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THE MASTER PLAN STUDY
ON
RURAL TELECOMMUNICATIONS NETWORK PROJECT
IN
THE REPUBLIC OF HONDURAS

MAIN REPORT

NOVEMBER 1992

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to a request from the Government of the Republic of Honduras, the Government of Japan decided to conduct a master plan study on the Rural Telecommunications Network Project and entrusted the study to Japan International Cooperation Agency (JICA).

JICA sent to Honduras a survey team headed by Mr.Kazushige KOMATSUZAKI, NTT International Corporation, twice between January 1992 and September 1992.

The team held discussions with officials concerned of the Government of Honduras, and conducted field surveys at the study area. After the team returned to Japan, further studies were made and the present report was prepared.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

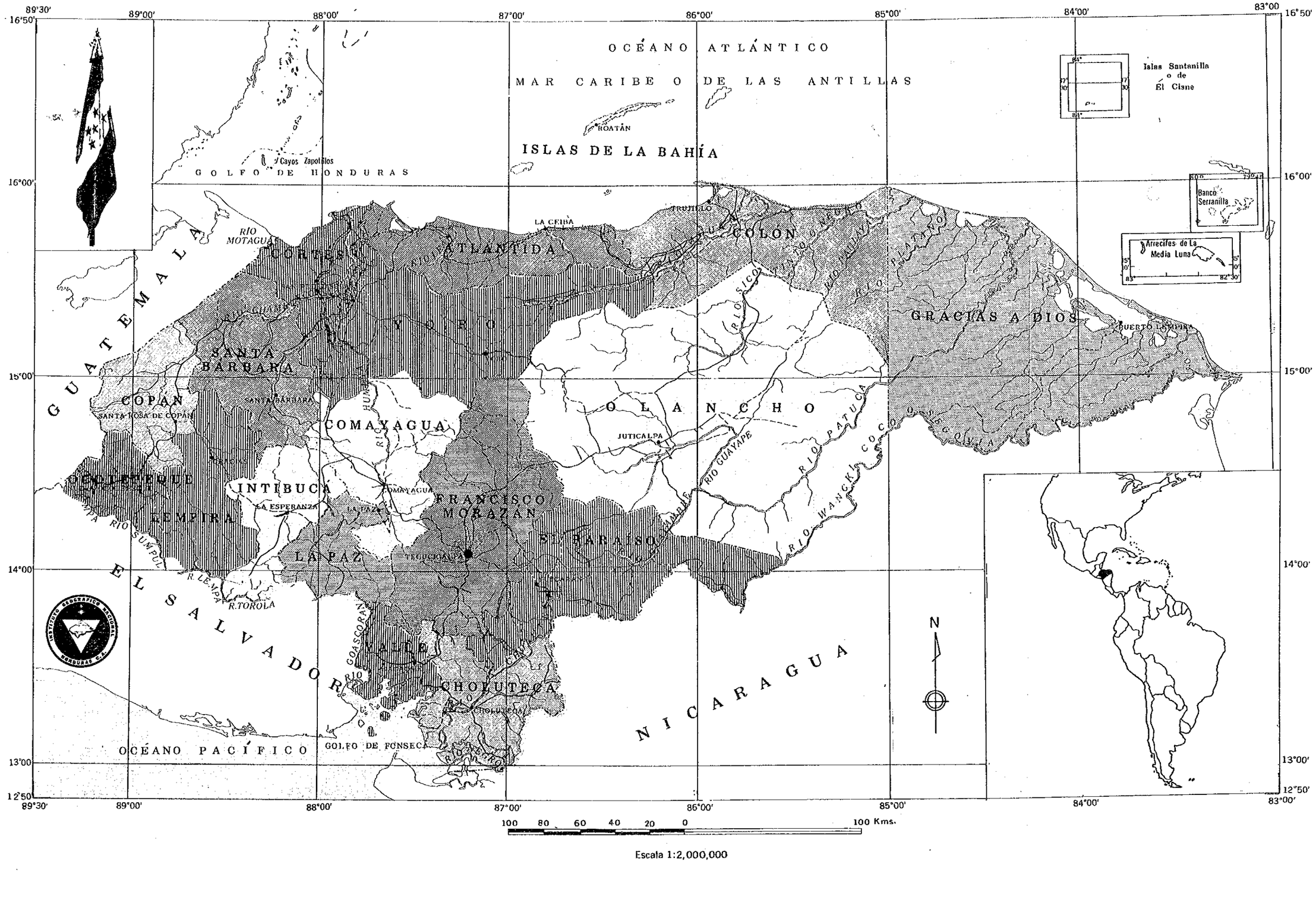
I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Honduras for their close cooperation extended to the team.

November 1992

Kensuke Yanagiya

Kensuke Yanagiya
President
Japan International Cooperation Agency

THE REPUBLIC OF HONDURAS



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CODE AND ABBREVIATIONS

1. Exchanges and radio stations

Code	Exchange & Radio Station
AGU	AGUA CALIENTE
CAT	CATACAMAS
CBA	LA CEIBA
CHL	CHOLAMA
CHO	CHOLUTECA
COM	COMAYAGUA
CRQ	CORQUIN
CSS	CENTRO SECUNDARIO SAN PEDRO SULA
CST	CENTRO SECUNDARIO TEGUCIGALPA
CUY	CUYAMEL
DAN	DANLI
FDP	SAN FRANCISCO DE LA PAZ
FLD	FLORIDA
FLE	LA FLECHA
GOA	GOASCORAN
GUA	GUANAJA
INT	INTERNACIONAL (INTERNATIONAL)
JOT	JESUS DE OTORO
JUT	JUTICALPA
LAN	LANGUE
LEM	LEMPIRA
LIM	LA LIMA
LLB	LA LIBERTAD
MIN	MINAS DE ORO
MIR	MIRAFLORES
MRZ	MORAZAN
NAC	NACAOME
NOC	NUEVA OCOTEPEQUE
NRJ	NARANJITO
OCO	NUEVA OCOTEPEQUE
OLA	OLANCHITO
ORI	OAK RIDGE
PAR	EL PARAISO
PAZ	LA PAZ
PCO	PUERTO CORTES
POT	POTRERILLOS
PRI	PRINCIPAL
PRO	EL PROGRESO
PRV	EL PORVENIR

Code	Exchange & Radio Station
PSP	PESPIRE
RIO	RIO LINDO
ROA	ROATAN
SBA	SANTA BARBARA
SBN	SABANAGRANDE
SCY	SANTA CRUZ DE YOJOA
SIG	SIGUATEPEQUE
SLO	SAN LORENZO
SMO	SAN MARCOS OCOTEPEQUE
SPS	SAN PEDRO SULA
SRC	SANTA ROSA DE COPAN
TAL	TALANGA
TAU	TAULABE
TEG	TEGUCIGALPA
TEL	TELA
TOC	TOCOA
TON	TONCONTIN
TRU	TRUJILLO
UTI	UTILA
VAL	VALLE DE ANGELES
VIL	VILLANUEVA
YOR	YORO
ZAM	EL ZAMORANO

2. Others

Abbreviation	Full spelling
COMTELCA	Comision Tecnica Regional de Telecomunicaciones
ITU	International Telecommunication Union
IADB	Inter-American Development Bank
IBRD	International Bank for Reconstruction and Development
IMF	International Monetary Fund
JICA	Japan International Cooperation Agency
USAID	US Agency for International Development
ENEE	Empresa Nacional de Energia Electrica
HONDUTEL	Empresa Hondurena de Telecomunicaciones
SANAA	Servicio Autonomo Nacional de Acueductos y Alcantarillados
SECOPT	Secretaria de Comunicaciones, Obras Publicas y Transporte
LE(LO)	Local Exchange (Local Office)
PC	Primary Center
SC	Secondary Center
M.D.C.	Municipio del Distrito Central
GNP	Gross National Product
GDP	Gross Domestic Product
erl.	Erlang
Lps.	Lempiras
p.a.	per annum
mn	million
N.A.	Not available

SUMMARY

1. BACKGROUND AND OBJECTIVE OF THE STUDY

1) Background of the Study

In Honduras, the total number of main telephone lines was 88,193 in 1990, with a penetration rate of 1.85 lines per 100 inhabitants. This rate is quite low compared with the average for Central America, which was 2.73 per 100 inhabitants. In rural areas, telephone and telegraph services are available at public telephone and telegraph-telephone service offices, but these facilities are not enough for the development of the rural community areas.

The state-owned enterprise responsible for telecommunications services in Honduras, Empresa Hondurena de Telecomunicaciones (hereinafter referred to as "HONDUTEL"), has made great efforts to expand telephone services in rural areas. However, HONDUTEL cannot afford to set up telephone services in rural areas because of technical and financial difficulties.

Under these circumstances, the Government of Honduras requested the Government of Japan to make a master plan for a rural telecommunications network offering automatic telephone service.

In response to this request, the Government of Japan decided to conduct a master plan study on the Rural Telecommunications Network Project and entrusted the study to Japan International Cooperation Agency (hereinafter referred to as "JICA"). JICA dispatched the preliminary study team to Honduras in April, 1991. As a consequence, the scope of work of the main study to follow was determined. Based on the agreement signed among the Ministry of Communications, Public Works and Transportation (Secretaria de Comunicaciones, Obras Publicas y Transporte, hereinafter referred to as "SECOPT"), HONDUTEL and JICA on April 17, 1991, JICA dispatched the Study Team to execute the Master Plan Study.

2) Objective of the Study

The objective of the Study is to formulate a master plan covering until the year 2002 for a rural telecommunications network offering automatic telephone service to 223 rural community areas.

2. OUTLINE OF THE REPUBLIC OF HONDURAS

1) Country Profile

Honduras is located almost in the middle of the Central American Isthmus. Total area is 112,088 square kilometers of which 65% is mountainous. The central and western parts of Honduras have mountain ranges each with an average elevation of 1,000-1,500 meters. The highest peak is 2,850 meters. Cultivation is limited to the plains of the coastal areas and the valleys.

2) Features of the Subject Areas

The features of 191 villages that the Study Team actually visited are as follows:

a) Most villages are isolated by mountains, rivers, and wilderness.

b) Villages in the northern part exist among banana or palm trees.

c) 49 villages do not have electricity service.

d) 191 villages do not have general telephone service.

e) 11 villages do not have water supply service.

f) 23 villages do not have postal service.

g) 169 villages have health centers.

h) 191 villages have elementary schools.

i) 124 villages have secondary schools.

j) Most houses are gathering at the area of one square kilometer of the center of each village.

k) The population of more than half villages is 1000-3000.

l) Service qualities of electricity and water supply are poor.

m) Access road conditions to the villages are bad.

n) Some rivers have no bridge.

o) Most of all people are engaged in the agricultural sector.

p) The scale of agriculture and stock-farming is very small.

q) Large scale agriculture and stock-farming can be seen only at plains.

3. PRESENT STATE OF TELECOMMUNICATIONS IN HONDURAS

All telecommunications services are offered by HONDUTEL except the paging service, which is offered by two companies in the private sector.

1) Telephone Service

The general subscriber telephone service is offered by automatic or manual telephone system. The 99% of the service is offered by automatic telephone system.

a) Number of main lines (1991)

Automatic	91,666
Manual	720

b) Telephone penetration rate (1991)

1.88 (Main lines/100 inhabitants)

c) Number of public coin telephones(1991)

320 (Total of 16 cities)

d) Telephone waiting applicants (Registered in 1991)

42,211 (Applicants)

2) Telecommunications Service in Rural Areas

Rural telecommunications service is offered through service office of HONDUTEL located throughout the country.

a) Number of HONDUTEL service offices (1991)

Telegram service office	200
Telegram & Telephone service office	152
Telephone service office	47
Radio service office	21
Total	420

b) Telephone density (1991)

0.02 (Lines/100 inhabitants)

c) Average number of telephone calls handled (1991)

132 (Calls/month)

d) Average telephone holding time (1991)

4 (Minutes/call)

e) Average telephone charge (1991)

4 (Lempiras/call)

The public telephone service is seldom offered by automatic telephone service, but mostly by manual telephone service. Those telephone sets are a magnetic type and connected to a manual switch board as far away as 20km or more.

The speech quality is very poor, noisy and faint, and interrupted occasionally during conversation.

3) Present State of Telecommunications Facility

a) Local exchange (1991)

Type of Exchange	Number of Exchanges	Installed Capacity	Lines in Service
Step by step	1	10,000	5,055
Crosspoint	12	3,648	3,487
Crossbar	16	20,900	15,403
Semi-electric	2	28,000	27,698
Digital	5	48,712	40,023
Digital(Satellite)	6	4,708	0
Manual	8	720	720
Total	50	116,688	92,386

b) Transit exchange (1991)

Type of Exchange	Number of Exchanges	Installed Capacity	Lines in Service
Digital	1	1,920	–
Crossbar	2	2,000	–
Total	3	3,920	–

4. DEMAND FORECAST

1) Method of Estimation

All the subject areas are located in rural areas and have similar socio-economic conditions such as population distribution and product per capita, even with some differences in the industrial and geographical conditions. Therefore, the sampling method for a field survey study will be applied to the Study for demand forecast.

2) Macroscopic Demand Forecast

In general, there is a correlation between telephone density in the metropolitan areas, the rural areas, and GDP per capita. The demand rate in the rural areas is approximately 1/10 to 1/20 of the demand rate in the metropolitan areas. Since the demand in metropolitan areas of Honduras was estimated to be 13.49 lines per 100 inhabitants in the year 1992, the demand in the rural areas was estimated from 0.7 to 1.4 lines per 100 inhabitants. For the demand forecast, the chronological model is extrapolated.

3) Microscopic Demand Forecast

a) Field survey

During Work in Honduras-1, the Study Team visited 191 of the total 223 subject areas with the HONDUTEL counterparts.

Not only the subject areas but also Departmental offices, Municipal offices and HONDUTEL's offices were visited. Many kinds of information for demand estimation were collected, such as development plans, population, condition of public services, socio-relationship with the nearest main city, official organizational activities, household goods, and present telecommunications services.

Further, the Study Team interviewed users, Departmental and Municipal officials and telephone operators with a questionnaire about telephone service and regional circumstances.

b) Telephone demand in total subject area

Telephone demand in 191 survey areas was estimated using the results of the field survey.

Telephone demand in 32 non-survey areas was estimated using the model equations with the data collected from the Central government, Departmental and Municipal governments, and HONDUTEL's head office.

c) Telephone demand in the future

Telephone demand up to the year 2002 was forecast based on the demand in 1992, considering the future population and penetration rate.

At present, automatic telephone service is not available in most of the subject areas. The demand is not likely to increase rapidly for some years to come. Once the telephone service starts, however, people will understand the benefit of telephones and develop the habit of using them frequently. Then the demand will start to rise rapidly, just as in the urban areas.

The result of the forecast for the total subject areas shows that the total demand in 2002 will be 12,090.

	Unit	1992	1994	1996	1998	2000	2002
Population	10^3	508.8	544.1	582.6	624.5	670.4	729.5
Demand	Lines	6,077	6,512	6,978	8,023	9,837	12,090
Demand rate	%	1.19	1.20	1.20	1.28	1.47	1.66

5. TRAFFIC FORECAST

1) Base of Traffic Forecast

It is preferred to forecast the rural telephone traffic in the future based on factors given through analysis of existing data, though these data are not available in a classified form in many cases. The raw data are then collected to estimate the factors.

In this Study, reliable raw data in the form of communications tickets for the rural public telephones and telegrams were obtained in addition to the partial statistic data for the telephone exchanges in the urban network. Useful statistics for the rural network traffic were not obtained.

2) Traffic on the Existing Network

a) Rural public telephone traffic

Rural public telephones are located at about 200 HONDUTEL offices throughout the country. Complete communication tickets for the five public telephone offices were obtained.

Through analysis of the communication tickets of the five offices, it was found that the day with highest traffic was Thursday, and about 19% of one-day traffic was concentrated in the hour starting from 8:00 in the morning. The average calling rate of busiest traffic hour of those public telephones was calculated to be 0.049 erlangs per line.

An analysis result of the traffic data of Tegucigalpa manual boards indicated that the calls to M.D.C. accounted for 89% of the total, while those to other communities in Francisco Morazán Department accounted for 3% with the other 8% going out of the Department. Similar tendencies will be found in San Pedro Sula and La Ceiba.

b) Telegram traffic

Telegram service is offered at about 350 HONDUTEL offices located in the country. About 50 completed telegram forms were collected from each of ten HONDUTEL offices.

According to the analysis results, on average, those directed to destinations within its own Department accounted for 19.4%, those to Francisco Morazán, where the capital is located, accounted for 23.44%, those to Cortes, where San Pedro Sula, the second largest city of Honduras is located, accounted for 13.3% of a total, and the rest were directed to different points in the country.

c) Automatic telephones in the urban telecommunications network

Urban telephone traffic data was collected for the purpose of finding a tendency in the calling rate of subscriber telephones. The calling rate of selected exchanges in 1990 and 1992 is as follows:

Exchange	Year		Exchange	Year	
	1990	1991		1990	1991
PRI-II	0.86	0.13	CHO	0.07	0.07
MIR	0.26	0.10	COM	0.05	0.07
TON	—	0.07	SIG	0.03	0.06
DAN	0.03	0.06	PAR	—	0.02
JUT	0.06	0.07	PAZ	—	0.02
CAT	0.08	0.07	SLO	—	0.02

Source: Presented by HONDUTEL for this Study.

