKS



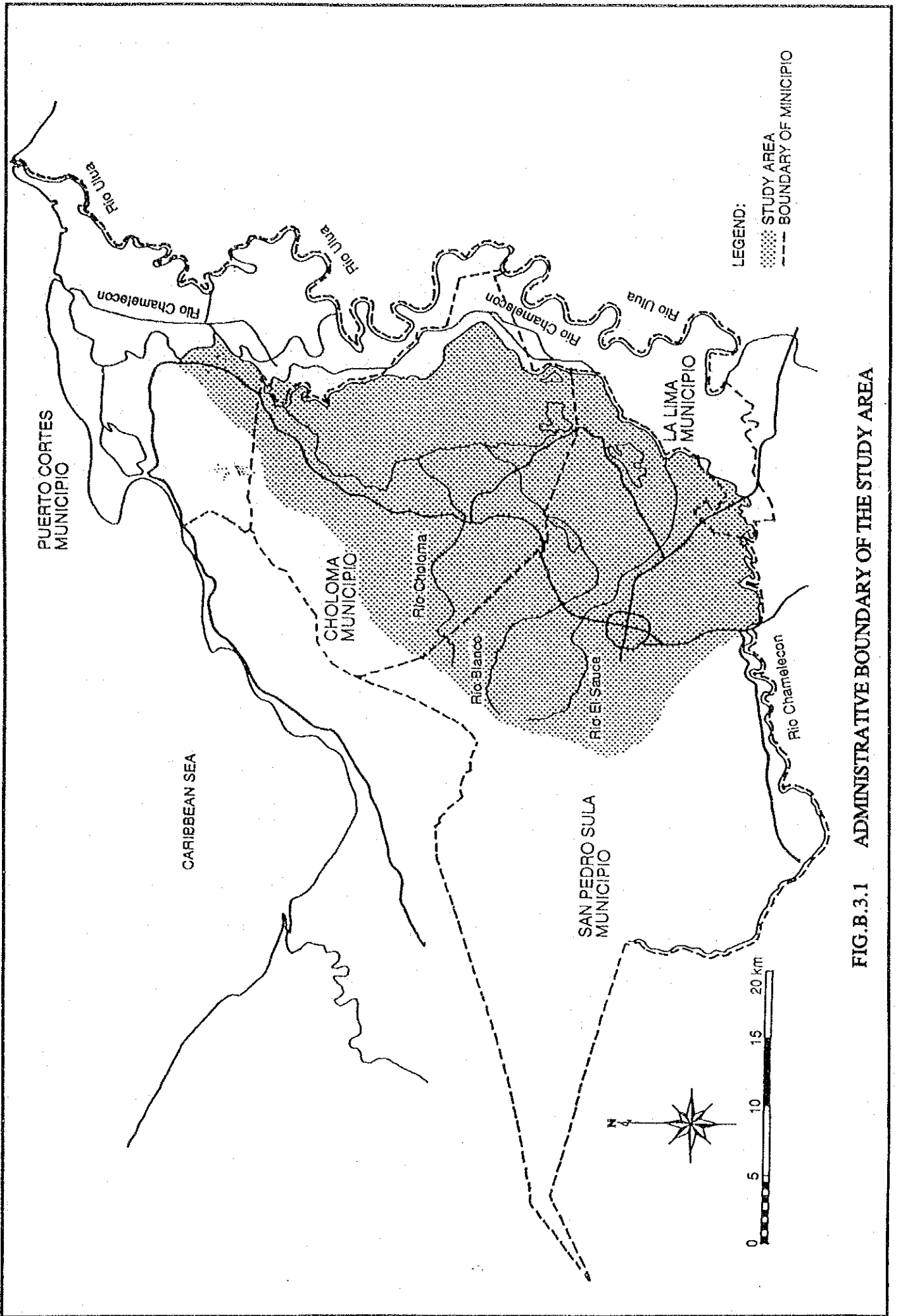


FIG.B.3.1 ADMINISTRATIVE BOUNDARY OF THE STUDY AREA

THE MASTER PLAN STUDY ON THE EROSION AND SEDIMENT CONTROL IN THE PILOT RIVER BASIN, CHOLOMA, SAN PEDRO SULA, CORTES
 IN THE REPUBLIC OF HONDURAS, 1993
 (RIO CHOLOMA AREA)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) • MINISTRY OF COMMUNICATIONS, PUBLIC WORKS AND TRANSPORTATION (CONSEP), THE REPUBLIC OF HONDURAS

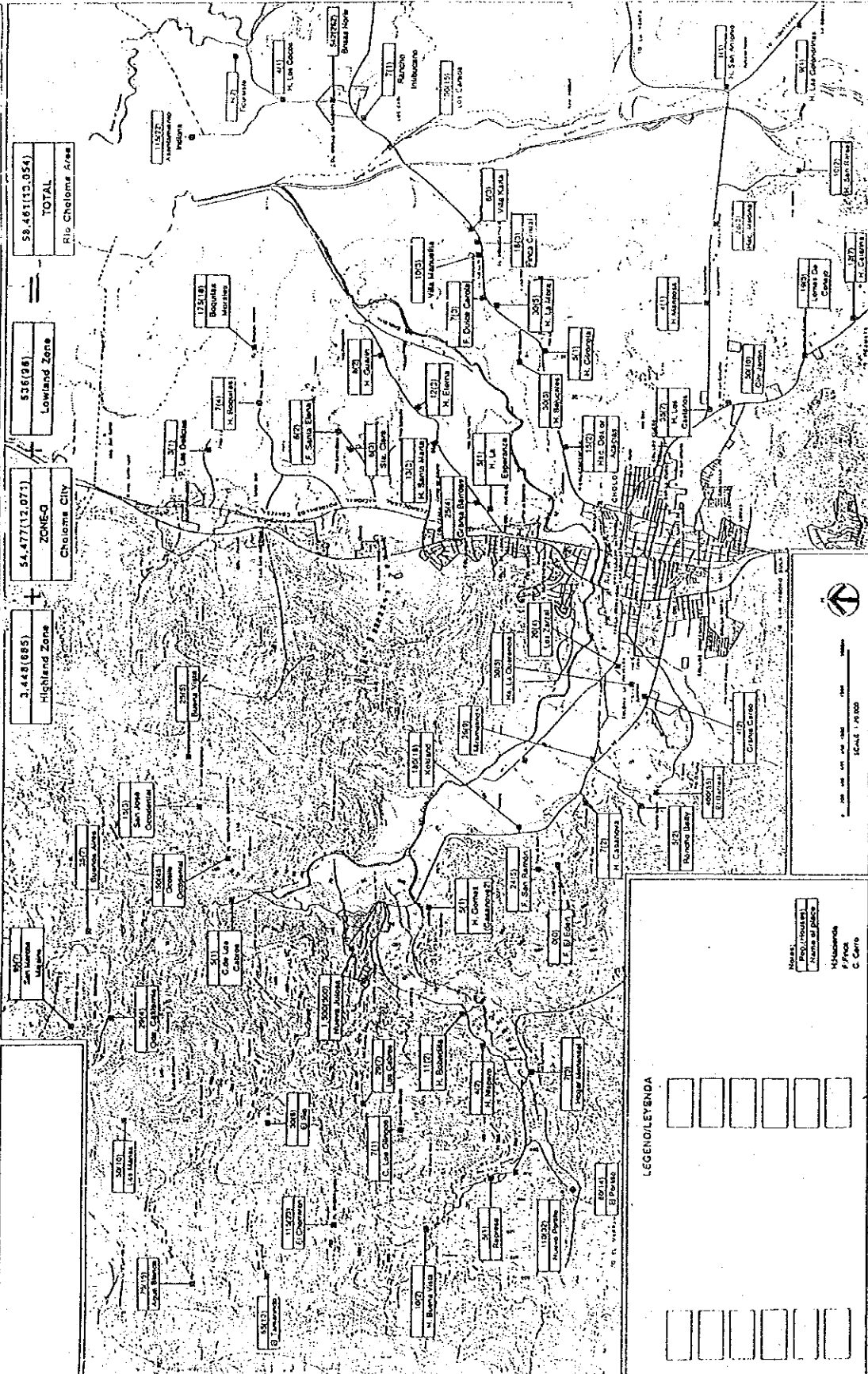


FIG. B.3.2 EXISTING POPULATION AND HOUSING OF THE RIO CHOLOMA AREA



- LEGEND
 SIGNOS CONVENCIONALES
- BAHANA B BAHANO
 - RICE/CORN A ARROZ / MAIZ
 - VEGETABLE/CITRUS / SUGARCANE C VEGETALES / CITRICOS / CANA DE AZUCAR
 - OTHER CHOIS / VEGETATIONS X OTROIS
 - CULTIVATED PASTURE O PASTO CULTIVADO
 - NATURAL PASTURE E PASTO NATURAL
 - AGRICULTURE/PASTURE (MOUNTAIN AREA) G
 - BRUSHWOOD M MATOIAL
 - FOREST D BOSQUE
 - BUILT-UP AREA U
 - WATER BODIES R

