

R. Ichord

**CITY OF TACLOBAN
PHILIPPINES**

PN-AAT-959
ISN 42515

62

SITUATION REPORT

**MANAGING ENERGY AND RESOURCE
EFFICIENT CITIES**

DECEMBER 1981

PREPARED BY CITY OF TACLOBAN

FOR

US AID

WASHINGTON, D.C. WORKSHOP

936-5402

000184

S

Mr. Ichord

UNITED STATES GOVERNMENT

memorandum

DATE: December 3, 1981

REPLY TO
ATTN OF: S&T/UD, Eric Chetwynd, Jr. *EC*

SUBJECT: Workshop on Managing Energy and Resource Efficient Cities:
Pre-test in Tacloban, Philippines

TO: SEE DISTRIBUTION

You are invited to attend all or any part of a two-day workshop on Energy and Resource Efficient Cities December 10-11, 1981. The workshop, sponsored by S&T/UD and conducted by Coopers and Lybrand at its Washington, D.C. offices, is one of a series of Philippine and U.S. workshops leading to development of an energy and resource conservation strategy for the City of Tacloban (population 106,000) in Leyte, the Philippines. This collaborative effort in Tacloban, involving S&T/UD, Asia Bureau, the Mission, the City of Tacloban and the Philippine Government, is part of an intensive effort to develop an S&T Bureau Project Paper, Managing Energy and Resource Efficient Cities. In its development of the PP for the interregional project, S&T/UD will integrate the Tacloban experience with other substantive materials being prepared by contractors.

This workshop is strictly a "sleeves up" working session involving the mayor, the city administrator, the city development coordinator and other key project operators from the City of Tacloban, along with U.S. experts representing various sectors in which energy and resource conservation is a factor. You are invited because of your participation in the PID review of this project last May or because of your current involvement in development of the project. We extend this invitation to give you an opportunity to gain a feel for the process that is underway and the technical issues and solutions that are emerging. As such, you should feel free to attend any portion of the workshop that interests you and fits in with your schedule.

The attached S&T/UD trip report will give you some background on developments to date, our expectations for the forthcoming workshop, and future steps. Material being prepared for the workshop will be sent to you as soon as it is made available to us. Also attached is the outline of activities so that you may plan your attendance. We ask that you notify Ms. Diannah McDaniel, S&T/UD (235-9062), of your attendance plans.

Attachments:
A/S

DISTRIBUTION

S&T, Ruth Zagorin
S&T/RAD, Jerome French
S&T/PO, Robert Meehan
S&T/EY, Pamela Baldwin
S&T/FNR, Molly Kux
AA/PPC, Stephen Kline
PPC/PDPR, Harold Lubell
FPC/PDPR, Maureen Lewis

AFR/DR, Robert MacAlister
AFR/DR/SDP, Sally Patton
ASIA/TR, Robert Ichord
ASIA/PTB, Dennis Chandler
LAC/DR, Thomas McKee
LAC/DR, Carl Duisberg
NE/TECH, Robert Mitchell
NE/TECH, George Self

04 DEC 1981

OPTIONAL FORM NO. 10
(REV. 1-80)
GSA FPMR (41 CFR) 101-11.6
5010-114

SCHEDULE OF ACTIVITIES

Tuesday, December 8, 1981

- Philippine group arrives from observation tour at Davis, California

Wednesday, December 9, 1981

- Morning: Philippine group meets with S&T and Asia Bureau representatives (tentative)
- Afternoon: Pre-workshop planning session at Coopers & Lybrand
- Evening: Reception at International Club, 18th and K Streets, N.W. (Southwest corner -- convenient to Farragut West Metro Station)

Thursday, December 10, 1981

- ✓ -- 9:00 a.m. - 5:00 p.m.: First Workshop Session, to cover Introductions, Land Use, Transportation, and Energy and Electric Power -- Coopers & Lybrand Offices, 4th Floor, 1800 M Street, N.W., North Tower (check in with receptionist -- coffee available at 8:30 a.m.)
- 6:30 p.m.: Social hour and dinner at International Club

Friday, December 11, 1981

- 9:00 a.m. - 5:00 p.m.: Second Workshop Session, to cover Water and Sewer, Solid Waste, Building Materials, and Conclusions -- Coopers & Lybrand Offices.

WORKSHOP RESULTS WILL BE MADE AVAILABLE TO ALL PARTICIPANTS.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	
Anthony M. Schwarzwaldler, Director, USAID/Phil.	xvi
Obdulia R. Cinco, City Mayor, City of Tacloban	xvii
TACLOBAN CITY PROFILE	1
HISTORY	1
LOCATION, AREA, AND ITS USE	1
CLIMATE	2
POPULATION AND INCOME	3
SOCIO-ECONOMIC ACTIVITIES	3
Trade and Commerce	3
Tourism and Industry	4
Education	5
INFRA-UTILITIES	5
Transportation Network	5
Power	6
Water	7
Solid Waste, Drainage and Sewerage System	8
FISCAL ADMINISTRATION	8
ADMINISTRATIVE STRUCTURE	9
EXHIBITS	
1 - Map of the Republic of the Philippines	11
2 - Map of Tacloban City (Proper)	12
3 - Climate, Tacloban City, 1979-1980	13
4 - Revenue By Sources, Tacloban City, 1976-1980	14

5 - Local Government Expenditures by Major Function, Tacloban City, 1976-1980	16
6 - Revenue and Expenditures, Infrastructure Fund, Tacloban City, 1976-1980	18
7 - Organizational Chart, City Government, Tacloban City	19
8 - Conversion Table	21
THE ROLE OF TACLOBAN CITY IN THE DEVELOPMENT OF EASTERN VISAYAS, Region VIII	22
1. General Description of Region VIII	22
2. The Regional Economy	23
3. Problems and Challenges Confronting Regional Development Efforts	24
4. Strategies for Development	26
5. The Role of Tacloban City in the Region	28
6. Major Programs and Projects That Will Affect Tacloban City (1982)	32
TABLE	34
1 - Tacloban City and Region VIII, Socio-Economic Indicators	34
MAPS	35
1 - Map of the Philippines Showing Eastern Visayas, Region VIII	35
2 - Eastern Visayas, Region VIII	36
INTRODUCTION	37
A. History of the Project	37
B. Organization of Tacloban Workshop	40
C. Energy and Resource Conservation	40
D. Overview of Tacloban Situation	42

LAND USE	44
I. AREA OF RESPONSIBILITY	44
II. SITUATIONAL ANALYSIS	45
A. Preface	45
B. General Land Use	46
1. Urban Land Use	46
2. Rural Land Use	48
C. The Land Use Plan	49
D. Institutional Framework	53
III. CONSERVATION PROBLEMS AND OPPORTUNITIES	55
1. Resource Efficiency Guidelines and Performance Standards for Land Use Planning and Zoning	55
2. Urban Farming	57
3. Aqua-marine Production in Unproductive Marshlands or Swamplands	59
4. Location and Development of Industrial Site	59
5. Location and Development of an Export Processing Zone	60
6. Shoreline Protection and Conservation	61
7. Conservation of Rivers and Creeks	62
8. Location of Garbage Dump Site and Cemetery	62
IV. PROPOSED STRATEGIES	63
1. Detailed Land Use Survey	63
2. Urban Farming	64
3. Development of a Single Industrial Estate	64

4. Development of a Coastal and Wetlands Management Program	65
5. Overall Strategy: Incorporation of the Above Strategies in a Land Use Plan and Zoning Ordinance	66
Preliminary Strategy Matrix	68
TABLES	71
1 - Existing Land Use, Tacloban City, Tacloban City (1977)	71
2 - Growth Trends in Land Use, Tacloban City (1977-1980)	72
CHARTS	73
1 - General Land Use: 1977-1980, Tacloban City	73
2 - Urban Land Use: 1977-1980, Tacloban City	74
3 - Rural Land Use: 1977-1980, Tacloban City	75
MAPS	76
1 - Existing Land Use Map of Tacloban	76
2 - Existing Land Use Map of Tacloban City Proper	77
3 - Political Map of Tacloban	78
4 - Topo Map, City of Tacloban	79
5 - Zoning Map, Tacloban City	80
TRANSPORTATION	81
I. STATEMENT OF AREA OF RESPONSIBILITY	81
II. SITUATIONAL ANALYSIS	81
A. Transportation System	81
1. Motor Vehicle Denomination	81

2. Registered Motor Vehicles	81
3. Age of Motor Vehicles	82
4. Routes Travelled	82
5. Passenger Capacity and Fuel Consumption Per Passenger	83
6. Passengers Transported	83
7. Commuter Behavior	84
B. Land	84
1. Road Network	84
2. Road Classification.	85
3. Traffic Density	85
C. Energy Consumption	86
III. CONSERVATION PROBLEMS AND OPPORTUNITIES	86
IV. PROPOSED STRATEGIES	86
Preliminary Strategy Matrix	89
TABLES	
1 - Data on Number of Motor Vehicles Registered, Tacloban City, 1976-1980	90
2 - Age of Motor Vehicles, Tacloban City	94
3 - Data on Number of Trips/Day, Tacloban City	95
4 - Data on Number of Passengers Transported, Tacloban City	96

5 - Fuel Consumption Per Passenger By Vehicle Type, Tacloban City	97
6 - Average Fuel Consumption By Denomination Tacloban City, 1980	98
7 - Road Classification, Tacloban City, 1977-1980	100
8 - Average Modal Split Density By Type of Vehicle, Northbound-Southbound- Tacloban City, 1976-1980	101
9 - Graphical Illustration Traffic Density	103
10 - Fuel Sales to Retail Outlets at Tacloban City (in liters), 1976-1980	104

EXHIBITS

1 - Definition of Terms	105
2 - Tricycle - 2 Passengers	108
3 - AC - 8 Passengers	109
4 - PUJ - 17 Passengers	109
5 - Existing Road Network of Tacloban City	110
6 - Map of Tacloban	111
7 - Map of Tacloban City (Proper)	112
8 - Time Fram for Planning and Implementing Proposed Mass Transit Bus System	113
9 - Mechanics of Preparations for Imple- mentation of Proposed Mass Transit Bus System	114

ENERGY AND ELECTRICAL POWER SYSTEM	115
I. AREA OF RESPONSIBILITY	115
II. SITUATIONAL ANALYSIS	115
A. Description	115
B. History	116

C. Trends	117
Residential Use	117
Commercial Use	117
Industrial Use	118
Public Buildings and Facilities	118
Power Rate	119
Fuel and Oil Consumption	120
Fuel Cost	120
Distribution System	121
System's Loss	121
Power Supply and Demand	122
Institutional Arrangements	123
Billing and Collection	123
Role and Responsibility	125
Relations with other Offices and/or Agencies	125
Future Sources of Power and Energy	125
III. CONSERVATION PROBLEMS AND OPPORTUNITIES	126
IV. PROPOSED STRATEGIES FOR MORE EFFICIENT USAGE OF ELECTRIC POWER AND ENERGY	127
Preliminary Strategy Matrix	131
TABLES	133
1 - Number of Connections, Power sold out and Revenues Collected, LEYECO II Service Area, Tacloban City	133
2 - System Rates of Visayas Coops as of March 1981	136

3 - Power Rate Per Kilowatt-Hour, LEYECO II, Tacloban City	137
4 - Fuel and Oil Consumption, LEYECO II Operation, Tacloban City, CY 1976-1980	138
5 - Fuel and Oil Consumption, LEYECO II Operation, Tacloban City, For the period from January - July, 1981	138
6 - Schedule of Rates for Diesel Fuel Purchases LEYECO II Electric Cooperative, Inc., Tacloban City, 1978-1981	139
7 - Internal Combustion Engines Operating at Don Orestes Romualdez Electric Cooperative, Inc. (DORELCO), San Roque, Tolosa, Leyte	140
8 - Internal Combustion Engines Operating at Leyte II Electric Cooperative, Inc. (LEYECO II), Sagkahan, Tacloban City	140
9 - Electric Power in Kilowatts Generated Monthly by Leyeco II and DORELCO for Leyeco II Service Area, January-July, 1981	141
10 - Status of Disconnection, Reconnection and New Connections	142
EXHIBITS	143
1 - LEYECO II Coverage Map	143
2 - 1980 Distribution of Electricity Sold	144
3 - Authorized Schedule of Rates	145
4 - DORELCO/LEYECO II Load Graph Feeders 1 to 5	146
5 - Illusation of LEYECO II Distribution System, Tacloban City	147
6 - Existing Distribution System of LEYECO II	148
7 - Electrical Power Sources of Leyte	149
8 - LEYECO II Organizational Structure	150

	ix
WATER	151
I. STATEMENT OF AREA OF RESPONSIBILITY	151
II. SITUATIONAL ANALYSIS	151
A. Water	151
1. Data: Historical & Trends	151
a) Old System	151
b) Present System	155
III. CONSERVATION PROBLEMS/OPPORTUNITIES	165
1. High Unaccounted for Water	165
2. Recurrence of Water Supply Shortage	166
3. Financial Viability	166
4. Educational or Information Drive on Water Conservation	166
5. Water is drawn from some fire hydrants for personal consumption purposes	166
IV. STRATEGIES	166
A. Areas covered by the Water District/ Service Area	166
1. Adopt measures to reduce unaccounted for water to an acceptable level	166
2. Ensure reliability and adequacy of water supply	169
3. Enhance Financial Viability	169
4. Implement conservation awareness or consciousness drive immediately	171
B. Barrios outside the LMWD Service Area	172
1. Establish new concepts and guidelines in the financing, development, operation and maintenance of Rural Waterworks Systems	172
Preliminary Strategy Matrix	174

	x
TABLES	181
1 - Summary, Pipelines Distribution System, Leyte Metropolitan Water District	181
2 - Pipelines Distribution Systems, Tacloban City	182
3 - Inventory of Barangay Water Facilities not served by LMWD (Level I & II)	186
EXHIBITS	192
1 - Leyte Metropolitan Water District Service Area in Tacloban City	192
2 - Service Area of Leyte Metropolitan Water District	193
3 - Map of Tacloban City (Proper) Show. Water Pipeline Networks	194
4 - Organizational Chart 1981 LMWD	195
5-9 .. Water Conservation Information Drive	196- 200
SEWER	201
B. Sewer and Drainage System	201
A. Historical Data and Trends	201
B. Description	202
C. Other Data	202
D. Flood Problems/Flood Elimination or Abatement Opportunities	204
III. CONSERVATION PROBLEMS AND OPPORTUNITIES	205
IV. STRATEGIES	205
A. For areas with inadequate drainage facilities, possible course of action	205
1. Regular maintenance of the drainage system	205

2.	Installation of catch basins and curb inlets	205
3.	Clear waterways of squatters	206
4.	Rivetment or channelization of waterways	206
5.	Increasing the gradient	206
6.	Install pumps at appropriate points	207
B.	Alternatives for areas lacking a drainage system	207
1.	Conduct topographic survey, design drainage system, and construction	207
2.	(a) Reduction of contamination of sea water and preservation of marine life	207
	(b) Sewage treatment	207
3.	Prohibit inhabitants of houses situated along rivers, streams and shorelines from disposing sewage directly into these waters/relocation of squatters	208
	Preliminary Strategy Matrix	209
	SOLID WASTE	211
	II. SITUATIONAL ANALYSIS	211
	A. Historical Data and Trends	211
	B. Description	211
	III. CONSERVATION PROBLEMS AND OPPORTUNITIES	217
1.	Improvement of Waste Collection Efficiency	217
2.	Health and Environmental Consciousness	218
3.	Resource Recovery and Reuse	218
4.	Uncertainties of Dump Sites	219
5.	Planning Constraint	219

IV. STRATEGIES	219
1. Divide Service area into four sectors and increase the number of collection trucks from three to four	219
2. Enforce Existing ordinances and implement educational Programs	220
3. Conversion of open dumps to sanitary landfill	220
4. The City Government Must Acquire its Own Dump Site	222
5. Need for Survey	222
Preliminary Strategy Matrix	223
EXHIBITS	225
1 - Map of Tacloban City (Proper) Showing Garbage Collection Route and Time Schedule of Group I	225
2 - Map of Tacloban City (Proper) Showing Garbage Collection Route and Time Schedule of Group II	226
3 - Map of Tacloban City (Proper) Showing Garbage Collection Route and Time Schedule of Group III	227
4 - Barangay San Jose Dumping Ground	228
BUILDING MATERIALS, INDUSTRY, FOOD DISTRIBUTION AND UTILIZATION	229
I. STATEMENT OF AREA OF RESPONSIBILITY	229
II. SITUATIONAL ANALYSIS	229
1. Building Materials	229
1.1 Historical Background	229
1.2 Roofing and Walling Construction Materials	229

1.3	Consumption of Building Materials	230
1.4	Sources of Building Materials	231
1.5	Energy Consumption	231
1.6	Institutional Factors	231
2.	Industry	232
2.1	Manufacturing establishments	232
2.2	Small Business Advisory Council (SBAC) Approved and Assisted Projects	232
2.3	Cottage Industries	232
2.4	Commercial Establishments	233
2.5	Commodity Flow	233
2.6	Banking and Financing Institutions	233
2.7	Tourism Industry	233
2.8	Energy and Resource Consumption	234
2.9	Institutional Factors	235
3.	Food Distribution and Utilization	235
3.1	Fish, Livestock and Field Crop Productivity ²	235
3.2	Markets	237
3.3	Estimated Food Requirements	237
3.4	Food Deficiency	237
3.5	Domestic Flow of Foodstuffs	237
3.6	Energy Consumption	238
3.7	Institutional Factors	238
III.	CONSERVATION PROBLEMS/OPPORTUNITIES	238
1.	Building Materials	238
2.	Industry	239
3.	Food Distribution and Utilization	239

IV. PROPOSED STRATEGIES	239
1. Building Materials	239
2. Industry	241
3. Food Distribution and Utilization	241
Preliminary Strategy Matrix	243
TABLES	247
1 - Number of Dwelling Units by Type of Building Construction Used in Walling, Tacloban City, 1970-1980	247
2 - Number of Dwelling Units by Type of Building Construction Materials Used for Roofing, Tacloban City, 1970-1980	248
3 - Number of Buildings Constructed, 1979-80	249
4 - Building Material Consumed for Vertical Construction, Tacloban City, 1979	251
5 - Building Materials Consumed for Horizontal, Tacloban City, 1979	252
6 - Comparative Data on Services and Manufacturing Establishments, Tacloban City, 1977-1980	253
7 - SBAC Yearly Assisted and Approved Projects, Tacloban City, 1977-1980	254
8 - Comparative Data of Cottage Industries in Tacloban City Registered with NACIDA, 1977 and 1979	256
9 - List of Commercial Establishment By Type and Classification, Tacloban City, 1977-1980	257
10 - Domestic Flow of Commodities	259
11 - Banking Institutions, Tacloban City, 1980	260
12 - Insurance Services, Tacloban City, 1980	261
13 - Foreign Tourist Arrival, Tacloban City, 1974-1980	262

14 - Tourist Spots in Tacloban City 1980	263
15 - Motels and Other Tourism Oriented Establishment, Tacloban City, 1980	265
16 - Agricultural Productive of Selected Crops, Tacloban City, 1970-1980	266
17 - Volume of Production of Selected Agricultural Crops, Tacloban City, 1970-1980	267
18 - Livestock and Poultry Population	268
19 - Volume of Fish Catch, Tacloban City, 1976-1980	269
20 - Volume of Slaughtered Livestock, Tacloban City, CY 1971-1980	270
21 - Food Requirements of Tacloban City Population, 1970-1980	271
22 - Food Deficiency of Tacloban City 1970-1980	272
23 - Domestic Flow of Selected Commodities	273
V. MANPOWER PROGRAM	274
Preliminary Strategy Matrix	275

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
Manila, Philippines

xvi

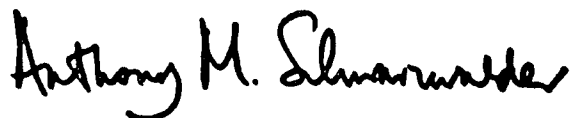
Ramon Magsaysay Center
1680 Roxas Boulevard

Telephone: 59-80-11

I am happy to convey our congratulations to the City of Tacloban for having been chosen as the pilot site for AID's global project on "Managing Energy and Resource Efficient Cities."

This exercise is the first phase of a project which is intended to improve efficiency in the consumption of scarce and costly resources such as energy, water, land, building materials and transportation in rapidly growing small and intermediate sized cities.

It is my hope that the energy and resource conservation strategy you develop will translate itself into operational policies and programs which will fit in with the Philippine's development goals and contribute to its continued growth. I feel confident that the strategy you develop will be equally applicable in other cities in the Philippines. U.S. AID is proud to be working with you in this effort, and will be equally proud in the future when the Tacloban/AID development strategy for energy and resource efficient cities is applied worldwide.



Anthony M. Schwarzwald
Director



REPUBLIKA NG PILIPINAS
 PAMAHALAANG SIYUDAD NG TACLOBAN
 (CITY GOVERNMENT OF TACLOBAN)
Tanggapan Ng Alkalde
 (OFFICE OF THE CITY MAYOR)

M E S S A G E

The global quadrupling of oil prices in 1973 stunned the entire world. Man had to take a very serious look into the oil problem. The structure of cities and the land use pattern must be altered to reflect this reality. Transportation and the Energy and Electric Power Systems must likewise address itself to this problem. Water, sewer and solid waste management and building materials and all the other sectors must likewise be included in this study.

Tacloban City, in Eastern Visayas, is very happy to have been chosen as the Pre-Test for Managing Energy and Resource Efficient Cities by USAID.

Today's preliminary workshop signals another "first" for Leyte since this is the first serious look by USAID to improve the consumption and use of energy and other key resources in the city. After this workshop, we shall look forward to a secondary workshop on December 10-11, 1981 at Washington, D.C., U.S.A. where American experts on the different areas of responsibility will discuss the Tacloban Workshop Report.

To have been chosen as the pre-test city to implement this project with USAID is a pleasant challenge.

Welcome to all the attendees from USAID and consultants from Manila and the United States of America.

October 22, 1981.

Abdul R. Cinco
 ABDULJA R. CINCO
 City Mayor

TACLOBAN CITY PROFILE

HISTORY

The name Tacloban is derived from the word "Taklub" meaning "cover", a name alluding to the natives' early means of catching fish with bamboo, and from the name of the area's original settlement, Kanabatok, which was ruled by Headman Khatok.

Tacloban became a town in 1770 and a chartered city on June 12, 1952.

During the early Spanish rule, Leyte, like Samar, was under the jurisdiction of Cebu. Later, it became a separate political entity. By 1735, Leyte was a politico-military province with jurisdiction over Samar.

In 1768, Leyte and Samar were separated, each constituting a politico-military province. The capital of Leyte was transferred from one town to another and finally to Tacloban in 1872.

LOCATION, AREA, AND ITS USE

The City of Tacloban is located in the northeast part of the island of Leyte. Leyte is one of the islands that comprise the Eastern Visayas. As shown in Exhibit 1, Tacloban lies at $11^{\circ}14'38''$ north latitude and about 125° east longitude and is situated about 360 miles southwest of Manila.

Tacloban City is bounded on the north by the municipality of Babatngon, on the south by the municipality of Palo, on the east by San Juanico Strait, and on the west by the town of Alangalang.

The city is composed of 138 political units known as barangays, 21 of which are located outside the city proper. Tacloban has a total land area of 10,855 hectares or about 108 square kilometers. The city proper covers an area of

about 1,770 hectares or approximately 16.31% of the total, while the remaining major portion is mostly rural land.

Existing land use of the city mixed. There are major commercial establishments in a residential zone, industries in a commercial district and residences in both commercial and industrial zones (Exhibit 2). In search for a practical solution that would systematize the geographical distribution of industries and other land users, the City of Tacloban is now implementing a land use plan supported by a Zoning Ordinance enacted on December 20, 1977. In this plan, the land of the city proper was zoned for 4 uses (60% commercial, 30% institutional, 5% residential, and 5% parks and plazas). The expanded urban core stretches up to the boundary of Barangay Tigbao on the north and nearly to the municipality of Palo on the south, with an area of highly spatial distribution of land use. An industrial estate for light and medium industries has been proposed for the Barangay Diit, Barangay Apitong, and Barangay Tigbao area, located about seven kilometers from the city proper.

CLIMATE

The data presented in Exhibit 3 show that in 1979 the highest rainfall was 308.5 mm. and took place in the month of June while the driest month was March having rainfall totalling 48.6 mm. On the other hand, in 1980, the highest rainfall was recorded in November at 481.3 mm. and the driest month was September with rainfall of 45.5 mm.

The average annual temperature from 1979-1980 was 27.1°C. The highest temperature in 1980 was recorded in May at 28.3°C while the coolest was in December at 25.2°C. Monthly variations are not very significant.

The annual change for the average number of days with rainfall for the last two years was 4.5%.

The prevailing wind direction has remained from the northwest during the last five years.

POPULATION AND INCOME

Based on the 1980 census, the city has a population of 103,433. Tacloban registered the nation's highest growth rate (5.6%) for a city over the past five years. Its average annual increase from 1903 to 1980 was 3.5%. This growth rate is higher than the "high assumption growth rate" of 2.8% used as a basis for population projections by both the National Census and Statistics Office (NCSO) and the National Economic and Development Authority (NEDA).

The household population is steadily increasing at an average of about 4.1% per annum for the last ten years.

In terms of income, the 1975 NCSO data revealed that the average annual income per household and per capita are ₱8,908 and ₱1,457 respectively, an increase of about 86% over the 1971 figure for income from all sources.

SOCIO-ECONOMIC ACTIVITIES

Trade and Commerce.- Tacloban is the primary trade center of the region. In the commodity flow survey conducted for the entire region by NEDA in 1972, the city recorded a share of 55.9% among five major ports in Region VIII. Catbalogan port in Samar was second with 15.8% followed closely by Borongan, Eastern Samar with 11.4%.

The Philippine Ports Authority records for 1980 show that the major sources of inflowing commodities are Cebu City (44.8% of the total), Manila (28.5%), and Gaway in Northern Samar (9.8%).

In order to institutionalize and hasten the socio-economic development of the region, the financing institutions located in the city are providing financial assistance to interested and qualified clients. From the second half of the seventies to the early part of the eighties, the number of banks has grown by 40% or at an average rate of 8% per annum.

At present, there are 21 banks. Of this total, four are government banks, one of which provides funding support to industrial enterprises, and the rest are privately owned banks which offer both agricultural and commercial loans.

Tourism and Industry.- The tourism industry has been proven supportive to the city's development since the time tourism's significance was considered by the government. Today, Tacloban has many points of interest. The City's tourist-oriented accommodation establishments have increased in number and today are among the most comfortable in the Eastern Visayas region. There are two one-star economy hotels, one five-star hotel, four pensions houses, and twelve other hotel establishments. Together these hotels and pensions houses offer a total of 481 rooms to tourists. Other establishments which help boost the city's tourism industry are twenty-two restaurants and coffee shops that offer a wide range of culinary specialties.

Bureau of Domestic Trade records show an increasing trend for the number of light and medium industries in the city. An increase of 48.0% was experienced for the last two years. Only one large manufacturing enterprise is found in the city, the rest are service type industries, typically of small and medium size.

Education.- Upon careful analysis of the salient features of the field of education, results indicate that the magnitude of development for the past few years was made possible through the orchestrated effort of three interlocking sectors, namely: private, local and national government. The current infrastructure development program of the Divine Word University, the expansion programs of the University of the Philippines and Leyte State College, the opening of two medical schools, and the offering of more advanced courses and courses which teach marketable skills have benefited the people of Tacloban and the entire region.

At present, the city has two universities, one college, one government college of nursing, eleven high schools and thirty-six elementary schools. For the last five school years, there was an enrollment increase of 24.7% for elementary schools, 27.9% for high schools, and 39.5% for colleges. The number of classrooms correspondingly increased by 35.8%, 49.7% and 37.9% for elementary schools, high schools and colleges, respectively.

INFRA-UTILITIES

Transportation Network.- Road construction, supportive to the development thrusts of the city, has been funded by both the national and city governments. Construction efforts were focused mainly on farm-to-market roads or barangay roads to facilitate the transport of farm products to marketing centers, thereby uplifting the quality of life of the farmers. In 1977, city roads totalled 22.7 km., national roads 42.8 km, and barangay roads 46.2 km. In 1980, city, national and barangay roads increased to 24.0, 44.4 and 76.8 kilometers, respectively, with barangay roads increasing in length by 66.5 per cent.

Almost all local and national bridges in the city have been improved from temporary to permanent. Anticipating increases in cargo and passenger traffic, the port and airport are also being improved.

Daniel Z. Romualdez Airport, acclaimed as the Eastern Visayas' prime airport, is located at Barangay San Jose, some 4.3 nautical miles southeast of the city proper or about ten kilometers by land. The national government intends to expand the runway so that bigger jets may be accommodated.

Tacloban sea port is the most spacious in the region. Located approximately 200 meters from the central business district of the city, it covers an area of about 3.5 hectares. A loan from the German government to the Philippine Ports Authority will be used to reclaim the port area and expand its facilities.

In 1980, the number of vehicles registered with the Bureau of Land Transportation was 6,548, subdivided as follows: 1,280 public utility vehicles, 4,549 private vehicles and 719 government vehicles. For the last four years, the average annual increases were: 8.5% for public utility vehicles, 53.3% for private vehicles, and 43.0% for government vehicles.

Power.- The major deterrents to the influx of large industrial enterprises into the city are the high cost of electrical power and frequent long brownouts. The Leyte Electric Cooperative II (LEYECO II) provides the electric power not only for Tacloban City but also for the adjacent town of Palo to the south and Babatngon to the north. LEYECO II buys power from the Don Orestes Romualdez Electric Cooperative (DORELCO). LEYECO II has four generator sets which are operated only during peak demand periods. It is not viable to operate these generator sets continuously since they have only about 66% efficiency.

The present power rates are as follows:

1. Residential/Public Buildings:

Minimum bill (1-10 kwh)	₱ 16.80
Excess	1.68/kwh
2. Commercial:

Minimum bill (1-20kwh)	₱ 34.00
Excess	1.70/kwh
3. Industrial

Without demand meter

Minimum bill (1-20kwh)	₱ 34.00
Energy charge in excess of 20 kwh	1.70/kwh

With Demand meter

Demand charge	₱ 15.00
Plus Energy charge	1.65/kwh
4. Street lights:

175 watts	₱ 90.00/bulb/mo.
or	0.51/watt

Water.- The local water district boasts of an efficient and well-managed water supply system serving Tacloban and adjoining municipalities of Palo, Tanauan, Tolosa, Dagami and Pastrana, Leyte. A ₱18 million waterworks project which utilizes the clear water of Binahaan River in Tingib, Pastrana and the dams at Hitugnob and Hiabangan Falls at Dagami, Leyte, were just completed.

The present waterworks system has a service area in the city of 88,729 people or 15,406 households. The aggregate number of water connections as of June 30, 1981 is 4,940; urban household connections totalled 3,956 while rural household connections totalled 1,824. The rest of the population get their water from public faucets, deep wells or artesian wells.

In 1980, net water production was 5,810,600 cu. m. while the total water billed amounted to only 2,371,639 cu. m. This means that about 59% of the water production was unaccounted for.

Solid Waste, Drainage and Sewerage System.-- Solid waste from households and other establishments is placed alongside of the streets for collection. The waste is collected regularly following a prescribed schedule. The frequency of collection varies. Areas are served daily, three times a week, four times a week, and even on special occasions only.

Disposal sites are located at Barangay San Jose, some eight kilometers away from the city proper, and at Sitio Cogon in the same barangay.

Collection and disposal equipment includes three dump trucks and fifteen buggies. The buggies are used by street cleaners.

Tacloban City does not have a sewer system. The present drainage system is at the same time the sewer system. The city proper utilizes concrete hollow blocks (CHB), canals, open ditches, and culvert pipes. Eleven culvert pipes serve as the drainage system for the southern side of the city (towards Cancabato Bay). The present drainage system consists of 10,840 lineal meters of reinforced concrete (RC) pipe and 1,800 lineal meters of riprap embankment along Lirang and Mangonbangon creeks.

Effluents from septic tanks are allowed to be discharged into the drainage system as long as the treated water passes first through a leaching field.

FISCAL ADMINISTRATION

The city through effective handling of fiscal and monetary policies attained a full First Class "A" classifi-

cation in 1980. Classifications are based on the magnitude of income generation, population size, and social and economic development in recent years.

The local fund of the city government is made up of the general fund and the infrastructure fund. The former is used to finance the general administrative services of the city and the latter is used to finance infrastructure projects and the operation of the City Engineer's Office. The major sources of income for the general fund are revenues from taxation, incidental revenues, receipts from operation and other receipts. The contributions of these sources to the general fund vary from year to year. In 1976, the city received around ₱7 million of gross income. Gross income dropped to ₱5 million in 1977, a decrease of about 29%. In 1980, a revenue of approximately ₱8 million was generated from all sources. The average annual increase for revenue for the last four years was about 7.1%.

The most important source of revenue to the city is taxation. As shown in Exhibit 4, revenues from taxation comprised about 44.6% of the city's total income in 1980, followed by incidental revenue with 37.8%, receipt from operation with 17.0% and lastly receipt from other sources of only 0.7%.

Regarding expenditures by major functions, it was government finance that spent most of the city's total appropriations in 1980. All the details are shown in Exhibit 5. Exhibit 6 lists sources of income and also expenditures associated with the Infrastructure Fund for the period 1976-1980.

ADMINISTRATIVE STRUCTURE

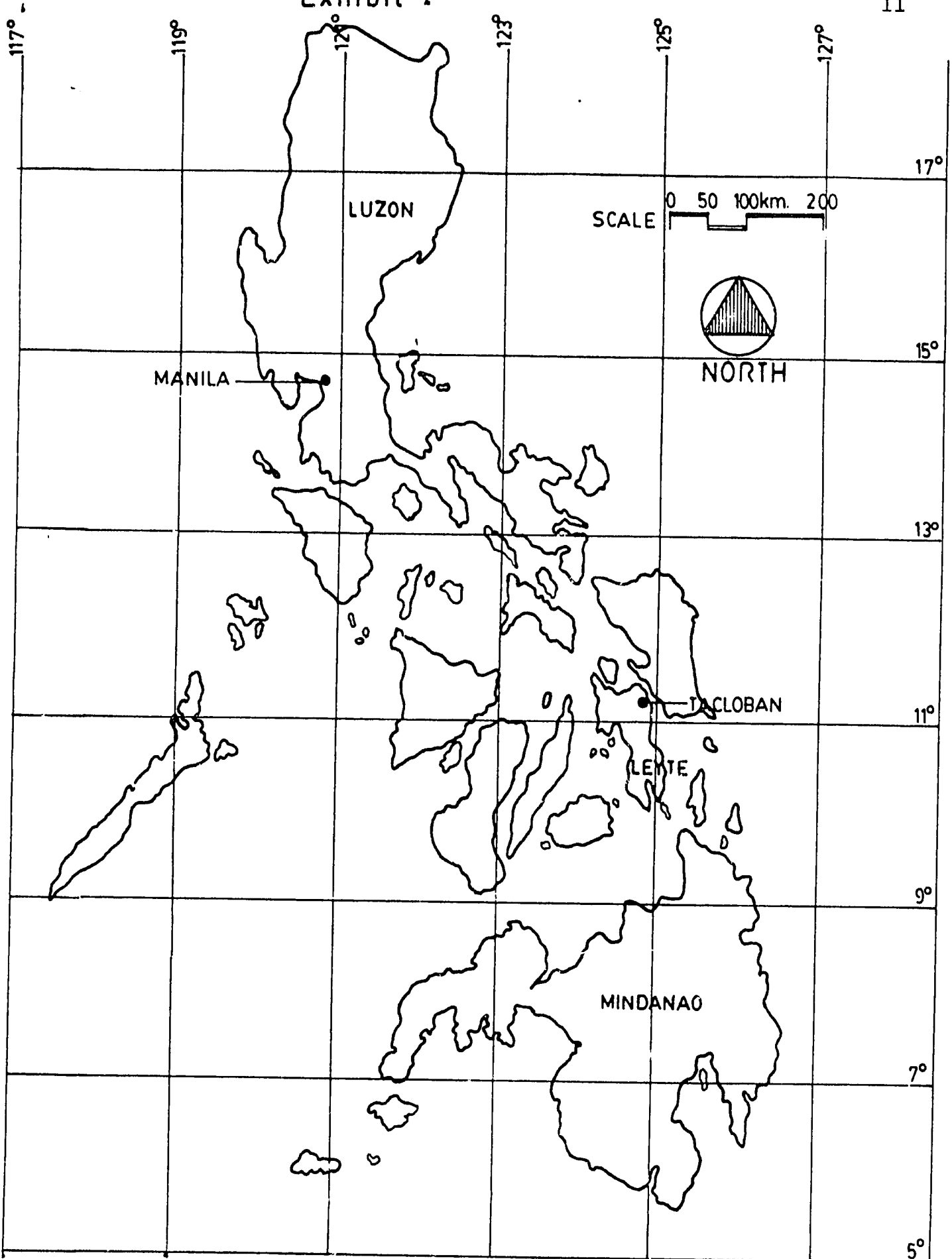
The local government is made up of twenty-one different offices and departments under the administrative and executive management of the city mayor. In case of his/her absence, sickness or temporary incapacity, the vice-mayor

takes over the position of city mayor.

The policy-making function is exercised by the City Council known as Sangguniang Panglunsod with ten members. The City Planning and Development Board (CPDB) acts as the planning and implementing body of the City Government with the City Planning and Development Staff as its technical and research arm headed by the City Development Coordinator. The City Development Coordinator is concurrently the Executive Secretary of the GPDB. The CPDB is composed of the City Mayor as Chairman, the City Administrator, the City Development Officer, the City Engineer, the City Treasurer, the City Superintendent of Schools, one representative from the Kabataang Barangay, three representatives from the Sangguniang Panglunsod, one representative from the religious sector, and one representative from the civic organization sector.

The direct implementing agencies are the different departments and offices each vested with specific duties and responsibilities. Exhibit 7 shows the organizational structure of the city government.

The total working force of the city government as of June 1981 was 1,429.



MAP OF THE REPUBLIC OF THE PHILIPPINES

MAP OF TACLOBAN CITY (proper)

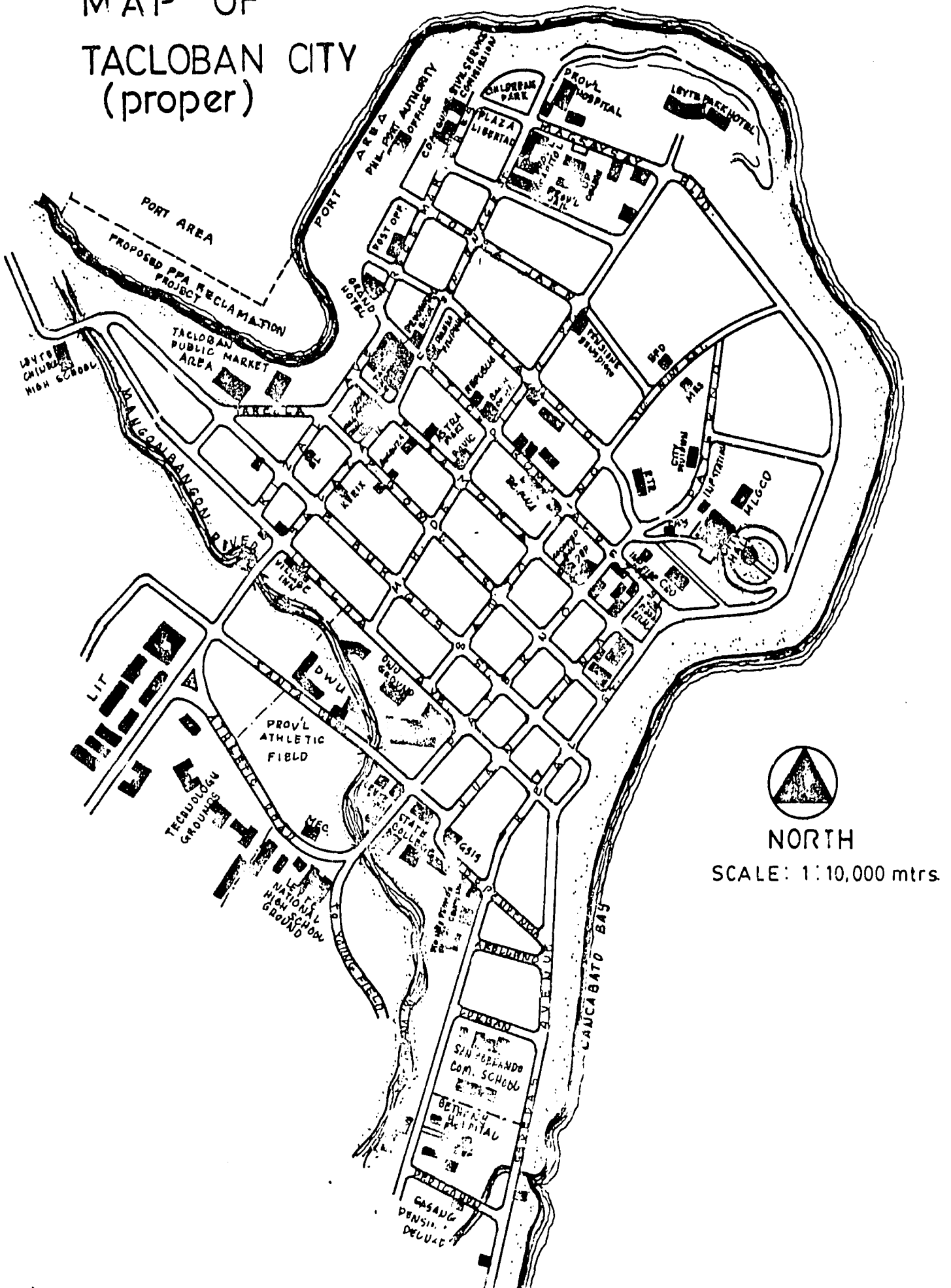


Exhibit 3

Climate
Tacloban City
1979-1980

MONTH	Temperature (In °C)			Rainfall (In mm.)			Number of Days with Rainfall		
	1979	1980	% of Change	1979	1980	% of Change	1979	1980	% of Change
January	: 26.6	: 25.6	: (3.76)	: 106.9	: 408.3	: 281.95	: 21	: 26	: 23.81
February	: 26.6	: 25.6	: (3.76)	: 162.1	: 261.3	: 61.20	: 16	: 20	: 25.00
March	: 27.1	: 26.4	: (2.58)	: 48.6	: 75.4	: 55.14	: 13	: 16	: 23.08
April	: 28.3	: 27.3	: (3.53)	: 132.7	: 153.7	: 15.83	: 17	: 22	: 29.41
May	: 28.5	: 28.3	: (.70)	: 167.4	: 66.2	: (60.45)	: 16	: 14	: (12.50)
June	: 28.7	: 26.9	: (6.27)	: 308.5	: 292.6	: (5.15)	: 27	: 28	: 3.70
July	: 28.5	: 26.7	: (6.32)	: 213.2	: 121.7	: (42.92)	: 20	: 19	: (5.00)
August	: 28.3	: 26.7	: (5.65)	: 60.7	: 375.5	: 518.62	: 17	: 22	: 29.41
September	: 28.2	: 27.2	: (3.55)	: 182.1	: 45.5	: (75.01)	: 18	: 16	: (11.11)
October	: 28.0	: 26.3	: (6.07)	: 274.7	: 143.7	: (47.69)	: 28	: 23	: (17.86)
November	: 27.6	: 25.8	: (6.52)	: 201.8	: 481.3	: 138.50	: 25	: 24	: (4.00)
December	: 26.3	: 25.2	: (4.18)	: 287.7	: 256.5	: (10.84)	: 25	: 24	: (4.00)
Average	: 27.7	: 26.5	: (4.33)	: 178.87	: 223.48	: 24.94	: 20.25	: 21.17	: 4.54

Source: PAGASA stationed at D. Z. Romualdez Airport, Tacloban City

Exhibit 4

Revenue By Sources
Tacloban City
1976-1980

SOURCES	1976	Per cent of total	1977	Per cent of total	1978	Per cent of total
Revenue from Taxation	₱4,216,075.00	61.98	₱2,804,528.55	54.43	₱2,964,358.14	41.93
Incidental Revenue	264,103.86	3.88	982,132.83	19.06	2,630,624.54	37.21
Receipt from Operation	888,814.77	13.07	1,358,017.32	26.36	1,470,546.20	20.81
Other Receipt	1,433,251.27	21.07	8,082.97	0.15	3,878.81	0.05
TOTAL	₱6,802,244.95	100.00	₱5,152,761.67	100.00	₱7,669,407.78	100.00

Source: City Treasurer's Office
Tacloban City

(Exhibit 4, Continued)

Sources	1979	Per cent of total	1980	Per cent of total	Average Annual Rate of Inc.
Revenue from Taxation	P3,187,407.03	43.46	P3,734,859.28	44.61	(0.77)
Incidental Revenue	2,695,348.35	36.75	3,160,564.52	37.75	153.72
Receipt from Operation	1,430,780.83	19.51	1,421,930.68	16.98	10.30
Other Receipt	20,600.96	0.28	55,551.08	0.66	112.33
Total	P7,334,137.17	100.00	P8,372,905.56	100.00	7.71

Exhibit 5

Local Government Expenditure By Major Function
Tacloban City
1976-1980

FUNCTION	1976	Per cent: of total:	1977	Per cent: of total:	1978	Per cent: of total
General Administration	₱ 822,752.42	12.94	₱1,065,158.96	16.88	₱1,239,210.22	17.48
Government Finance	691,948.65	10.88	754,289.41	11.96	1,698,476.66	23.95
Adjudication	250,958.72	3.95	294,176.79	4.65	283,896.87	4.00
Protective Services	1,331,323.40	20.94	1,559,334.55	24.70	1,694,519.97	23.90
Social Improvement	113,004.68	1.78	138,611.48	2.20	313,053.54	4.42
Economic Development	234,785.83	3.69	283,489.68	4.49	535,930.06	7.55
Operation of Economic Enterprises	251,802.53	3.96	273,837.66	4.34	318,134.84	4.49
Inter-government Aids	982,028.09	15.44	1,942,952.43	30.78	1,007,308.27	14.21
Capital Outlay	1,680,527.41	26.43	-	-	-	-
TOTAL	₱6,359,131.73	100.00	₱6,311,850.96	100.00	₱7,090,530.43	100.00

Capital Outlay figure was only stated in 1976 on account that it was only in that year when this item was treated separately. In the succeeding years capital outlay entry was absorbed by each function.

