ANNEX B

Profile of the Study Area

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B Profile of the Study Area

B.1 Country Profile on Urban Sanitation Environment (USE)

B.1.1 National Development Plan

a. Strategy for Urban Development

According to the census in 1995, the population of the ten largest cities in Nicaragua totaled 1,785,205, equivalent to about 43 percent of the total population of the country (4,139,486) as shown below.

Table B-1: Population of Ten Largest Cities in Nicaragua

	Name of 10 Cities	Population 1995	(1971)	Population of Urbanized Area and Its Percentage	
1.	Managua	882,945	(430,690)	819,731	(92.8%)
2.	Leon	161,530	(75,584)	123,865	(76.7%)
3.	Masaya	120,856	(45,174)	80,051	(66.2%)
4.	Chinandega	117,037	(45,298)	97,387	(83.2%)
5.	Matagalpa	96,076	(60,325)	49,148	(51.2%)
6.	Granada	96,996	(44,453)	71,783	(74.0%)
7.	Esteli	86,183	(34,828)	65,036	(75.5%)
8.	Tipitapa	81,106	(20,315)	47,779	(58.9%)
9.	Jinotega	73,973	(69,919)	41,053	(55.5%)
10.	El Viejo	70,782	(24,084)	33,320	(47.1%)
	Sub-total	1,787,484	(887,370)		

Nicaragua is characterized by the remarkably large population of the capital city compared to other cities. As of 1995, Managua's population, about 21.3% of the national population, was about 2.2 times as much as the combined population of the three major cities, Leon, Masaya and Chinandega. Regarding population distribution, the Republic of Nicaragua is also characterized by a concentration in the Pacific regions: of the ten largest cities above, seven are located in the Pacific zone, three are in the Central Highland zone and none in the Caribbean zone.

The national strategy for the development of the urban areas through the improvement of land use conditions focuses on the following points;

i. To achieve an even development in the Pacific regions

ii. To strengthen the urban areas in the Central Highland as the core of the system, as well as to create a new urban system to be linked with each other to finalize an urban system network in the Central regions.

iii. To strengthen the areas of comparatively high development potential in the Caribbean regions to join the system network of the central regions.

In order to realize the above development plan, the following strategies have been established in view of the population distribution in the urban areas:

i. Decrease the population of Managua under a decentralization policy.

ii. Promote the development of the middle-class cities based on the agricultural potential of their surrounding areas. The middle-class cities are Leon, Granada, Masaya, Chinandega, Esteli, Matagalpa, Rivas, Jinotepe, Bluefields, Diriamba, Corinto, Jinotega, Chichigalpa, Juigalpa, El Viejo, Ocotal, Nagarote, Tipitapa, etc.

iii. Establish a different population plan for the Pacific, Central and Caribbean regions

b. Improvement of Macro-economic Conditions

The stagnant or very slow development of the urban area is caused mainly by the following problems which the Government of Nicaragua has been facing since the present political parties came into power in 1990.

i. The uncontrolled migration to cities resulting in an ill-balanced population distribution, which was caused by the marked decline of agricultural activities in areas surrounding the cities in relation to the unsolved problems on land ownership

ii. The negative legacy of the former government, such as lowered exports or per-capita gross national product, suspended activities of the private sector and stagnant market, and hyper-inflation, a result of the partial macro-economic policy.

iii. Concentrated flow of public investment to the capital, Managua, which is still short of meeting the requirements.

In order to improve the above mentioned conditions, the Government of Nicaragua has made efforts paying particular attention to the following matters:

i. Population strategy mentioned previously.

ii. Increase in public works not only for Managua but also for the cities in other regions with foreign assistance.

iii. Stimulation of private sector, and transfer of management from the various governmental enterprise to non-governmental organizations or private enterprises.

iv. Promotion of private investment for commerce, agriculture and industry by solving the problems of the land system; matters related to land ownership are one of the most important problems confronting the Government.

v. The proper development of the natural resources without destroying the environment, especially forests and fishing grounds which are the most promising natural resources of Nicaragua.

B.1.2 National Environmental Action Plan

a. Preparation of the Environmental Action Plan

Out of recognition that conservation of the environment is particularly essential for Nicaragua, especially in view of the national conservation strategy for sustainable development (ECODESNIC), the Government of Nicaragua has prepared the National Environmental Action Plan, which became official in December 1993.

The Nicaraguan Institute for Natural Resources and Environment (IRENA), assigned as the coordinating body for execution of this action plan, has been raised to the status of ministry since 1994 in order to strengthen the environmental management system.

b. Environmental Problems and Countermeasures

The environmental problems in the urban areas have been studied during the preparatory work for establishment of the action plan. One of the most marked problem is related to water.

Although Nicaragua is generally blessed with abundant water resources, many of the cities have a shortage of water supply service due to the partial distribution of the water resource and also to the disparity in urban population distribution, resulting in difficulties in eradicating water-born diseases. Coverage of the sewage system is lower than the water supply allowing poor environmental hygiene to thrive. The service level in the water related sector of Nicaragua is the lowest among the countries in Central America (see Table B-2).

Table B-2: Service Coverage of Water Supply and Sewerage in Nicaragua

Unit : %

Area	Whole Country		Urban Area		Rural Area	
	W/Supply	Sewerage	W/Supply	Sewerage	W/Supply	Sewerage
Pacific Regions	68.4	23.9	85.5	32.8	22.6	0
Central Regions	37.0	10.6	71.2	32.2	20.1	0
Caribbean Regions	14.1	-	15.3	-	13.0	0

The problems of the deteriorating quality of water supply sources, e.g. lakes that are potential tourist attraction, have become the subjects to be taken into consideration. For example, Asososca Lake, the major source of Managua's water supply, is exposed to contamination by effluents of nearby factories. Managua Lake, facing the city of Managua, has been terribly contaminated by untreated DWW, effluents from factories, leachate from solid waste landfill, water drained from Momotombo geothermal power station, and by agrochemicals. Some of the wells in Chinandega City have been abandoned because of poor water quality caused by insecticide infiltration.

In order to deal with the above mentioned problems, the Ministry of Natural Resource and Environment (MARENA) and the Nicaraguan Institute of Water Supply and Sewage (INAA) have been given the task. MARENA is responsible for the preparation of watershed conservation plans, establishment of restricted areas for water resource development and preparation of water quality standards; INAA should undertake every possible means to manage drinking water and treatment of the DWW.

Another marked problem in urban sanitary environment is the inadequate disposal of solid waste, including industrial and medical solid waste, in many of the cities where population increase is rapid. The National Action Plan describes that the problems should be resolved by each of the concerned city authorities.

The Action Plan gives priority to the following 8 cities in solving concerning water related problems and solid wastes:

Leon, Managua, Granada, Esteli, Matagalpa, Jinotega, Bluefields and Puerto Cabesas.

B.1.3 Administration and Organization Concerning USE

a. Political and Administrative Division of the Country

The Republic of Nicaragua's political structure is divided into four central powers: Executive (Central Government), Legislative (National Assembly), Judiciary, and Electoral. Municipalities are the political and administrative units of the state, with a deliberative council (Consejo Municipal) and Mayor (Alcalde), all of which are directly elected by the citizens for a four year mandate (starting with the election in 1996 according to the amended constitution).

The country is divided geographically in zones, regions and departments for planning and management purposes, except for two regions (RAAN and RAAS) that have special political and administrative autonomy. Central government authorities may decentralize by establishing offices in various departments or regions headed by a delegate. Delegates are posted in either the departmental or regional capital to oversee the authority's operation within that region or department.

b. Municipal Autonomy and Competence

Municipalities have constitutional, political, administrative and financial autonomies. Constitutional autonomies are stipulated in the Municipalities Law (Ley de Municipios No. 40 - 88), in the Municipal Financing Plan (Plan de Arbitrios Municipal ratified by the central government through Dec. Ejec. No. 455 - 89 for all municipalities except Managua that has an exclusive plan), and would be supported by a pending Tributary Code (Código Tributario).

In order to make the financial autonomy feasible, the eligibility to collect national taxes on real estate (bienes inmuebles) and vehicles (rodamiento) was temporarily transferred to municipalities representing a high percentage of the municipal income.

The 2% Municipal Consumption Tax (IMI : Impuesto Municipal sobre ingresos) was the largest source of income for municipalities, charged together with the national consumption tax of 15% on sales of goods and services. The recent National Tributary System, Law No. 257-97 (published in La Gaceta in June 6, 1997) established the General Value Added Tax (IGV : Impuesto General al Valor) of 15% on sales and importation of goods and services, as well as the reduction of the IMI to 15% from January 1, 1998 and to 1% from January 1, 2000.

To compensate the reduction in income, municipalities were allowed to extend the consumption tax to cigarettes and alcoholic beverages levied on consumers and net the producers.

Municipalities have their own obligations and may share them with national institutions such as ministries and institutes. In addition, they may assume Central Government duties and acquire revenue, as part of the decentralization policy. The municipalities may also become affiliated to develop or cooperate in common projects.

Table B-3: Political - Administrative Division of Nicaragua

REGION (Cabecera)	DEPARTMENTS (Cabecera)	MUNICIPALITIES (Quantities)
I. Las Segovias (Estelí)	Nueva Segovia (Ocotal)	11
	Madriz (Somoto)	9
	Estelí (Estelí)	6
II. Occidental	Chinandega (Chinandega)	13
(Leon)	Leon (Leon)	10
III. Managua (Managua)	Managua (Managua)	7
IV. Sur	Masaya (Masaya)	9
(Granada)	Carazo (Jinotepe)	8
	Granada (Granada)	4
	Rivas (Rivas)	10
V. Central	Boaco (Boaco)	6
(Juigalpa)	Chontales (Juigalpa)	8
VI. Norte	Jinotega (Jinotega)	7
(Matagalpa)	Matagalpa (Matagalpa)	13
IX. San Juan (San Carlos)	Río San Juan	6
VII. Región Autónoma Atlántico Norte- RAAN (Puerto Cabezas)		7
VIII. Región Autónoma Atlántico Sur - RAAS (Bluefilds)		9

ZONES: Costena Pacífico
Costena Atlántico
Central

c. National Institutions Concerning USE

Ministries and national autonomous bodies (directly under the Presidential Cabinet - Ministerio de la Presidencia) more deeply involved in USE are:

- Ministry of Health (MINSA)
- Ministry of Environment and Natural Resources (MARENA)
- Ministry of Agriculture and Livestock (MAG)
- Ministry of Economy and Development (MEDE)
- Ministry of Construction and Transportation (MCT)
- Nicaraguan Institute of Municipal Development (INIFOM)
- Nicaraguan Institute of Water and Wastewater (INAA)
- Nicaraguan Institute of Territorial Studies (INITER)
- Nicaraguan Institute of Technology (INATEC)

Universities and non-governmental organizations also play an important role that should be extended further.

MINSA express its action and operations in coordination with all municipal governments (Alcaldías) through the Local Integral Attendance Systems (Sistemas Locales de Atención Integrada - SILAIS - Min. Res. No. 96, January 14, 1992). The main tools for SILAIS and the General Superintendence of Hygiene and Epidemiology, both of which are division of MINSA, are the Sanitary Code and the Regulations for Sanitary Inspection.

MARENA, formerly the Nicaraguan Natural Resources and Environmental Institute (IRENA, 1979) and later a part of MAG, finally became a ministry in 1993 to deal specifically with environmental matters. MARENA oversees its operation throughout all fifteen departments, RAAN and RAAS, and has several delegates in municipalities.

MAG, MEDE, and MCT execute specific operations in the departments, that have a transient extend their specific activities to the departments that have immediate and strong impacts on the environment.

INIFOM was created, in 1990, to improve municipal capabilities and promote municipal development. Its directive council, with 40 members, includes 34 mayors, and its executive division includes a coordination department made up of delegates from nine regions.

INAA (1979) succeeded both DENACAL - Departamento Nacional de Acueductos y Alcantarillados and Empresa Aguadora de Managua, National Department of Waster and Wastewater to assume the responsibility of planning, executing and controlling of municipal and regional water, and sewage systems. Besides operational activities, the Organic Law of INAA (Dec. No. 123 - 79) gave it the right to fix standards and specifications for design, construction and operation of urban and rural systems that would be functioning with other public water and sewage services. INAA operates through regional administrations that are subdivided into departmental and municipal sectors.

For instance, in Region VI, all municipalities in the northern departments of Matagalpa and Jinotega, manage INAA water supply system, which was entrusted by INAA under an agreement signed by all parties.

Currently, the National Assembly is discussing a new structure for the potable water and sewage sector including:

- creation of ENACAL - (Empresa Nicaragüense de Acueductos y Alcantarillados Sanitarios), a state enterprise which will undertake all operational and managerial duties;
- reduction of INAA so that its role only involves regulation, fiscal planning and determination of fees.
- transfer national policies on the water and sewage sector, as well as planning and coordination to the MCT.

[This new structure was the subject of Presidential Decree Nos. 27-95, 31-95 and 32-95 published in June 26, 1995 that was returned for legislative approval due to ambiguities. (Please see, section B.1.4f).]

INITER (1981) has been affiliated with MCT since 1991 and is responsible for studying, classifying and inventory of physical resources, as well for the physical planning of land usage of the national territories.

INATEC (1990) is the institution that provides technical and professional support in environmental and sanitation matters. INATEC manages grants from international cooperation, as well as national funds.

Universities play an important role as a link between public and private institutions involved in sanitation and environmental protection, as well as in professional training and technical/scientific research. Fortunately, the cities of Granada, Leon and Chinandega have universities able to cope with these requirements. For example, the Universidad Nacional Autónoma de Nicaragua recently developed an improvement plan and directives for environmental sanitation in Granada and its surrounding area. This study was coordinated by the Investigation Center on Water Resources (CIRA) of the University with the aim of bringing together several governmental and non-governmental organizations and the intellects of Granada so that they can benefit from its environment.

In every sense, NGO's, foreign organizations, members of twin cities and volunteers have assisted in the development and organization of Nicaragua.

For the various experts in planning, including the Study Team, uniting and coordinating a multitude of professionals and authorities with be an ambitious task.