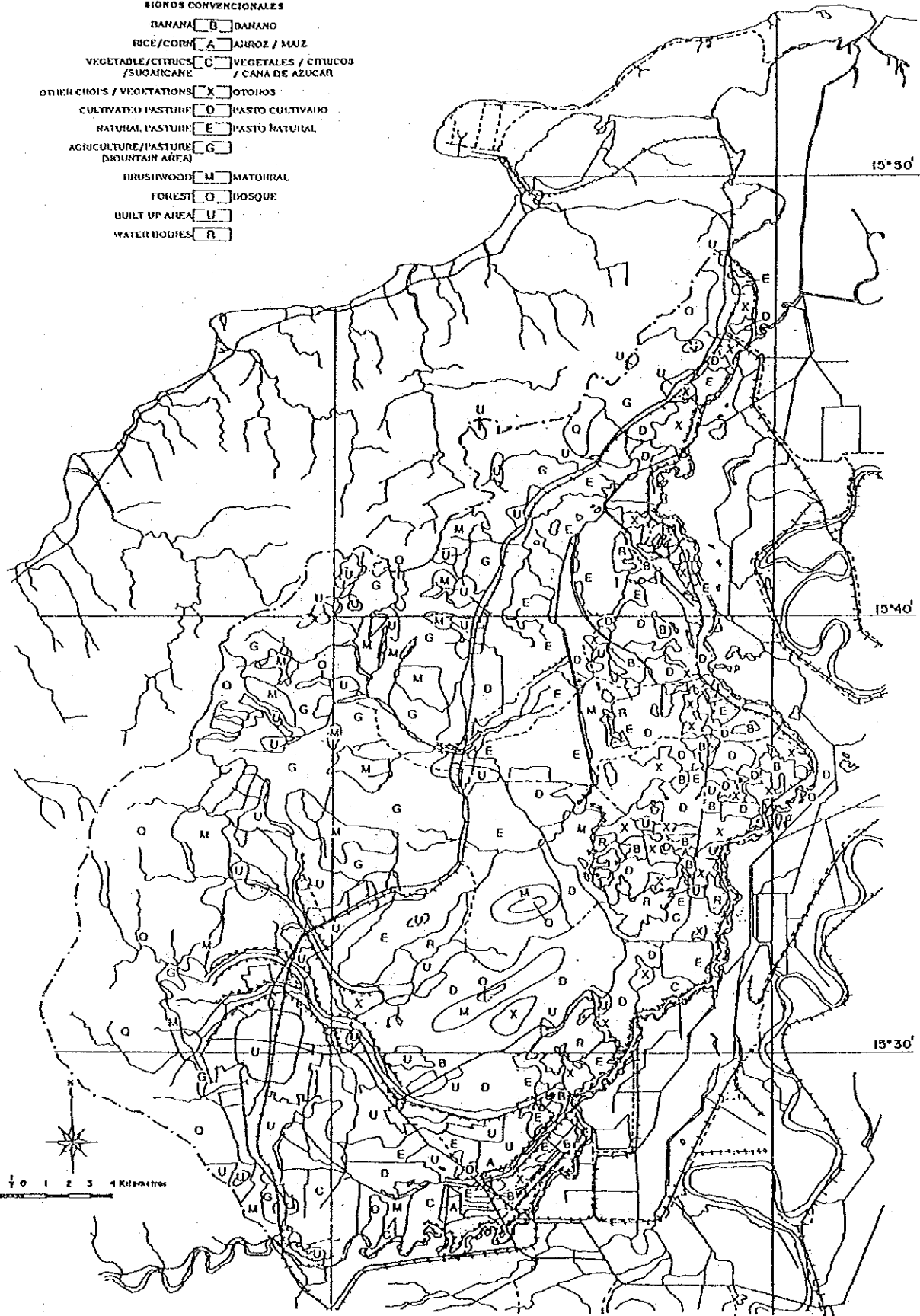


FIG. B.3.3 PRESENT LAND USE OF THE STUDY AREA

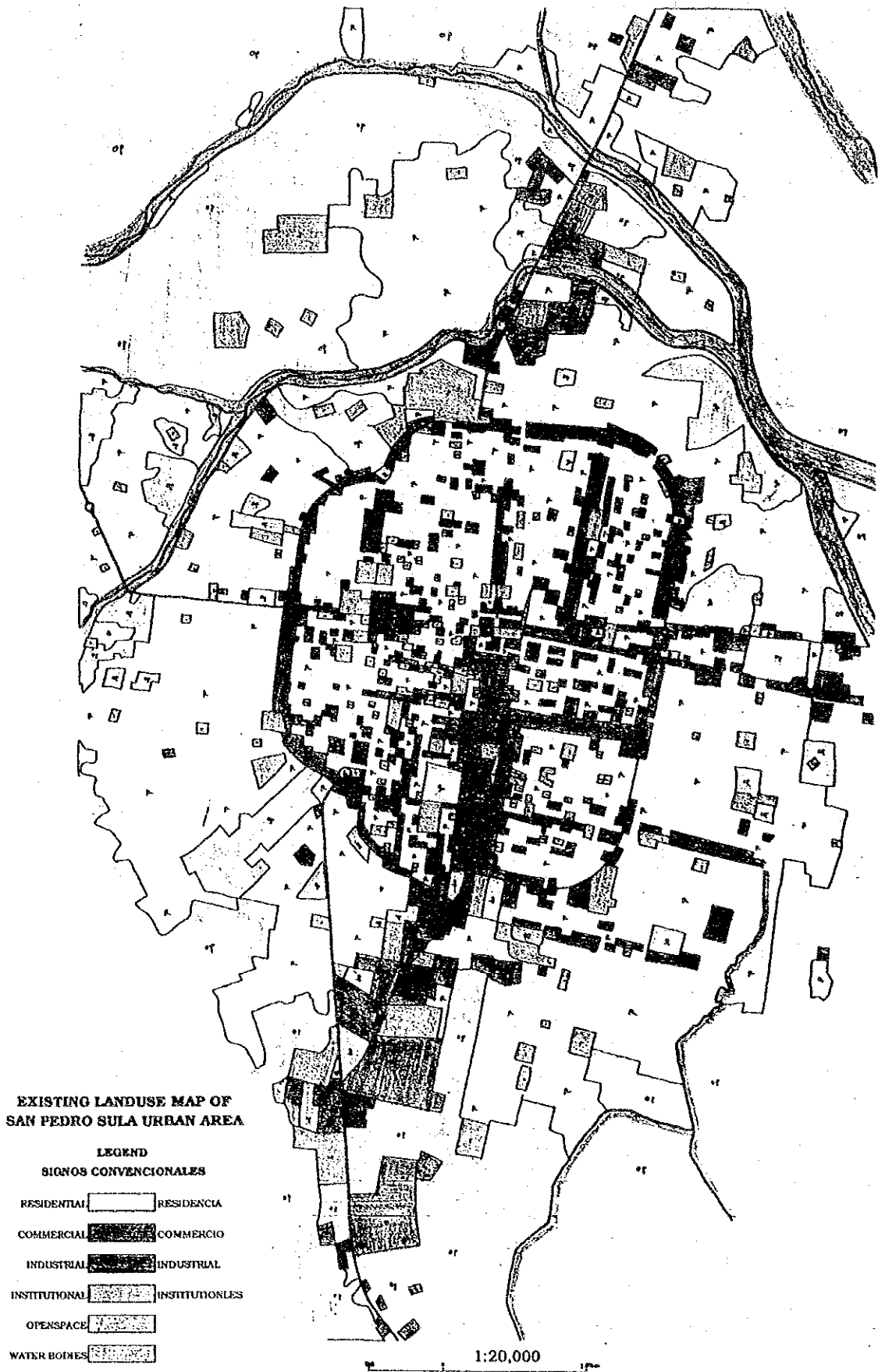


FIG.B.3.4 LAND USE OF SAN PEDRO SULA CITY IN 1992

LEGEND SIGNOS CONVENCIONALES	
PRESENT BUILT-UP AREA	
SITE UNDER PREPARATION	
URBAN DEVELOPMENT SCHEME	
BOUNDARY OF URBAN AREA	
RIVER / CANAL AND WATER BODY	
EMBANKMENT	
FORESTRY AREA	
MUNICIPAL BOUNDARY	

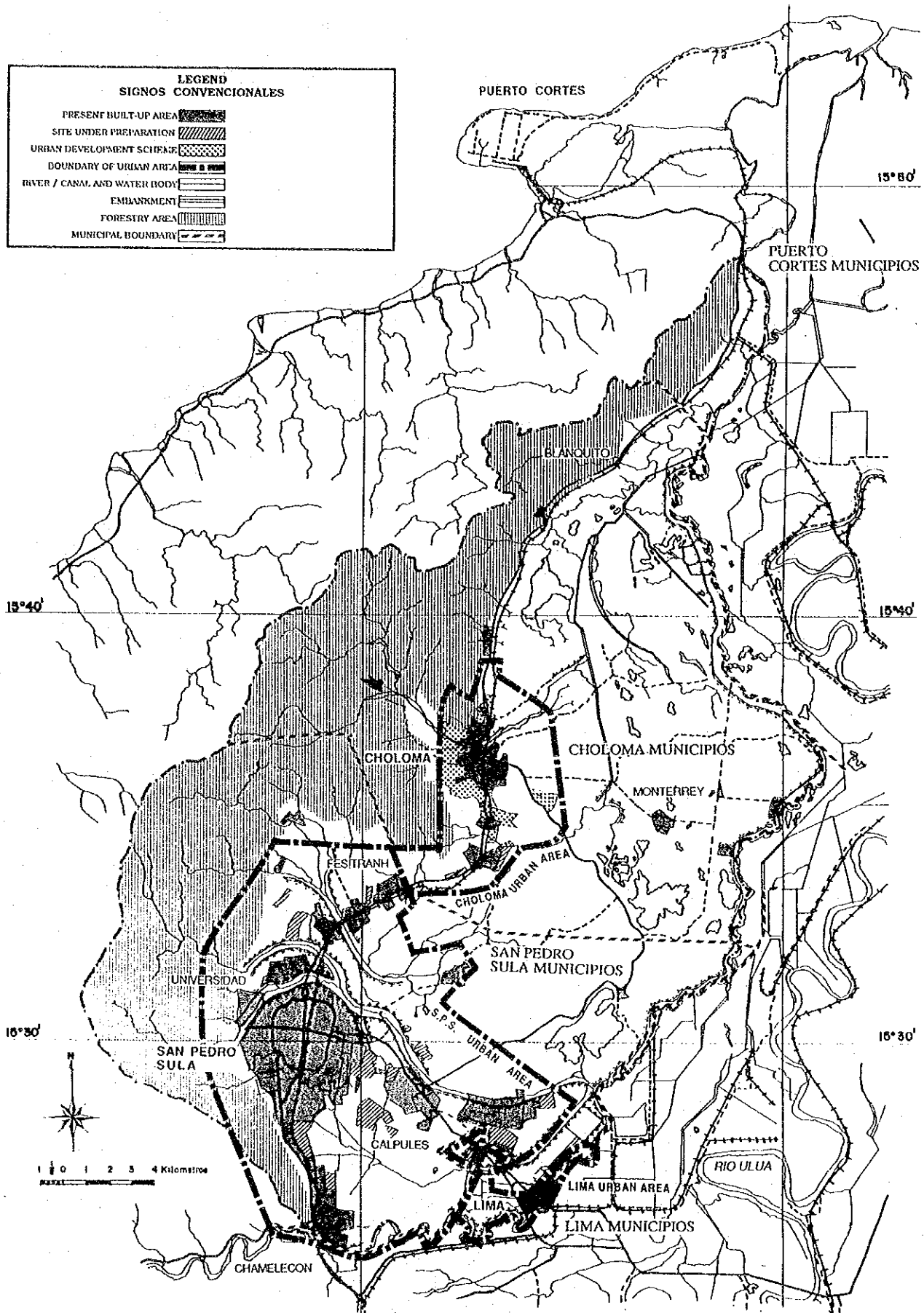
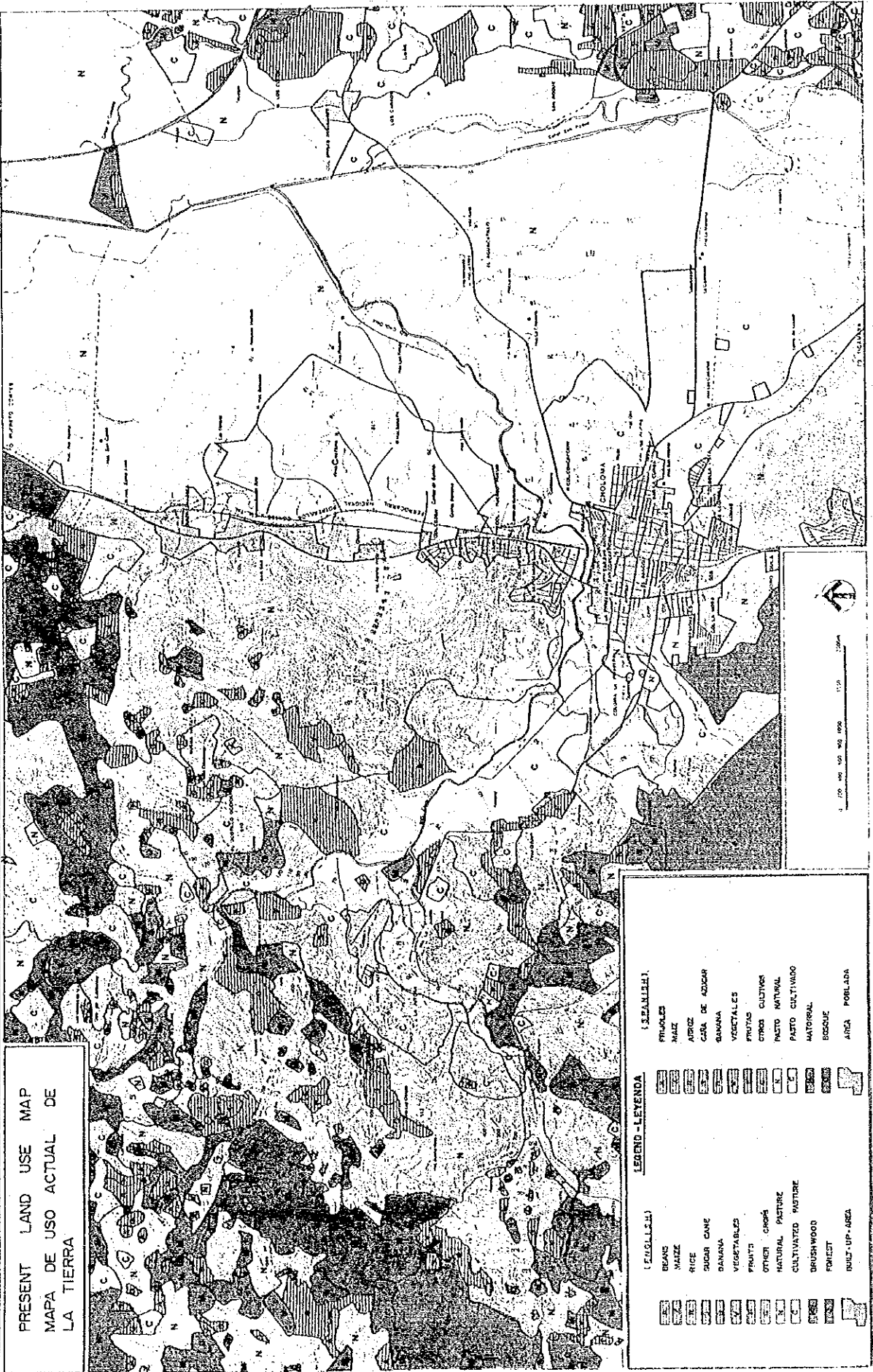