Source: City Treasurer's Office
Tacloban City

Exhibit 5, continued

FUNCTION	1979	Per cent of total	1980	Per cent of total	AVERAGE ANNUAL RATE OF INCREASE
General Administration	P1,634,309.30	21.10	P1,799,608.66	20.46	21.95
Government Finance*	1,926,954.66	24.88	2,119,577.88	24.10	39.41
Adjudication	287,458.08	3.71	290,946.80	3.32	4.05
Protective Services	1,750,200.59	22.60	2,074,541.86	23.59	11.91
Social Improvement	208,543.46	2.69	372,832.93	4.24	48.48
Economic Development	261,952.82	3.38	384,653.11	4.37	3.60
Operation of Economic					
Enterprises	427,989.26	5.53	478,235.80	5.44	17.80
Intergovernment Aids	1,248,079.92	16.11	1,272,687.66	14.47	18.89
Capital Outlay	-	-	-	-	-
TOTAL	P7,745,488.09	100.00	P8,793,084.48	100.00	6.39

Exhibit 6

Revenue and Expenditure
Infrastructure Fund
Tacloban City: 1976-1980

	1976	Per cent of total	1977	Per cent of total	1978	Per cent of total
INCOME						
Revenue from Taxation :						
Internal Revenue Allotment :	P 611,482.43	62.62	P 556,266.36	63.98	P 571,015.32	79.16
Other Receipts :						
Aid from National Government :	249,377.20	25.54	311,831.00	35.87	86,833.00	12.04
Prior Year Adjustment :	89,187.44	9.13	-		-	
Other Receipt :	26,433.40	2.71	1,276.67	0.15	2,680.00	0.37
Barangay Road Development :	-		-		60,833.00	8.43
Total :	P 976,460.47	100.00	P 869,374.03	100.00	P 721,361.32	100.00
EXPENDITURE						
City Engineer's Office :	P 754,619.10	83.82	P 716,027.93	75.51	P 730,940.46	95.06
Capital Outlay :	145,650.32	16.18	232,251.31	24.49	38,006.96	4.94
Total :	P 900,269.42	100.00	P 948,279.24	100.00	P 768,947.42	100.00
Surplus/Deficit :	P 76,191.05		(P 78,905.21)		(P 47,586.10)	

Source: City Treasurer's Office
Tacloban City

Exhibit 6, continued

	1979	Per cent of total	1980	Per cent of total	Average Annual Growth Rate
INCOME					
Revenue from Taxation					
Internal Revenue Allotment	P 2,417,345.76	96.60	P 3,531,120.36	97.88	90.76
Other Receipts					
Aid from National Government	85,012.00	3.40	76,500.00	2.12	(14.81)
Prior Year Adjustment	-		-		-
Other Receipts	-		-		7.38
Barangay Road Development	-		-		-
Total	P 2,502,357.76	100.00	P 3,607,620.36	100.00	65.77
EXPENDITURE					
City Engineer's Office	P 997,780.48	44.89	P 1,195,431.31	36.58	13.32
Capital Outlay	1,224,785.35	55.11	2,077,299.59	63.42	791.89
Total	P 2,222,565.83	100.00	P 3,267,730.90	100.00	55.62
Surplus/Deficit	P 279,791.93		P 339,889.46		

Exhibit 7

Organizational Chart City Government Tacloban City

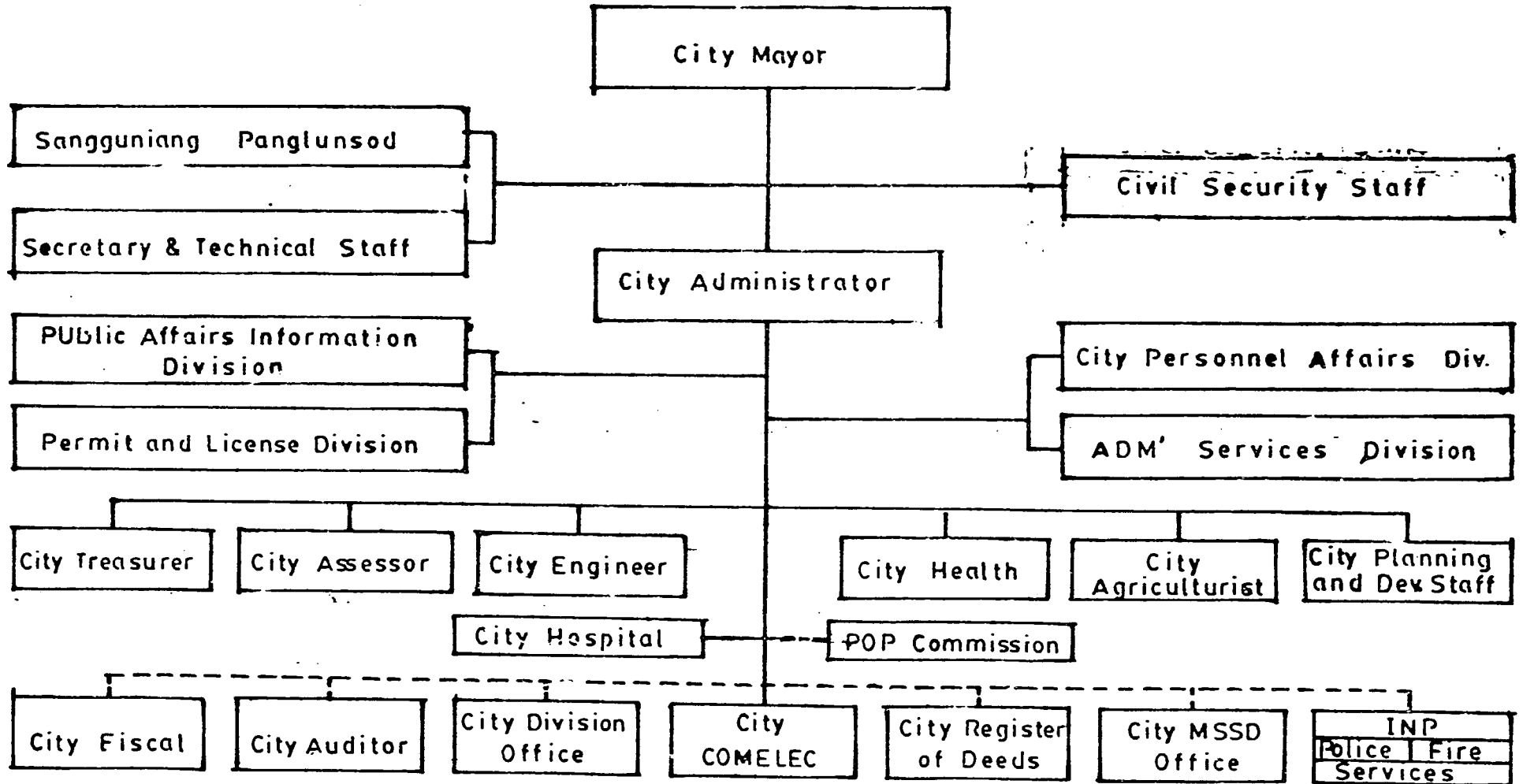


Exhibit 8
Conversion Table

CONVERSIONS

kilo	= one thousand of a unit
mega	= one million of a unit
giga	= one billion of a unit
kilowatt	= 1,000 watts
megawatt	= 1,000 kilowatts = 1,000,000 watts
gigawatt	= 1,000 megawatts = 1,000,000 kilo- watts
1 foot	= .3048 meter
1 kilometer	= .624 mile
1 US dollar	= ₱8.00
1 US gallon	= 3.785 liters
meter	= feet x 0.305
kilometer	= miles x 1.609
square meter	= square feet x 0.093
square kilometer	= square miles x 2.590
cubic meter	= cubic feet x 0.028
cubic meter	= cubic yards x 0.765
hectare	= acres x 0.405

**THE ROLE OF TACLOBAN CITY IN THE
DEVELOPMENT OF EASTERN VISAYAS
Region VIII**

I. General Description of Region VIII

Eastern Visayas is one of thirteen (13) administrative and planning regions in the Philippines. It is located in the eastern part of central Philippines (refer to Map No. 1). Two main islands comprise the region, namely: the Island of Leyte and the Island of Samar. The region has five provinces, one sub-province, and three cities. The provinces are Leyte, Southern Leyte, Samar (Western), Eastern and Northern Samar. The Sub-province is Biliran and the three cities are Tacloban, Ormoc and Calbayog (Refer to Map No. 2). The region has 138 municipalities and 3,583 barangays.

Eastern Visayas has a population of 2.8 million, a land area of 21,431 square kilometers, and a population density of 131 persons per square kilometer. Approximately 80 percent of the people live in rural areas and 20 percent in urban areas. Sixty-six percent (66%) of the employed labor force is in agriculture and thirty-four (34%) percent in non-agricultural work. The unemployment rate (1980) is 10.5 percent.

2. The regional economy

The economic base of the region is agriculture. The gross regional domestic product (GRDP) amounts to about ₱2.3 billion (1979) at 1972 constant prices for a per capita GRDP of approximately ₱2,000. Forty-eight percent (48%) of this GRDP originated from the agriculture sector, 28 percent from services, 24 percent from the industry sector.

The main agricultural crops of eastern visayas are coconut, rice, rootcrops, sugar, abaca, and corn. These traditional crops also comprise the bulk of the region's direct export products, namely, copra, sugar, molasses, lumber, logs, RNA (ribonucleic acid), and copper ore.

The region is surrounded by large bodies of water which are rich sources of marine life. Inland fishing is undertaken in many areas particularly in samar (western) and northern samar.

Productivity in agriculture is low compared to other areas of the country. Underutilization of land resources is evident.

3. problems and challenges confronting regional development efforts

The regional development investment program (1981-1982) for eastern visayas approved by the regional development council groups into four categories the challenges which confront the region. These categories which also summarize the key problems of the region are as follows,

- a. the deterioration of regional economic performance and poor social conditions (macro view);
- b. the existence of intra-regional imbalance in economic and social conditions (intra-regional spatial view);
- c. the underdevelopment of the region in relation to other regions of the country (inter-regional spatial view); and
- d. the need to strengthen sectoral interdependence (sectoral view).

The main points of these challenges are cited below,

- A. The macro-economic and social dimension
 - 1) accelerating the use of the region's resources in a manner that would increase productivity in both urban and rural areas.

- 2) Providing employment opportunities to a growing number of unemployed.
- 3) Improving productivity and economic returns to labor. The region has to provide jobs to at least 80,000 persons who enter the region's labor force every year. Output per worker declined from ₱2,296 in 1977 to ₱2,284 in 1979 (based on 1972 prices).
- 4) Upgrading the conditions in which people live. Seventy-three percent (73%) of preschoolers (ages 0-6 years) are malnourished. Many areas are not served by competent medical personnel.

B. The intra-regional spatial view

In Eastern Visayas, a comparison of development by province will show the dominance of the province of Leyte. Among the factors indicating this situation is the concentration of commercial and trade activities resulting from the presence of a port in Tacloban City, which accommodates both domestic and foreign vessels. The Socio-Economic Indicators included found in Table 1, further reveal the significant position of Tacloban City in relation to other parts of the region.

C. The inter-regional spatial view

- 1) Eastern Visayas contributes only around 2.6 percent of the Gross National product, while other regions contribute a lot more (i.e., National capital Region 32.2%, Southern Tagalog 13.8%, and central Luzon 7.8%).

- 2) The per capita output (GDP/population) of eastern visayas is only ₱823 (at 1972 prices) while the national figure is ₱1,823 or a difference of ₱1,001.
- 3) productivity per worker is a low ₱2,931 - but a high ₱5,130 for the country as a whole. Low returns to labor and undertutilization of manpower resources is clearly evident.
- 4) The rate of unemployment in eastern visayas is among the highest in the country.

D. The inter-sectoral dimensions

- 1) Low productivity in agriculture. Annual output per worker in non-agricultural pursuits is over ₱3,000 while that of agriculture is a low ₱1,755.
- 2) Industrial processing of the region's traditional agricultural products is still at a low pace and volume.
- 3) There is a need to initiate and coordinate sectoral projects with spatial strategies (e.i. concentration of industrial efforts in specific locations)

4. Strategies for development

The regional development council of eastern visayas has identified the following general strategies that will be pursued in 1983 to 1987, and to be reflected in the

projects of the national and local governments,

- a. reducing the rate of population growth;
- b. setting up of livelihood projects that would generate income and employment;
- c. maximum utilization of the region's resources in a manner that would benefit the region, especially the poor;
- d. raising productivity especially in the production of food crops, meat, and fish so that the rate of inflation of these food items can be minimized and real incomes will increase;
- e. increasing the market orientation of crop production strategies, particularly in export crops;
- f. reducing intra-regional disparities in socio-economic conditions with emphasis placed on the development of the rural provinces;
- g. increasing the growth rate of investments, both government and private, and directing investments mainly to enterprises that utilize the region's primary resources such as land and labor;
- h. formulating policies that would effectively attract investor and encourage local entrepreneurship;

- i. promoting a strong interdependence between agriculture and industry;
- j. Improving the revenue generating capabilities of local governments through resource management trainings; and
- k. Linking isolated municipalities in samar to the national highways.

5. The role of Tacloban city in the region

The regional office of the national economic and development authority, in a study of the region's centers of growth, has arrived at the following conclusions which affect region VIII and which refer to the role of Tacloban city,

- a) The city of Tacloban has the highest development index (i.e., it is the region's most developed area). It is the region's metropolitan core with the entire Leyte sub-basin development authority (LSRDA) area as its immediate urban field. This field represents the fusion of metropolitan center and non-metropolitan peripheries through the use of this field, the continued economic growth of Tacloban can be promoted, particularly its trading function. The

economic boundary of Tacloban will continue to transcend its political boundary as its urban field expands.

- b) while Tacloban city is the region's primate city, there are four other areas which follow it in the development hierarchy. Two of these areas are in Leyte and two are in Samar.
- c) The short and medium - run strategy calls for an emphasis on projects which will utilize existing potentials. In this strategy, the sub-provincial areas which will need to improve the utilization of potentials includes Tacloban city and its metropolitan area.
- d) Industrial programs will be promoted in the major urban centers and inter-urban centers because of market considerations.
- e) Industries requiring large markets to achieve viable profitability levels will be located in major urban centers, especially Tacloban city.
- f) The Leyte export processing zone and the Tacloban mini-industrial estate will serve as counter - magnets to the Leyte industrial estate at Isabel Leyte. Small and medium-scale industries will be located in Tacloban city, thus necessitating the expansion of the Tacloban port.

All indications and plans point to the prominent and far-reaching role that the city of Tacloban will have in the progress and growth of Visayas. The following trends are forecasted for the city,

- a) Population growth will exceed previous levels, primarily due to in-migration far outpacing out-migration. A growth rate of 5.4% per annum is a conservative estimate, based on past trends and the expected significant growth of industry and services in the city.
- b) The population of Tacloban city will increase from 102,602 (1980) to 173,116 by 1990. The population of Metro Tacloban (eight municipalities and city near or adjacent to Tacloban city) is estimated to grow from 252,046 in 1980 to 309,618 in 1990.
- c) The volume of traffic passing through the port of Tacloban will increase. The value of direct exports will possibly increase by 149.0%. This includes the value of copra and coconut oil for the years 1975-80.
- d) The personnel complement of regional offices of national government agencies will expand.

Best Available Document

e) Enrollment in elementary and secondary levels is expected to increase by 5.0 and 10.4 percent respectively.

The above trends will necessitate corresponding adjustments in the provision of basic services. Among these reactions which should already need anticipative planning and decisions are:

- a) Increasing food supply not only to meet the demands but to keep inflation down. It is observed that the rate of inflation of food commodities in Tacloban is higher than many other cities (e.g.: Cebu, Iloilo, Cagayan de Oro and Legaspi).
- b) Providing for housing requirements, in terms of financing, materials, manpower and land availability.
- c) Improvement of water supply. In late 1981 Tacloban City experienced frequent low water pressure, particularly during days with and after heavy rains.
- d) Meeting the power/energy requirements of both industrial and residential users. If the power expected to benefit the city from the Mongonan geothermal project, does

not materialize the industrial growth of Tacloban will be jeopardized and forestalled.

failure to act on the above-mentioned future needs would have the effect of diverting business interests and population flows to other parts of the region, such as Ormoc City and Calbayog City.

6. Major programs and projects that will affect Tacloban city (1982)

The regional development investment program (RDIP) which includes the major national and local government programs proposed for implementation in 1982 reveals that P103 million are expected to be allocated to projects in Tacloban City. This is broken down as follows:

(P)	(Sector)
40,000	for agriculture
70,595,500	for industry
13,175,000	for infrastructure
19,429,100	for social services

The above figures include only those which refer to programs/projects specifically located in Tacloban City. Programs/projects with nationwide application are not included. The above estimates

must, therefore, be considered as conservative.

Among the major programs and projects are,

- Agriculture: vegetable production
 fish production and integrated sea farm
 bio-gas demonstration
 provincial nursery
- Industry : integrated fishery project
 Tacloban mini-industrial estate
 Tacloban export processing zone
 cottage and small industries (mat-weaving, woodworking, rattanraft)
- Infrastructure: port development, fish port and marketing complex port dredging
 airport - shore protection
 drainage construction
 construction of public market
 construction of school buildings
- Social services: construction and operation of regional youth rehabilitation center
 slum area improvement
 economic housing project

The above programs/projects affirm the statement made earlier that the socio-economic growth of Tacloban needs concomittant improvements in physical facilities and program content.

The DPTD represents a response to anticipated problems and a multi-agency, intersectoral effort to promote the role of Tacloban city as the center of socio-economic growth in Eastern Visayas.

Table No. 1
Tacloban City and Region VIII
Socio-Economic Indicators

Indicator	Tacloban City	Region VIII	Remarks
Land Area (Sq. Km.)	100.9	21,431.7	Tacloban City is .47% to the region.
Annual Growth Rates (%) 1975-1980	5.4	1.6	Tacloban City is higher by 3.8%.
Population Density (Persons/sq.km.) 1980	1,016.9	131.2	The City is higher by 885.7 person/sq. km.
Number of Banking Institutions 1980	17	82	Twenty-one percent (21%) of the region's banking establishments is located in the City.
Enrolment in Elementary (SY 1980-81)	17,474	429,589*	Tacloban City enrolled 4.0% of the total elementary pupils in Eastern Visayas.
Enrollment in Secondary (SY 1980-81)	9,646	129,321	The city shares 7.4% of the regional figure for secondary enrollment.
Hospital Bed: Population Ratio	1:210	1:1050	Fewer people in the city are to use a hospital bed than in the region.
Number of Registered Vehicles (1980) (For hire, private and government use)	6,212	19,573	Thirty-one percent (31%) of the registered vehicles in the region is in the city
Rice Production** (m.t.) 1980	21,600	250,616	Over eight percent (8.6%) of the regional harvest from the M-99. Rice Production Program was gathered from Tacloban City

Note: Region VIII (Eastern Visayas) has 138 municipalities and 3 cities

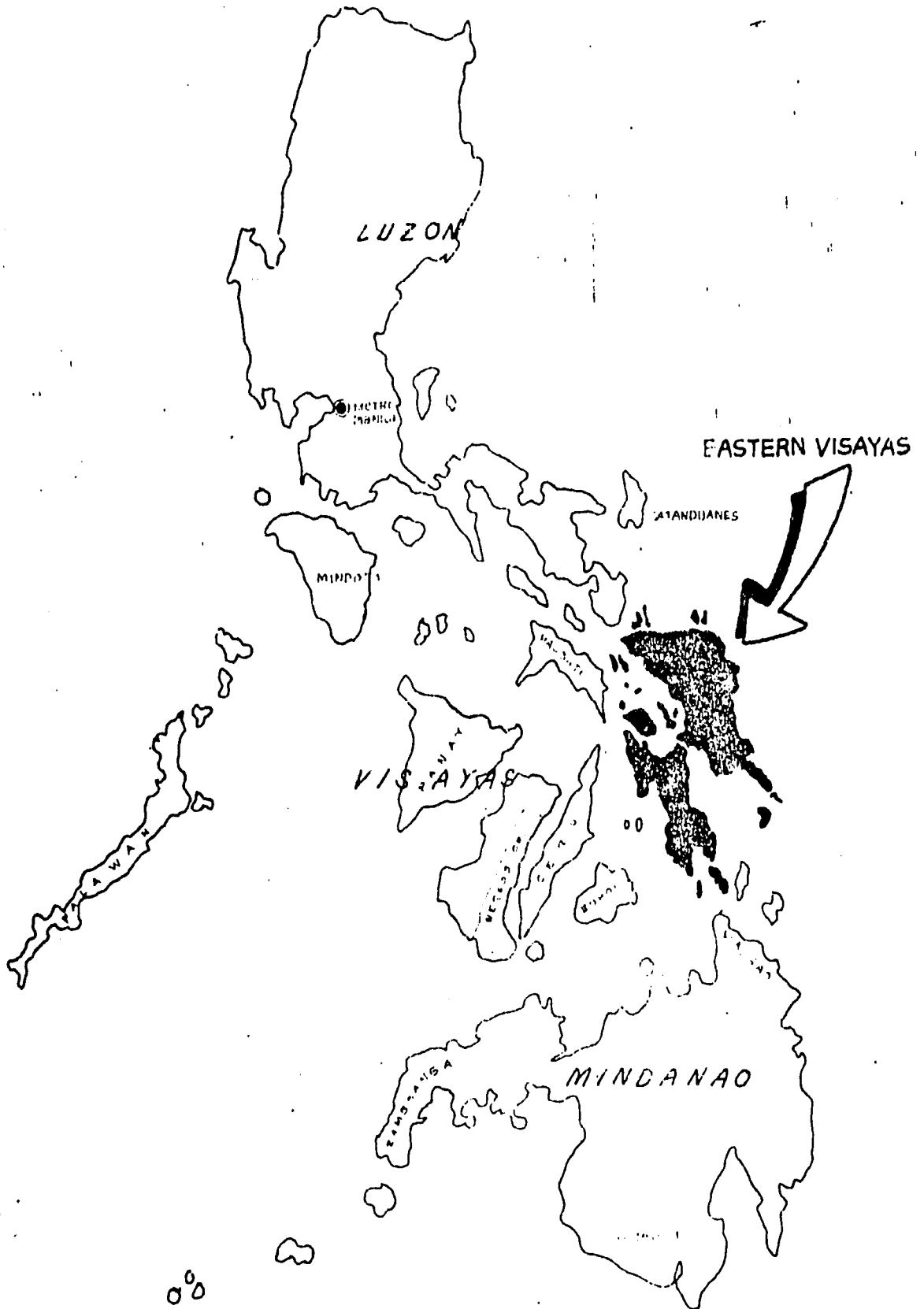
* Does not include private schools enrollment in Eastern Samar

** Masagana 99 only

MAP OF THE PHILIPPINES

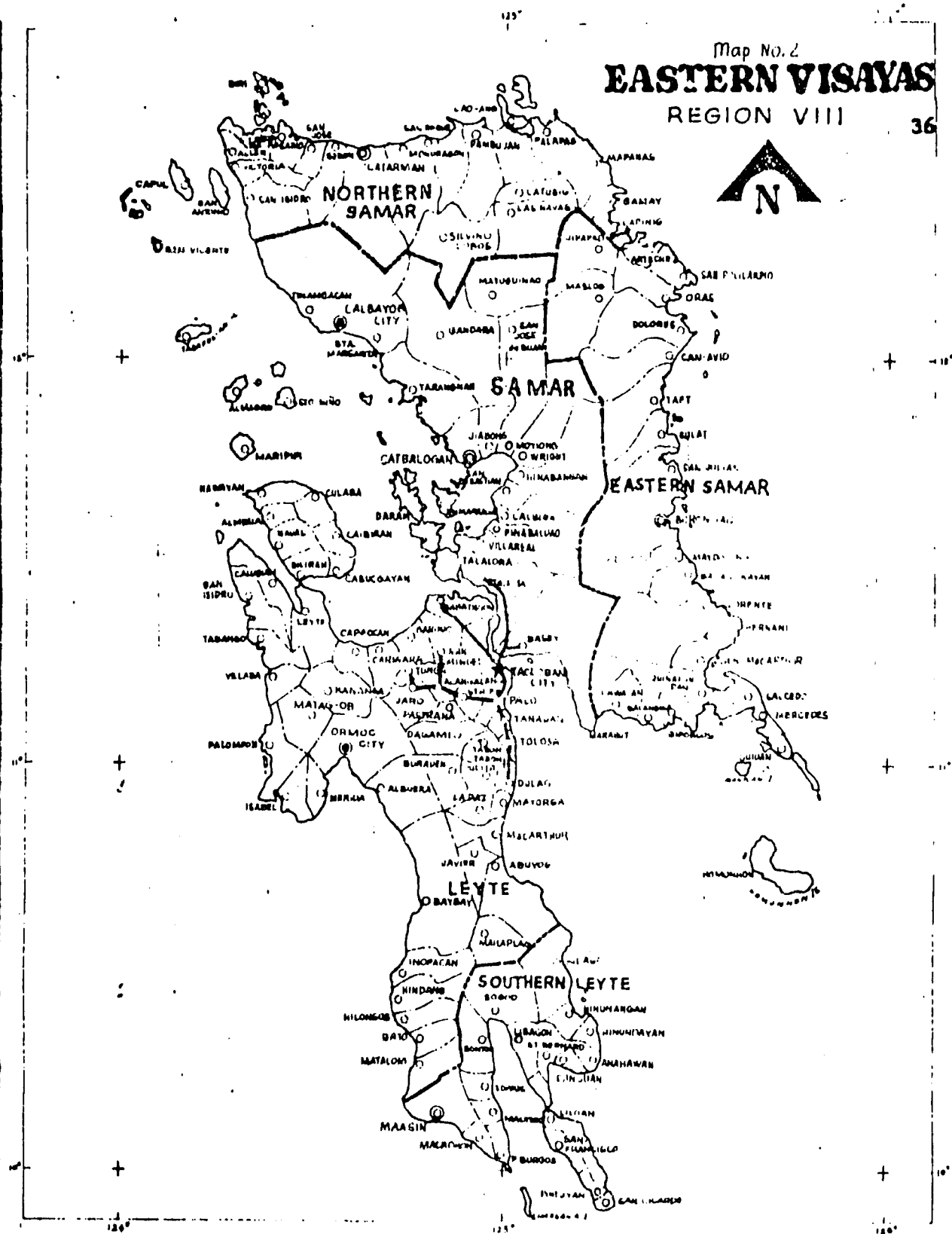
SHOWING EASTERN VISAYAS
REGION VIII

35



Map No. 2
EASTERN VISAYAS
 REGION VIII

36



- LEGEND:**
- REGIONAL CAPITAL
 - CITY
 - PROVINCIAL CAPITAL
 - MUNICIPALITY
 - PROVINCIAL BDRY.
 - MUNICIPAL BDRY.

I. INTRODUCTION

A. History of the Project

The global quadrupling of oil prices in 1973 focused on the vital need for man to take a serious look into the oil problem.

In July, 1978, Eric Chetwynd, Jr., USAID/Washington, D.C., submitted a paper "Development with Resource Conserving Urbanism" to the First International Conference on Energy and Community Development at Athens, Greece. The Athens Conference triggered the mechanism of this joint project with the United States Agency for International Development (USAID). In June, 1979, the energy conservation idea started to take a new shape when Eric Chetwynd, Jr. submitted another paper entitled "Energy Efficient Cities for Developing Countries: Towards an Agenda for Action" to the Energy in the Cities Symposium of the American Planning Association. As stated by the above paper, cities in the developed countries are highly energy intensive organisms. They have evolved in this fashion because an abundance of relatively cheap energy has fostered development of technologies, land use patterns, and personal and societal consumption habits which are heavily dependent upon a massive and steady supply of hydrocarbon fuel and by-products.

Today, conventional forms of energy are no longer abundant relative to demand, and their supply is seen as diminishing and finite in the long term. Thus, the structure of cities must be altered to reflect this reality. Many changes are being cited for study, but most of these approaches are extremely costly and expensive. Prime agricultural land is being taken over at an alarming rate.

These conversions of arable lands to urban uses are particularly costly in view of the historical tendency to locate cities in the midst of good crop-lands capable of supporting a large non-agricultural population.

The Office of Urban Development, Bureau for Development Support, USAID/Washington, prepared the groundwork for a project to selectively address the problem of increasing the efficiency of small and intermediate sized cities in consumption of scarce and costly resources. Rapidly growing small and intermediate sized cities in developing countries are at a stage of growth in which the future pattern and nature of their development still can be influenced.

Thus, this project, entitled "Managing Energy and Resource Efficient Cities", was proposed by S&T/U.P. The project is designed to improve the consumption and use of energy and other key resources in rapidly growing small and intermediate sized cities.

The areas of concern are as follows:

1. Land Use Planning
2. Transportation
3. Energy and Electric Power System
4. Water, Sewer and Solid Waste
5. Building Materials, Industrial Development, Food Distribution and Utilization, and Manpower

After looking over USAID assisted countries, e.g. India, Indonesia and the Philippines, the latter country was chosen as a pre-test for this project to help USAID in the overall design of the proposed regional project.

Tacloban City in Central Philippines, met the criteria and on the last week of July, 1981, Eric Chetwynd, Jr. (USAID/Washington), Lawrence Ervin (Senior Energy Advisor, USAID/Philippines), and Lawrence Revzan of Coopers & Lybrand (C&L), finally selected Tacloban City to implement the project. Mayor Abdulia R. Cinco; Vice-Mayor Uldarico E. Mate; Engr. Romeo F. Crisostomo, City Development Coordinator; and Atty. Antonio A. Zeta, City Administrator and Task Force Chairman, accompanied the USAID team to Manila to complete the Project Agreement.

Among other reasons, Tacloban City, Philippines, was chosen as the pre-test site of the global project because of the enthusiastic efforts of the City Mayor and her support staff.

On July 31, 1981, City Mayor Cinco signed the Project Agreement with USAID and on September 8, 1981, it was approved by Director General Placido Mapa, Jr. of the National Economic and Development Authority. On September 11, 1981, USAID/Philippines signed the Project Agreement.

The Chairman of the Tacloban Task Force, having finished the work schedule, immediately went back to Tacloban and convened the Task Force. Sub-Committees were organized to address the issues involved (see list of sub-committee members).

The preliminary workshop was scheduled for October 22-23, 1981 at Tacloban City. Initial reports were reviewed by Lawrence Revzan and Andrew Goddard who arrived in Tacloban on September 26, 1981.

On October 12, 1981, Mrs. Conchita Silva, the USAID/Philippines project monitor and Dr. Luis Diaz,

a consultant to Coopers & Lybrand, arrived in Tacloban to assist in the preparation of the initial reports. The Task Force conferred with them and the preliminary sub-committee reports were reviewed. Thus, the stage for the Tacloban Workshop was set.

B. Organization of Tacloban Workshop

On October 22-23, 1981, the first inter-regional workshop was conducted at the Leyte Park Hotel, Tacloban City. The workshop, drawing broadly upon relevant Philippine expertise in the resource and conservation fields, reviewed the Tacloban Situation Report prepared by the Task Force groups, and a Preliminary State-of-the-Art document prepared by Coopers & Lybrand. Acknowledged Philippine experts in the areas of responsibility were invited to participate. These members were the following: Land Use Planning - Lilia Casanova; Transportation - Gigi Lallana; Energy & Electric Power System - Engr. Benjamin Lim; Water - Engr. Jose Po; Sewer & Solid Waste - Engr. Mel Ricafrente; Building Materials, Industrial Development, Food Distribution & Utilization and Manpower - Architect Ronie Manahan.

The workshop provided the opportunity for the various sub-committee Chairmen to present their reports (see Agenda). Each sub-committee separately discussed their reports together with their consultants. On October 23, 1981, the Task Force reconvened and all the sub-committee workshop reports were discussed by the attendees in a plenary session. Upon approval of submitted reports, these were drafted to form part of the Tacloban Workshop Reports.

C. Energy and Resource Conservation

We recognize that the continuing escalation of oil prices and the uncertainty of supply are realities beyond

our sphere of control. But the search for alternative sources of energy, the acceleration of oil, coal and geothermal exploration work and the dedicated efforts to conserve energy are matters we can decisively influence. The President of the Philippines has provided support to this effort by giving energy a priority throughout the country.

Domestically, the political leadership has been decisive and prompt in anticipating the outbreak of the energy crisis by setting up the institution required to deal with the problem.

Total commercial energy consumption in the Philippines is projected to rise from 97.8 million barrels in 1981 to 133.7 million barrels in 1985. To reduce dependence on oil, the Government has targeted the current 88 percent share of oil in the nation's energy requirements to be reduced to 55 percent by 1985. Much of this can be achieved by reducing consumption of energy in the urban areas where per capita consumption is significantly greater than in the rural areas. It is imperative, therefore, to promote efficient and judicious utilization of energy and other scarce resources in our cities.

Growing cities like Tacloban are continuously making heavy demands not only on scarce resources, such as energy, but also on land, water, building materials and transport.

Energy wastage in the land transportation sector stems from traffic jams in the crowded cities, the mechanical inefficiencies of vehicles, the lack of efficient urban mass transit systems, and inappropriate location of urban services and institutions. Prime agricultural land is being consumed for urban purposes without examination of the resulting impacts. In some

cities water supply is becoming a major problem. In short, cities could manage these scarce and costly resources more efficiently.

Toward this concern, AID in cooperation with the City of Tacloban, has launched the project on Energy and Resource Efficient Cities. This joint effort will explore possibilities of conserving energy and resources such as land, water and other local materials.

D. Overview of Tacloban Situation

Toward AID's concern on the growth and development of small and intermediate sized cities, groundwork was prepared for a project addressing the problem of increasing the efficiency in consumption of scarce and costly resources such as energy, land, water, food and building materials.

The inter-regional project known as "Managing Energy and Resource Efficient Cities" is intended to improve efficiency in consumption and use of energy and other key resources in rapidly growing small and intermediate sized cities. The purpose of the project is to: (a) assist host countries to identify and exploit opportunities for greater economy of resource consumption in key sectors, (b) help create and strengthen the skills and institutions needed in the host country to continue and expand the work.

The objective of the pre-test is to develop for Tacloban City a strategy designed to increase the city's efficiency in consumption of important scarce resources. The project is based on the assumption that the future pattern and nature of development of rapidly growing

small and intermediate sized cities like Tacloban can still be influenced while they are still in the relatively early stages of their growth and modernization.

The Tacloban City pre-test will be used as a major input to AID's inter-regional project which may have application in Africa, Asia, Latin America and the near East, if it can be fully developed and approved in AID/Washington. The first field demonstration is planned for Tacloban City, Philippines, in FY 1982.

1. AREA OF RESPONSIBILITY

The role of the land use sector in the present study on "Pre-Test for Managing Energy and Resource Efficient Cities" is twofold: firstly, it shall stress the value of land as a basic resource that requires efficient management, and secondly, it shall relate land use to resource management and conservation programs in sectoral concerns of the present study, namely: transportation, water, energy, food distribution, building materials and industrial development.

In line with these tasks, this report will present an analysis of existing land uses in the City of Tacloban and shall propose a Land Use Plan which shall be the basis for a program of land resource management and zoning.

In relation to other sectors, the major function of the land use sector will be to provide the physical or spatial dimension to its development planning efforts. Specifically, it will perform the following functions:

1. Provide the direction for establishing a transportation network and the systems for water and power supply as well as food distribution.
2. Guide the location or siting of buildings and other land development projects
3. Induce industrial development and economic growth through a rational allocation of land uses for commerce and industry and for services supportive of industrial development
4. Secure the protection or conservation of lands which are valuable sources of water, food and indigenous materials
5. Secure the protection and conservation of lands which are valuable for their aesthetic, scientific or historical significance

6. Institute a system of development control through zoning as a measure to carry out the above functions.

Hence, the expected output of the land use sector shall be a Land Use Plan and a Zoning Ordinance. The Land Use Plan shall be consistent with the functional role of the City within the framework of regional development and with the development policies and thrusts of the national government. The Zoning Ordinance shall be the legal instrument to implement the Plan.

II. SITUATIONAL ANALYSIS

A. Preface

The analysis presented herein is a preliminary assessment of existing land use in the city based on available data obtained from a study conducted in 1977. A more accurate situational analysis would require the collection of recent data on land use (See Maps 1 & 2).

At present the City of Tacloban has a Comprehensive Development Plan which contains a Land Use Plan and a Zoning Ordinance. The Comprehensive Development Plan was approved by the Human Settlements Regulatory Commission (HSRC) in 1978. Land use plans and zoning ordinances must be reviewed at least every 5 years after they become effective in order to determine their viability and relevance. Consequently, the present Land Use Plan and Zoning Ordinance of the City would have to undergo a review process in order to ascertain sections that may need revisions or amendments by 1982. The present study assisted by USAID on "Pre-Test for Managing Energy and Resource Efficient Cities" piloted in the City of Tacloban is most opportune. The study will facilitate the review of the present Land Use Plan and Zoning Ordinance.

B. General Land Use

Tacloban City has a total land area of 10,855 hectares representing both urban and rural lands (see Table 1). This includes an area of 1,79 hectares reclaimed from the sea by the Philippine Ports Authority and given to the City in 1980. The City's total land area is classified into urban lands and rural lands. The built-up area, which covers the central business district (CBD) or the city proper, and the developed adjacent areas are classified as urban lands. Lands outside the built-up area are classified as rural (See Maps 3, 4, & 5).

Thus, urban lands comprise areas used for residential, commercial, industrial, institutional and recreational purposes or open spaces within the built-up area. Rural lands are those outside the built-up area which include arable lands, lands under permanent crops, pasture lands, barren lands and forest or woodlands.

1. Urban land use

In 1977, the area allocated as urban land amounted to 1,020 hectares or 9.40% of the total land area. The rest were classified as agricultural or rural lands. In 1980, a survey undertaken by various different city government offices and regional offices of national agencies stationed in Tacloban City indicated that some 1,029 hectares of agricultural land were lost to urban development between 1977 and 1980. This change increased the

size of urban land to 2,051 hectares or an increase of more than 100%. (Refer to Table 2 and Chart 1). With this increase in size, urban land in the City now represents 18.90% of the total land area or double that of 1977. On the other hand, agricultural lands were reduced by 10.46% in the same period. The type of rural lands which were converted to urban uses were generally arable lands and pasture or barren lands.

In 1980, the largest portion of urban land was residential having a total of 1,800 hectares. It accounted for 87.80% of the total urban land. The increase in residential areas from 1977 to 1980 was 933 hectares or 107%. This could be attributable to the high population increase that took place between 1975 and 1980.

Other urban uses are far behind in size from residential use. Institutional areas represent only 6.30%, commercial and recreational areas each represent only 2.90% and industrial use is barely .10% of total urban land. The increase in size of these different uses are very negligible compared with the increase in residential use. Although these other uses increased in size by 50-100% still their areas are very inadequate to meet the needs of the growing population.

The present imbalance in urban land uses reflects the very low level of socio-economic development in the city. (Please refer to Table 2 and Chart 2 for the analysis on urban land use).

However, the increase in size of urban land is indicative of a rapid urbanization trend in the city. It is also indicative of the need to guide and closely monitor the pattern of growth to prevent sporadic urban sprawl.

2. Rural Land Use

The dominant use of land outside the built-up portion of the city is rural or agricultural which is 81.10% of the total land area. Forest and woodland comprise the biggest portion of rural land or 52.82%. The remaining portions are 21.40% arable land, 18.74% pasture or barren land and 7.04% are lands planted to permanent crops like coconuts and fruit trees. (Please refer to Table 2 and Charts 3 and 5 for the analysis on rural land use)."

The forest and woodland area is located in the northwest side of the city. It has thick vegetation that may be suitable for wildlife and the development of natural parks. Within the forest area is a watershed that has been delineated as part of a sub-regional development area called Sab-A Basin, the planning and development of which falls within the jurisdiction of the Leyte Sab-A Basin Development Authority. In view of this situation, it is clear that close coordination in planning among the offices of the Leyte Sab-A Basin Development Authority, the Bureau of Forest Development and the City of Tacloban is necessary because of the impact that may be had on the watershed.

C. The Land Use Plan

The present Land Use Plan of the city seeks to guide the allocation and distribution of land uses as well as guide the regulation of land uses through a Zoning Ordinance.

On the whole, the Plan aims to make the city physically, socially and economically attractive to local, national, and foreign investors through an integrated scheme of developing all sectors of society. The goal is to make the city reach a level of economic growth that is necessary to improve the quality of life of its people and at the same time radiate development to the generally depressed communities within the region.

Specifically, the development objectives of the Plan are:

1. Creation of a social, economic and physical environment for the city that will give it the character of a Regional Center, an environment that is attractive to local, national and foreign investors and conducive to the undertaking of social, economic, educational, cultural and political activities
2. Optimum utilization of land through an efficient pattern of land use and zoning
3. Encouragement of agricultural and industrial development which could induce a level of economic growth necessary to improve the quality of life of the population
4. Promotion of efficient mobility of people, goods and services within the city and of access to the major population centers within the region and outside

5. Dispersal of development outside the urban core.

To meet the above objectives, the development strategies contained in the Plan are the following:

1. Planned expansion of the present urban area to as far as Barangays San Jose, Sagkahan and Marasbaras in the south and part of Barangays Tigbae and Diit in the north in order to accommodate the growing population.

2. Development of self-contained communities following the concept of neighborhood centers which are complete with the basic amenities of comfortable community life in Barangays Palanog, Abucay, Camansihay and Sta. Elena which shall serve as growth poles to discourage the migration of rural population to the urban core. The strategy hopes to control the ribbon type of development along the major thoroughfare which has naturally evolved because of the coastal location of the city, its limited flat lands and mountain areas separating it from other municipalities.

3. Development or encouragement of commercial and market complexes in the urbanizing areas of San Jose and Sagkahan in the south. The strategy hopes to facilitate the exchange of goods and services with the growing Municipalities of Palo, Tanauan and Alang-alang.

4. Development or encouragement of agri-based industries, such as, livestock, poultry, fish production, and small-scale manufacturing industries in Barangay Diit in the north.

5. Location of institutional, residential, commercial and recreational use zones within the urban core with provisions for segregating incompatible uses.
6. Development of a medium to heavy industrial site in Barangay Old Kawayan in the north. The location is rationalized by its proximity to the Municipality of Babatngon and to the Province of Samar.
7. Maintenance of agricultural and open spaces in areas outside of the expanded urban core and of sites identified for major land development, i.e., for residential neighborhoods, commercial, industrial and institutional uses.
8. For the urban core, buffer zones, such as green belts and small parks shall serve the purpose of both beautifying the city and separating certain incompatible land uses. The beautification of Magsaysay Boulevard shall be a continuing project of the city. The beautification of the boulevard shall consider the protection of the Kankabato Bay from pollution with all types of waste. Part of the Bay shall be developed into a healthy beach resort and recreational area.
9. Provision of service roads and/or sidewalks for national roads and highways including city streets especially in the central business district in order to separate pedestrians from vehicular traffic and ensure safety.

10. Development of scenic spots and historical landmarks for recreation and tourism purposes.
11. Protection of riverbanks and coasts from erosion and conservation of the watershed area, swamps and marshlands in order to protect the environment and maintain the ecosystem.
12. To hasten the development of Tacloban City as the center for economic, social and political activities in Region VIII. Priority shall be given to the development of infra-utilities, especially the development of an integrated transport system connecting major functional zones, the improvement of the existing system of communication, water supply and power supply, the development of the regional hospital and medical center and the development of Palanog Resettlement Area.

To reiterate, the Land Use Plan with the Zoning Ordinance was approved in 1978 for implementation. However, development trends in the city from 1978 to 1980 show that the Land Use Plan and Zoning Ordinance have not been fully implemented. If it has been implemented, there are glaring discrepancies between implementation and formulation. Examples of these glaring discrepancies are the location of a cockpit and sports complex within a designated residential zone, the conversion of swamps and marshlands into housing subdivisions and the location of a satellite communication station within the designated agro-industrial site. Likewise, while the Plan

aims to encourage the expansion of urban development to the northern and southern parts of the city, development towards the north lags behind that in the south because of the continued absence of good roads, piped water, power lines and suitable transportation.

On the other hand, some programs and projects which have been implemented follow the guidelines of the Plan as stated in its strategies and objectives. These programs and projects include: (1) the development of Barangay Diit as agro-industrial area by locating the slaughterhouse and allowing goat farming within the barangay (2) the development of Palanog Resettlement area (3) the development of the seaport and airport (4) the continued beautification of Magsaysay Boulevard.

D. Institutional Framework

The City Planning and Development Board (CPDB) is the planning and decision-making body of the city. It is assisted by the City Planning and Development Staff (CPDS) which serves as its technical arm in the conduct of research and plan formulation.

The CPDB is composed of the City Mayor as Chairman of the Board, the City Planning Coordinator as Executive Secretary and eleven members representing the following sectors:

- Sangguniang Panglunsod (local legislature)
- Barangays or villages
- Business sector
- Civic organizations
- Religious sector
- Educational sector

The City Engineer
The City Treasurer
The City Development Officer of the Ministry
of Local Government and Community
Development (MLGCD)

The CPDS is headed by the City Planning Coordinator who is assisted by a technical staff consisting of an Urban Planner, Management Specialist, Economist, Fiscal Analyst, Sociologist, Engineering Analyst and Statistician.

The development of the city should be guided by its Land Use Plan and Zoning Ordinance which were formulated by the CPDS, adopted by the Sangguniang Panglunsod, endorsed by the Regional Development Council and ratified/confirmed by the Human Settlements Regulatory Commission in 1978. In brief, the Land Use Plan and Zoning Ordinance of the city went through a process of formulation, review, public hearing and legitimation at the local, regional and national levels of government.

The administration and implementation of the Land Use Plan and Zoning Ordinance is the responsibility of the City Zoning Administrator. Plan administration entails the development of programs and projects within the land use scheme, a continuous monitoring of development trends, and a periodic evaluation of the Plan to determine its viability. Zoning administration, on the other hand, means the enforcement of land use regulations contained in the Zoning Ordinance. This is accomplished through a system of locational clearance/development permit which requires all project proponents to site projects within the approved land use zones and to secure a certificate of zoning compliance from the

Zoning Administrator as a prerequisite to the issuance of the building permit by the local Building Official.

The Zoning Administrator is also responsible for monitoring compliance of conditions attached to locational clearances, if any, monitoring non-conforming uses and other developments violative of zoning regulations. To ensure the implementation of the Zoning Ordinance, the Zoning Administrator is empowered to recommend for a cease and desist order from the court and to impose penalties on violators.

The decision of the Zoning Administrator is however appealable to the Zoning Board of Appeals of the City and to the Human Settlements Regulatory Commission if the case is not settled at the local board level.

III. CONSERVATION PROBLEMS AND OPPORTUNITIES

The analysis on existing land use and development trends in the city has brought to the surface problem areas and opportunities for conservation of land and other resources.

1. Resource Efficiency Guidelines and Performance Standards for Land Use Planning and Zoning

An opportunity area that has been identified as first priority is the formulation of well-defined, resource efficiency guidelines and performance standards for land use planning and zoning. This set of efficiency guidelines and performance standards shall be the basis for promoting economy of land uses or space accessibility and convenience, promoting beauty and environmental quality and protecting land values

through conservation and harmony of uses. It shall also serve as a basis for controlling development in functional use zones and environmentally critical areas.

Specifically, the resource efficiency guidelines and performance standards shall be the basis for decision-making on:

1. Size and location of functional uses vis-a-vis: industrial, commercial, residential, agricultural, institutional, recreational, open spaces and other uses
2. Density levels per functional use appropriate to local conditions
3. Classification and identification of critical lands that require conservation measures
4. Classification of permissible uses within specified functional zones and critical areas
5. Area or distances of variance, exceptional use and other deviations from the zoning regulations

The preparation of resource efficiency guidelines and performance standards will require data gathering, particularly physical data, i.e., soil capability, suitability and development constraints. Examples of development constraints are natural hazard areas, such as, floodplains/floodways, fault-lines and erosion areas because of the dangers they pose for people, and valuable lands such as forests, watershed, and inland wetlands which have to be preserved because of their value as sources of food, water, or for their aesthetic, scientific and recreational values.

The survey technique for gathering land use data can be any one of the following:

(a) Aerial photo method

This method is accurate and efficient but quite expensive. It is most useful for urban area analysis, ground water survey, locating sources of granular construction materials (sand, gravel, etc.), determining terrain, structural bearing capacity of soils and other studies related to detailed land use.

(b) Topographic map method

This method is useful for general land use studies but not for urban area analysis. It can provide data on terrain, surface drainage pattern, vegetation, transportation network and size of built-up area but not detailed urban land uses. But the advantage of this method is that it costs very little and quite simple to undertake.

(c) Ocular and foot survey

This method is very inaccurate and crude. However, the method is necessary in the absence of aerial photos and/or topo maps. This method may even be more expensive and time-consuming than the topographic map method.