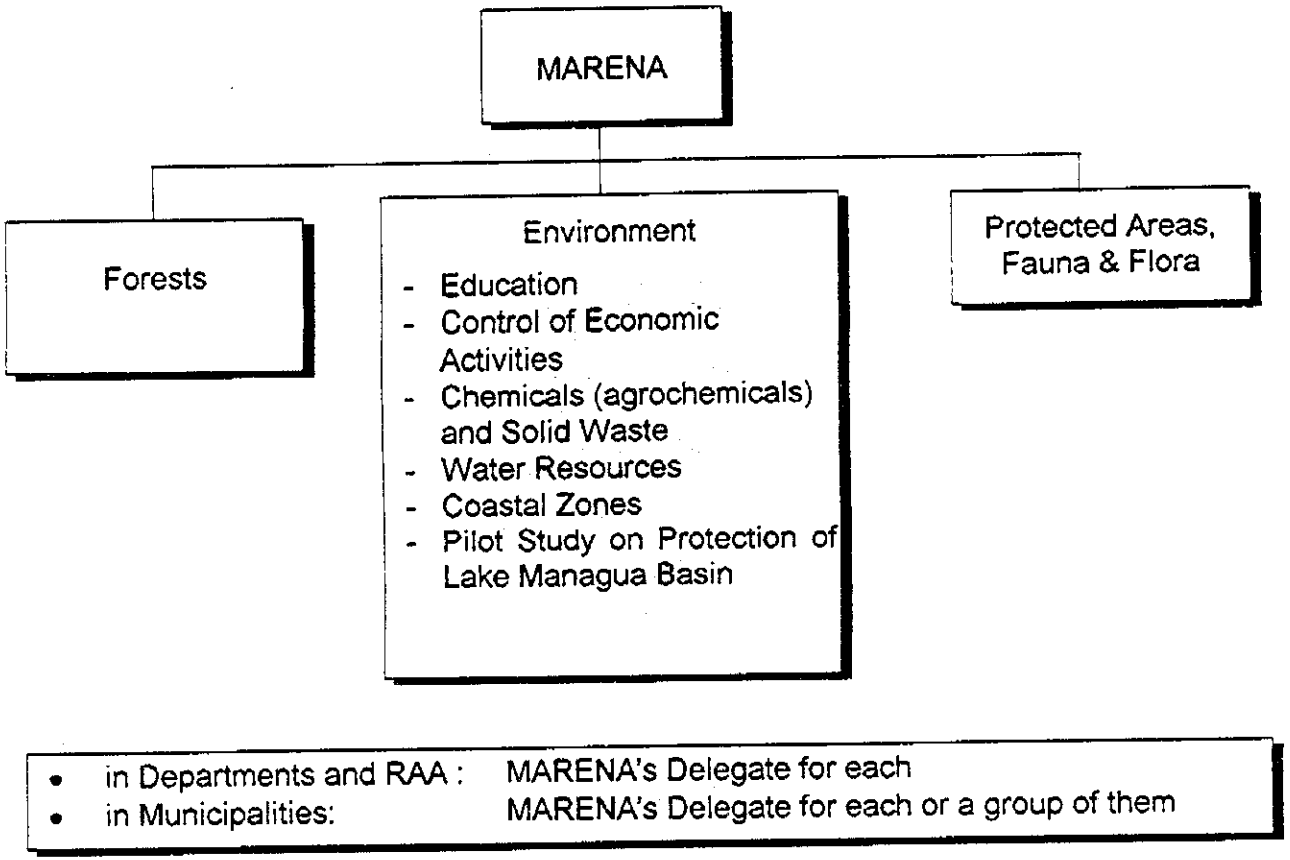


Figure B-1: Activities of MARENA, Ministry of Environment and Natural Resources

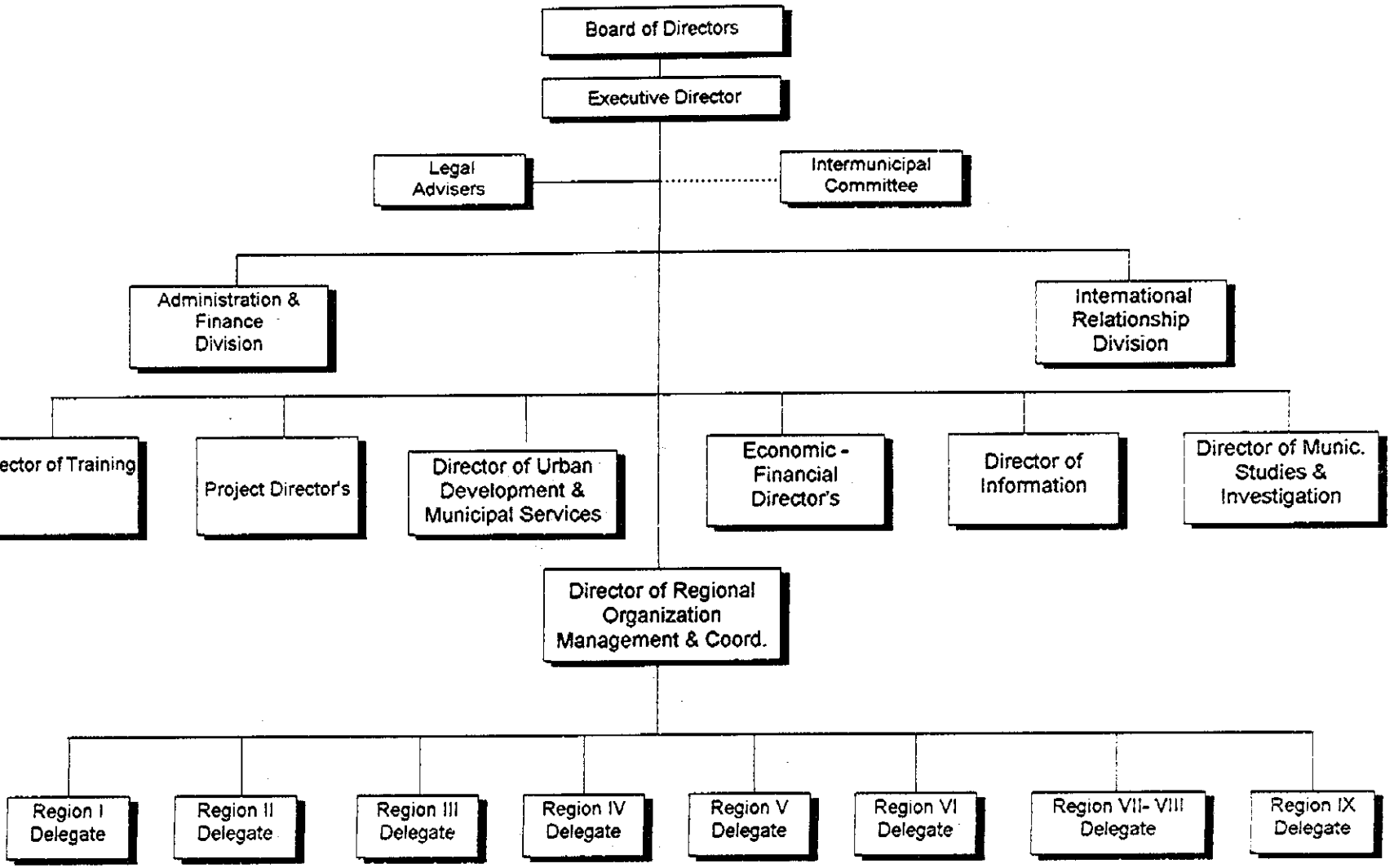


Figure B-2: Organization Chart of INIFOM

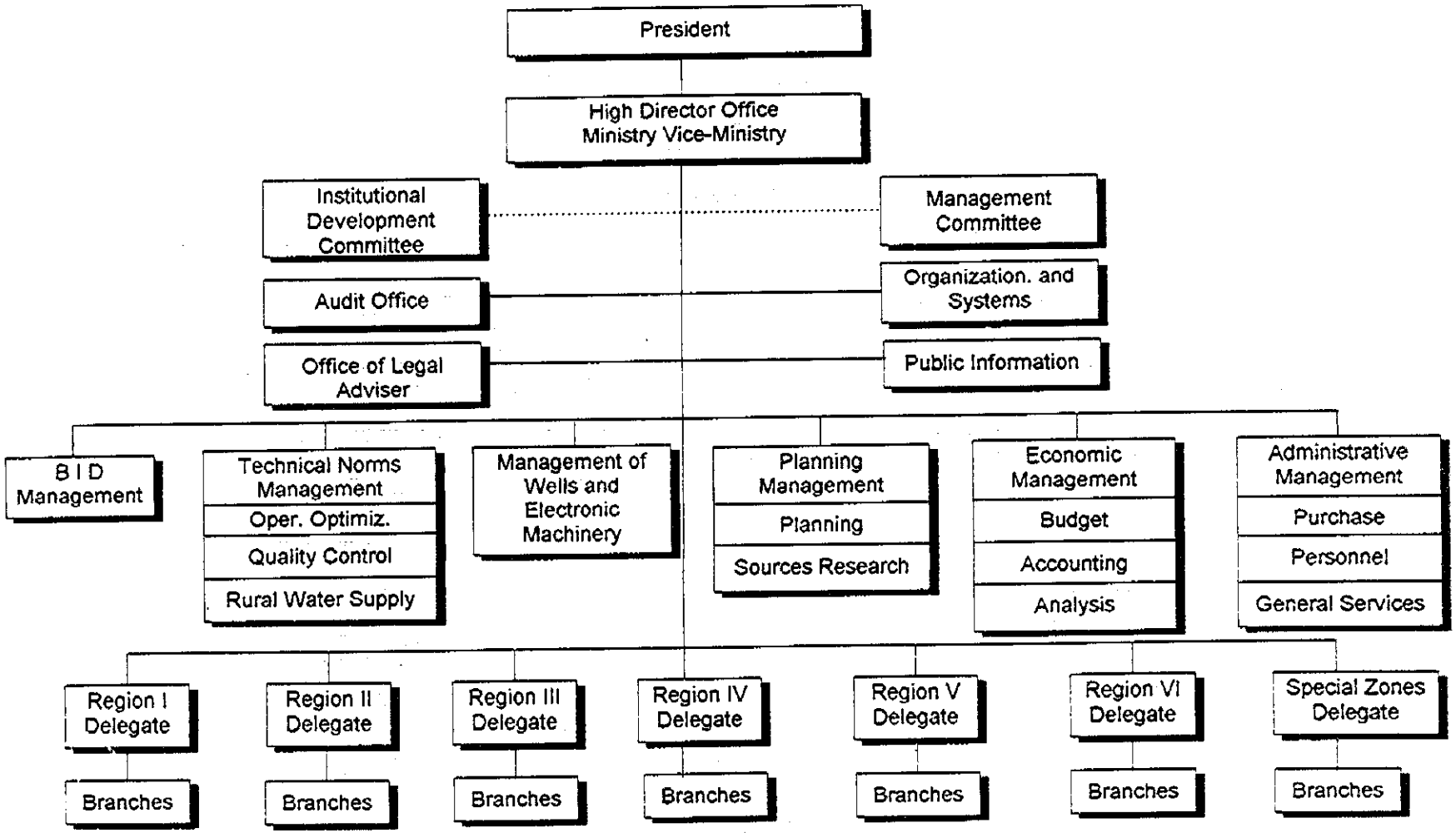


Figure B-3: INAA - Organization Structure

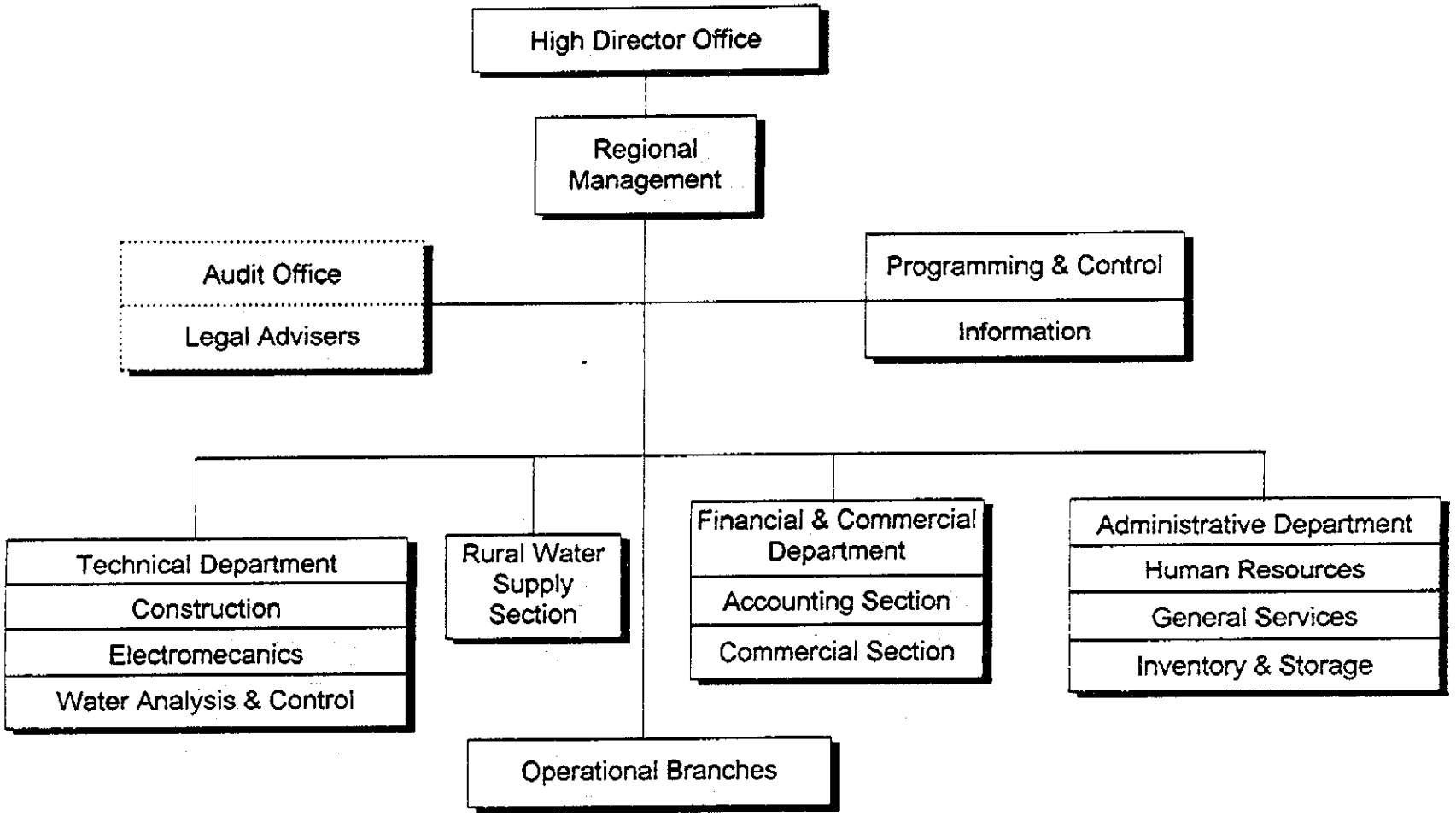


Figure B-4: INAA - Typical Regional Organization Structure

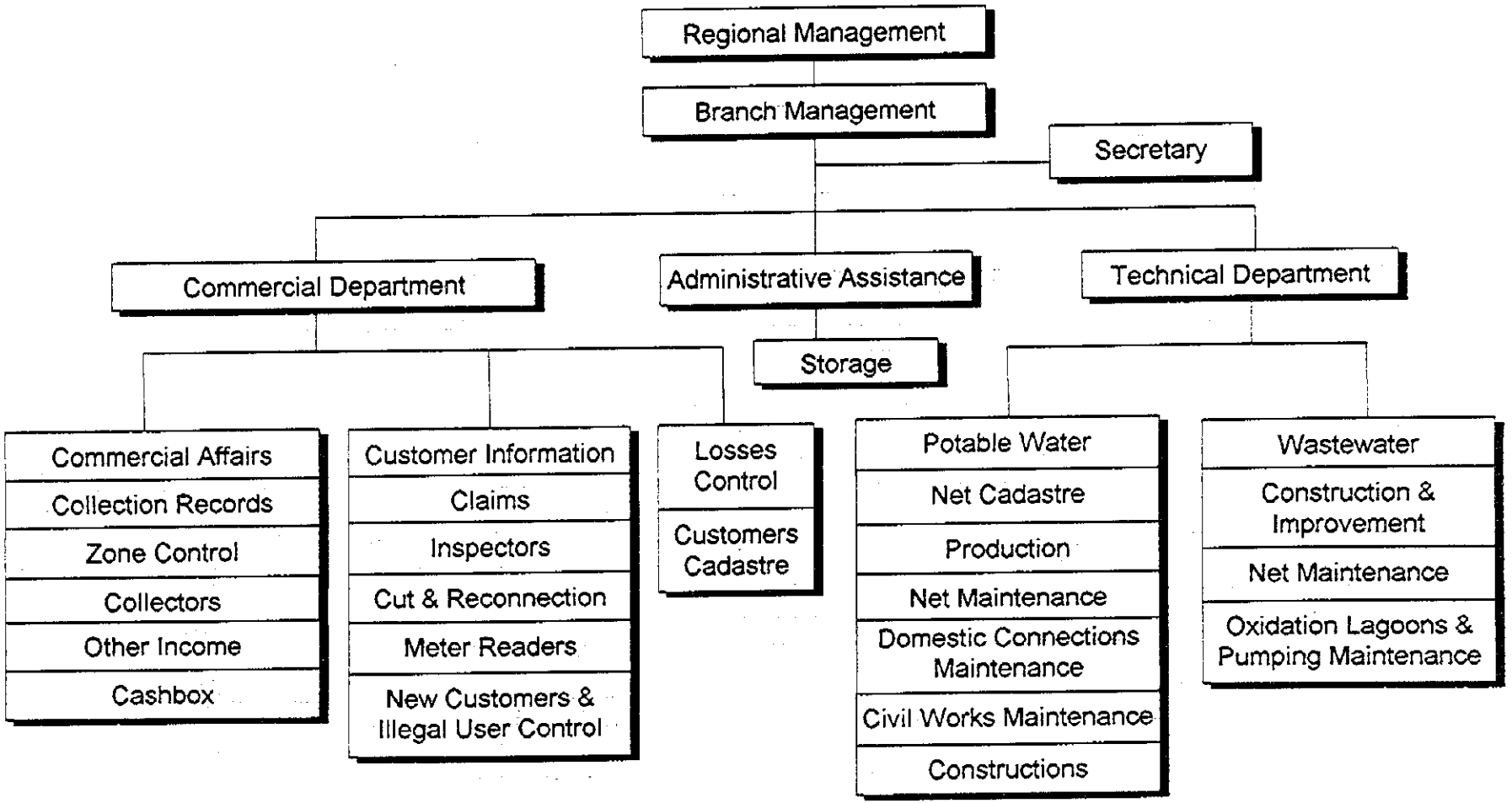


Figure B-5: INAA - Typical Branch Organization Structure

Table B-4: Allocation of INAA Personnel to Municipal Branches (Persons)

Professional or Function	Leon	Chinandega	Granada
Technician	-	-	1
Manager	1	1	1
Janitor	1	1	1
Secretary	1	1	1
Inspectors	2	1	-
Laborers	6	5	5
Plumber	4	5	8
Chainer	-	-	1
Team Responsible	1	1	1
Collectors	17	2	5
Measure Lectors	6	4	5
Commercial Responsible	1	1	1
Claims Responsible	1	1	1
Claims & File Responsible	1	1	2
Claims Technician	1	-	-
Collection & File Analyst	4	-	-
Collection Zones Analyst	3	2	-
Analyst	-	-	2
Cashier	2	1	1
Accouter	2	-	-
Assistant Plumber	5	2	-
Driver	2	1	-
Pumping Operator	16	10	12
Pumping Operator A.N.	4	-	-
Administrative Director	1	-	-
Measure Lectors Responsible	-	1	-
Warehouse Manager	-	1	-
Technical Manager	-	1	-
Maintenance and Security	-	2	-
Total	82	45	48

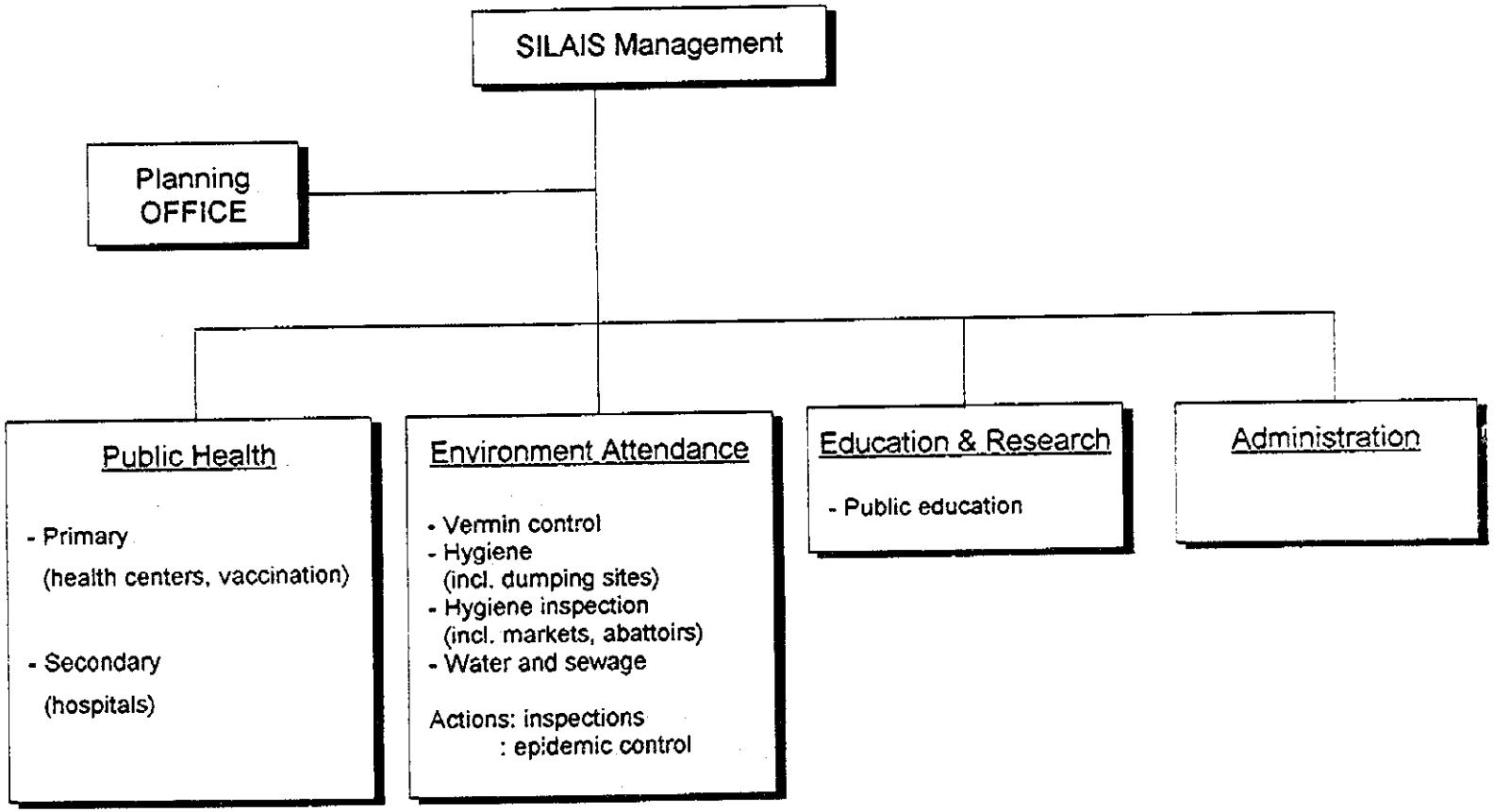


Figure B-6: Typical Organization Chart of SILAIS (e.g., Dpt. Leon)

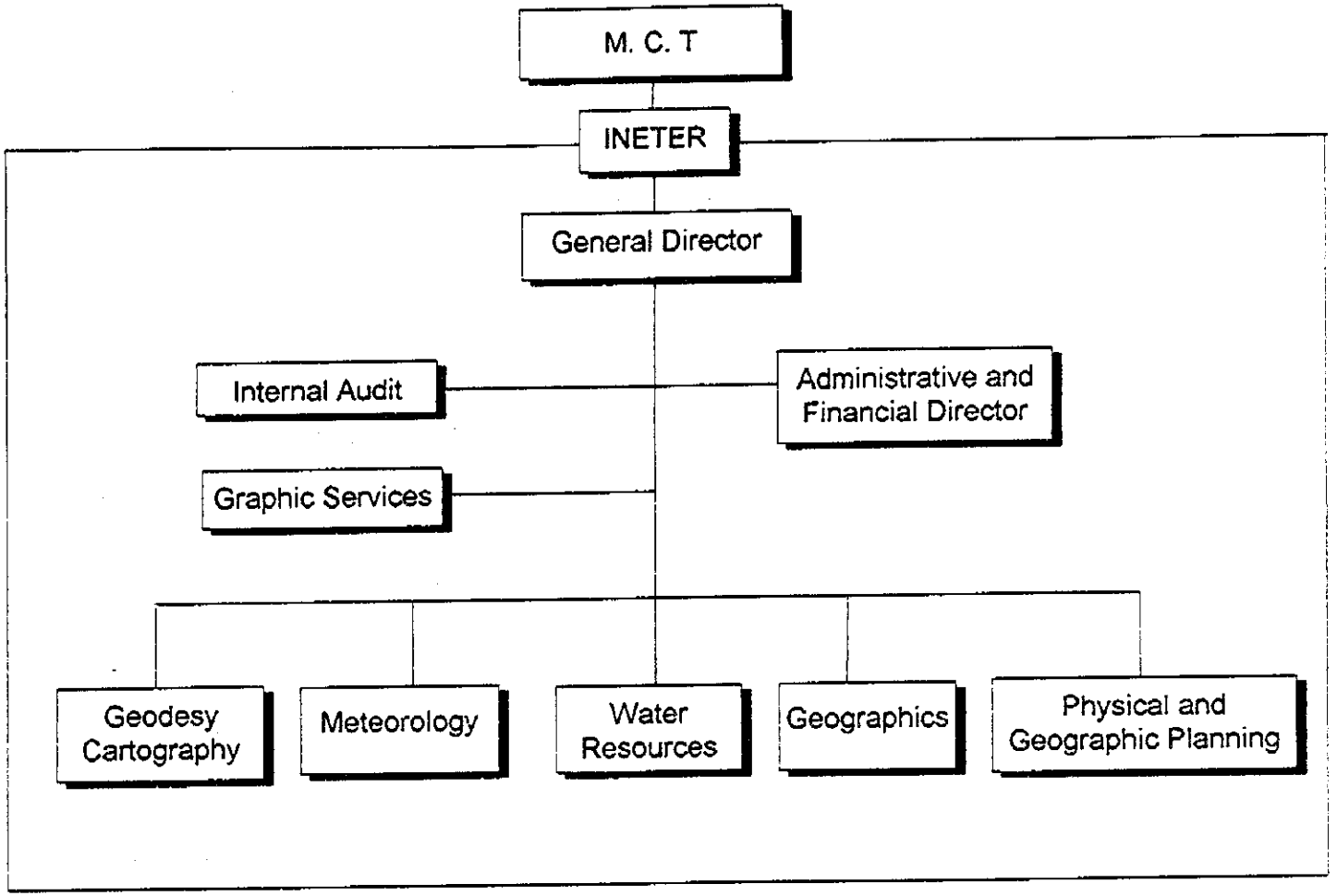


Figure B-7: Organization Chart of INETER

B.1.4 Legislation on USE

It is very important to keep in mind that the decrees (Decree 27-95, 31-95, 32-95, 33-95) mentioned have not been approved and transformed into laws, to date, (December 4, 1996) by the National Assembly. Anticipating their approval, these decrees are referred to in this study in view of current political trends.