FIG.B.3.5 URBAN AREAS IN THE STUDY AREA

THE MASTER PLAN STUDY ON THE EROSION AND SEDIMENT CONTROL IN THE PILOT RIVER BASIN, CHOLOMA, SAN PEDRO SULA, CORTES
 IN THE REPUBLIC OF HONDURAS, 1993
 (RIO CHOLOMA AREA)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) • MINISTRY OF COMMUNICATIONS, PUBLIC WORKS AND TRANSPORTATION (SECTOP), THE REPUBLIC OF HONDURAS

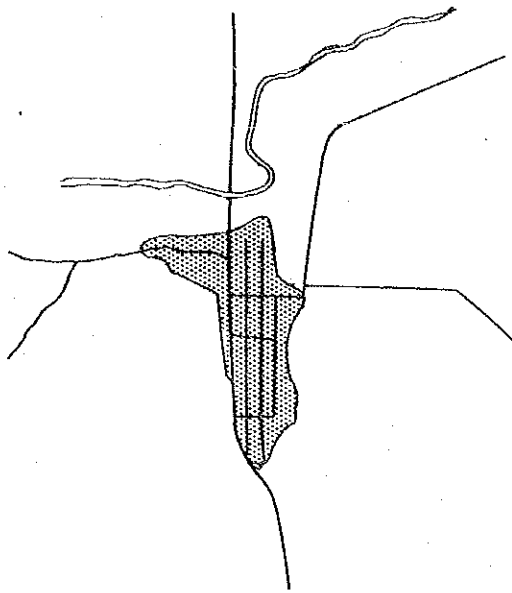


PRESENT LAND USE MAP
 MAPA DE USO ACTUAL DE LA TIERRA

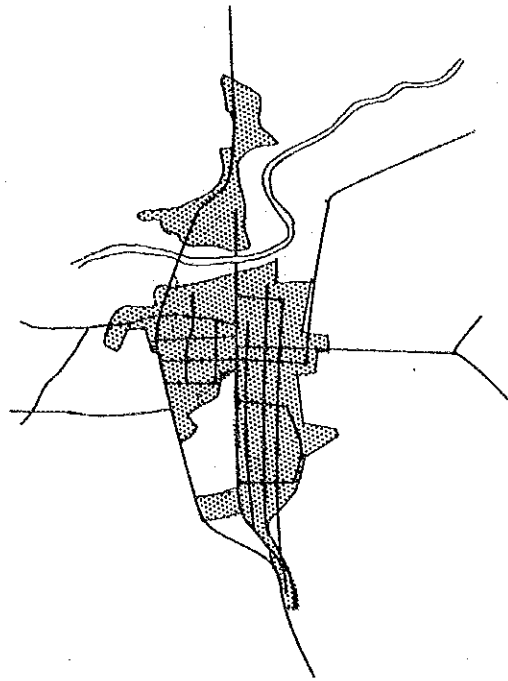
(EN INGLÉS)	(ESPAÑOL)
BEANS	FRIJOLES
MAIZE	MAIZ
RICE	ARROZ
SUGAR CANE	CASA DE AZÚCAR
VEGETABLES	BANANA
FRUITS	VEGETALES
OTHER CROPS	FRUTAS
NATURAL PASTURE	OTROS CULTIVOS
CULTIVATED PASTURE	PASTO NATURAL
BRUSHWOOD	PASTO CULTIVADO
FOREST	NATURAL
BUILT-UP AREA	BOSQUE
	ARCA
	POBLADA

FIG. B.3.6 PRESENT LAND USE IN RIO CHOLOMA BASIN

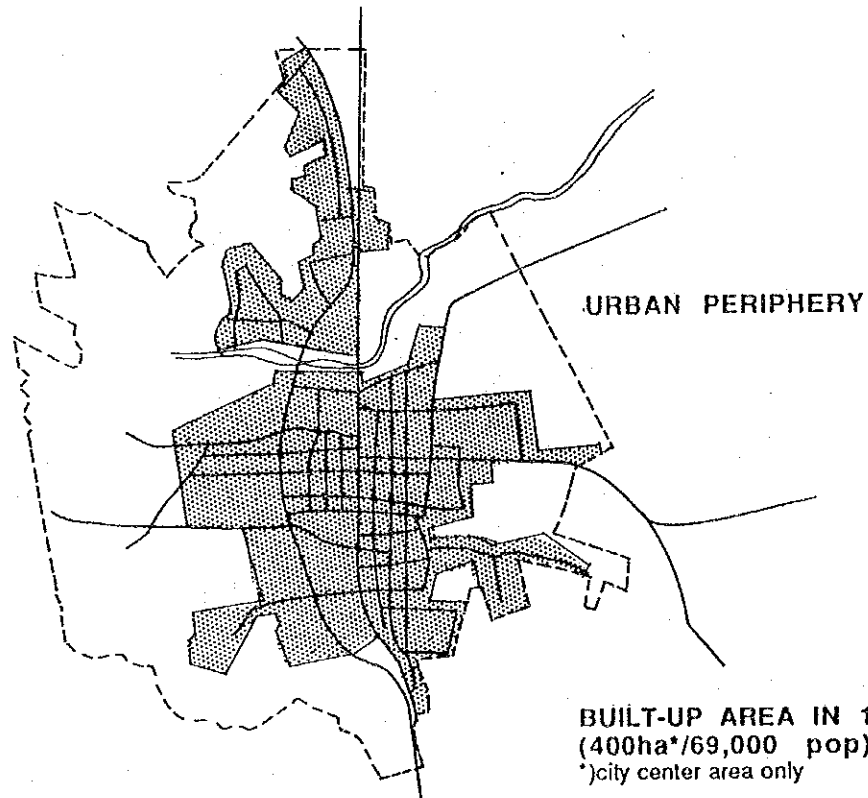




BUILT-UP AREA IN 1954
(50ha/14,000 pop)



BUILT-UP AREA IN 1974
(120ha/36,000 pop)