3) Traffic Estimation Factors

a) Calling rate

The average calling rate of busiest one hour of rural public telephones to be introduced in the rural telecommunications network was settled to be 0.10 erlangs per line in total and that of general subscriber telephones to be 0.05 erlangs per line in total, by referring to CCITT GAS-6 and in reference to the collected data analysis results.

b) Percentages of traffic categories

Using the case of the smallest exchange of the exchange model of CCITT GAS-6, 25% of the total origination traffic was applied to the traffic terminating in its own community area.

For the Departments other than Francisco Morazán, the traffic going to its Department capital, to other communities in the same Department, and going out of the Department were determined, by to be 6%, 13%, and 81%, respectively, of outgoing traffic. For Francisco Morazán Department, they were determined, to be 89%, 3%, and 8%, respectively, of outgoing traffic.

c) Holding time

HONDUTEL's average measured holding time is as follows. Those values should be referred to in making a system design.

- Local call: 180 seconds
- Toll call: 264 seconds
- International call: 306 seconds

6. BASIC TELECOMMUNICATIONS NETWORK PLAN

1) General

The new national telecommunications network will be developed as one which incorporates the rural telecommunications network in it. In other words, the rural telecommunications network will be added to the national telecommunications network as parts to develop the latter, being structured compatible technically with the existing national telecommunications network.

2) Structure of National Telecommunications Network

The existing national telecommunications network places the national center (the international switch) at the top of the network hierarchy. Secondary centers, primary centers, and local exchanges are placed under the national center to form a pyramid shape.

3) Routing Plan

a) Existing routing plan

Honduran switching stages are structured into hierarchy levels of the national center, secondary center, primary center, and local exchange. All the exchanges

are classified into one of these levels and connected to the other exchange by means of inter-exchange circuits.

b) Future routing plan

HONDUTEL has an expansion plan for 1992-1996 which aims to introduce digital local exchanges (LE) and transit exchanges to make a modern national telecommunications network. In keeping with the digital exchange introduction, No. 7 Common Channel Signaling System will be introduced for linking the digital exchanges.

All the subject rural communities will be incorporated into the national telecommunications network.

4) Exchange Location Plan

a) Local exchange

The existing location plan of exchanges was used in this Plan without modification.

The service area or subscriber lines of a local telephone exchange can be extended, from a technical point of view. Therefore, existing local telephone exchange service area should be extended up to this limit when connecting rural area subscribers around the exchange.

The telephone exchanges in rural telecommunications network should be located in adequate places in accordance with demand forecast and taking into consideration the economical provision of service.

b) Toll exchange

The primary centers are now located in Tegucigalpa, San Pedro Sula, La Ceiba, Choluteca, and Comayagua.

5) Numbering Plan

Telephone exchange codes or the toll codes were assigned in accordance with the following principles.

- Exchange codes are assigned, in succession to the existing numbering plan, not to bring about substantial change in the existing assignment of the codes.

- In principle, exchange codes are assigned in a pyramid-shaped structure, i.e., the first digit represents the zone in the numbering plan, the second represents the Department, and the third and the fourth represent the Municipality.
- Codes and numbers are assigned to the Municipality or a group of Municipalities as a unit of area for charging.

The national telephone number consists of six digits. The prefix code for an international call is "00", while the discrimination code for a toll call is not used in the existing telecommunications network. Accordingly, all local and toll calls are connected using 6-digit dialing.

The numbering capacity for subscribers with the existing numbering plan is 800,000 terminals.

The telephone number in the rural telecommunications network was assigned in the same way as the existing subscribers in the urban telecommunications network, using six-digit numbering.

6) Signaling Plan

The existing signaling system should be kept in accordance with the principles stated in Section 6.1. Interexchange signaling systems now in use in Honduras are R2(D), R2(A), DC/MFC, and DC/DP for domestic channels, and R2(D) and System No. 5 for international channels.

For the section to be introduced in relation to this Plan, as a rule, the signaling system R2(D) will be applied. However, if the counterexchange is not equipped with this function, a signaling system equipped for the counterexchange will be applied.

7) Charging Plan

The existing charging method should be kept and the switching equipment should be programmed in accordance with specified requirement when introducing actually.

The rural telecommunications network subscribers should be charged in the same way as that effective now in the urban telecommunications network in order to

maintain a unified charging system in the country. That is, the call should be charged in such way that the local call is charged in accordance with its duration, the toll call in accordance with its duration and distance, the international call in accordance with its duration and destination. The toll call and the international call should be charged by the method having a bill of detailed call information.

8) Engineering Standard

a) Connection loss probability

The connection loss probability now applied to the existing urban telecommunications network should be kept.

b) Transmission loss assignment

The transmission loss assignment now applied to the existing telecommunications network should be kept. The standard transmission loss is 23 dB for digital-to-digital connection and 30 dB for analog-to-analog connection. However, it is proposed, for structuring an economical network, that the same transmission loss as analog-to-analog connection presently effective or 30 dB be allowed for rural subscriber connection even if the rural subscriber is connected to a digital exchange.

9) Network Synchronization Plan

The base of the existing synchronization plan will be kept without change. The exchanges to be introduced in the rural telecommunications network will be distributed clock pulses from PC in the existing national telecommunications network.

7. RURAL TELECOMMUNICATIONS NETWORK PLAN

1) Basic Policy of Plan Making

a) Base of design

The rural telecommunications network was designed based on the principles of HONDUTEL, which intended to establish a network mainly by means of digital radio technology.

In addition to this, the initial cost and the operating cost were to kept as low as possible.

b) Target of rural telecommunications network plan

This Plan aims to provide 12,090 telephone lines, which was the result of the telephone demand forecast for the year 2002 performed on the subject communities, based on the information obtained by the field survey in Honduras. The telephone density will increase to 1.66 main lines per 100 inhabitants, when the 12,090 telephones are provided.

c) Services to offer

This Plan aims to offer the automatic subscriber dial telephone service in the subject areas. The public telephone service is assumed to be realized with operator assistance by means of the general telephone line.

d) Term of the Plan

This Plan aims to design the facilities of a telecommunications network that will satisfy telephone demand in the year 2002.

e) Consideration for present facilities

For planning an economical rural telecommunications network, land and facilities owned by of HONDUTEL were used as much as possible.

This Plan was made up in conjunction with and assumption of the expansion plans of HONDUTEL, which aims to bring the installed capacity to 241,000 in the three major cities and 62,200 in other important cities.

f) Facilities for the rural telecommunications network

i) Exchange

The exchanges to be introduced in the rural telecommunications network should have functions to offer same services as available to urban telecommunications network subscribers.

In consideration of flexibility of replacement or transfer which may be caused by incresing demand in the future, the exchanges to be introduced in the rural telecommunications network in the future should be the digital, independent, and portable (or container) type.

ii) Inter-exchange transmission systems

The inter-exchange transmission system to be introduced in this Plan should be a digital system for consistency with the digital exchanges. The transmission system between exchanges can be generally provided by cable transmission technology or by radio transmission technology.

A cost comprison was made on those two technologies and the optical fiber cable transmission system was found more advantageous.

iii) Subscriber line extension system

The subscriber line extension technology is used for a section where the ordinary metallic cable system cannot be applied because of distance conditions. The metallic cable system should be used in as many cases as possible if the engineering standards are satisfied.

The subscriber line extention technology includes 1) digital radio multi-access system (DMAS), 2) digital subscriber cable system (DSCS), 3) single channel system, and 4) satellite system. Through technical study in relation to the demand density, it was found that DMAS and DSCS were most adequate among them. Then a cost comprison was made and DMAS was found more economical than DSCS in the forecast demand and topograghic conditions of the subject rural areas.

iv) Combination of applicable technologies

Another way for accommodating rural subscribers to the national telecommunications network, involves installing an exchange in the service area, in place of providing subscriber line extension systems, DMAS for example, which was discussed previously.

In the case of DMAS, however applicable frequencies are limited and this in turn limits the margin for the future expansion of the system. Consequently, it is better to introduce a telephone exchange in an area with telephone demand higher than a certain level. The comparison result indicated that the introduction of exchange would be advantageous if the demand was 200 or more.

v) Outside plant

– Facilities of inter-exchange circuits

The optical fiber cable transmission system was found to be advantageous in the preceding comparison of inter-exchange transmission systems. Since non-gas single mode type cables are widely used in establishing the inter-exchange circuits, they are chosen in this Plan. The cables will be laid overhead by means of poles.

– Facilities of subscriber line

Color corded polyethelene (CCP) cables are widely used for local networks to reach subscriber terminals and thus the CCP cable should be chosen in this Plan. In areas with higher possibility of lighting damage, aluminium polyethelene sheathed (ALPES) cables are preferred. The cable will be laid overhead by means of poles.

vi) Power equipment

– Power equipment for exchange

The power system for exchanges should run by commercial power. The power system consists of power receiving equipment, a generator, rectifier, and batteries.

– Power equipment for transmission

The power system consists of power receiving equipment, rectifier, and batteries. Normally, commercial power should be applied. A generator or a solar cell system will be applied in the case where the commercial power is not available. The solar cell system will be chosen when the power consumption is not great, in other cases the generator will be applied.

g) Application to the rural telecommunications system

In accordance with the previous study results, the Plan was designed based on the policies stated below.

– The rural telecommunications network should be established using a digital multi-access system.

- Subscribers in a rural community should be connected by metallic cable pairs if the community is located within a technical acceptable distance from an exchange and/or radio terminal station.
- An exchange should be introduced if the forecast demand is 200 or more in the year 2002.
- The new rural exchange should be connected to the existing national telecommunications network by means of optical fiber cables.

2) Rural Telecommunications Network Plan

a) Principles of designing the network

The principles for designing the rural telecommunications network are as follows:

- The existing and/or planned facilities in the existing national telecommunications network should be used where possible.
- The rural telecommunications network should be designed in harmony with the expansion plans of HONDUTEL.
- The system should be free from foreseen problems, especially those on charging.
- The rural telecommunications network should be flexibile to allow evolution in the future.

b) Preparation of alternative plans

i) Plan 1

The country is divided into two parts. The rural subscriber lines are connected to the existing digital exchanges, or to new digital exchanges to be introduced for rural telecommunications service, in Tegucigalpa and San Pedro Sula.

ii) Plan 2

Each of the rural subscriber lines is connected to the nearest exchange.

iii) Plan 3

Rural subscriber lines are, in principle, connected to the digital exchanges in the cities where the primary center is located. If a digital exchange is located at a nearest place than those exchanges, the rural subscribers are connected to it.

c) Comparison of the plans

Comparing these three plans, Plan 3 is generally the best for building the rural telecommunications network because the lack of charging problems is very important.

d) Basic network structure

The rural exchanges are planned to be introduced in accordance with the principles stated in the application of technology and the results of comparing the three plans.

The constitution of the rural network was designed based on the Study resuls of the applicable technology and the comparison of the three plans.

8. FACILITIES PLAN

1) Basic Policy of the Facilities Plan

a) Subject of the facilities plan

The subject facilities are those necessary to offer the telephone service to the 223 subject communities in the rural areas.

b) Use of existing facilities

Existing facilities were used as much as possible to make up the rural telecommunications network.

c) Capacity of facilities

The capacity of the facilities to be introduced in Phase-I was designed to meet the forecast demand in the year 2002. For the facilities to be introduced in Phase-II, a certain amount of capacity margin was included.

d) Consideration for new services in the future

The exchange and transmission systems to be introduced by this Plan were designed with digital technology for possible incorporation in an ISDN system in the future.

2) Facilities Plan

a) Subscriber line extension system

It was decided that the DMAS system be used for the subscriber line extension system. A total telephone demand of 6,786 in the year 2002 in 178 areas was designed to be accommodated using a total of 13 systems.

13 radio base stations, 41 repeater stations, and 171 terminal stations will be provided by this Plan.

b) Exchange and power equipment

Eighteen (18) telephone exchanges were counted according to the rural communities connection plan. The work volume is as follows:

	Exchange	Lines	Switching equipment	Power equipment	Building equipment	Land (container)
Total	18	4,900	18	18	18	18

c) Inter-exchange circuit transmission equipment

The inter-exchange circuit transmission equipment is designed by using the optical fiber transmission system. The number of sections to be provided by this Plan is 18.

d) Outside plant

i) Inter-exchange circuits line facilities

Optical fiber cable of the non-gas system, single mode (SM) type, should be used. An aerial type line should be used. The work volume is as follows:

- Optical fiber cables 2,728 (core x km)
- Poles 8,525

ii) Subscriber line facilities

Self-supporting CCP cables of an aerial type should be applied. The work volume is as follows:

– CCP Cables	30,520	(pair x km)
– Poles	6,251	
– Drop wires	12,090	

e) Buildings

Fifty-seven(57) buildings will be provided by this Plan.

f) Sites

One hundred eight (108) sites will be provided by this Plan.

g) Access roads

Thirty-three(33)access roads will be provided for the digital radio multi-access system by this Plan.

9. OPERATION AND MAINTENANCE PLAN

1) Basic Policy

a) Organization

The existing operation and maintenance sector in the current organization shall be responsible for the operation and maintenance of the rural telecommunications system. The establishment of a new organization or integration and/or abolition of existing organizations shall not be made for the rural telecommunications system. The operation and maintenance of the rural telecommunications system shall be covered by increasing the number of staff required.

b) Staff

An appropriate number of staff shall be positioned at the maintenance telephone offices considering the amount of equipment to be introduced to these offices and the facts that it is highly reliable equipment with a low fault rate.

c) Service

The existing telegraph service in the rural areas shall be provided continuously.

d) Public telecommunications service office

A new public telecommunications service office shall be established for a rural area currently having no such office. An appropriate number of employees shall be deployed to provide the users with public telephone service and public telegraph service via telephone.

e) Training

Necessary training shall be provided so as to perform smooth operation and maintenance of the rural telecommunications system.

2) Operation and Maintenance System

Employees of the telephone offices that will be connected and installed with the exchange system, transmission equipment, and telephone sets for the rural telecommunications service shall be responsible for the maintenance of the exchange system, transmission equipment, outside plant, and telephone sets.

3) Posting of Staff

An appropriate number of staff shall be positioned according to the basic policies.

Number of Necessary Staff up to the year 2002

Telephone Office or Station	Number of Necessary Additional Staff
Telephone Office	75
Public Telecommunications Service Office	123
Radio Base Station	2
Radio Repeater Station	66
Transmission Repeater Station	2
Rural Exchange	36
Total	304

4) Training Plan

To promote smooth operation and maintenance of newly installed equipment, the training shall be conducted according to the training implementation plan.

Training Course Name and Number of Trainees

Training Course Name	Number of Trainees
Leaders Course	17
Engineers Course	43
General Maintenance Technicians Course	40
Staff Training Course	669
Total	769

10. IMPLEMENTATION PLAN

1) Division of the Areas into Some Phases

This rural telecommunications network project involves 223 rural communities which are spread over almost the whole country. For smooth implementation in harmony with the national projects and importance of respective areas, it is necessary to divide the plan by Department into two(2) phases.

a) Phase-I

Choluteca, El Paraíso, Intibucá, Lempira, Ocotepeque, Copán, Valle, La Paz, Cortés, Atlántida, Yoro

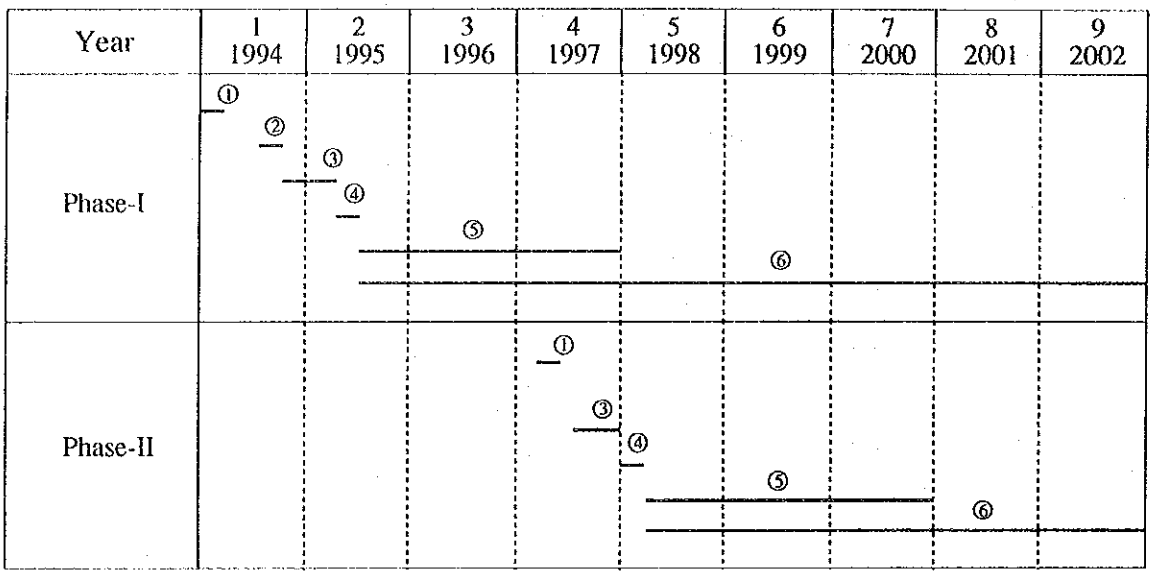
b) Phase-II

Comayagua, Colón, Santa Bárbara, Francisco Morazán, Olancho

2) Implementation Schedule

Implementation schedule is shown as follows. Phase-I and Phase-II should be completed by 1997 and 2002 respectively.