2. Urban Farming

Another opportunity identified is urban farming. Urban farming would refer to small type of farms for growing vegetables, root-crops, fruit trees and orchards. Farms can

be in the form of:

- (a) backyard farming or gardening compatible with all urban areas
- (b) corporate or institutional farming within the compounds of government offices, churches, schools and on vacant and idle lands.

Urban farming is a technique of land resource management which can be related to the opportunity of utilizing certain wastes as fertilizers. This type of activity may be implemented in the short-run with low to medium cost.

Urban farming will not, however, make Tacloban a food supplier in the region. The most that it can do is improve food production to meet the basic requirements of its population in terms of vegetables and fruits which the city has been importing from Cebu, Manila and other places.

However, there are disadvantages or adverse consequences of this kind of activity. It can lead to environmental risks from pollution in the urban core if solid waste utilization, for instance, is not properly provided with the necessary safeguards. It is also likely to encounter cultural constraints because some city people may not be receptive to urban farming. The development of an organization or association at the community level would be needed to implement this kind of activity. Although it is to be noted that institutional farming thrives in schools especially in the public elementary and high schools because gardening is made a part of the curriculum.

3. Aqua-marine production in unproductive marshlands or swamplands

A third opportunity area identified is the use of marshlands or swamplands which are no longer productive for aquaculture or fishery activities. Similar with urban farming, these activities can be tied-up with the KKK or National Livelihood program. However, consideration has to be given to the conservation of the shoreline and wetlands and to the impact of the activities on the ecosystem. This activity is implementable in the short-run and at low to medium cost.

4. Location and Development of Industrial Site

A fourth opportunity area identified is the location and development of an industrial site for light to medium and heavy industries. While the Land Use Plan has indicated Barangay Old Kawayan as a site for medium to heavy industries, the location of the site may not be optimum in terms of cost and time involved in transportation.

The following alternatives have been considered as possible strategies for locating industries:

- (a) Allocate a separate site for light and non-polluting industries and another site for medium to heavy and polluting industries. The proposed sites are Barangays Tigbao and Old Kawayan which are six kilometers and ten kilometers respectively, away from the CBD.

(b) Concentrate all types of industries in one single estate. The proposed site is Barangay Tigbao.

The first alternative is considered advantageous since the segregation of hazardous industries from non-hazardous industries protects public safety and health. It will also promote development dispersal. However, the development of two separate industrial sites will be very costly for the city. It will mean additional cost in land development and in the provision of infra-utilities, such as access roads, water and power supply.

The second alternative is less costly but it may not be attractive to many types of investors.

Industrial development whether in two separate industrial sites or in a single industrial estate is a high cost activity and requires a medium to long-term period for implementation.

5. Location and development of an Export Processing Zone

Related to the opportunity for industrial development, another area identified is the opportunity to locate an Export Processing Zone (EPZ) which can be developed by the Export Processing Zone Authority (EPZA).

A proposed alternative is to locate the EPZ within the site identified for a single industrial estate because of its proximity to the ports.

Another alternative is to locate a separate site as EPZ which can be adjacent to the seaport or airport.

The development of an EPZ within the city is considered advantageous because of its potential to generate mass employment and increase revenue.

6. Shoreline Protection and Conservation

Tacloban City, being a coastal area, requires protection and conservation of its shoreline. This opportunity area has a long-term advantage. The shore fronting Kankabato Bay is particularly noted as an important target for conservation because of its marine products and recreational value.

However, the city is presently confronted with the problem of squatter settlements along the shorelines of Kankabato Bay and Panalaron Bay and with the problem of pollution in the two bays due to waste discharges.

Several courses of action have been proposed in order to conserve the shorelines of Kankabato and Panalaron Bays. These are:

- (a) Resettlement of the squatters to the Resettlement Area in Palanog.
- (b) Beautification of Magsaysay Boulevard
- (c) Construction of a seawall in some parts of Panalaron Bay
- (d) Extension of the sewage outfalls to the open sea. This course of action is not considered feasible because of the high cost involved.

A program to protect and conserve the shoreline is medium to long term with medium to high cost.

7. Conservation of rivers and creeks

Flooding in some parts of the city's Central Business District has become a frequent occurrence especially during rainfall. It is observed that, perhaps, flooding is due to the clogging of the natural passage of water and run-off by siltation, illegal construction, and squatting along the banks of rivers and creeks.

In this regard, two courses of action are proposed:

- (a) Removal of silt in clogged rivers and creeks through dredging
- (b) Relocation of squatters along banks of rivers and creeks to the Resettlement Area in Palanog

Conservation of rivers and creeks as a program is medium to long term with medium to high cost.

8. Location of Garbage Dump Site and Cemetery

A problem area which needs immediate attention is identifying an appropriate location for a garbage dump site and a public cemetery.

The present dump site is located in an abandoned ricefield in a populated barangay within the urban core. The present site is risky for the health of the people within its vicinity. On the other hand, the size of the present cemetery has become congested and insufficient. Another public cemetery has become necessary.

The proposed site for public cemetery is a small valley in Barangay Anibong in the north. There is no site yet being proposed as a dump site.

Locating an alternative dump site and public cemetery should especially consider the impact of the proposed uses on public health, ground water quality, potential for more productive use, and land values of surrounding areas.

Please note that problems no. 7 & 8 are not listed in the Land Use Matrix. However, the aforementioned problems are a result of the discussions of the solid waste and water sectors. Hence, they are herein being added as problem areas in land use.

IV. PROPOSED STRATEGIES

1. Detailed Land Use Survey

A detailed land survey has to be given priority since it is necessary for the preparation of resource efficiency guidelines and performance standards as basis for land use planning and zoning.

It is proposed that the land use survey shall utilize the aerial photo method for accuracy and efficiency. Since this is a costly method, it is recommended that financial assistance be provided by USAID. If the recommendation is not feasible, the alternative method of using topographic maps prepared by the Bureau of Coast and Geodetic Surveys (BCGS) shall be applied. The topographic map method shall, however, be supplemented with an ocular and geodetic survey to determine boundaries of barangays and functional zones. The ocular and geodetic survey can be undertaken with assistance from the City Engineer's Office.

2. Urban Farming

Backyard farming of vegetables and fruits should be encouraged in residential areas and in vacant and idle lots.

Corporate or institutional farming shall also be encouraged in areas such as schools and government offices.

However, urban farming should not include the raising of livestock and fowl which cannot be allowed in the urban core because of their environmental impact. Urban farming shall be limited to the planting of vegetables, fruit trees, orchards and rootcrops. Seedlings can be provided by the Bureau of Plant Industry.

Urban farming shall also be integrated with the potential for utilizing wastes as organic fertilizers and with the National Livelihood Program or KKK for tapping its potential as a business enterprise for low-income groups. The KKK can provide assistance in the form of marketing services.

In order to avoid environmental risks which could arise from the use of wastes, consultations should be made with an agronomist and waste specialists.

Above all, the program shall be supported with a massive information and promotional campaign to ensure acceptance and support.

3. Development of a Single Industrial Estate

The development of a single industrial estate for light to medium and heavy industries is considered more efficient and economical than industrial dispersal. The estate is proposed to be located

at Barangay Tigbao. The proposed Export Processing Zone can be located in the same industrial estate.

Since the proposed industrial site has become a property of the Leyte Sab-A Basin Development Authority (LSBDA), it is recommended that coordination of planning and development of the site be made between the officials of LSBDA and the City Government. Consultation with officials of EPZA is also necessary to determine the appropriateness of the site for an export processing zone.

The development of an industrial estate does not preclude, however, the development of a separate site for small-scale agro-based industries in Barangay Diit by the city.

4. Development of a Coastal and Wetlands Management Program

The protection and conservation of the shorelines, rivers, creeks, swamps, marshlands, and other sources of water and marine products call for the development of a comprehensive coastal and wetlands management program. The program shall include the following activities:

- (a) Beautification of Magsaysay Boulevard which shall include tree planting near the coast to prevent erosion.

The implementing agency for this activity is the city government.

- (b) Relocation of squatters along Kankabato and Panalaron Bays and along banks of

rivers and creeks to Palanog Resettlement Area.

The implementing agency for this activity is the National Housing Authority or the Ministry of Human Settlements. The program of resettlement shall be coordinated with the program of developing Palanog as a resettlement area.

- (c) Construction of a seawall in some parts of Panalaron and Kankabato Bay

The implementing agency for this activity is the Ministry of Public Works.

- (d) Dredging to remove silt in clogged rivers and creeks.

The implementing agency for this activity is the Ministry of Public Works.

- (e) Development control in areas along the coasts, banks of rivers, creeks and other wetlands through zoning and enforcement of regulations on buildings and subdivisions.

The implementing office for this activity is the city government.

5. Overall Strategy: Incorporation of the Above Strategies in a Land Use Plan and Zoning Ordinance

The above strategies shall be incorporated in a Land Use Plan and Zoning Ordinance to ensure their implementation. For this purpose, the present Land Use Plan and Zoning Ordinance of the City shall be revised accordingly. Revision of the documents should be based on the resource efficiency guidelines and performance standards that will be established.

The implementing office for this activity is the City Government through its City Planning and Development Staff.

The foregoing discussion on Problems and Opportunities (IID) and on Proposed Strategies (IV) is a narrative presentation of the items incorporated in the Land Use Matrix which was the outcome of the initial workshop conducted at Tacloban City.

PRELIMINARY STRATEGY MATRIX FOR SECTION ON LAND USE

CONSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIOR (RA)
1. Resource Efficiency for Land Use Planning; Incompatibility of Land Use (example, machine shop located in residential area)			Emphasize importance of efficiency in use of resources			Local Government	S	L	1
2. Urban Farming	1. Backyard Farming		1. Use of waste products	1. Environmental risks	Food Production/distribution	Ministry of Agriculture	S	M-L	2
2.1 Urban farming and Fisheries	2. Single large site		2. Increase supply of vegetables and fruits	2. Organization required	Solid Waste				
	3. Corporate farming		3. Access to market	3. Cultural constraints	Water/Drainage				
	4. Institutional farming (schools, Min. of Agr. Nurseries)		4. Employment and income						
	5. Uplands								
	6. Lowlands								
	7. Industrial site		5. Link water and waste disposal with farming						
Agricultural potential survey of lands designated by working group criteria									
Consultation with agronomist									
Consultation with solid waste authorities									
Consultation with water authorities									

PRELIMINARY STRATEGY MATRIX
FOR SECTION ON LAND USE

CONSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LOW) N(NONE)	PRI (R)
2.2 Utilization of Marshlands and swamp-lands for agriculture and fisheries (use of idle resources)	encourage private sector to undertake project (e.g. under KKK)				Food distribution, water drainags	Local gov't. Ministry of Agriculture Ministry of Natural Resources LSBDA	S L	L H	3 4
3. Location and development of industrial site	1. Separate sites for heavy, medium industry 2. Concentrate on 1 site (future dev. Tigbao) 3. Develop site of existing industries (rice and corn mills, sawmills in Marasbaras but control future growth)	Combine 2 and 3	Pollution and hazardous industries should be located away from other industries and residential area. Free other sites for other uses Concentration of facilities and services Proximity to existing plants.		Transport Energy Water Drainage	Local Gov't.			

PRELIMINARY STRATEGY MATRIX FOR SECTION ON LAND USE

CONSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENING AGENCIES	TIME FOR IM- PLEMEN- TING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PR (F)
4. Shoreline protection and conservation (Particularly Cancabato Bay)	1. Total shore- line control		In line with na- tional government project (NHA)	Relocation decrease land values adjacent areas	Trans- port Sewerage Drainage	(EPZA)	M	M	5
5. Location and Deve- lopment of Export Processing zone	Choose a site separate from identified industrial areas Combine EPZA with proposed industrial area	Consultation with EPZA and LSBDA	Employ- ment gene- ration Income generation	alt. 1 dispensed provision of facili- ties and services alt. 2 pollutive and non- pollutive industries maybe located in one area security and ad- ministration	Transport Water Power Drainage	Export Processing Zone Authority (EPZA)	L	H	6

TABLE 1
Existing Land Use
Tacloban City
(1977)

LAND USE	: Existing : (hectares)	: Percentage : Distribution
1. Urban Land	1,022	9.40
a) Residential	99	0.92
b) Commercial	41	0.36
c) Institutional	57	0.52
d) Industrial	-	-
e) Recreational	33	0.31
f) Other built-up areas outside urban core	792	7.29
2. Rural Land	9,833	90.60
a) Arable or agricultural land	2,257	20.80
b) Lands under Permanent Crops	644	5.93
c) Pasture or barren land	2,277	20.98
d) Forest and Woodland	4,655	42.89
TOTAL LAND AREA	10,855	100.00

TABLE 2
Growth Trends in Land Use
Tacloban City
(1977-1980)

LAND USE (Area in hectares)	1977	Per Cent Share to Urban Land	1980	Increase in Area	Per Cent Increase	Per Cent Share to Urban Land in 1980
I. URBAN LAND	<u>1,020</u>	<u>9.40 % *</u>	<u>2,051</u>	<u>1,031</u>	<u>101%</u>	<u>18.90% *</u>
1. Residential	867	85%	1,800	933	107.6%	87.80%
2. Commercial	40	4.0%	60	20	.5%	2.90%
3. Institutional	73	7.1%	130	58	79.4%	6.30%
4. Industrial	1	.10%	2	1	100%	.10%
5. Recreational and open spaces	39	3.8%	59	20	51.2%	2.90%
	1977	Per Cent Share to Rural Land	1980	Decrease in Area	Per Cent Decrease	Per Cent Share to Rural Land in 1980
II. RURAL LAND	<u>9,833</u>	<u>90.60% *</u>	<u>8,804</u>	<u>1,029</u>	<u>10.46%</u>	<u>81.10% *</u>
1. Arable Land	2,257	23%	1,884	373	16.52%	21.40%
2. Land under permanent crops	644	6.6%	620	24	.04%	7.04%
3. Pasture or barren land	2,277	23.1%	1,650	627	27.53%	18.74%
4. Forest or woodland	4,655	47.3%	4,650	5	.11%	52.82%
T O T A L	10,853	100 %	10,855			100 %

* Per Cent share to total land area

NOTE: Two (2) hectares of land was reclaimed from the sea by the Philippine Ports Authority (PPA) and given to the City in 1980.

CHART 1

GENERAL LAND USE 1977-1980 TACLOBAN CITY

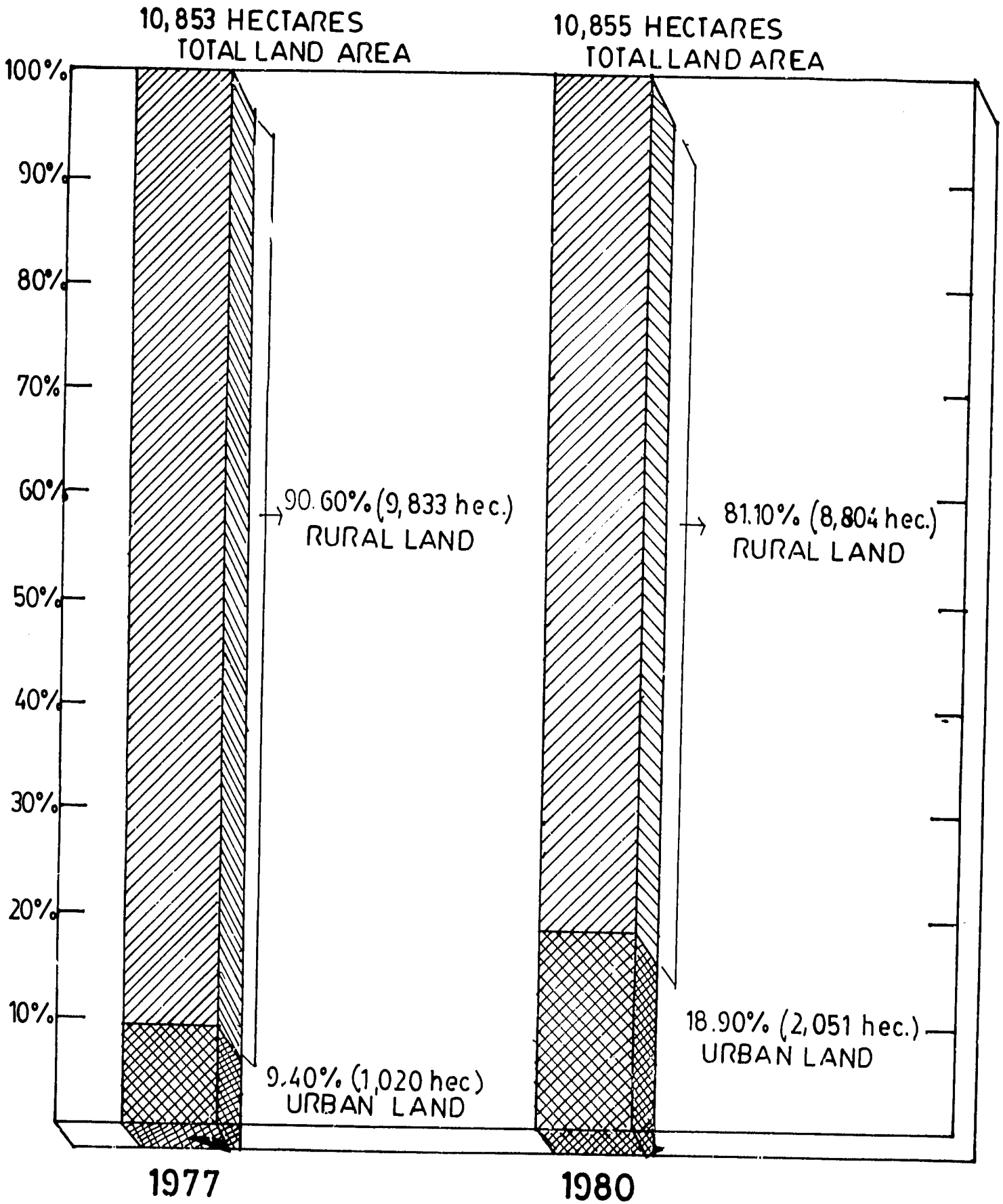
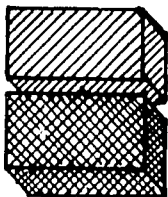
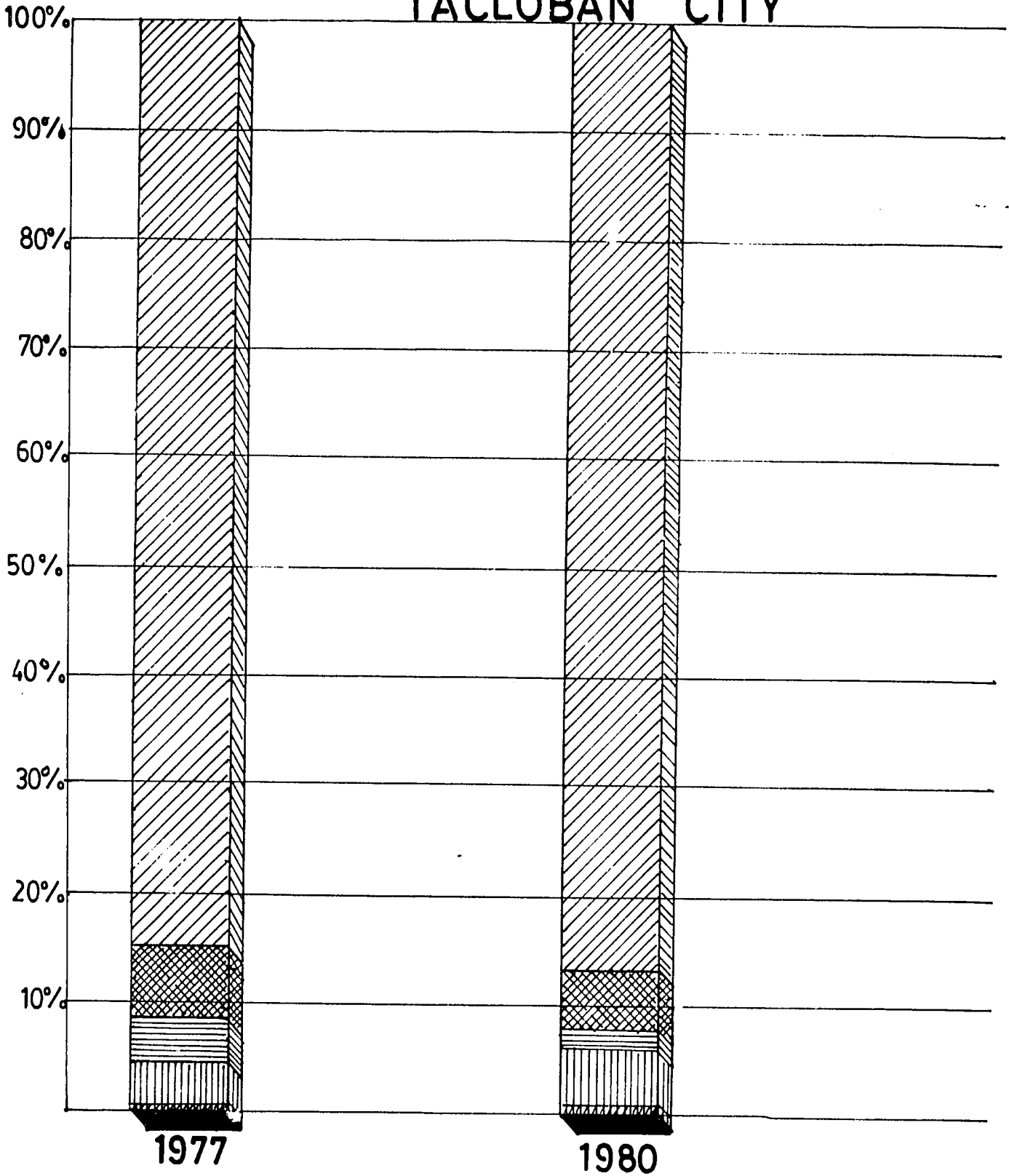
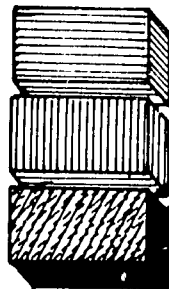


CHART 2

URBAN LAND USE : 1977 1980
TACLOBAN CITY



RESIDENTIAL
INSTITUTIONAL



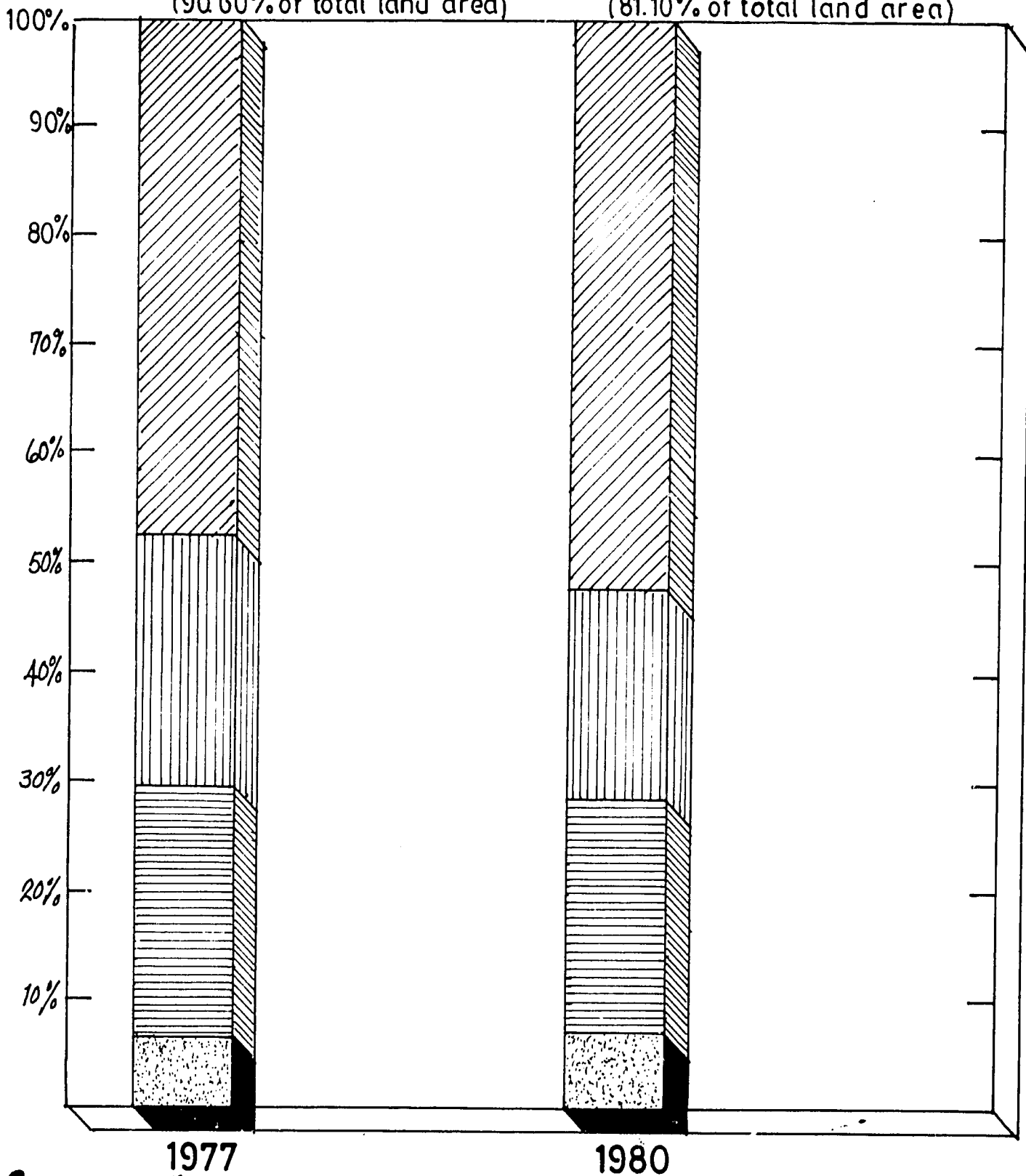
COMMERCIAL
PARKS & OPEN SPACE
INDUSTRIAL

CHART 3 RURAL LAND USE: 1977 - 1980

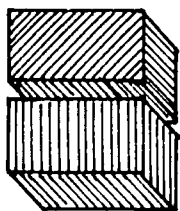
TACLOBAN CITY

9,833 Hectares
(90.60% of total land area)

8,804 Hectares
(81.10% of total land area)

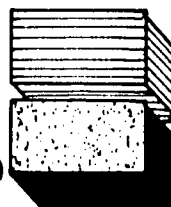


Legend:



● FOREST/WOODLAND

● BARREN/PASTURE LAND



● ARABLE LAND

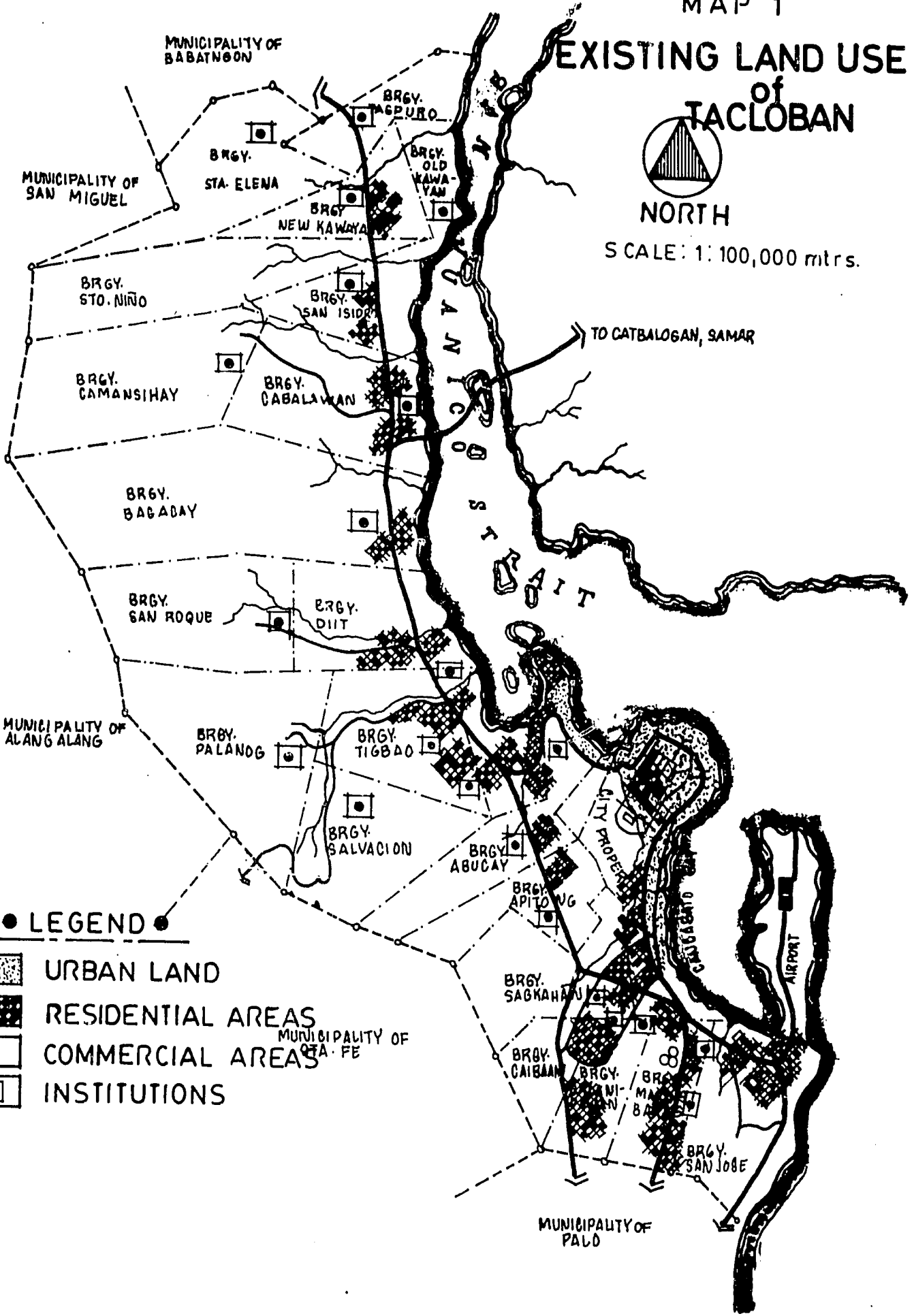
● LANDS PLANTED TO PERMANENT CROPS

EXISTING LAND USE MAP of TACLOBAN


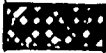
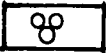



NORTH

SCALE: 1: 100,000 mtrs.



● LEGEND ●

-  URBAN LAND
-  RESIDENTIAL AREAS
-  COMMERCIAL AREAS
-  INSTITUTIONS

MUNICIPALITY OF
BABATNOON

MUNICIPALITY OF
SAN MIGUEL

MUNICIPALITY OF
ALANG ALANG

MUNICIPALITY OF
ATAFE

MUNICIPALITY OF
PALD

BRGY. TAGPURO

BRGY.
STA. ELENA

BRGY. OLD
KAWAYAN

BRGY.
NEW KAWAYAN

BRGY.
STO. NIÑO

BRGY.
SAN ISIDRO

BRGY.
CAMANSIHAY

BRGY.
CABALAWAN

BRGY.
BAGADAY

BRGY.
SAN ROQUE

BRGY.
DIIT

BRGY.
PALANOG

BRGY.
TIGBAO

BRGY.
SALVACION

BRGY.
ABUCAY

BRGY.
APITONG

BRGY.
SABKAHAN

BRGY.
CAIBANAN

BRGY.
MAGNANAYAN

BRGY.
MAGNANAYAN

BRGY.
SAN JOSE

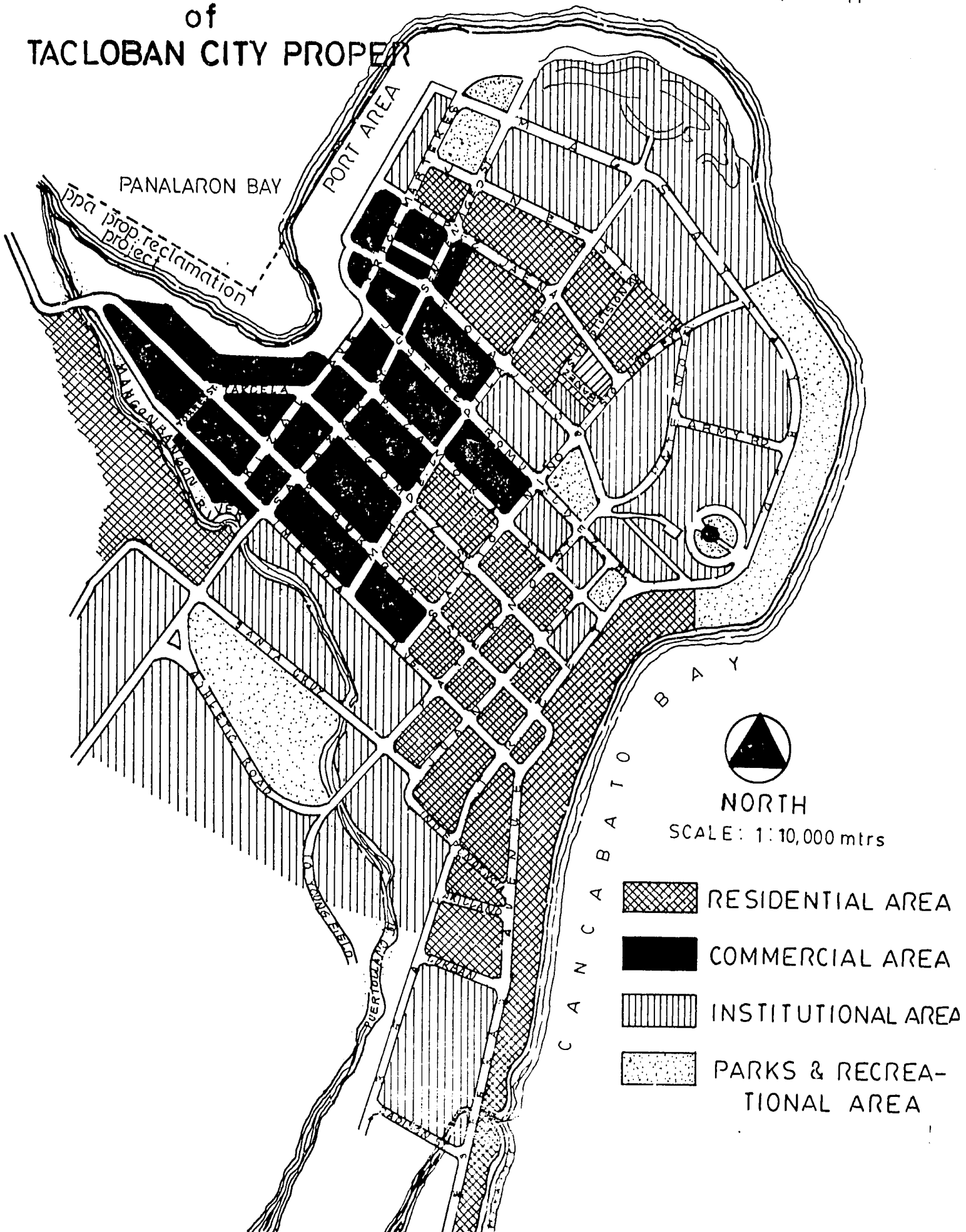
TO CATBALOGAN, SAMAR

AIRPORT

EXISTING LAND USE MAP of TACLOBAN CITY PROPER

MAP 2

77



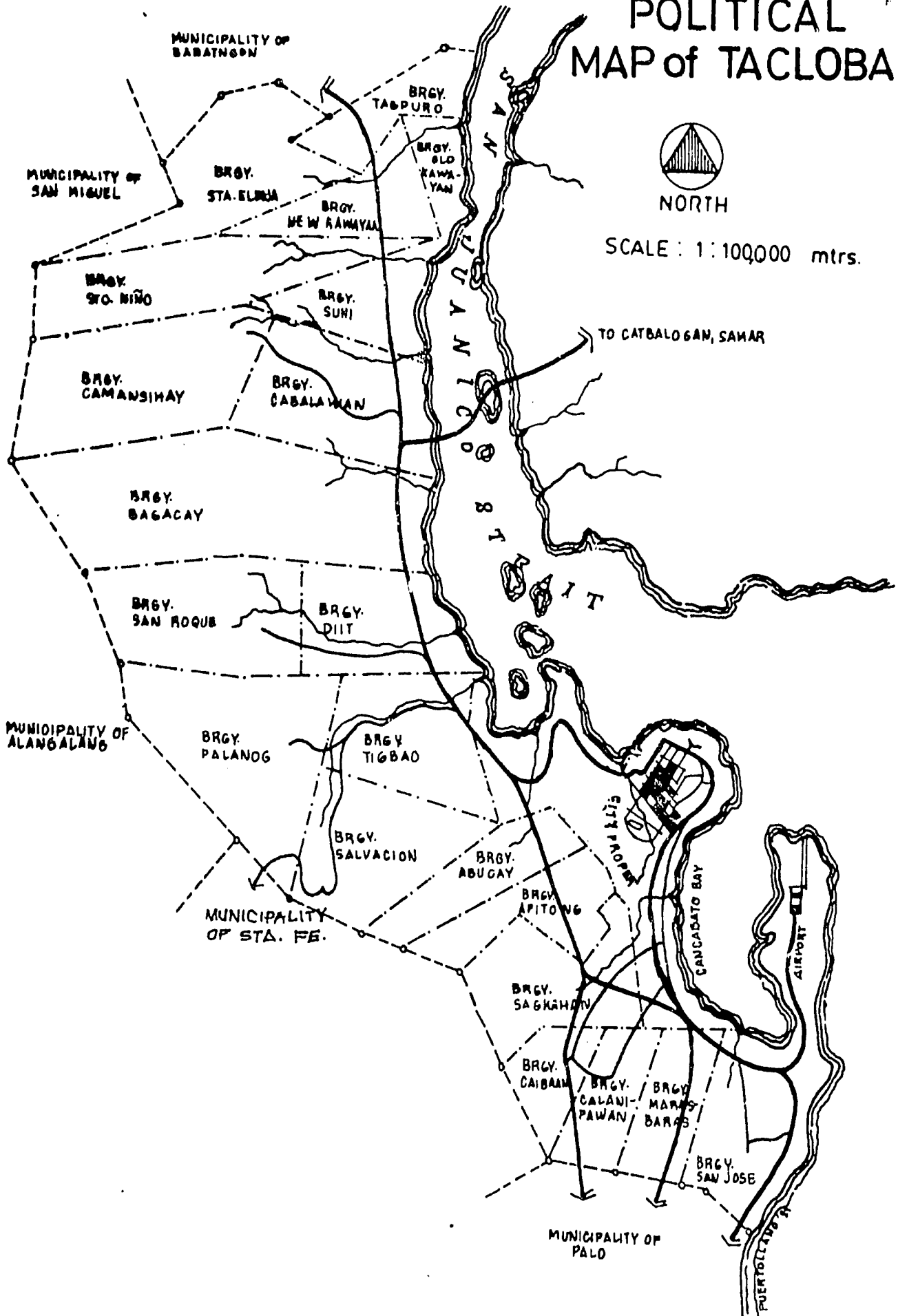
POLITICAL MAP of TACLOBAN



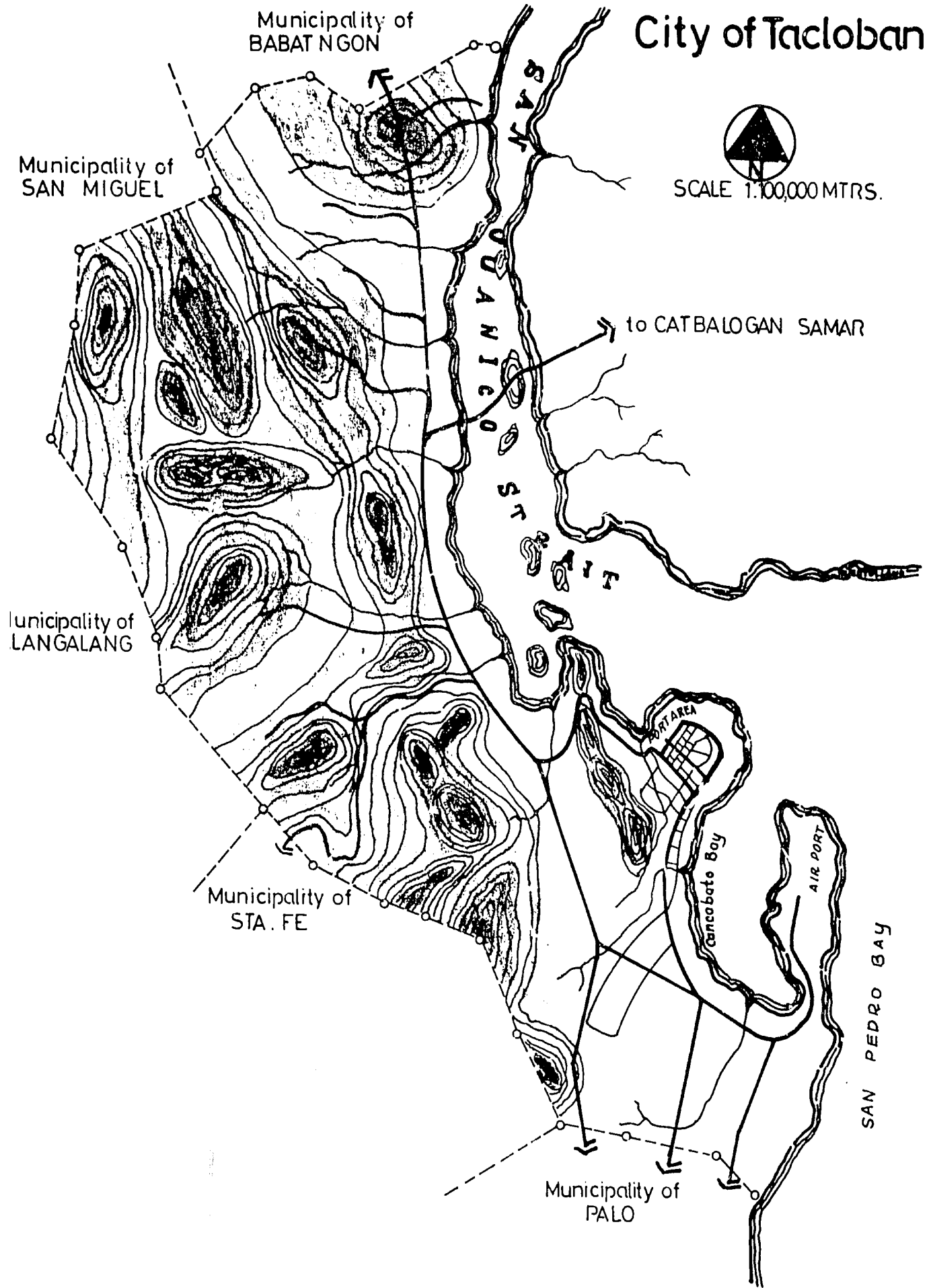
NORTH

SCALE : 1 : 100000 mtrs.

TO CATBALOGAN, SAMAR



MAP 4
75
TOPO MAP
City of Tacloban



Municipality of
BABAT NGON

Municipality of
SAN MIGUEL

SCALE 1:100,000 MTRS.

to CATBALOGAN SAMAR

Municipality of
LANGALANG

Municipality of
STA. FE

Municipality of
PALO

MART AREA

San Pedro Bay

AIR PORT

SAN PEDRO BAY

ZONING MAP TA CLOBAN CITY



NORTH

SCALE: 1:100,000 mtrs.

MUNICIPALITY OF
BABATNGON

MUNICIPALITY OF
SAN MIGUEL

MUNICIPALITY OF
ALANG-ALANG

◦ LEGEND ◦



URBAN CORE



RESIDENTIAL AREAS



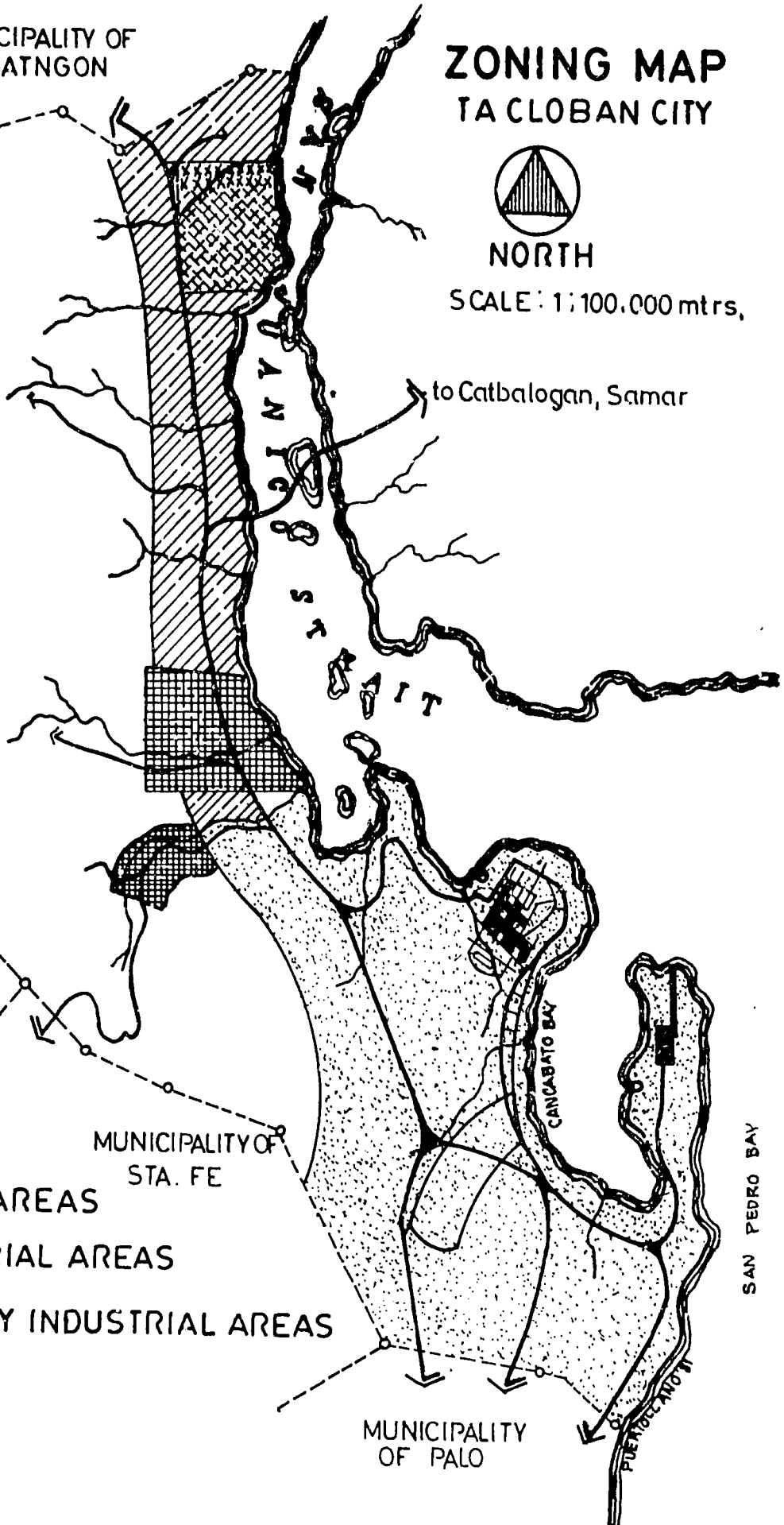
LIGHT INDUSTRIAL AREAS



MEDIUM & HEAVY INDUSTRIAL AREAS

MUNICIPALITY OF
STA. FE

MUNICIPALITY
OF PALO



SAN PEDRO BAY

TRANSPORTATION

I. STATEMENT OF AREA OF RESPONSIBILITY

Land, sea and air transportation are available in Tacloban City. This report attempts to analyze Tacloban's land transport system. Prevailing means of land transport and characteristics of commuter behavior are discussed within an energy conservation context.