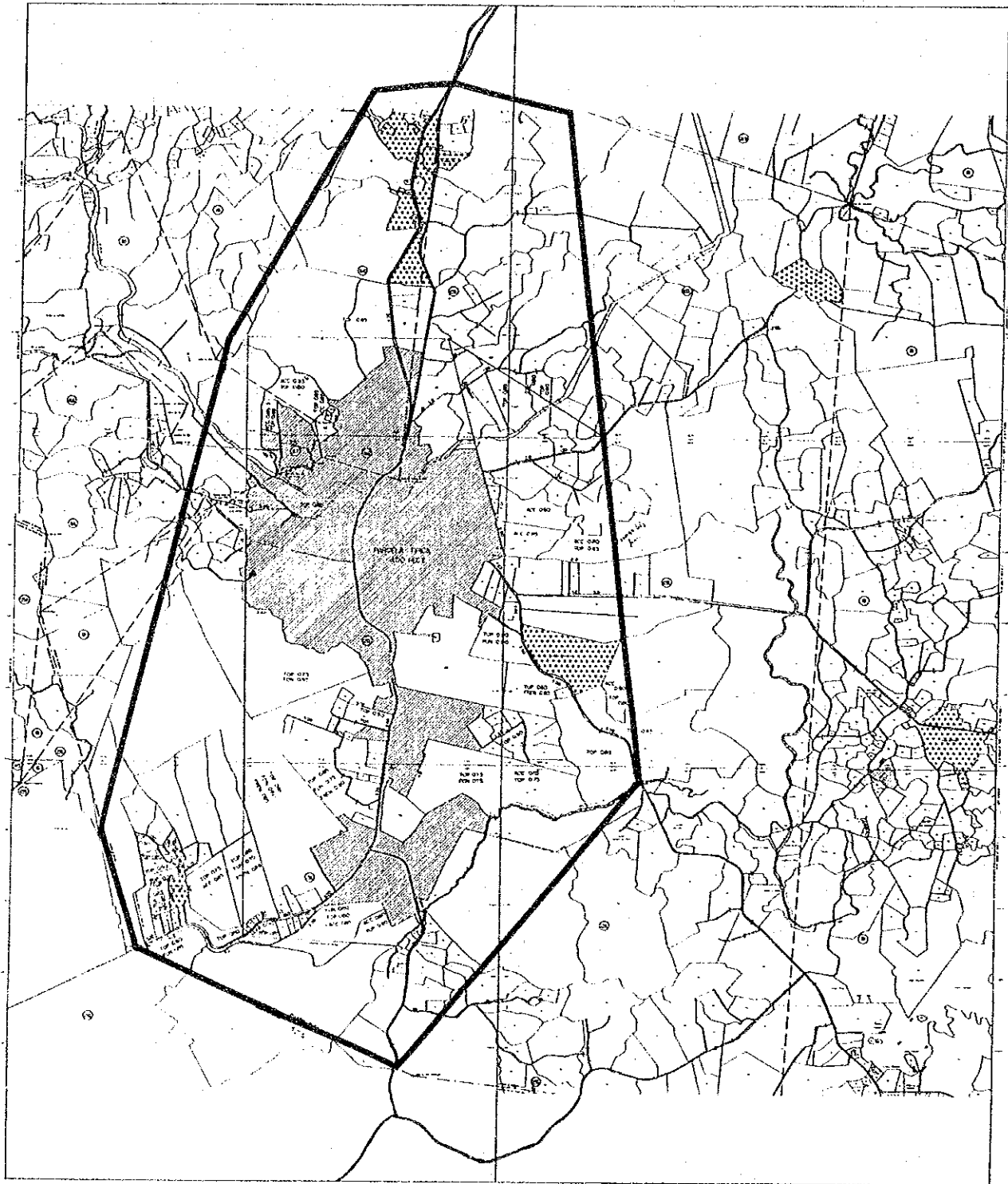
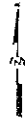


BUILT-UP AREA IN 1992
(400ha*/69,000 pop)
*city center area only

FIG.B.3.7 HISTORICAL DEVELOPMENT PATTERN OF CHOLOMA CITY

MAPA DE LA ZONA URBANA DEL MUNICIPIO DE CHOLOMA, DEPARTAMENTO DE CORTEZ, MOSTRANDO LAS ZONAS URBANAS, LAS ZONAS DE DESARROLLO Y LA ZONA DE PERIMETRO URBANO, SEGUN EL PLAN DE DESARROLLO DE LA CIUDAD.









(ESALA 1:70000)
 0 200 400 600 800 M
 2 10 20



BOUNDARY OF URBAN AREA	—	LIMITE DEL AREA URBANO
URBAN DEVELOPMENT AREA	[Solid Grey Box]	PERIMETRO URBANO
DEVELOPMENT SCHEME	[Dotted Box]	SQUEMA DE DESARROLLO

FIG.B.3.8 URBAN DEVELOPMENT PLAN OF CHOLOMA CITY

LEGEND / LEYENDA

RESIDENCIAL		RESIDENCIAL
COMERCIAL		COMERCIAL
INDUSTRIAL		INDUSTRIAL
PUBLIC FACILITIES		FACILIDADES PUBLICAS
OPENSOURCE		CAMPO LIBRE
ROAD		CARRETERA
AGRICULTURAL		AGRICULTURA
RIVER		RIO

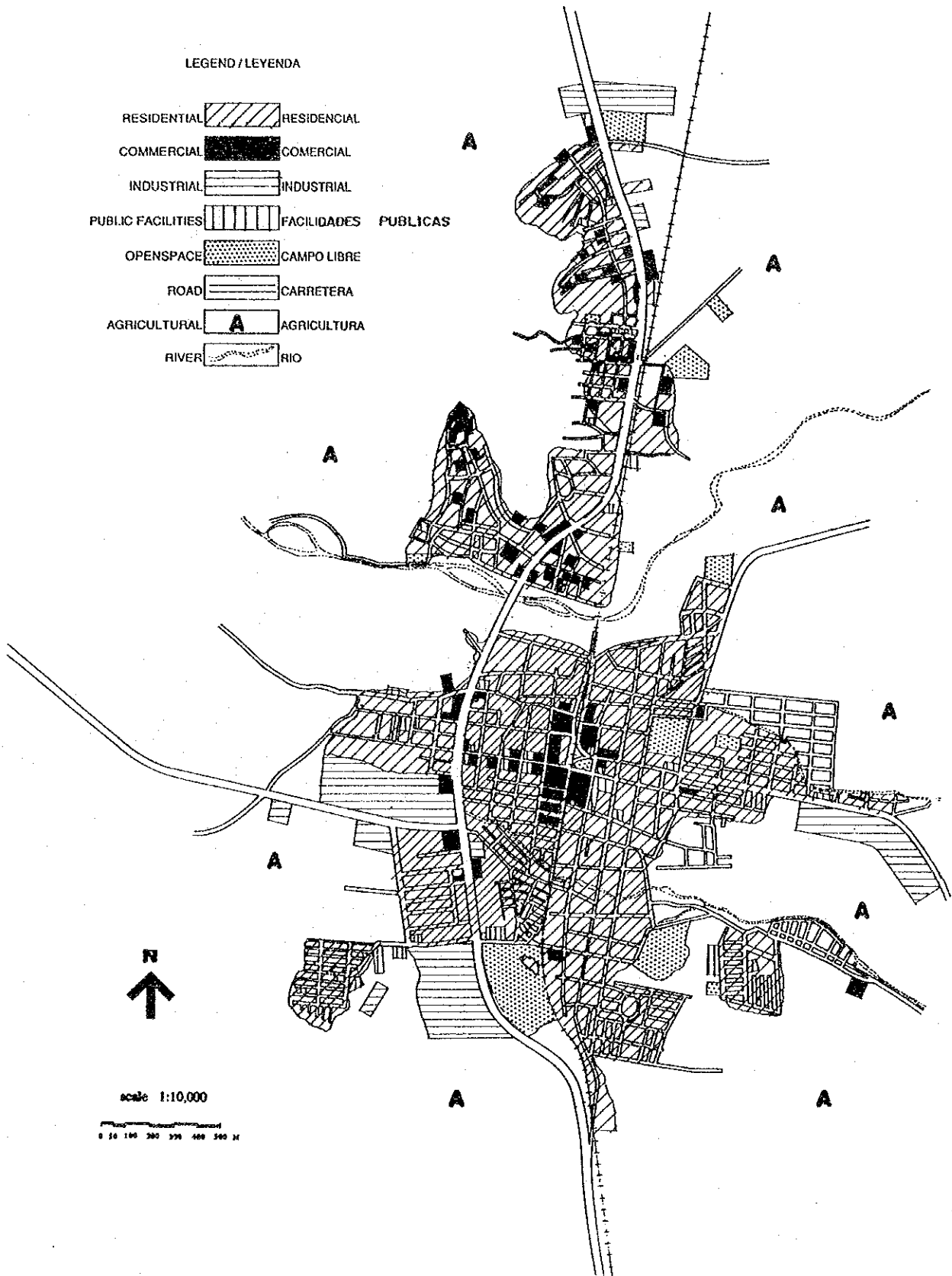


FIG.B.3.9 PRESENT LAND USE OF CHOLOMA CITY

LEYENDA	
●	GOBIERNO
1	Municipalidad
2	Fuerza de Seguridad Publica
3	Mercado Municipal
4	Instituto Nacional Agrario
5	Supervision De Educacion Primaria
6	Registro Nacional De Las Personas
7	Recursos Naturales
8	Hondutiel
9	Antigua Sede De Los Bomberos
10	Nueva Sede De Los Bomberos
11	Estación Del Ferrocarril Nacional
12	Antigua Sub Estación De La Enea
13	Rastro Municipal
14	Terminat De Transporte
15	Cementerio
16	Cámara E Industria De Choloma
17	Cohedlor (Corporación Hondureña De desarrollo Forestal)
18	Nueva Sede De La Sub estación De La Enea
○	SALUD
A	Centros De Salud
⊙	RECREACION
I	Estadio Municipal
⊞	Campos De Football
M	Parques
●	EDUCACION
A	Escuela José Trinidad Cabañas
B	Escuela José Cecilio Del Valle
C	Escuela José Trinidad Reyes
D	Escuela Lempra
E	Escuela Republica De Costa Rica
F	Escuela Republica De Venezuela
G	Escuela El Buen Samaritano
H	Escuela Abraham Bueso Pineda
I	Escuela Marcelino Pineda Lopez
J	Escuela Durán De Caraccioli
K	Escuela Virgilio Rodriguez
L	Escuela Julio César Yanez
M	Escuela De Pequeñas Industrias
N	Escuela Roberto Suazo Córdova
O	Escuela Cristo Rey
P	Instituto Departamental De Choloma
○	Jardín De Niños Maria Montesson
R	Jardín De Niños Cámara Junior