Implementation Schedule



① System Design, Preparation of Specifications
② Tender, Contract
③ Equipment Manufacture
④ Transportation
⑤ Construction Work, Test
⑥ Subscriber's Equipment Installation

3) Work Volume

Main work items		Unit	Quantity		
			Phase-I	Phase-II	Total
Digital exchange		Number of exchanges	11	7	18
		Number of lines	2,920	1,980	4,900
Transmis-sion	Optical fiber cable transmission	Section	12	6	18
	DMAS	System	7	6	13
Inter-exchange lines		Core × kilometers	1,944	784	2,728
Subscriber lines		Pair × kilometers	15,670	14,850	30,520
Power facilities		Set	150	97	247
Buildings		Number of buildings	40	17	57
Access roads		Number of roads	20	13	33
Sites		Number of sites	72	36	108

Note: The newly established exchanges are all container type.

4) Investment cost

Unit: Foreign currency in ('000) US dollars; Local currency in ('000) Lempiras.

Description		Phase-I		Phase-II		Total	
		Foreign	Local	Foreign	Local	Foreign	Local
1.	Systems and equipment						
1.1	Exchanges	1,574	0	1,038	0	2,612	0
1.2	Transmission systems	13,288	5,229	9,679	3,647	22,967	8,876
1.3	Outside plant of transmission system	5,532	4,473	2,232	1,800	7,764	6,273
1.4	Outside plant of local network	2,197	5,035	1,661	3,404	3,858	8,439
1.5	Power equipment	3,192	760	1,950	482	5,142	1,242
1.6	Sub-total (1.1 to 1.5)	25,783	15,497	16,560	9,333	42,343	24,830
2.	Others						
2.1	Buildings	0	2,000	0	850	0	2,850
2.2	Roads	0	20,000	0	13,000	0	33,000
2.3	Sites	0	472	0	269	0	741
2.4	Common	92	0	62	0	154	0
2.5	Consultancy	2,500	194	2,052	194	4,552	388
2.6	Training	579	991	45	618	624	1,609
2.7	Sub-total (2.1 to 2.6)	3,171	23,657	2,159	14,931	5,330	38,588
3.	Total (1 + 2)	28,954	39,154	18,719	24,264	47,673	63,418
4.	Contingency	2,895	3,915	1,872	2,426	4,767	6,342
5.	Grand total	31,849	43,069	20,591	26,690	52,440	69,760
6.	For reference (in '000 US dollars)	39,825		25,534		65,359	

11. PROJECT EVALUATION

1) Financial Analysis

a) Underlying assumptions

i) Project life is assumed to be 20 years.

ii) The salvage value of the equipment after the end of its service life is assumed to be nil.

iii) Inflation of the initial investment cost is not taken into account.

The operating and maintenance costs per main line are assumed to remain at the same level until the year 2002 by streamlining the operation and maintenance activities. After 2003, these costs are assumed to increase 2 % every year.

iv) The exchange rate applied to this analysis is 5.4 lempiras per US dollar.

v) Telephone revenue per main line in the future is assumed to be the same as the current revenue.

b) Estimate of the Project revenue

The Project revenues are as follows:

i) Installation fee

ii) Basic monthly charge

iii) Toll call charge

c) Estimate of the Project cost

The Project costs are as follows:

i) Investment costs

ii) Operating and maintenance costs

iii) Working capital

d) Result of financial analysis

The following table shows the financial internal rate of return (FIRR) and the results of sensitivity analysis. The Project has an internal rate of return of 2.25 %.

FIRR and Results of Sensitivity Analysis (FIRR)

	Phase-I	Phase-II	Whole project
FIRR	1.75 %	3.83 %	2.25 %
Sensitivity Analysis (FIRR)			
1) Contingency			
- where no contingency is needed	2.64 %	4.85 %	3.21 %
- where contingency is doubled	0.96 %	2.93 %	1.41 %
2) Exchange rate			
- Lps. 4.9 per US$1	2.47 %	4.66 %	3.02 %
- Lps. 6.0 per US$1	0.97 %	2.94 %	1.43 %
3) Telephone revenues			
- where annual increase rate is 4 %	6.93 %	9.21 %	7.33 %
- where annual increase rate is 2 %	4.42 %	6.60 %	4.85 %
4) Operating and maintenance costs			
- where annual increase rate is 4 %	1.34 %	3.18 %	1.82 %
- where annual increase rate is 6 %	0.82 %	2.30 %	1.26 %

2) Economic Evaluation

a) Method of evaluation

In this Study, economic benefits are defined as the benefits which belong to the telephone users. The benefit which belongs to the telephone users is the benefit value minus the call charges that the users pay. In other words, economic benefit is the difference between the maximum willingness to pay of the users and the actual payment for the telephone use. This difference is called the "Consumers' surplus" in the field of economics. The consumers' surplus is calculated from the demand function which shows the relationship between the price and the demand. In this evaluation, based on the data collected through the field survey, the demand function was derived by the multiple regression analysis.

b) Estimate of benefits

The amount of the consumers' surplus was calculated to be 3.34 times as large as the call charges.

c) Estimate of costs

The costs of the Project are the same as that for the financial analysis.

d) Result of economic evaluation

The result of the calculation shows that the economic internal rate of return (EIRR) is 30.2 %. This means that the Project will bring a large economic benefit to the Honduran communities.

12. OVERALL EVALUATION AND SUGGESTIONS

1) Overall Evaluation

As the economy in Honduras depends on primary products, development of primary industries is of vital importance for the nation. In rural areas, however, social infrastructure such as education, medical care, water, and electricity have not been implemented. Telecommunications services are concentrated only in cities whose population is over 20,000. The differential in the standard of living is great. The government, therefore, is actively promoting the development of rural areas.

When the Project is implemented, automatic telephone service will be provided in 223 communities, each with a population below 20,000, in 16 out of the 18 Departments in the country. It will facilitate information interchange with most areas in the country and with foreign countries. It has so far been clarified that the influence on HONDUTEL and on the society, economy and culture in Honduras will extend over a very wide range. In other words, the Project not only contributes to the development of the economy and industries in Honduras but also bring about very large development effects such as convenience to inhabitants and improvement of administrative services. During the field survey, many Departmental governors, district headmen and regional inhabitants strongly requested early telephone installation. Since the implementation of the Project is very meaningful for Honduras, the government of Honduras and HONDUTEL should give a higher priority to the investment and implementation of the Project than in the past.

Rural areas are targeted to be covered by this Project. Unlike urban areas, the population is small and scattered making efficient construction of telecommunication facilities very difficult. As described in the financial analysis section, it is possible to maintain and manage the facilities within the range of income after the end of construction, but not much profit can be expected. In the analysis from the aspect of the economic benefit, the effect is great and a certain degree of profit can be confirmed. It is, therefore, necessary to ensure long-term low-interest loans or subsidies from the central government as funds for construction. In other words, it is necessary to implement the Project in combination with development projects in other fields or to adopt the benefit theory in the bearing of the construction cost. Another method is to implement the Project in combination with the urban telephone network project. It is also necessary to divide the Project into multiple segments as the required amount of fund is too large for execution as one project.

This Project is to provide 223 rural areas with automatic telephone service. For this purpose, construction of office buildings, switching units, transmission equipment, radio equipment, power cabling and subscriber lines should be done without delay. It is necessary to make communication among related parties closer and to obtain cooperation and assistance from regional administrative organizations etc. The system for executing the construction takes these situations into consideration. Since the Project adopts the radio system for establishing the rural telecommunications network, aerial expansion of the telecommunications facilities is possible without much increase in the number of necessary maintenance personnel. Implementation by division into two phases in view of the work scale will eliminate possible problems when proceeding with the construction and training of maintenance personnel.

As described above, the Project has sufficient socioeconomic merits for the regional communities. Since the merits are sufficient and smooth work is possible, early implementation of the Project is desirable.

2) Suggestions

The Project will not only provide economic merits for rural communities but also contribute much to activation of their economy in rural areas by bringing about a strong impact in a wide range to society and administrative services. Providing the telephone service in areas where telephone service has not been available will

contribute to improving the convenience to regional inhabitants. The necessity of the Project having diversified development effects is very high. Since this survey has revealed the effects and feasibility of the Project, the following suggestions are proposed.

a) Determining the priority of development

The necessity and effects of the Project have been confirmed as economic merits to the whole society and will have a strong impact on the activation of the economy in rural areas. It is therefore suggested that the government of Honduras and HONDUTEL should take necessary actions for giving higher priority to the investment and implementation of the Project than before.

b) Establishing the system for construction work

The Project is to provide automatic telephone service in 223 rural areas in the country. It is therefore important to execute the various work for office building construction, switching, transmission and radio equipment installation, and telephone terminal installation. Any problem arising in the course of such construction work should be solved quickly and appropriately through good coordination among related parties. For execution of the heavy construction work load, parallel operation of many kinds of work is required, calling for tremendous man-hours. In executing such work, cooperation and support from regional administrative organizations are necessary. For smooth execution of the Project, it is suggested that HONDUTEL ensure the necessary operation in view of these circumstances and establish a system for execution of the construction work. This should be provided with the follow-up function for the work in progress and the coordinating function for problems that may occur in the process of execution.

c) Division into phases

The Project covers 223 rural areas distributed throughout the country. Implementing the Project as a single step project will be difficult financially in view of the large amount of investment necessary and relatively low profitability. Implementation matching the national development plan is necessary. Division into two phases after considering the training of employees and the system for construction work execution is proposed. The financial internal rate of return of Phase-I is greater than that of Phase-II. It is suggested to give priority to Phase-I because of the need to implement the Project in coordination with the

national development plan of the Honduran Government. If it is necessary to further divide them according to the scale of the construction funds, a division into 13 segments is proposed.

d) Training of maintenance personnel

For the smooth execution of operation and maintenance of the new telecommunications facilities, it is necessary to train the required number of maintenance personnel at the same time as the construction work. The present training center of HONDUTEL is insufficient in its equipment and trainers for training on new technologies. It is suggested, therefore, that training of trainers and key engineers should be carried out in the plants of the contractor and general engineers should be trained by participation in the construction work, in Honduras.

e) Raising the funds for construction

After complete implementation of the Project, it is possible to maintain and manage the facilities within the range of income from the provided service. The significance of implementing the Project in Honduras is great. Therefore, the following suggestions concerning the raising of funds for construction are proposed:

(i) Implementing the Project entirely by internal funding from HONDUTEL is not favorable for HONDUTEL when considering the low profitability. Use of low-interest long-term loans from local and foreign sources should be studied.

(ii) Implementing the Project entirely by internal funding from HONDUTEL is a heavy burden when considering the large amount of investment necessary. Getting gratuitous subsidies from the government should be studied.

(iii) Regional development projects in the national development plan are packaged with other kinds of projects to obtain the necessary effect through lateral coordination. Implement of the Project in combination with other projects in the form of a package should be studied.

(vi) The construction cost for telecommunications facilities in rural areas is much higher in comparison with that in urban areas. Setting a higher installation fee in rural areas should be studied according to the benefit theory.

(v) Since a project for rural areas only is not sufficiently profitable, combination with profitable urban project should be studied.

(vi) Expansion of telecommunication service to rural areas requiring a higher cost for construction, operation and maintenance than urban areas will be necessary in the future. Raising the telephone tariff to cover the expenses should be studied.

(vii) If the planned funds can be raised, the Project will be implemented in two phases. If sufficient construction fund cannot be obtained, the Project should be divided into 13 segments for implementation in order of priority either individually or in combination, according to the scale of the available funds.

CHAPTER 1 INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Composition of the Study Report

The Study Report consists of three volumes as follows:

Volume-I: Main Report,
Volume-II: Appendix,
Volume-III: Summary.

This report is Volume-I, Main Report, composed of descriptions and illustrations of the result of the Study.

1.2 Background of the Study

The Honduran economy relies primarily on agricultural production, such as banana, coffee, and timber, which is mainly in the rural areas. These three items account for 87% of all Honduran exports. Therefore, it is beneficial for Honduras to develop the agricultural sector in the rural areas. However, rural areas have an underdeveloped infrastructure, with few schools, hospitals, drinking water facilities, or electricity services. The standard of living in rural areas is much lower than that in urban areas.

The development of rural areas, where two thirds of the population lives, is very important for the Honduran Government if it is to achieve well-balanced growth. This is also necessary if the government is to encourage continued production in the rural areas and prevent urban migration.

In telecommunications, the total number of main telephone lines was 88,193 in 1990, with a penetration rate of 1.85 lines per 100 inhabitants. This rate is quite low compared with the average for Central America, which was 2.73 per 100 inhabitants. In Honduras, most telephones are in cities having a population over 20,000. In rural areas, telephone and telegraph services are available at public telephone and telegraph-telephone service offices, but these facilities are not enough for the development of the rural community areas.

The Government of Honduras has given high priority to developing a telecommunications network because it is indispensable for social and economic development. The state-

owned enterprise responsible for telecommunications services in Honduras, Empresa Hondurena de Telecomunicaciones (hereinafter referred to as "HONDUTEL"), also has made great efforts to expand telephone services in rural areas. However, HONDUTEL cannot afford to set up telephone services in rural areas because of technical and financial difficulties.

Under these circumstances, the Government of Honduras requested the Government of Japan to make a master plan for a rural telecommunications network offering automatic telephone service in January 1990.

In response to this request, the Government of Japan decided to conduct a master plan study on the Rural Telecommunications Network Project and entrusted the study to Japan International Cooperation Agency (hereinafter referred to as "JICA"). JICA dispatched the preliminary study team to Honduras in April, 1991. As a consequence, the scope of work of the main study to follow was determined. Based on the agreement signed on April 17, 1991, among the Ministry of Communications, Public Works and Transportation (Secretaria de Comunicaciones, Obras Publicas y Transporte, hereinafter referred to as "SECOPT"), HONDUTEL and JICA, JICA dispatched the Study Team to execute the Master Plan Study.

1.3 Objective of the Study

The objective of the Study is to formulate a master plan covering until the year 2002 for a rural telecommunications network offering automatic telephone service to 223 rural community areas.

1.4 Study Area

The Study area covers 223 rural community areas which are shown in Table 1.4-1.

Table 1.4-1 Subject Communities (1/6)

	Community		Municipality	
(01)	Atlantida Department	Total=18		
	(01)	Sambo Creek	(01)	La Ceiba
	(02)	Corozal	(01)	La Ceiba
	(01)	La Unión	(02)	El Porvenir
	(02)	El Porvenir	(02)	El Porvenir
	(01)	Arizona	(03)	Esparta
	(02)	Esparta	(03)	Esparta
	(03)	Ceibita Way	(03)	Esparta
	(04)	Santa María	(03)	Esparta
	(05)	Mezapa	(03)	Esparta
	(06)	Atenas de San Cristóbal	(03)	Esparta
	(01)	Nueva Armenia	(04)	Jutiapa
	(02)	Jutiapa	(04)	Jutiapa
	(01)	La Masica	(05)	La Masica
	(02)	San Juan Pueblo	(05)	La Masica
	(03)	San Juan Benque	(05)	La Masica
	(01)	Santa Ana	(06)	San Francisco
	(02)	San Francisco	(06)	San Francisco
	(01)	El Triunfo de la Cruz	(07)	Tela
(02)	Colón Department	Total=7		
	(01)	Limón	(04)	Limón
	(01)	Elixir	(05)	Savá
	(01)	Santa Rosa de Aguán	(07)	Santa Rosa de Aguan
	(01)	Salamá	(09)	Tocoa
	(02)	Quebrada de Arena	(09)	Tocoa
	(03)	Zamora	(09)	Tocoa
	(01)	Corocito	(10)	Bonito Oriental
(03)	Comayagua Department	Total=13		
	(01)	Palo Pintado	(01)	Comayagua
	(01)	El Rosario	(03)	El Rosario
	(01)	Esquías	(04)	Esquías
	(01)	La Libertad	(06)	La Libertad
	(01)	Lamaní	(07)	Lamaní
	(01)	Minas de Oro	(11)	Minas de Oro
	(01)	San Antonio de la Cuesta	(13)	San Jerónimo
	(02)	San Jerónimo	(13)	San Jerónimo
	(01)	San José del Potrero	(15)	San José del Potrero
	(01)	San Luis	(16)	San Luis
	(01)	San Sebastián	(17)	San Sebastián
	(01)	Las Lajas	(20)	Las Lajas
	(01)	Taulabé	(21)	Taulabé

Table 1.4-1 Subject Communities (2/6)