II. SITUATIONAL ANALYSIS

A. Transportation System

1. Motor Vehicle Denomination

Vehicles are classified as private, public utility and government owned. These three categories are subdivided into denominations such as light, medium, heavy (for cars), utility vehicles, trucks, truck buses, motorcycles, tricycles, and school buses. Descriptions of these and other vehicle classifications are included as Exhibit 1. Pictures of a tricycle, autocalesa and public utility jeep appear as Exhibits 2, 3 and 4.

2. Registered Motor Vehicles

Table 1 shows Tacloban City's registered motor vehicles numbered 4,785 units in 1976, and 6,212 units in 1980, a 30% increase for the five year period. Government owned vehicles increased by 68%, privately owned vehicles by 30%, and public utility vehicles by 10%.

Public utility vehicles (i.e. public utility jeeps and autocalesa) are highest in absolute number amongst Tacloban's motor vehicles, with 492 units or 44% of all motor vehicles. There are 487 tricycles, also 44% overall. Together, utility vehicles and tricycles

comprise the major mode of public conveyance in the city. Base fares are ₱0.50 for tricycles and ₱0.65 for autocycles, with an additional ₱0.14 charged for each kilometer after the first five. The popularity of these conveyances can be accredited to a lack of alternatives, and to the fact that these units carry passengers to their doorsteps. Relatively high amounts of fuel consumed per passenger per mile indicate this form of transportation is not energy efficient.

Although registered in Tacloban City, buses (truck buses) do not operate within the city limits. Tacloban registrations are explained by the fact that operators reside in the city. Routes connect various points in the region.

3. Age of Motor Vehicles

Local vehicles range in age from new to 36 years old.

Privately owned vehicles, utility vehicles, trucks and medium sized cars tend on the average to be older than motorcycles and light cars. Table 2 shows an average age of 18 years for private vehicles, 7.5 years for public utility conveyances and 10 years for government units.

Fuel efficiency tends to decrease as engines age. This trend can be countered by reconditioning engines.

4. Routes Travelled

Tacloban City contains four main public transportation routes. These are the San Jose-Airport, Barangay Marasbaras, Barangay Diit, and V & G-Imelda Village routes.

Real Street is the main outlet for vehicles leaving Tacloban City traveling north, while Daang Maharlika is the major exit for southbound traffic.

Data relating to these routes are presented in Tables 3 and 4. Table 3 shows the distances of the 4 major routes, using the University of the Philippines as a reference point (kilometer zero). Also listed in this table are average amounts of travel time per route and average number of trips per day per vehicle. Table 4 estimates passengers transported per vehicle type per route per day, based on passenger capacity and the average number of trips per day.

Fares charged are as follows: ₱1.20 for the San Jose-Airport route; ₱0.95 for the Marasbaras and Diit routes; and ₱0.90 to ₱1.00 for the V & G-Imelda Village route. Some consider these fares too high.

5. Passenger Capacity and Fuel Consumption Per Passenger

Autocalesas have a passenger capacity of 8; light cars 4; tricycles 2; and public utility jeeps, 17.

Table 5 shows that fuel consumption per passenger in liters per kilometer varies with vehicle type. Tricycles consume 0.0145 liters of gasoline per passenger per kilometer, an average which nearly matches the corresponding 0.0147 figure for autocalesas. Light cars consume 0.03 liters gasoline per kilometer per passenger, and diesel engined public utility jeeps use 0.0059 liters/km/passenger.

Table 6 lists average fuel consumption in liters per kilometer broken down by vehicle denomination.

6. Passengers Transported

The average passenger capacity for public utility jeeps is 17, while tricycles can carry only two passengers.

The data in previously mentioned Table 4 indicate that all vehicles in operation in Tacloban can transport an average of 1,184 passengers each 12 hour day along the 4 main routes. The number of round trips per vehicle range from 9 to 12. An average of 7 passengers are transported per vehicle per trip. This is a rather low figure suggesting fuel inefficiency.

7. Commuter Behavior

Commuters expect to-the-doorstep service. This attitude is incongruous with the spirit of fuel conservation.

B. Land

1. Road Network

A map of Tacloban's existing road network is presented as Exhibit 5, and a larger scale map as Exhibit 6.

In order to support the development thrusts of the city, infrastructure projects are being undertaken by both the city and national governments. The city administration through the City Engineer's Office focusses its attention on the construction of farm-to-market roads, otherwise known as barangay roads.

Linking the city to its neighboring towns are Real Street for southbound traffic and Daang Maharlika for northbound traffic (see Exhibit 7). Vehicles traveling along the four main routes and vehicles entering and exiting the city from neighboring towns must pass along the same thoroughfares used by intra-city traffic. Through traffic must therefore travel a greater-than-necessary distance, and the result is congestion and delays.

2. Road Classification

The city has three road classifications, namely: national, city, and barangay roads. These roads have a total length of 145.3 kilometers and are surfaced with either concrete, asphalt or gravel.¹

The data presented in Table 7 show that as of 1980 only 16.5% of the city roads and 30.8% of the national roads were paved. Annual growth rates ranged from 2.4% in 1977 to 0.2% in 1980, with an average annual rate of 1.4%.

3. Traffic Density

The Tacloban City Police Station with the cooperation of the Bureau of Land Transportation and the Constabulary Highway Patrol Group enforces the city's traffic rules and regulations.

To ensure traffic safety, the city imposed regulations such as prohibiting tricycles from using the main thoroughfares from 7 AM to 7 PM, thus minimizing congestion. Buses entering and exiting the city and public conveyances such as jeeps must follow designated routes and park at particular places in the downtown area.

The average annual growth rate of traffic density has been 2.1% for northbound vehicles and 15.8% for southbound vehicles. Between 1979 and 1980, northbound density increased by 9.1% and southbound density by 6.8% (see Table 8). Changes in traffic density between 1976 and 1981 are graphed in Table 9.

At least 9,720 vehicles enter the city from neighboring areas every day, contributing to the city's congestion problem.

¹City Engineer's Office, Tacloban City, 1980.

C. Energy Consumption

Fuel sales to retail outlets from 1976 to 1980 are tallied in Table 10. The data show that in 1980, a total of 28,686,713 liters of fuel and other petroleum products were sold to retail outlets in Tacloban City. This represents a decrease of 22.7% from 1979. This decrease is attributable to the government's energy conservation program.

III. CONSERVATION PROBLEMS AND OPPORTUNITIES

1. Tacloban City presently lacks a comprehensive transportation plan.
2. Most public transportation vehicles have a small passenger carrying capacity.
3. Streets are congested, a problem which is compounded by disorderly driving practices.
4. Safety features such as bus stops, traffic signs, and pedestrian lanes are lacking.
5. Existing statistical data are insufficient.
6. The city's traffic code is outmoded and should be revised.
7. Only 46 traffic law enforcement personnel serve the city's 103,430 residents, a ratio of 1:2,249.
8. Coordination between various agencies involved in the transportation sector has been weak.

IV. PROPOSED STRATEGIES

1. The major strategy proposed is the creation of an integrated transportation plan for the City of Tacloban.
2. A survey to determine travel demand and travel patterns should be conducted.

3. A mass transit bus system designed to save energy and to minimize traffic congestion has been suggested. This system would consist of 14 buses, 3 for each of the four main sub-urban routes, and two spare units. Buses would operate at 30 minute intervals during slack periods and at 20 minute intervals during peak hours. Assuming a speed of 30 KM per hour (estimated fuel consumption is .25 liters per KM at this speed), the twelve bus units would be able to make 16 round trips totalling 236 KM each day. These units can transport 40-50 passengers per trip. Employment will be generated - at least 36 bus drivers, 36 conductors, 4 service mechanics, 4 cashiers and 3 clerks will be required (at the same time this system would displace tricycle and auto-rickshaw operators). A feasibility study on this mass transit system is being prepared by a consultant.

It has not yet been decided whether the buses acquired would be new or reconditioned. The cost of one new bus, including financing charges, amortization, etc., is approximately P350,000.00, so a fleet of 14 new buses would cost about P4.9 M. Operational expenses have not yet been estimated.

Such a bus system definitely would result in a decrease in the total quantity of fuel consumed for land transportation purposes city wide, but the exact amount of fuel savings to be expected has not been calculated.

Exhibit 8 is a time frame for planning and implementing the proposed bus system project. Exhibit 9 lists preparations that are prerequisite to full scale implementation.

4. To mitigate congestion, bus terminals should be relocated. A terminal for northbound traffic could be constructed along Marasbaras and another at Naga-Naga for southbound traffic. Buses now enter the city to load and unload passengers and cargo. This practice would cease if terminals were situated at the proposed locations, and congestion would thereby be reduced.

5. Undesirable disorderly driving habits would be discouraged if features such as bus and jeepney stops, traffic signs and pedestrian lanes were introduced.

6. A revision of the traffic code would permit the re-routing of traffic and an increase in the number of traffic regulation enforcement personnel.

PRELIMINARY STRATEGY MATRIX
FOR SECTOR ON TRANSPORTATION

GENERAL PROBLEM	SPECIFIC PROBLEM	MAJOR STRATEGY	COURSES OF ACTION	ADVANTAGES	DISADVANTAGES	RELATION TO OTHER SOURCES	RESPONSIBLE AGENCIES	TIME FRAME	COST
Lack of transportation strategy to effect efficient movement of people and goods	<p>I. Planning & Engineering</p> <p>a) Excess consumption of fuel due to many vehicles and unnecessary trips</p> <p>b) Congested narrow streets</p> <p>c) Lack of safety facilities like bus stops, traffic signs and pedestrian lanes</p> <p>d) Lack of adequate data on travel demand and travel patterns</p> <p>II. Management</p> <p>a) outmoded traffic code</p> <p>b) lack of enforcement personnel</p> <p>c) Weak coordination between agencies</p>	Integrated transport of traffic plan	<p>1. Develop data on travel demand and travel pattern.</p> <p>2. Develop mass transit system based on data analysis</p> <p>3. Develop facilities to support mass transit system</p> <p>4. Develop traffic management plan to relieve congestion</p> <p>5. Revise traffic code to respond identified needs</p> <p>6. Increase enforcement personnel (recruitment, training, etc.)</p>	<p>1. Cross Sectoral Approach more efficient</p> <p>2. Maximized the use of resources</p> <p>3. Rationalize the transportation industry</p> <p>4. Accelerate and guide development</p>	<p>1. Time Cost</p> <p>2. Management and organizational cost</p> <p>3. Capital cost</p> <p>4. Temporary disruption of traffic</p>	<p>1. Land Use</p> <p>2. Building Materials</p> <p>3. Energy</p>	<p>1. Private Sector</p> <p>a) bus operators</p> <p>2. Gov't. Sector</p> <p>a) City Gov't.</p> <p>b) BOT</p> <p>c) BLT</p> <p>d) PC/INP</p> <p>e) CHPG</p> <p>f) MPH</p>	<p>2-3 months</p> <p>1. 2-3 mos.</p> <p>2. 3 mos.</p> <p>3. 6-1 yr. & 6 mos.</p> <p>Total Plan: 2 years</p>	<p>Medium to High</p>

TABLE 1

Data on Number of Motor Vehicles Registered
Tacloban City
1976-1980

TYPE OF VEHICLE	NUMBER OF VEHICLES							
	1976	% of total	1977	% of total	Rate of Inc./Dec.	1978	% of total	Rate of Inc/Dec
I. Private								
L	236	7.25%	287	7.79%	21.61%	328	8.54%	14.29%
M	123	3.73%	142	3.85%	15.45%	121	3.15%	(14.79%)
N	59	1.81%	48	1.30%	(18.64%)	56	1.46%	16.67%
UV	891	27.36%	940	25.52%	5.50%	919	23.92%	(2.23%)
UC	1,006	30.90%	1,321	35.86%	31.31%	1,199	31.21%	(9.24%)
T	753	23.13%	775	21.04%	2.92%	1,042	27.12%	34.45%
TAL	138	5.77%	171	4.64%	(9.04%)		4.61%	3.51%
TRH	-	-	-	-	-	-	-	-
ARM	-	-	-	-	-	-	-	-
Sub-Total	3,256	100.00%	3,684	100.00%	13.14%	3,842	100.00%	4.29%
II. For Hire								
L	10	.99%	8	.65%	(20.00%)	11	.83%	37.50%
UV	348	34.29%	480	38.90%	37.93%	666	50.08%	38.75%
TB	55	5.42%	54	4.33%	1.81%	69	5.18%	27.78%

Table 1

Page 2

TYPE OF VEHICLE	NUMBER OF VEHICLES								
	1976	% of total	1977	% of total	Rate of Inc/Dec	1978	% of total	Rate of Inc/Dec	
TC	564	55.56%	643	52.51%	14.89%	560	42.10%	(13.58%)	
T	33	3.25%	41	3.32%	24.24%	21	1.58%	(43.73%)	
SE	5	.49%	3	.24%	(95.2%)	3	.23%	-	
Sub-Total	1,015	100.00%	1,234	100.00%	21.58%	1,330	100.00%	7.73%	
III. Government									
UV	221	43.00%	238	33.10%	7.69%	391	47.80%	64.29%	
T	263	51.16%	413	57.44%	57.03%	325	39.73%	21.31%	
HC	30	5.84%	57	7.93%	90.00%	71	8.68%	24.56%	
TKL	-	-	11	1.53%	-	31	3.79%	131.82%	
Sub-Total	514	100.00%	719	100.00%	39.83%	818	100.00%	13.77%	
GRAND TOTAL	4,735		5,637			5,990			

Table 1

Page 3

TYPE OF VEHICLE	NUMBER OF VEHICLES					
	1979	% of Total	Rate of Inc/Dec	1980	% of Total	Rate of Inc./Dec.
<u>I. Private</u>						
L	388	3.42%	18.29%	403	9.64%	5.15%
M	174	3.73%	43.00%	205	4.84%	17.31%
N	57	1.24%	1.73%	44	1.04%	(22.31)%
UV	1,035	23.56%	18.06%	1,163	27.59%	7.65%
UG	1,516	32.91%	26.43%	1,391	32.85%	(8.25)%
T	1,200	26.05%	15.16%	837	19.77%	(30.25)%
TRL	186	4.03%	5.00%	161	3.80%	(13.44)%
TRH	-	-	-	7	.17%	-
TRM	4	0.10%	-	13	.30%	225%
Sub-Total	4,606	100.00%	19.99%	4,234	100.00%	(8.08)%
<u>II. For Hire</u>						
L	14	1.16%	27.27%	6	.54%	(57.14)%
UV	571	47.39%	(14.26)%	492	44.05%	(13.34)%
TB	77	6.39%	11.59%	16	1.43%	(79.22)%

Table 1

Page 4

TYPE OF VEHICLES	NUMBER OF VEHICLES					
	1979	% of Total	Rate of Inc./Dec.	1980	% of Total	Rate of Inc./Dec.
TC	510	42.32%	(8.93%)	487	43.60%	(4.51%)
T	29	2.41%	38.09%	77	6.89%	165.52%
SB	4	.33%	.33%	39	3.49%	875%
Sub-Total	1,205	100.00%	(9.39%)	1,117	100.00%	7.30%
III. <u>Government</u>						
UV	340	40.62%	(13.04%)	297	34.49%	(12.6%)
T	364	43.40%	12%	337	44.95%	6.32%
LC	133	15.39%	(87.32%)	176	20.44%	32.33%
TRL	-	-	-	1	.12%	-
Sub- Total	837	100.00%	2.32%	861	100.00%	2.87%
GRAND TOTAL	6,648			6,212		

TABLE 2
AGE OF MOTOR VEHICLES
Tacloban City

MOTOR VEHICLES CLASSIFICATION	1959 and below	1960-1964	1965-1969	1970-1974	1975-1979	1980 and above	TOTAL
I PRIVATE							
L	-	-	50	33	233	92	408
M	21	21	21	15	77	50	205
UV	158	110	63	316	474	47	1,168
MC	-	89	237	118	592	355	1,391
T	49	-	-	443	328	17	837
H	-	-	-	33	11	-	44
Sub-Total	228	220	371	958	1,715	561	4,053
II FOR HIRE							
L	-	-	-	-	-	6	6
SB	-	-	-	39	-	-	39
TC	-	-	-	26	256	205	487
UV	-	-	-	80	305	107	492
T	-	-	29	38	10	-	77
TB	-	-	-	3	13	-	16
Sub-Total	-	-	29	186	584	318	1,117
III GOVERNMENT							
UV	-	3	69	71	140	14	297
T	-	-	28	303	28	28	387
Sub-Total	-	3	97	99	443	42	684
GRAND TOTAL	228	223	497	1,243	2,742	921	5,854

CONSOLIDATED BY: BLT and CPDS Personnel
Tacloban City
1981

TABLE 3
DATA ON NUMBER OF TRIPS/DAY
Tacloban City

ROUTE	MOTOR VEHICLES IN OPERATION	DISTANCE TRAVELLED (from km. 0)	TIME CONSUMED (at 30 km/hr speed)	* TRIPS ** (at 12 hrs/day operation)	*** PER DAY
1. San Jose - Airport	AC	9 kms.	40 mins.	9	
	PU	9 kms.	40 mins.	9	
	TC	9 kms.	40 mins.	9	
2. Marasbaras	AC	7	30 mins.	12	
3. Di-it	AC	7	30 mins.	12	
	TC	7	30 mins.	12	
4. Imelda - V & G	AC	5.8 kms.	33-38 mins.	10	
	PUJ		33-38 mins.	10	
T O T A L				83	

* 1981 Commuter-Motor Vehicle Ratio Survey, BLT, R08

** On round trip basis

*** At one unit of MV in operation per route

Consolidated by: BLT and CPDS Personnel
 Tacloban City
 1981

TABLE 4
DATA ON NUMBER OF PASSENGERS TRANSPORTED
Tacloban City

ROUTE	MOTOR VEHICLES IN OPERATION	PASSENGER CAPACITY	TRIPS PER DAY* (at 12 hrs/day operation)	PASSENGERS** TRANSPORTED (at 12 hrs/day operation)
1. San Jose - Airport	AC	8	9	144
	light cars	4	9	72
	TC	2	9	36
2. Marasbaras	AC	8	12	192
3. Di-it	AC	8	12	192
	TC	2	12	48
4. Imelda - V & G	AC	8	10	160
	PUJ	17	10	340
TOTAL			166	1,134

* 1981 Computer-Motor Vehicle Ratio Survey, Round trips, BLT, R08
** At one unit of MV in operation per route

Consolidated by: BLT and CPDS Personnel
Tacloban City
1981

TABLE 5
 FUEL CONSUMPTION PER PASSENGER BY VEHICLE TYPE
 Tacloban City

Vehicle Type	:	Passenger Capacity	:	Fuel Consumption (l/km/passenger)
AC	:	8	:	0.0147
Light Car	:	4	:	0.03
TC	:	2	:	0.0145
PUJ	:	17	:	0.0059 (diesel)

Consolidated by:

BLT & CPDS Personnel
 Tacloban City 1980

TABLE 6
 AVERAGE FUEL CONSUMPTION BY DENOMINATION
 Tacloban City
 1980

DENOMINATION	LITERS PER KILOMETER	
	Gasoline	Diesel
I. PRIVATE		
Light	.0645	"
Medium	.108	-
Heavy	.125	-
Utility Vehicles	.1	.0833
Trucks	-	.2
Truck-Bus	-	.2
Motorcycles	.022	-
Sub-Total	.0113	.0455
II. FOR HIRE		
Light	.0645	-
Medium	.108	-
Heavy	-	-
Utility Vehicles	.1176	0.1
Trucks	-	0.25
Truck-Bus	-	0.25
Tricycles	.0286	-
Service Bus	.2	-
Sub-Total	.0137	0.0455

TABLE 6 (con'd)

DENOMINATION	LITERS PER KILOMETER	
	Gasoline	Diesel
III. GOVERNMENT		
Light	.06 5	-
Medium	.108	-
Heavy	.125	-
Utility Vehicles	.096	.0833
Trucks	-	0.2
Truck-Bus	-	0.2
Motorcycles	.022	-
Other Exempt Vehicles	.108	

Source: Leysan, Tacloban
 Gleen Marketing, Tacloban
 San Juanico Motors, Tacloban
 Norkis Industries, Tacloban

TABLE 7
ROAD CLASSIFICATION
Tacloban City
1977-1980

ROAD CLASSIFICATION km.	1977		1978		1979		1980	
	Number	% of total	Number	% of total	Number	% of total	Number	% of total
<u>City:</u>	<u>24.773</u>	<u>22.28%</u>	<u>27.464</u>	<u>24.11%</u>	<u>27.464</u>	<u>23.61%</u>	<u>27.464</u>	<u>23.66%</u>
Concrete	10.706	9.63	16.842	14.79	12.712	15.22	19.114	16.46
Asphalt	3.376	3.04	2.769	2.43	2.769	2.38	1.494	1.29
Gravel	8.591	7.72	5.753	5.05	4.883	4.20	4.756	4.10
Earth	2.100	6.89	2.100	1.84	2.100	1.81	2.100	1.81
<u>National:</u>	<u>42.130</u>	<u>37.33%</u>	<u>42.130</u>	<u>36.99%</u>	<u>44.347</u>	<u>38.12%</u>	<u>44.377</u>	<u>38.23%</u>
Concrete	33.230	29.88	33.230	29.17	35.740	30.72	35.770	30.82
Asphalt	2.162	1.94	2.162	1.90	2.162	1.86	2.162	1.86
Gravel	6.738	6.06	6.738	5.92	6.445	5.54	6.445	5.55
Earth	-	-	-	-	-	-	-	-
<u>Barangay:</u>	<u>44.308</u>	<u>39.84%</u>	<u>44.308</u>	<u>38.90%</u>	<u>44.531</u>	<u>38.28%</u>	<u>44.248</u>	<u>38.11%</u>
Concrete	0.288	0.26	0.288	0.25	0.511	0.44	0.511	0.44
Asphalt	1.200	1.03	1.200	1.05	1.200	1.03	1.200	1.03
Gravel	42.820	38.50	42.820	37.60	42.820	36.85	42.537	36.64
Earth	-	-	-	-	-	-	-	-
GRAND TOTAL	111.211	100.00%	113.902	100.00%	116.342	100.00%	116.089	100.00%

Annual Growth Rate: 2.42%

Average Annual Growth: 1.44%

Source: CEO, Tacloban City, 1981

2.14%

2.14%

(0.43%)

TABLE 8
 AVERAGE MODAL SPLIT DENSITY
 BY TYPE OF VEHICLE
 Northbound-Southbound-Tacloban City
 1976 - 1980

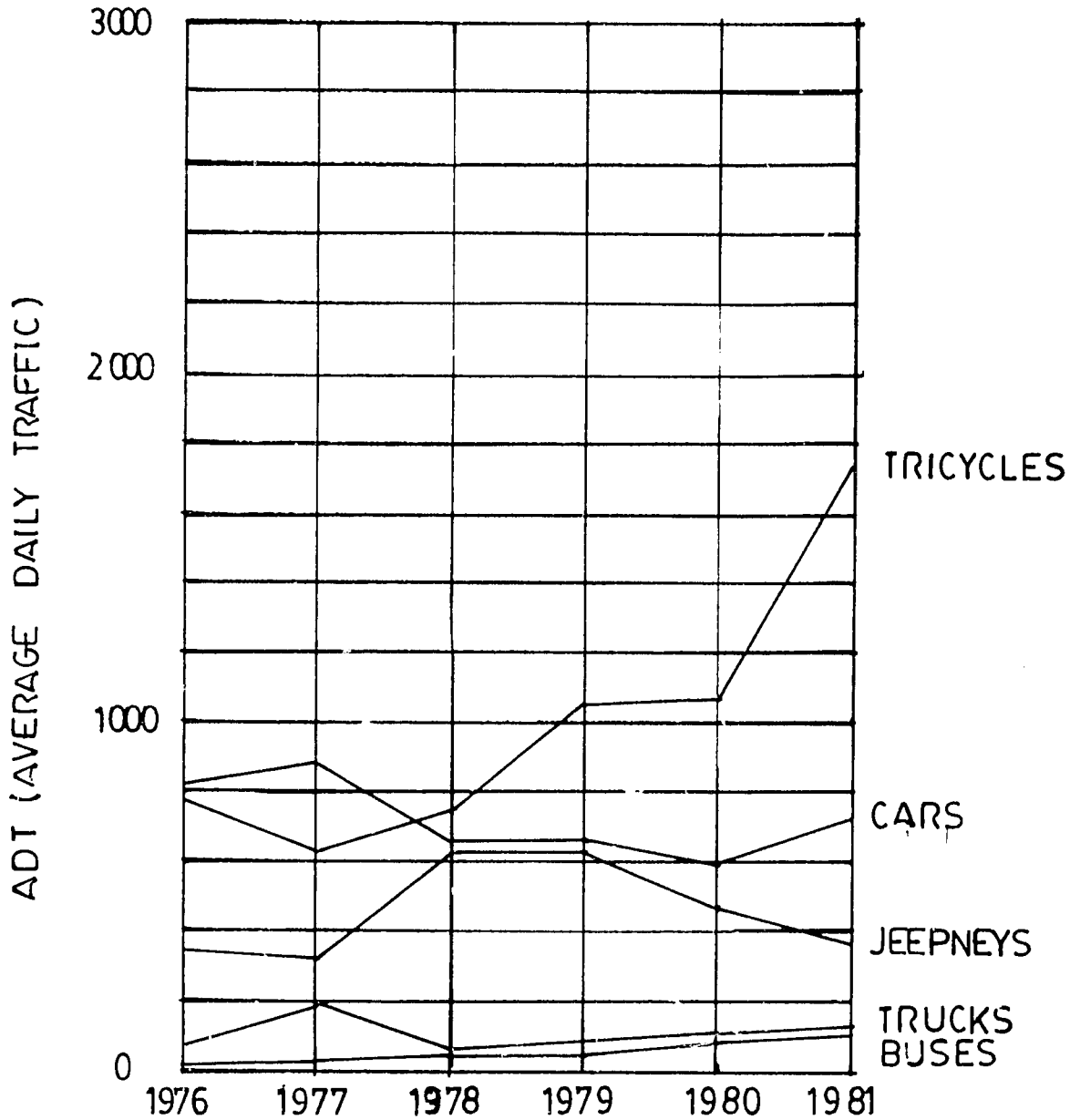
TYPE OF VEHICLE	NUMBER OF VEHICLES								
	1976	% of Total	1977	% of Total	Rate of Inc/Dec.	1978	% of Total	Rate of Inc./Dec.	
<u>NORTHBOUND:</u>	<u>2,488</u>	<u>100.00</u>	<u>2,548</u>	<u>100.00</u>	<u>2.41</u>	<u>2,582</u>	<u>100.00</u>	<u>1.33</u>	
Car	902	36.25	994	39.01	10.20	767	29.71	22.84	
Jeepney	465	18.69	521	20.43	12.04	759	29.40	45.68	
Bus	34	1.37	37	1.45	8.82	39	1.51	5.41	
Motorized cabs for hire	395	35.97	702	27.55	21.56	856	33.15	21.94	
Trucks	10	7.72	294	11.54	23.40	161	6.24	45.24	
<u>SOUTHBOUND:</u>	<u>4,194</u>	<u>100.00</u>	<u>6,467</u>	<u>100.00</u>	<u>54.20</u>	<u>6,464</u>	<u>100.00</u>	<u>(0.05)</u>	
Car	1,990	47.45	2,395	44.77	45.43	3,147	48.69	8.70	
Jeepney	1,027	24.49	1,984	30.63	93.13	2,115	32.72	6.60	
Bus	134	3.20	273	4.30	107.46	206	3.19	25.90	
Motorized cabs for hire	723	17.24	533	8.24	26.23	486	7.52	8.82	
Trucks	320	7.63	777	12.01	142.31	510	7.89	34.36	

TABLE 8 (cont'd)
 AVERAGE MODAL SPLIT DENSITY
 BY TYPE OF VEHICLE
 Northbound-Southbound-Tacloban City

TYPE OF VEHICLE	NUMBER OF VEHICLES					
	1979	% of Total	Rate of Inc./Dec.	1980	% of Total	Rate of Inc./Dec.
<u>NORTHBOUND:</u>	<u>2,932</u>	<u>100.00</u>	<u>13.56</u>	<u>2,665</u>	<u>100.00</u>	<u>(9.11)</u>
Cars	798	27.22	4.04	700	26.27	12.28
Jeepney	748	25.81	1.45	591	22.18	20.99
Bus	89	3.04	128.81	101	3.79	13.48
Motorized cabs for hire	1,133	38.81	32.94	1,153	43.26	1.32
Trucks	159	54.2	1.24	120	4.50	(24.53)
<u>AVERAGE ANNUAL GROWTH RATE</u>	<u>2.5%</u>					
<u>SOUTHBOUND:</u>	<u>6,608</u>	<u>100.00</u>	<u>2.23</u>	<u>7,055</u>	<u>100.00</u>	<u>6.86%</u>
Cars	3,168	47.94	0.67	3,301	46.79	4.20
Jeepneys	2,216	33.54	4.78	2,316	32.83	4.51
Bus	196	2.97	4.85	321	4.55	63.78
Motorized cabs for hire	541	8.19	11.32	537	7.61	0.74
Trucks	487	7.37	(4.51)	580	8.22	19.10
<u>AVERAGE ANNUAL GROWTH RATE</u>	<u>15.78%</u>					

TABLE 9
 GRAPHICAL ILLUSTRATION
 TRAFFIC DENSITY

NORTH RD. CONTROL SECTION @ KM. 4,000



YEAR	CARS	JEEPNEYS	BUSES	TRUCKS	TRICYCLES
1976	902	465	34	192	895
1977	994	521	37	294	702
1978	767	759	39	161	856
1979	798	748	39	159	1138
1980	700	591	101	120	1153
1981	816	497	110	120	1803

TABLE 10

FUEL SALES TO RETAIL OUTLETS
AT BACLODAN CITY (in liters)
1976 - 1980

DESCRIPTION	1976	1977	1978	1979	1980	TOTAL
Premium	-	-	-	485,000	491,000	976,000
Extra-Regular	1,386,937	1,660,000	2,905,300	2,641,000	2,082,000	10,675,556
Regular	11,855,043	10,738,142	12,226,422	14,695,949	9,431,921	58,947,482
Kerosene	5,539,205	6,957,536	8,526,070	8,326,363	6,789,000	36,138,174
Diesel Fuel	7,561,923	7,564,371	8,727,523	10,480,780	9,554,800	43,839,902
Lubricants	351,092	375,407	454,123	466,214	337,992	1,984,833
T O T A L	26,744,205	27,295,956	32,839,448	37,095,625	28,686,713	152,661,947

SOURCES:

Caltex

Shell

Petrophil, Inc.

Basic Land Oil

DEFINITION OF TERMS

A. Motor Vehicle Classification

1. Private - refers to motor vehicles that are not registered to be used for hire under any circumstances.
2. Public Utility - Refers to motor vehicles that are authorized to be operated as for hire by virtue of certificates of public convenience or provisional authority or special permit.
3. Government - Refers to motor vehicles owned by the government of the Philippines or any of its political subdivisions including government owned or controlled corporations.

B. Sub-Classification of Motor Vehicles:

1. Light - Refers to cars with a cubic centimeters piston displacement of 1600 and below.
2. Medium - Refers to cars with a cubic centimeter piston displacement range from 1601 to 2300 cc.
3. Heavy - Refers to cars with a cubic centimeter piston displacement range from 2301 and above.
4. Utility vehicles - Refers to utility vehicles such as owner-type jeeps, Ford Fiera, Tamaraw, Pinoy, etc. This denomination shall include the Toyota Land Cruiser, International Scout, Land Rover, Nissan Patrol, Mini-Cruiser, and other vehicles with similar design or configuration. The gross vehicle

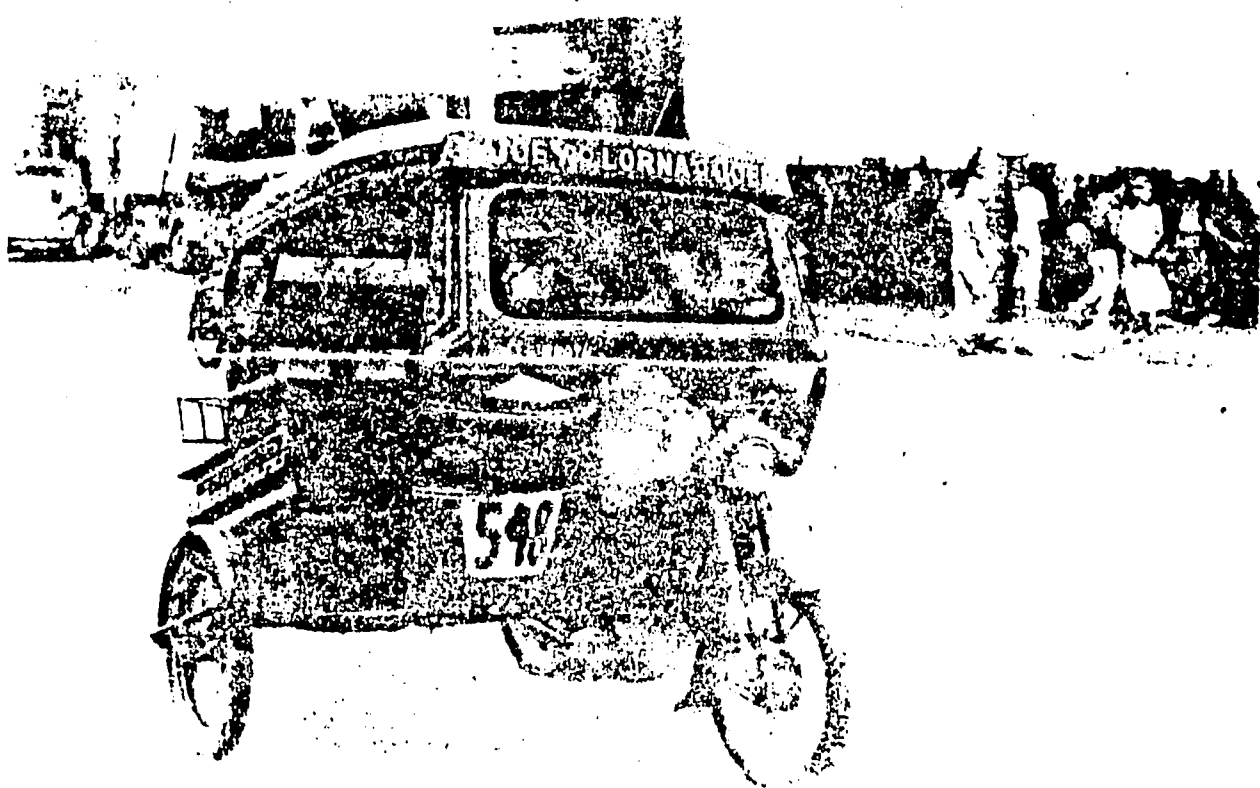
weight thereof shall not exceed 4500 kilograms, except in those instances where the passenger capacity is less than eighteen(18).

5. T - Refers to the types of trucks such as stake, platform, pickup, trucks for gravel and sand, and others of the same configuration, including van and tanker types, provided that the gross vehicle weight exceeds 4500 kilograms.
6. TB - Refers to private buses and coaches whose passenger capacity ranges from eighteen (18) and above.
7. MC - Refers to mopeds and motorcycles, both with or without sidecars.
8. TRL - Refers to trailers with a gross vehicle weight of 1800 kilograms and below.
9. TRM - Refers to trailers with a gross vehicle weight range of 1601 to 4500 kilograms.
10. TRH - Refers to trailers with a gross vehicle weight range of 4501 and above.
11. SB - Refers to school buses used to transport students covered by a franchise/provisional authority or special permit.
12. TC - Refers to public utility motor-cycles with sidecar.

C. Others

1. Mopeds

- Two wheeled or three-wheeled vehicle that is powered by a small motor of less than fifty (50) cubic centimeters piston or cubic centimeter displacement.



TRICYCLE — 2 PASSENGERS
Exhibit 2

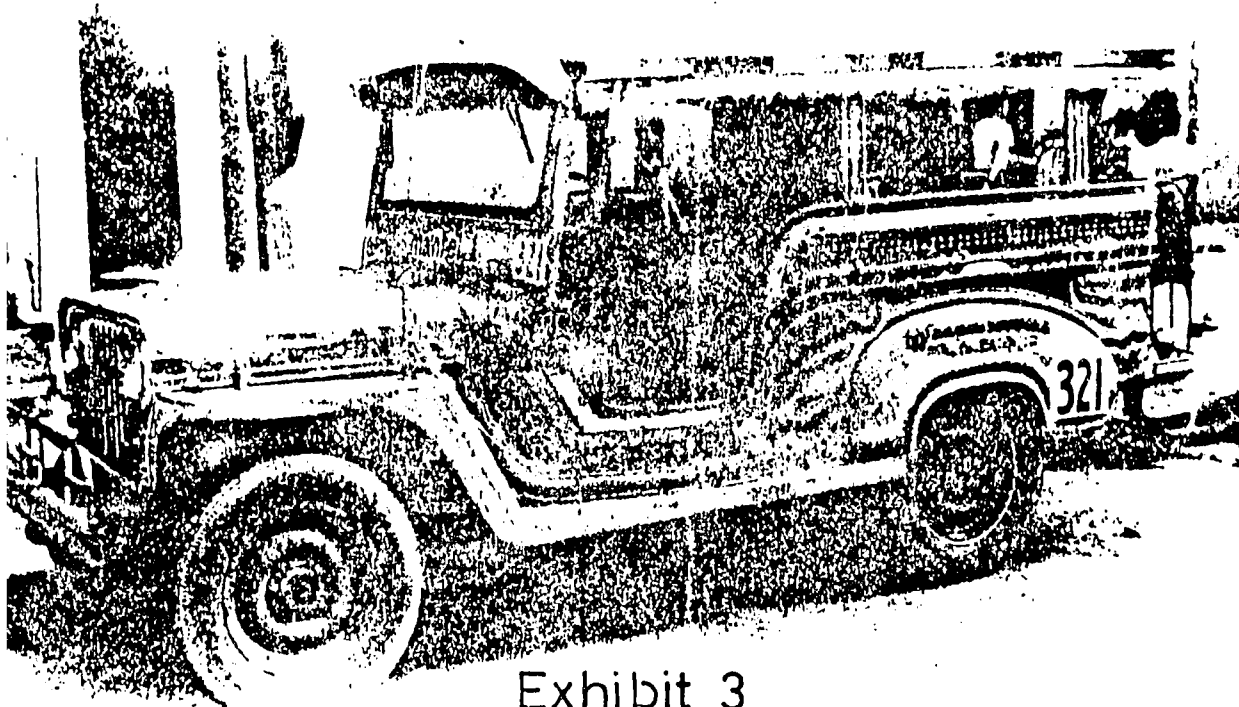


Exhibit 3
AC- 8 PASSENGERS

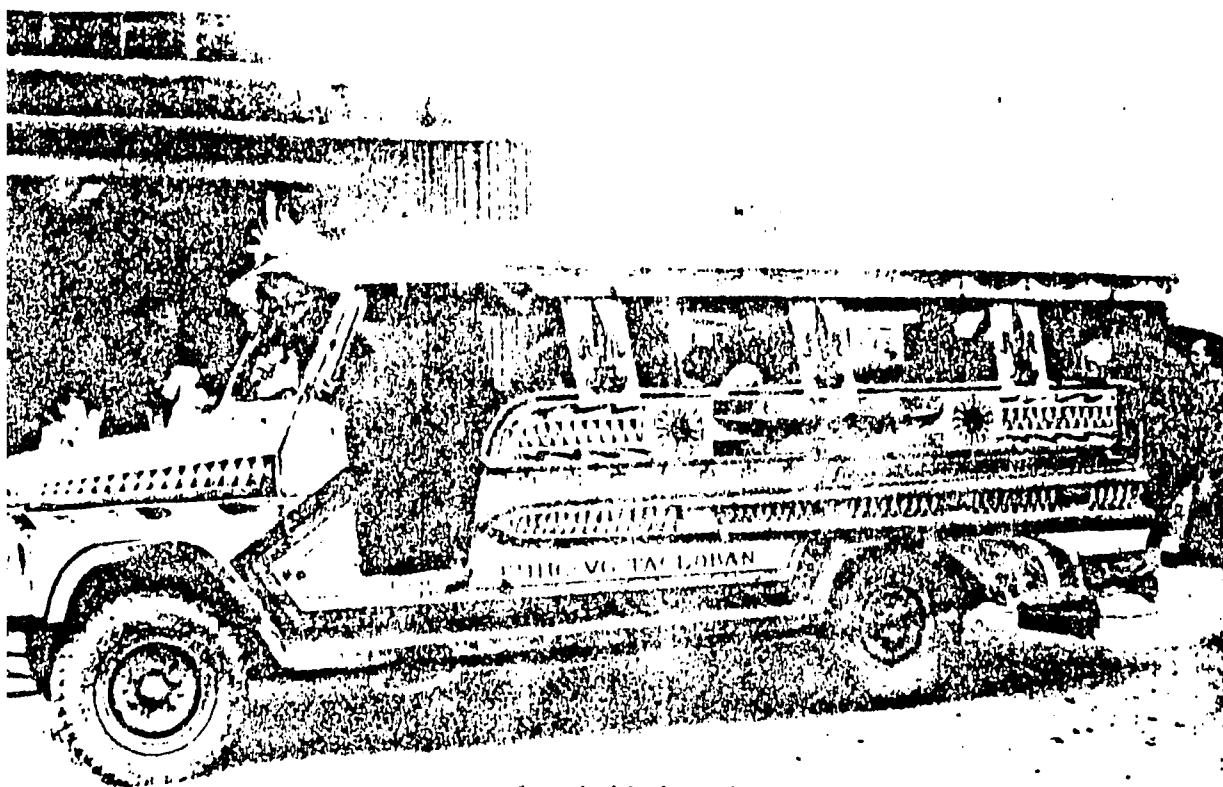


Exhibit 4
PUJ- 17 PASSENGERS

Exhibit/5

URBAN CORE EXISTING ROAD NETWORK OF TACLOBAN CITY 110

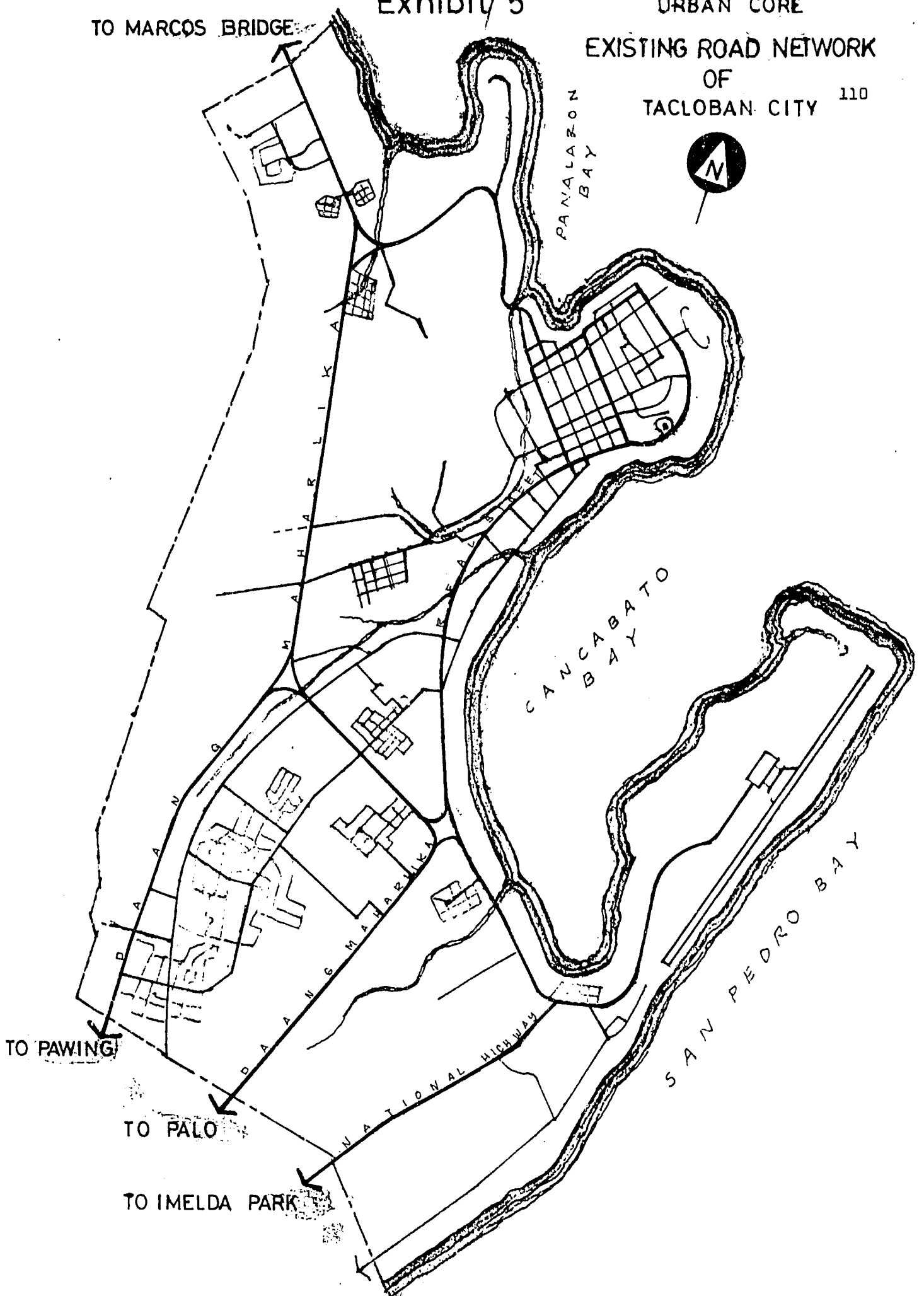
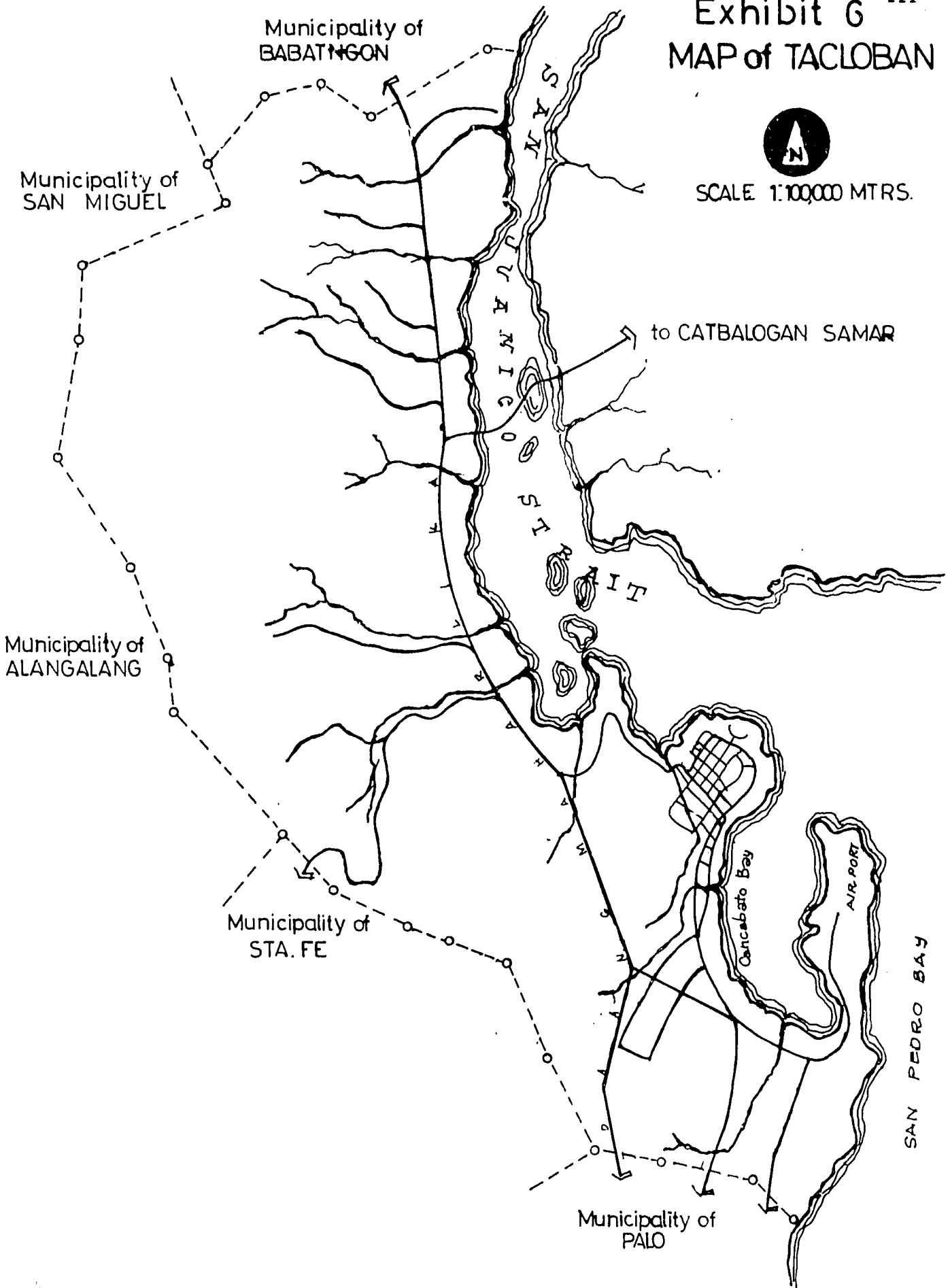


Exhibit G ¹¹¹
MAP of TACLOBAN

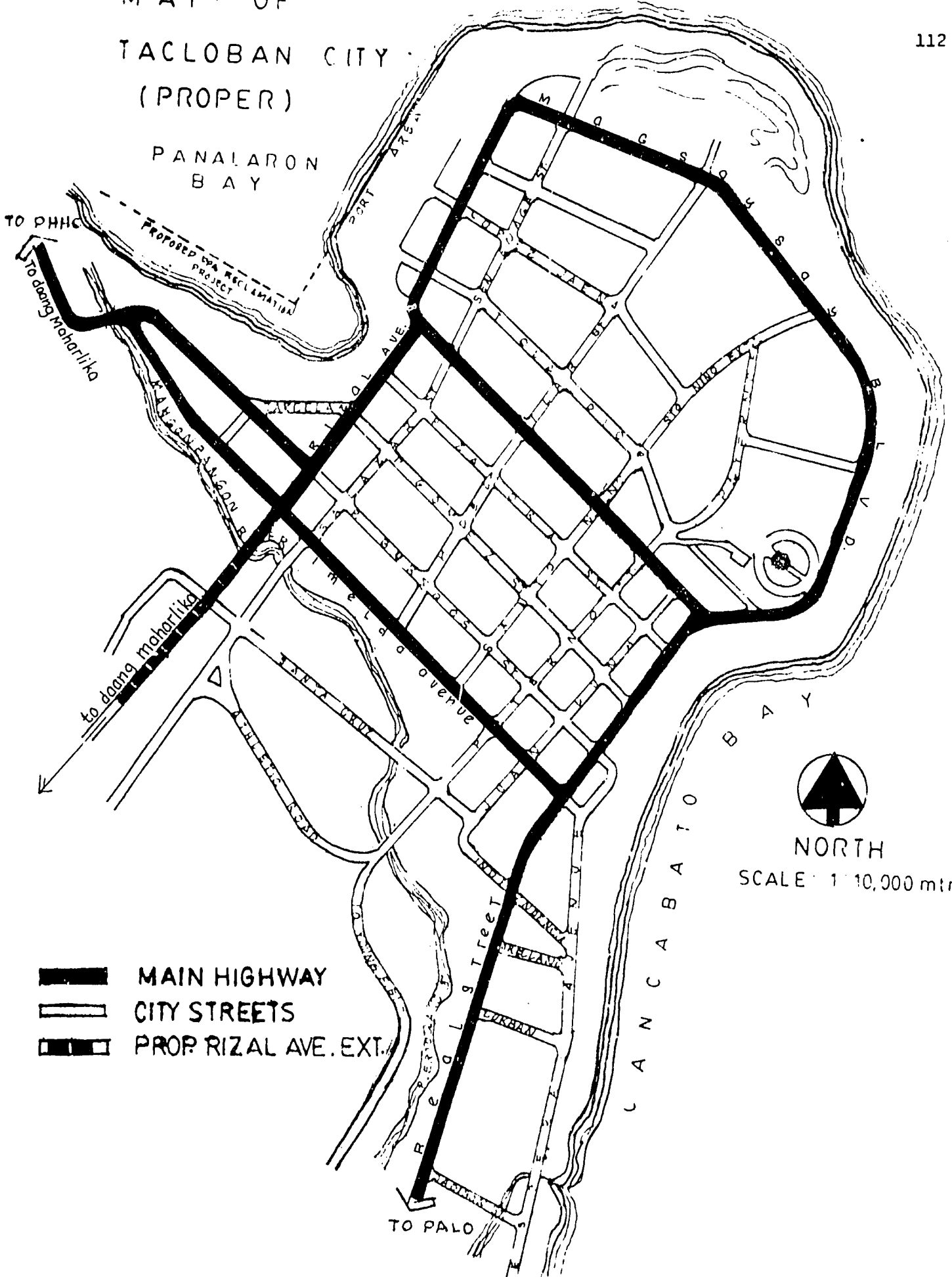



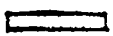

SCALE 1:100,000 MTRS.