The main national act is the General Law for Environment and Natural Resources - Law No. 217, June 6, 1996. However, in order to apply most of its contents, supportive regulations must be enacted.

The Sanitary Code - Dec. No. 394, October 21, 1988, regulated by Dec. No. 432, April 17. 1989, is the main national regulation on health and sanitation, at present, and also to complement it is a Sanitary Inspection Regulation - Dec. No. 432, April 17,1989. At a local level, the main legal act, with a strong impact on USE, is the law of Municipalities - Law No. 40, August 17,1988. National acts that regulate water and wastewater under the responsibility of INAA, and the norms established by this institute, Decree No. 33,, June, 26, 1995, also play an important role in regulating domestic, industrial and agricultural wastewater.

The Municipal Tributary Plan - Dec. No. 455, July 31, 1989 and municipal resolutions (Ordenanzas y Acuerdos) usually determine the effectiveness of any action on USE.

Some resolutions of Ministries strongly affect USE, such as norms on agrochemicals (MAG, MARENA) and on land use and protected areas (MARENA, INETER).

a. The General Law for Environment and Natural Resources

MARENA and other governmental and NGO proposals were consolidated in this law, that consider all environmental aspects.

The brief outline of the main contents are:

- Section II - Environmental Management
- Chapter I - The National Environment Committee (CNA)
  The central government has 90 days to set up the CNA acting as an advisory committee for politics, strategies and programs on environment. Representatives from six ministries, two institutes and delegates from other organizations will make up the CNA.

  MARENA is responsible for making this law effective. It has created the Prosecutors Office for the protection of the Environment and natural resources, a branch of the Attorney Office, to defend the state and citizens' interests on this matter.

- Chapter II - The instruments for Environmental Management
  Planning and legislation
  Environmental protection of territory
  Protected areas (National Protected Areas System)
  Permits and Environmental Impact Assessment (EIA)
  National system of environment information
  Education, improving access to information and scientific/technological development

Incentives
Public investments
National funds for the environment
Disclosure of contaminated areas and notification of environmental emergencies.

- Section III - Natural Resources
- Section IV - Environmental Quality
- Chapter I - Ordinary Norms
- Chapter II - Contamination of the Atmosphere, Water and Soil
- Chapter III - Non-Hazardous Solid Waste
- Chapter IV - Hazardous Waste
- Section V - Responsibilities, Actions and Penalties
- Chapter I - Responsibilities and Actions
- Chapter II -Civil Responsibilities
- Chapter III - Penalty System (from warning and fines to closures; revenue from fines will be shared by affected municipalities (25%) and National funds for the environment (75%)

b. The Sanitary Code

The Sanitary code and its complementary Sanitary Inspection Regulation are the most useful tools for MINSA and the municipalities concerning activities on sanitation. The following are some of its contents:

Chapter II

- Forbids discharge of wastewater into any water sources; as well as any emissions into the atmosphere.
- Solid waste and animals carcasses should be collected and disposed of properly.
- Solid waste from ships and airplanes should be incinerated or disposed in a landfill in respective ports.
- Vacant lots should be closed off and kept clean.
- Housing and building plans must firstly be approved by MINSA with respect to sanitary conditions.

Chapter IV

- Defines the sanitary inspector's, which includes the authority to immediately suspend establishments, works, sales and services indefinitely.

Chapter V: Penalties -

- Defines penalties for violations, from fines to complete shut-down of an establishment.

c. Sanitary Inspection Regulation

- MINSA's director of general hygiene and epidemiology has the authority to organize, control and instruct inspectors, and to coordinate them with the municipalities.
- Establishes qualifications of the would be inspectors, and their attributes.
- Determine the degree of penalty based on gravity of the violation.

d. Law of Municipalities

- Art. 7 The municipality's responsibility to carry out its duties
- Urban development and land use
- Public hygiene and environmental protection
- Stormwater drainage
- The municipal council should publicly announce any plans for buildings, utilities or land to be expropriated for public use, under Decree No. 895, Dec. 14, 1981. Furthermore the constitution, revised in 1995, states that the appropriate value of the property to be acquired must be paid for in advance in money that is in circulation.
- Art. 10 the municipalities undertake some of the duties pertaining to other institutions, including those related to sanitation, housing and water.
- Art. 11, the central government may decentralize and transfer duties and corresponding resources to municipalities.
- Art. 12 municipalities may become affiliated to improve their performance on the activities.

The Law of Municipalities must be adapted to conform with the revised constitution. Proposals are being discussed by the National Assembly.

e. The Municipal Tributary Plan (MTP)

The MTP defines four kinds of taxes, one of which is for municipal services as well as one for refuse collection and street sweeping. This is a direct tax only charged if the service is provided. No less than 50% of the service costs must be paid by its beneficiary, according to the MTP (Art. 40). There are no taxes for street maintenance including drainage, but the municipalities receive, as a temporary transfer from the central government, taxes imposed on vehicles not included in the MTP.

A described in the plan, the municipality may eventually charge up to 80% for new constructions (e.g., storm water drainage and pavement) to the direct beneficiaries of the improvement, as a special contribution.

A municipality may revise the MTP and submit a draft to the National Assembly, that may or may not pass it as law. This can not be modified by the Central government.

f. Legal Acts Referring to INAA, Water and Wastewater

It is very important to consider the present criteria used to fix tariffs and also the one proposed in the suspended Dec. No. 32 - 95.

The present unit prices (C$/$m^3$) are fixed by INAA according to the consumption amount, nature (residential, commercial, industrial, institutional) of the customer, degree of and urbanization and socioeconomic level of the residence.

According to Dec. No. 32-95 tariffs should be fixed considering development costs; the enterprises that provide the services should submit to INAA its tariffs, based on operational costs and supplementary capital needed for the actual expansion of the system, and justify the consumption increase. This new criteria supports the decentralization of water supply and sewage services.

The important decrees are summarized as follows:

- Decree No. 27-95 created ENACAL (Empresa Nicaragüense de Acueductos y Alcantarillados Sanitarios), that takes on all duties of INAA and all operatives and commercial functions of this Institute referring to water and sewage systems. ENACAL, a state company, may establish branches anywhere in Nicaragua.

- Decree No. 31-95 transfers from INAA to MCT, all political, planning and coordinating functions pertaining to potable water and sewage at national and municipal levels. INAA remains the authority that regulates, controls and fixes standards for potable water and the sewage sector. This involves establishing technical specifications for works and services, and control of potable water quality according to standards fixed by MINSA. It also includes control of discharging industrial effluents into the public sewage system according to proper regulations; also in coordination with MARENA, it should ensure that regulations concerning protection of water sources and receiving waters are being observed. It should impose strict sanctions on violations of water and sewage regulations to systemize national rules on tariff, and to approve and adjust tariff levels according to specific decrees.

- Decree No. 32-95 establishes directives for setting tariffs on potable water and sewage services, owned by public or private institutions. The decree is innovative in a sense that it self-sufficiency , in potable water output distribution, and residually water collection, by adding a fraction to the tariff for improvement and expansion costs, for a projected period of approximately 15 years.

The same "La Gaceta" dated June 26, 1995 published the Presidential Decree No. 33-95, edited for complement and regulate Decree Nos. 123-79, No. 394-88, No. 432-89, establishing rules on controlling discharge of domestic, industrial and agricultural residual waters. The decree authorizes INAA and MARENA to supervise, control and penalize those who discharge effluents into sewage nets and water bodies respectively; and reinforces other present duties of MINSA. The decree establishes restrictions on the discharge of residual waters into the sewage nets and natural bodies and sets parameters on wastewater quality, frequency of sampling and other aspects as shown below:

- storm water and uncontaminated water from cooling systems and others must be discharged into storm water drains.

- the dilution of industrial or agricultural effluents with uncontaminated waters will be prohibited.

- the generators are responsible for categorizing and monitoring their effluents according to the decree, and for submitting details to MARENA, which in turn will inform INAA, MINSA and the municipality when requested to.

- sludge from treatment processes should be handled and disposed of according to MARENA's instructions.

- the generator should submit details on the volume and characteristics of effluents, raw material and chemicals utilized in their processes, as well a clean technologies used to reduce pollution to MARENA; MARENA should present relevant details to INAA and the municipalities when requested.

- MARENA or INAA will improve administrative sanctions on violations, which will be classified as "slight", "grave" and "very serious.

- fines for light and grave violations will double if they are not paid on time and will keep doing so until the third and final warring. After this for serious violations, not only will they have to pay the fine but activities will be suspended for an eight day period.
- very serious violations will result in a fine as well as a 15 day suspension of activities; after this period, if the situation remains the activity will be suspended indefinitely.
- MARENA will evaluate and register laboratories capable of performing the required analysis of effluents.
- MARENA and INAA together with the industry will prepare a two stage "gradual plan for decontamination", unique to each generator, regardless of whether or not they discharge effluents into sewage systems.

This decree does not change the parameters of potable water quality, that is established by Central-American Institutions for Central-America, Panama and the Dominican Republic (i.e., CAPRE (first edition in September 1993, revised in March 1994)).

B.1.5 Policy on USE

Nicaragua's current state has shown signs of prosperity: in the past two decades, various foreign organizations have conducted studies that have contributed to shaping present environmental policies.

Changes in legislation have taken place in a shot period, fueling the rapid growth of the institutional structure; development of human resources and evaluation of new proposals have not kept in line with these changes.

The overall situation has seen many advances, however, implementation of plans have been rather chaotic at times.

a. Water and Wastewater

The water supply system covered 80.7% of the urban population in 1995 and this figure is expected to increase to 85.0% in 2002 (INAA - Planning Office). In the same period, coverage of the sewage system is expected to grow from 34.2% to 40.0% (Source: INAA - Planning Office). The tariff payment rate was 96.0% in 1995, which implies that customers are generally satisfied with the quality and price of the services. The new initiative to provide incentives for private companies should accelerate improvements in this sector (see sections B.1.3 and B.1.4).

Both the constitution and Law No. 217 - 96 consider water as a natural resource and national heritage to be conserved and exploited by the State (directly or indirectly). Art. 72 to 87, Chapter III under Title III in Law No. 217 -96 treats national waters as a natural resource, and Art. 125 to 128 deals with water pollution; MARENA is in charge of this matter, sometimes with the involvement of municipalities and RAA.

Dec. No. 33 - 95 regulates discharge of domestic, industrial and farm wastewater, and gives to MARENA competence to control discharges in water bodies and in agriculture fields, and to INAA competence to control discharges in sanitary sewage nets.

b. Drainage

Stormwater drainage system is under Municipal competence, (Law No. 40 - 88). Due to very insufficiency of both pluvial and wastewater collection system, these waters drains usually to the same ways, causing sanitary and institutional problems. In cities where there are treatment wastewater plant (usually lagoons), the pluvial water disturbs and minimizes its efficiency. Where there are no sewage collectors, the wastewater and septic tanks effluent go into the open or closed pluvial drains, becoming a really big sanitary problem.

Municipalities do not charge directly the citizens for drainage and street maintenance.

INAA charges 30% of water tariff for the sewage system. But only 34.2% of population have this system, while 80.7% have water supply and pay both services.

c. Solid Waste (SW)

Law No. 217 - 96 fixes the responsibility of Municipalities for collection /treatment/ disposal system of non-hazardous SW, and MARENA and MINSA for normative (Art. 129).

The Chapter on hazardous waste do not fix similar responsibilities on this waste, but enforces who manages HW to know its properties (Art. 131). The next articles (132 and 133) prohibits to import toxic waste and fix conditions to export toxic waste for disposal.

Law No. 40 - 88 also establishes the competence of Municipalities for collection / disposal - but do not give competence to penalize a transgressor. This competence is given to sanitary authorities, by the Sanitary Code, and Municipal Authorities may receive delegated power from MINSA . The SWMS is really insufficient in all country. A document from 1989 "Situación Municipal en Nicaragua" - INIFOM, 1989 points only 51% Municipalities with SW collection and 37% with street cleaning. Now should have better conditions, but in 1993 from 130 Municipalities only 56 charged for collection / disposal service and 14 for street cleansing. The tax value is far from the costs, that are usually unknown; 25 of that 130 Municipalities did costs study on collection and 8 on street cleansing, during the period 1990 - 1993 ("Descentralización" - Fundación Friedrich Ebert). Even the low value of the tax is not paid and the Municipalities do not force the payment considering: the people is poor and the service is unsatisfactory.

d. Cost and Taxes

Considering the economic heterogeneity of population, the MTP (Section B.1.4.e of this Annex) fix 50% of the cost as minimum tax to be paid by a beneficiary. But the Municipalities do not know the costs and do not have a strategy to fix values, and practice the social justice being tolerant beyond the poor people.

e. Results

In Nicaragua, diseases caused by insanitary conditions are common such as acute respiratory illness, diarrhea, cholera, dengue fever, food poisoning, pesticide poisoning, etc. ("Nicaragua 2000" USAID, March 1995). Even in urban areas incidences of illness are remarkably high due to poor waste disposal and potable water supply services.

On the other hand, people's economic situation have deteriorated and it is increasingly difficult to provide public services municipalities, more than the state, are aware of this situation and has overlooked the collection of service fees, thus compromising the provision of adequate services.

B.1.6 National Economy

a. GDP and Per Capita GDP

The Central Bank of Nicaragua (BCN) has announced the Gross Domestic Product (GDP) on a yearly basis. Annual figures tend to be constant, therefore, the latest figures published in August 1996 are adopted in this study. The GDP in the period from 1987 to 1989, which were not reported in the previous publication, are based on the "Statistical Summary 1987-1991" published by INEC (refer to Table B-5).

This table shows that GDP had decreased from C$21.1 billion in 1987 to C$18.1 billion in 1993, and has increased rapidly to C$19.5 billion in 1995 (all figures are measured at constant price (1980)). The figure in 1995 was 92.5 percent of that in 1987.

Table B-5: Changes in GDP of Nicaragua

	Unit	1987	1988	1989	1990	1991	1992	1993	1994	1995
GDP	million C$ in 1980	21,100	18,473	18,159	18,156	18,127	18,202	18,136	18,743	19,523
Growth Rate	%		-12.4	-1.7	0.0	-0.2	0.4	-0.4	3.3	4.2

Sources: Compendio Estadistico, INEC 1987-1991
Indicadores Economicos Agosto 1996, BCN
Growth rate is calculated by JICA Study Team

Concerning per capita GDP, the figure given will be amended because the population, as a denominator, has to be revised as a result of the population census survey in 1995.

The GDP per capita announced was estimated at C$4,716 at a constant price (1980) (about US$ 463) in 1995, based on the estimated population of 4,139,600.

The GDP composition is shown in Table B-6.

Table B-6: Changes in GDP Composition

Unit : %

	1987	1988	1989	1990	1991	1992	1993	1994	1995
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Primary Sector	21.7	22.2	24.7	24.8	23.8	24.5	25.0	26.8	27.0
Agriculture	14.2	14.4	16.0	15.9	15.1	15.0	14.1	15.8	16.3
Livestock	6.7	7.3	8.1	8.3	8.0	8.7	9.8	9.4	8.7
Fishing	0.5	0.3	0.4	0.3	0.4	0.5	0.8	1.2	1.7
Forestry	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Secondary Sector	30.5	26.8	26.5	25.8	27.0	26.0	26.2	26.0	26.2
Manufacturing	26.4	22.6	22.5	22.2	23.6	22.3	22.4	21.9	21.7
Construction	3.5	3.8	3.2	3.1	2.8	3.0	3.1	3.5	3.9
Mining	0.5	0.5	0.8	0.6	0.6	0.7	0.7	0.6	0.6
Tertiary Sector	47.8	50.9	48.8	49.4	49.1	49.5	48.8	47.2	46.7
Commerce	17.4	17.3	17.1	17.2	18.1	18.3	17.9	17.6	17.7
Civil Service	11.8	14.5	12.3	12.8	11.2	11.1	11.0	10.0	9.5
Transport & Communication	5.1	4.9	4.8	4.9	5.1	5.2	5.0	4.8	4.8
Bank, Security & Others	2.9	3.3	3.3	3.3	3.2	3.2	3.2	3.1	3.1
Electric, Gas & Water Supply	2.4	2.6	2.7	3.0	3.0	3.1	3.1	3.1	3.2
Property & Dwelling	3.9	4.2	4.3	4.1	4.2	4.2	4.2	4.1	4.1
Other Services	4.3	4.0	4.1	4.2	4.4	4.4	4.4	4.4	4.4

Sources : Calculated by JICA Study Team based on;
Informe Anual 1995, 1994, BCN
Compendio Estadistico 1987-1991, INEC

The table points out the characteristics of Nicaraguan economy as follows:

- The primary sector has increased continuously. The secondary sector has not recovered to the level of 1987, though it has increased from 1990 to 1995. The share of the secondary industry in GDP has decreased from 1992 to 1995.
- Within the primary sector, fishery has increased rapidly from 1993 to 1995, while the share of livestock has decreased.
- Within the secondary sector, manufacturing has decreased from 1991 to 1995, while construction has increased.
- Within the tertiary sector, electricity, gas and water supply have increased, while civil service has decreased from 1988 to 1995.