	Community		Municipality	
(04)	Copán Department	Total=21		
	(01)	Quezailica	(01)	Santa Rosa de Copán
	(01)	Concepción	(03)	Concepción
	(01)	El Florido	(04)	Copán Ruinas
	(01)	Corquín	(05)	Corquín
	(01)	Cucuyagua	(06)	Cucuyagua
	(01)	Dulce Nombre	(08)	Dulce Nombre
	(01)	El Paraíso	(09)	El Paraíso
	(01)	Florida	(10)	Florida
	(01)	La Jigua	(11)	La Jigua
	(02)	La Unión	(12)	La Unión
	(01)	Nueva Arcadia	(13)	Nueva Arcadia
	(02)	Chalmeca	(13)	Nueva Arcadia
	(01)	San Agustín	(14)	San Agusting
	(01)	San Antonio	(15)	San Antonio
	(02)	Concepción	(15)	San Antonio
	(02)	La Esperanza	(16)	San Jerónimo
	(01)	San José	(17)	San José
	(01)	San Juán de Opoa	(18)	San Juán de Opoa
	(01)	San Nicolás	(19)	San Nicolás
	(01)	San Pedro de Copán	(20)	San Pedro de copán
	(01)	Trinidad	(22)	Trinidad
(05)	Cortés Department	Total=18		
	(01)	Cuyamel	(04)	Omoa
	(01)	Santiago	(05)	Pimienta
	(01)	San Buenaventura	(09)	San Francisco de Yojoa
	(02)	Rio Lindo	(09)	San Francisco de Yojoa
	(03)	San Francisco de Yojoa	(09)	San Francisco de Yojoa
	(04)	Cañaveral	(09)	San Francisco de Yojoa
	(01)	San Manuel	(10)	San Manuel
	(01)	Agua Azul Sierra	(11)	Santa Cruz de Yojoa
	(02)	Yojoa	(11)	Santa Cruz de Yojoa
	(03)	El Olivar	(11)	Santa Cruz de Yojoa
	(04)	Los Caminos	(11)	Santa Cruz de Yojoa
	(05)	San Isidro	(11)	Santa Cruz de Yojoa
	(06)	El Edén	(11)	Santa Cruz de Yojoa
	(07)	Concepción	(11)	Santa Cruz de Yojoa
	(08)	La Barca	(11)	Santa Cruz de Yojoa
	(09)	Peña Blanca	(11)	Santa Cruz de Yojoa
	(10)	Santa Cruz de Yojoa	(11)	Santa Cruz de Yojoa
	(01)	Dos Caminos	(12)	Villanueva

Table 1.4-1 Subject Communities (3/6)

	Community		Municipality	
(06)	Choluteca Department	Total=20		
	(01)	Pavana	(01)	Choluteca
	(01)	Apacilagua	(02)	Apacilagua
	(01)	Concepción de María	(03)	Concepción de María
	(01)	Duyure	(04)	Duyure
	(01)	El Corpus	(05)	El Corpus
	(02)	El Banquito	(05)	El Corpus
	(01)	El Triunfo	(06)	El Triunfo
	(02)	El Guasaule	(06)	El Triunfo
	(01)	Punta Ratón	(07)	Marcovia
	(02)	Cedeño	(07)	Marcovia
	(03)	Marcovia	(07)	Marcovia
	(04)	Monjarás	(07)	Marcovia
	(05)	Azucarera Choluteca 1	(07)	Marcovia
	(06)	Azucarera Choluteca 2	(07)	Marcovia
	(01)	Morolica	(08)	Morolica
	(01)	Orocuina	(10)	Orocuina
	(01)	Pespire	(11)	Pespire
	(01)	San Antonio de Flores	(12)	San Antonio de Flores
	(01)	El Espino	(15)	San Marcos de Colón
	(01)	Santa Ana de Yusguare	(16)	Santa Ana de Yusguare
(07)	El Paraíso Department	Total=20		
	(01)	El Rodeo	(01)	Yuscarán
	(01)	Alauca	(02)	Alauca
	(02)	Las Manos	(02)	Alauca
	(01)	Jutiapa	(03)	Danlí
	(02)	El Arenal	(03)	Danlí
	(03)	Chichicaste	(03)	Danlí
	(01)	Güinope	(05)	Güinope
	(01)	Jacaleapa	(06)	Jacaleapa
	(01)	Liure	(07)	Liure
	(01)	Morocelí	(08)	Morocelí
	(01)	Oropolí	(09)	Oropolí
	(01)	Potrerillos	(10)	Potrerillos
	(01)	San Lucas	(12)	San Lucas
	(01)	San Matías	(13)	San Matías
	(01)	Soledad	(14)	Soledad
	(01)	Teupasenti	(15)	Teupasenti
	(01)	Texiguat	(16)	Texiguat
	(01)	Yauyupe	(18)	Yauyupe
	(01)	Trojes	(19)	Trojes
	(02)	Cifuentes	(19)	Trojes

Table 1.4-1 Subject Communities (4/6)

	Community		Municipality	
(08)	Francisco Morazán Department	Total=22		
	(01)	San Juancito	(01)	Distrito Central
	(01)	Agalteca	(03)	Cedros
	(02)	El Suyatal	(03)	Cedros
	(03)	Cedros	(03)	Cedros
	(01)	Curarén	(04)	Curarén
	(01)	El Terrero	(05)	El Porvenir
	(02)	El Porvenir	(05)	El Porvenir
	(01)	Lepaterique	(09)	Lepaterique
	(01)	Maraita	(10)	Maraita
	(01)	Marale	(11)	Marale
	(01)	Ojojona	(13)	Ojojona
	(01)	Orica	(14)	Orica
	(01)	Reitoca	(15)	Reitoca
	(01)	Sabanagrande	(16)	Sabanagrande
	(01)	San Antonio de Oriente	(17)	San Antonio de Oriente
	(01)	San Ignacio	(19)	San Ignacio
	(01)	San Juan de Flores	(20)	San Juan de Flores
	(01)	Santa Ana	(22)	Santa Ana
	(01)	Jalaca	(24)	Talanga
	(01)	Tatumbla	(25)	Tatumbla
	(01)	Villa de San Francisco	(27)	Villa de San Francisco
	(01)	Vallecillo	(28)	Vallecillo
(10)	Intibucá Department	Total=8		
	(01)	Camasca	(02)	Camasca
	(01)	Colomoncagua	(03)	Colomoncagua
	(01)	Concepción	(04)	Concepción
	(02)	Jesús de Otoro	(07)	Jesús de Otoro
	(01)	Magdalena	(08)	Magdalena
	(01)	Masaguara	(09)	Masaguara
	(01)	Santa Lucía	(15)	Santa Lucía
	(01)	Yamaranguila	(16)	Yamaranguila
(12)	La Paz Department	Total=4		
	(01)	San José	(12)	San José
	(01)	San Pedro de Tutule	(14)	San Pedro de Tutule
	(01)	Santa María	(17)	Santa María
	(01)	Santiago de Puringla	(18)	Santiago de Puringla

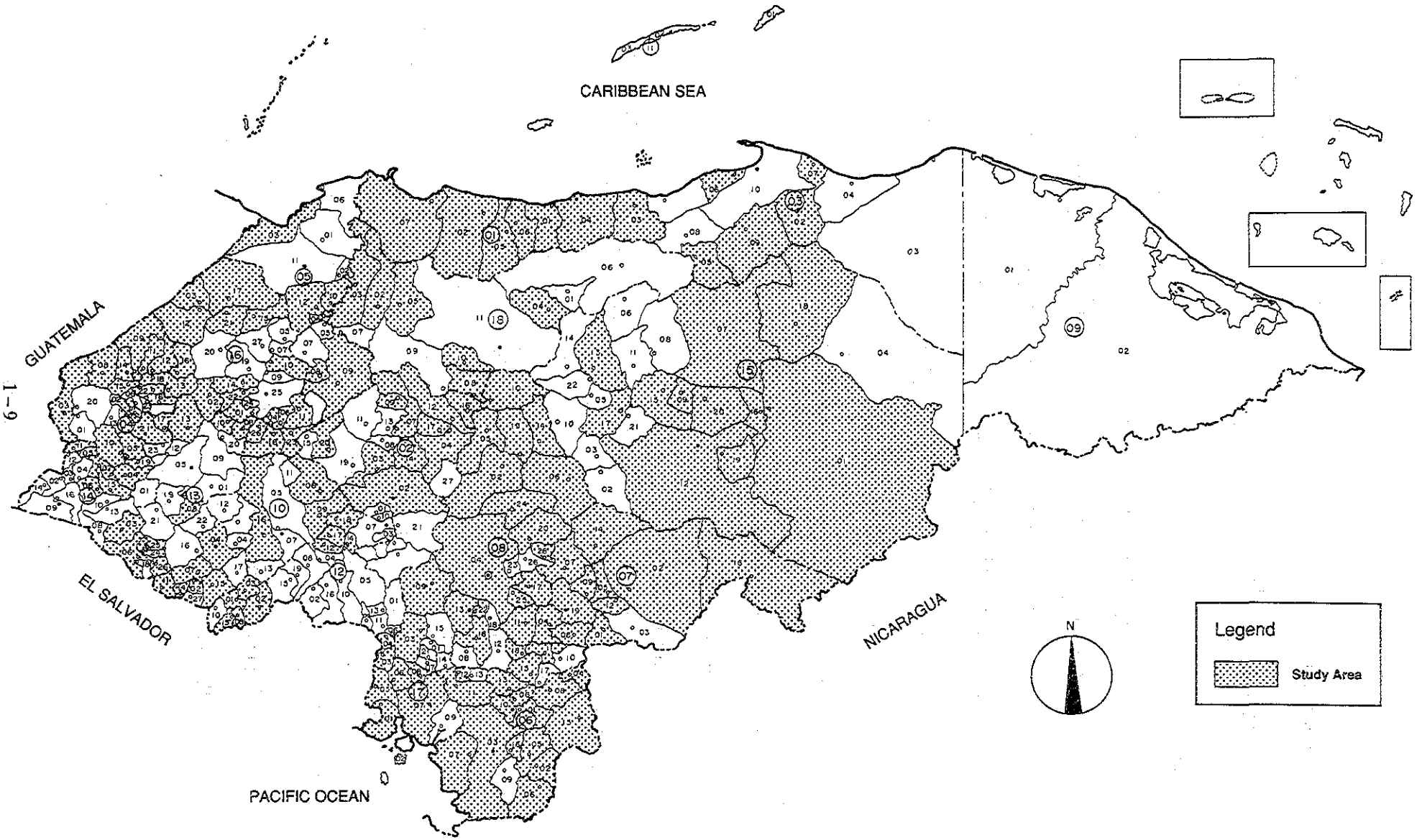
Table 1.4-1 Subject Communities (5/6)

	Community		Municipality	
(13)	Lempira Department	Total=14		
	(01)	Candelaria	(03)	Candelaria
	(01)	Cololaca	(04)	Cololaca
	(01)	Erandique	(05)	Erandique
	(01)	Gualcince	(06)	Gualcince
	(01)	Guarita	(07)	Guarita
	(01)	La Campa	(08)	La Campa
	(01)	La Unión	(11)	La Unión
	(01)	La Virtud	(12)	La Virtud
	(01)	Lepaera	(13)	Lepaera
	(01)	Mapulaca	(14)	Mapulaca
	(01)	Piraera	(15)	Piraera
	(01)	Tambla	(24)	Tambla
	(01)	Tomalá	(25)	Tomalá
	(01)	Valladolid	(26)	Valladolid
(14)	Ocotepeque Department	Total=7		
	(01)	La Encarnación	(06)	La Encarnación
	(01)	La Labor	(07)	La Labor
	(01)	Lucerna	(08)	Lucerna
	(01)	San Francisco del Valle	(11)	San Francisco del Valle
	(01)	Sensenti	(15)	Sensenti
	(02)	Azacualpa	(15)	Sensenti
	(03)	San Antonio	(15)	Sensenti
(15)	Olancho Department	Total=14		
	(01)	Jutiquile	(01)	Juticalpa
	(02)	Punuare	(01)	Juticalpa
	(03)	Arimís	(01)	Juticalpa
	(01)	San José de Río Tinto	(03)	Catacamas
	(02)	San Pedro	(03)	Catacamas
	(01)	Gualaco	(08)	Gualaco
	(01)	Guarizama	(09)	Guarizama
	(01)	La Unión	(13)	La Unión
	(01)	Manto	(15)	Manto
	(01)	Salamá	(16)	Salamá
	(01)	San Esteban	(17)	San Esteban
	(01)	San Francisco de Becerra	(18)	San Francisco de Becerra
	(01)	San Francisco de la Paz	(19)	San Francisco de la Paz
	(01)	Santa María del Real	(20)	Santa María del Real

Table 1.4-1 Subject Communities (6/6)

	Community		Municipality	
(16)	Santa Bárbara Department	Total=22		
	(01)	Arada	(02)	Arada
	(01)	Atima	(03)	Atima
	(01)	Azacualpa	(04)	Azacualpa
	(01)	Ceguaca	(05)	Ceguaca
	(01)	Concepción del Sur	(07)	Concepción del Sur
	(01)	El Níspero	(09)	El Níspero
	(01)	Ilama	(11)	Ilama
	(01)	Sula	(12)	Macuelizo
	(02)	La Flecha	(12)	Macuelizo
	(01)	Naranjito	(13)	Naranjito
	(01)	Nuevo Celilac	(14)	Nuevo Celilac
	(01)	Pueblo Nuevo	(15)	Petoa
	(01)	Protección	(16)	Portección
	(01)	Pinalejo	(17)	Quimistán
	(02)	Quimistán	(17)	Quimistán
	(01)	San Francisco de Ojuera	(18)	San Francisco de Ojuera
	(01)	San Francisco Valle	(21)	San Marcos
	(01)	El Porvenir	(22)	San Nicolás
	(01)	San Pedro Zacapa	(23)	San Pedro Zacapa
	(01)	San Vicente Centenario	(24)	San Vicente Centenario
	(01)	Santa Rita	(25)	Santa Rita
	(01)	El Mochito	(27)	Las Vegas
(17)	Valle Department	Total=8		
	(06)	Jicaro Galán	(01)	Nacaome
	(02)	Alianza	(02)	Alianza
	(01)	Aramecina	(04)	Aramecina
	(01)	Caridad	(05)	Caridad
	(01)	Goascorán	(06)	Goascorán
	(02)	Amatillo	(06)	Goascorán
	(01)	Langue	(07)	Langue
	(01)	San Francisco de Coray	(08)	San Francisco de Coray
(18)	Yoro Department	Total=7		
	(01)	Jocón	(03)	Jocón
	(01)	Agua Blanca Sur	(04)	El Progreso
	(01)	El Negrito	(05)	El Negrito
	(01)	Morazán	(06)	Morazán
	(02)	Neuva Esperanza	(06)	Morazán
	(01)	Sulaco	(09)	Sulaco
	(01)	Yorito	(11)	Yorito
	Total	223 Communities		

Figure 1.4-1 Study Area



1.5 Scope of the Study

The major items are listed below.

(1) Collection and review of data.

- Review of previous studies
- Social and economic conditions and statistics
- Present condition of telecommunications facilities and services
- Development plans and on-going projects for telecommunications

(2) Field survey

- Social and economic conditions
- Existing telecommunications facilities and services

(3) Analysis and evaluation

- Demand forecast
- Traffic forecast

(4) Forming the Master Plan

- Target of the plan
- Telecommunications network plan
- Facilities plan
- Operation and maintenance plan
- Management and organization
- Cost estimation
- Implementation program
- Project evaluation

1.6 Characteristics of the Master Plan

The Master Plan is a long term plan which is prepared based upon the information available about telecommunications in general, financial conditions of the operating entity, socio-economic tendency of the country, national policies, development plans, etc. This Master Plan has been created using information obtained in 1991 and the early months of 1992.

This Master Plan covers general information about the rural telephone network using the latest data. However, it should be noted that the present hypotheses is time limited. Thus, this time sensitivity should be taken into consideration at the implementing stage. The designated communities, telephone demand, applicable technologies, and the cost formula should be reexamined and up-dated to reflect the actual situation and national benefit to Honduras, before making a detailed design and/or feasibility study.

1.7 Process of Executing the Study

The Study process was divided into the following six steps.

(1) Work in Honduras - 1 (Jan. - Mar. 1992)

- Explanation and discussion of the Inception Report
- Information collection
- Field survey
- Preparation, explanation and discussion of the Progress Report

(2) Work in Japan - 1 (Mar. - May 1992)

- Socio-economic analysis
- Demand forecast
- Traffic forecast
- Setting up the target of the plan
- Formulation of draft rural telecommunications network plan
- Preparation of the Interim Report

(3) Work in Honduras - 2 (May - June 1992)

- Presentation, explanation and discussion of the Interim Report
- Field survey and information collection for the facilities plan

(4) Work in Japan - 2 (June - Aug. 1992)

- Adjusting the rural telecommunications network plan
- Drawing up the facilities plan
- Drawing up the organization for the management plan
- Drawing up the operation and maintenance plan
- Estimation of the project cost
- Setting up the implementation program
- Evaluation of the project
- Preparation of the Draft Final Report

(5) Work in Honduras - 3 (Sept. 1992)

- Presentation, explanation and discussion of the Draft Final Report

(6) Work in Japan - 3 (Sept. - Nov. 1992)

- Preparation of the Final Report

1.8 Organization for the Study

1.8.1 Japanese team members

1) Japanese advisory committee

Name	Duty-in-charge	Affiliated to
Mr.Masayasu Mugishima	Chairman	Deputy Director, International Cooperation Division, Communications Policy Bureau, Ministry of Posts and Telecommunications
Mr.Makoto Ono	Member	Monitoring and Examination Division, Radio Department, Telecommunications Bureau, Ministry of Posts and Telecommunications
Mr.Takao Yamazaki	Member	Telecommunications Development Specialist, Institute for International Cooperation, Japan International Cooperation Agency

2) Study Team

Name	Duty-in-charge	Affiliated to
Mr.Kazushige Komatsuzaki	Leader/Network plan	NTT International Corporation
Mr.Yasuo Ishihara	Switching	NTT International Corporation
Mr.Kenji Todokoro	Demand forecast	NTT International Corporation
Mr.Shunji Masuzawa	Transmission	NTT International Corporation
Mr.Kenji Akiyama	Outside plant	NTT International Corporation
Mr.Soichi Sakata	Operation & Maintenance	NTT International Corporation
Mr.Haruhiko Ueda	Socio-economic / Finance	NTT International Corporation

Mr.Yuichi Endo	Interpreter	Nichiei International Inc.