M A P . O F
TACLOBAN CITY
(P R O P E R)

PANALARON
B A Y



-  MAIN HIGHWAY
-  CITY STREETS
-  PROP. RIZAL AVE. EXT.



NORTH

SCALE 1 : 10,000 mtrs

TIME FRAME FOR PLANNING AND IMPLEMENTING PROPOSED MASS TRANSIT BUS SYSTEM

MONTH

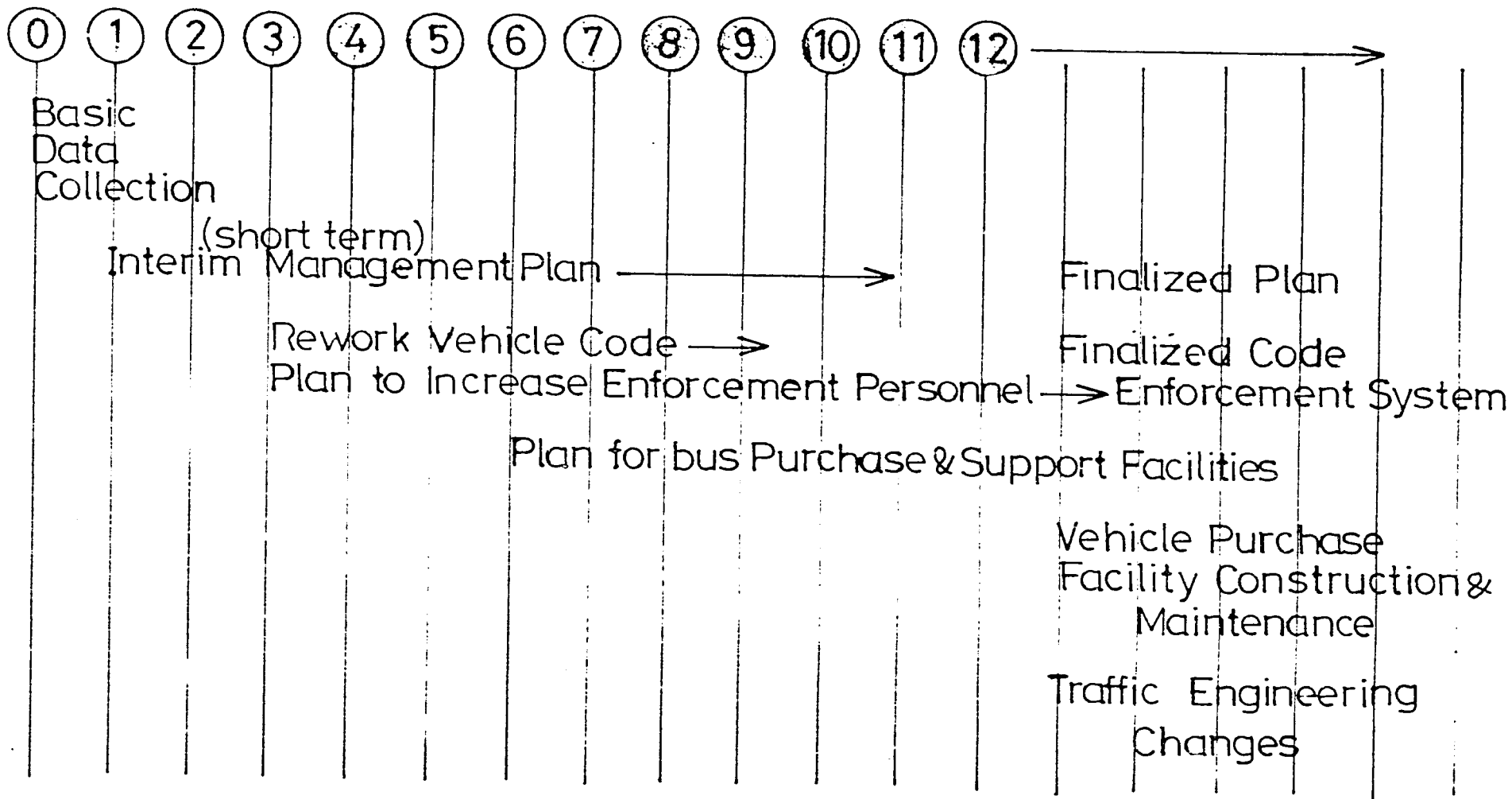
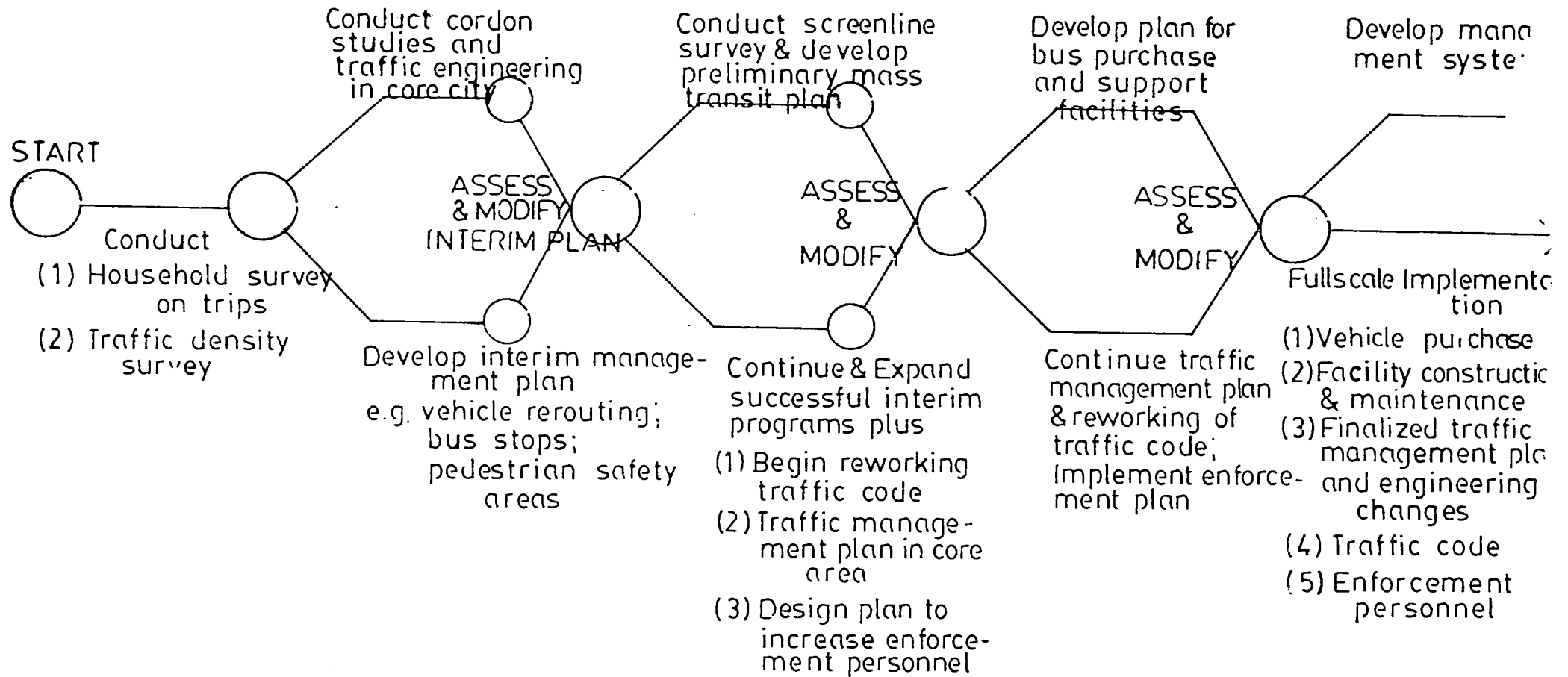


Exhibit 9

MECHANICS OF PREPARATIONS FOR IMPLEMENTATION OF PROPOSED MASS TRANSIT BUS SYSTEM



ENERGY AND ELECTRICAL POWER SYSTEM

I. AREA OF RESPONSIBILITY:

1. Home and commercial use
2. Power capacity and source
3. Reduction of transmission and distribution losses
4. Reduction of power interruptions
5. More effective methods of pricing and bill collection
6. Discussion of other energy conservation opportunities, with special attention given to indigenous energy resources.

II. SITUATIONAL ANALYSIS

A. Description

Without question, energy is a critical global concern today.

On September 21, 1972, His Excellency, President Ferdinand E. Marcos issued Presidential Decree No. 269, declaring a national policy objective for the total electrification of the Philippines on an area coverage basis. To pursue this objective, the government launched the "Countryside Electrification Program". The principal goal is to energize the rural areas in order to accelerate economic activity.

The electrification program aims to supply electricity to the most remote areas, and to search for new sources of energy from which electricity could be derived. This nationwide program was originally targeted for completion in 1990. The First Lady, Imelda Romualdez-Marcos, in her capacity as Chairperson of the Board of Administrators of the National Electrification Administration (NEA), accelerated the completion date to 1987.

The demand for electric power in the City of Tacloban is met by the Leyte II Electric Cooperative, Inc. (LEYECO II), which also provides services to the towns of Palo and Babatngon as well as their barrios and barangays. In order to comply with the Rural Electrification Program of the President, LEYECO II developed an expansion program to provide electricity to remote parts of Tacloban, Palo, and Babatngon. The program is scheduled for completion in 1985.

LEYECO II has one power plant located in Sagkahan, Tacloban City. The plant consists of four generators with a total rated capacity of 3010 kilowatts. Its actual generating capacity is 2000 kilowatts. LEYECO II purchases supplementary electricity from the Don Orestes Romualdez Electric Cooperative, Inc. (DORELCO) located at San Roque, Tolosa, Leyte.

B. History

Initially, the Leyte Electric Cooperative, Inc. (LECI) was the franchise holder of the service area of DORELCO. To enhance the rural electrification program using the concept of an area coverage basis, the NEA mandated the split of the system.

On October 26, 1975 LEYECO II was established and registered with the NEA. At that time its service area covered only the City of Tacloban and the municipality of Palo. Later, it expanded to other barrios and barangays including Babatngon and barrios (see Map displayed as Exhibit 1).

For its initial operating capital, LEYECO II was granted a loan of P27.3 M by the NEA payable in 30 years with a five-year grace period. The interest rate is 3% per annum.

On June 5, 1978, NEA granted LEYECO II a certificate of franchise to operate for a period of 50 years.

C. Trends

Exhibit 2 is a pie chart illustrating the percentages of the total amount of electricity sold in 1980 that were purchased by the various demand sectors. Residential users bought 32% of the total, commercial users 34%, and industrial users 20%. Eleven percent of the electricity sold went to public buildings and facilities and 3% powered streetlights and security lights.

Residential Use

In 1975, which marked the beginning of LEYECO II operations, residential customers accounted for a total of 5,805 connections, and this number increased slightly each year. As of August, 1981, a total of 9,758 connections were registered with LEYECO II. Connections increased at an average annual rate of 9.7% for the period.

The quantity of power sold in 1975 amounted to 3,866 kilowatt-hours. Quantities of power sold decreased in the years 1976 (by 5.3%) and 1979 (by 1.9%) even as the number of connections increased. This is evidence that the service area has encountered power interruptions.

Except for the year 1976, revenues collected have increased yearly. This may be attributed to higher power rates (please refer to Table 1).

Commercial Use

The data in Table 1 show that commercial connections increased from 1,149 in 1975 to 1,243

in August of 1981, an average yearly increase of 3.8%.

As with residential users, consumption decreases of 1.1% in 1977 and 12.3% in 1979 can be attributed to power failures. In 1980 there was a remarkable increase of 37.4% in the quantity of power sold to commercial customers.

Revenue derived has increased each year. The amount of revenue collected in 1980 was high due to an increase in power rates.

Industrial Use

Industrial users increased in number from 40 in 1975 to 127 as of August 1981, an average annual rate of increase of 35%. This indicates that new industries are locating in the City of Tacloban.

Power consumed by industries increased in 1976 and decreased from 1977 to 1979, increasing again in 1980. Again, brownouts or power losses explain the decreases. Industrial users apparently have access to alternate sources of power for their operations in case of LEYECO II power failures.

Revenue collected from these industrial users decreased in 1976, 1978 and 1979 and increased by 69.1% in 1980.

Public Buildings and Facilities

The number of connections to public buildings and facilities increased at an average yearly rate of 10.2%, from 117 in 1975 to 190 in 1981.

Power consumption and revenue collection climbed gradually from 1975 to 1978, dropped in 1979, then increased markedly in 1980.

Streetlight and security lighting connections increased in number in the years 1976, 1977 and 1979, while decreases were recorded in 1978 and 1980.

Power Rate

Electric rates of self-generating cooperatives are usually much higher than the rates of those connected with the power grid of the National Power Corporation (NPC). Table 2 shows the current system rates of many of the self-generating cooperatives located in the Visayas area of the country.

In determining the rates of an electric cooperative, the management submits its recommendations to the Board of Directors for perusal and deliberations. Once approved, the same is forwarded to the NEA for final resolution.

To come up with a just and fair rate structuring LEYECO II management considers the following factors:

- (a) cost of fuel and oil (LEYECO II power plant operations)
- (b) cost of power purchases (from DORELCO - about 85%)
- (c) loan amortizations
- (d) salaries and wages
- (e) spare parts
- (f) administrative and other overhead expenses

The LEYECO II system's rate was ₱0.45 in 1974, and has increased to ₱1.68 in 1981, an average increase of 16% a year. Rates increased twice in both the years 1979 and 1980 and once every other year since LEYECO II was established (refer to Table 3).

The current LEYECO II rate schedule appears as Exhibit 3.

Fuel and Oil Consumption

Table 4, based on LEYECO II records, shows that diesel fuel consumption by the plant has continuously decreased, from 5,033,691 liters in 1976 to 997,994 liters in 1980. The average rate of decrease has been 29.9% annually.

Similarly, lube oil consumption is also diminishing at a rate of 31.5% annually, from 167,668 liters in 1976 to 25,295 liters in 1980. This may be explained by the fact that LEYECO II only operates its power plant during peak load hours, that is between 5:00 P.M. and 12:00 midnight. The bulk of the power demand is met by DORELCO.

Exhibit 4 plots the load in kilowatts produced over a typical 24-hour period. Demand is fairly stable, except for the to-be-expected peak in the early evening hours.

For a period of seven months (January - July, 1981), diesel fuel consumption decreased from 99,415 to 20,371 liters. Lube oil consumption also went down from 1,492 to 1,485 liters during that period. Consumption peaked in March totalling 123,153 liters of diesel fuel and 4,448 liters of lube oil (please refer to Table 5).

Fuel Cost

The cost of fuel per liter in 1978 was ₱1.17. In 1979 there were two increases -- a 16.1% increase in April and another 18.5% increase in August. In the year 1980 the cost of fuel again increased twice: 10.8% in March and 0.4% in May. At present, the price of fuel is ₱2.98 per liter (source of fuel and oil is PETRON, Tacloban City Branch). The average rate of increase of fuel cost is 17.5% annually (Please refer to Table 6).

Distribution System

The total length of electric lines is 243 kilometers as of July 1981. These are classified into primary and secondary lines. Primary lines are provided with conductors of different sizes. For particulars, please refer to Exhibit 5.

The existing distribution system of LEYECO II consists of five feeder lines originating from its plant at Sagkahan and a 69-KV transmission line from DORELCO to the LEYECO II plant. Of the five feeders, three serve Tacloban City (Feeders 1, 2 and 3). Feeder 4 serves certain parts of the City and the municipality of Babatngon and its barrios. Feeder 5 serves Barrio San Jose, V & G Subdivision in Tacloban and the Municipality of Palo including its barrios and barangays (Please refer to the map labelled Exhibit 6).

System's Loss

The energy losses of an electric distribution system are the unaccounted quantities of power in kilowatt-hours, or the difference between the energy purchased and/or generated and the energy billed. In a typical distribution system, substation transformers, secondary conductors, distribution transformers, primary conductors and service conductors are the primary contributors to losses.

For a period of five years the yearly system's loss of LEYECO II follows:

1976	. . . . .	25%
1977	. . . . .	27%
1978	. . . . .	25%
1979	. . . . .	22%
1980	. . . . .	23%

The average yearly system loss is 24%. The maximum percentage of loss occurred in the year 1977.

No statistics are available to pinpoint where in the system the losses occur. Pilferage or illegal connections are suspected to be a major contributor to the losses.

Power Supply and Demand

The major source of power for LEYECO II is the power plant at DORELCO located at San Roque, Tolosa, Leyte. This power plant is equipped with eight generators with a rated capacity of 10,250 kilowatts but the actual generating capacity is only 6,450 kilowatts (please refer to Table 7).

As mentioned earlier, LEYECO II has its own power plant equipped with four generators. Old and overused with the passing of the years, this plant has a rated capacity of 3,010 kilowatts with an actual generating capacity of only 2,000 kilowatts. (Please refer to Table 8).

As may be gleaned from these data, DORELCO and LEYECO II have a combined power capability of 8,450 kilowatts which is barely enough to meet the demand for electric power in the LEYECO II service area.

Table 9 shows the quantity of electric power generated monthly by LEYECO II and DORELCO for the LEYECO II service area. It can be seen that only about 25% of the electricity consumed in this area is produced by LEYECO II. The remaining 75% is generated by DORELCO.

Aside from serving LEYECO II, DORELCO also supplies power to the LEYECO III Electric

Cooperative, Inc. (LEYECO III) based at Tunga, Leyte and the Southern Leyte Electric Cooperative, Inc. (SOLECO) based in Maasin, Southern Leyte. (Please refer to the map presented as Exhibit 7).

With barely enough power base to support the demand for electric power of these four electric cooperatives, it is significant to note that there is no back-up power. Hence, when DORELCO undertakes maintenance and repair work on its generators, power interruptions frequently occur, affecting all service areas.

Institutional Arrangements

Like any other entity, LEYECO II has its own organizational structure, which is diagramed in Exhibit 8. The Board of Directors serves as the policy-making body. There are five members of the Board, each representing his own district area.

The management of the electric cooperative is headed by the General Manager and is supported by his staff. Directly under the General Manager are three executive officers, namely: the Manager for the Office Services Department; the Manager for the Engineering Department, and the Manager for the Member Services Department.

The management also retains a Legal Counsel on a contractual basis. Rank and file personnel are supervised by division heads and section heads.

Billing and Collection

LEYECO II uses the standard cyclical billing method. Metered and non-metered consumers are billed on a monthly basis. Industrial, commercial and public buildings and residential consumers are

grouped into "blocks" for efficient billing.

Consumer meters are read every 30 days. From the time the meter is read, it takes between three and five days to prepare and address the bills. Scheduling and actual distribution of bills require another five days. After consumers receive their bills, they are given 15 days grace period to settle their accounts. Therefore, it takes between 50 and 55 days before consumer bills are paid and/or collected.

Disconnection occurs if customers still have not paid the amount due 60 days after receiving their bills. A 48-hour final notice is served before the actual disconnection is enacted. The re-connection fee is ₱25.00. This amount compensates for the labor, fuel, and service costs of disconnection. The number of disconnections, reconnections, and new connections for 1981 are listed in Table 10.

Non-metered installations such as street-lighting and security lighting facilities are billed on fixed rates as stipulated in the rate structure.

Special lighting requirements are also accepted on a case by case basis. Prospective customers are required to deposit an amount equivalent to the cost of their estimated consumption. Any excess amount may be refunded.

Despite increasing power consumption and power rates, the cooperative has been experiencing decreases in revenues collected. The high cost of living has prevented many consumers from settling their accounts on time.

Consumers' ability to pay is also influenced by copra price fluctuations. Copra is Leyte's

major agricultural product. Tacloban City being the economic center of Leyte feels the effect of changes in copra prices.

Role and Responsibility

As a franchise holder, LEYECO II is empowered to:

a) generate, manufacture, purchase, acquire, accumulate and transmit electric power and energy and to distribute, sell, supply and dispose of electric energy to persons who are its members and to other persons not in excess of ten percent (10%) of its members.

b) construct, maintain and operate electric transmission and distribution lines along, upon, under and across publicly owned lands and public thoroughfares, including, without limitation, all roads, highways; and

c) fix, maintain, implement and collect rates, fees, rents, tolls and other charges and terms and conditions for service.

Relations with other Offices and/or Agencies

LEYECO II coordinates and cooperates with other agencies and offices. Electric cooperatives, as private institutions, operate independently. The system is not regionalized. The cooperative reports directly to the National Electrification Administration.

Future Sources of Power and Energy

As discussed earlier in this report, the power capability of DORELCO is barely enough to provide for the ever increasing demand for electric power within the service areas of the four electric cooperatives.

To compensate for the deficiencies in power generating capacity, these electric cooperatives will eventually link with the power grid of the NPC. In the immediate future, NPC is considering the transferral of a power barge from Naga, Cebu to Isabel, Leyte. Owned by the NPC, the 32-megawatt power barge would serve as an interim source of power pending the completion and operationalization of at least one unit of the Tongonan Geothermal plant. The power barge, once installed in Isabel, has more than enough power capability to serve Leyte and Southern Leyte.

The final solution to all these power and energy problems is the Tongonan Geothermal Plant located in Kananga, Leyte. It will have three geothermal units, each with a capacity of 37.5 megawatts. Upon completion of this project, the total power potential would amount to 112.5 megawatts, more than enough to supply electricity to the islands of Leyte and Samar.

III. CONSERVATION PROBLEMS AND OPPORTUNITIES

Flaws in the electric power generation and distribution system have caused significantly high power losses for several years. An appraisal of the cooperative's distribution system by an audit team revealed that from January 1980 through March 1981, system losses totalled 4,782,134 kilowatt-hours (KWH), equivalent to ₱6,377,235 in foregone revenues, an amount large enough to have financed several plant operations improvements.

Frequent power interruptions constitute a conservation problem for the City. During brownouts some establishments shut down, while others activate stand by generating sets, which are less energy efficient than LEYECO II and DORELCO generators.

There exists an opportunity to conserve energy by utilizing more fully indigenous energy resources.

In Tacloban there are several rice mills and saw mills which generate rice hull and saw dust as waste products. Copra production operations produce coconut shells and husks as by-products. All of these waste materials may be used as fuel for cooking. It seems that these materials have not been generally accepted for domestic use. This problem must be overcome. In order to enhance acceptability, the reliability of supply must be guaranteed.

Such a promotion of utilization of indigenous energy resources would require financing -- a source of funding must be identified. Money is needed to establish cooperatives and to conduct an education drive to expedite acceptance.

Increased usage of indigenous energy resources would reduce the demand for electricity.

There seems to be potential for enacting other conservation measures in Tacloban City as well.

IV. PROPOSED STRATEGIES FOR MORE EFFICIENT USAGE OF ELECTRIC POWER AND ENERGY

(1) Improve electric power supply and distribution system.

Alternatives considered were: (a) replacing inefficient LEYECO II generating units with higher capacity generating sets, and (b) waiting for the power barge of the NPC.

The first alternative was discarded for cost and practicability reasons. The NPC power barge is expected to arrive in early 1982. After an estimated 15 months, this power barge will be replaced by the

Tongonan Geothermal Plant at Kananga, Leyte, which will become Tacloban's permanent source of power. This 37.5 megawatt plant is located 109 kilometers (68 miles) west of Tacloban City. Subterranean steam will be tapped to drive a turbine. The turbine will be coupled to a dynamo, which converts mechanical energy to electrical energy. Both the power barge and the Tongonan Geothermal Plant are owned and controlled by the NPC.

While awaiting the availability of these new sources of electrical energy, DEYECO II is undertaking short term measures to promote more efficient power supply, distribution and usage. Measures include improved power line maintenance, replacement of broken insulators and defective meters, periodic checking of transformers, more rigorous inspections for illegal connections, improvement of the power factor delivered to various consumers, and provision of energy audit services to major customers enabling them to become more efficient energy users.

An outline of the recommended procedure for reducing losses follows:

Step # 1 A system circuit diagram must be produced. This diagram is a vital tool for monitoring system operations, improving system protection, and reducing system losses.

Step # 2 Geographic areas with particularly high system losses must be identified.

Step # 3 Problem areas must be investigated by task force personnel.

Step # 4 Data collected during the investigation must be evaluated. Recommendations for rehabilitating the system will ensue.

Step # 5 Additional investigations should be initiated to analyze losses not considered line losses.

Step # 6 The recommended strategy will be implemented.

The advent of the power barge and the geothermal plant will have a displacing impact on employment. Employees made redundant would subsequently be provided with job opportunities by NEA. Jobs within the LEYECO organization could be found for some displaced workers while others could be offered positions in the Middle East.

(2) Develop and promote utilization of indigenous energy resources.

Marketing cooperatives could be established designed to ensure consumers of a constant supply of indigenous fuel materials while providing producers with marketing assistance.

Low collateral, low interest loans could be an effective tool in the development of the indigenous energy resource sector. Such loans might be extended to marketing cooperatives. Individuals and groups in the private sector interested in producing firewood or charcoal for commercial purposes might receive some of the loans. Industries contemplating conversion from petroleum-based fuels to indigenous fuels might be enticed by concessionary loans. Such potential converters are already provided with incentives by the nation government. Pursuant to Letter of Instruction No. 1152, signed recently by the President, converting industries are rewarded by the Board of Investments. Low collateral, low interest loans could also be used to encourage rice mills and saw mills to use their own waste materials to meet internal energy demands.

In the transport sector gasifier powered vehicles, which use charcoal instead of gasoline as a power source, should be encouraged. This program is being promoted by the Ministry of Human Settlements.

(3) Implement energy conservation measures in various sectors.

An energy survey would help planners to identify conservation opportunities. This survey would be a continuing activity so as to institutionalize a current energy data base.

The existing power rate structure should be reviewed, and changes to encourage energy conservation recommended. For example, some sort of progressive rate structure might be established thereby discouraging excessive electricity consumption. A rate structure change should be accompanied by an educational campaign. In fact, the chances of success for all energy conservation strategies would be enhanced if efforts are made to inform and educate the public.

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON ENERGY & ELECTRIC POWER SYSTEM

CONSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PF (R)
1. Improve electric power supply and distribution system	<p>A) Replace generators</p> <p>B) Wait for power barge improve distribution system & promote efficient power utilization at consumer level</p>	B	<p>1) Less cost</p> <p>2) Easy payment terms for LEYECO</p> <p>3) Improve system reliability</p>	<p>1) Displacement of power plant personnel</p>	A. Cross-Sectoral Improvement	NPC LEYECO	<p>L- 15 mos.</p> <p>S- 3 mos.</p>	L	:
2. Develop and promote utilization of indigenous energy resources	<p>A) Establish marketing cooperatives</p> <p>B) Encourage rice mills, lumber mills, to utilize rice hull, sawdust</p> <p>C) Provide low collateral/low interest loans</p> <p>D) Use of gasifier powered vehicles</p>	<p>A</p> <p>B</p> <p>C</p> <p>D</p>	<p>1) Immediate implementation</p> <p>2) Petro. fuel displacement</p> <p>3) Supply stability</p> <p>4) Employment opportunities</p> <p>5) Better solid waste management</p> <p>6) Industrial development</p> <p>7) Better land use</p>	<p>1) Need financing</p> <p>2) Need proper education of people for acceptance</p>	A. Cross-Sectoral benefits	<p>1) Office of the Mayor</p> <p>2) Barangays</p> <p>3) KKK</p> <p>4) USAID</p>	<p>L-A,C M-D</p> <p>L-B 1 yr.</p>	M	

PRELIMINARY STRATEGY MATRIX
FOR SECTOR ON ENERGY & ELECTRIC POWER SYSTEM

CONSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	P()
3. Implementation of energy conservation opportunities in various sectors	<p>A. Conduct survey of efficiency of utilization of various forms of energy & identify conservation opportunities</p> <p>B. Review existing power rate structures, recommend measures to encourage conservation</p> <p>C. Conduct education & information campaign</p>	<p>A B C</p>	<p>1) Better planning & management of energy use</p> <p>2) Energy savings</p> <p>3) Provide employment</p>	<p>1) Need for well trained, well-organized survey team</p> <p>2) Need for cooperation from populace & city government</p> <p>3) Regulatory measures may be unpopular & costly</p>	<p>1) Increase available energy resources for other sectors</p>	<p>1) Office of the Mayor</p> <p>2) Baran-gay</p> <p>3) Ministry of Labor</p> <p>4) Ministry of Human Settlements</p> <p>5) Chamber of Industry</p> <p>6) Student groups</p> <p>7) Civic organizations</p> <p>8) USAID & consultants</p>	<p>Approximate-ly one (1) year</p>	<p>About \$150,000.00</p>	

Table No. 1
 Number of Connections, Power sold out and Revenues Collected
 LEYECO II Service Area
 Tacloban City

Year	No. of Connections	% Inc/Dec.	Power Sold (in KWH)	% Inc/Dec.	Revenue (in Pesos)	% Inc/dec
A. Residential						
1975	5,805		3,866,522		2,736,159.82	
1976	6,379	9.89	3,663,490	(5.25)	2,533,216.86	(7.42)
1977	7,474	17.16	3,821,104	4.30	2,832,410.30	11.81
1978	8,539	14.25	4,140,352	8.35	3,180,936.50	12.30
1979	8,964	4.98	4,060,135	(1.94)	3,300,611.46	3.76
1980	9,161	2.14	4,098,151	0.94	5,237,522.58	58.68
1981 (Jan-August)	9,758	16.29	2,630,346		4,275,950.43	
*Average rate of increase on the number of residential connections yearly is 9.70%						
B. Commercial						
1975	1,143		2,952,178		2,208,990.97	
1976	1,180	3.24	3,168,493	7.33	2,365,997.18	7.11
1977	1,263	7.03	3,136,607	(1.07)	2,476,493.70	4.67
1978	1,266	0.24	3,717,874	18.53	2,847,434.35	14.98
1979	1,219	(3.71)	3,262,063	(12.26)	2,985,471.34	4.85
1980	1,264	3.69	4,480,520	37.35	5,777,632.75	93.52
1981 (Jan-Aug)	1,243	12.50	2,208,068		3,635,869.01	
Average rate of increase on the No. of commercial connections yearly is 3.83%						

Table 1, continued

Year	No. of Connections:	% Inc/Dec.	Power sold (in KWH)	% Inc/Dec.	Revenue (in Pesos)	% Inc/Dec
C. Industrial						
1975	40		2,787,739		2,353,536.71	
1976	38	(5.00)	3,056,083	9.63	2,111,425.73	(10.23)
1977	39	2.63	2,995,026	(2.00)	2,186,900.70	3.57
1978	119	205.13	2,726,323	(8.97)	2,033,996.90	(6.99)
1979	125	5.04	2,175,553	(20.20)	2,002,521.86	(1.55)
1980	126	0.08	2,658,225	22.19	3,390,978.43	69.34
1981 (Jan-Aug)	127	1.19	1,659,431		2,697,762.47	
Average rate of increase on industrial connections yearly is 34.96%						
D. Public Bldgs. & Facilities						
1975	117		857,727		589,326.17	
1976	149	27.35	1,092,369	27.36	755,262.36	28.16
1977	189	26.85	1,103,263	1.00	808,467.25	7.04
1978	213	12.70	1,347,007	22.09	1,023,970.25	26.66
1979	185	(13.15)	1,127,714	(16.28)	1,018,805.90	(0.50)
1980	196	5.95	1,390,604	23.31	1,787,983.91	75.50
1981 (Jan-Aug)	190	1.53	894,227		1,377,081.67	
Average rate of increase on the connections of public Bldgs. and Facilities is 10.20% yearly.						

Table 1, continued

Year	No. of Connections:	% Inc/Dec.	Power sold (in KWH)	% Inc/Dec.	Revenue (In Pesos)	% Inc/Dec.
E. Streetlights Security Lightings	:	:	:	:	:	:
1975	331	:	68,335	:	186,657.65	:
1976	786	15.57	393,791	476.27	193,048.76	3.42
1977	826	5.03	386,927	(1.74)	258,659.96	33.99
1978	717	(13.20)	323,127	(16.49)	232,590.22	(10.08)
1979	915	27.62	441,243	36.55	316,524.57	36.09
1980	883	(2.84)	349,271	(20.84)	304,261.57	(3.87)
1981 (Jan-Aug)	:	:	:	:	:	:
: Average rate of increase on streetlights and security lighting connections is 7.21% yearly.						

Source: LEYECO II, Tacloban City
October, 1981

TABLE 2
System Rates of Visayas Coops
as of March 1981

I. Self-Generating Coops

1. CENECO (Negros)	=	₱1.020/kwh
2. VRESCO	=	1.175
3. NEGROS OCC.	=	1.655
4. ANTIQUE	=	1.853
5. DOREICO (Leyte)	=	1.680
6. LEYECO II (Leyte)	=	1.680
7. LEYECO III (Leyte)	=	1.895
8. SOUTHERN LEYTE	=	2.175
9. SAMELCO I (Samar)	=	2.075
10. SAMELCO II (Samar)	=	2.075
11. ESAMELCO	=	2.030
12. NORSAMELCO	=	2.075
13. CEBU II	=	2.218

Table No. 3

Power Rate Per Kilowatt-Hour
LEYECO II
Tacloban City

Date	:Rate Per kilowatt, : Hour (in pesos) :	Amount of Increase (in pesos)	: Per cent of : Increase
1974	0.45		
June, 1975	0.57	0.12	26.67
February, 1976	0.70	0.13	22.81
June, 1977	0.75	0.05	7.14
November, 1978	0.80	0.05	6.67
April, 1979	0.90	0.10	12.50
September, 1979	1.02	0.12	13.33
March, 1980	1.31	0.29	28.43
October, 1980	1.41	0.10	7.63
May, 1981	1.68	0.27	19.15
Yearly average rate of increase			16.04%

Source: LEYECO II, Tacloban City
October, 1981

Table No. 4
 Fuel and Oil Consumption
 LEYECO II Operation
 Tacloban City
 CY 1976-1980

Year	Diesel Consumed (in Liters)	% Inc/Dec.	Lube Oil Consumed (in Liters)	% Inc/Dec.
1976	5,033,681		167,668	
1977	4,563,381	(9.34)	204,238	21.81
1978	1,875,615	(58.90)	108,817	(47.72)
1979	1,668,737	(11.03)	64,951	(40.31)
1980	997,994	(40.19)	25,395	(60.90)

Source: LEYECO II, Tacloban City
 October, 1981

Table No. 5
 Fuel and Oil Consumption
 LEYECO II Operation
 Tacloban City
 For the Period from January-July, 1981

Month	Diesel Consumed (in Liters)	% Inc/Dec.	Lube Oil Consumed (in Liters)	% Inc/Dec.
January	95,415		1,492	
February	117,432	23.07	2,273	52.23
March	123,153	4.87	4,448	95.69
April	75,222	(38.92)	2,009	(54.83)
May	121,874	62.02	3,244	(61.47)
June	89,024	(29.95)	2,314	(28.67)
July	70,371	(20.95)	1,485	(35.83)

Source: LEYECO II, Tacloban City
 October, 1981

Table No. 6

Schedule of Rates for Diesel Fuel Purchases
 Leyeco II Electric Cooperative, Inc.
 Tacloban City
 1978-1981

Date	: Cost Per Liter : (In Pesos)	: Amount of Increase : (In Pesos)	: Per cent of : Increase
1978	: 1.1712	:	:
April, 1979	: 1.3592	: 0.1880	: 16.05
August, 1979	: 1.6110	: 0.2518	: 18.53
March, 1980	: 2.2790	: 0.6680	: 41.46
October, 1980	: 2.6790	: 0.4000	: 17.55
March, 1981	: 2.9670	: 0.2880	: 10.75
May, 1981	: 2.9777	: 0.0107	: 0.36

Note: For a period of three years, average rate of increase of diesel fuel per liter is 17.45%.

Source: LEYECO II, Tacloban City, 1981

Table 7

140

Internal Combustion Engines Operating at
Don Orestes Romualdez Electric Cooperative, Inc. (DORECO)
San Roque, Tolosa, Leyte

TYPE	MODEL	RATING (HP)	DATE INSTALLED	Generating Capacity	
				Rated	Actual
1. GMR 278A	: 1961:	720 :	1973	: 500	: 250
2. -do-	: 1961:	720 :	-do-	: 500	: 250
3. -do-	: 1961:	720 :	-do-	: 500	: 250
4. -do-	: 1961:	720 :	-do-	: 500	: 250
5. -do-	: 1961:	720 :	-do-	: 500	: 250
6. 16PA6V280:	:	4,770 :	1975	: 3,350	: 2,200
7. -do-	:	3,140 :	1980	: 2,200	: 1,500
8. MAN	:	:	1981	: 2,200	: 1,500

Source: LEYECO II, Tacloban City
October, 1981

Table 8

Internal Combustion Engines Operating at
Leyte II Electric Cooperative, Inc. (LEYECO II)
Sagkahan, Tacloban City

TYPE	MODEL	RATING (HP)	DATE INSTALLED	Generating Capacity	
				Rated	Actual
1. MAN 9-1	:1964:	1335	: November, 1966	: 920	: 600
2. ENTDSG38	:1956:	1525	: September, 1979	: 1090	: 600
3. WS403XB	:1966:	715	: June, 1980	: 500	: 400
4. WS403XB	:1966:	715	: June, 1980	: 500	: 400
T O T A L				: 3010 kw	: 2000 kw

Source: LEYECO II, Tacloban City
October, 1981

Table No. 9

**ELECTRIC POWER IN KILOWATTS GENERATED MONTHLY
BY LEYECO II and DOBELCO FOR LEYECO II SERVICE AREA
January - July, 1981**

MONTH	: LEYECO II	: CONTRIBUTION	: DOBELCO	: CONTRI- : BUTION	: TOTAL : (kilowatts)
January	: 973	: 24.34	: 3,024	: 75.66	: 3,997
February	: 1,020	: 25.22	: 3,024	: 74.78	: 4,044
March	: 1,040	: 25.99	: 2,961	: 74.01	: 4,001
April	: 1,209	: 28.56	: 3,024	: 71.44	: 4,233
May	: 1,090	: 24.61	: 3,339	: 75.39	: 4,429
June	: 1,205	: 26.34	: 3,370	: 73.66	: 4,575
July	: 1,381	: 25.51	: 4,032	: 74.49	: 5,413
Monthly Average		: 25.80		: 74.20	

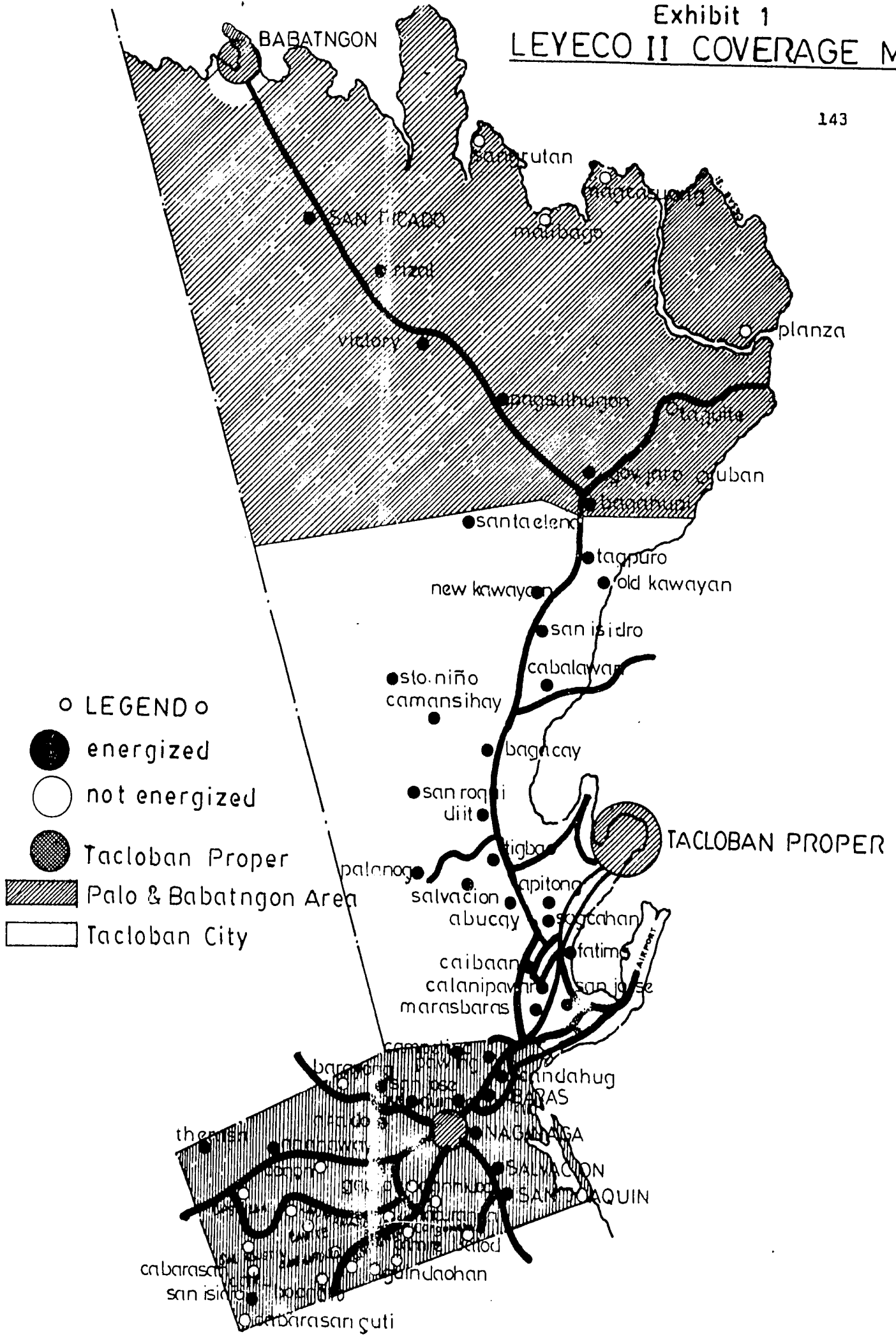
Source: LEYECO II, Tacloban City
October, 1981

TABLE 10
 Status of Disconnection, Reconnection and
 New Connections

AS OF 1981:

	<u>No. of Disconnections</u>	<u>No. of Reconnections</u>	<u>New Connections</u>
January	111	75	61
February	75	94	77
March	53	83	111
April	148	55	28
May	190	186	40
June	19	83	132
July	0	41	85
August	50	63	102
September	192	141	143
TOTALS	<u>838</u>	<u>821</u>	<u>779</u>

Exhibit 1 LEYECO II COVERAGE MAP



1980 DISTRIBUTION OF ELECTRICITY SOLD

Exhibit 2

A. RESIDENTIAL	4,098,151	32%
B. COMMERCIAL	4,480,520	34%
C. INDUSTRIAL	2,658,225	20%
D. PUBLIC BLDGS. & FACILITIES	1,390,604	11%
E. STREETLIGHTS & SECURITY LIGHTS	349,271	3%
TOTAL ENERGY USED	12,976,771	100%

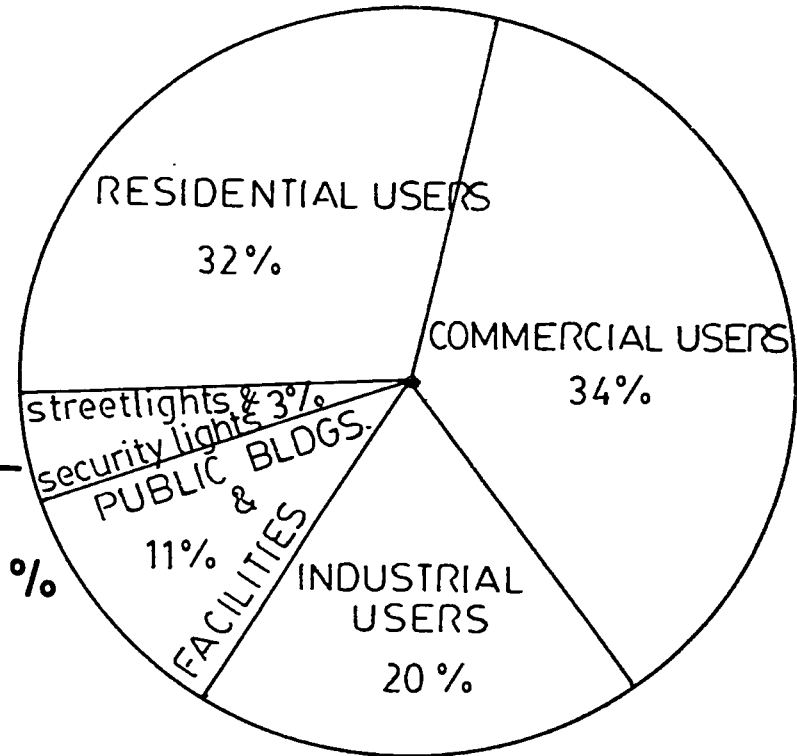


Exhibit 3
Republic of the Philippines
Office of the President
NATIONAL ELECTRIFICATION ADMINISTRATION
Quezon City

145

April 28, 1981

The Board of Directors
Leyte II Electric Cooperative, Inc.
Tacloban, Leyte

Gentlemen:

You are hereby authorized to implement the following rates schedule effective immediately :

<u>Type of Consumers</u>	<u>Rate</u>
<u>Residential/Public Bldgs.</u>	
Minimum bill (1-10 kwh)	P 16.80
Excess	1.68/kwh
<u>Commercial</u>	
Minimum bill (1-20 kwh)	P 34.00
Excess	1.70/kwh
<u>Industrial</u>	
<u>Without Demand Meter :</u>	
Minimum bill (1-20 kwh)	P 34.00
Energy Charge	1.70/kwh
<u>With Demand Meter :</u>	
Demand Charge	P 15.00/KW
Energy Charge	1.65/Kwh
<u>Street Lights</u>	
175 watts	P 90.00/bulb/mo.
or	0.514/watt

Energy/Fuel Cost Adjustment Clause

For every P0.001 increase in DORELCO basic cost at P1.18/kwh, an additional charge of P0.000397/kwh sold shall be applied.