The selected economic indicators assumed for the study are shown in Table B-7.

Table B-7: Selected Economic Indicators

	Unit	1990	1991	1992	1993	1994	1995*
Population	1,000	3,871	3,964	4,058	4,156	4,255	4,357
Economically Active Population (EAP)	1,000	1,331	1,376	1,412	1,451	1,492	1,536
Gross Domestic Product Total	million C$ in 1980	18,156	18,127	18,202	18,136	18,743	19,523
Distribution							
Primary Sector	%	24.7	23.8	24.4	24.8	26.8	27.0
Secondary Sector	%	25.8	27.1	26.1	26.0	26.0	26.2
Tertiary Sector	%	49.5	49.2	49.5	49.1	47.2	46.8
per capita**	US$ in 1980	508	493	480	465	464	470
Unemployment rate	%	11.1	14.8	18.4	21.8	20.7	18.2
Sub-utilization rate***	%	44.3	46.3	48.3	50.1	53.6	53.2
Export (FOB)	mill.US$	330.6	272.4	222.3	267.1	351.3	519.8
Import (CIF)	mill.US$	637.5	751.4	855.1	744.0	874.7	961.7
Total external Debt	mill.US$	10,616	10,313	10,792	10,987	11,695	10,299
Exchange rate (ave.)	C$/US$	1.00	4.50	5.00	6.12	6.72	7.53
Inflation rate (accumulated)	%	13,490.2	865.6	3.5	19.5	12.4	11.1

Notes: * 1995 preliminary
** FIDEG "El Observador Economico", No.57
*** (unemployment + sub-employment)/Economically Activity Population x100
Sources: Informe Anual 1994,1995
Indicadores Economicos Agosto, 1996

The population in this table is calculated based on the figures published in 1990 by INEC and the result of the population census in 1995, under the assumption that the rate of increase in the period from 1990 to 1995 is constant. The economically active population (EAP) is calculated by multiplying the above populations and the employment rates announced each year, though the unemployment rates are the same figures announced by BCN are quoted.

b. Employment

Figures for the economically active population should be revised in accordance with the revision in population estimates. The rate of economically active population in 1995 was announced as 35.2 percent. The figure of employed persons in 1995 was 1,193,800 within the economically active population: these figures show that the unemployment rate may be calculated as 22.2 percent, which is higher than the 18.2 percent announced by BCN.

The population census survey in 1995: 4,357,100
The economically active population:
$$4,357,100 \times 35.2/100 = 1,533,700$$
Unemployment rate:
$$(1,533,700 - 1,193,800)/1,533,700 \times 100 = 22.2$$

The unemployment rate in the eight major cities was announced as 14.8 percent in 1995. About 58 percent of employees work in the informal sector, and the rate of sub-utilized work force, which is the sum of unemployment and under-employment, reaches 42.3 percent.

The composition of workforce by economic activity has not been announced in Nicaragua but the number of social security contributions have been published (refer to Table B-8).

Table B-8: Changes in Employment in Nicaragua

	1990	1991	1992	1993	1994	1995*	share (%)	1995/90
Total	261,439	228,931	214,676	207,492	203,344	208,935	100.0	0.799
Primary Sector	37,866	31,917	28,042	22,563	19,180	17,438	8.3	0.461
Agriculture	37,866	31,917	28,042	22,563	19,180	17,438	8.3	0.461
Secondary Sector	61,292	47,922	41,282	38,900	37,773	40,220	19.3	0.656
Manufacturing	47,668	37,350	33,436	32,138	31,048	32,938	15.8	0.691
Construction	11,490	9,142	6,578	5,527	5,418	5,921	2.8	0.515
Mining & quarry	2,134	1,430	1,268	1,235	1,307	1,361	0.7	0.638
Tertiary Sector	162,281	149,092	145,352	146,029	146,391	151,277	72.4	0.932
Commercial, restaurants & hotels	23,851	21,037	21,509	20,768	20,348	21,885	10.5	0.918
Transport & Communication	11,679	9,965	8,832	7,597	9,125	9,937	4.8	0.851
Electricity, gas & water supply	5,599	5,775	6,095	6,208	6,129	4,942	2.4	0.883
Finance, security, property & service for enterprises	15,478	14,482	11,234	10,820	10,665	10,586	5.1	0.684
Social, community services	103,461	96,228	96,308	99,563	99,251	103,095	49.3	0.996
Non-specific activities	2,213	1,605	1,374	1,073	873	832	0.4	0.376

Note : * Preliminary
Source : Indicadores Economicos Agosto 1996, BCN
Informe Anual 1994, BCN

The table shows that the composition of employment by sector in 1995 was as follows:

- Primary sector: 8.3 percent
- Secondary sector: 19.3 percent
- Tertiary sector: 72.4 percent
- The number of social, community services, commerce, restaurants and hotels have recovered to the level of 1990, while that of unspecified activities and agriculture have dropped to less than half of 1990.

c. Industries

c.1 Primary Sector

Agriculture in Nicaragua is recognized to have a dual structure: commercial farming for exportation and farming for domestic consumption. The cropping area for exports has increased, while that for domestic supply has decreased as shown in the following table.

Table B-9: Changes in Cropping Area

Unit : 1,000 manzanas

Type of Farm	1993/94	1994/95	1995/96
For exportation	202.6	237.7	265.1
For domestic consumption	636.3	602.0	587.3
Total	890.1	894.0	914.3

Source : Inform Annual 1995,BCN

Main exports are coffee, sugarcane and sesame. Fluctuations in primary sector production are summarized in Table B-10.

Table B-10: Fluctuations in Primary Sector Production

Unit : C$ million in 1980

		1990	1991	1992	1993	1994	1995	1995/1990
Agriculture	added value	2,887	2,742	2,727	2,558	2,970	3,184	1.103
Exportation		1,699	1,579	1,575	1,231	1,528	1,656	0.975
Domestic consumption		1,188	1,162	1,152	1,327	1,443	1,528	1.286
Livestock	added value	1,508	1,455	1,583	1,775	1,767	1,706	1.131
Cattle		1,218	1,120	1,200	1,357	1,323	1,242	1.020
Pig		62	56	62	48	53	55	0.890
Poultry		228	279	321	370	391	409	1.792
Fishing	gross value	74	107	137	218	339	485	6.575
Shrimp		47	60	50	114	212	311	6.566
Lobster		23	38	70	75	94	148	6.341
Fish		3	9	17	29	34	27	8.397

Sources : Informe Anual 1995, BCN
Informe Anual 1994, BCN

The table shows the tendency of the fishery production to increase. The production of fishing in constant price (1980) has increased from C$74 million in 1990 to C$485 million in 1995, which is 6.6 times of 1990. On the other hand, the production of livestock has decreased in value added based on the constant price (1980) from C$1,775 million in 1993 to C$1,706 in 1995, while it has increased slightly from 1990 to 1995.

Concerning agriculture, production had decreased from 1990 to 1993, but has increased after 1993. The production in 1995 was 1.1 times of 1990.

c.2 Secondary Sector

The production of the manufacturing sector has increased smoothly after 1992, while it saw a dent in 1992 (refer to Table B-11). Production in 1995 was 1.1 times of 1990. The beverage industry showed the highest increase, about double from 1990, followed by the non-metallic minerals industry at 1.5 times of 1990.

On the other hand, the clothing and machinery industries have decreased rapidly, reaching less than 20 percent of 1990.

Table B-11: Fluctuations in the Manufacturing Sector (Gross-value base)

Unit : C$ million in 1980

	1990	1991	1992	1993	1994	1995	1995/1990
Total	9,300	9,815	9,500	9,547	9,811	10,188	1.095
Food	3,780	3,845	3,768	3,979	4,143	4,356	1.152
Beverage	799	1,290	1,420	1,450	1,510	1,586	1.985
Tobacco	322	503	435	395	394	399	1.239
Textiles	408	290	219	157	107	108	0.265
Clothing	90	45	14	9	7	7	0.075
Leather & leather products	16	20	22	23	20	19	1.178
Footwear	69	80	88	89	82	82	1.189
Wood & cork	156	164	165	170	170	171	1.095
Furniture & accessories	30	45	41	35	33	33	1.114
Paper & paper products	56	75	64	60	61	61	1.102
Printing & publishing	153	136	133	128	129	130	0.845
Rubber & rubber products	13	9	9	9	8	8	0.629
Chemical	810	606	391	420	421	429	0.529
Petroleum products	1,704	1,787	1,865	1,807	1,892	1,915	1.124
Non-metallic minerals	353	458	505	485	500	545	1.545
Metal products	281	224	105	68	71	66	0.236
Machinery	127	51	22	19	19	19	0.151
Transportation	10	11	22	19	18	18	1.812
Miscellaneous	123	174	214	226	226	236	1.915

Source :Informe Anual 1995, BCN
Informe Anual 1994, BCN

c.3 Tertiary Sector

Concerning the tertiary sector, there were no data announced for sales and value added in Nicaragua. The changes in GDP by economic activity are shown in Table B-12.

Table B-12: Changes in GDP in Tertiary Sector

Unit : C$ million in 1980

	1990	1991	1992	1993	1994	1995	1995/1990
Total	8,973	8,908	9,011	8,850	8,841	9,128	1.017
Commerce	3,126	3,280	3,327	3,249	3,300	3,459	1.106
Civil Service	2,317	2,027	2,028	1,992	1,882	1,848	0.798
Transport & Communication	883	926	940	903	899	943	1.068
Bank, Security & others	600	589	589	581	589	607	1.010
Electric, Gas & Water Supply	538	540	556	564	583	617	1.147
Property & Dwellings	752	757	762	765	769	795	1.058
Other Services	757	790	809	796	819	859	1.135

Sources : 1990-92 BCN, Informe Anual 1994
1993-95 BCN, Informe Anual 1995

The table shows a marginal increase in the production of the sector from 1990 to 1995. Electricity, gas and water supply, commercial activities and other services have increased to more than 1.1 times of 1990, though civil services have decreased to less than 80 percent of 1990.

The tourism industry has increased greatly and became a big source for the generation of hard currencies in Nicaragua as shown in Table B-13.

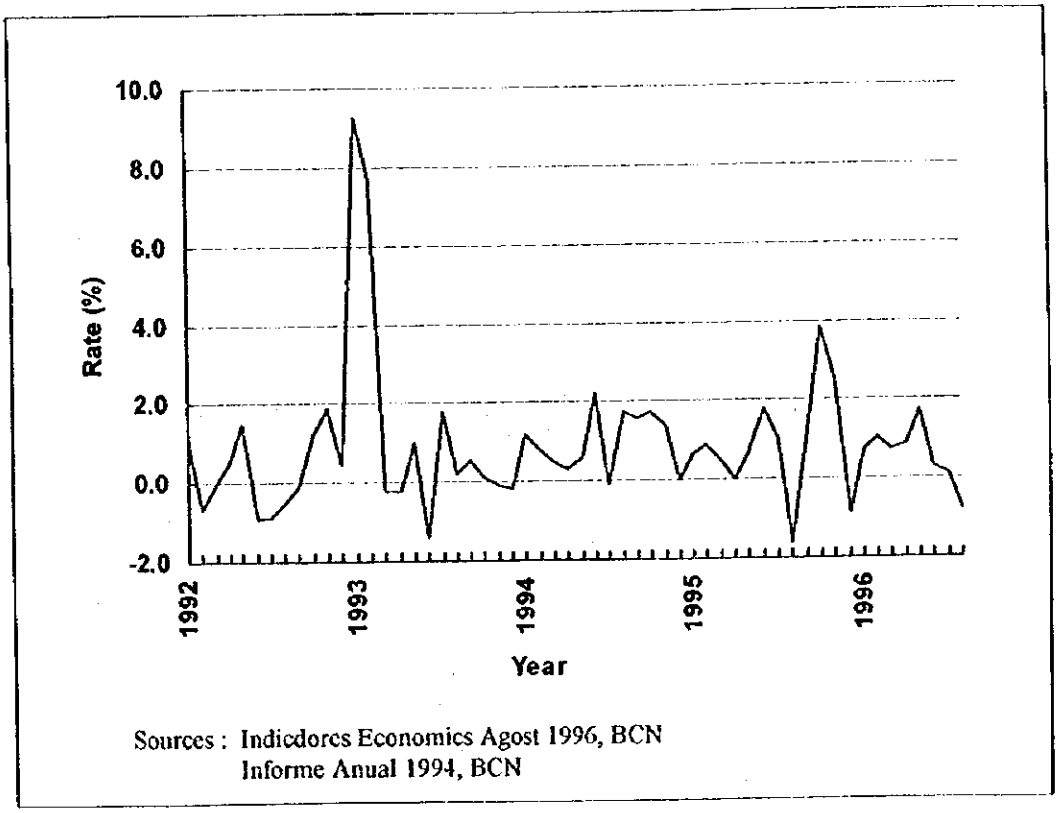
Table B-13: Basic Indicators of Tourism in Nicaragua

	Unit	1990	1991	1992	1993	1994	1995	1995/1990
Inflow of Tourists	1,000	106.5	145.9	168.9	197.6	237.6	281.3	2.641
Revenue of Tourism	US$ million	12.2	15.8	20.9	29.9	40.1	49.5	4.057
Ratio to Export	%	3.7	5.8	9.4	11.2	11.4	9.4	

Source : Encuesta Turistica 1995, MITUR

d. Prices of commodities

The inflation rate has dropped sharply from 866 percent per annum in 1991 to 11.1 percent per annum in 1995. The average monthly rate of inflation for the first nine months in 1996 was 0.43 percent, 3.8 percent for October was and 2.6 percent by November of 1995 (refer to Figure B-8).



Sources : Indicdores Economics Agost 1996, BCN
Informe Anual 1994, BCN

Figure B-8: Fluctuations in Inflation Rates

e. International Trade and Foreign Debt

e.1 International Trade

Nicaraguan exports have increased after 1992 and the level in 1995 was 1.57 times of 1990. In particular, shrimp and lobster production has increased greatly at US$74.2 million, and ranked as the second major commodity following coffee (refer Table B-14).

Table B-14: Exports and Imports

Unit : US$ million

	1990	1991	1992	1993	1994	1995	1995/1990
Export (FOB)	330.6	272.5	222.3	267.1	351.3	519.8	1.572
Coffee	71.0	36.2	45.3	31.9	73.0	124.8	1.758
Cotton	37.3	44.4	26.2	0.4	4.2	2.2	0.059
Sesame	6.5	7.3	4.3	8.3	7.3	11.9	1.831
Sugar	38.6	31.3	19.1	16.0	15.5	29.6	0.767
Molasses	1.5	3.3	4.6	1.6	2.0	3.5	2.333
Meat	57.0	37.5	40.8	60.8	67.6	54.5	0.956
Shrimp	8.7	12.9	20.4	26.8	21.3	38.3	4.402
Lobster					20.8	35.9	
Banana	27.1	28.7	10.0	5.5	6.3	14.3	0.528
Others	82.9	70.9	51.6	115.8	133.3	204.8	2.470
Import (CIF)	637.5	751.4	855.1	744.0	874.7	961.7	1.509
Consumer goods	158.7	223.5	292.7	211.1	231.1	243.8	1.536
Petroleum	123.1	114.5	121.4	103.9	115.0	128.4	1.043
Intermediate goods	158.5	222.6	227.1	244.7	305.6	355.0	2.240
Capital goods	197.2	190.8	213.9	184.3	223.0	234.5	1.189
Trade Balance	-306.9	-478.9	-632.8	-476.9	-523.4	-441.9	1.440

Source : Indicadores Economicos Agosto 1996, BCN

Nicaraguan imports have also increased, especially those of intermediate goods. Imports are classified into consumption goods, petroleum, intermediate goods and capital goods, accounting for 25.4%, 13.4%, 36.9% and 24.4% of the import volume, respectively.

As a result, the international trade deficit also increased and became 1.44 times of 1990, though it dropped to be 70 percent of 1992.

e.2 Foreign Debt

The Nicaraguan foreign debt had increased from US$10.6 billion in 1990 to US$11.7 billion in 1994, but after 1995 it showed a decline to US$10.3 billion in 1995. The amount is still big for the Nicaraguan economy because it is about 5.38 times of GDP.

e.3 Exchange Rate

Though the average exchange rate in January 1995 was C$7.15 to the US$, the end rate in December 1995 was C$7.97 to one US$. The value of the Cordoba has dropped continuously and the end rate in August 1996 was C$8.59 to one US$. The tendency for the Cordoba to devalue against the US$ will continue in the near future.

f. Central Government Finances

The preliminary budget of the Central Government in 1995 was C$3,146 million in revenue and C$4,244 million in expenditures. The actual financial situation is estimated to be C$3,136 million in revenue, a little smaller than the preliminary budget, and C$4,396 million in expenditures, a little larger than the preliminary budget. The deficit was C$1,260 million, of which C$1,191 million was covered by foreign aids.

The ratio of revenue to GDP has gradually increased. The ratio of deficit to GDP continues to be around 7.5 percent because expenditure has not decreased. In 1994 the ratio of deficit increased up to 9.7 percent because the expenditure for interest payment was relatively large (refer to Table B-15).

The table shows that the transfers to municipalities have been small.

Table B-15: Changes in Central Government Budget

	1990	1991	1992	1993	1994	1995*
Revenue	229	1,447	1,893	2,222	2,530	3,146
Tax revenue	206	1,317	1,779	2,063	2,383	2,948
Income, Profit & capital gains	57	252	313	285	269	406
Goods & services	116	798	1,101	1,333	1,596	1,858
International trade & transaction	33	267	364	444	516	683
Others	0	1	1	1	1	1
Nontax Revenue	24	115	101	101	116	134
Transfer from INSS	3	0	4	0	0	0
Others	21	115	98	101	116	134
Other revenues	0	15	13	59	31	64
percentage of GDP	14.6	19.5	20.5	20.1	20.3	21.8
Expenditure	545	2,003	2,596	3,034	3,735	4,244
Current expenditure	521	1,743	2,042	2,282	2,610	2,720
Salary	112	605	783	819	834	866
Interest payment	0	85	264	426	643	566
Transfer	78	490	469	433	547	803
for Municipalities	8	2	3	2	3	3
for other authorities	70	488	467	431	545	800
Other current expenditure	330	563	526	604	586	485
Capital expenditure	24	193	536	727	1,046	1,362
Transfer	9	37	223	450	467	633
for Municipalities	2	0	8	11	49	66
for INAA	2	15	20	12	28	25
for other authorities	5	22	195	428	390	542
Other expenditure	0	67	18	25	79	162
percentage of GDP	34.8	27.0	28.1	27.4	30.0	29.4

Note : * preliminary
Source : Informe Anual 1994, BCN
Informe Anual 1995, BCN

The changes in budget for ministries related to USE are summarized in Table B-16.