1.8.2 Honduran officers

This Study was performed in close cooperation with the executives and officers of the departments concerned in HONDUTEL and other governmental agencies. Jefe División Desarrollo, Director Ingenieriá y Proyectos and counterparts of División Desarrollo in HONDUTEL and others gave the Study Team constant and sincere cooperation, made many arrangements and provided hospitality during the study period. Counterparts of División Desarrollo in HONDUTEL are as follows:

Name	Duty-in-charge
Ing. José Amán Tábora Tálbott	Coordinator/Transmission
Ing. Jose Francisco Orellana	Rural network plan
Ing. Héctor Antonio Suazo	Rural network plan
Ing. Nubia Isbeth Mendoza	Switching
Ing. Carlomagno Sierra	Transmission
Ing. Antonio Ramón Aparicio	Transmission
Lic. Adalid Ruiz Andrade	Finance
Ing. José Raúl Cruz Murcia	Outside plant
Ing. Olga Patricia Chávez de Serpa	Demand forecast
Ing. Tania Sabillón de Sorto	Information
Ing. Gerardo Discua	Outside plant

CHAPTER 2 OUTLINE OF THE REPUBLIC OF HONDURAS

CHAPTER 2 OUTLINE OF THE REPUBLIC OF HONDURAS

2.1 Country Profile

2.1.1 Location and geographic features

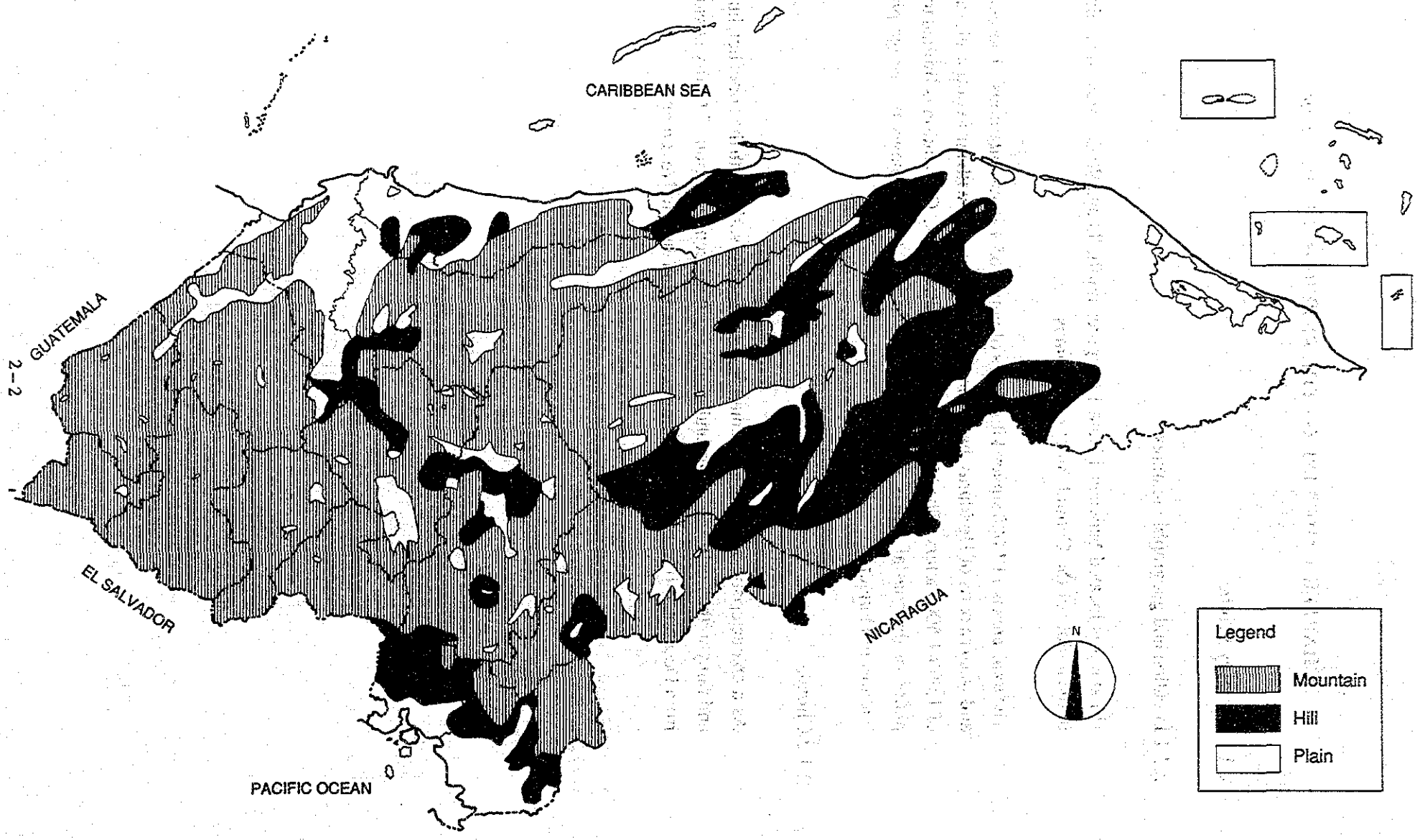
Honduras is located between 13 and 17 degrees north, 83 and 90 degrees west, almost in the middle of the Central American Isthmus.

The total area is 112,088 square kilometers of which 65% is mountainous. The central and western parts of Honduras have mountain ranges each with an average elevation of 1,000-1,500 meters. The highest peak is 2,850 meters. Cultivation is limited to the plains of the coastal areas and the valleys. Figure 2.1.1-1 shows the geographical features of Honduras.

2.1.2 Climate

As a characteristic of the tropical countries, its climate varies with the zone: hot, humid and rainy in the north and south, and moderate in the central region. The dry season is from December to May, and the rainy season is from June to November.

Figure 2.1.1-1 Geographic Map



2.1.3 Population

The population of Honduras was approximately 4.76 million in 1990 with an annual growth rate of 3.3% over the past decade.

Table 2.1.3-1 Population Density by Regions

Department	Population (Persons)	Area (Square Km)	Population density (Persons/Square Km)
ATLANTIDA	238,741	4,251.2	56.2
COLON	149,677	8,874.8	16.9
COMAYAGUA	239,859	5,196.4	46.2
COPAN	219,455	3,203.0	68.5
CORTES	662,772	3,954.0	167.6
CHOLUTECA	295,484	4,211.0	70.2
EL PARAISO	254,295	7,218.1	35.2
FRANCISCO MORAZAN	828,274	7,946.2	104.2
GRACIAS A DIOS	34,970	16,630.0	2.1
INTIBUCA	124,681	3,072.2	40.6
ISLAS DE LA BAHIA	22,062	260.6	84.7
LA PAZ	105,927	2,330.6	45.5
LEMPIRA	177,055	4,289.7	41.3
OCOTEPEQUE	74,276	1,680.2	44.2
OLANCHO	283,852	24,350.9	11.7
SANTA BARBARA	278,868	5,115.3	54.5
VALLE	119,965	1,546.6	77.6
YORO	333,508	7,939.2	42.0
Total	4,443,721	112,070.0	39.7

Source: "CENSO NACIONAL DE POBLACION Y VIVIENDA 1988",
Secretaría de Estado, Planificación, Coordinación y Prespuesto(SECPLAN)

2.1.4 Administration

Honduras is divided into 18 Departamentos (hereinafter referred to as 'Departments') for the purpose of local administration. These are further subdivided into autonomous Municipios (hereinafter referred to as 'Municipalities'). Each Municipality consists of several villages.

Each Department has an honorable political governor appointed by the Minister of the Interior and Justice, however, actual administration of each Municipality is executed by the mayor elected.

Municipalities are shown in Table 2.1.4-1 and Figure 2.1.4-1.

Table 2.1.4-1 Municipalities of Honduras (1/2)

(01) ATLANTIDA		(02) COLON		(03) COMAYAGUA		(04) COPAN		(05) CORTES	
01	La Ceiba	01	Trujillo	01	Comayagua	01	Santa Rosa de Copán	01	San Pedro Sula
02	El Porvenir	02	Balfate	02	Ajuterique	02	Cabañas	02	Choloma
03	Esparta	03	Iriona	03	El Rosario	03	Concepción	03	La Lima
04	Jutiapa	04	Limón	04	Esquías	04	Copán Ruinas	04	Omoa
05	La Masica	05	Savá	05	Humuya	05	Corquín	05	Pimienta
06	San Francisco	06	Santa Fe	06	La Libertad	06	Cucuyagua	06	Potrerillos
07	Tela	07	Santa Rosa de Aguán	07	Lamaní	07	Dolores	07	Puerto Cortés
08	Arizona	08	Sonaguera	08	La Trinidad	08	Dulce Nombre	08	San Antonio de Cortés
		09	Tocoa	09	Lejamaní	09	El Paraíso	09	San Francisco de Yojoa
		10	Bonito Oriental	10	Meámbar	10	Florida	10	San Manuel
				11	Minas de Oro	11	La Jigua	11	Santa Cruz de Yojoa
				12	Ojo de Agua	12	La Unión	12	Villanueva
				13	San Jerónimo	13	Nueva Arcadia		
				14	San José de Comayagua	14	San Agustín		
				15	San José del Potrero	15	San Antonio		
				16	San Luis	16	San Jerónimo		
				17	*San Sebastián*	17	*San José*		
				18	Siguatepeque	18	San Juán de Opoa		
				19	Villa de San Antonio	19	San Nicolás		
				20	Las Lajas	20	San Pedro		
				21	Taulabé	21	Santa Rita		
						22	Trinidad de Copán		
						23	Veracruz		

(06) CHOLUTECA		(07) EL PARAISO		(08) FRANCISCO MORAZAN		(09) GRADIAS A DIOS		(10) INTIBUCA	
01	Choluteca	01	Yuscarán	01	Distrito Central	01	Puerto Lempira	01	La Esperanza
02	Apacilagua	02	Alauca	02	Alubarén	02	Brus Laguna	02	Camasca
03	Concepción de María	03	Danlí	03	Cedros			03	Colomoncagua
04	Duyure	04	El Paraíso	04	Curarén			04	Concepción
05	El Corpus	05	Güinope	05	El Porvenir			05	Dolores
06	El Triunfo	06	Jacaleapa	06	Guaimaca			06	Intibucá
07	Marcovia	07	Liure	07	La Libertad			07	Jesús de Otoro
08	Morolica	08	Morocelí	08	La Venta			08	Magdalena
09	Namasigue	09	Oropolí	09	Lepaterique			09	Masaguara
10	Orocuina	10	Potrerillos	10	Maraita			10	San Antonio
11	Pespire	11	San Antonio de Flores	11	Marale			11	San Isídro
12	San Antonio de Flores	12	San Lucas	12	Nueva Armenia			12	San Juan
13	San Isidro	13	San Matías	13	Ojojona			13	San Marcos de La Sierra
14	San José	14	Soledad	14	Orica			14	San Miguelito
15	San Marcos de Colón	15	Teupasenti	15	Reitoca			15	Santa Lucía
16	Santa Ana de Yusguare	16	Texiguat	16	Sabanagrande			16	Yamaranguila
		17	Vado Ancho	17	San Antonio de Oriente				
		18	Yauyupe	18	San Buenaventura				
		19	Trojes	19	San Ignacio				
				20	San Juan de Flores				
				21	San Miguelito				
				22	*Santa Ana*				
				23	Santa Lucía				
				24	Talanga				
				25	Tatumbla				
				26	Valle de Angeles				
				27	Villa de San Francisco				
				28	Vallecillo				

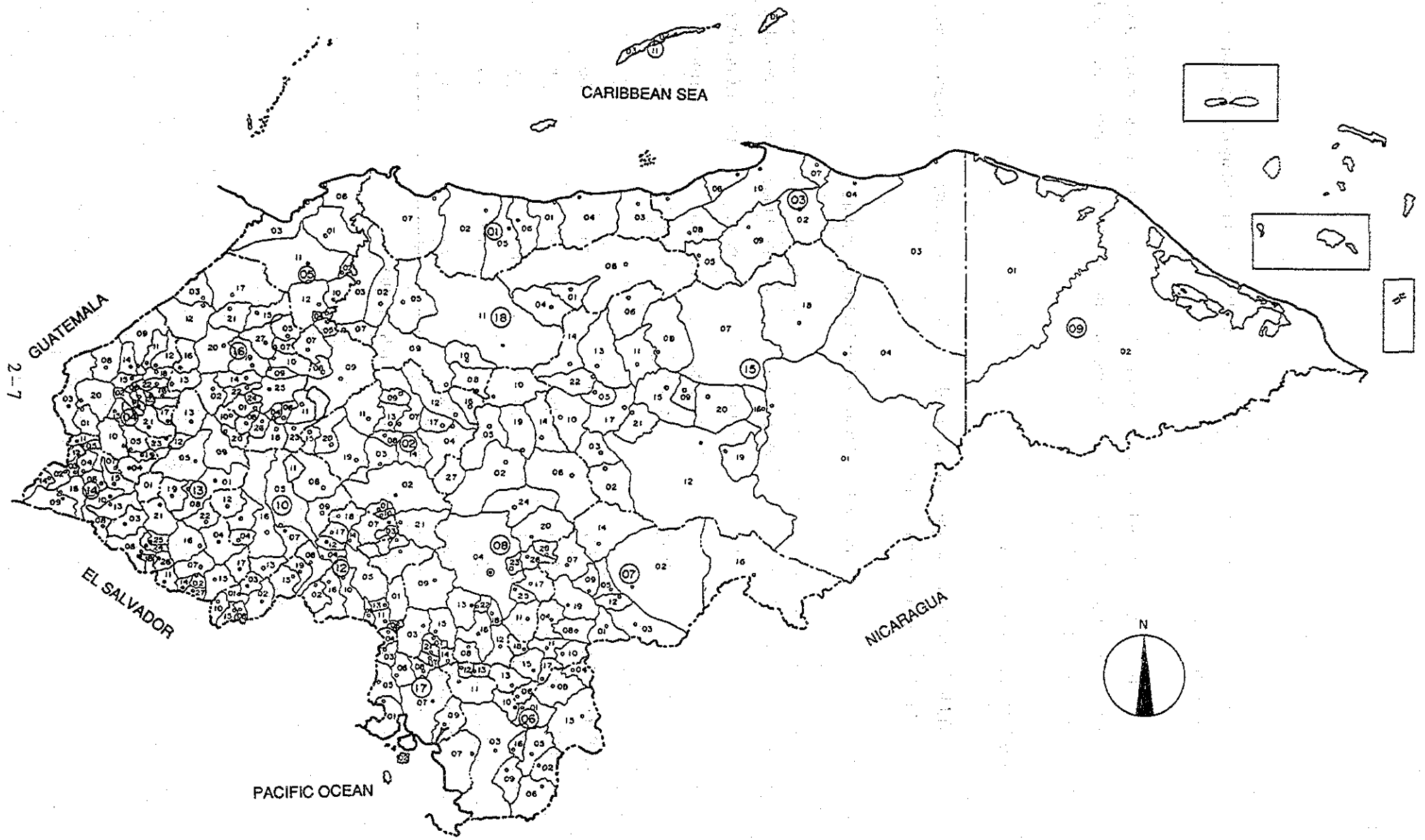
Table 2.1.4-1 Municipalities of Honduras (2/2)

(11) ISLAS DE LA BAHIA		(12) LA PAZ		(13) LEMPIRA		(14) OCOTEPEQUE		(15) OLANCHO	
01	Roatán	01	La Paz	01	Gracias	01	Nueva Ocotepeque	01	Juticalpa
02	Guanaja	02	Aguanqueterique	02	Belén	02	Belén Gualcho	02	Campamento
03	José Santos Guardiola	03	Cabañas	03	Candelaria	03	Concepción	03	Catacamas
04	Utila	04	Cane	04	Cololaca	04	Dolores Merendón	04	Concordia
		05	Chinacla	05	Erandique	05	Fraternidad	05	Dulce Nombre de Culmí
		06	Guajiquiro	06	Gualcince	06	La Encarnación	06	El Rosario
		07	Lauterique	07	Guarita	07	La Labor	07	Esquipulas del Norte
		08	Marcala	08	La Campa	08	Lucerna	08	Gualaco
		09	Mercedes de Oriente	09	La Iguala	09	Mercedes	09	Guarizama
		10	Opatoro	10	Las Flores	10	San Fernando	10	Guata
		11	San Antonio del Norte	11	La Unión	11	San Francisco del Valle	11	Guayape
		12	San José	12	La Virtud	12	San Jorge	12	Jano
		13	San Juan	13	Lepaera	13	San Marcos	13	La Unión
		14	San Pedro de Tutule	14	Mapulaca	14	Santa Fe	14	Mangulile
		15	Santa Ana	15	Piraera	15	Sensenti	15	Manto
		16	Santa Elena	16	San Andrés	16	Sinuapa	16	Salamá
		17	Santa María	17	San Francisco			17	San Esteban
		18	Santiago de Puringla	18	San Juan Guarita			18	San Francisco de Becerra
		19	Yarula	19	San Manuel Colohete			19	San Francisco de la Paz
				20	San Rafael			20	Santa María del Real
				21	San Sebastián			21	Silca
				22	Santa Cruz			22	Yocón
				23	Talgua				
				24	Tambla				
				25	Tomalá				
				26	Valladolid				
				27	Virginia				

(16) SANTA BARBARA		(17) VALLE		(18) YORO	
01	Santa Bárbara	01	Nacaome	01	Yoro
02	Arada	02	Alianza	02	Arenal
03	Atima	03	Amapala	03	El Negrito
04	Azacualpa	04	Aramecina	04	El Progreso
05	Ceguaca	05	Caridad	05	Jocón
06	Concepción del Norte	06	Goascorán	06	Morazán
07	Concepción del Sur	07	Langue	07	Olanchito
08	Chinda	08	San Francisco de Coray	08	Santa Rita
09	El Níspero	09	San Lorenzo	09	Sulaco
10	Gualala			10	Victoria
11	Ilama			11	Yorito
12	Macuelizo				
13	Naranjito				
14	Nuevo Celilac				
15	Petoa				
16	Protección				
17	Quimistán				
18	San Francisco de Ojuera				
19	San José de Colinas				
20	San Luis				
21	San Marcos				
22	San Nicolás				
23	San Pedro Zacapa				
24	San Vicente Centenario				
25	Santa Rita				
26	Trinidad				
27	Las Vegas				

TOTAL: 290 Municipalities

Figure 2.1.4-1 Map of Municipalities



2.1.5 Education

According to "HONDURAS en CIFRAS 1988-1990" published by the Central Bank of Honduras, the illiteracy rate in 1990 was 30.9%.