For every P0.001 increase in the present price of diesel at P2.9955/liter, an additional charge of P0.0001135/kwh sold shall be applied.

With this rate adjustment, you are hereby required to set aside a monthly reserve fund of P130,000 for the amortization of your Construction Loans.

With best regards.

Very truly yours,

SCD: GEN. PEDRO G. DUMOL
Administrator

True Copy

Exhibit 4 DORELCO / LEYECO II

LOAD GRAPH FEEDERS 1 to 5

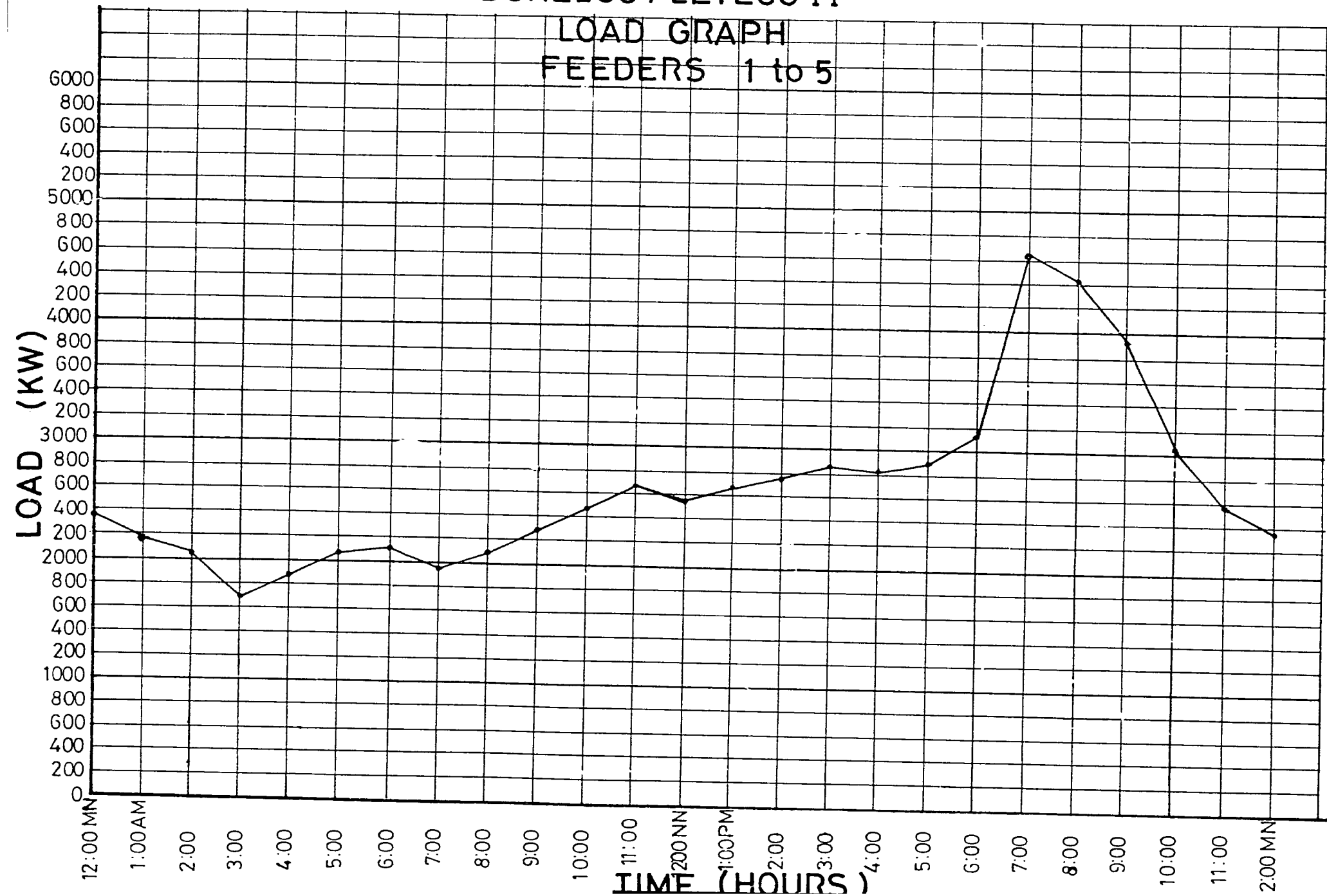
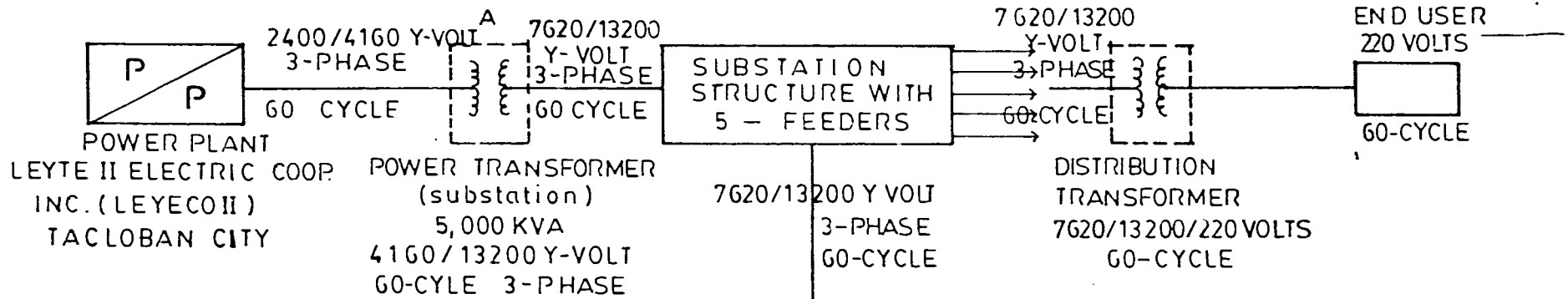


Exhibit 5
ILLUSTRATION OF LEYECO II DISTRIBUTION SYSTEM
TACLOBAN CITY



* The source of power of Leyeco II is DORELCO. It transmit 69000 volts, three-phase, 60-cycle to LEYECO II through 5,000 kva, power transformer B, stepping-it-down to 7620/13200 wye-volt, 3-phase 60-cycle. It enters through a substation structure to serve 5-feeders and to the end-user (consumer) through distribution transformer for 220-volts 60-cycle.

LEYECO II has an existing power plant generating 2400/4160 wye-volt, 3-phase, 60 cycle, through a 5,000 kva power transformer A, stepping-it-up to 7620/13200 wye-volt, 3-phase, 60-cycle. It also enters through the same substation structure to serve only one feeder at times when DORELCO can't cope up the load.

69000 VOLTS
3-PHASE
60-CYCLE

FROM DON ORESTES
ELECT. COOP. INC.
SAN ROQUE, TOLOSA
LEYTE

Exhibit 6
 ○ EXISTING DISTRIBUTION SYSTEM ○
 OF LEYECO II

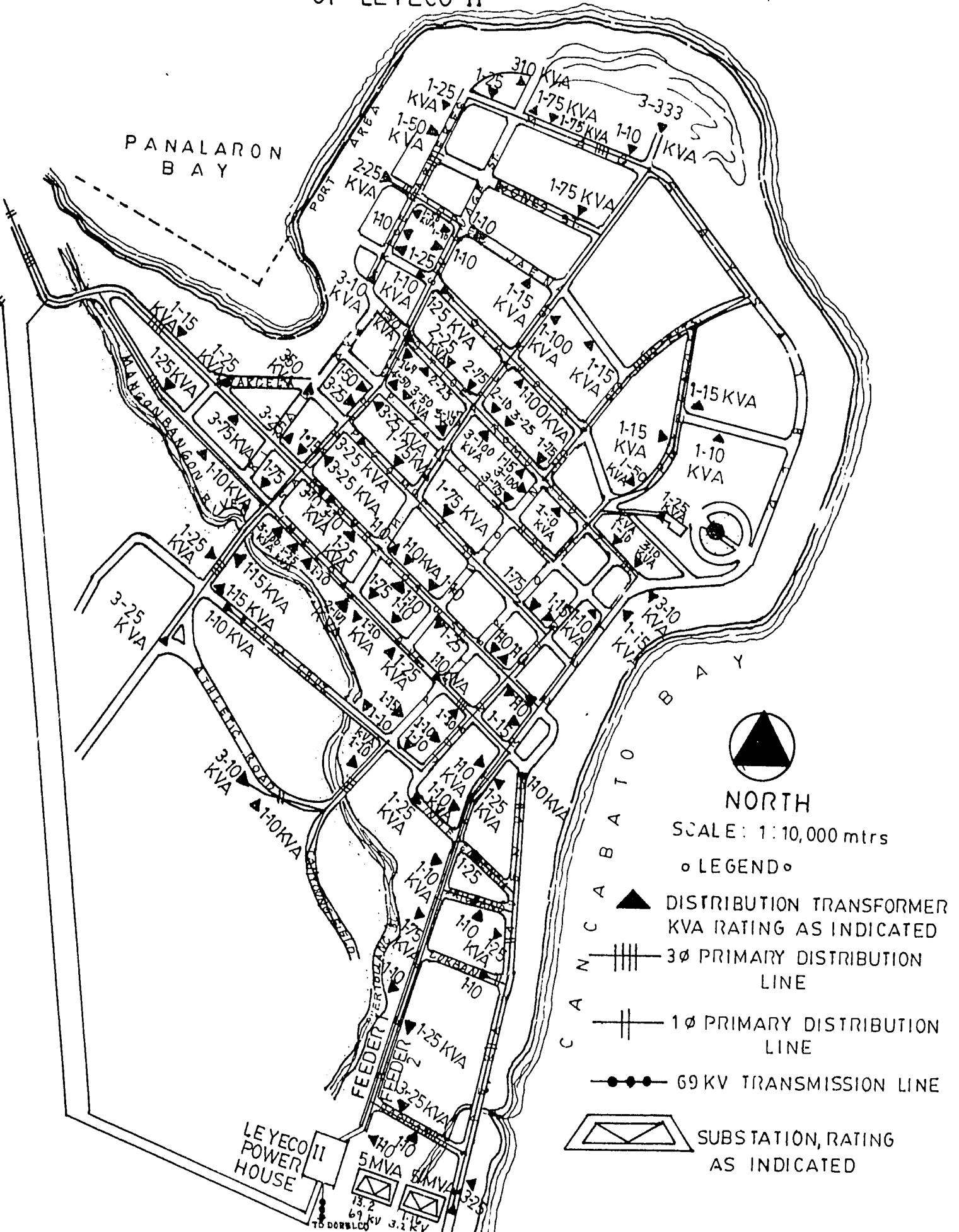
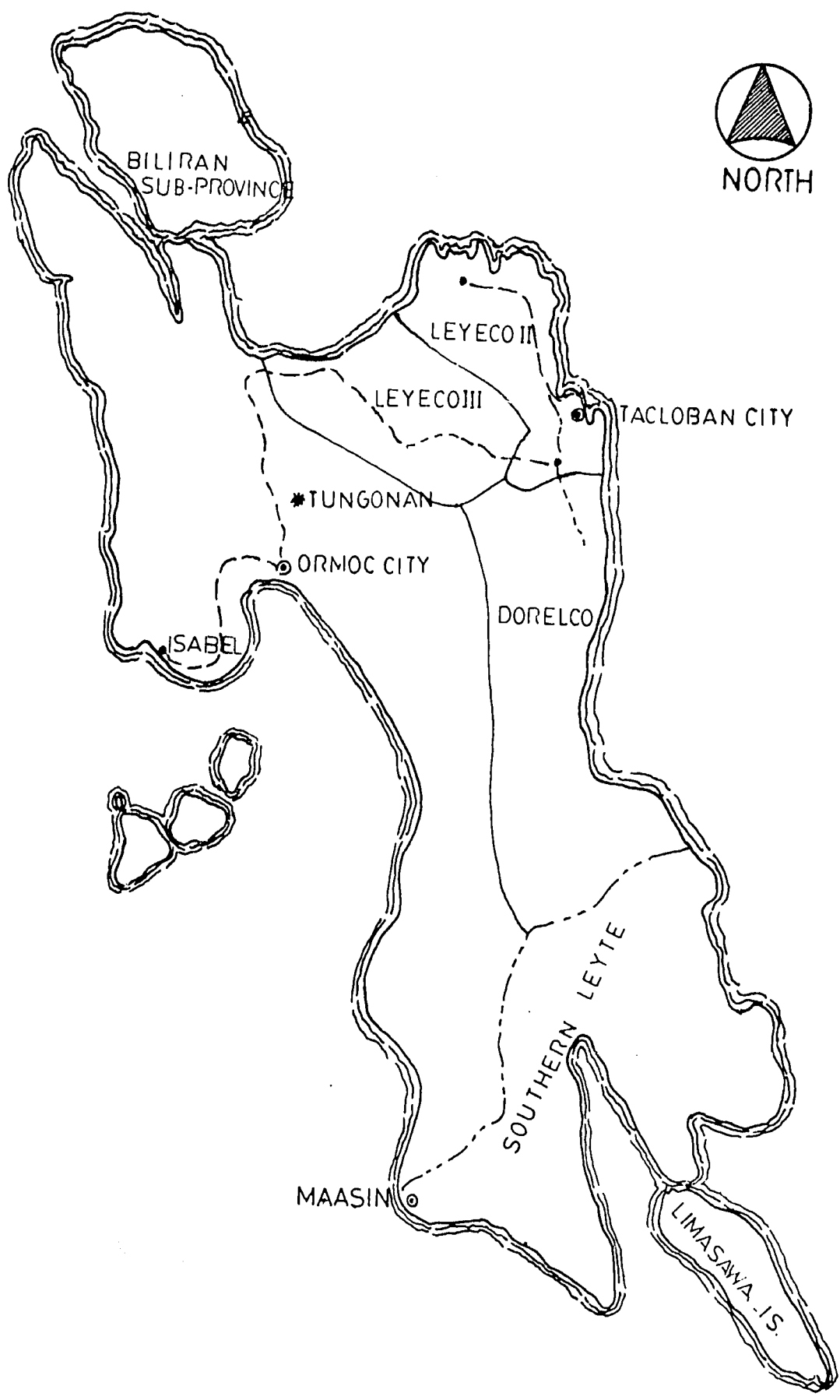
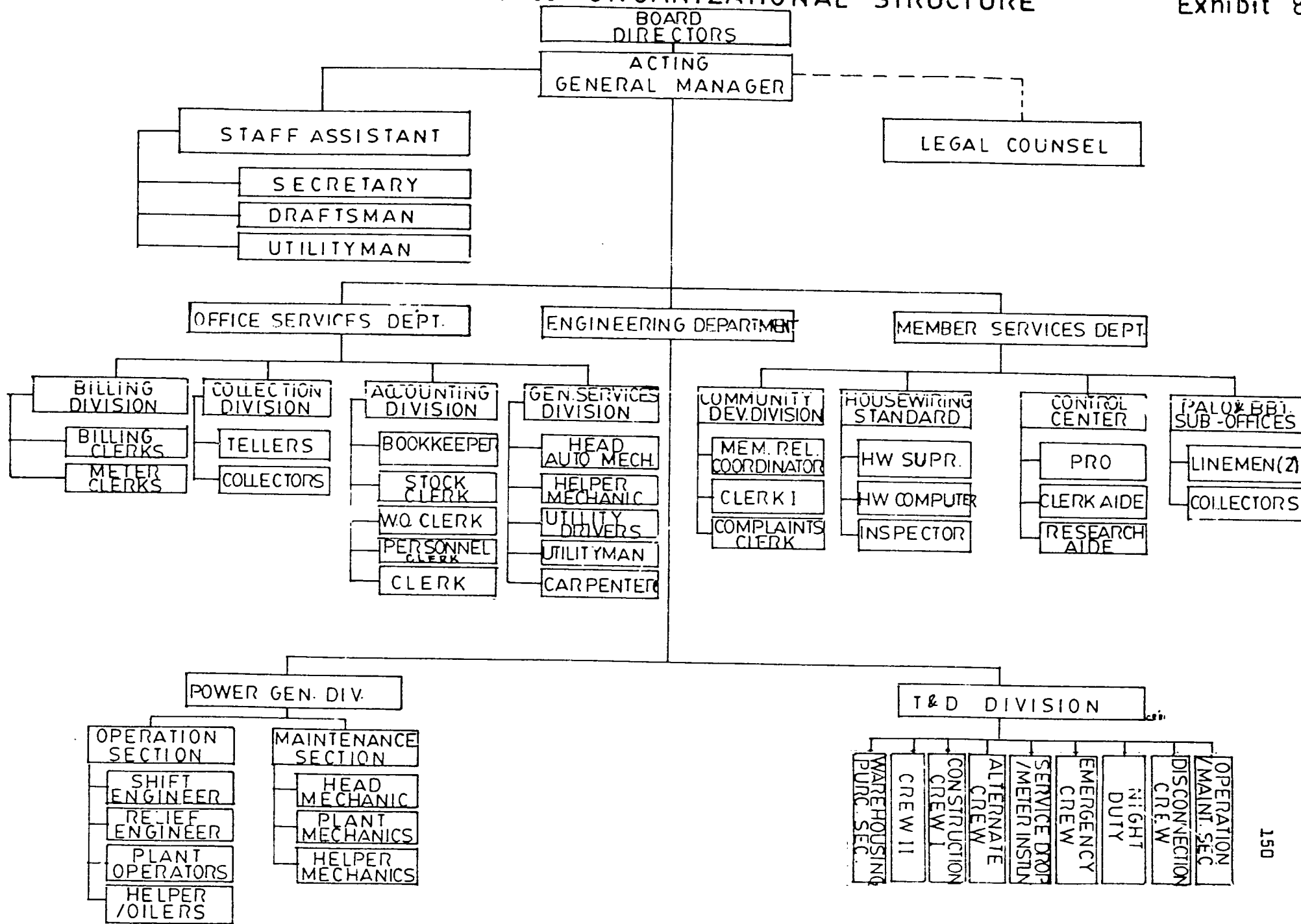


Exhibit 7
ELECTRICAL POWER SOURCES OF LEYTE



LEYECO II ORGANIZATIONAL STRUCTURE

Exhibit 8



I. STATEMENT OF AREA OF RESPONSIBILITY

Heightening population pressure through the so-called "developing countries" compels efficient management of energy and other resources. Tacloban, like all other cities situated in the developing world, must face the problems associated with simultaneously increasing population and decreasing resource base. Planners and decision makers of this City must formulate and adopt measures that will, in effect, conserve and utilize efficiently energy and other resources required to deliver water, sewage, and solid waste services.

Opportunities to conserve and to utilize resources more efficiently have been identified in the areas of water collection, treatment, transmission and distribution; effective water rate determination, billing, and collection; sewage collection, treatment and disposal; and composting and biogas production potentials using solid waste.

II. SITUATIONAL ANALYSIS

A. Water

Data: Historical & Trends

OLD SYSTEM

The Leyte Metropolitan Waterworks (LMW) provided services to portions of Tacloban City and to the municipalities of Palo, Tanauan, Dagami and Tolosa. The system was initially constructed in 1937 and became operational in the same year. From its inception in 1936 until 1955, the system was under the control and admi-

nistration of the Provincial Government which served as owner and operator of the system. When the National Waterworks and Sewerage Administration (NAWASA) was created by Republic Act 1383 in 1955, the Provincial Government transferred control and administration of the LMW to the NAWASA in compliance with the Act. Ownership of the system, however, was retained by the Leyte Provincial Government.

1. Service Area:

Land area served by LMW - 610 hectares
(Tacloban City) City Proper and portion
of five (5) barrios.

2. Population: (As of 1970 Census)

- a. Tacloban City - 76,531
- b. Service area - 69,000
- c. Actually served - 34,000 (48% of City population)

3. Sources of Supply:

Source (System)	<u>Location</u>	<u>Treatment</u>	<u>Disinfectant</u>	<u>Capacity</u>
Hiabangan Falls & Hitognob Falls (gravity)	Dagami, Leyte	sedimentation	Cl ₂	930 gpm 59 L/sec
Tigbao-Palanog River (pumping)	Tacloban City	sedimentation	Cl ₂	800 gpm 50 L/sec
Shallow well (pumping)	Tacloban City	N o n e	Cl ₂	100 gpm 6 L/sec
Shallow well (pumping)	Tacloban City	N o n e	Cl ₂	60 gpm 4 L/sec

4. Old Utility Organization:

Administered by: Provincial Services Staff
under the direction of the
District Engineer in
Tacloban City

Management: Chief - LMW Superintendent
with 38 personnel (no section heads)

5. Previous Revenues and Expenses:

Gross Revenue (for FY 1970-71)	- -	₱326,125.00
Expenses: a) Administration & for Salaries & Allowances	- - - - -	193,556.00
b) Supplies & Maintenance	- - - - -	54,313.00
c) Payment of Interest on System Indebtedness	-	100,000.00

6. Schedule of rates and charges as of May 1973:

The schedule of rates and charges as of May 1973 and details on the combination of flat and metered rate are shown below:

SCHEDULE OF RATES & CHARGES
LEYTE METROPOLITAN WATERWORKS
(May 1973)

ITEM	Monthly Charges Per Customer, Pesos	
	Domestic	Commercial
Flat rate:		
First Faucet	4.00	
Each additional faucet	1.00	
Metered rate:		
Minimum Monthly payment	4.00	6.00
Cost per cubic meter		
Entitlement up to 100 Cu. M.	0.25	0.30
Above 100 Cu. M.	0.25	0.40
Meter Rental Per Month		
1/2" to 5/8" meter	0.70	0.70
3/4" to 2" meter	1.00	1.00
Maintenance:		
Charge per Service Connection per month	0.20	0.20

Public Fire Hydrant	no charge
Bulk Water Delivery per Cu. M.	1.00 1.00
Public Faucet	same as domestic metered rate

Notes:

- 1) includes entitlement of 16 cu. meters
- 2) includes entitlement of 20 cu. meters

7. Water Service Connections; LMW
(for Tacloban City only)

WATER SERVICE CONNECTIONS
LEYTE METROPOLITAN WATERWORKS
(For Tacloban City Only)

Type of Service	No. of Connections
1. Domestic	500
Active meters	500
Defective meters	1,334
Flat Rate	314
2. Commercial & Industrial	
Active meters	96
Defective meters	114
Flat Rate	<u>43</u>
T O T A L . .	2,401

PRESENT SYSTEM

The old water utilities system degenerated for two apparent reasons, namely: (1) key elements of the old system were deteriorating faster than they were being maintained or replaced, and (2) expansion of delivery capacity was not keeping pace with the demands of a growing population

The National Government was aware of these conditions. The old system inhibited economic growth, threatened public health, and affected negatively the spirit and well being of the citizenry. Presidential Decree 198 was the result of the Government's concern.

Created under the same charter as LMWD was the Local Water Utilities Administration (LWUA), a specialized lending institution empowered to grant loans to eligible water districts. LWUA is the source of LMWD's loan funds used to improve and expand programs. From its creation in 1975 to the present, the LMWD has received loans in the amount of ₱56,800,000.00, used to expand and upgrade the entire system.

1. Service Area/2. Population:

The present service area covered by the Water District in Tacloban City, depicted on the map presented as Exhibit 1, includes the City Proper and seven barrios of 121 barangays. Although Tacloban City had a total population of 103,433 as of the 1980 census, only 88,729 reside in the service area and only about 49,400 are actually served.

3. Sources of Supply, Collection, Treatment, Transmission & Distribution

The following table gives the sources of supply for the present water system.

<u>Source (System)</u>	<u>Location</u>	<u>Treatment</u>	<u>Disinfectant</u>	<u>Capacity</u>
*Hiabangan Falls & Hitognob Falls (gravity)	Dagami, Leyte	Sedimentation	Cl ₂	930 gpm 59 L/sec
Binaha-an River	Brgy. Tingib, Pastrana, Leyte	Sedimentation & & Filtration	Cl ₂	5,000 gpm 315.4 L/sec

*Note: These sources are serving the Municipality of Dagami alone but are an emergency source of supply for Tacloban City area and the adjoining municipalities.

a) Water Collection:

Water collection in Hiabangan and Hitognob Falls is carried out by impounding dams and an inlet structure. In Binaha-an River, water is also collected by means of an improvised impounding reservoir and a low dam.

b) Treatment:

Water coming from Hiabangan and Hitognob Falls flows by gravity to the sedimentation basin in Dagami where sedimentation takes place, improving the physical characteristics of the water so as to meet standards of acceptability. This is the only treatment facility being used because of the good quality of raw water from the supply source.

At the Binaha-an River, water flows directly from the inlet channel to the slow-sand filter bed where raw water is filtered and flows to the chlorine house for disinfection.

c) Transmission:

Exhibit 2 shows key features of the transmission system. Water from the collection structure in Hiabangan and Hitognob Falls flows by gravity to the

sedimentation basin in Dagami and thereafter the effluent from the sedimentation basin flows by gravity to Dagami, Palo and Tacloban. Raw water in Binaha-an River enters the slow-sand filter by gravity and thereafter is conveyed by gravity to Pastrana, Palo, Tacloban City and to other towns served by the Water District.

d. Distribution:

Potable water is transmitted to the distribution network of Tacloban City and the reservoir at Utap Hill by gravity. This reservoir, at an elevation of 38 meters, releases water to the distribution lines of Tacloban City to supplement water supply during peak hours of demand. Tables 1 and 2 contain data on the lengths and diameters of the pipelines which compose Tacloban's water distribution system. The map labelled Exhibit 3 illustrate the distribution piping network.

4. Present Utility Organization:

Pursuant to PD 198, as amended, a 5-man Board of Directors was appointed by the Provincial Governor of Leyte. The Board of Directors, which is the policy-making body of the Water District, is composed of five members representing different sectors, namely: 1) Civic-oriented service clubs, 2) professional associations, 3) business, commercial or financial organizations, 4) educational institutions and 5) women's organization (No public official serves as a director).

Initially, two directors were appointed for a maximum of two years, two for a maximum of four years, and one for a maximum of six years. The term of at least one director, but not more than two, will expire on December 31 of each even-numbered year. The regular

term of office after the initial term is six years commencing on January 1 of odd-numbered years.

The Board of Directors appoints a General Manager by a majority vote, with duties being determined and specified from time to time by the Board. The GM has full supervision and control of the maintenance and operation of the Water District facilities, with power and authority to appoint all personnel of the district. The appointments of supervisory level personnel are confirmed by the Board.

Auditing is performed by an External Auditor (a certified public accountant not in government service) appointed by the Board.

Functional relationships of the different positions are reflected in the attached Organizational Chart of the Water District (Exhibit 4).

5. Revenues and Expenses:

The Leyte Metropolitan Water District acquires revenues mainly from collection of water sales bills. The office operates under the concept of self-reliance and viability and thus does not receive any subsidy from the government. Revenues that the office does receive are used for operations, capital outlay and debt servicing.

The Water District passes on to the customer in the form of rate increases whatever expenses are incurred.

The following table gives a list of the gross revenues, expenditures and net income of the water district for the years 1978, 1979, 1980 and up to June of 1981.

	1978	1979	1980	1981 As of June 30
Gross Revenue	₱2,557,317.85	₱3,446,618.06	₱5,045,060.65	₱3,052,300.69
a) Collection of water sales	2,471,808.29	3,309,810.27	4,727,762.55	
b) Others	85,509.56	136,807.79	317,297.10	
Expenditures:	4,193,464.07	4,941,929.56	4,379,912.20	3,273,484.39
a) Operational	1,339,882.36	1,790,106.71	2,346,150.96	1,660,301.22
b) Capital Outlay	785,601.46	69,949.74	251,439.64	455,900.18
c) Annual Debt Servicing	2,067,980.25	3,081,873.11	1,782,321.60	1,157,282.99
Net Income (loss)	(1,636,146.22)	(1,495,311.50)	665,148.45	(221,183.70)
Expenses for Power/Fuel (pumping)	149,019.11	52,461.48	16,588.98	
Total salaries wages and other emoluments	560,514.09	786,555.58	1,214,184.66	

6. Comparison of Water Production Against Billing:

As noted in the following table, water produced from the different sources is much greater in volume than the water actually billed due to excessive unaccounted for water attributable to unreliable registration of flow meters at the source, overflow of reservoirs, leakages along old distribution and service lines, and illegal connections.

	1978	1979	1980	1981 As of June 30
Water Production	3,318,292 Cu.m	4,586,101 Cu.m	5,810,600 Cu.m	3,139,824 Cu.m
Water Billed Production & Dist. Cost	1,295,881 Cu.m	1,734,469 Cu.m	2,371,639 Cu.m	1,305,178 Cu.m
Water Unaccounted For	₱ 0.37/ Cu.m	₱ 0.31/ Cu.m	₱ 0.35/ Cu.m	₱ 0.54/ Cu.m
	61%	62%	59%	58%

7. Average Monthly Fuel and Oil Consumption (For Service/Support Vehicles) As of September 1981

The Leyte Metropolitan Water District utilizes light and heavy vehicles and construction equipment in the operation and maintenance of the water system. Monthly expenditures for fuel and oil needed to operate this equipment are as follows:

	<u>No. of Liters</u>	<u>Amount</u>
Diesel	1209	P 3,808.35
Regular Gasoline	1688	8,591.92
Premium Gasoline	<u>2144</u>	<u>11,341.76</u>
Total Fuel . . .	5041	P23,742.03

The LMWD consumes 120.9 liters of oil and lubricants monthly at a cost of P1,295.15.

(Monthly averages for fuel and oil consumptions based on the months May, June, July, and August, 1981).

8. Schedule of Present Rate and Charges:

As previously discussed, all expenses incurred by the water district are passed on to the water-consuming public in the form of water rates. Present rate structures are based on a socialized concept, that is, the rich partly subsidize the poor. A public hearing is usually conducted before an increase in water rates is effected. The conduct of the public hearings had already been part of the administration and management of the water district before these public hearings were made mandatory by a 1978 presidential directive.

REVISED WATER RATES EFFECTIVE AUGUST 1, 1980

I - Domestic & Government Connections

A. Service Charge (First 10 cubic meters)

<u>Size</u>	<u>Service Charge</u>
3/8"	P 11.00

1/2"	. . . . .	27.50
3/4"	. . . . .	44.00
1"	. . . . .	88.00
1-1/2"	. . . . .	220.00
2"	. . . . .	550.00

B. Commodity Charge

₱1.35 per cubic meter in excess of 10 cubic meters.

II - Commercial & Industrial Connections

A. Service Charge (First 10 cubic meters)

<u>Size</u>	<u>Service Charge</u>
1/2"	₱ 55.00
3/4"	88.00
1"	176.00
1-1/2"	440.00
2"	1,100.00

B. Commodity Charge - ₱2.70 per cu. m. in excess of 10 cu. m. as embodied in Board Resolution No. 007-80 and as approved by the Municipal and City Officials and opinion leaders during the public hearings conducted last May and June, 1981.

The adjustment in water rates, which does not reflect the increase in payment of monthly interest on the comprehensive loan, is necessary to partially cover the increased costs of operation and maintenance of the water system.

The new compromised water rates are lower than what is allowed by LWUA per its letter dated February 14, 1980.

If consumption does not exceed 10 cubic meters per month, the water consumer will not be affected by this adjustment.

9. Water Service Connections within Tacloban City;

Water service connections in Tacloban City are classified as domestic/residential, government, commercial, industrial and public faucet. A breakdown of these classifications, pipe sizes, and number of connections are shown below:

NO. OF CONNECTIONS AS OF AUGUST, 1981

A. Domestic/Residential		4,548
Breakdown: 3/8" Ø -	8	
1/2" Ø -	4538	
3/4" Ø -	2	
B. Government		98
1/2" Ø -	32	
3/4" Ø -	45	
1" Ø -	8	
1-1/2" Ø -	3	
2" Ø -	10	
C. Commercial		479
1/2" Ø -	452	
3/4" Ø -	13	
1" Ø -	9	
1-1/2" Ø -	2	
2" Ø -	2	
4" Ø -	1	
D. Industrial		7
1/2" Ø -	5	
4" Ø -	2	
E. Public Faucet		9
1/2" Ø -	1	
3/4" Ø -	8	
TOTAL NO. OF CONNECTIONS		<u>5,141</u>

10. Present Consumption Classification and Percentage Consumption:

Distribution based on the existing active connections of the LMWD:

Tables A & B show the present consumption classification, percentage consumption, and revenue of Tacloban City and of the Water District as of August 1981, respectively:

A. Classification of Consumption and Revenue of Tacloban City (August, 1981)

Classification	No. of Connections	% to -total	Consumption	% to -total	Revenue	% to -total
Residential	4,557	- 88.7	114,569 Cu.m.	-63.4	₱223,849.70	- 54.7
Government	98	- 1.9	21,824 Cu.m.	-12.1	35,656.05	- 8.7
Commercial	479	- 9.3	35,778 Cu.m.	-19.8	121,423.00	- 29.7
Industrial	7	- 0.1	6,805 Cu. m.	- 3.7	20,156.75	- 4.9
Bulk/Wholesale	-	-	1,787 Cu. m.	- 1.0	8,041.50	- 2.0
T O T A L	5,141	-100%	180,763 Cu.m.	-100%	₱409,129.90	-100%

Note: Based on the Total Consumption for the month of August, 1981 (Tacloban City) the average per capita consumption is 31 gal/day

B. Classification of Consumption and Revenue of the Water District (August 1981)

Classification	No. of Connections	% to -total	Consumption	% to -total	Revenue	% to -total
Residential	6,235	- 90.4	149,934 Cu.m.	-57.6	₱292,947.35	- 50.1
Government	158	- 2.3	40,636 Cu.m.	-15.6	66,391.10	- 11.4
Commercial	498	- 7.2	36,476 Cu.m.	-14.0	123,792.80	- 21.2
Industrial	10	- 0.1	31,315 Cu.m.	-12.1	92,756.60	- 15.9
Bulk/Wholesale	-	-	1,787 Cu.m.	- 0.7	8,041.50	- 1.4
T O T A L	6,901	-100%	260,148 Cu.m.	-100%	₱585,929.35	-100%

Note: Based on the Total Consumption for the month of August, 1981 from the preceding table, the average per capita consumption is 33 gal/day.

11. Meter Reading, Billing and Collection:

The Water District employs a cyclical system for monthly meter reading, billing and collection. The entire service area of the Water District is divided into 20 zones, with the Tacloban City area covering 12 zones. Each zone is assigned a working day of the month for meter reading, billing and collection. This system utilizes most efficiently the manpower available in the commercial division.

With this commercial practice, the Water District attains a consistent efficiency of collection ranging from 92% to 98%.

12. Other Existing water sources classified as point sources outside the service area of LMWD:

Areas outside the service region of the Leyte Metro Water District use water system facilities classified as Level 1, 2 and 3 by the Rural Waterworks Development Corporation (RWDC). An inventory of non-LMWD water sources existing in Tacloban City is presented in Table 3. The RWDC provides water services to areas with population not greater than 20,000. Level 1 facilities are point sources such as hand pumps on shallow wells, springs and open dug wells. The Level 2 classification refers to piped water originating from wells or springs which serve a small cluster of homes. The Level 3 category refers to piped water serving a community, barangay or settlement.

Over the past 40 years, open wells have been the common source of drinking water. Open well water may or may not be potable. Even with the introduction of pump wells in recent years, an average of 50% of the population

still depend on open wells as their source of drinking water, except in those areas where spring water is available.

Reasons that pump wells have not been more widely adopted include:

- (1) The wells dry up during dry season
- (2) Because pump wells are permanent, they may not easily be transferred if minerals or other water impurities are encountered
- (3) corrosion of pump wells themselves can render the water passing through undrinkable
- (4) Lack of maintenance knowhow
- (5) indifferent attitude on the part of the people/community towards scientific advancement. People use the facilities but do not accept responsibility for maintenance and upkeep.
- (6) Scarcity of potable point sources
- (7) Ownership constraint -- sources located on private land may not be used
- (8) Inconvenience in terms of time and effort required
- (9) Expense of the pump well makes it unaffordable to many individuals.

III. CONSERVATION PROBLEMS/OPPORTUNITIES:

1) High Unaccounted for Water

Several problems are confronting the Water District, foremost of which is the large quantity of unaccounted-for water. Every year, the office loses a great deal of potential revenue because of unaccounted-for water which is attributed to: (1) illegal connection; (2) leakages through service connections and along old transmission and distribution lines; (3) erroneous registration of flow meters at the source and at reservoir overflows; (4) wastage due to improper use of fire hydrants; and

(5) inaccurate registration of water consumed because of water meters obstructed due to sediment accumulated in the distribution system.

2) Recurrence of Water Supply Shortage

Another problem is the water supply shortage during rainy season and during shutdowns of one of the filters due to periodic cleaning. When heavy rains occur, it is necessary that the inlet channel of the slow sand filters at Tingib, Pastrana, Leyte be closed to prevent entrance of muddy water and particles which could clog the filters, resulting in substantial reduction in the production capacity of the plant.

3) Financial Viability:

Financial viability is also a major problem confronting the Water District. Contributing to the financial strain is the high fuel consumption of service and support vehicles and equipment which are necessary in the operation and maintenance of the water system.

4) Educational or Information Drive on Water Conservation:

Finally, another major challenge facing the Water District is the immediate full scale implementation of its information drive on water conservation. Various conservation campaign public information materials are presented as Exhibits 5 through 9. Necessary funds and support like audio-visual aids and instruction manuals are lacking.

5. Water is drawn from some fire hydrants for personal consumption purposes.

IV. STRATEGIES :

A. Areas covered by the Water District/Service Area

1. Adopt measures to reduce unaccounted-for water to an acceptable level:

a) Embark on massive campaign against illegal connection.

To insure efficient service to the general public, the LMWD has established an ongoing program of activities. House-to-house checks for illegal connections incorporate the participation of private individuals and Barangay Chairmen who are given honoraria for extra services performed. Incentives are offered for persons who have knowledge of illegal connections to report the same to the LMWD Office. A reward in the amount of 50% of the fine imposed upon the owner of the dwelling with an illegal connection and the guarantee that the disclosure will be treated with strict confidentiality are provided. The office also **grants** amnesty to people who voluntarily report illegal connections at their own residences so long as corrections are made within the grace period.

b) Continue replacement of leaking service pipelines

The Water District has started its program of replacing leaking dilapidated galvanized iron pipe service connections with polybutylene plastic tubings to minimize unaccounted-for water and to generate an adequate supply of water and system pressure, especially at the extreme ends and at the higher elevations of the distribution system.

c) Rehabilitate, replace or repair existing transmission and distribution pipes

One proposed solution that will definitely achieve a reduction of high unaccounted-for water is to pursue the original plan of the Water District to replace old dilapidated transmission and distribution lines with new ones using strong and non-corrosive materials. Likewise, the Water District should carry out its previous plan to rehabilitate leaking, encrusted or tuberculated transmission and distribution pipes by relining in situ. The scheme will undoubtedly eliminate illegal connections and reduce both unaccounted-for water and repair and maintenance costs. The

immediate realization of this plan will largely depend on how soon funds can be made available to the Water District. This Project is estimated to cost a total of ₱7 million, more or less, based on the 1980 construction cost index.

In the meantime, linemen are always in search of leakages from old service connections, and distribution and transmission lines, and, whenever necessary, immediate repairs of leakages are made.

d) Implement immediately the calibration of Flow Meters.

Another activity which the Water District undertakes as a solution to the problem of unaccounted-for water is the calibration of all flow meters used in measuring water production and overflow of reservoirs in order to have a more reliable and accurate record of unaccounted-for water.

e) Enforce proper use of Fire Hydrants

Efforts to ensure that water from fire hydrants is used for fire fighting only should be intensified.

f) Use appropriate or suitable water meters to reduce unaccounted-for water and increase revenue.

Part of the ongoing project of the Water District is the immediate replacement of the clogged water meters, supplied by LWUA, with new water meters which are less sensitive to fine sand and sediment. This fine sand and sediment was pumped into the system from 3 water wells in Tacloban City. These 3 wells were phased out after the completion of the comprehensive

project. The completion of this program will reduce the unaccounted-for water and increase the revenue of the Water District which in turn will enhance its financial viability.

2. Ensure reliability and adequacy of water Supply.

The recurring problem of inadequate water supply and pressure during rainy season is brought about by (1) the closing of the inlet channels of the slow sand filters in Tingib, Pastrana due to the high turbidity of the raw water entering the filter beds, and (2) the cleaning of either of the two existing slow sand filters. To solve this problem, the district has recently begun the construction of a sedimentation basin and an additional one unit slow sand filter bed.

With the completion of these new facilities on or before the end of January 1982, turbid raw water will be allowed to enter the sedimentation basin where solids such as sand, silts, etc. will settle to the bottom, resulting in the improvement of the physical characteristics of the raw water before it is conveyed by gravity to the slow sand filters. During shut-down cleanings of one of the three filters, the District is still assured of adequate water supply and pressure because the remaining two units of slow sand filters can produce more than the present water requirement of the area.

3. Enhance Financial Viability.

a) Scale down project cost to meet financial viability requirement.

The Water District originally proposed replacement of all dilapidated leaking transmission and distribution lines to solve the problem of

unaccounted-for water, but since the total estimated construction cost would be beyond the consumers' capability to pay, the said improvement was not pushed through. It was decided that some elements of the proposed improvement and expansion be deleted, such as the replacement of the old pipelines in the existing service area. It was also decided that the construction of a slow-sand filter at Tingib, Pastrana, Leyte at about 7.5 kilometers downstream from the proposed site of the permanent intake structure should be pursued. This cost reduction amounted to almost P20 M.

b) Adopt marketing strategy to increase revenue.

To enhance the financial viability of the Water District, the office also takes efforts to campaign for more service connections in order to avoid the necessity of raising water rates for a certain period of time and likewise to increase its revenues. The campaign takes the form of barangay-to-barangay meetings and radio plugs and announcements on free water service connections for 3/4" diameter and 1/2" diameter individual connections for a maximum of 20 lineal meters under the domestic and government classifications as well as 6 lineal meters for 1/2" diameter service connections under the commercial category.

c) Implement cost reduction program.

To minimize fuel and oil consumption, the LMWD utilized pedicabs for carrying out the majority of its operations, repairs and maintenance of the water system. This proved to be economical because pedicabs are operated manually and require very little repair and maintenance.

4. Implement conservation awareness or consciousness drive immediately.

a) Integrate water concepts and water conservation in school curricula.

Sometime in 1979, the Local Water Utilities Administration through the facilities of the LMWD, conducted an orientation seminar known as "PROJECT WATER" (WATER is an acronym for Water Awareness Through Educational Recourse) which was attended by administrators and teachers of the pilot schools selected. Participants were categorized as those belonging to the Elementary, Urban and Rural and Secondary Urban and Rural. The following areas of discussion were given emphasis during the seminar: (a) raw water collection and treatment (b) transmission and distribution of treated water and (c) water conservation.

b) Undertake massive public information drive.

The Water District makes use of billboards in the campaign for proper and effective conservation of water to make sure that the information reaches not just a few people but the water-consuming public in general.

c) Establish priority allocation of water during scarcity.

Sometime in the future, when water supply becomes inadequate, a prioritization should be established by the Water District among various water uses. In critical periods salt water could be used for fire-fighting purposes as Tacloban City proper is nearly surrounded by sea water.

As part of the conservation drive, water from other sources such as shallow wells should be utilized for watering plants and washing cars and

trucks. The District should implement this program before a true crisis arises.

B. Barrios outside the LMWD Service Area

1. Establish new concepts and guidelines in the financing, development, operation and maintenance of Rural Waterworks Systems.

For water outside the service area, the government issued memoranda and Letters of Instruction and policies and guidelines for improving and strengthening water supply programs for urban and rural areas. Innovations were made, new approaches were introduced, new technologies were adopted and more government extension workers were deployed in the implementation of the program.