Table B-16: Changes in USE Related Budget

	C$ million				%			
	1992	1993	1994	1995	1992	1993	1994	1995
Total revenue*	2,589.6	2,458.5	2,538.2	2,677.8	100.0	97.0	91.0	91.1
Total expenditure	2,589.6	2,535.2	2,790.4	2,940.8	100.0	100.0	100.0	100.0
MINSA	421.8	481.5	539.8	590.8	16.3	19.0	19.3	20.1
MARENA	64.2	119.8	108.2	112.0	2.5	4.7	3.9	3.8
MAG	78.3	58.0	54.7	35.2	3.0	2.3	2.0	1.2
MEDE	24.1	38.9	40.0	22.9	0.9	1.5	1.4	0.8
MCT	329.7	182.9	239.7	242.7	12.7	7.2	8.6	8.3
INIFOM	13.9	16.5	36.7	49.9	0.5	0.7	1.3	1.7
Others	1,657.6	1,637.6	1,771.2	1,887.2	64.0	64.6	63.5	64.2

	1992	1993	1994	1995	1992	1993	1994	1995
Capital expenditure Total	815.6	484.9	579.3	697.7	100.0	100.0	100.0	100.0
MINSA	50.4	54.9	79.0	103.4	6.2	11.3	13.6	14.8
MARENA	56.2	5.6	94.8	99.4	6.9	1.1	16.4	14.2
MAG	55.7	20.6	16.3	15.9	6.8	4.3	2.8	2.3
MEDE	11.7	21.8	22.1	10.1	1.4	4.5	3.8	1.5
MCT	265.3	130.1	188.2	195.7	32.5	26.8	32.5	28.0
INIFOM	7.7	9.5	26.9	40.3	0.9	2.0	4.7	5.8
Others	368.8	242.4	151.9	233.0	45.2	50.0	26.2	33.4

Note : Total budget is different from the actual one shown in the previous Table.
Source : Presupuesto General de la Republica 1995, Direccion General de Presupuesto 1992, 1993, 1994, 1990

The table shows that the budget for MINSA and INIFOM has increased remarkably.

g. National Development Plan

"The study to take priority of investments for the sector of water supply and sanitary wastewater", which was studied by INAA in 1996, introduced the final draft of the "National Plan for Sustainable Development" prepared by the Central Government in 1995. The strategies of economic development summarized the increase in economic growth more than population growth. The targets of economic growth are as follows:

1996-1997	4.5 percent (actual)
1998-2000	from 6 to 7 percent (actual)

Other major strategies are summarized as follows:

- preservation of amenities and natural resources
- modernization and decentralization
- human development

B.1.7 Relevant Studies and Projects

Data and information regarding studies and projects realized nationwide in Nicaragua, which are relevant to this Study, were obtained from the counterpart. Table B-17 lists those studies and projects.

Table B-17: Relevant Studies and Projects in Nicaragua

Classification of project	Name (or Outline) of project	Date of project	Organization	Project location	Study, design or construction	Cost of Project (US$)
Potable Water and Wastewater	Improvement and extension of water and sewer system	Aug'95	Government of Germany	Matagalpa , Jinotega , Corinto	Construction	33,800
Potable Water and Wastewater	Rural water and sanitation	Aug'94	AOS	Matagalpa and Jinotega	Construction of water supply and latrines	709,700
Potable Water and Wastewater	Improvement and rehabilitation of water and sewer system	Jan'92	IDB , NDF, OPEP	National (27 municipalities in Region I, II, III, IV, VI)	Rehabilitation of services	58,500,000
Potable Water and Wastewater	Rural potable water	Sep'92 (Phase VII)	Government of Switzerland	Region I and II	Rural community water supply	2,779,000
Potable Water and Wastewater	Improvement and extension of water and sewer system in urban centers	Jun'95	European Union	Region II, IV and V	Construction of head works, intake, treatment plant for water supply and sewer improvement and rehabilitation	7,700,000
Potable Water and Sanitation	Water and sanitation	Jan'92	UNICEF	Rural sector in Region I, V and VI	Construction of 181 water supply works and 1,620 latrines	469,800
Industrial SWM	Inventory of Industries and Industrial SW	not available	DANIDA (Denmark)	National	Study	not available
SWM	Collection and treatment of hospital SW	Jan'95 - Dec'97	European Union	National	Training of adequate handling for hospital waste	816,670
Municipal Development	Program of local development (PRODEL)	Jun'93 - Mar'97	ASDI (Sweden)	Segovias and Occident	Program	5,475,354
Municipal Development	Promotion for self-sufficiency of the social development	Jun'94 - Jun'98	Government of Finland	Municipalities in Region V	Multi-component (credit, primary health, nutrition)	3,810,000
Municipal Development	Promotion and development of municipalities	Mar'96 - Mar'98	UNDP - Government of Spain	45 municipalities in the country	Training program and technical assistance	460,825
Municipal Development	Unitary system of appropriate cadastre in the level of municipality	Jan'96 - Dec'97	UNDP - ASDI (Sweden)	14 representative department and 26 municipalities	Study, training and finance for equipment	497,200
Municipal Development	Project: East-West-South	Mar'96 - Dec'99 (Phase II)	Government of Holland	National	sister city affiliation, infrastructure and training	2,675,754
Municipal Development	Transmission of local government	Apr'96 - Aug'97	UNDP, Governments of Sweden and Spain	National	campaign and publication	743,550
Municipal Development	Promotion of municipalities in Las Segovia	Mar'96 - Dec'98	Government of Denmark	Municipalities in Region I		6,600,000
Municipal Development	Municipal fund for the sustainable development	1996-2000	World Bank	23 municipalities in Region II and 9 in Region IV	Funds, Training	35,000,000

B.2 Leon

B.2.1 Definition of the Study Area

At the meeting of the discussion on the inception report (IC/R) for the Study, the Nicaraguan side requested to expand the boundary of the Study Area from that shown in the IC/R. Although the boundary of the Study Area of the IC/R was defined as the present (1995) urban area in the S/W (scope of work) for the Study, agreed upon between INIFOM and the JICA Preparatory Study Team in November 1995, the Team agreed that the expansion will be the urban limit in the target year 2010, on condition that the Nicaraguan side clarify and provide information necessary for projecting the improvement plan of USE, such as proposed boundary, projected population, etc., in the target year 2010.

Based on the above-mentioned discussion, counterparts from Leon Municipality presented a map showing the boundary of the urban area of Leon City in 1995 (see Figure B-9) and the urban expansion area for 2010. Consequently the Study Area for the city of Leon covering about 43 km^2, was defined as the projected urban area in 2010 as shown in Figure B-10.

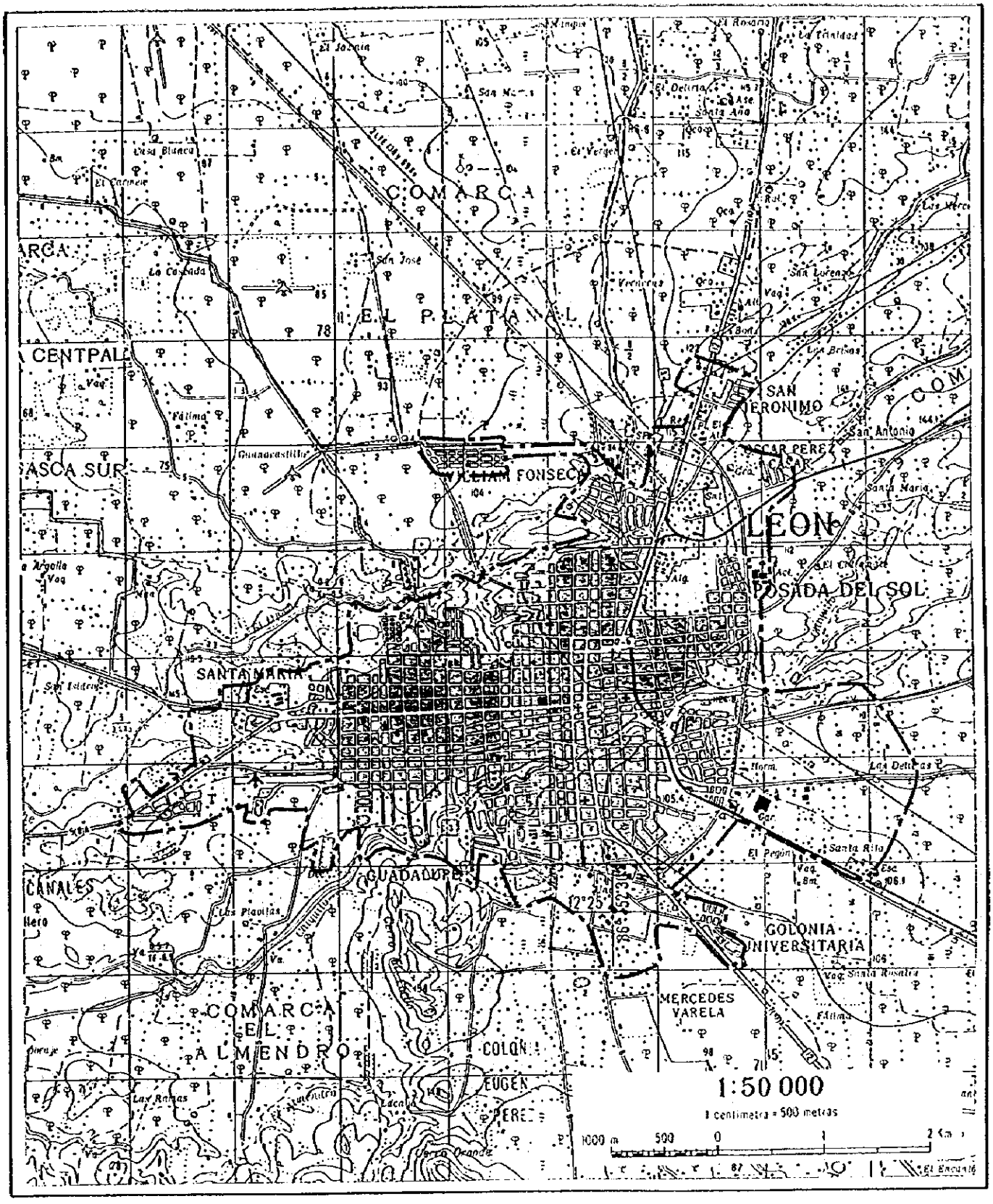


Figure B-9: Urban Area of Leon in 1995

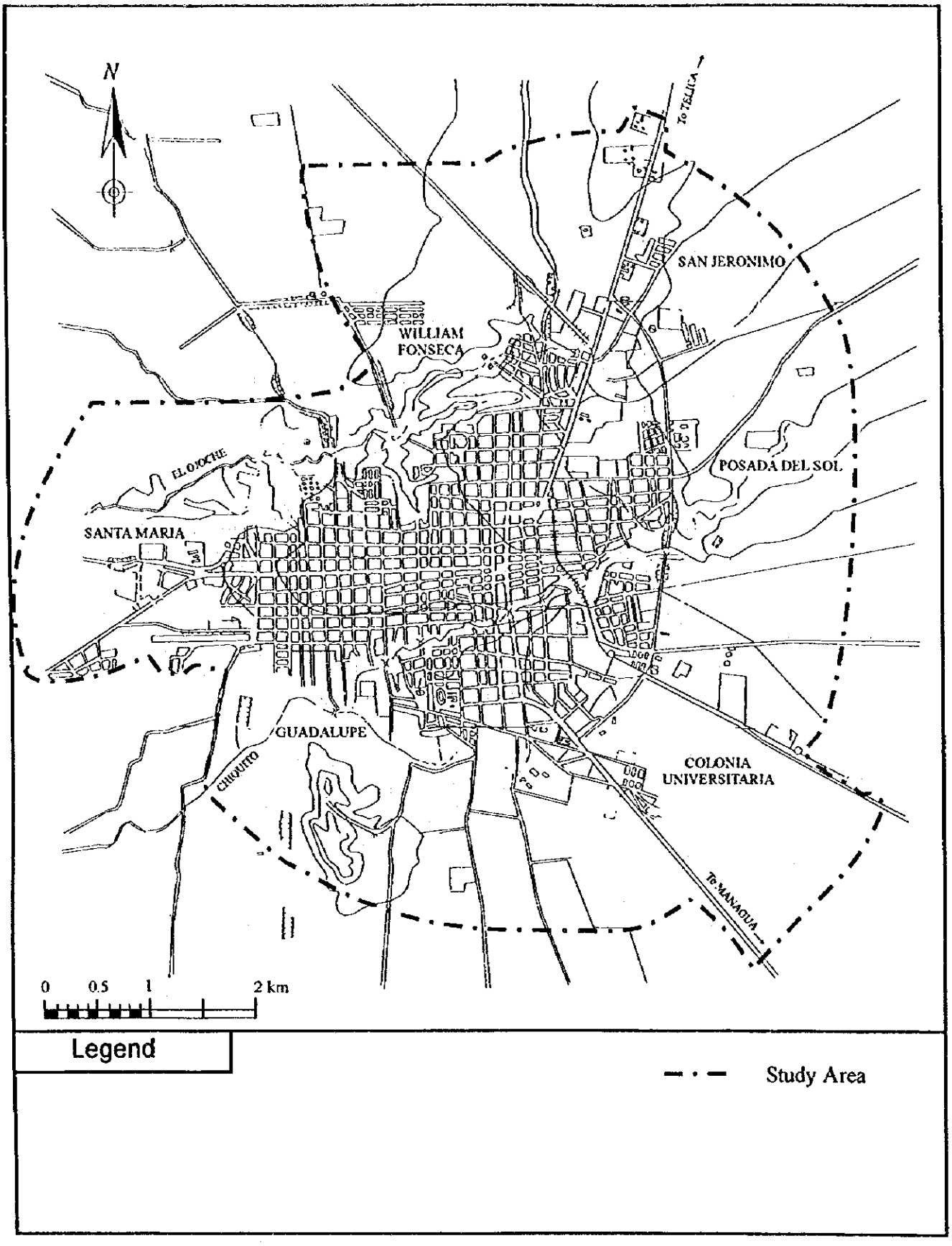


Figure B-10: Study Area in Leon

B.2.2 Natural Conditions

a. Location and Area

The city of Leon is located on a gently sloping area off the western coastal plain of Nicaragua. This area slopes westward as it extends from the foot of the Maribios mountain range, with volcanoes aligned from NW to SE such as V. Tiela (1,010m), V. Santa Clara (834m), V. Rota (836m), V. Cerro Negro (675m), V. El Hoyo (1,050m) and V. Las Pilas (983m).

The "Mesa de Tamarindo" plateau is located south, south-west of Leon. The Plain of Leon, therefore, is situated between the volcanic mountain range and the Tamarindo plateau.

Leon City falls between the northern latitude of 12°25' and 12°28' and 86°51' and 86°55' longitude. It has an elevation ranging from 120 m in the east to 80 m in the west. The city area totals about 1,800 ha as of 1993, occupying about 2.5 % of the Leon Department. The area has been expanding rapidly and unsystematically, especially northward and eastward.

b. Climate and Hydrology

b.1 Precipitation

The rainy season usually begins in May and ends at the beginning of November. The peak monthly rainfall is more or less 300 mm in September. The dry season is from November to April. Monthly precipitation in the dry season is usually limited to less than 20 mm and usually zero in January and February.

About 95 % of the annual rainfall occurs in the rainy season, while the remaining 5 % falls in the dry season.

The annual precipitation for the past 20 years averages about 1,220 mm. Fluctuation in annual precipitation is considerably large ranging from 600 mm in 1976 to 2,360 mm in 1988, as shown in Figure B-11. Although the data in 1982 was not available for Leon City, rainfall in 1982 was presumably higher than that in 1988, estimated by the recorded highest in 1982 at the Chinandega observation station.

The average monthly precipitation for the past 20 years is given in Figure B-12 along with the minimum and maximum monthly rainfalls of given years.

Monthly precipitation is given in Table B-18.

b.2 Temperature, Humidity and Evaporation

Table B-19 gives various meteorological data observed at the meteorological station in Leon in 1992. Mean maximum temperature exceeds 33°C throughout the year, with the highest recorded in April at 37.1°C. The highest temperature recorded was 40°C, also in April. Mean minimum temperature ranges from 20.3°C in December to 24.9°C in April, and the lowest temperature recorded was 16.7°C in December.

Monthly mean relative humidity varies from 53 % in March to 80 % in September. The wet season (May - November) averages 73 % and the dry season (December - April) averages 63 %.

Monthly pan evaporation is generally larger than monthly precipitation, except for the 3 months in the rainy season. The annual evaporation in 1992, 1,726 mm, was twice the total precipitation in the same year. Under field conditions, however, the actual evaporation and evapotranspiration were much smaller than the measured pan evaporation.

b.3 Hydrology

The city has only two perennial rivers, namely El Ojoche and Chiquito. El Ojoche, which originates from the northern end of the city area, flows in a W-S-Westerly direction to join the Chiquito River at Cristobal Caballero about 6 km west from the city center. The main source of both rivers is groundwater trickling out in the dry season and/or gushing out in the rainy season from the shallow aquifers in the foot of Maribios mountains. The water level of the rivers decreases in the dry season; accurate data on the discharge of rivers in the area is not available.

c. Geology and Hydrogeology

c.1 Geological structure and composition

The gently sloping plain on which Leon is situated extends to or near the western edge of the Nicaraguan Depression. The basement rocks of the area consist of the Tamarindo Formation, which is composed of hard and compact ignimbrite rocks formed during a period of active volcanism in the Miocene of the Tertiary Period.

Basement rocks crop out 5 km southwest of Leon City forming a plateau called "Mesa de Tamarindo". To the east, however, the Tamarindo Formation is at depth, due to structural movement of the Nicaraguan depression.

While the depression progressed until the late Pleistocene, a thick formation of the Las Sierras Group is composed of various volcanic materials such as tuff, tuffbreccia, lava, agglomerates, tuffaceous sand and tuffaceous silt.

The Las Sierras Group is overlain by alluvial deposits and volcanic deposits from the recent activity of the Maribios volcanoes. Both of the alluvial and recent volcanic deposits consist mainly of volcanic sand, volcanic ash, agglomerate, scoria and tuff. These recent deposits are 100 m or more in thickness. Figure B-13 presents a schematic cross section running from SW to NE.

c.2 Hydrogeology

The area has a relatively high potential for groundwater development because the thick volcanic deposits are characterized by high permeability and high stirativity, and also due to its gently sloping topography. Moreover, as shown in the schematic section, the area is in an ideal hydrogeological condition as the basement rock, 'ignimbrite', forms a natural underground dam of inexhaustible groundwater resource.