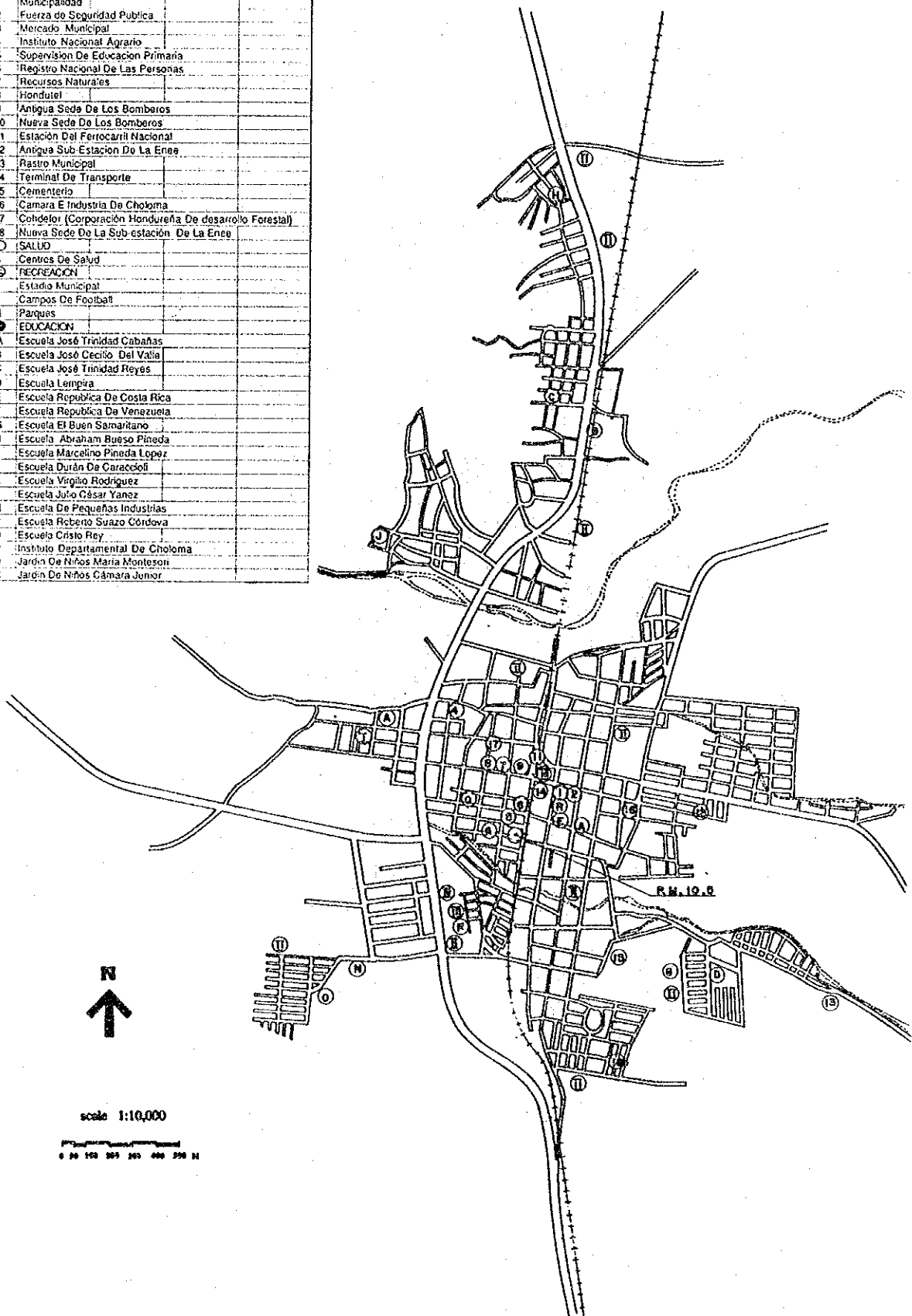


FIG. B.3.10 LOCATION OF PUBLIC FACILITIES IN CHOLOMA CITY

CHOLOMA CITY

No.	N A M E
1	COL. CEDEN
2	COL. INFOP
3	COL. 11 DE ABRIL
4	COL. MISSISSPI
5	BAR. PUEBLO NUEVO
6	COL. LOS ALMENDROS
7	COL. 19 DE SEPTIEMBRE
8	COL. SAN FRANCISCO
9	COL. MUNICIPAL
10	BAR. CONCEPCION
11	BAR. LA PRIMAVERA
12	(INDELBA)
13	(CHIP)
14	BAR. SAN ANTONIO
15	QUINADA
16	BAR. GUAYABAL
17	ARRIBA
18	EL BANCO
19	BAR. EL CENTRO
20	BAR. ABAJO
21	(LA RUBI)
22	COL. LOS COCOS
23	BAR. LA CURBA
24	COL. LOS PROFESIONALES
25	COL. CANADA
26	(SANTA FE ?)
27	COL. LA MORA
28	(ZIP)
29	(SOS)
30	BAR. CHAPARRO
31	COL. BELLA VISTA
32	COL. LAS LOMAS
33	COL. LOS LEONES

BAR. : BARRIO
COL. : COLONIA

BUILDING DENSITY

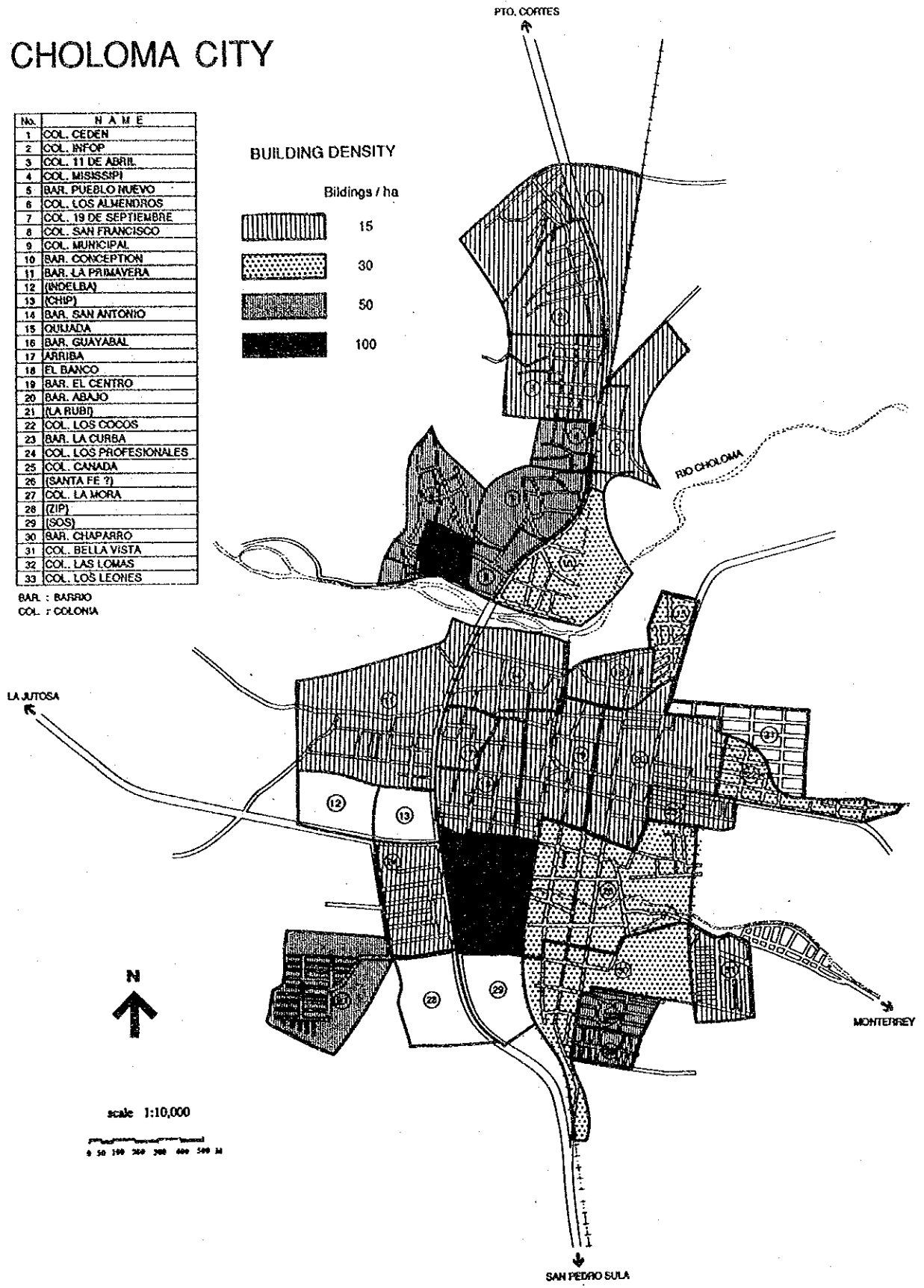
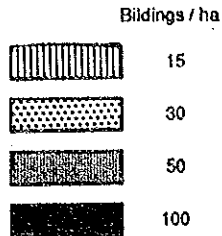


FIG. B.3.11 BUILDING DENSITY OF CHOLOMA CITY

**SUPPORTING REPORT C
FLOOD AND FLOOD DAMAGE SURVEY**

SUPPORTING REPORT C FLOOD AND FLOOD DAMAGE SURVEY

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SUPPORTING REPORT C FLOOD AND FLOOD DAMAGE SURVEY

1 FLOOD AREA SURVEY

A questionnaire survey was carried out by the study with the aims of the followings:

- In order to clear the flood conditions in the past, flood area, depth of flood, thickness of sediment deposits and duration of flood were surveyed for major floods through questionnaires,
- In order to get data and information of flood damages in the past flood, houses and assets in the flood hazard area were surveyed and studied.

The survey area is divided into three zones and shown in *Figs. C.1.1 and C.1.2*. They are explained as follows:

- 1) Zone-A: Western area of San Pedro Sula (*Fig. C.1.1*)
 - A-1: Calpules (lower reach of the Rio El Sauce)
 - A-2: Santa Marta (lower reach of the Rio Blanco)
 - A-3: Lima (Western part of La Lima, Old Lima)
- 2) Zone-B: Eastern area of San Pedro Sula (*Fig. C.1.1*)
 - B-1: Fesitránh (upper reach of the Rio Blanco)
 - B-2: Universidad (upper reach of the Rio El Sauce)
 - B-3: Chamelecon (Southern part of San Pedro Sula)
- 3) Zone-C: Choloma and northern part of the study area (*Fig. C.1.2*)
 - C-1: Choloma (along the Rio Choloma)

- C-2: Monterrey (eastern part of Choloma, including of La Ceibita, La Galves, La Devis, La Montanuela, San Roque and La Danta)
- C-3: Blanquito (along the national road, including of Quebrada Seca, Rio Bijao, El Triunfo, Baracoa and Campana)

A questionnaire survey has been carried out from September 1992 through October 1992 for the past flood areas and flood damages. The form used in the questionnaire survey is shown in *Table C.1.1* and *Table C.1.2*. 260 sites and 580 households are visited and interviewed in the flood hazard area. The numbers of households interviewed are shown in *Table C.1.3*.

The table shows that out of the 628 households interviewed, 523 households (83 percent) have experienced flood damages in the past. Although the study area was suffered from the floods in 1935, 1945, 1954, 1969, 1974, 1979 and 1990, the questionnaire survey has been carried out on the largest flood of 1974, the current large flood of 1990 and yearly flood.

The supplementary survey was carried out in May and June 1993 for the Feasibility Study area which is identified in the Master Plan.

2 FLOOD CONDITIONS AND FLOOD DAMAGES IN THE PAST

2.1 Outlines of the Questionnaire Survey

Table C.1.3 shows that 523 samples (84 percent) among 628 samples show that they have had flood experiences in the past. The actual situations of the survey areas are explained as follows:

(1) Zone-A

The households of 147 have experienced flood damages. Their locations and experienced floods are explained as follows:

In A-1, it is 60 samples to have flood experiences, of which 23 and 21 samples indicated yearly flood and the 1974 flood respectively.

- In A-2, it is 66 samples to have flood experiences, of which 36 samples indicated the 1990 flood.
- In A-3, it is 21 samples to have flood experiences, of which 13 samples indicated the 1990 flood.