Enrollment ratios, which are expressed as the ratios of pupils to the population of school-age children, in primary school and secondary school were approximately 90% and 20%, respectively in 1990.

2.1.6 Standard of living indicators

Table 2.1.6-1 shows some of the standard of living indicators for Honduras and four other Central American countries.

Table 2.1.6-1 Standard of Living Indicators

	GNP in US$ (per capita) 1989	Daily calorie supply (per capita) 1988	Life expectancy at birth (years) 1989	Infant mortality (per 1,000 live births) 1989
HONDURAS	900	2,164	65	66
GUATEMALA	910	2,352	63	55
EL SALVADOR	1,070	2,415	63	55
NICARAGUA	N.A.	2,361	64	57
COSTA RICA	1,780	2,782	75	17

Source: "World Development Report 1991", The World Bank, 1991

2.2 Economic Trends

2.2.1 Economic performance in the 1980s

1) Economic structure

The agricultural sector, which produces bananas, coffee, and timber, represents the main activity of the Honduran economy. It generates a quarter of gross domestic product (GDP), 90% of exports, and employs half of the economically active population. Its growth rate has stagnated recently.

The manufacturing sector generates 17% of GDP, and employs 12% of the work-force. This sector in Honduras is still labor intensive, and producing processed-food, textile, timber & wood, and chemicals. Most of these products are for the domestic market.

Over the past decade, no major change in the economic structure was noted, except that the labor share of the agricultural sector decreased from 57% in 1979 to 47% in 1990. Figure 2.2.1-1 and 2.2.1-2 show the share of GDP and labor by sectors.

Figure 2.2.1-1 GDP Share by Sectors

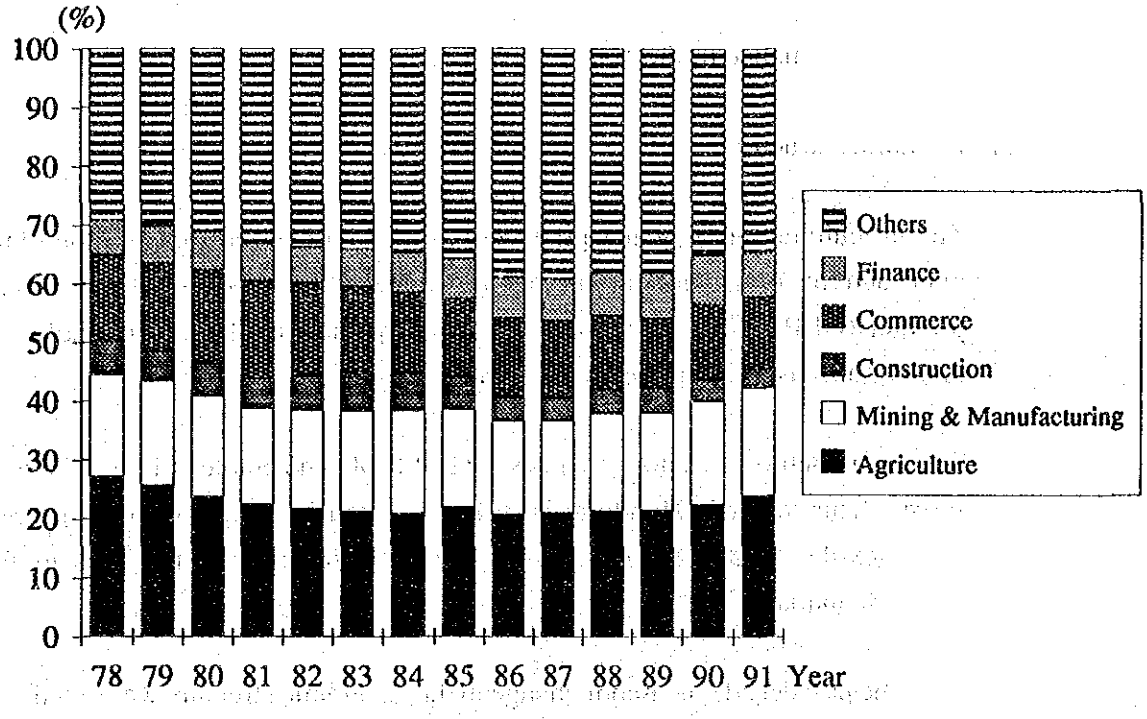
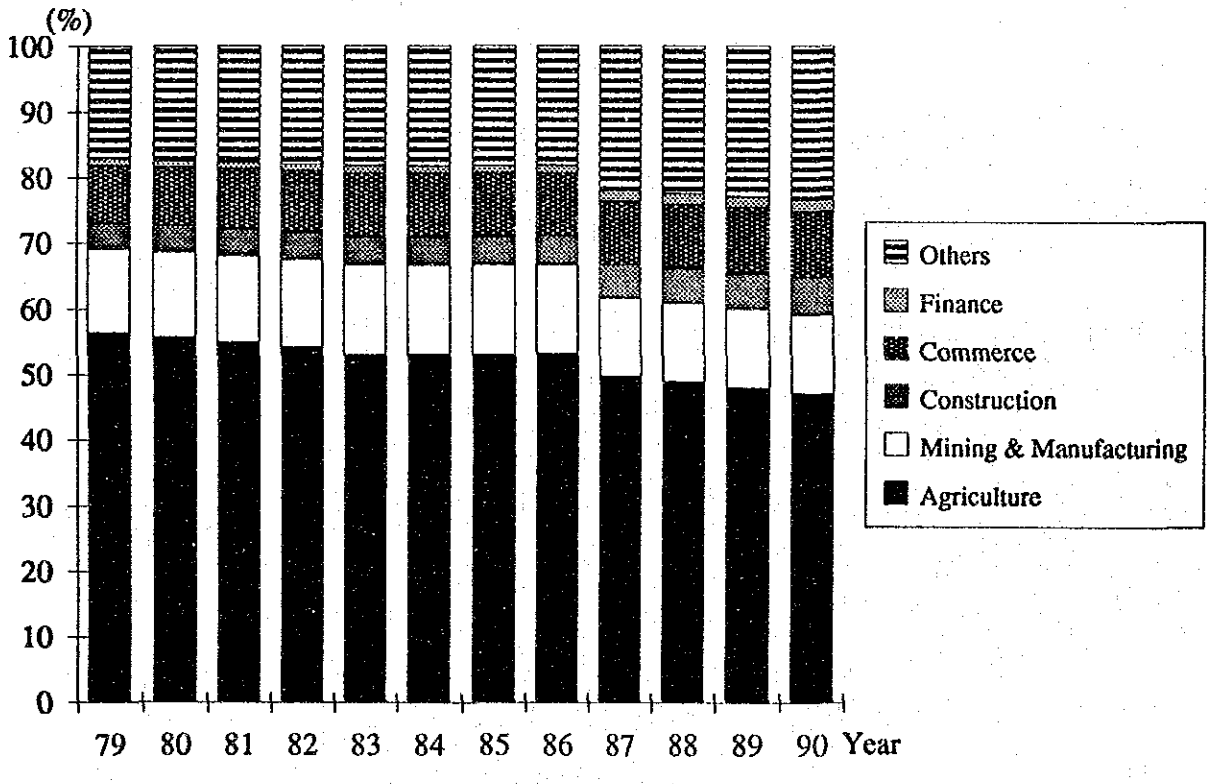


Figure 2.2.1-2 Labor Share by Sectors



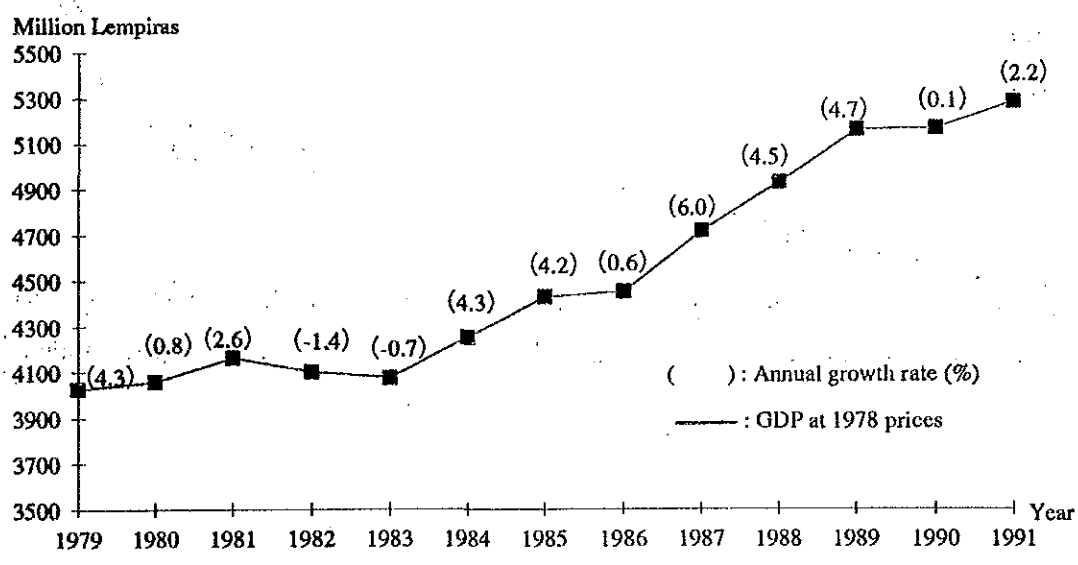
2) Economic growth

The economic growth rate of Honduras in 1982 and 1983 was negative because of weakened prices in its primary markets and recession in the major trading partners such as the USA and Central American countries.

The main reasons for the economic recovery between 1984 and 1986 were the increases of public investment concerning the El Cajon dam Project (1981-85), good harvests, and the increase in exports of bananas, crops and coffee. After the completion of the El Cajon dam Project in 1985, the growth of the service sector accelerated national economic growth. In 1987, the growth rate reached 6%, because of the good performance of the agricultural and service sectors. The construction and manufacturing sectors in 1988, and the mining and construction sectors in 1989 sustained economic growth. The economic growth rates were 4.5% and 4.7% respectively.

The growth rate in 1990 was almost zero as a result of flood damage in the northern area, the strike of workers in the banana sector, and fiscal austerity implemented by the new cabinet. Figure 2.2.1-3 shows GDP at constant prices of 1978 and annual growth rate of GDP.

Figure 2.2.1-3 GDP at Constant Prices



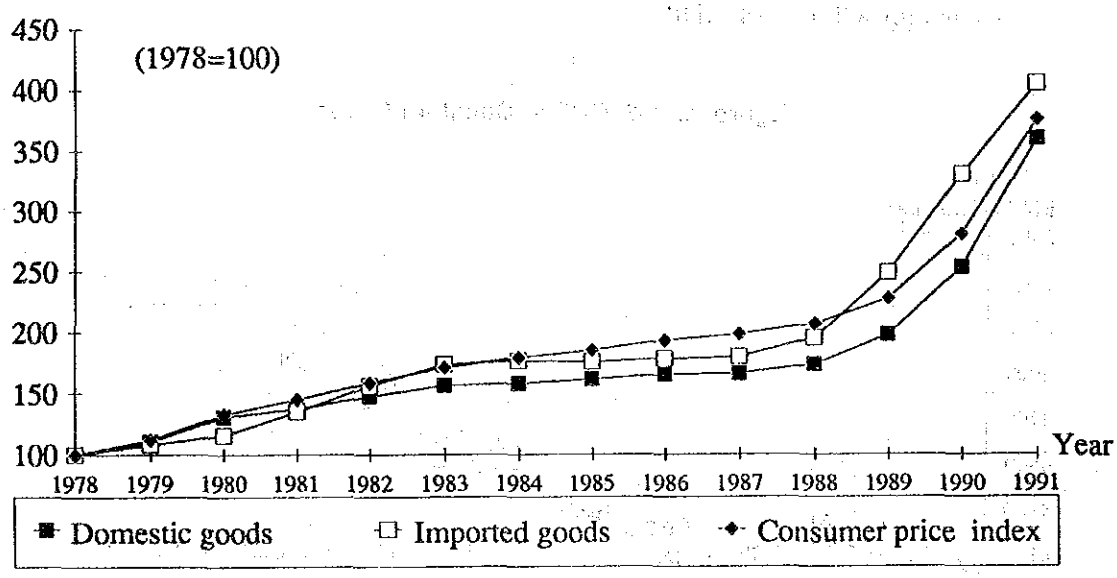
3) *Prices*

The inflation rate in Honduras had been relatively low: the average rate between 1974 and 1979 was 7.6%. This was because of the fixed foreign exchange rate and the price control of the foods and consumption goods.

From 1980 to 1983, the rise in the prices of primary products and the imported goods caused the inflation rate to stay high. From 1984 to 1987, the stable prices of the main trading partners, and the increased supply of agricultural products and imported goods kept the inflation rate between 2-4%. But in 1989, the rate exceeded 10% because of the bad harvest and "imported" inflation caused by adopting the parallel exchange rate.

In 1990, the devaluation of the Lempira, the increase in the charges for public utilities, government-controlled prices, and fruit prices produced an average annual inflation rate of 23%. Figure 2.2.1-4 shows the changes of prices.

Figure 2.2.1-4 Consumer Price Index (CPI)



4) Public finance

The public sector of Honduras consists of the general government (Central government, local government, social security, education, social services) and public corporations (Electricity, Telephone & Telegraph, Harbor facilities, Water supply, etc.).

The public finance was in the red in the 1980s with most of the deficit originating in the central government.

From 1982 to 1984, the increased investment in the El Cajon dam Project, the slow increase of tax revenue caused by weakened prices in the primary markets, and the recession in the national economy increased the deficit to 14.3% of GDP in 1983.

The deficit was reduced as a result of tax reform in 1985-86, but increased again after that and was 7.7% of GDP in 1989.

After 1990, the new cabinet's fiscal austerity measures such as tax reform and salary reduction for government officials reduced the deficit to 5.3% of GDP in 1990.

The financing of the deficit relied mainly on loans and aid from foreign countries. Since 1983, reliance on foreign loans became great because of the increased aid from the USA as a result of the Nicaraguan conflict. But after 1986, as it became difficult to borrow from foreign countries, financing by issuing national bonds and delays in debt repayment compensated the deficit.

5) Balance of payments

a) Trade

For commodity trade, the proportion of bananas and coffee is more than half of the total exports. Others include shrimp, lobster, beef, sugar, wood, lead, zinc, and silver. For imports, raw materials, oil and lubricants account for about 50%, consumption goods and capital goods, 25% each. Table 2.2.1-1 shows the main exports and imports.

The main trading partner, the USA, takes about 50% of the total exports, and provides about 40% of the total imports. Other main destinations for exports are Germany, Italy, and Japan. Japan, Venezuela, and Mexico follow the USA for providing imported goods.

Table 2.2.1-1 Trade (Unit: Millions of Lempiras)

Year	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Main Exports (FOB)											
Total	1465.0	1644.2	1507.2	1309.2	1343.6	1453.9	1529.2	1708.5	1616.1	1737.4	1880.7
Bananas	399.7	456.0	426.6	436.6	406.3	464.5	547.0	513.5	643,6	690.7	686.1
Coffee	393.7	408.2	345.7	306.2	302.4	338.2	370.4	644.1	399.8	384.2	381.8
Shrimp & lobster	48.5	46.8	52.5	55.9	72.0	99.6	81.9	90.7	116.8	164.0	158.6
Wood	84.1	72.4	86.3	89.3	80.8	69.7	68.2	64.6	69.5	59.6	50.9
Lead & zinc	54.9	40.0	41.3	32.4	49.6	76.1	71.8	64.9	38.0	60.1	177.5
Main Imports (CIF)											
Total	1663.9	2038.6	1920.0	1423.7	1605.2	1776.2	1791.0	1750.1	1797.3	1865.8	1962.1
Manufactured products	508.5	558.6	550.1	395.6	458.3	494.8	489.0	492.4	453.6	495.8	509.6
Machinery & transportation material	494.2	600.9	496.2	274.1	297.2	387.1	404.1	406.6	482.5	489.2	496.5
Chemical products	275.5	308.6	332.2	256.8	337.6	336.0	353.8	403.9	388.8	406.6	417.8
Oil & lubricants	226.0	342.3	326.4	340.1	327.6	359.2	317.1	194.7	238.5	229.8	292.9
Food products	113.3	171.1	154.6	116.9	146.5	154.3	160.7	165.8	170.4	179.9	184.4

Source: Central Bank of Honduras

b) Trend in the balance of payments

There was a deficit in the trade balance during the 1970s which became large during the 1980s. The main reasons were as follows:

- weakened prices in primary commodity markets such as bananas and beef
- recession in Central American countries
- halt in the growth of exports
- increase of imports.