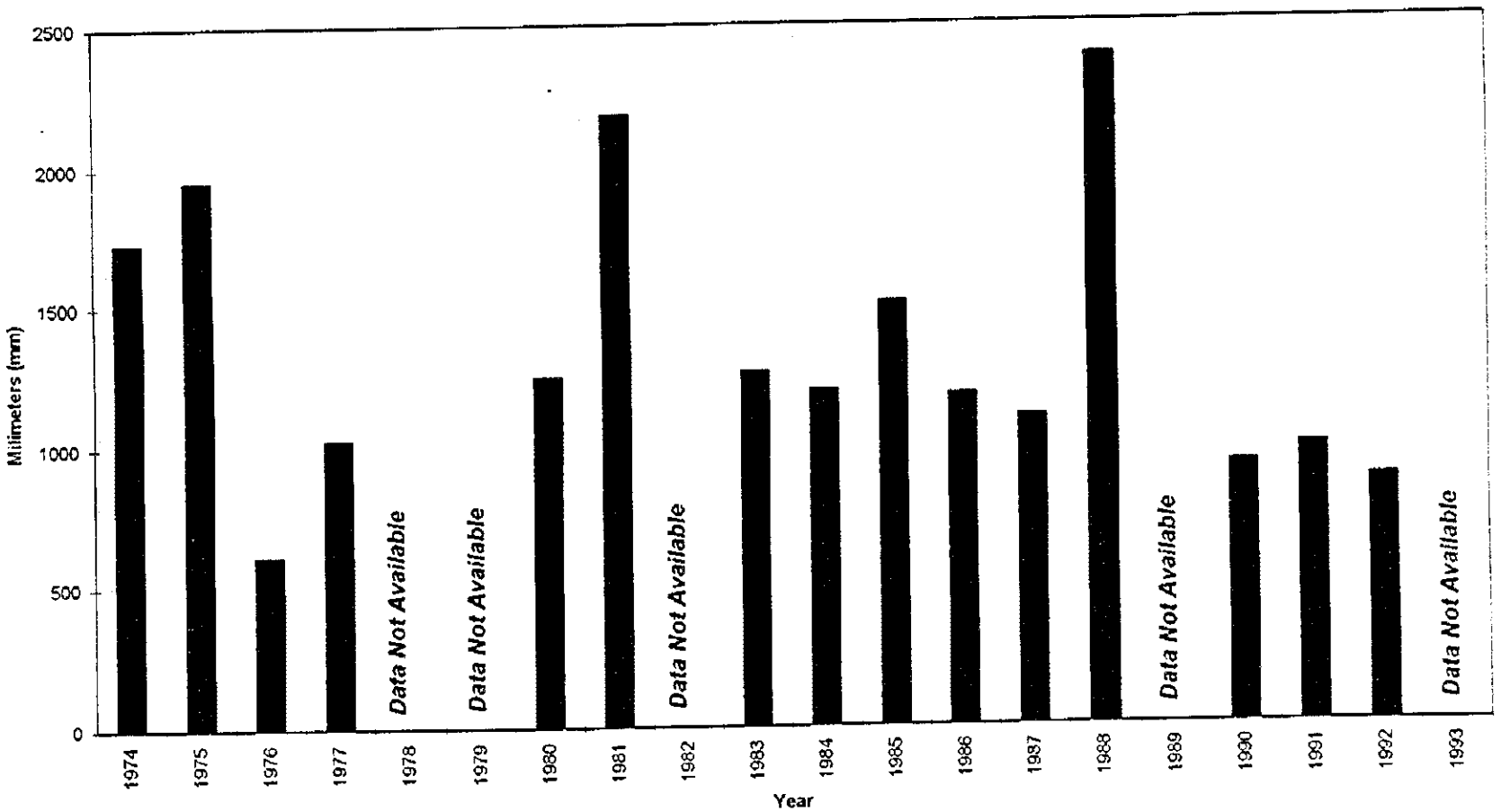


Figure B-11: Fluctuations in Annual Precipitation in Leon

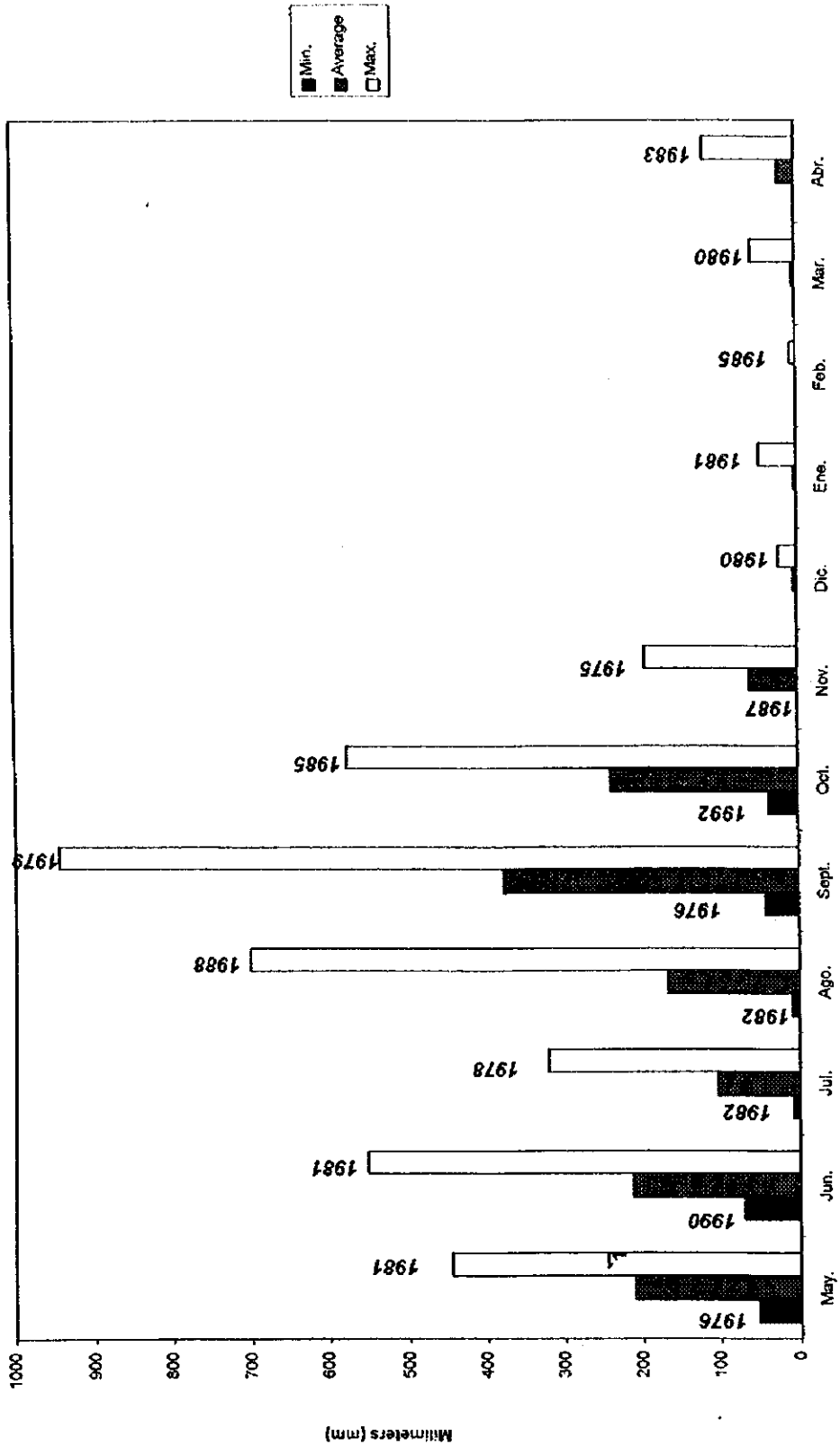


Figure B-12: Monthly Average Precipitation in Leon (19 Years from 1974 to 1993)

Table B-18: Monthly Precipitation in Leon

Code	Station	Elevation	Latitude	Longitude	Type
64043	LEON	60	122536	865448	Principal Hydrometeorology

Unit : mm

Year	May.	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total
1974	230	187	82	146	886	191	4	0	0	0	0	0	1726
1975	243	86	98	162	674	489	192	0	0	0	0	5	1949
1976	54	212	13	53	42	142	94	0	0	0	0	0	610
1977	291	227	11	69	194	148	84	0	0	0	2	0	1026
1978	331	122	320	276	297	191	38	0	0	0	0	-1	
1979	-1	-1	-1	-1	944	335	79	0	0	0	0	0	
1980	169	218	122	62	283	184	126	23	0	0	55	0	1242
1981	445	550	143	276	263	447	3	7	48	0	0	0	2182
1982	-1	126	8	8	383	110	1	14	0	0	10	2	
1983	92	158	60	94	308	252	176	10	0	0	1	113	1264
1984	150	182	121	94	499	48	27	0	0	0	0	75	1196
1985	66	128	232	228	180	574	91	2	0	6	1	0	1508
1986	408	252	15	84	170	238	10	0	0	0	2	0	1179
1987	57	266	156	144	294	170	0	1	0	0	1	6	1095
1988	265	285	232	701	393	488	18	1	0	0	0	0	2383
1989	61	270	190	291	473	118	-1	-1	0	0	0	100	
1990	140	71	82	98	98	283	91	1	1	0	0	61	925
1991	280	188	45	93	142	203	33	1	0	3	0	0	989
1992	59	174	20	130	377	39	49	13	2	0	0	5	868
1993	425	323	17	129	654	86	35	0	-1	-1	-1	-1	
Average	209	212	103	165	378	237	61	4	3	0	4	20	1343
Standard Deviation	135	107	90	152	248	155	58	7	11	2	13	38	508
Min.	54	71	8	8	42	39	0	0	0	0	0	0	610
Max.	445	550	320	701	944	574	192	23	48	6	55	113	2383
75 % (*)	147	148	73	116	265	166	42	3	2	0	3	14	978
95 % (*)	88	90	21	55	286	112	7	0	0	0	0	1	660

Source : INETER (*) Probability Distribution: (Normal and Weibull), elaborated by ITS-LOTTI/LAMSA -1 = No Data

Table B-19: Various Meteorological Data in 1992, Leon

INSTITUTO NICARAGUENSE DE ESTUDIOS TERRITORIALES (INETER)
METEOROLOGY DEPARTMENT
*** SUMMARY OF METEOROLOGICAL DATA ***

STATION : LEON
CODE : 064043
YEAR : 1992

LATITUDE : 12°25' N
LONGITUDE : 86°54' W
ELEVATION : 60 msnm
TYPE : HMP

		TEPERATURE				RELATIVE HUMIDITY	VAPOR TENSION	RECIPITATION.	EVAP.(ml)(mm)		FINE WEATHER	AVERAGE CLOUDY		WIND (m/dec.)		
MONTH	ABSOLUTE MIN.	ABSOLUTE MAX.	MIN.	MAX.	AVERAGE	(%)	(mm)	(mm)	RICHER	TANK	HOURS	1/8 OF SKY COVERED	MIN.	MAX.	AVERAGE	DIRECTION
JAN.	18.2	36.6	20.7	34.6	27.7	63	16.7	0.0	210.0		265.6	1	2.0	3.2	2.2	E
FEB.	19.1	38.4	21.6	35.9	28.8	32	17.6	3.3	179.5		259.2	1	1.9	3.2	2.3	NE
MAR.	21.0	38.3	23.6	36.6	29.9	53	16.1	0.0	241.0	371.0	283.3	1	2.2	6.2	2.4	NE
APR.	21.7	40.0	24.9	37.1	30.5	58	18.3	0.0	190.8	327.0	206.3	2	2.1	4.6	0.8	E
MAY.	22.3	39.4	24.5	35.9	29.6	64	19.4	59.1	158.7	291.5	166.9	2	2.0	4.0	1.7	SW
JUN.	22.1	37.4	23.8	34.5	28.5	77	21.8	173.9	94.4	225.8	195.6	3	2.0	3.6	1.9	SE
JUL.	20.2	35.8	22.7	33.7	28.0	72	20.0	19.6	121.7	238.5	172.9	2	2.0	4.5	2.6	NE
AUG.	18.9	36.9	22.3	34.5	27.9	72	19.5	129.8	126.1	239.1	189.0	2	2.0	4.6	2.7	NE
SEP.	20.8	35.5	22.1	32.4	26.8	80	26.6	376.7	76.8	176.7	169.9	3	1.9	SE	1.8	E
OCT.	20.5	34.0	21.9	32.5	27.3	78	21.0	39.3	79.7	164.0	196.6	3	1.8	3.3	1.9	SE
NOV.	19.9	35.2	21.6	33.6	27.2	74	19.5	49.2	91.5	165.1	184.8	3	1.8	3.5	2.0	SE
DEC.	16.7	35.6	20.3	33.9	27.0	65	16.6	13.0	156.3	232.0	206.0	2	2.0	4.4	2.6	NE
TOTAL								863.9	1726.5	2430.7	2496.1	26				
ABSOLUTE	16.7	40.0														
AVERAGE	20.1	36.9	22.5	34.6	28.3	68	19.4	72.0	143.9	243.1	208.0	2	2.0	3.7	2.1	NE

Source : INETER

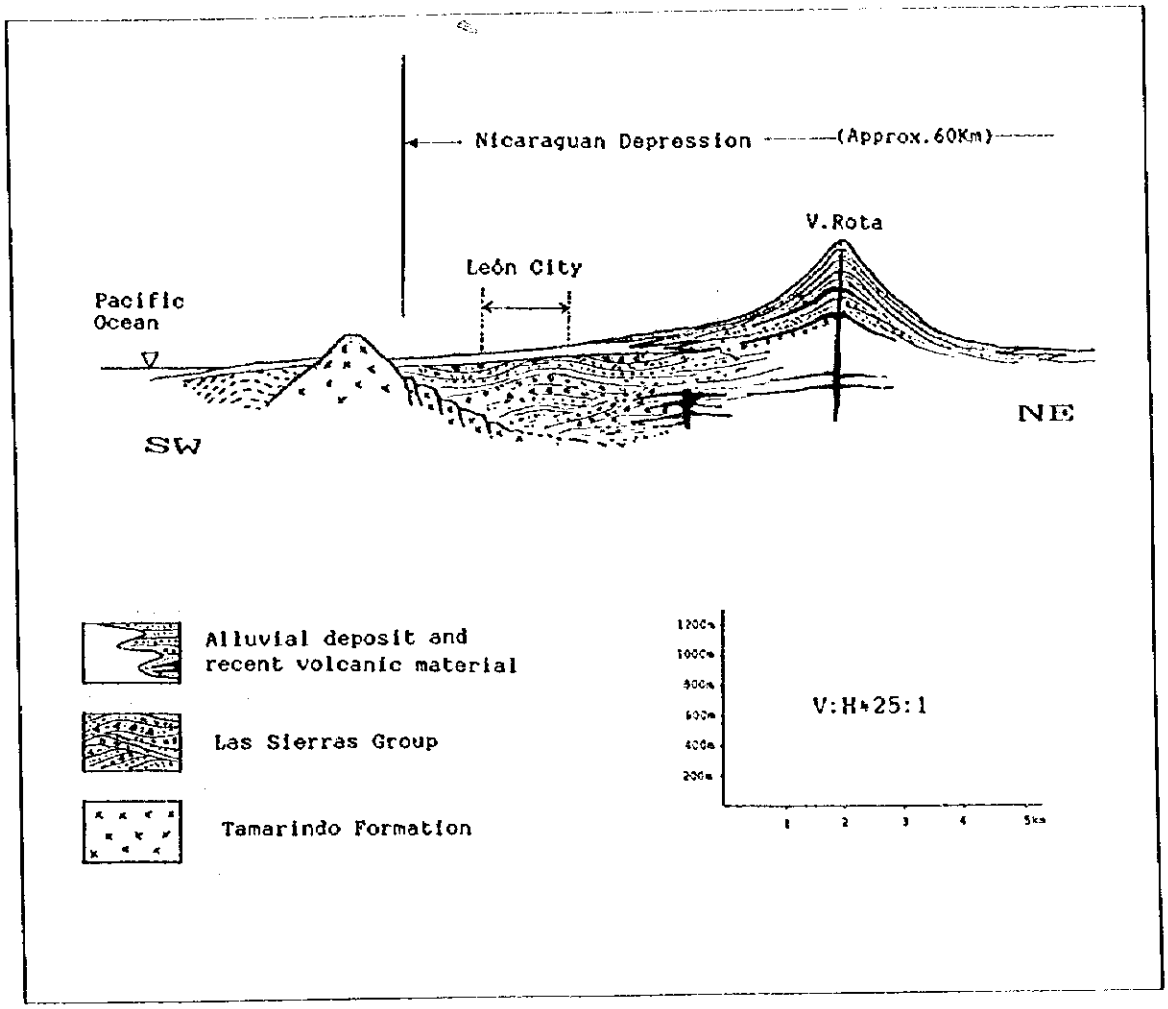


Figure B-13: Schematic Cross Section of Leon

B.2.3 Social Conditions

a. Administration

As established in Law No. 40 - 88, the municipal government is made up of the Municipal Council (ten councilors directly elected by the citizens) and the Executive Organ, under the Mayor, "Alcalde". The Mayor and his deputy, the Vice Mayor, are also councilors elected by the Council.

[The amended 1995 Constitution states that the major and vice mayor should be directly elected.]

a.1 Executive Structure and Some Relevant Procedures

Under the Mayor and Vice Mayor are the four departments and four divisions, employing a total of 517 employees. Nowadays, Project Division and M.E.D. are blended in just one "Project Direction'.

- Municipal Services Direction (MSD)

  The MSD is divided into SW Collection, Parks and Cemeteries, Abattoirs and Market sectors. SW Collection also includes street cleansing and refuse disposal,

and the director accumulates the direct responsibility for this sector - due to its importance - while the other sectors have their own chief. The SWC is not structured but divided in several collection and sweeping teams, plus 2 employees allocated to the disposal site, involving 72 employees and a few task - workers in charge of sweeping, some downtown streets at night for the second time.

Abattoirs and Markets Sector allocate 10 employees (including 1 veterinary surgeon) to (the only municipal abattoir, and 26 employees to two municipal markets. This sector operates the abattoir, but only check up on the activities of the merchants (renters).

- Project and Foreign Cooperation Direction (PECD)

  PECD is actually divided into Sector of Project Elaboration, Project Execution, Regional Enterprise for the Supply of Construction Material (ERAMAC), Public Work Machines Workshop, and Street Maintenance.

  The referred workshop includes garage and maintenance for donated Japanese machines destined for "new" public constructions. Sometimes the municipality rents out machines to private constructors.

  ERAMAC produces concrete pieces (blocs and adoquines) for street paving.

  Street maintenance should include a drainage system, however, it is not usual this maintenance, but just an occasional cleaning of gallery entrances. The municipality does not have equipment to clean tubes, and consider this work a duty of INAA.

  A designing plan (drawing) of a drainage system is in this Superintendence.

- Environmental Protection Superintendence (EPD)

  This Superintendence includes a municipal wood and small zoo, and promotes communities and NGOs' participation aimed to improve environmental conditions.

- Urban Planning and Control Division

  This Division includes the Land Cadastre Sector , where the urban and rural territories are registered and divided in zones with typical unitary value of land.

  These values constitute the basis for calculating taxes on real estate and for waste collection.

  The urban area is divided in eight zones and the unitary values (C$/$m^2$) in each one is different for lots in front of paved or unpaved street.

  The value of the building, to be added to the land value, is evaluated according to the area, level and age of the building, and to the public services offered: water supply, wastewater and SW collection, street cleansing, electricity supply and so on.

  The evaluation is checked with the value informed by the owner, and a final decision is taken after discussing both prices.

  The cadastre system uses micro stations called SISCAT, fixed all around the country by the Central Government, and started at the end of the year.

- Financial Division (FD)

  The Municipal Budget is coordinated by this Division according to the proposed sectorial budgets of each department. [The municipal executive must approve and submit the budget before October 15 to the Municipal Council, that have to approve it until October 30. Until November 7, the Municipal Budget must be delivered to the Republic Presidency, that have until December 31 to respond to this request. A non answered budget proposal will become valid on January 1st].

  The structure of the municipal Budget is nationally standardized, and its execution mobilizes the three sectors of the Division: Budget, Accountancy and Treasury.

- Administrative Division (AD)

  The AD Sectors consist of: Personnel, Purchase, and General Services - that comprehends: Maintenance, Storeware and Housekeeping.

  The Maintenance sub-sector includes a workshop and a diesel oil & lubricants station (gasoline is supplied externally). The sub-sector controls and performs the maintenance of all vehicles and machines of the municipality, except that ones in charge of PECD. The procedures are resumed as follows:

  i. The sub-sector maintains the Life-Sheet of each vehicle;

  ii. One Service Order is open when needed; it supplies data for the Life-Sheet and Costs (actually not performed);

  iii. Materials are requested to the Superintendence, that authorizes the acquisition; the material is received by the Storeware, registered and delivered to the workshop;

  iv. External services are requested the same way (except passing through storeware);

  v. Acquisition procedures for materials and services are exposed in the Materials and Services Acquisition Handbook approved by the Municipal Council according to the National Regulations established by National Comptroller Office;

  vi. It is permitted to buy to C$ 200,000.00, consulting directly at least three suppliers; to C$ 1 million through formal invitation to at least three suppliers; more than C$ 1 million needs public bidding announced at least 20 days in advance;

  vii. It is feasible to buy rapidly without these process, in case of urgency - it would take only 2 or 3 days since a request; it is also feasible to bid and contract an amount of materials or services and use this contract continuously during the period it is valid.

a.2 Support from MINSA

Since 1992 MINSA has appointed specialists on sanitation and environment to the municipality, aiming to coordinate the two.