(2) Zone-B

The households of 172 have had flood experiences as follows:

- In B-1, it is 49 samples to have flood experiences, of which 25 samples indicated the 1974 flood.
- In B-2, it is 42 samples to have flood experiences, of which 39 samples indicated 1974 flood.
- In B-3, it is 81 samples to have flood experiences, of which 40 samples indicated the yearly flood.

(3) Zone-C

The households of 195 have had flood experiences as follows:

- In C-1, it is 74 samples to have flood experiences, of which 36 samples indicated the 1974 flood.
- In C-2, it is 50 samples to have flood experiences, of which 20 samples indicated the 1974 flood.
- In C-3, it is 71 samples to have flood experiences, of which 39 samples indicated the 1974 flood.

The total numbers of the sample houses (or buildings) are 427, of which 323 houses (or buildings) are residential, 46 houses (or building) are farmhouses. The rest of them

are commercial, industrial, school, clinic, church and office buildings as shown in *Table C.2.1*.

The residential houses are divided into 4 classes as follows:

- (1) High class More than Lps. 150,000,
- (2) Middle class Lps. 150,000 to 80,000,
- (3) Low class Lps. 80,000 to 20,000,
- (4) Poor class Less than Lps. 20,000,

2.2 Description of the Past Floods

1) 1974 flood (the hurricane Fifi)

The flood caused by the hurricane Fifi is the largest flood ever experienced in the study area. The all rivers in the study area caused floods and the flood area map was prepared and shown in *Fig. C.2.1*. *Table C.2.2* shows the situations of the 1974 flood caused by the hurricane Fifi. The average duration of inundation is 10 days in the study area. The average depth of flood water was 106 cm above the ground level and 79 cm above the floor level. The thickness of sediment deposits was 28 cm above the ground level.

The flood areas, submerged deeper than 100 cm above the building floor, covered widely in Calpules, Fesitranh and Chamelecon. Also sedimentation areas, thickness about 10 cm above the building floor level, were identified in Fesitranh, Santa Marta, Choloma and Monterrey.

During the Feasibility Study stage, supplementary surveys were carried out in the Rio Choloma basin. The flood situations informed and recorded in the newspapers of *Tiempo* and *La Prensa*, were summarized in *Table C.2.3*.

2) 1990 flood (the hurricane Gilbert)

Chamelecon, Choloma and Monterrey were affected by the flood water from the Rio Chamelecon and the Rio Choloma. The areas of Calpules and Santa Marta were also inundated during the flood. The flood area map was prepared and shown in *Fig. C.2.2.*

Table C.2.4 shows the situations of the 1990 flood caused by the hurricane Gilbert. The average flood water depth was 79 cm above the ground level and 49 cm above the floor level. The sediment deposits were 13 cm in thickness. The duration of inundation was 7 days.

3) Yearly flood

The yearly flood area map is prepared and shown in *Fig. C.2.3.* Calpules, Santa Marta, Universidad, Fesitranh, Chamelecon, Choloma, Monterrey and Blanquito that are located in the low lying areas, are affected by floods yearly from the Rio Chamelecon and its tributaries because of poor flood mitigation facilities and poor drainage facilities. *Table C.2.5* shows the conditions of the yearly floods.

TABLES

TABLE C.1.1 QUESTIONNAIRE FORM OF FLOOD AND FLOOD DAMAGE SURVEY

Point no.

Date Interviewer

A. Sample Point

Address

Municipios	<input type="text"/>
Community	<input type="text"/>
Location	<input type="text"/>

B. Use of building

<input type="text"/>	residential high	<input type="text"/>	office
<input type="text"/>	residential mid	<input type="text"/>	government
<input type="text"/>	residential low	<input type="text"/>	school
<input type="text"/>	residential poor	<input type="text"/>	medical
<input type="text"/>	shop	<input type="text"/>	church
<input type="text"/>	factory	<input type="text"/>	others;

C. Type of building

type	A / B / C / D
height of the floor from the ground	cm
height of the elevated ground	cm

D. Ownership

Land	owned/rented
Building	owned/rented
How long have you been here	years

TABLE C.1.1 QUESTIONNAIRE FORM OF FLOOD AND FLOOD DAMAGE SURVEY (CONTINUED)

E.Flood records

year	damaged	max. flood depth above ground	depth of sediments	duration
1954	y / n / not known	cm	cm	days
1969	y / n / not known	cm	cm	days
1974	y / n / not known	cm	cm	days
1979	y / n / not known	cm	cm	days
1990	y / n / not known	cm	cm	days
others	y / n / not known	cm	cm	days
	y / n / not known	cm	cm	days

F.Property value

ground floor area		sq.m
age of the building		year
construction cost		Lp

G.Economic damage

1) loss of land	no / yes-----	year
		sq.m.
		Lp
2) loss of building	no / yes-----	year
(have you spent for the building maintenance, repair or rebuilding?)	repair / rebuilt	Lp
3) loss of stocks	no / yes-----	year
(household, materials, vehicles, machines, equipments, etc.,)		Lp
4) Income loss (residential)	no / yes-----	year
		Lp
5) sales loss (commercial)	no / yes-----	year
		Lp
6) products loss (industrial)	no / yes-----	year
		Lp
7) products loss (farmer)	no / yes-----	year
		Lp
8) loss of livestock (farmer)	no / yes-----	year
		Lp

TABLE C.1.3 NUMBER OF SAMPLES OF THE QUESTIONNAIRE SURVEY

	Number of buildings	Number of places*1)	Number of samples	Inundated cases*2)	share(%)	Valid samples for flood and damage analysis	Valid samples for stock analysis
AZONE	197	80	208	148	71%	147	161
A1:Calpules	93	37	96	60	63%	60	77
A2:Santa Marta	79	35	84	67	80%	66	69
A3:Lima	25	8	28	21	75%	21	15
BZONE	192	85	217	175	81%	172	118
B1:Universidad	78	31	79	49	62%	49	52
B2:Fesitranh	51	26	53	44	83%	42	24
B3:Chamelecon	63	28	85	82	96%	81	42
CZONE	189	94	203	200	99%	195	148
C1:Choloma	76	36	79	76	96%	74	67
C2:Monterrey	47	25	53	53	100%	50	30
C3:Blanquito	66	33	71	71	100%	71	51
TOTAL	578	259	628	523	83%	514	427

Notes:

*1) Barrio, Colonia, Hacienda, Finca, etc.

*2) the sample with the indications of "inundated in the past", counts as 1.

TABLE C.2.1 USE OF THE BUILDINGS

Use of Buildings	A Zone	B Zone	C Zone	Total	Share
Residential High Class(RH)	16	34	5	55	13%
Residential Middle Class(RM)	23	8	5	36	8%
Residential Low Class(RL)	40	29	44	113	26%
Residential Poor Class(RP)	48	18	53	119	28%
Residential Total	127	89	107	323	76%
Farmhouse(RF)	13	10	23	46	11%
Commercial(C)	9	10	13	32	7%
Industrial(I)	1	0	1	2	0%
School(EK/EP)	5	4	0	9	2%
Clinic(CL)	3	0	1	4	1%
Church(CH)	2	4	1	7	2%
Office(OG/OP)	1	1	2	4	1%
Other Buildings Total	21	19	18	58	14%
TOTAL	161	118	148	427	100%
(Share)	38%	28%	35%	100%	

TABLE C.2.2 1974 FLOOD

Zone	Water Depth from the Ground Level (cm)	Water Depth from the Floor Level (cm)	Sed. Depth from the Ground Level (cm)	Sed. Depth from the Floor Level (cm)	Duration (days)	Number of Samples	Source of Water
STUDY AREA	External	106	79	28	1	204	
	Internal	108	80	29	1	200	
		50	40	9	X	4	
EXTERNAL							
A1: Calpules	136	119	15	X	3	5	Rio Blanco
A1: Calpules	146	134	7	X	5	12	Rio Chamelecon
A1: Calpules	73	26	0	X	3	2	Rio El Sauce
A2: Santa Maria	83	33	17	X	4	2	Rio Chamelecon
A2: Santa Maria	108	68	17	X	7	6	Rio Choloma
A2: Santa Maria	104	93	24	13	6	3	Rio El Sauce
A3: Lima	93	70	23	X	3	3	Rio Chamelecon
B1: Universidad	122	86	25	X	6	25	Rio El Sauce
B2: Fesitranh	99	80	33	17	4	34	Rio Chamelecon
B2: Fesitranh	133	103	23	X	5	3	Rio El Sauce
B3: Chamelecon	141	107	31	X	5	11	Rio Chamelecon
C1: Choloma	75	58	25	8	8	5	Rio Chamelecon
C1: Choloma	102	79	36	14	15	31	Rio Choloma
C2: Monterrey	80	65	24	9	18	20	Rio Choloma
C3: Blanquito	100	83	33	2	26	18	Rio Chamelecon
C3: Blanquito	98	53	34	X	8	8	Rio Choloma
C3: Blanquito	97	31	39	X	8	12	Other Rivers
INTERNAL							
A1: Calpules	45	36	18	9	9	2	Rain
B2: Fesitranh	55	45	0	X	13	2	Rain

Note: X=below the level

TABLE C.2.3 MAJOR EVENTS AND TOPICS AT THE DAYS OF FIFI IN CHOLOMA

Memorandum of the 1974 flood in Choloma (major sources; newspapers and interview to the residents)