Innovation programs for providing sufficient potable water supply were targeted toward three levels.

The first level consists of clusters of 1-50 families using shallow well pumps. The second level involves clusters of not more than 100 families who use deep wells with complete accessories such as reservoir tanks, pipelines and faucets. The third group is distinguished by individual faucets for each residence, with water sources varying among deep wells, springs, or tapped/ piped water. Materials used for this program are non-corrosive and heat and pressure resistant. Gadgets such as water finders and other similarly advanced equipment are used in identifying potential point sources.

To ensure cooperation in administering the program, communities are compelled to form an association which performs legal or juridical functions.

The Level I program seems to be a failure. It is not able to deliver the volume of water required by the community, and the same problems were experienced as were previously mentioned. In rural areas at present, the people insist for convenience reasons on using open wells as their source of water for drinking and other purposes. It is suggested that this kind of program be implemented only in distant communities.

The Level II program has been more successful. Costs of production are minimal and therefore affordable for users. The beneficiaries understand their legal duties and obligations and this understanding increases their confidence and interest in the project. Additionally, the Level II program is able to provide the quantity of water demanded by involved communities.

The Level III program has encountered management difficulties. Recipients manage the project, and they need assistance and guidance. Still, it is recommended that this program be continued. The Level III program may be able to interplay with Level II program. Hopefully the ultimate goal of providing ample potable water to rural areas can one day be attained.

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON WATER, SEWER & SOLID WASTE

Sub-Sector Water

OBSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORITY (RANK)
i. Large unaccounted-for water:									
(1) illegal connections	a) continual house to house survey on illegal connections	immediate implementation	increase revenue	additional cost on the operating expense of the Water District		LMWD & Barangay	continuing	M	1
	b) legalization of and granting amnesty for voluntarily reporting illegal connections	immediate implementation	increase revenue	none		LMWD	continuing	M	1
(2) leakages thru:									
a) service connections	replacement of dilapidated G.I. pipe service lines with Polybutylene plastic tubings	immediate implementation	a) minimize operational & maintenance cost	Huge capital outlay		LMWD	M	H P700,000	1
			b) generate adequate supply of water at extreme ends of lines						

**PRELIMINARY STRATEGY MATRIX
FOR SECTOR ON WATER, SEWER & SOLID WASTE**

Sub-Sector Water

OBSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORITY (RANK)
b) transmission lines	repair of repairable transmission lines and/or replacement of dilapidated transmission lines	Adopt repair/replacement on a priority basis depending upon availability of funds	<p>c) generate adequate water pressure in entire system</p> <p>a) minimize operational & maintenance cost</p> <p>b) generate adequate supply of water at the extreme ends of the line and at the higher elevations of the distribution system.</p> <p>c) generate adequate system pressure in the entire system.</p>	Huge capital outlay		LMWD	M	H	2

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON WATER, SEWER & SOLID WASTE

Sub-Sector Water

OBSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORITY (RANK)
) Distribution lines	repair of economically repairable distribution lines & replacement or relining of deteriorating lines which are beyond economical repair.	adopt repair/replacement on a priority basis depending upon availability of funds	a) minimize operational & maintenance cost b) generate adequate supply of water at the extreme ends of the distribution system and at higher elevation of entire system.	Huge capital outlay		LMWD	H P10 M (replacement of 18,000 lineal meters distribution lines including appurtenances) H P4.6 M (relining of 18,000 lineal meters distribution lines)	3	

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON WATER, SEWER & SOLID WASTE

Sub-Sector Water

OBSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORITY (RANK)
(3) erroneous registration of flow meters at sources and at the overflow of the distribution reservoirs	a) immediate implementation of the calibration of all flow meters to determine the magnitude of error and introduce the factor of error in the determination of the actual volume of water produced.	a) installation of compound water meter in series with the flow meter to be tested.	a) pinpoint & narrow down the search for causes of the unaccounted-for water.			LMWD (ongoing)	2 mo.	5,000	1
(4) wastage due to improper use of fire hydrants	prohibit withdrawal of water except for fire fighting purposes	immediate implementation	(1) maintain adequate pressure (2) increase revenue (3) decrease operating cost	Possible strain relationship with INP	INP	LMWD INP	S	N	1

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON WATER, SEWER & SOLID WASTE

Sub-Sector Water

OBSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORITY (RANK)
(5) accumulated sediments in the distribution system cause the displacement-type water meter inaccurate registration of water consumed	replacement of defective water meter with current type water meter	immediate implementation	(1) increase revenue (2) decrease unaccounted-for water	high capital outlay		LMWD	M	M P250,000	1
II. Water supply shortage during rainy season & during shutdowns of one of the filters due to periodic cleaning	Construction of additional filter bed and sedimentation basin	on-going	1) continuous adequate supply of water even during rainy season 2) increase in revenue 3) sanitary benefit			LMWD	M 6 mo.	H P2,000,000	1

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON WATER, SEWER & SOLID WASTE

Sub-Sector Water

OBSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORITY (RANK)
III. Financial viability of the Water District	a) cost reduction on operation & maintenance by cutting down fuel & oil consumption	on-going	(1) savings in operating cost	none		LMWD	S	N	1
	b) campaign for more service connections		(2) avert frequent increase in water rates	none		LMWD	continuing S		1
	c) increase water rate		(3) by not attaining the desired number of service connection this alternative may be implemented	may unduly overburden the consumers	LMWD			3	

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON WATER, SEWER & SOLID WASTE

Sub-Sector Water

OBSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIC (RAN)
IV. Conservation of Water	a) discourage the use of tap water for watering plants	immediate implementation	more people will be benefited	decrease revenue		public (continuing)	L	L	1
	b) integrate water concept and system operation in the school curricula	immediate implementation	will create awareness for water conservation among the youth	high capital outlay		LMWD MEC	L	H	1
	c) if water becomes scarce, the consumption should be limited to domestic, commercial & industrial demands; fire-fighting needs be satisfied by using other sources as sea water	to be implemented in the future as the need arises				City Gov't & LMWD	M	M	4

TABLE 1

SUMMARY

Pipelines Distribution System
Leyte Metropolitan Water District

I. TACLOBAN CITY:	
A. Pipelines Under Project Phase 1-B:	19,638.00 LM
B. Pipelines Extension Projects: (Administration)	13,247.00 LM
C. Pipelines Under Old System:	14,210.00 LM
II. PALO, LEYTE:	
A. Pipelines Under Project Phase 1-B:	6,270.00 LM
B. Pipelines Under Old System:	5,330.00 LM
III. TANAUAN, LEYTE:	
A. Pipelines Under Project Phase 1-B:	5,645.00 LM
B. Pipelines Under Old System:	4,865.00 LM
IV. TOLOSA, LEYTE:	
A. Pipelines Under Project Phase 1-B:	3,355.00 LM
B. Pipelines Under Old System:	1,440.00 LM
V. DAGAMI, LEYTE:	
A. Pipelines Under Old System:	3,240.00 LM
VI. BASTRANA, LEYTE:	
A. Pipelines Under Project Phase 1-B:	3,585.00 LM

TOTAL LENGTH OF PIPELINES SYSTEM:
(L.M.)

!	OLD	!	NEW	!
!	29,085	!	51,740	!

T o t a l . . . 80,825.00 LM

PIPELINES DISTRIBUTION SYSTEMS
Tacloban City

A. PIPELINES INSTALLED UNDER PHASE I-B:

<u>Pipe</u>	<u>Size</u>	<u>Type</u>	<u>Length (M)</u>	<u>Location</u>
4"		uVC	530.00	Port Area
			570.00	Jones Street
			280.00	San. Enage Street
			390.00	Tucson Boulevard
			350.00	Army Road
			600.00	Canhuraw Hill
			500.00	Sto. Nilo Extension
			275.00	Lopez Jaena Street
			260.00	L. Jaena (Dirt Road)
			190.00	T. Claudio Street
			625.00	Sta. Cruz Street
			390.00	Youngfield District
			65.00	Home's Variety
			350.00	Dobo District
			340.00	El Reposo Street
			350.00	Asluns Road
			325.00	Sambaguita District
			150.00	Kalipayan Road
			270.00	Calanipawan Road
			605.00	Algo Homes
			650.00	Jabezville Subdiv. II
			450.00	Jandy Lane
			320.00	San Jose-Cogon Section
			1,775.00	San Jose, proper
6"	MC/CL	Steel Pipe	255.00	Frece Martinez Street
			1,527.00	Magsaysay Boulevard
			165.00	Del Pilar Street
			380.00	Kalipayan Road
			520.00	Jabezville II
8"	MC/CL	Steel Pipe	1,500.00	Patina-San Jose Section

Table 2 (cont'd)

<u>Pipe</u>	<u>Size</u>	<u>Type</u>	<u>Length (IM)</u>	<u>Location</u>
8"	MC/CL		490.00	Salazar Street
			925.00	Del Pilar Street
			310.00	Trece Martirez Street
			710.00	Real-J. Romualdez
			2,206.00	Calanipawan - V & G
			500.00	San Jose

T O T A L :

4"Ø uVC Pipe - - - - -	10,570.00 IM
6"Ø MC/CL STL Pipe - - - - -	2,627.00 IM
8"Ø MC/CL STL Pipe - - - - -	1,500.00 IM
8"Ø uVC Pipe - - - - -	5,141.00 IM

Total Length Installed Under Project Phase I-B - - - - - 19,638.00 IM

B. PHASE II - OTHER LOCAL PROJECTS:
(Administration)

<u>Pipe</u>	<u>Size</u>	<u>Type</u>	<u>Length (IM)</u>	<u>Location</u>
4"		uVC	1,404.00	Slaughter House-Diit
			2,452.00	Caiba-an - V & G
			1,073.00	El-Reposo-Apitong
			275.00	Dgy. 59-B, Bagkahan
			625.00	Taboan Han Bungto
			198.00	Dgy. 62-B, Bagkahan
			360.00	Sampaguita District
			370.00	Rawis-Auibong
			250.00	Picas Road
			366.00	Real-Pericohon
			290.00	Bañezville I
			480.00	Allande Subdivision
			570.00	Bliss Project
			235	P R H C
4"		ACP	260.00	Manlurip
6"		uVC	122.00	Bliss Project
			1,272.00	Tri-Star-Diversion Road
6"		ACP	280.00	Manlurip

Table 2 (cont'd)

<u>Pipe</u>	<u>Size</u>	<u>Type</u>	<u>Length (IM)</u>	<u>Location</u>
8"		ul'VC	1,526.00	Government Center
			530.00	Bliss Project

T O T A L :

4"Ø ul'VC	-----	9,457.00 IM
4"Ø ACI'	-----	260.00 IM
6"Ø ul'VC	-----	1,394.00 IM
6"Ø ACI'	-----	280.00 IM
8"Ø ul'VC	-----	1,856.00 IM

Net Length Installed By Administration ----- 13,247.00 IM

4"	CCI	1,015.00	Magallanes Street
		205.00	Lukban Street
		180.00	Arellano Street
		520.00	Independencia Street
		725.00	J. Luna Street
		375.00	Sto. Niño Street
		275.00	L. Jacna Street
		580.00	Del Pilar Street
		865.00	Salazar Street
		820.00	Gomez Street
		850.00	P. Camora Street
		1,390.00	Imelda Avenue
		845.00	Real Street
		195.00	Trece Martinez Street
		185.00	Bonifacio Street
6"	CCI	470.00	T. Claudio - Mabini
		210.00	Tarcela Street
6"	CCI	490.00	P. Burgos Street
		760.00	P. Burgos Street
		790.00	Salazar - Imelda Ave.
8"	CCI	1,075.00	J. Romualdez Street
		650.00	Paterno Street
		465.00	Rizal Avenue

Table 2 (cont'd)

T O T A L :

4"Ø CCI - - - - -	9,800.00 LM
6"Ø CCI - - - - -	1,550.00 LM
8"Ø CCI - - - - -	2,860.00 LM

S U M M A R Y :

- TACLOBAN CITY -

A. Pipelines Under Project Phase I-B - - - - -	19,638.00 LM
B. Pipelines Extension Project (Admin.) - - -	15,247.00 LM
C. Old Systems - - - - -	14,210.00 LM
TOTAL LENGTH OF DISTRIBUTION SYSTEMS . . .	47,095.00 LM

TABLE 3

Inventory of Barangay Water Facilities
not served by LMD
(Level I & II)

Brgy. No.	Type of H ₂ O Supply	Sponsoring Agency	Installation Method	No. of Pumps	Population		Location	Status	Use(s)
					H.H.	No. of Persons			
Tagpuano (108)	JEEP (I)	EMDC	dugged	1	47	255	in front of the school	functioning	drinking
	JEE	MIGCO	"	1	-	-	near the residence of	"	-
	-	Nat'l Gov't	-	1			Barangay Captain		
	-	-	-	1			School	unserviceable	
Sta. Elena (107)	-	-	-	1			"curve"	pump stolen	
	JEEP (I)	EMDC	dugged	2	74	445	School compound	functioning	drinking
	-	MIGCO	-	1			Barangay Hall	"	"
	Artesian well	religious sector		1			School	unserviceable	
New Hawaiian (101)	Artesian Well	MIGCO		1			near the school site	functioning	
	Deep well (II)	EMDC - MGC		1	85	418	School	90% completed	drinking
	Artesian Well	Nat'l Gov't		1			"	functioning	washing
	JEEP	CMC		1			near the junction of Prov'l road & the Brgy. Road	but not potable	
Sto. Niño (106)	JEEP (I)	EMDC		5				non-functioning installed	
	Artesian Well	MIGCO		1	89	479	unidentified	non-functioning	
	JEEP	Private (political) sector	dugged	1			-	-	
	JEEP	EMDC		3			School site	uninstalled	

Table 3 (cont'd)

Inventory of Barangay Water Facilities
not served by LDCD
(Level I & II)

Brgy. No.	Type of H ₂ O Supply	Sponsoring Agency	Installation Method	No. of Pumps	Population		Location	Status	Use(s)
					H.I.	No. of Persons			
Sto. Niño (103)	Deep Well (II)	EMDC-NEW		1			interior cluster of commu- nity	functioning	drinking
							unidentified target for 4th quarter	uninstalled	"
Suhí (105)	JMEP	D W U	H ₂ O jetting	1	140	740	School	non-functioning	
	"	Jaycees (Civic Organization)	"	2			Cluster community	"	
	"	private dona- tion	"	1			"	"	
	"	EMDC	dugged	2			interior comm. cluster	on-going	
Cabalawan (97)	Artesian Well	PACD		1	147	745	School	functioning but not pot- able	
	JMEP (I)	EMDC	dugged	1			cluster of Mrs. Letecia Inot	functioning	drinking, washing, laundry
	JMEP	Civic Org.	"	1			Military Community (351st Army Det.)	functioning	drinking, washing, laundry
	"	"	"	3			Barangay proper	uninstalled	
Bagacay (95)	Spring	Community		1	178	980	Boundary between Bgy. Baga- cay & Diit	functioning	drinking, laundry
	JMEP (I)	EMDC		1			near school compound	on-going	

Table 3 (cont'd)

Inventory of Barangay Water Facilities
not served by INED
(Level I & II)

Brgy. No.	Type of H ₂ O Supply	Sponsoring Agency	Installation Method	No. of Pumps	Population		Location	Status	Use(s)
					H.H.	No. of Persons			
	Deep Well (II)	RMDC-MPW		1				targeted for	
	JMHP	BIDA		5				4th Qrtr.	
Diit (99)	River, Spring			1			Diit River	functioning	drinking
	JMHP	D W U	H ₂ O jetting	1			Bgy. Hall	nonfunctioning	
	JMHP (I)	RMDC	Dugged	5			1. C C F 2. seaside cluster 3. Barangay Hall 4. Catalina Lorenzo 5. Bgy. Capt.	on-going nonfunctioning uninstalled functioning	laundry, washing
Palanog (12) Resettlement	Deep Well (II)	RMDC - MPW		1			School	90% completed	drinking
	JMHP (I)	RMDC		2			2 cluster at 1 ea./cluster	uninstalled	
Palanog Proper (105)	JMHP	D W U		1	135	737	along the road of cluster	nonfunctioning	
	JMHP	MLGCD		1			community	-	
	JMHP (I)	RMDC		2			same of the above	functioning	drinking
San Roque (100)	Spring, Piped Water	MLGCD		1	101	517		nonfunctioning for re-habilitation	
	JMHP (I)	RMDC		1			school	on-going	
Tigbao (94)	JMHP (I)	RMDC		3			1. school 2. cluster of community	functioning	drinking
	Artesian Well	1. Magsaysay		3					

Table 3 (cont'd)

Inventory of Barangay Water Facilities
not served by LMB
(Level I & II)

Brgy. No.	Type of H ₂ O Supply	Sponsoring Agency	Installation Method	No. of Pumps	Population		Location	Status	Use(s)
					H.H.	No. of Persons			
Apitong (91)	JMEP (I)	EMDC		1			interior cluster along the road	on-going	
	JMEP	Personal		10			-	-	drinking, washing, laundry
Caiba-an (95)	JMEP (I)	EMDC	dugged	1	V & G Subdiv.		School	functioning	drinking, washing, gardening
	JMEP (I)	EMDC	"	1	325	1,792	Caiba-an School	functioning	-do-
Caiba-an (95-A)	JMEP (I)	EMDC	"	1	Part of 95-A		interior cluster	on-going	
Sagkahan 59	JMEP (I)	EMDC	"	2	584	3,661	Bgy. 59 cluster	functioning	drinking, washing
Sagkahan (59-B)	JMEP (I)	EMDC	"	2	-	-	Bgy. 59-B slum areas	on-going	
Bgy. 62	JMEP (I)	EMDC	"	2	-	-	1. Bgy. Chairman) 2. back of the school)	functioning	drinking, laundry, washing
" 62-A	JMEP (I)	EMDC	"	2	-	-	1. Bgy. 62-A cluster	functioning	-do-
"	JMEP (I)	EMDC	"	2	-	-	School	on-going	-do-
San Jose (85)	JMEP	BIDA		1	122	1,296	Mrs. Nena Elias	functioning	laundry, washing, drinking

Table 3 (cont'd)

Inventory of Barangay Water Facilities
not served by LAMD
(Level I & II)

Brgy. No.	Type of H ₂ O Supply	Sponsoring Agency	Installation Method	No. of Pumps	Population		Location	Status	Use(s)
					H.H.	No. of Persons			
		2. Red Cross 3. Vice-Mayor Quintero		3			school	functioning	
Salvacion (104)	Artesian Well	D W U	dugged	1	175	984	unidentified	nonfunctioning	laundry, washing, drinking
	J M H P	B I D A		2			center of cluster of community (2) cluster	on-going	
	JMHP (1)	INDC		2			-	(1) installed (1) 80% computed	
Salvacion (104)	Spring, Piped II	RMDC-MPW		1			mountain side	on-going	drinking
Camansihay (98)	JMHP	POPCOM	dugged	3	115	650	school	nonfunctioning	drinking
	JMHP (1)	INDC					1. school 2. community cluster at one (1) each	functioning	
Abucay (91)	JMHP	BIDA		1	157	706	school	nonfunctioning	drinking
	JMHP	INDC		2			1. school 2. along the road near the rice farm 3. along road after (the other cluster)	" functioning	
Apitong (91)	JMHP	INDC		1	175	1,682	School	nonfunctioning	

Table 3 (cont'd)
Inventory of Barangay Water Facilities
not served by LMD
(Level I & II)

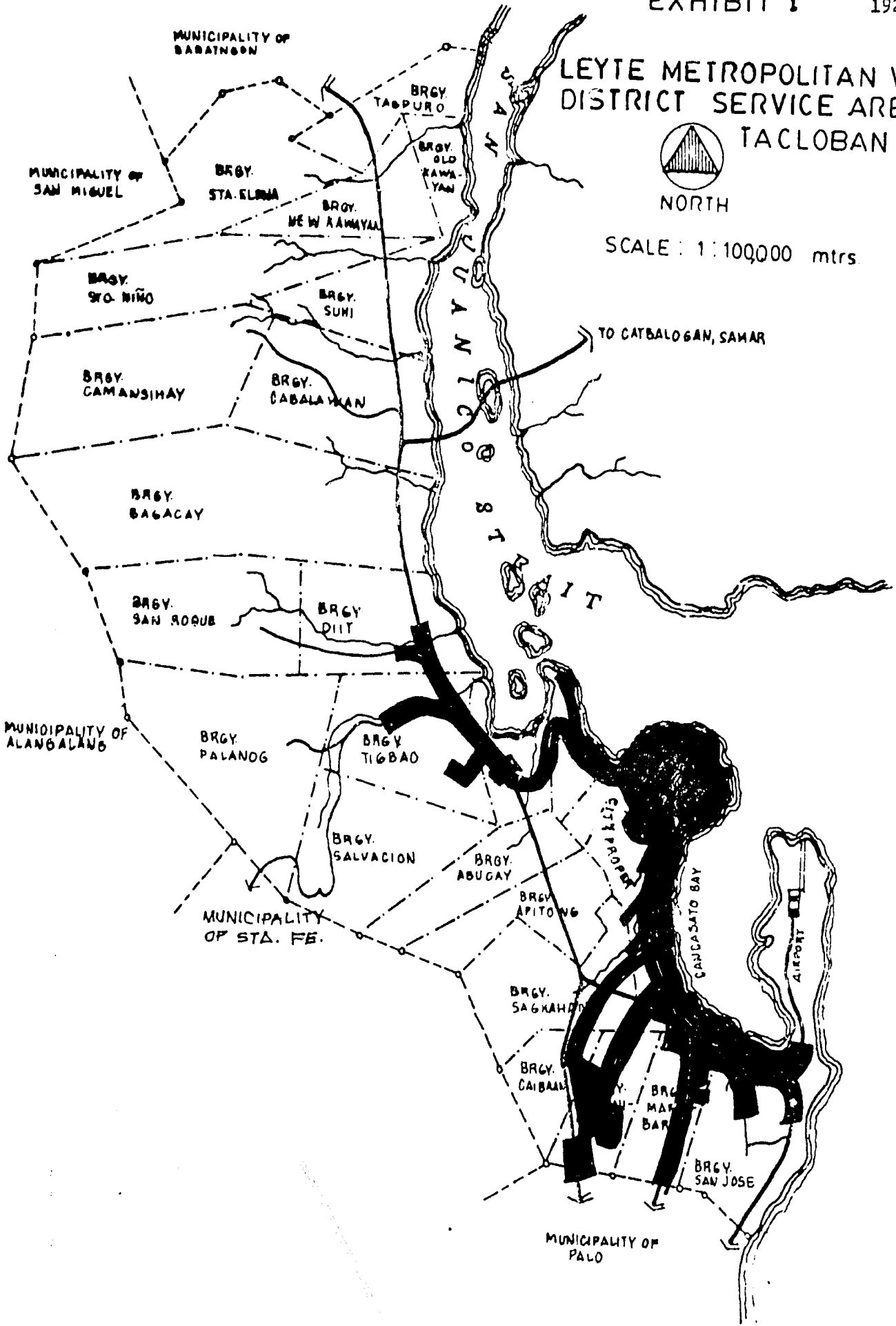
Brgy. No.	Type of H ₂ O Supply	Sponsoring Agency	Installation Method	No. of Pumps	Population		Location	Status	Use(s)
					U.II.	No. of Persons			
San Jose (85)	JMHP	IACD		1			Bgy. Chairman	functioning	drinking, washing, laundry
	JMHP (I)	IMDC		1				uninstalled	
Bgy. 85-A	JMHP	D W U		1			Bgy. Chairman	functioning	-do-
" 85-C	JMHP (I)	IMDC		1			Bgy. Chairman	uninstalled	
" 88	JMHP (I)	IMDC		1			Bgy. Chairman	-do-	
" 85	JMHP (I)	IMDC		1			-do-	-do-	

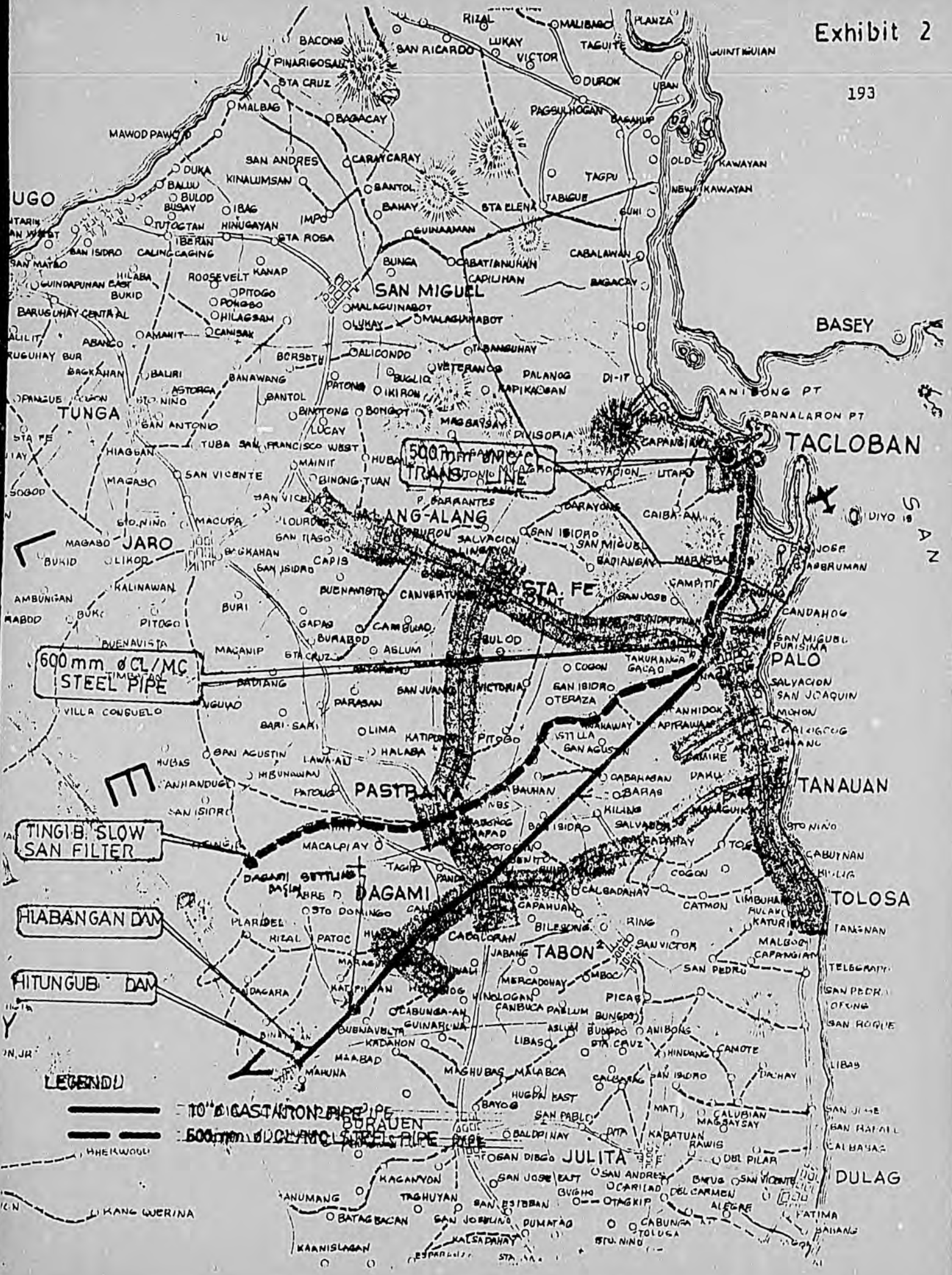
LEYTE METROPOLITAN WATER DISTRICT SERVICE AREA IN TACLOBAN CITY



NORTH

SCALE : 1 : 100,000 mtrs.





500m TRANSVERSE LINE

600 mm CL/MC STEEL PIPE

TINGI B. SLOW SAN FILTER

HIABANGAN DAM

HITUNGUB DAM

LEGEND

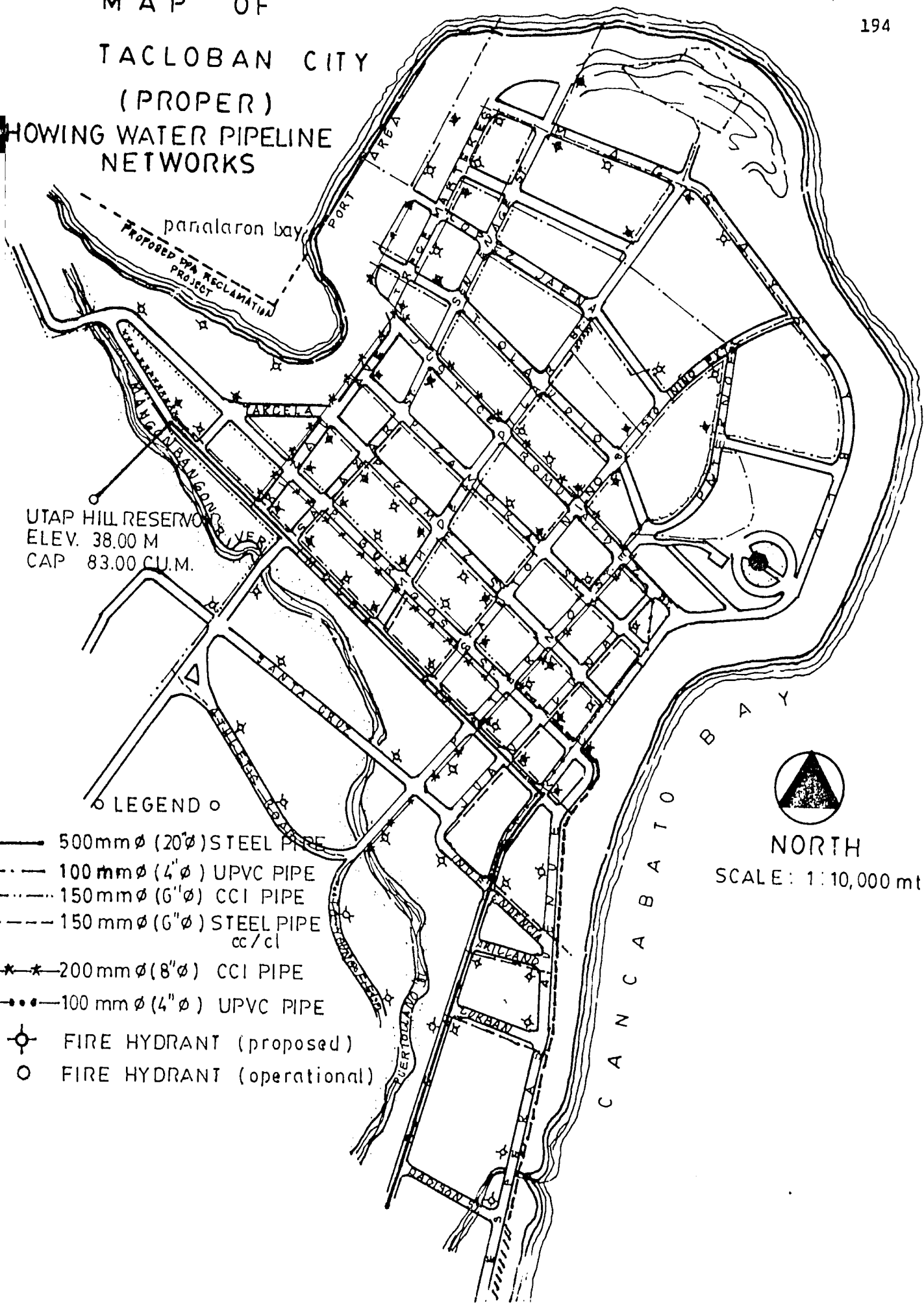
- TO 4" GASTATION PIPE
- 500 mm CL/MC STEEL PIPE

S
A
N

IN. JR
Y
ICN

MAP OF
TACLOBAN CITY
(PROPER)

SHOWING WATER PIPELINE NETWORKS



UTAP HILL RESERVOIR
ELEV. 38.00 M
CAP. 83.00 CU.M.

LEGEND

- 500mm ϕ (20" ϕ) STEEL PIPE
- - - 100mm ϕ (4" ϕ) UPVC PIPE
- · - · - 150mm ϕ (6" ϕ) CCI PIPE
- - - - 150mm ϕ (6" ϕ) STEEL PIPE
cc/cl
- * * - 200mm ϕ (8" ϕ) CCI PIPE
- · · · - 100mm ϕ (4" ϕ) UPVC PIPE
- ⊕ FIRE HYDRANT (proposed)
- FIRE HYDRANT (operational)

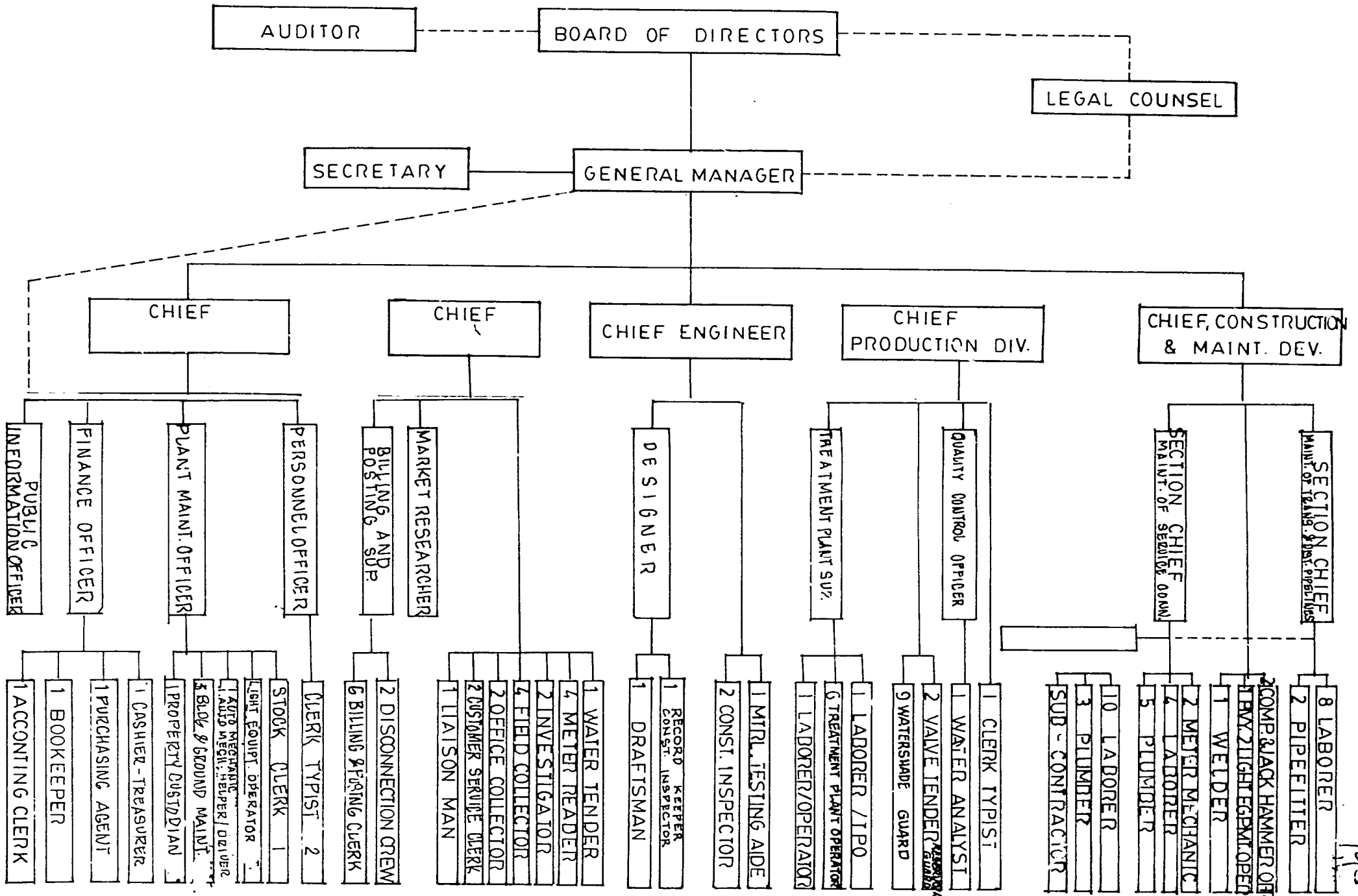


NORTH

SCALE: 1:10,000 mtrs

ORGANIZATIONAL CHART 1981
 LEYTE METROPOLITAN WATER DISTRICT

EXHIBIT 4



195

WATER CONSERVATION INFORMATION DRIVE

The following are some information dissemination materials which are in the form of hand-outs distribution to the consumers and billboards installed at public places and other conspicuous places.



are you HE?

He who tampers with water meters.

He who steals or pilfers water and water meters.

He who possesses a water connection not authorized by the water district.

Shall, upon conviction, be punished by imprisonment of six months to six years, or be fined 2,000 to 6,000 pesos, or both

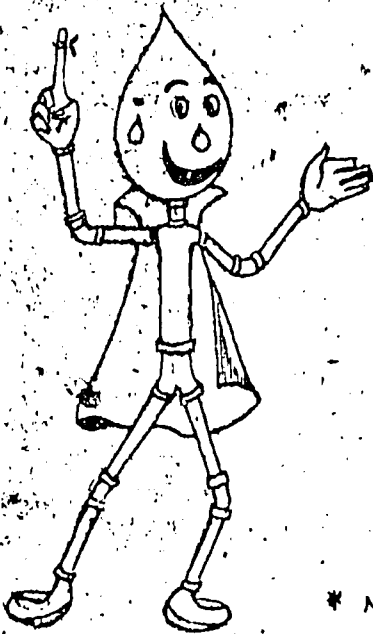
Section 32 (d) of Presidential
Decree No. 198 as amended by
Presidential Decree 76-B



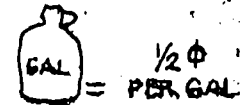
LEYTE METROPOLITAN WATER DISTRICT

DO YOU KNOW THAT....

YOU PAY ONLY P.10 FOR 1 CU. OR 264 GALLONS AT ONLY 1/2¢ PER GALLON
 FOR 52 KEROSENE CANS AT ONLY 2.1¢ PER KEROSENE CAN
 FOR 5 GASOLINE DRUM AT ONLY 22¢ PER DRUM

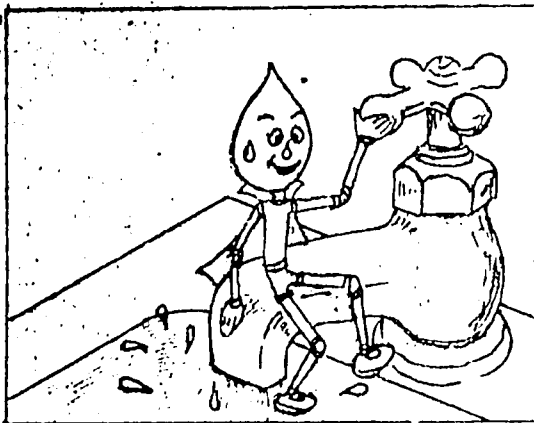


1 CU. M. = 264 GAL = 1/2¢ PER GAL
 = 52 KEROSENE CANS = 2.1¢ PER KEROSENE CAN
 = 5 DRUMS = 22¢ PER DRUM



* NOTE: WATER RATE BEFORE AUGUST 30, 1981.

THIS YOU SHOULD KNOW...



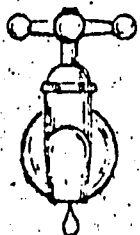
30 GALLONS A DAY

YES SIR! THAT'S HOW MUCH WATER THE AVERAGE PALIPINO USES AT HOME AT THE RATE OF ONLY 16¢ PER PERSON A DAY.

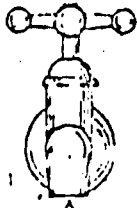


AND FOR THESE 30 GALLONS OF WATER DELIVERED TO OUR HOME BY YOUR WATER DISTRICT YOU PAY LESS THAN THE COST OF A BOTTLE OF SOFTDRINK.

FACTS ABOUT LEAKING FAUCETS:



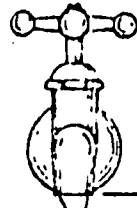
30
DROPS
PER
MINUTE
54
GALLONS
PER
MONTH



60
DROPS
PER
MINUTE
113
GALLONS
PER
MONTH



120
DROPS
PER
MINUTE
237
GALLONS
PER
MONTH



1/2"
1014
GALLONS
PER
MONTH



1 1/2"
2202
GALLONS
PER
MONTH

AVERAGE LOSS OF WATER FROM COMMONLY USED TYPES OF FAUCETS AT DIFFERENT RATES OF DRIPPING.

A PUBLIC INFORMATION SERVICE OF LAYTE METROPOLITAN WATER DISTRICT

TO THE ONE CONCERNED ... BEWARE!

- * ONE WHO TAMPERS WATER METERS
- * ONE WHO USES BY-PASSES OR DEVICES TO GET WATER UNREGISTERED IN WATER METERS.
- * ONE WHO STEALS OR POSSESSES STOLEN WATER METERS.
- * ONE WHO INSTALLS ILLEGAL WATER CONNECTIONS.
- * ONE WHO USES BOOSTER PUMPS DIRECTLY CONNECTED TO THE WATER SERVICE LINE.

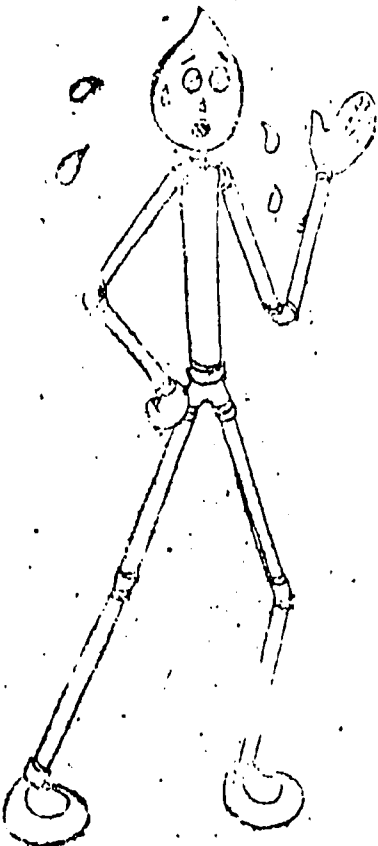
IF YOU ARE ONE OF THOSE MENTIONED -

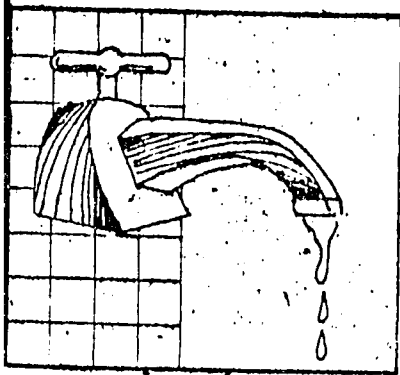
THEN UPON CONVICTION, YOU SHALL BE PUNISHED WITH AN IMPRISONMENT OF SIX MONTHS TO SIX YEARS. . .

OR A FINE OF P2,000.00 TO P6,000.00

OR BOTH AT THE DISCRETION OF THE COURT.

A PUBLIC INFORMATION SERVICE OF LAYTE METROPOLITAN WATER DISTRICT

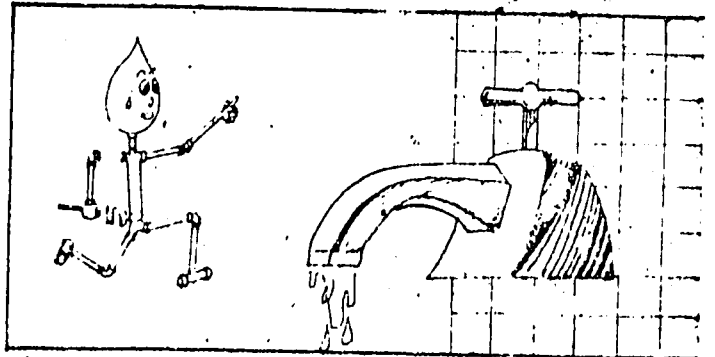




WATER IS A BIG BARGAIN IN YOUR BUDGET

A WHOLE TON OF WATER COSTS ONLY ₱ 1.10 BASED ON RESIDENTIAL RATE!

MAKE A LEAK CHECK TODAY!



- ✓ CHECK ALL FAUCETS.
- ✓ CHECK OUTSIDE WATERTAPS TO SEE THAT THEY ARE TURNED OFF WHEN NOT IN USE. DON'T DEPEND ON THE HOSE NOZZLE, USE THE FAUCET.

WATER LEAKAGE AND COST CHART

(AT THE RATE OF 1/2 CENTAVO PER GALLON)

SIZE OF HOLE	CUBIC METER PER DAY	COST PER MONTH
1/32 OF AN INCH	0.91	₱ 1.00
1/16 OF AN INCH	3.64	4.00
1/8 OF AN INCH	14.45	15.89
1/4 OF AN INCH	57.72	63.50

A NORMAL WATER HOSE USES 10 GALLONS PER MINUTE OR 600 GALLONS PER HOUR AT ₱ 11.00 PER HOUR.

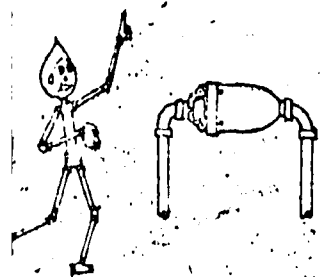
TO AVOID UNNECESSARY EXPENSES ON YOUR WATER BILL, BE SURE TO CHECK FOR LEAKS IN YOUR PIPES, FAUCETS AND TOILETS (THESE ARE SPOTS WHERE LEAKS ARE MOST LIKELY TO OCCUR.) EVEN THE SMALLEST, UNNOTICED LEAK CAN COST YOU MONEY. REMEMBER — A LEAK RUNS 24 HOURS A DAY!

THESE SUGGESTIONS ARE PROVIDED BY THE LEYTE METROPOLITAN WATER DISTRICT TO HELP YOU GET THE MOST OF YOUR PESO.



- ✓ CHECK FLUSH TANKS OF TOILETS BY PLACING LAUNDRY BLUING IN TANK AND WATCHING THE BOWL TO SEE IF IT LEAKS THROUGH. IF THE COLORING APPEARS IN THE BOWL IT MEANS THERE'S A LEAK.

EXHIBIT 9



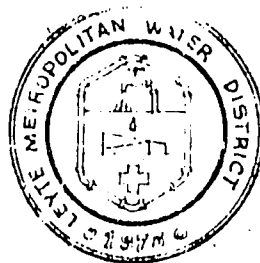
**YOUR WATER METER
IS TRUTHFUL!**

THE METER STRUCTURE IS SO SIMPLE THERE'S LITTLE THAT CAN GO WRONG WITH IT OR INTERFERE WITH THE ACCURACY OF THE OPERATION. BUT FOR ALL ITS SIMPLE, TROUBLE-FREE WAYS, YOUR WATER METER IS A VERY SENSITIVE INSTRUMENT, CAPABLE OF CORRECTLY CALCULATING THE PRECISE AMOUNT OF WATER YOU RECEIVE.

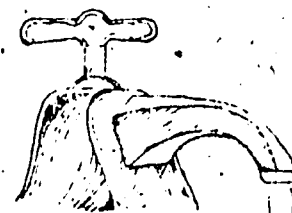
BUT LIKE ANY MECHANICAL DEVICE, IT DOES TEND TO WEAR WITH TIME. DOES THIS MEAN YOUR METER HAS FAILED YOU? NO, NOT YOU..... BECAUSE ANY METER VARIATION FROM THE NORM IS ALWAYS IN YOUR FAVOR.