In 1986, there was a surplus in the balance of trade because of the sharp rise in coffee prices and the decrease in the price of imported oil. In 1987, it returned to a deficit again, but in 1989 a surplus was achieved mainly by a rise in zinc exports.

There has been a deficit in the services account of the balance of payments primarily caused by the remittance in profits and the increase in the debt interest payment.

Owing to the above reasons, the current account balance has continued to be unfavorable.

In the capital account, the surplus decreased from 10% of GDP in the late 1970s to 8% in 1981 and 4% in 1982. This was because of in difficulty in borrowing new loans from private banks owing to the serious external debt-servicing problems which arose in Latin American countries. During 1983-85, the capital account had a great surplus due to the financing from the IBRD for the El Cajon dam Project and other financing from the IADB and USAID. But after the completion of the project in 1985, the loans from the international financial institutions and the surplus in the capital account decreased sharply. Table 2.2.1-2 shows the balance of payments.

Tablee 2.2.1-2 Balance of Payments (Unit: Millions of Lempiras)

Year	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Current balance	-384.1	-633.6	-605.4	-448.8	-438.4	-603.7	-408.3	-294.3	-449.7	-458.7	-543.1
(Share to GDP) (%)	-8.6	-12.4	-10.8	-7.7	-7.1	-9.1	-5.6	-3.9	-5.4	-5.0	-5.3
Trade balance	-53.8	-207.6	-229.6	-8.4	-115.2	-267.8	-179.1	34.4	-99.0	-47.3	5.4
Exports	1,513.0	1,700.5	1,567.6	1,353.0	1,397.3	1,491.3	1,579.2	1,782.5	1,688.7	1,786.0	1,933.4
Imports	1,566.8	1,908.1	1,797.2	1,361.4	1,512.5	1,759.1	1,758.3	1,748.1	1,787.7	1,833.3	1,928.0
Invisible trade balance	-371.2	-469.0	-430.8	-500.4	-412.2	-495.9	-520.4	-645.4	-613.3	-681.4	-692.6
Receipts	205.4	234.4	238.8	214.0	232.6	252.5	257.2	261.8	275.1	271.5	277.3
Payments	576.6	703.4	669.6	714.4	644.8	748.4	777.6	907.2	888.4	952.9	969.9
Net transfer	40.9	43.0	55.0	60.0	89.0	160.0	291.2	316.7	262.6	270.0	144.1
Net capital flow	391.8	563.1	455.7	254.1	388.1	637.2	510.1	385.4	486.5	456.1	384.0
Long-term capital	372.6	541.2	428.4	329.0	304.7	542.5	510.7	189.8	184.5	193.4	-13.1
Short-term capital	19.2	21.9	27.3	-74.9	83.4	94.7	-0.6	195.6	302.0	262.7	397.1
Errors & Omission	-41.6	-37.0	4.9	9.7	14.5	-48.4	-66.9	-102.9	42.5	47.9	147.6
Overall balance	-33.9	-107.5	-144.8	-185.0	-35.8	-14.9	34.9	-11.8	79.3	45.3	-11.5

Source: Central Bank of Honduras

6) Exchange

The fixed exchange rate of Lps. 2 (two Lempiras) to the dollar was used for more than a half century. But in the 1980s, as the balance of payments position became weak with the currency overvalued, the government introduced the parallel exchange rates; the official rate, the interbank rate, and the free rate. In 1990, the Callejas cabinet unified the rate.

7) Trade

In March 1990, the range of tariffs was reduced from 0-90% to 2-40%. It was further cut to 4-35% on January 1, 1991.

After March 13, 1990, the export tax on traditional goods was 12% and that on non-traditional goods was 9%. In September 1990, the export tax on non-traditional goods was repealed.

8) Foreign debt

The external debt of US$1,842 mn, or 69% of GNP in 1982, increased to US$2,732 mn, or 82% of GNP in 1985 because of the loans for the El Cajon dam Project from the IBRD, and for the Nicaraguan conflict from the USAID. After 1985, the difficulty in borrowing for new loans slowed the increase rate of foreign debt, however, the debt reached US$3,300 mn, or 86 of GNP in 1987.

The debt-service to export ratio rose from 22.9% in 1984 to 36.1% in 1988. Table 2.2.1-3 shows the debt data.

As the debt became large compared to the scale of the national economy, Honduras negotiated with the creditors for the rescheduling of repayment in 1986 and 1989.

The proportion of long-term loans to the total debt was 88% in 1989, with 90% of it coming from foreign governments and the international financial institutions such as the IADB and IBRD.

Table 2.2.1-3 Debt Data (Unit: US$ millions)

Year	1982	1983	1984	1985	1986	1987	1988	1989
TOTAL DEBT STOCKS	1,842	2,125	2,284	2,732	2,974	3,302	3,304	3,349
Long-term debt	1,571	1,822	1,936	2,282	2,503	2,816	2,855	2,907
Use of IMF credit	119	161	149	147	110	77	37	35
Short-term debt	152	142	199	303	361	409	412	407
(Share of short-term debt) (%)	8.3	6.7	8.7	11.1	12.1	12.4	12.5	12.2
TOTAL DEBT FLOWS								
Disbursements	324	303	270	348	217	250	307	153
Long-term debt	256	254	270	348	217	250	307	153
IMF purchases	68	49	0	0	0	0	0	0
Principal repayments	92	83	86	101	157	215	212	76
Long-term debt	92	83	84	82	105	169	176	76
IMF repurchases	0	0	2	19	52	46	36	0
Short-term debt's net flows	–	–	–	90	39	2	-25	-48
Net flows on debt	232	220	184	337	99	37	70	29
Interest payments	152	120	112	128	142	127	158	69
Long-term bebt	112	97	88	101	114	94	129	46
IMF charges	4	8	11	11	10	6	4	0
Short-term debt	36	15	13	16	18	27	25	23
Net transfers on debt	80	100	72	209	-43	-90	-88	-40
Total debt service	244	203	198	229	299	342	371	145
Long-term debt	204	180	172	183	219	263	305	121
IMF repurchases & charges	4	8	13	30	62	52	41	1
Short-term debt (interest)	36	15	13	16	18	27	25	23
Exports of goods & services	784	815	863	918	1,022	982	1,029	1,105
Debt Service Raito (%)	31.1	24.9	22.9	24.9	29.3	34.8	36.1	13.1
GNP (US dollar)	2,680	2,866	3,053	3,314	3,545	3,827	4,195	4,622
Total Debt Stocks/GNP (%)	68.7	74.1	74.8	82.4	83.9	86.3	78.8	72.5

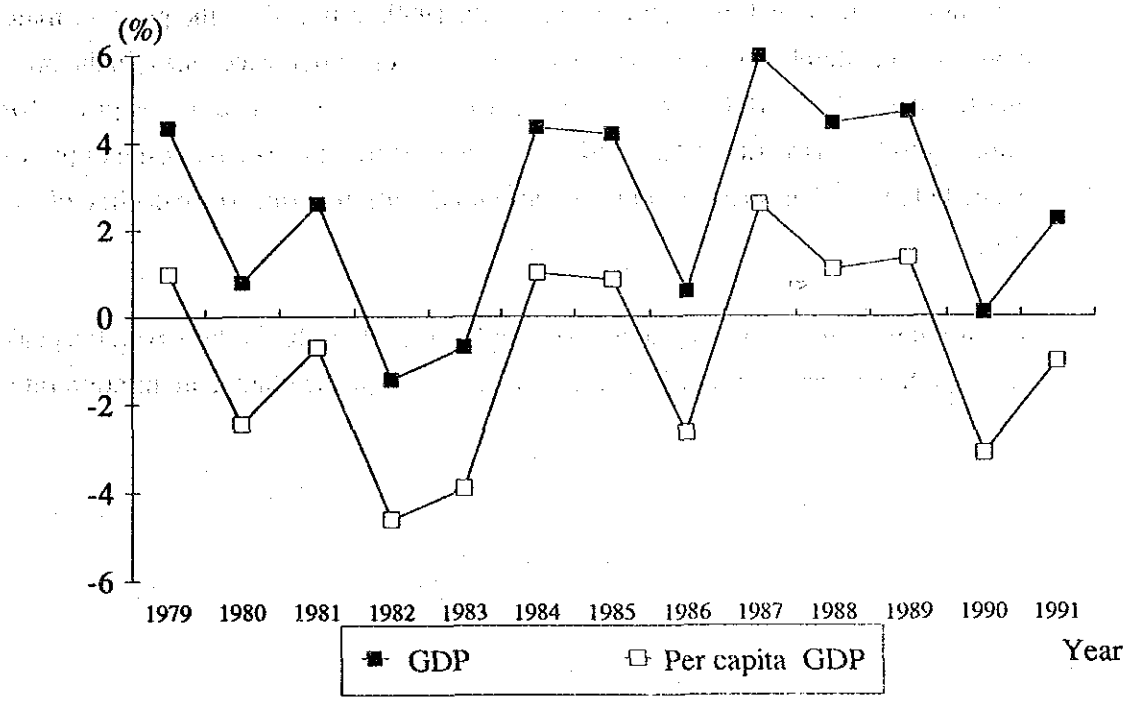
Source: 'World Debt Table 1990-91', The World Bank, 1990

2.2.2 Recent economic trends

1) Economic growth

The growth rate of real GDP in 1990 was almost zero and estimated at 2.2% in 1991. As the population growth rate(3.3%) is higher than the economic growth rate, per capita GDP has not increased. Figure 2.2.2-1 shows the growth rate of GDP.

Figure 2.2.2-1 Real GDP Growth Rate



Agriculture is the most important sector for Honduras, however, the following prevent it from developing rapidly;

- 65% of the total area is mountainous; only 30% is cultivated land.
- Main products are bananas and coffee, which are not suitable for mechanization.
- The influence on the economy by the US, the largest trading partner, is quite large.
- The main export commodities are primary products, whose prices fluctuate very much.

In the industrial sector, the government is expecting a good performance in the Export Processing Zones (EPZs), where the South Korean presence is particularly notable.

For continuous economic development, a high priority for investment is given to the infrastructure such as the construction of roads, ports, housing, and sewage.

2) Prices

Consumer prices had been quite steady until 1989. After that the price climate changed considerably; prices, as measured by the consumer price index, in the third quarter of 1989 rose 10.6% from a year earlier mostly because of rising prices for import goods. In the first quarter of 1991, the year-to-year rise in consumer prices exceeded 39%. This was because of "imported" inflation due to the decline of the lempira.

The annual increase rate in prices is still high (more than 30%), however, the peak seems to have passed. Figure 2.2.2-2 and 2.2.2-3 show the change in inflation rate.

Figure 2.2.2-2 Inflation Rate (1986-91)
(Quarterly year-to-year rate)

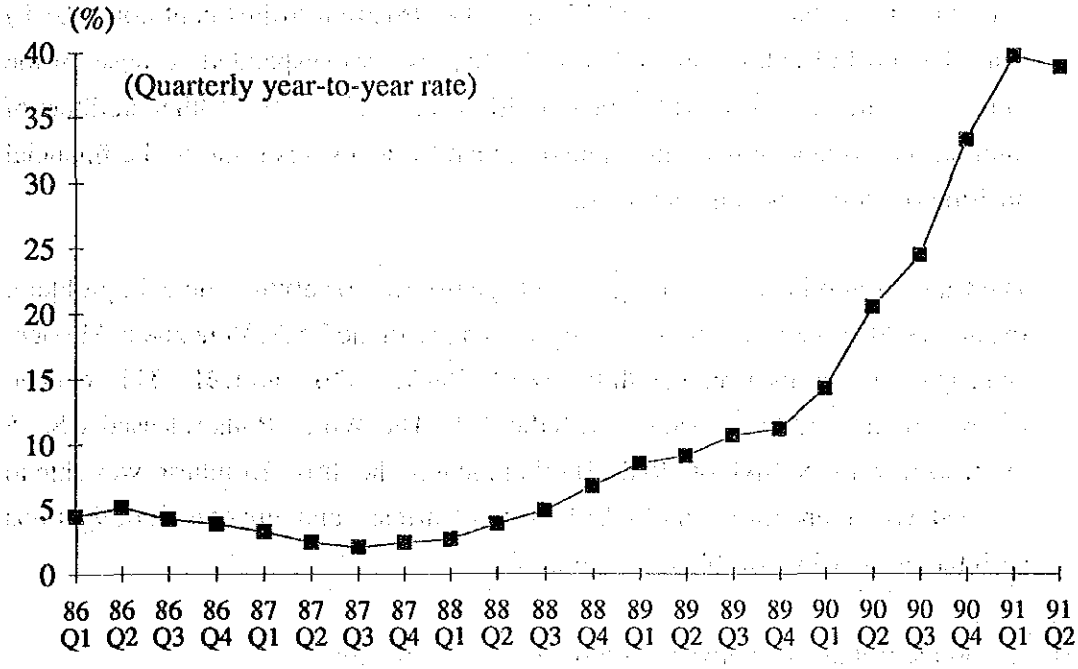
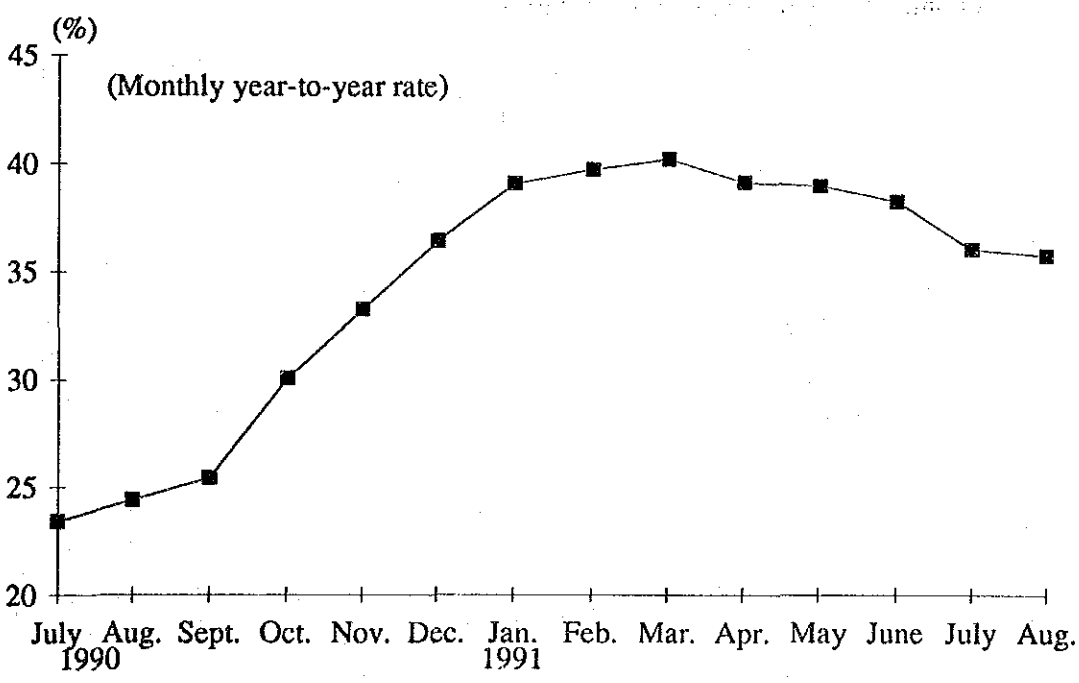


Figure 2.2.2-3 Inflation Rate (1990-91)
(Monthly year-to-year rate)



3) Foreign debt

After the first disbursement of US$25 mn of the Structural Adjustment Loan (SAL) from the World Bank in September 1988, the rest was suspended because of the failure in achieving the World Bank conditions in January 1989. Other creditors of international financial institutions also suspended loans, resulting in the financial position of Honduras being strained.

The Callejas administration has given a high priority to solving the debt problem. In June 1990, Honduras tied up a bridging loan with the USA, Venezuela, Mexico, and Japan to clear its arrears with the World Bank, IADB, and IMF. This opened the way for a stand-by agreement with the IMF. The World Bank released US$25 mn frozen from the SAL of 1988. Having pleased the IMF, Honduras was able to proceed with a renegotiation of US$170 mn of arrears and impending obligations with the Paris Club of bilateral creditors.

4) Economic imbalance between urban areas and rural areas

Statistics about gross domestic product by region do not exist in Honduras. Table 2.2.2-1 shows income tax by each Department. As can be seen, the differences in annual income taxes per taxpayer are quite large. This means that there exists large economic imbalances among the regions.

Table 2.2.2-1 Individual Income Tax by Department

Department	[A] (*) Individual income tax (1990) (Thousand of Lempiras)	[B] (**) Economically active population (1988) (Persons)	[C] [A]/[B] (Lempiras/Persons)
FRANCISCO MORAZAN	67,471.6	289,861	232.8
COMAYAGUA	2,739.3	70,350	38.9
LA PAZ	243.3	30,901	7.9
OLANCHO	688.7	77,720	8.9
ATLANTIDA	7,281.2	71,367	102.0
COLON	357.9	41,453	8.6
CORTES	67,031.8	230,349	291.0
ISLAS DE LA BAHIA	352.2	7,862	44.8
YORO	2,244.2	96,741	23.2
GRACIAS A DIOS	7.9	9,033	0.9
COPAN	1,571.7	68,497	22.9
INTIBUCA	43.7	35,417	1.2
LEMPIRA	51.7	52,518	1.0
OCOTEPEQUE	81.1	22,121	3.7
SANTA BARBARA	289.1	87,384	3.3
EL PARAISO	1,176.8	77,654	15.2
CHOLUTECA	1,972.9	89,656	22.0
VALLE	104.6	34,181	3.1
Total	153,709.7	1,393,065	110.3

Source : (*) Information presented for this Study by Ministerio de Hacienda y Credito Publico
(**) "DIAGNOSTICO EMPRESARIAL 1990", HONDUTEL

2.3 National Development Plan

The following are extracts from "Strategy for 1990-1994 integral development" prepared by the government of Honduras for the consultative group meeting in Paris on December 5, 1990.