Day	Time	Major events at Choloma City	At La Jutosa/Ocotillo/Majaina/Portillo
17 Sept. (Tue)		Rain began at 10:00 p.m. continuously	Rain began at 10:00 p.m. continuously
18 Sept. (Wed)		Heavy rain with strong wind all the day The airport was closed and all flights were cancelled	Heavy rain with strong wind all the day
	18:00	General warning by radio, but with no detail information, so that people were not so cautious The road (SPS-Pto Cortes) is flooded with water up to 30 cm	General warning by radio, but with no detail information, so that people were not so cautious
	22:00	Water depth of the road increased by 1 m	
19 Sept. (Thu)	1:00		Flood water with sand and stones came at Ocotillo Water higher than the roof of the houses at Ocotillo
	3:00	Some people were evacuated to other places Flood water hits Choloma city area and the road and railway bridges were washed away in a few minutes Almost all the city area was inundated and 2/3 of the Choloma submerged People were floated and drowned, and some people evacuated at 2nd floor of neighbor's houses	People evacuated to the mountain at Ocotillo/La Jutosa 25 houses (85 persons) were damaged at Portillo (14 ha) 16 persons were killed by land slide at Ocotillo 100 houses (1000 persons), 5 ha of village area were destroyed, and livestock and all crops were totally washed away at La Jutosa
	6:00	Flood water depth went down	10 houses (80 persons) were washed away with land slide and the road was washed away at Majaina
20 Sept. (Fri)		Choloma was still flooded, there are no power supply and water Up to this date there have been 70 bodies buried in Choloma and 22 bodies in Quebrada Seca At a school in Quebrada Seca, the water depth is 2 m There are hundreds of people on the roofs of the houses were asking for help 80% of the people in Choloma city lost their houses	Water depth approx. 10 meter at La Jutosa 95% of La Jutosa and Ocotillo were destroyed
21 Sept. (Sat)		2/3 of Choloma city are flooded	
22 Sept. (Sun)		Choloma city is isolated	Flood water was stabilized at La Jutosa
23 Sept. (Mon)		Electricity supply was recovered in some area	People suffered from no food/communication and sick
24 Sept. (Tue)			People received foodstuff from the rescue (French aid)
25 Sept. (Wed)		People received food, clothing, medicines, etc. by air	
28 Sept. (Sat)		One water well was built, capacity 60,000 gal/day	
4 Oct.		Rescue from University Tegc. started to work Railway bridges were reconstructed Road was connected by temporal bridge	
9 Oct.		3 water well were built but with no distribution tank	
10 Oct.		1,640 bodies have been incinerated and 240 people are missing in Choloma by this time People were suffering from the sickness Reconstruction works were started	125 bodies were found and buried
After 1 month		Electricity supply was recovered Provisional wooden bridge was built	Road was connected to Choloma at Ocotillo
After 3 months		Water supply was recovered completely	
After 1 year		Reconstruction work were completed so far	Completion of new settlement area in La Nueva Jutosa with church, hospital and school
After 2 years		Permanent concrete bridge was built	Completion of reconstruction at the Ocotillo

Estimation of Flood Damages to the People and Houses (Rio Choloma Area)

	Damaged/Injured	Destroyed/Killed
La Jutosa	80-100 houses, 1,500 persons	50 people were killed
Ocotillo	40-50 houses, 1,000 persons	31 people were killed
Choloma city*)	3,000 houses, 15,000 persons	2,000 people were killed
Other areas	500 houses, 1,500 persons	
TOTAL	Approximately 4,000 houses and 20,000 persons	Approximately 2,500 people killed

Reference Information

Around 90,000 people were injured in San Pedro Sula
Approximately 1,600 ha area of banana were destroyed in the Sula Valley
60% of the railway was destroyed in Honduras
Total cost of the damage was \$300-400 millions in Honduras
Preliminary estimate show that there could be a total of 10,000 deaths in nationwide

*) Especially at Guayabal, San Antonio, Pueblo Nuevo, La Playa and Concepcion

TABLE C.2.4 1990 FLOOD

Zone	Water Depth from the Ground Level (cm)	Water Depth from the Floor Level (cm)	Sed. Depth from the Ground Level (cm)	Sed. Depth from the Floor Level (cm)	Duration (days)	Number of Samples	Source of Water
STUDY AREA							
	External	79	49	13	X	7	
	Internal	86	58	15	X	8	
	55	17	9	X	3		
EXTERNAL							
A1: Calpules	107	85	14	X	6	4	Rio Chamelecon
A2: Santa Marta	65	48	9	X	6	2	Rio Blanco
A2: Santa Marta	105	75	14	X	6	27	Rio Chamelecon
A3: Lima	116	56	14	X	4	13	Rio Chamelecon
B3: Chamelecon	72	48	13	X	3	18	Rio Chamelecon
C1: Choloma	45	18	15	43	6	2	Rio Chamelecon
C1: Choloma	65	55	25	15	9	7	Rio Choloma
C2: Monterrey	57	41	14	X	25	15	Rio Chamelecon
C3: Blanquito	100	100	30	30	4	1	Rio Chamelecon
C3: Blanquito	60	60	20	20	9	2	Other Rivers
INTERNAL							
A1: Calpules	52	39	13	X	4	7	Rain
A2: Santa Marta	89	14	6	X	3	7	Rain
B1: Universidad	18	X	0	X	1	6	Rain
B3: Chamelecon	20	X	0	X	5	1	Rain
C2: Monterrey	59	36	15	X	5	4	Rain
C3: Blanquito	70	50	40	20	3	1	Rain

Note: X=below the level

TABLE C.2.5 ANNUAL FLOOD

Zone	Water Depth from the Ground Level (cm)	Water Depth from the Floor Level (cm)	Sed. Depth from the Ground Level (cm)	Sed. Depth from the Floor Level (cm)	Duration (days)	Number of Samples	Source of Water
STUDY AREA							
	External	27	X	7	X	2	153
	Internal	66	48	16	X	8	5
	26	X	6	X	2	148	
EXTERNAL							
A3: Lima	40	0	3	X	1	1	Rio Chamelecon
C1: Choloma	73	60	19	6	10	4	Rio Choloma
INTERNAL							
A1: Calpuiles	29	X	4	X	1	23	Rain
A2: Santa Marta	26	X	3	X	1	9	Rain
B1: Universidad	11	X	1	X	1	16	Rain
B2: Resitranh	4	1	0	X	1	1	Rain
B3: Chamelecon	12	X	2	X	1	40	Rain
C1: Choloma	37	21	11	0	3	24	Rain
C2: Monterrey	41	28	12	0	9	8	Rain
C3: Blanquito	40	9	13	0	2	27	Rain

Note: X=below the level

FIGURES

B-2: UNIVERSIDAD

LEGEND;

- SURVEY AREAS
- SURVEY POINTS

B-1: FESITRANH

A-2: SANTA MARTA

A-1: CALPULES

A-3: OLD LIMA

B-3: CHAMELECON

FIG. C.1.1 SURVEY ZONE MAP OF RIO EL SAUCE AND RIO BLANCO AREA

LEGEND;

 SURVEY AREAS

 SURVEY POINTS

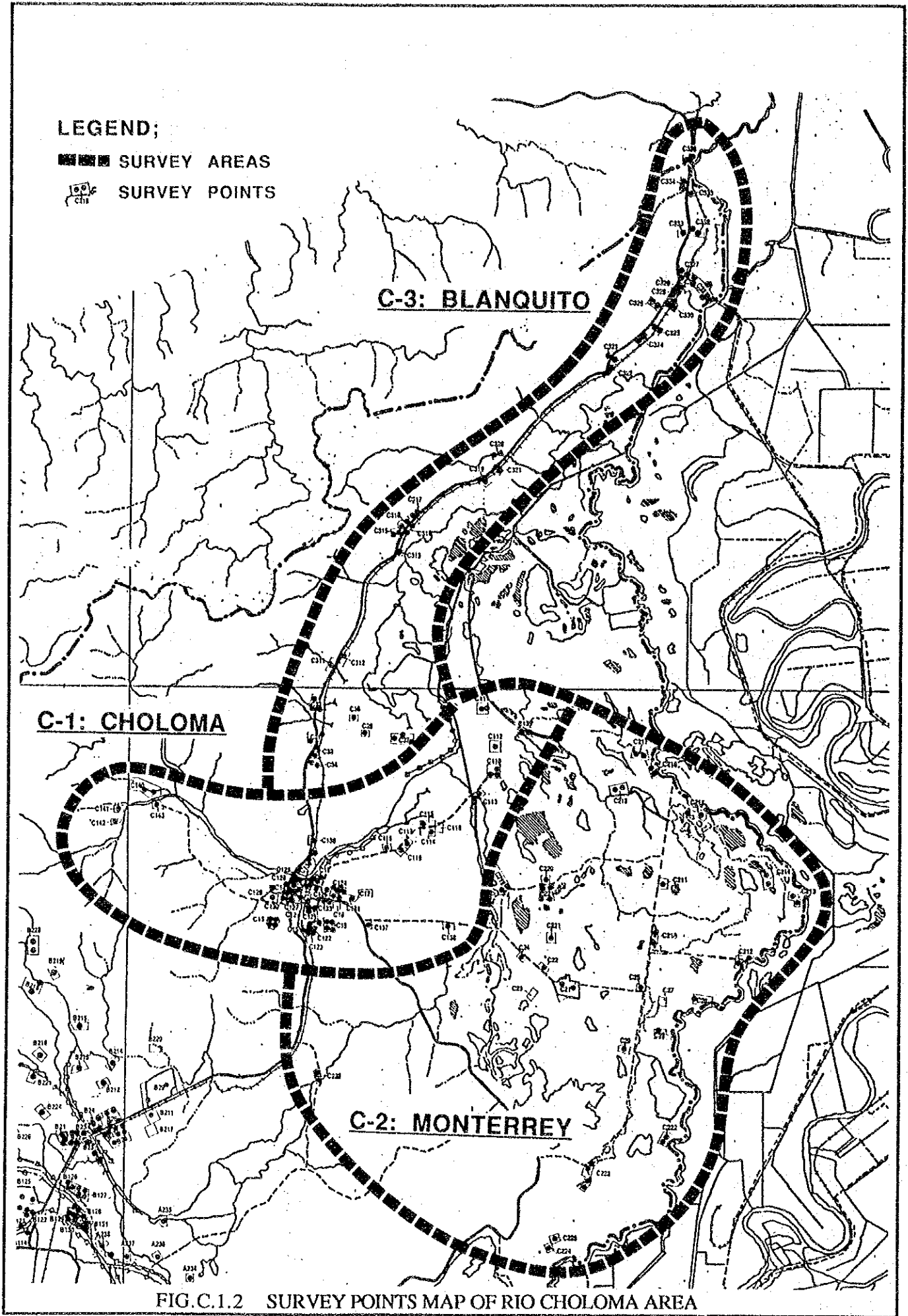
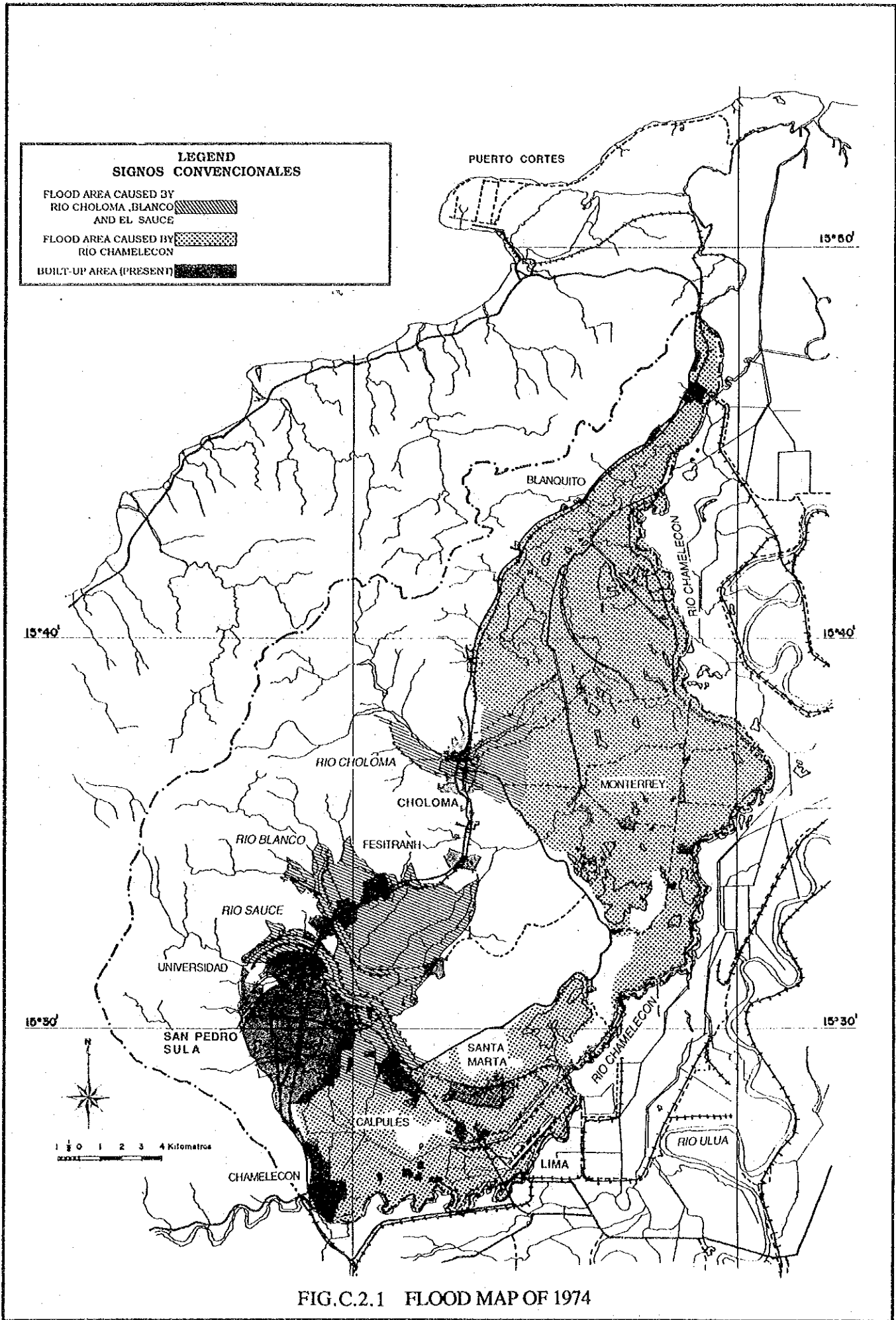