Direct activities of MINSA are performed through the SILAIS of Leon Department that is extended to ten municipalities offering the services presented in the flowchart. Within

the municipality of Leon, SILAIS operates through the executive divisions that offer personal and environmental assistance.

There is a good relationship between SILAIS, Municipal Government and the University of Leon.

a.3 Relevant Aspects of the Municipal Budget (MB)

Some indices may be calculated from the MB for a macro-analysis of the 1995 and 1996 budgets:

TsI /MB =	0.41
HI / MB =	0.08
D / MB =	0.35
R / MB =	0.13
MiT / TsI =	0.62
MT / TsI =	0.28
R / TsI =	0.33

Other indices may be calculated for a specific analysis, taking as Relevant Costs as: RC = PpE + (S.M.P):

WRC =	5097
MkRC =	1817
A RC =	576
WT / WRC =	0.71
MkT / MkRC =	1.19
AT /ARC =	0.79

Some conclusions are as follow:

- Taxes correspond to 41% of the MB and 35% is from foreign donations.
- In proportion to the total tax income (TsI), direct municipal taxes for services and usage (MT) correspond to only 28%, and imposed taxes (MiT) correspond to 62% (these taxes are transferred from national taxes).
- 49% of TsI correspond to the tax on sales and services.
- Outstanding debts reach to 33% of TsI.
- The waste & cleansing tax covers 71% of the relevant costs (RC) of the services.
- Market and abattoirs taxes cover 119% and 79% of the services respectively.

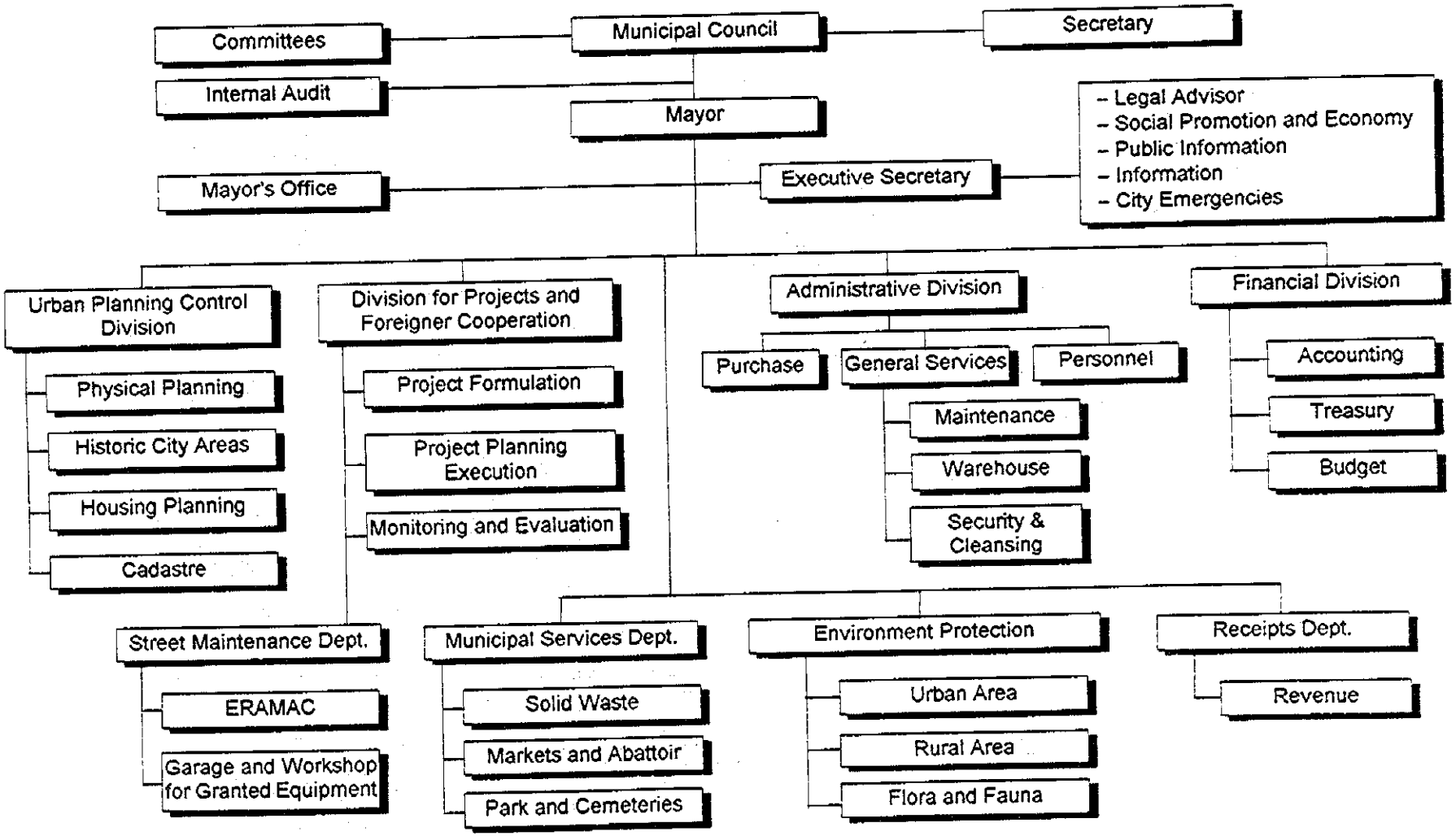
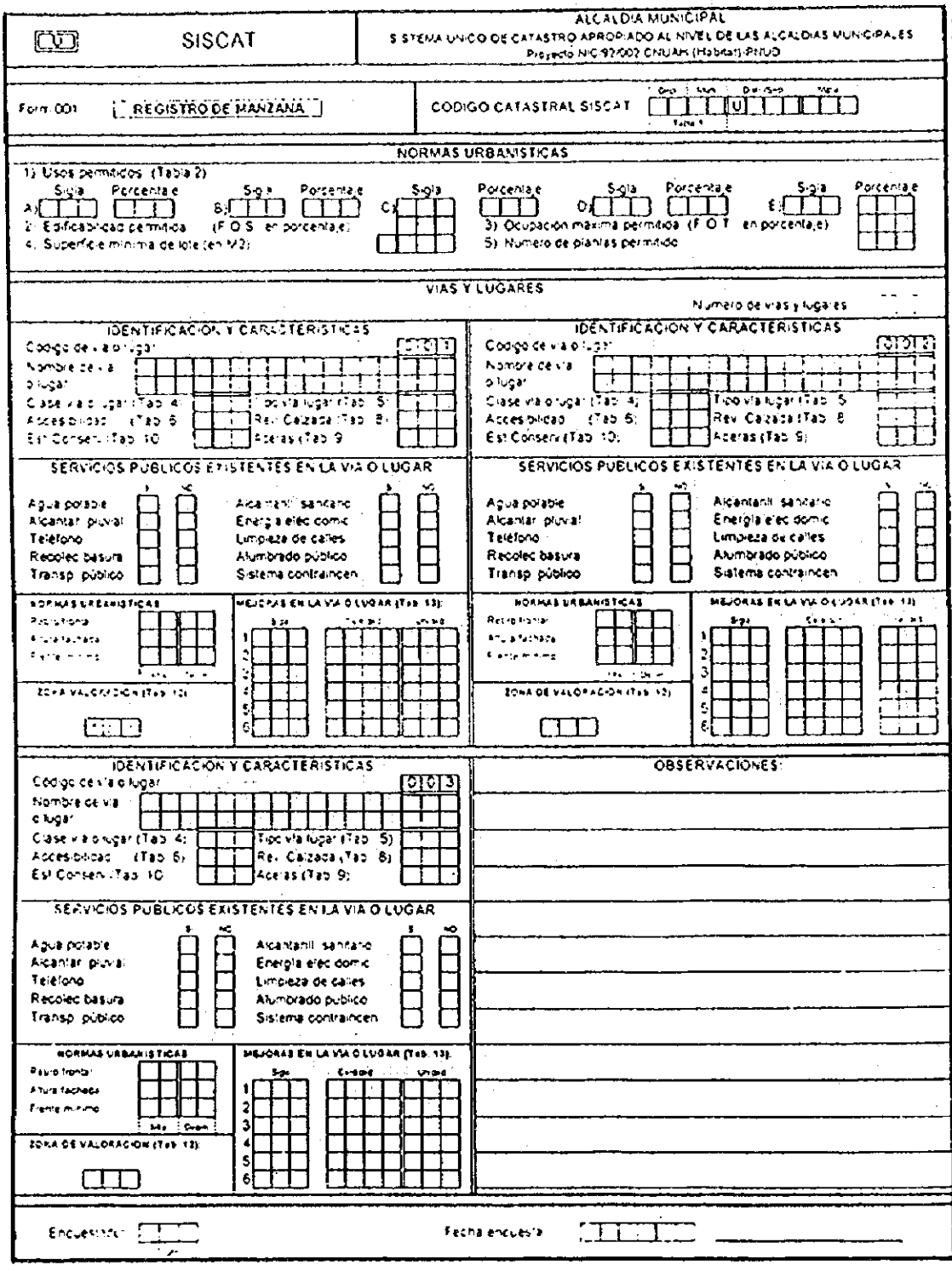


Figure B-14: Organization Chart of the Municipal Government of Leon

Form of SISCAT(1)



SISCAT

ALCALDIA MUNICIPAL
SISTEMA UNICO DE CATASTRO APROPIADO AL NIVEL DE LAS ALCALDIAS MUNICIPALES
Proyecto NIC/92/002 CNUAH (Habitat)-PNUD

Form 001 REGISTRO DE MANZANA

CODIGO CATASTRAL SISCAT

NORMAS URBANISTICAS

1) Usos permitidos (Tabla 2)
Sigla / Porcentaje
A) B) C) D) E)
2) Edificabilidad permitida (F O S en porcentaje)
3) Ocupación maxima permitida (F O T en porcentaje)
4) Superficie minima de lote (en M2)
5) Numero de plantas permitido

VIAS Y LUGARES

Numero de vias y lugares

IDENTIFICACION Y CARACTERISTICAS
Codigo de via o lugar
Nombre de via o lugar
Clase via o lugar (Tab 4)
Tipo via lugar (Tab 5)
Accesibilidad (Tab 6)
Rev. Calzada (Tab 8)
Est. Conserv. (Tab 10)
Aceras (Tab 9)

SERVICIOS PUBLICOS EXISTENTES EN LA VIA O LUGAR
Agua potable
Alcantar. pluvial
Telefono
Recolec. basura
Transp. público
Alcantarill. sanitario
Energia elec. domic.
Limpieza de calles
Alumbrado público
Sistema contraincen.
S / NO

NORMAS URBANISTICAS
Retro frontal
Altura fachada
Frente minimo
Min / Obligat.

MEJORAS EN LA VIA O LUGAR (Tab 13)
Sigla / Cantidad / Unidad
1 2 3 4 5 6

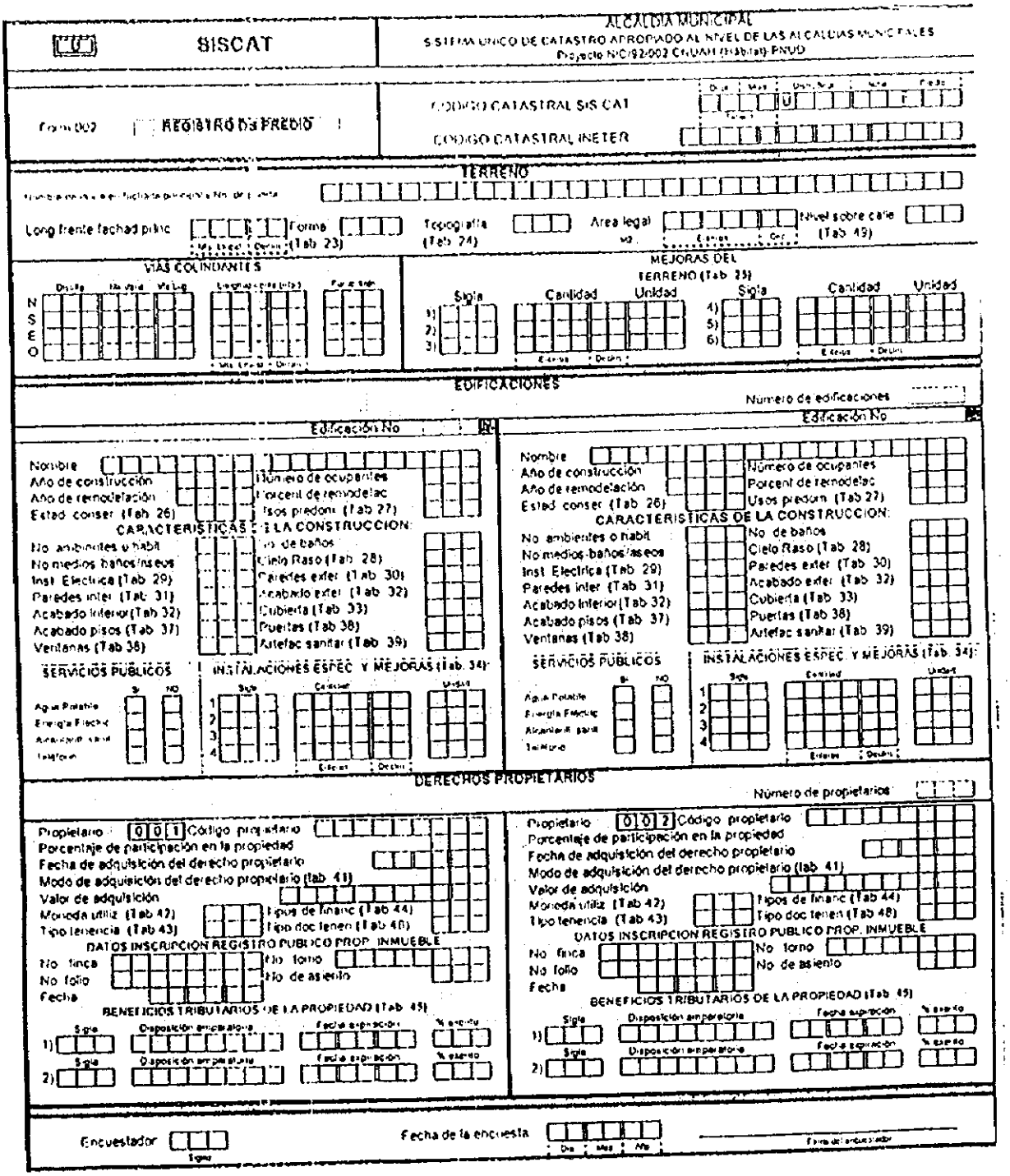
ZONA DE VALORACION (Tab 12)

OBSERVACIONES:

Encuestador

Fecha encuesta

Form of SISCAT(2)



Form of SISCAT(3)

U SISCAT	ALCALDIA MUNICIPAL SISTEMA UNICO DE CATASTRO APROPIADO AL NIVEL DE LAS ALCALDIAS MUNICIPALES Proyecto INC/92 CO2 CRUAA (Hospital) PNUD
Form (1): REGISTRO DE PROPIETARIO	CODIGO CATASTRAL SISCAT: Dpto / Mpio / Sector / Manzana / Predio (U) CODIGO CATASTRAL MUNER

PROPIETARIO

Numero de propietarios

Propietario No

Codigo del Propietario:

NOMBRE DEL PROPIETARIO: Apellido de casada (si corresponde), 1er. apellido, 2do. apellido, 1er. nombre, 2do. nombre, o Razon Social

Personeria (Tab 45) | Numero Cedula Identidad | Reg. Unico Contrib. (RUC)

APODERADO O REPRESENTANTE LEGAL DEL PROPIETARIO

NOMBRE DEL APODERADO: Apellido de casada (si corresponde), 1er. apellido, 2do. apellido, 1er. nombre, 2do. nombre, o Razon Social

Documento poder (tipo, numero, notaria, fecha)

DOMICILIO FISCAL

Direccion Tradicional

Municipio | Ciudad o poblado

Telefono | Fax | Apartado postal

BENEFICIOS TRIBUTARIOS DEL PROPIETARIO (Tabla 47)

Tipo	Descripcion del beneficio	Fecha expiracion (Dia / Mes / Año)	Porcentaje
1)			
2)			

OBSERVACIONES:

Encuestador | Fecha de la encuesta (Dia / Mes / Año) | Firma del encuestador

? 8 |

Form of SISCAT(4)

SISCAT

ALCALDIA MUNICIPAL:

Proyecto NIC/92/002 CNUAH (Habitat)-PNUD

Form 003 REGISTRO DE PROPIEDAD HORIZONTAL

CODIGO CATASTRAL SIS-CAT: Dept | Mun | U | Dist/Sect | Manzana | No Predio | No Edific

CODIGO CATASTRAL INETER: Tabla 1

UNIDAD DE PROPIEDAD HORIZONTAL

Número de propiedades de propiedad horizontal en la edificación:

Edificación No. | Edificación No.

Código unidad de propiedad horizontal:

Nombre

Bloque | Planta | Local

Año de construcción | Número de ocupantes

Año de remodelación | % Remodelación

Edo conserv (Tab 26) | Usos predom (Tab 27)

CARACTERISTICAS DE LA CONSTRUCCION:

No ambientes
No baños
No 1/2 baños
Acab int (ab 32)
Pisos (Tab 37)
Puertas(Tab 38)
Sanit (Tab 39)

INSTALAC.ESPEC. Y MEJOR.(Tab 34):

	Sigla	Cantidad	Unidad
1)	U		
2)			
3)			
4)			
5)			

DERECHOS PROPIETARIOS

Número de propietarios:

Propietario: 001 Código propietario

Porcentaje de participación en la propiedad

Fecha de adquisición del derecho propietario

Modo de adquisición del derecho propietario (tab 41)

Valor de adquisición

Moneda utiliz (Tab 42) | Tipos de financ (Tab 44)

Tipo tenencia (Tab 43) | Tipo doc tenen (Tab 45)

DATOS INSCRIPCION REGISTRO PUBLICO PROP. INMUEBLE

No finca | No tomo

No de folio | No de asiento

Fecha

BENEFICIOS TRIBUTARIOS DE LA PROPIEDAD (Tab. 45)

	Sigla	Disposic amparatoria	Fecha	Vigencia	%
1)					
2)					

Propietario: 002 Código propietario

Porcentaje de participación en la propiedad

Fecha de adquisición del derecho propietario

Modo de adquisición del derecho propietario (tab 41)

Valor de adquisición

Moneda utiliz (Tab 42) | Tipos de financ (Tab 44)

Tipo tenencia (Tab 43) | Tipo doc tenen (Tab 45)

DATOS INSCRIPCION REGISTRO PUBLICO PROP.INMUEBLE

No finca | No tomo

No de folio | No de asiento

Fecha

BENEFICIOS TRIBUTARIOS DE LA PROPIEDAD (Tab. 45)

	Sigla	Disposic amparatoria	Fecha	Vigencia	%
1)					
2)					

OBSERVACIONES:

Encuestador (Siglas) | Fecha de la encuesta (Día | Mes | Año) | Firma del encuestador

b. Community

Communities tend to be structured in levels, starting with individual premises at the bottom, then moving up to neighbors, districts, etc., and finally to the level of the official administrative ward (e.g., barrio, reparto, etc.).