2.3.1 Macroeconomic goals

For the 1991-1995 period, an economic recuperation is projected with a growth rate ranging between 3% and 4%. This performance will be due to an expected increase in exports and private investment.

The total amount of financial requirements for 1990-94 is US$2,489 mn, which includes support grants for the balance of payments, external donations, mid-term project grants, and other operations to pay-off arrears and refinancing payments.

2.3.2 Social goals

- During the 1991-1994 period, literacy training to 260,000 people is expected to be provided.
- For peasant women, 200 centers will be opened to provide literacy training for 10,000 women.
- The student/teacher ratio is expected to be reduced from 80 to 30-40 students per teacher.
- The enrollment rate in school of children aged 4 to 6 years, and 14 to 19 years will be increased from 13% to 27%, and from 42% to 60%, respectively.
- 100 agro-industrial technical education centers are expected to be created, with a capacity of 80 students each.
- The drinkable water supply will cover 73% of the rural area and 83% of the urban area by 1994.
- Nearly all of the children under one year old is planned to be vaccinated.

2.3.3 Social situation

1) Population

- The annual growth rate is 2.8%.
- Urban population is 40%.
- The birth rate is still high: 38 per thousand population.
- The population is very young: 47% under 15 years old.

2) Unemployment

- Estimated unemployment rate is around 9%; it is over 15% in some provinces, and does not reflect disguised unemployment.

3) Poverty and income distribution

- As a result of a low per capita income and an uneven income distribution, it is estimated that approximately 70% of the families live in poverty conditions and 54% in extreme poverty. This situation becomes critical in rural areas.

4) Education

- Illiteracy rate is 32% at a national level and 42.4% in rural areas.

5) Health

- 30% of the population lack access to basic health services.
- Infant mortality in rural areas is twice as much as in urban areas.
- 69% of houses have access to drinkable water services; 59% are supplied by aqueducts and 10% by wells.
- 41.2% of houses lack sanitation services.

6) Food and nutrition

- Low birth weight rate, at a national level, is 20%.
- 57% of the children under five years old, 40% of children from six to nine, and 40% of pregnant women are malnourished.

7) Housing

- 19% of houses are built with makeshift materials and lack basic sanitary services.
- 43% of houses need repairs and some basic sanitary services.

2.3.4 Communications' strategic guideline

To achieve the communications' objective, projects under execution will be continued and other new ones will be started, geared to satisfy the population's service needs. Specifically, there will be enlargements and new installations in the 25 most important cities of the country, as well as in the transmission network. Additionally, other areas will be included in the communication services and some post office buildings will be improved.

2.3.5 Classification of Department by socio-economic condition

1) Departments classified as having most critical conditions
COPAN, LEMPIRA, INTIBUCA, SANTA BARBARA, GRACIAS A DIOS

2) Departments classified as having relatively good conditions
CORTES, FRANCISCO MORAZAN, ATLANTIDA, ISLAS DE LA BAHIA

3) Departments classified as having average conditions
COLON, COMAYAGUA, CHOLUTECA, EL PARAISO, LA PAZ, OCOTEPEQUE, OLANCHO, VALLE, YORO

2.4 Regional Development Plans

16 Departments (171 Municipalities) were investigated in the Study. Almost all Municipalities had information on regional development plans. The total number of plans was 293.

The average number of plans per Department (a.d.) and the average number of plans per Municipality (a.m.) are as follows:

- a.d. : 18.3 plans
- a.m. : 1.71 plans

The plans were projected such that provision for the improvement of the infrastructure was given priority in each Department in Honduras.

- Construction and maintenance of schools : 66 plans
- Construction and maintenance of roads : 61 plans
- Construction and maintenance of water supply facilities : 47 plans
- Construction and maintenance of sewerage drain facilities : 39 plans
- Installation and supply of electric power facilities : 36 plans

For example, the contents of the projects of Department Cortés have the largest number of the plans and the proportion to total projects in the Department are as follows:

- Construction and maintenance of schools : 26.3%
- Construction and maintenance of roads : 21.1%
- Construction and maintenance of water supply facilities : 18.4%
- Construction and maintenance of sewerage drain facilities : 13.2%
- Installation and supply of electric power facilities : 2.6%

The contents of the projects of Department Colon, that have the lowest number of the plans, are as follows:

- Construction and maintenance of schools : 50 %
- Construction and maintenance of roads : 50 %

The order of the number of the plans per each Department is shown as follows:

Best three	Worst three
– Department Cortés	– Department Colón
– Department Copán	– Department Valle
– Department El Paraíso	– Department Ocotepeque

Thus the complete provision of the infrastructure is projected in accordance with the actual circumstances of each Department in Honduras.

The local governments do not make the telecommunications plan because it is within the jurisdiction of HONDUTEL. However, a strong desire for telephone service was made to HONDUTEL by people in almost every community areas visited. Interviewed municipality authorities informed the Study Team that they had submitted requests to HONDUTEL for years.

2.5 Socio-economic Situation in Rural Areas

2.5.1 Economic activity in each Department

1) Francisco Morazán

Main economic activities: commercial, manufacturing, construction, agriculture.

More than half population of this Department lives in the Capital, Tegucigalpa. Main industries are textiles, fabrics, beer brewing, construction, and printing, in the Capital; agriculture and forestry outside of the Capital.

2) Atlántida

Main economic activities: agriculture, manufacturing.

Main products: bananas, citrus fruits, coco, oil palm.

The economy is based on banana plantations. Bananas are shipped to the US from the ports of La Ceiba, and Tela. At La Ceiba, there are some plants manufacturing of margarine, soap, and vegetable oil. In rural areas, cultivation of grain and stock-farming are popular.

3) Colón

Main economic activities: agriculture, forestry, fishery.

Main products: grain, oil palm, coco.

Population density is low (16.9 Persons/Km^2).

4) Comayagua

Main economic activities: agriculture, forestry, commerce.

Main products: corn, rice, kidney beans, sugarcane, coffee.

5) Copán

Main economic activities: agriculture.

Main products: grain, kidney beans, coffee, tobacco, corn.

6) Cortés

Main economic activities: agriculture, manufacturing, commerce.

Main products: bananas, sugarcane, corn, rice, oil palm, citrus fruits, pineapples, livestock, cement, beer, sugar, clothes, dairy products.

The most important Department from the economic aspect. San Pedro Sula is the center of industry. Puerto Cortes is an important shipping port.

7) Choluteca

Main economic activities: agriculture, stock-farming.

Main products: grain, kidney beans, sugarcane, coffee, cotton, cattle, pig, salt.

At Choluteca there are sugar manufacturing companies and salt farms.

8) El Paraíso

Main economic activities: agriculture, stock farming.

Main products: coffee.

9) Gracias a Dios

Main economic activities: agriculture.

Main products: rice.

Population density is quite low. (2.1 Persons/Km^2)

People are living in a self-sufficient economy.

10) Intibucá

Main economic activities: agriculture (small scale).

Main products: grain and fruits for self-sufficiency.

11) Islas de la Bahía

Main economic activities: tourism.

Islands in the Caribbean Sea. Many tourists come from the USA.

12) La Paz

Main economic activities: agriculture.

Main products: coffee, sugarcane.

13) Lempira

Main economic activities: agriculture (small scale).

Main products: corn and wheat.

14) Ocotepeque

Main economic activities: agriculture, stock farming.

Main products: wheat, tobacco, corn, coffee.

15) Olancho

Main economic activities: agriculture, forestry.

Main products: grain, bananas, coffee, oil palm.

The largest Department in Honduras (24,351 Km^2).

16) Valle

Main economic activities: agriculture, stock farming.

Main products: grain, cotton, chicken, pig, goat, salt.

Amapara and San Lorenzo are important shipping ports.

17) Santa Bárbara

Main economic activities: agriculture, stock farming.

Main products: grain, coffee, livestock.

18) Yoro

Main economic activities: agriculture, stock farming, forestry.

Main products: bananas, grain, coffee.

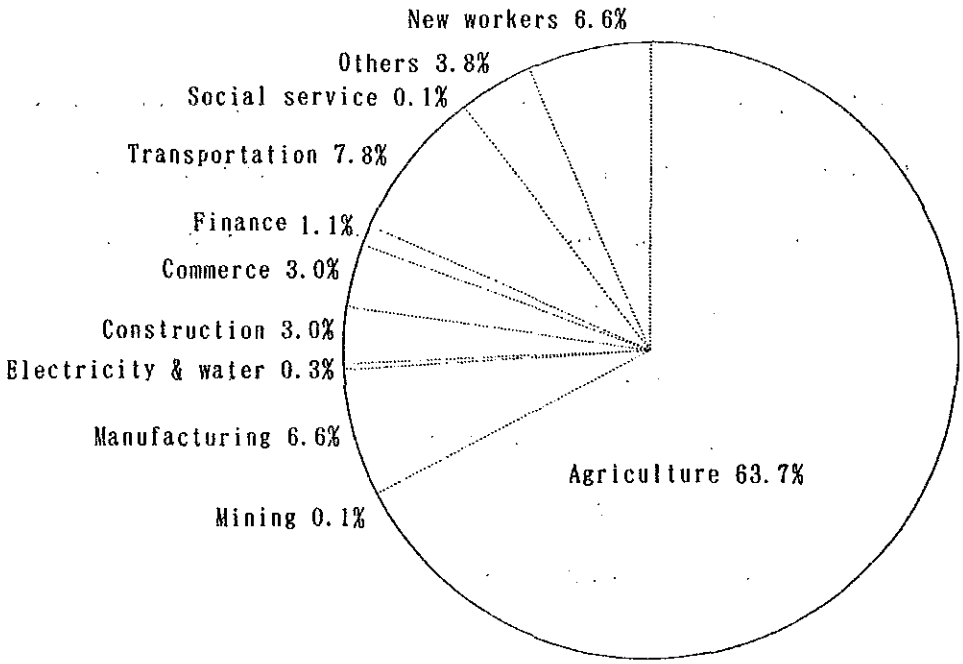
2.5.2 Features of rural areas

The features of 191 villages that the Study Team actually visited are as follows:

1) Most villages are isolated by mountains, rivers, and wilderness.
2) Villages in the northern part exist among banana or palm trees.
3) 49 villages do not have electricity service.
4) 191 villages do not have general telephone service.
5) 11 villages do not have water supply service.
6) 23 villages do not have postal service.
7) 169 villages have health centers.
8) 191 villages have elementary schools.
9) 124 villages have secondary schools.
10) Most houses gather in an area of one square kilometer surrounding the center of each village.
11) The population of more than half villages is 1000-3000.
12) Service qualities of electricity and water supply are poor.
13) Access road conditions to the villages are bad.
14) Some rivers have no bridge.
15) Most people are engaged in the agricultural sector.
16) The scale of agriculture and stock-farming is very small.
17) Large scale agriculture and stock-farming can be seen only in the plains.

Figure 2.5.2-1 shows the labor share of the subject areas at the Municipality level.

Figure 2.5.2-1 Labor Share of the Subject Areas



Source: "Population census, 1988", Bureau of Statistics

CHAPTER 3 PRESENT STATE OF TELECOMMUNICATIONS IN HONDURAS

CHAPTER 3 PRESENT STATE OF TELECOMMUNICATIONS IN HONDURAS

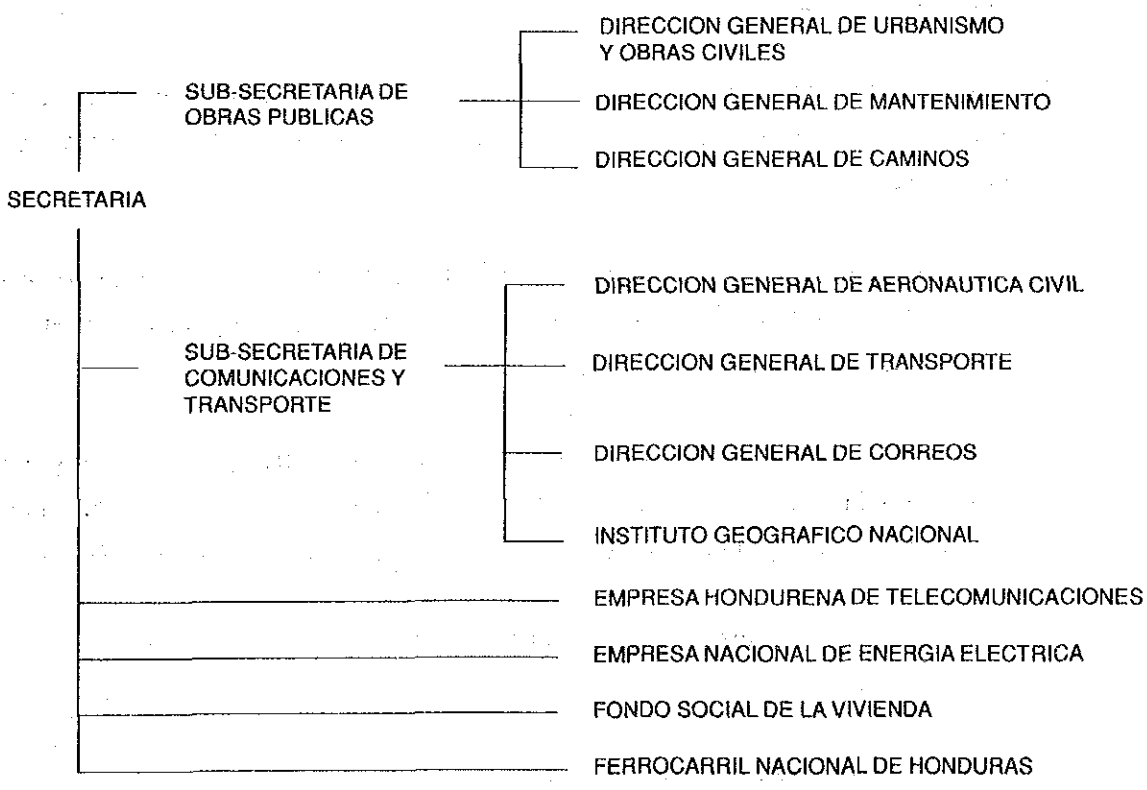
3.1 Organization

3.1.1 General

Governmental organizations in charge of telecommunications are the Ministry of Communications, Public Works and Transportation (Secretaria de Comunicaciones, Obras Publicas y Transporte, hereinafter referred to as "SECOPT") and HONDUTEL.

SECOPT, which controls HONDUTEL, oversees policies on telecommunications and coordinates them with other policies. The organization chart of SECOPT is shown in Figure 3.1.1-1.

Figure 3.1.1-1 Organization Chart of SECOPT



3.1.2 Organizational structure of HONDUTEL

The present state of organizational structure is shown in Figure 3.1.2-1 and the details are shown in Appendix 3.1.2-1.

The Directive Board (Junta Directiva) decides policies, development plans, and operation plans, which are concerned with the telecommunications services.

The Committee of the Directive Board consists of the Ministers of SECOPT, Interior and Justice (Secretaría de Gobernación y Justicia), National Defense (Secretaría de Defensa Nacional), Finance (Secretaría de Hacienda y Crédito Público), and Culture and Tourism (Secretaría de Cultura y Turismo). The Minister of SECOPT acts as the chairman of the Committee.

HONDUTEL provides services that are decided upon by the Directive Board.

The General Manager of HONDUTEL has no voting right, but can propose telecommunications policies and plans, and can attend the Directive Board meetings. The Directive Board has the Internal Audit.

The following four departments: Human Resources, Radio Communications, Legal, and Relations, are under the management of the General Manager and the Assistant Manager of HONDUTEL.

The telecomunications operation of HONDUTEL is mainly executed by three Divisions: Development, Exploitation, and Administration, which are also organized under the General Manager and the Assistant Manager.

The Development Division has two support departments: Strategical Planning and Organization & Methods, and has three Directions: Engineering & Project, Information Communications, and Planning & Control. The principal functions are as follows:

- Development of the telecommunications network
- Planning of maintenance
- Outlining of telecommunications project
- Planning

- Technical study for information network outlining
- Processing of data

The Exploitation Division has four support departments: Electronics Laboratory, Service Productivity & Service Quality, Standard & Authorization, and Technical Assistance, and controls five Directions: Commercial Service, International Service, Central-South, North-West, and Atlantic Coast Directions. The details of three regional Directions are as follows:

a) Central-South Direction

This Direction is composed of Tegucigalpa, Central, and South District offices, which are located in Tegucigalpa, Comayagua, and Choluteca cities. Each District office has eight sections: maintenance, trunk circuit, communications service, commercial service, telegraph & national radio, local, outside plant, and administration.

b) North-West Direction

This Direction is composed of Central and West District offices. The organization of the West District office is nearly equivalent to Central District office.

c) Atlantic Coast Direction

This Direction has an Urban Center, which has the same function as a District office.

The Administration Division is composed of Documentation, Internal Security, and Technical Assistance Sections.

Figure 3.1.2-1 Organizational Structure of HONDUTEL (March 1992)