FIG. C.1.2 SURVEY POINTS MAP OF RIO CHOLOMA AREA



LEGEND
SIGNOS CONVENCIONALES

FLOOD AREA CAUSED BY RIO CHOLOMA 

FLOOD AREA CAUSED BY RIO CHAMELECON 

BUILT-UP AREA (PRESENT) 

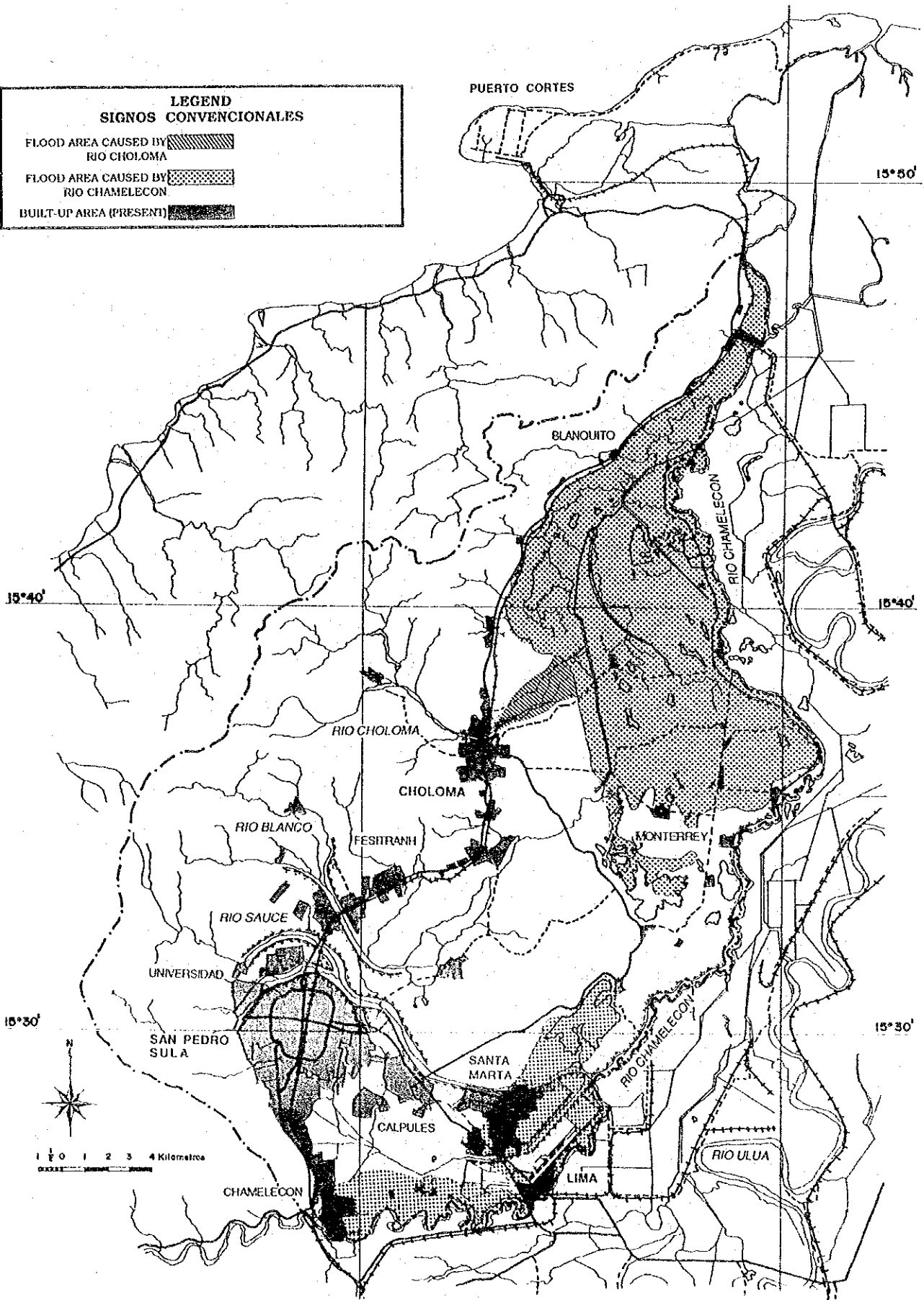
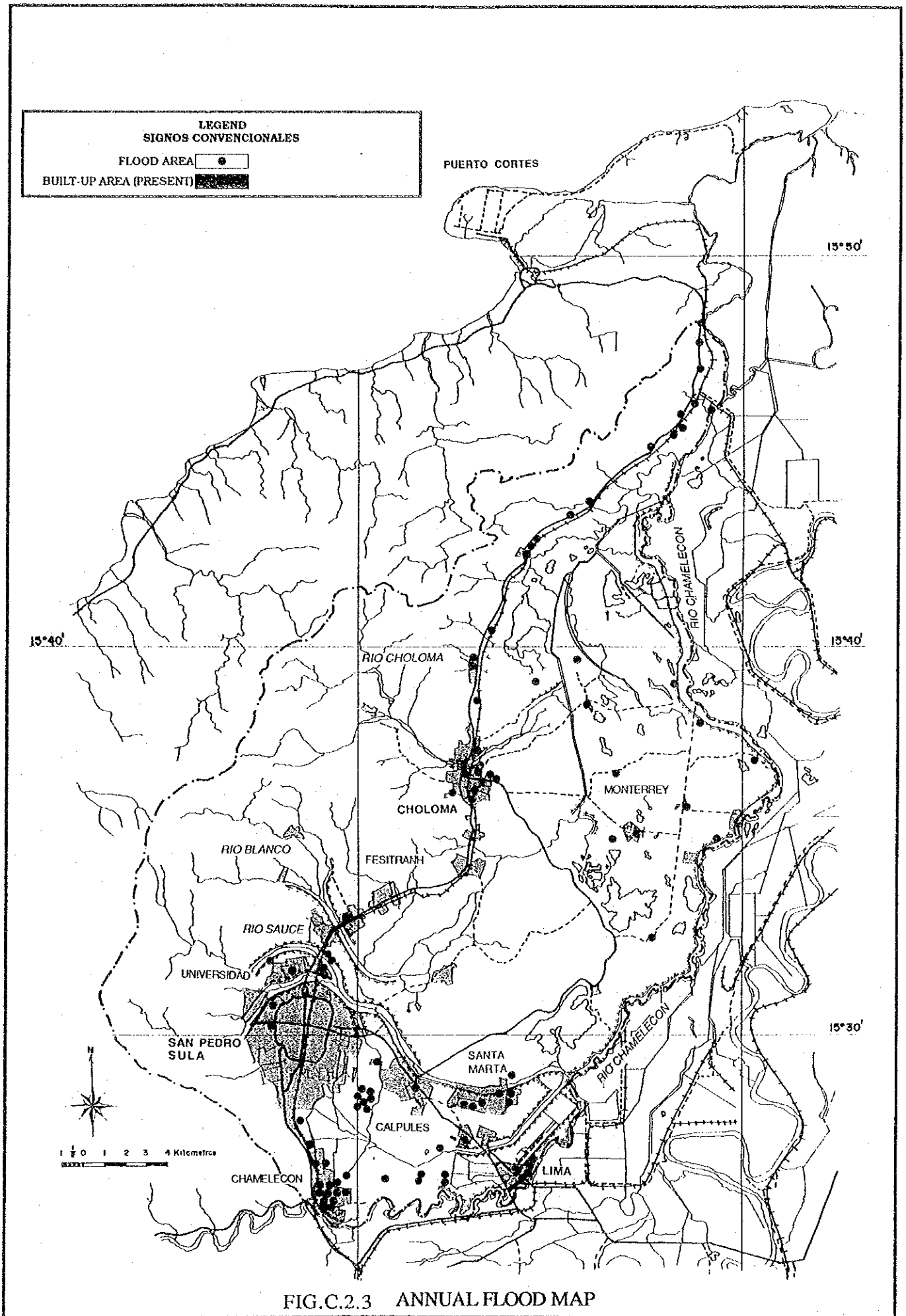


FIG.C.2.2 FLOOD MAP OF 1990



**SUPPORTING REPORT D
SEDIMENT YIELD AND EROSION
CONTROL STUDY**

**SUPPORTING REPORT D SEDIMENT YIELD AND EROSION CONTROL
STUDY**

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