Communication and/or cooperation between authorities and a community are normally exchanged at the level of the administrative ward (i.e., barrio, reparto, etc.). Community activities supported by authorities, such as community based education programs and health promotion, are normally extended by community volunteers (called brigadas or brigadistas). Some of these volunteers' activities in relation to public health are mentioned in the following sections.

c. Public Health

At the national level, it is reported that the following diseases and/or illnesses (morbidity and mortality, as indicated in the first column of the table below) affect the people most and thus need to be taken into consideration for the improvement of national public health conditions. The principal diseases (morbidity or mortality) in Leon Municipality recorded in 1993-1995 are shown in the table below.

Table B-20: Principal Diseases (Morbidity or Mortality)

	Morbidity or Mortality	1993	1994	1995
Acute Diarrhea	Morbidity	5,807	5,514	5,526
	Mortality	20	16	17
Acute Respiratory Infection	Morbidity	43,728	43,127	50,094
	Mortality	41	33	31
Cholera	Morbidity	257	119	269
	Mortality	1	0	1
Classic Dengue	Morbidity	1,171	2,561	961
	Mortality	0	0	0
Hemorrhagic Dengue	Morbidity	349	312	80
	Mortality	0	0	0
Malaria	Morbidity	2,477	2,468	6,000
	Mortality	0	0	1
Injury by Animal Bites	Morbidity	599	544	578
	Mortality	0	0	0
Maternal Death	Mortality	2	4	3
Neonatal Death	Mortality	55	66	35
Fetal Disease	Mortality	?	108	84

Source : MINSA

There are 2 public and 3 private hospitals, 11 health centers (centro de salud) and 55 health posts (puesto de salud) throughout Leon Department (Departamento). Medical institutions in Leon Municipality are shown in the table below in comparison to those in Leon Department.

Table 8-21: Medical Institutions in Leon

	Unit	Leon Department	Leon Municipality
Public hospitals	No.	2	2
Private hospitals	No.	3	1
Health centers with bed facilities	No.	8	0
Health centers without beds	No.	3	3
Health posts attended by medical doctors	No.	38	21
Health posts attended only by nurses	No.	17	8

Health centers can be divided into 2 types: one with inpatient facilities, the other only for outpatients. Health posts also can be categorized into 2 types: one visited by medical doctors, the other attended by nurses.

d. Public Health Education

d.1 Education Program by MINSA

Public health education in Leon is the responsibility of MINSA. Currently, MINSA is collaborating with the MED (Ministry of Education) in a pilot project called "Healthy School (Escuela Saludable)", which is directed to several primary schools in different sectors of the city. The project consists mainly of:

- Sanitary education training for primary school teachers.
- Formation of secondary student volunteer groups, who are trained in public health education to support the community;
- An education program for children, which teaches hygiene practices that they should be accustomed to.
- Field workshops of sanitary education in several parts of the city, held on Wednesdays and Thursdays.
- Radio announcements to provide information about vaccination and cleansing schedules.

d.2 Participation of Foreign Cooperation

With respect to foreign cooperation in sanitary education, the following information were obtained:

- The Pan-American Health Organization (OPS) finances training directed to medical professionals ;
- Kellogg's Foundation (USA) finances the UNI (A New Initiative) project: this project is more targeted to the higher education sector (i.e., the university level), specifically the medical, dental, and nursing schools. Furthermore the project includes provision of educational equipment and materials, and training.
- Another foreign cooperation scheme is with the Swedish Agency (ASDI). The project mainly supports SILAIS, since the work of SILAIS is basically oriented to

the municipalities and guiding them, especially providing information on sanitary education and support of epidemic controls.

d.3 NGOs in Public Health Education in Leon

Participation of NGOs (e.g., PRODE-MUJER and FUNCOD) in sanitary and environmental education is realized in some projects in Leon.

i. Development and Promotion of Women's Roles (PRODE-MUJER)

PRODE-MUJER has a compost production project, which is incorporated with a sanitary and environmental education program since September 1995. This work deals with market wastes and is coordinated with people from 4 barrios. Furthermore the project implements the following works.

- Training of the women in waste separation.
- Field workshops regarding the elimination of disease vectors, food preparation and protection, use and construction of lavatories, and contamination.
- In 1995 an agreement of having cleaning services 4 times in a six months was made and executed by PRODE-MUJER, the municipality and MINSA.

The compost project is financed by a foreign cooperation (UTRECHT-Holland).

ii. FUNCOD (Nicaraguan Foundation for Conservation and Development)

This foundation has an office (Oficina de Medio Ambiente) where sanitary education programs are extended. A foreign volunteer is working there.

Twenty three ecological volunteer teams (brigadas) in the schools (secondary and primary) have been formed and they work permanently in health promotion activities as well as, cleaning, protection and management of forest reserves.

e. Employment

"Statistics of socio-labor in Leon City" surveyed by the ministry of work (MITRAB) reported that the number of employees in Leon was 40,768 in 1994. From that data, the unemployment rate can be calculated as 10.3% (refer to Table B-22). The major economic activity is "social, community services", with 16,688 people involved, followed by "commerce, restaurant and hotel", with 11,312. The employees of these two major activities occupied about 70 percent of the total. The employees in the informal sector was 63 percent, involving 25,816 people, therefore the EAP seems considerably low.

The Institute of Nicaraguan Social Security and Welfare (INSSBI) reported the number of social security contributions, but it only covered 30 percent of the employees of the urban area, as many of them were employed outside of the urban area.

Table B-22: Number of Employees and Unemployment Rate in 1994

	EAP*	Employee	Unemployment Rate (%)	Reference INSSBI
Total	45,472	40,768	10.3	12,459
Primary Sector	1,736	1,512	12.9	1,123
Agriculture	1,736	1,512	12.9	1,123
Secondary Sector	9,408	8,344	11.3	1,872
Manufacturing	7,280	6,664	8.5	1,317
Construction	2,072	1,624	21.6	274
Mining	56	56	0.0	281
Tertiary Sector	34,328	30,912	10.0	9,464
Commercial, restaurant & hotel	11,816	11,312	4.3	41
Transport & Communication	2,296	2,072	9.8	799
Electricity, gas & water supply	392	336	14.3	124
Finance, security, property & service for enterprises	672	504	25.0	317
Social, community services	17,864	16,688	6.6	7,910
Non-specific activities	1,288	0	100.0	273

Note: * "EAP" = economically active population
Source: Estadisticas Sociolaborales de la Ciudad de Leon 1995, ITRAB
Anuario Estadistico 1994, INSSBI

f. Income Level

"Department of Leon" edited by INAA reported that the average monthly income per household in Leon was C$961 in 1994. The above mentioned survey by MITRAB reported that 30.5% of households had a monthly income of less than C$500.

INSSBI reported that the average weekly salary was C$249.02, which is equivalent to 74 percent of the average national income (C$336.50). Bearing in mind that in 1993 the figure was 84 percent nationally, the gap in income level in comparison to the rest of the country seems to have increased. Comparing the average income by economic activity, the salary of unspecified activities and that of electricity, gas and water supply is very low (refer to Table B-23) .

Table B-23: Average Salary (Weekly)

Unit : C$

	1991	1993	1995	ratio to whole country (%)
Total	141.27	244.26	249.02	74.0
Primary Sector	93.15	145.28		
Agriculture	93.15	145.28	170.34	70.4
Secondary Sector	184.6	290.06		
Manufacturing	198	295.38	345.5	92.9
Construction	158.99	297.61	321.86	98.2
Mining	100.61	123.6	424.41	97.9
Tertiary Sector	143.9	238.09		
Commercial, restaurant & hotel	154.78	224.33	219.59	52.4
Transport & Communication	234.32	337.6	356.75	69.4
Electricity, gas & water supply	277.56	158.65	239.75	43.6
Finance, security, property & service for enterprises	176.39	368.82	356.49	58.7
Social ,community services	130.23	241.23	223.71	85.4
Non-specific activities	147.84	301.51	280.97	30.0
Total in Nicaragua	168.96	291.49		

Source : Anuario Estadistico 1991,1993,1995, INSSBI

B.2.4 Population of Leon

a. Demography

This section deals with the demographic characteristics in the urban area of Leon, based on the 1995 Population and Housing Census. The variables examined here include: population size, household size and population distribution.

b. Nicaragua's Population and Growth Rate

Nicaragua covers an area of 130,668 km² (121,428 km² land and 9,240 km² water area). It has an estimated population of 4.4 million based on the 1995 figures of the National Institute of Statistics and Census (INEC).

The country has an annual growth rate of 3.37% and a population density of 36 persons/km^2. The urban population makes up 54% of Nicaragua's total population due to migration of rural residents to Managua and other important cities.

The country is ethnically diverse and the majority of the population is made up of mestizos of Indian and Spanish descent. Like other developing countries, Nicaragua has a high birth rate and a gradually declining mortality rate. Regardless of a high population growth rate, the population density (36 persons/km²) of the nation is lower than most Latin American countries.

The country is divided into 16 Departments. Table B-24 shows the population distribution by department based on the national census taken by INEC in 1971 and 1995.

According to the table, the population of Nicaragua soared from 1.9 million in 1975 to 4.4 million in 1995, showing a 2.32% increase and a 3.37% average annual growth rate.

The greater part of the country's population, 57% (1995 estimate), is concentrated in the Pacific region, which is the most urbanized and economically developed region in the country. The central zone, which is reported to have the highest annual growth rate, makes up 31% of the national population, while the Atlantic zone only covers 12%.

Table B-24: Population of Nicaragua

Country / Department	Population		Growth Rate (%)
	1971	1995	95/71
Country	**1,877,952**	**4,357,099**	**3.37**
Chinandega	155,286	350,212	3.45
Leon	166,820	336,894	2.97
Managua	485,850	1,093,760	3.44
Masaya	92,152	241,354	4.09
Granada	71,102	155,683	3.32
Carazo	71,134	149,407	3.14
Rivas	74,129	140,432	2.70
Chontales	68,802	144,635	3.14
Boaco	69,187	136,949	2.89
Matagalpa	168,139	383,776	3.50
Jinotega	90,640	257,933	4.45
Esteli	79,164	174,894	3.36
Madriz	53,423	107,567	2.96
Nueva Segovia	65,784	148,492	3.45
Rio San Juan	20,832	70,143	5.19
Zelaya (1)	145,508	464,968	4.96
R.A.A.N.		192,716	
R.A.A.S.		272,252	

Note : 1971 and 1995 Census (INEC)

c. Population by Municipality in Leon Department

With a population of 336,894 (INEC 1995 final census data), the department of Leon represents 7.7% of the country's total population. Occupying a land area of 5,107 km², it has a population density of 66 persons/km². The department is made up of 10 municipalities: Leon, Quezalguaque, Telica, Larreynaga, El Sauce, Achuapa, Santa Rosa del Peñón, El Jicaral, La Paz Centro and Nagarote.

Forty eight percent of the department's population is focused in the municipality of Leon, which is inhabited by 161,530 people. The municipality of Leon is the most populated municipality in the department and its population is higher than that of the municipalities of Chinandega and Granada. The population distribution and growth rates by municipality in Leon Department according to the 1971 and 1995 census are shown in Table B-25.

Table B-25: Population and Growth Rate by Municipality in Leon Department

Municipality	1971			1995			Growth Rates		
	Total	Urban	Rural	Total	Urban	Rural	71/95 (T)	71/95 (U)	71/95 (R)
1. Leon	75,584	54,841	20,743	161,530	123,865	37,665	3.21	3.45	2.52
2. Achuapa	9,589	1,349	8,240	13,186	2,345	10,841	1.34	2.33	1.15
3. El Jicaral	3,090	434	2,656	10,036	566	9,470	5.03	1.11	5.44
4. Larreynaga	17,375	4,183	13,192	29,798	5,476	24,323	2.27	1.13	-
5. Nagarote	12,699	7,250	5,449	29,200	19,646	9,554	3.53	4.24	2.37
6. La Paz Centro	13,308	6,622	6,686	27,509	17,299	10,210	3.07	4.08	1.78
7. Quezalguaque	3,506	364	3,142	7,754	981	6,773	3.36	4.22	3.25
8. El Sauce	12,869	3,246	9,623	25,973	7,052	18,921	2.97	3.29	2.86
9. San Nicolas *	3,413	198	3,215						
10. S.R.del Penon	4,530	509	4,021	9,129	2,070	7,059	2.96	6.02	2.37
11. Telica	10,857	2,338	8,519	22,779	6,221	16,558	3.14	4.16	2.81
Total	166,820	81,334	85,486	336,894	185,520	151,374	2.97	3.50	2.41

Source : 1995 Population Census Data (INEC)

d. Population of the Urban Area of Leon Municipality

With 123,865 inhabitants in a land area of 19.09 km^2, the urban area of Leon Municipality has a population density of 6,488 persons/km^2, as shown in Table B-26.

Table B-26: Urban and Rural Area Population of Leon Municipality

Leon	Area (km^2)	Population (1971)	Population (1995)	Population Density (p/km^2)	Growth Rate (1971/1995)
Urban Area	19.09	54,841	123,865	6,488	3.45
Rural Area	800.91	20,743	37,665	47	2.52
Total	820.00	75,584	161,530	197	3.21

Source : Population data (INEC); Growth rates estimated by the Study Team

The above 1995 population census placed the total population of the municipality of Leon at 161,530 people. The table above also indicates that the urban area of Leon covers 76.7% of the total municipal population.

d.1 Household

With an annual growth rate of 3.45%, the 1995 population of the urban area has increased by 69,024 people and by about 15,740 households, from the 1971 figures.

Occupying an area of 19.09 km^2, the urban area was estimated in 1995 to have 21,906 households and an average household size of 5.7 persons per household, as shown in the table below.

Table B-27: Urban Area of Leon: Population and Household

Leon	Area (km^2)	Urban Population	Number of Households	Person per Household
Urban Area	19.09	123,865	21,906	5.7

Source : 1995 Population Census Data (INEC)

d.2 Population Composition and Division by Zone

Zones categorized by income in the urban area of Leon are illustrated in Table B-28, and each zone is divided as follows:

- *barrios* (towns)
- Residential areas
- *Repartos*
- Progressive urban areas
- Spontaneous settlements

Most of the *barrios* and residential areas are provided with the necessary public services, such as drinking water, sewerage, and electricity. However, repartos and progressive urban areas, arising from the subdivision of lots by the municipality to offset housing shortage problems, are not equipped with any of these utilities.

Foreign twin cities of Leon, however, are currently financing projects for the construction or installation of such facilities.

On the other hand, the provision of such services for spontaneous settlements would first necessitate the legalization of the housing situation in these areas, an issue that is currently a major concern of the municipal government. At present, the municipal technical committee is conducting studies on this situation.

The number of households and population density based on the municipal government of Leon (MGL) and INEC data are shown in the table below:

Table B-28: Urban Area of Leon : Number of Households and Population Density by Zone

Zone	Area (ha)	Population in 1993 (MGL)	Population in 1995 (INEC)	Households	Density (INEC) (p/ha)
Zone 1	415.1	35,351	26,391	4,630	63.6
Zone 2	477.9	62,955	51,049	8,956	106.8
Zone 3	425.6	56,235	42,648	7,482	100.2
Other	590.4	-	3,777	838	6.4
Total	1,909.0	154,541	123,865	21,906	64.9

Source : Population (1993), Municipal Government of Leon
Total population (1995), INEC
Population by zones, estimated by the Study Team

There is a significant difference between the INEC population data and the population data obtained from the municipal government of Leon (MGL). This study decided to use the INEC data. However, only data on the total population was available. To calculate the population of the zones it was, therefore, necessary to use the zonal population percentages of the MGL data. Based on this estimation, the average population density in Leon was calculated at 64.9 persons/hectare.

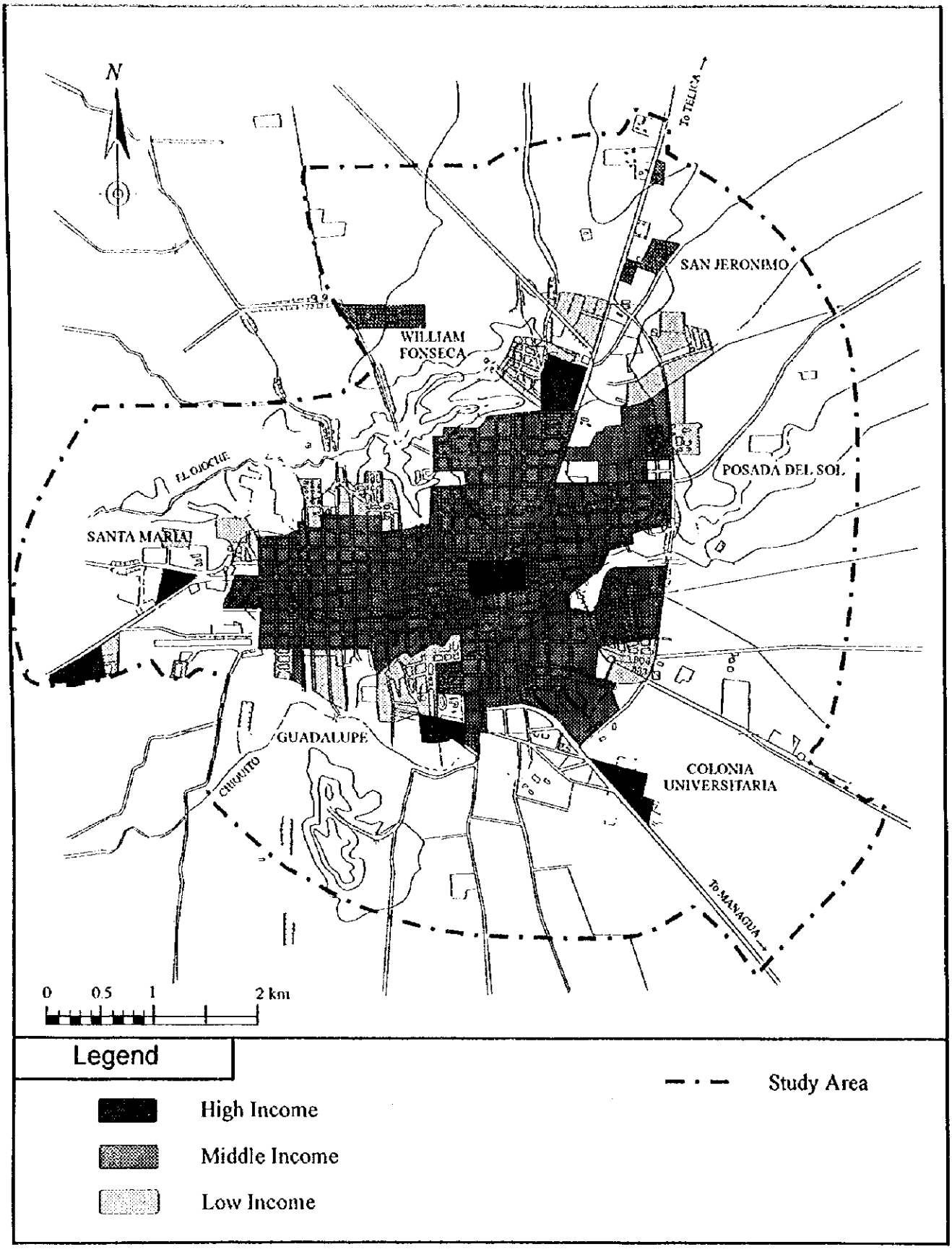


Figure B-15: Zones Categorized by Income in Leon