APART FROM THE METER'S INHERENT HONESTY, WHAT DO WE DO TO CHECK UP ON THE HUMAN FACTOR? BEFORE YOU ARE BILLED, CHECKS ARE MADE TO DETERMINE UNUSUAL CHANGES IN THE AMOUNT OF WATER YOU USE. WHEN WE SUSPECT DIFFERENCES THAT MIGHT BE DUE TO HUMAN ERROR, WE REPEAL YOUR METER IMMEDIATELY BEFORE YOUR ACCOUNT IS BILLED.

THAT'S THE TRUTH ABOUT YOUR TRUTHFUL WATER METER. IT'S AS PRECISE AS CAN BE. YOUR WATER METER IS YOUR BEST FRIEND. PROTECT IT TO MAKE SURE IT WILL PERFORM WITH ACCURACY.



YOUR SERVICE WILL BE METERED FOR YOUR WATER CONSUMPTION. THE WATER METER WILL BE YOUR BEST GUIDE. PROTECT YOUR WATER METER.



PAY FOR WHAT YOU USE,
NOT FOR WHAT YOU LOSE!

SO, **STOP**
WATER WASTES!
AND... **SAVE**
ON **WATER BILLS!**

USE WATER WISELY!

SEWER

B. Sewer and Drainage SystemHistorical Data and Trends

There is no separate sanitary sewer system for Tacloban City. The present storm/drainage serves also as the sanitary sewer system. The effluent coming from septic tanks and domestic sewage are allowed to flow into the storm or drainage pipes provided it passes through a leaching chamber then to a catch basin before they enter the drainage pipes. No charges are imposed for tapping or connecting with the drainage pipelines. Direct connections to pipelines from buildings are however prohibited.

Before the drainage system for Tacloban City was established run-off and waste water flowed to the following creeks or rivers: (1) Northern Area (Capitol site) Drainage Division I (DD-I) to a creek passing through the Capitol grounds which discharges to the Tacloban harbor; (2) On the commercial area (DD-II) to a creek passing through the old Panalaron Public Market (now the Tacloban Shopping Center) and discharging to the Tacloban harbor; (3) On the southwest, (DD-III), storm and waste water is collected by the Mangonbangon River which discharges to Panalaron Bay; and (4) Storm/run-off and waste water on the southern portion (DD-IV) of Tacloban proper flow into the Lirang Creek which discharges to Cancabato Bay, passing the eastern periphery of the Bethany Hospital Compound.

In 1954, a topographic survey of Tacloban City proper was carried out by Geodetic Engineers from the then Bureau of Public Works. Since then, construction of drainage pipes has been done in accordance with the approved drainage system plan for Tacloban City.

At present, Tacloban City Proper is divided into four drainage areas while the suburbs, included in the Urban Core, are divided into five drainage areas (please see attached map labelled Exhibit I). Run-off and waste water in drainage area I (drainage division I, DD-I) are collected into a box culvert (located where there was once a creek) that discharges into Tacloban harbor after passing through the Capitol Grounds. The creek serving DD-II was converted into a box culvert. DD-III and DD-IV still discharge to Mangonbangon River and Lirang Creek, respectively. Storm sewage in DD-V enters the natural drainage channel of Abucay Creek. Water run-off of DD-VI flows out into the Cancabato Bay through Lirang Creek. Rain water of DD-VIII flows directly into the sea.

Description

The present storm/drainage system consists of 10,840 lineal meters of variously sized reinforced concrete culvert pipes. Exhibit 3 lists the diameters of pipes found throughout the system, and the length of piping corresponding to each diameter. Locations of these pipes are indicated on the attached map (Exhibit 1). There are also 1,800 lineal meters of riprap embankment along Lirang and Mangonbangon Creeks which serve to partially channelize these waterways. The total cost to the government of drainage system improvement projects implemented since 1974 has been almost ₱4 M. Exhibit 2 offers breakdown on the appropriations for individual projects.

Because the present system utilizes only gravity to draw run-off and waste water to the outfalls, no outside sources of energy need to be tapped.

Other Data

The total land area served by DD-I to DD-IV is approximately 144 hectares.

The following table shows the amount of monthly rainfall in Tacloban for the year 1980:

M O N T H	TOTAL RAINFALL mm.	MAXIMUM RAINFALL FOR 24 HOURS
January	408.3	45.0
February	261.3	48.6
March	75.4	44.0
April	153.7	25.7
May	66.2	20.6
June	292.6	57.2
July	121.7	56.9
August	375.5	102.4
September	45.5	20.3
October	143.7	26.9
November	481.3	134.9
December	256.5	75.6

Highest rainfall for 1980 occurred in November. In one 24-hour period 134.9 mm. of rainfall was recorded. Total rainfall for the same month was 481.3 mm.

The highest tide elevation which occurs during typhoons is 2.8 m. above MLLW (Mean Low Low Water). This is the elevation of the concrete gutter at Roxas Park of the Wharf Area. The invert elevation of the discharge point of the drainage pipe there is 0.33 m. The mean ground elevation of the City Proper is 2.5 m.

Records from the Leyte Metropolitan Water District show that 180,763 Cu. M. of household water is consumed monthly. The areas served by this water supply and their corresponding populations are as follows:

A R E A	PRESENT POPULATION
City Proper	71,723
Barangay Marasbaras	2,502
Barangay San Jose	8,156
V and G Subdivision	3,748

Barangay Apitong	:	1,082
Barangay Utep	:	1,267
PHHC, and	:	1,248
Barangay Di-it	:	1,232
	:	
<hr/>		
TOTAL	:	90,958
<hr/>		

Based on climatological data, the average monthly rainfall is 223.5 mm. For the drainage areas DD-I to DD-IV, the total volume of monthly rainfall is 223.5 mm, multiplied by 144.00 hectares which amounts to about 447 cubic meters per hour.

Using the records for water supply and the table for population, household water use may be calculated by taking the population of the City Proper, dividing by the total population of the area served by the water supply and then multiplying by the total amount of water consumed by the total population. The figure yielded by this computation is about 198.0 cubic meter per hour.

The estimated discharge flow of run-off and waste water as shown in the above analysis, assuming 85% run-off of the total rainfall, is approximately 578 cu. m. per hour.

Flood Problems/Flood Elimination or Abatement Opportunities:

Drainage problems in the City Proper are minimal, due to the existence of an adequate drainage plan and the fact that many pipes have already been installed. However, there are only a few installed catch basins. Money appropriated for drainage so far has been devoted primarily to the installation of underground pipes.

Drainage areas DD-V, DD-VI, DD-VII and DD-VIII are only slightly above sea level. This small gradient prevents flood waters from flowing rapidly into the sea. No drainage plan has been designed for Drainage Areas DD-V to DD-IX.

III. CONSERVATION PROBLEMS AND OPPORTUNITIES:

The marine life in the receiving waters of Cancabato Bay and Tacloban Harbor is adversely affected by the outflow of waste water from the City. Cancabato Bay is a natural habitat of fish, shrimps, crabs, etc. and it has been a fishing ground for small fishermen.

Houses near the rivers and streams discharge their sewage directly into the waterways. Likewise, the houses along the shoreline dispose their sewage directly into the sea waters of Cancabato Bay and Tacloban Harbor. This practice adversely affects marine life.

IV. STRATEGIES:

Heavy rains bring flooding to some areas of Tacloban City due to inadequate or non-existent drainage facilities.

A. For areas with inadequate drainage facilities, possible courses of action include:

1. Regular maintenance of the drainage system:

This routine activity should be carried out by the maintenance section of the Office of the City Engineer. Maintenance of the system is accomplished by removing obstructions in the system to prevent clogging during periods of heavy rains. Proper maintenance must be done year round, but special efforts may be taken immediately prior to the rainy season.

2. Installation of catch basins and curb inlets:

To allow storm water to enter the drainage pipes, curb inlets and catch basins should be installed. Few curb inlets and catch basins have so far been constructed, as the primary goal has been to lay out drain pipes to as wide an area as

possible. This goal has now nearly been achieved, so future appropriations may be used to construct inlets and catch basins. This will remedy flooding problems in some areas.

3. Clear waterways of squatters:

Another cause of flooding is the presence of squatters along waterways. This prevents the rapid flow of storm water. The President issued a Presidential Decree outlawing squatters along waterways. This should be enforced immediately with the help and coordination of other government agencies particularly in relocating the squatters.

4. Rivetment or channelization of waterways:

Another cause of flooding is that storm water cannot flow fast enough due to vegetation and siltation in waterways. One solution to this problem is channelizing the waterways. This involves clearing the waterways of vegetation and construction of rivetment to prevent erosion of the banks. Rivetment/improvement of the waterways can be done by driving sheet piles and installing concrete lining or rubble concrete on the banks. This work entails higher cost than the first three alternatives described above.

5. Increasing the gradient:

For areas far from the outlets, land fill is recommended to prevent floods. The gradient or slope the water follows as it flows toward the outlet would thereby be increased. The greater the slope, the faster the water flows. This method is expensive.

When applying for a building permit, land owners can be advised by building officials as to the appropriate elevation for the floor level of their structure in order to permit water to subside more quickly.

6. Install pumps at appropriate points:

This should be the last alternative to be considered to remedy the flooding of some areas in Tacloban City because of the prohibitive cost. This choice entails high initial cost as well as high operation and maintenance costs.

B. Alternatives for areas lacking a drainage system:

1. Conduct topographic survey, design drainage system, and construction:

Within Tacloban City there is an absence of drainage facilities in sectors DD-V to DD-IX. Work on the topographic survey necessary for the design of a drainage system has already begun. Topographic maps for sectors DD-VII and DD-VIII have been completed and forwarded to Manila where they are being used to aid the designers of the new drainage structures. Construction will ensue immediately upon receipt of the approved drainage plans by the Office of the City Engineer.

2. (a) Reduction of contamination of sea water and preservation of marine life:

One proposed solution to the problem of sea water contamination due to sewage inflow is the construction of a submarine outfall. This outfall would extend out into deeper waters where dilution would take place more rapidly due to stronger water current. The initial cost of such an outfall, as well as operation and maintenance costs, are much less than the costs of a sewage treatment plant.

(b) Sewage treatment:

Treating the sewage at the outfall is another potential solution. This treatment facility would

be constructed after the physical and chemical properties of the sewage had been determined.

The kind of treatment necessary, which may be primary, secondary or tertiary, will depend on the characteristics of the sewage. For Tacloban it may be worthwhile to consider oxidation ponds taking into account the kind of sewage generated and the climate of the locality. This kind of treatment is less expensive and operates efficiently in tropical countries. There are useful by-products such as fertilizers from such a treatment process.

3. Prohibit inhabitants of houses situated along rivers, streams and shorelines from disposing sewage directly into these waters/relocation of squatters:

At present the problem of direct sewage disposal into rivers, streams and the sea is still a minor one. The national and local governments are aware of the problem. The National Housing Authority (NHA) has begun relocating people from the Sagkahan shoreline to an inland area. There will be a phased relocation of the remaining shoreline dwellers. In the meantime, an education drive should be initiated, aimed at the residents of these areas and emphasizing the need to construct individual septic tanks or to identify other means to avoid direct disposal of sewage into Cancabato Bay and Tacloban Harbor.

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON WATER, SEWAGE & SOLID WASTE

Sub-Sector Sewage

CONSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS- ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IM- PLEMEN- TING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORI- (RANK)
I. Flooding in some areas	1. Regular Main- tenance of drainage system		1. Prevent clogging	n o n e			routine	L	1
	2. Install catch basins and curb in- lets on street corners	Carry out first four alternatives	Avert street flooding	n o n e		CEO-Main- tenance	S	M	2
	3. Clear water- ways of squatters		1.Prevent obstruction 2. environ- mental benefit	social & eco- nomic impact in relocation			S	H	3
	4. Rivetment & channelization		1. increase discharge 2. improve sanitation	high cost of rivetment		MPWH Construction	M	H	4
	5. Raise ground elevation by land fill		1.increase land value 2. Minimize drainage problem.	high cost			L	H	5
	6. Install pumps at appropriate points	Last remedy	Ultimate solution	high initial and main- tenance cost			L	H	6
. No drainage system in some areas		1.Topographic survey 2. Design 3. Construction	1.Environmental sani- tation benefit 2. improve land values	none	Land Use	MPWH	S	H	1

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON WATER, SEWAGE & SOLID WASTE

Sub-Sector Sewage

CONSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORITY (RANK)
III. Contamination of Cancabato Bay and other receiving sea waters	1. Monitor the quality of receiving water					City Gov't in coordination w/NPCC & Universities	M	M	1
	2. submarine outfall		1) lower cost compared to treatment 2) Dilution			City Gov't & MPWH	L	H	2
	3. Treatment (after monitoring the physical & chemical properties of sewage)		1. eliminate the waste	expensive		City Gov't (CEO) and MPWH	L	H	3
	4. Status quo		no cost	environmental pollution				N	
IV. Direct Sewage disposal of houses along shorelines	1. require affected residents to construct septic tanks		eliminate pollutant	Additional cost to the City Gov't		City Gov't Barangay	S	M	1
	2. Relocation of houses along shorelines		eliminate pollution	-do-		City Gov't & MHS, MSSD	S	M	2
	3. Status quo		no cost	environmental pollution					

SOLID WASTE

II. Situational Analysis

a) Historical Data and Trends

Solid waste management in the City of Tacloban was initiated in the early 1950's through the creation of the City Garbage Collection and Disposal Services then under the supervision of the City Engineer's Office. Administration and supervision responsibilities were transferred in 1968 to the then newly created Department of City General Services.

b) Description

The present system provides collection and disposal services for residences, commercial establishments, and institutions like hospitals and schools. The area covered by the system contains a total population of 70,000 and is divided into three collection areas. Two of the collection areas are designated as residential areas and one is classified as a commercial area.

The system maintains a labor force consisting of one labor foreman, three drivers, twenty-four waste collectors and twenty street sweepers. There are only three open dump trucks for collection, two of which are old and owned by the City Government and one which is temporarily on loan from the 8th Highway Regional Office, Ministry of Public Works and Highways. Other collection equipment includes fifteen buggies used by street sweepers. All this equipment is scheduled for daily collections throughout the year.

1. Expenses and Revenues - The City Garbage Collection and Disposal Services operates under the City General

Fund, and revenues are collected by the City Treasurer's Office. Annual garbage collection and disposal rates were fixed by the existing Municipal Ordinance. The schedule of annual rates is based on the type of business, trade or occupation for commercial establishments, and on assessed value for residential houses. For restaurants and/or bakeries, the maximum annual rate is ₱60.00. There is a minimum charge of ₱6.00 for residences with assessed value of ₱1,000.00 or less, and ₱12.00 for residential houses valued at ₱10,000.00 or more.

The following tables list expenditures and revenues of the City Garbage Collection and Disposal Services for the years 1978, 1979 and 1980.

Table I

	1978	1979	1980
Total Annual Expenditure:	₱183,683.02	₱268,792.24	₱378,160.76
Total Annual Fees Collected	41,481.50	39,746.50	43,831.00

Table II

Expenditures Breakdown
1980
(City Garbage Collection and Disposal Services)

Personal

Salaries and Wages - - - - -	₱228,051.07
Life Insurance Premiums - - - - -	9,718.17
Medicare Premiums - - - - -	1,348.20
State Insurance - - - - -	<u>1,143.32</u>
	₱240,260.76

Operating Expenditures

Supplies and Materials (Fuel & Oil & etc.) - - - - -	₱108,000.00
--	-------------

Uniforms, Raincoats, & Boots - - -	6,900.00	
Repair of Equipment - - -	20,000.00	
Other Services - - -	<u>3,000.00</u>	<u>₱137,900.00</u>
T o t a l - - - - -		₱378,160.76

For the year 1980 there was a deficit of ₱334,329.76 which was shouldered by the City Government of Tacloban as part of City Government's welfare obligations.

2. Waste by origin - The average quantity of solid waste disposed is estimated at 22,000 cu. meters a year. This figure is merely based on a count of the vehicles entering the dumping ground. Of the total solid waste disposed, it has been observed that about 50% is residential, 32% commercial, 8% street sweepings, 5% agricultural, and 5% others. No estimate for demolition debris such as used lumber and conglomerates of concrete bricks and others is available. This type of waste is usually disposed of by owners or building contractors themselves into low land areas in order to reclaim land. Demolition wastes from minor repairs and from residential houses are cleared by the City Collection Service and are regarded as residential wastes. This type of waste, which consists primarily of used nipa shingles from the slum areas, is especially great in quantity during the summer months.

Means of disposing human waste include septic tanks, water sealed toilets, pit privies, and direct disposal into the sea, rivers, and streams. Some human waste is deposited in the waste piles found along the sides of city streets.

Below is a breakdown on the types of toilets found in the City of Tacloban as of September 1981.

Types of Toilet		No. of Houses
Septic tank	:	2,962
Water Sealed toilet	:	7,037
Pit Privy	:	216

Of the estimated 12,040 houses in this City, only 9,999 or 80% have a sanitary toilet. The remaining 20% depend on the unsanitary disposal methods previously mentioned.

3. Waste Variation - The quantity of waste generated varies according to day and season. It has been noted that there is a wide seasonal variation and a moderate daily variation. During summer months (April to June), the quantity generated may rise to as high as 30% above the average. During this period houses are repaired and cleaned in preparation for both the opening of classes and the City Fiesta celebration, a major social event.

4. Waste by kind - Approximately 50% of the residential wastes collected are plant wastes. These can be treated and converted into a quality compost. The remaining generated wastes are composed of materials such as plastics, corrugated cartons, metal and others.

5. Storage - It is observed that 80% to 90% of the solid wastes generated are left in open piles along the sides of the streets for collection instead of being placed in a covered and stable container as required by existing city ordinances.

6. Collection - The collection areas are served daily by permanently assigned collection groups with

specific routes and time schedules. Exhibits 1, 2, and 3 are sketch maps showing the routes followed by each of the City's three collection teams. All collection groups are composed of six to seven crew members and an open dump truck. Each group is equipped with two dust pans (tools made of galvanized iron sheet with wooden handle used for collecting and gathering the waste piled along the streets), and baskets. The wastes are collected and tossed up to another member of the crew on top of the open dump truck, where the waste is piled.

The collection time needed to fill the open dump truck is no less than two and a half hours, and the disposal time including travel to and from the dump is no less than forty minutes.

7. Disposal System and Dump Sites - The method of disposal is open land fill. The loaded trucks dump the waste at a designated area. The dumped wastes area arranged and levelled manually and left as fill material.

The dumping area, depicted in Exhibit 4 consists of privately owned lots and a man-made lagoon at the barangay proper of San Jose, and also an abandoned ricefield in Sitio Cogon of the same barrio. The lagoon, with an area of approximately five hectares and an average depth of six meters, was formed during the Japanese Occupation. At that time the soil was excavated and used as construction material for the airfield. Presently the lagoon is 60% to 70% filled. Residential houses and residential centers have been erected on top of the filled portion.

8. Scavengers: Their Role and Effect. There are two groups of scavengers in the City. One group searches

the garbage piled along the streets for saleable materials. The search process leads to further scattering of the waste, rendering collection more difficult. The other scavenger group, consisting mainly of children and aged people, comb the dumping grounds throughout the day. This activity serves as their means of livelihood.

Recovered materials include corrugated cartons, tin cans, plastic, scrap iron and empty bottles. These materials are immediately sold to junk dealers in the locality. The prevailing prices of the recovered materials are shown below as of the month of October, 1981.

Description of Waste Materials :		Buying Price/Kilogram
Corrugated Carton	:	₱0.30
Plastics	:	0.60
Scrap Iron	:	0.30
Tin Cans	:	0.15
Empty Bottles	:	According to Classification

The accumulated recovered materials sold to the junk dealers are shipped either to Cebu or Manila where a higher selling price may be obtained.

At present there are no available records showing the incidence of disease or mortality statistics pertaining to scavengers and inhabitants of areas near the dumping sites. Unsanitary conditions are evident at these sites, and it would seem these conditions pose a health problem.

9. Average Annual Fuel Consumption - The City Garbage Collection and Disposal System uses open dump

trucks for collection. Yearly fuel consumption for the three collection trucks for the years 1978 to 1980 is tabulated below:

Fuel	No. of Liters		
	1978	1979	1980
Diesel	14,376	13,044	25,149
Gasoline	21,769	27,036	12,161

The above table shows that fuel consumption remained fairly constant for the period. Maintenance of the dump site requires no fuel consumption, employing only the manual services of one laborer.

10. Equipment Maintenance - Preventive maintenance cannot be undertaken regularly because the three dump trucks in the system are scheduled daily. The office has only one automotive mechanic who regularly checks the conditions of the three dump trucks. In case of breakdown, the automotive mechanic reports immediately to the site of the breakdown and makes the necessary repair.

Service disruption is experienced whenever any of the garbage trucks undergoes major repair.

III. CONSERVATION PROBLEMS AND OPPORTUNITIES

1. Improvement of Waste Collection Efficiency

Inefficient collection can be attributed primarily to two factors:

a) Each collection area is too big for a single group to cover in eight hours. Waste generated per area amounts to approximately 20 cu. meters a day, a volume equivalent to more than three full truck loads (each truck has a carrying capacity of 6 cu. meters).

An average of two and a half truck loads or 15 cu. meters of waste can be collected and disposed of per truck per day. Thus, there remains an average surplus of 5 cu. meters of uncollected waste per collection route.

b) Due to the limited number of trucks, preventative maintenance is precluded by their constant usage. Two of the three trucks are old and in unreliable mechanical condition. Mechanical problems cause collection service interruptions.

2. Health and Environmental Consciousness

There has not been an effective public education effort on health and environmental consciousness. Solid wastes are consistently piled in the open along the streets. This practice, besides being very unpleasant and unsanitary, actually violates existing city ordinances and decrees.

3. Resource Recovery and Reuse

All the solid waste collected is deposited at the designated dumping site and left as fill material. Open dumps attract vectors and insects. The dump site at the man-made lagoon of Barrio San Jose is currently densely populated with such pests, and this may present a severe health threat to the area, although so far no serious health problems have been reported.

After saleable materials (such as corrugated cartons, plastics, scrap iron, empty bottles, and tin cans) have been recovered by scavengers, what remains serve as fill material. Plant wastes, which comprise 50% of the quantity of the original unscavenged waste material, can be converted into quality compost. City parks and plazas as well as City Government operated

agricultural farms may advantageously replace costly chemical fertilizers with good quality compost. Low land depressions which are presently used as dump sites can be adapted for methane gas recovery.

4. Uncertainties of Dump Sites

The City Government uses privately owned dump sites without any contractual agreement. Whims and caprices of private land owners may cause service interruptions.

5. Planning Constraint

Effective planning is difficult due to inadequate data on factors such as actual quantities involved, percentage of major components, physical and chemical characteristics and seasonal variations.

IV. STRATEGIES

1. Divide Service area into four sectors and increase the number of collection trucks from three to four.

The present service area should be divided into four instead of the existing three sectors. One new collection group, of the same size as each of the existing three groups, would be added. All groups would work 8 hours a day, the same number of hours as at present. Also, one collection truck would be added to the existing fleet, allowing regular preventative maintenance for all vehicles. The addition of a new collection team would eliminate the present problem of uncollected garbage. Performance of the collection groups may be improved if the number of collection points could be reduced by introducing common storage containers. Such containers would, however, involve additional cost to the City Government, and it may be difficult to regulate the type of waste placed in the containers. Time might be required to remove undesirable materials.

2. Enforce Existing ordinances and implement educational Programs

The City should assign officers to enforce existing ordinances on garbage collection and disposal, and should simultaneously assign competent persons to vigorously conduct an education program on solid waste management. Although effective educational campaigns demand much time and exhaustive effort, there are long range benefits, including the need for fewer enforcement officers in the future once the population has become better informed and has learned to appreciate the advantages of wise solid waste management policies.

3. Conversion of open dumps to sanitary landfill

Such conversion, although more costly than maintaining the status quo, would certainly have positive health and environmental effects. With the sanitary landfill method, each day's collection of refuse is compacted and entirely covered at the end of the day in an environmentally and hygienically acceptable manner. This would discourage scavengers at the dump site and lessen adverse environmental effects.

a) Composting Pilot Plant. Plant waste, which presently composes an estimated 50% of all collected residential waste material, should be converted into a quality compost. The quantity of disposed material would be reduced and less chemical fertilizers would be used if composted fertilizers were to become accepted. Disadvantages include the added cost the City Government would realize in implementing such a composting scheme and the fact that farmers may at first resist the transition to natural fertilizer.

It is recommended that a pilot composting plant utilizing the aerobic decomposition process be

established. The operation would be labor-intensive with plant waste shredded and windrowed manually. Based on supplied information, one laborer can windrow an average of 5 cu. meters of waste per day. This project should be initiated in the near future.

b) Establish a Methane Gas Recovery System at the Dump Site. The sides and bottom of a dumping pit would be coated with a sealing material, the most common and least costly material being clay. After coating, the pit would be filled with compacted solid waste, and a clay covering would be constructed to control gas and leachate migration. Methane gas may later be extracted by means of a gas well that would be drilled to the bottom of the confined waste. Studies show that gas production varies from 1,000 to 3,000 cu. ft. of methane per ton of organic refuse. Uses for methane gas include electricity generation. A high initial cost would be realized with this project. Before a decision is made on whether or not to build a methane recovery system, a feasibility study is suggested.

c) Systematize Scavenging. The City Government in coordination with civic organizations should attempt to organize scavenger activities.

Instead of recovering saleable materials from streetside piles and dumping sites, scavengers could buy directly from householder, building administrators, or commercial establishment operators, and sell at Government Buying Centers. Tools and equipment needed by the scavengers could be made available by the City Government. Recovered materials accumulated at the government buying centers would be shipped to Cebu or Manila where selling prices are higher. All government profit or gain resulting from this activity would be used to assist the scavengers. The task of the

scavengers would be facilitated if householders could be educated regarding the separation of recoverable materials and the benefits of recycling.

4. The City Government Must Acquire its Own Dump Site

Again, this involves added cost but disposal disruption would be averted.

5. Need for Survey

Presently unavailable data must be gathered, by means of a survey and sampling of waste materials, to facilitate efficient solid waste planning. Necessary information includes type of waste, composition (by major components), actual quantities involved, and physical and chemical characteristics.

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON WATER, SEWAGE & SOLID WASTE

Sub-Sector Solid Waste

OBSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORITY (RANK)
I. Inefficient Collection	1) Increase Number of shifts		no additional expenses required.	Increase operation & maintenance cost			S	L	1
	2) Reduce collection points by having common storage		1) Faster collection 2) Sanitary benefit	Additional cost			S	L	2
	3) Increase number of trucks from 3 to 4		Increase capacity of collection	Initial cost			S	M	3
II. Indiscriminate disposal of solid waste along sides of street	1) Provide common container		1) faster collection	Additional cost to City Government			S	L	2
	2) Strict enforcement of existing ordinance on garbage collection		2) Sanitation benefit	Additional enforcement officers					
	3) Educational campaign		1) Sanitation benefit 2) Faster collection 1) Sanitation and environmental benefit	Impact not immediate			L	L	3

**PRELIMINARY STRATEGY MATRIX
FOR SECTOR ON WATER, SEWAGE & SOLID WASTE
Sub-Sector Solid Waste**

CONSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS- ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IM- PLEMEN- TING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORITY (RANK)
					2) Availa- bility of subs- titute fertilizer				

EXHIBIT 1
MAP OF TACLOBAN CITY (PROPER)

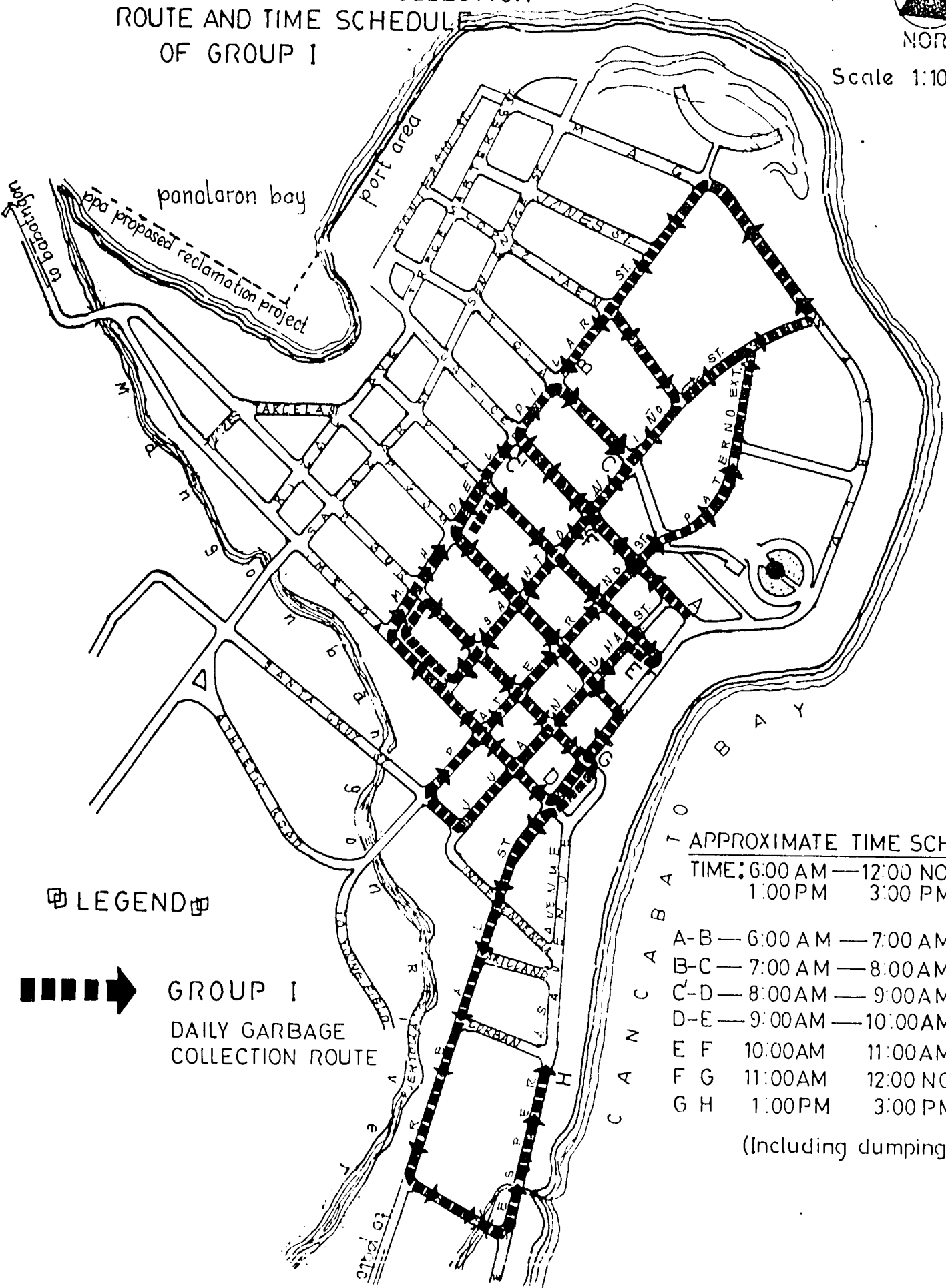
SHOWING GARBAGE COLLECTION
 ROUTE AND TIME SCHEDULE
 OF GROUP I



225

NORTH

Scale 1:10,000 mtrs



☐ LEGEND ☐



GROUP I
 DAILY GARBAGE
 COLLECTION ROUTE

APPROXIMATE TIME SCHEDULE

TIME: 6:00 AM — 12:00 NOON
 1:00 PM 3:00 PM

- A-B — 6:00 AM — 7:00 AM
- B-C — 7:00 AM — 8:00 AM
- C-D — 8:00 AM — 9:00 AM
- D-E — 9:00 AM — 10:00 AM
- E-F 10:00 AM 11:00 AM
- F-G 11:00 AM 12:00 NOON
- G-H 1:00 PM 3:00 PM

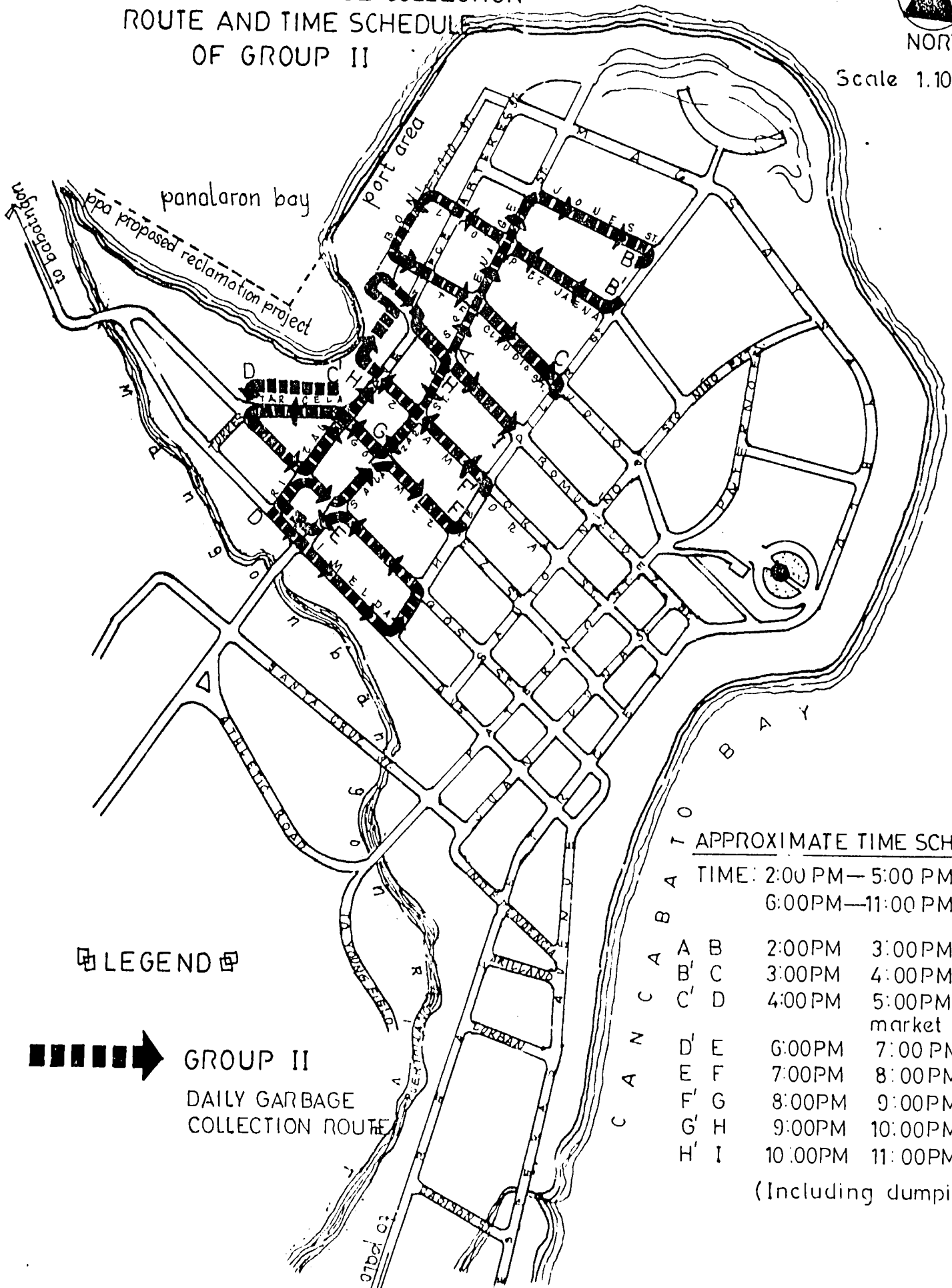
(Including dumping time)

EXHIBIT 2
MAP OF TACLOBAN CITY (PROPER)

SHOWING GARBAGE COLLECTION
 ROUTE AND TIME SCHEDULE
 OF GROUP II



Scale 1:10,000 mtrs



LEGEND



GROUP II
 DAILY GARBAGE
 COLLECTION ROUTE

APPROXIMATE TIME SCHEDULE

TIME: 2:00 PM — 5:00 PM
 6:00 PM — 11:00 PM

A	B	2:00 PM	3:00 PM
B'	C	3:00 PM	4:00 PM
C'	D	4:00 PM	5:00 PM (super-market area)
D'	E	6:00 PM	7:00 PM
E'	F	7:00 PM	8:00 PM
F'	G	8:00 PM	9:00 PM
G'	H	9:00 PM	10:00 PM
H'	I	10:00 PM	11:00 PM

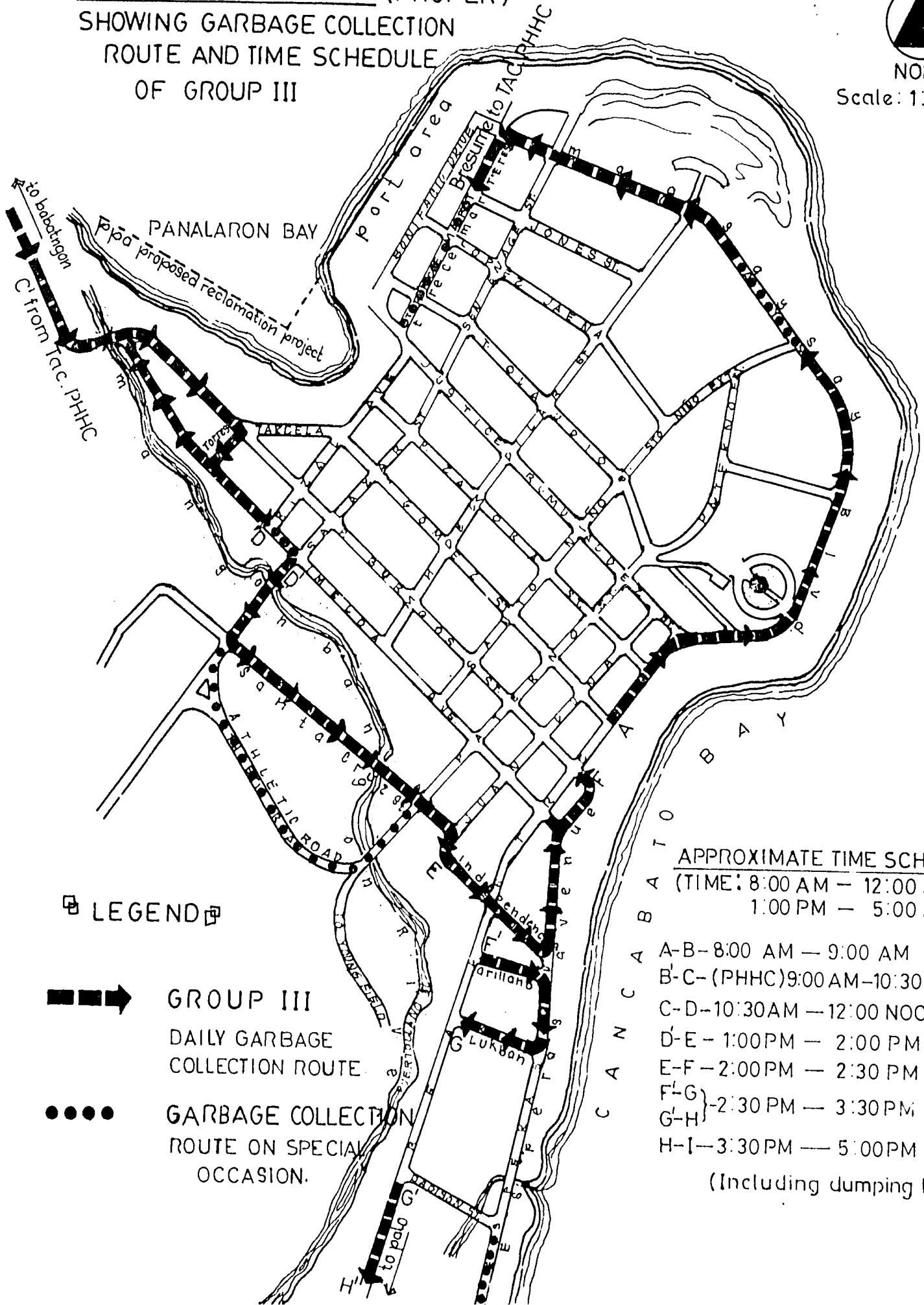
(Including dumping time)

EXHIBIT 3
MAP of TACLCBAN CITY (PROPER)
 SHOWING GARBAGE COLLECTION
 ROUTE AND TIME SCHEDULE
 OF GROUP III



NORTH

Scale: 1:10,000mtrs



LEGEND



GROUP III
 DAILY GARBAGE
 COLLECTION ROUTE



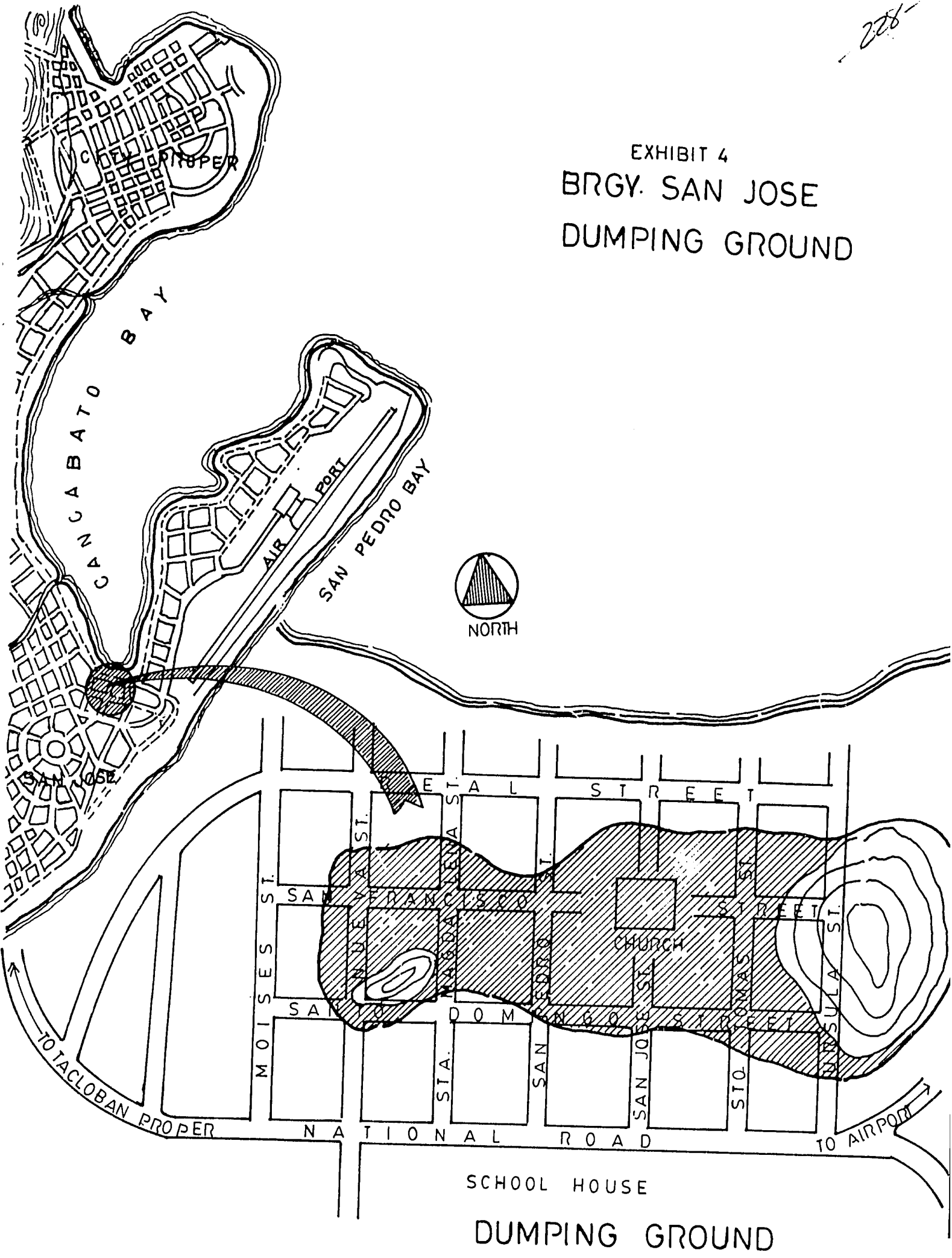
GARBAGE COLLECTION
 ROUTE ON SPECIAL
 OCCASION.

APPROXIMATE TIME SCHEDULE
 (TIME: 8:00 AM — 12:00 NOON
 1:00 PM — 5:00 PM)

- A-B- 8:00 AM — 9:00 AM
- B-C- (PHHC) 9:00 AM-10:30 AM
- C-D- 10:30AM — 12:00 NOON
- D-E- 1:00PM — 2:00 PM
- E-F- 2:00PM — 2:30 PM
- F-G- } -2:30 PM — 3:30 PM
- G-H- }
- H-I- 3:30PM — 5:00PM

(Including dumping time)

EXHIBIT 4
BRGY. SAN JOSE
DUMPING GROUND



BUILDING MATERIALS, INDUSTRY, FOOD DISTRIBUTION AND UTILIZATION

I. STATEMENT OF AREA OF RESPONSIBILITY

In this report, energy conservation opportunities related to building materials, industry, and food distribution and utilization are presented after each of these areas has been discussed.

II. SITUATIONAL ANALYSIS

1. Building Materials

1.1 Historical Background

Tacloban's concrete residential, commercial, and public buildings as well as the residences of average income families typically constructed of indigenous materials abundantly available from nearby swamps and hills suffered heavy damage during World War II. After the war, the city was rebuilt, and local sawmills, lumberyards, and quarries developed.

Over the past two decades, the City of Tacloban has experienced a construction boom. Building materials have been obtained from Manila and from nearby cities and provinces. The inflow of building materials by land from Manila has been expedited by the completion of the Philippine-Japanese Highway, otherwise known as the Maharlika Road.

1.2 Roofing and Walling Construction Materials

In 1970, wood was used for walling in 65.4% of the dwelling units constructed, and nipa¹ in 17.4%. Smaller percentages of concrete, bamboo, and galvanized iron were also used. Over the

¹ Nipa are thatches formed by tying together elongated palm leaves.

next decade, concrete gained in popularity. By 1980, 36.7% of the walls built in Tacloban were of concrete, while 41.5% were of wood (see Table 1).

A similar shift toward a more "modern" material occurred with roofing. Nipa was used for 64.1% of the roofs fabricated in 1970 and only 47.4% in 1980. Galvanized iron roofs composed 31.9% of the total in 1970 and 49.9% in 1980 (see Table 2). Apparently higher status is associated with houses built using modern materials.

1.3 Consumption of Building Materials.

Three hundred eighty three residential buildings were constructed in the city in 1980, a 7.6% increase over 1979. The total cost of materials for the construction of these buildings was ₱16,222,308, an increase from 1979 of 175.7%.

New commercial buildings constructed numbered 36 in 1979 and 53 in 1980. The amount of ₱3,379,382 was spent for materials in 1980, a decrease of 45.1% from 1979.

No industrial buildings were constructed in 1979, and only 1 in 1980, with ₱22,320 spent for materials (see Table 3).

The data in Table 4 show quantities of building materials consumed in 1979 for vertical construction. A report from the City Engineer's Office reveals that approximately 232,447 bags of cement were used for the construction of residential, commercial, agricultural, and government buildings. Structural steel and steel bars consumed totalled 1,066,543 kilograms in weight. Lumber used amounted to 1,445,497 board feet.

Quantities of building materials used in horizontal construction, primarily road paving, are

tabulated in Table 5. The data show that 53,790 bags of cement were used in 1979. Gravel, sand, and common borrow consumed amounted to 10,881, 3,270, and 5,420 cubic meters, respectively. Lumber utilized totalled 7,650 board feet, and nails used weighed a total of 24.4 kilograms.

1.4 Sources of Building Materials

The city imports building materials such as cement, galvanized iron corrugated sheets, plywood, tiles, steel bars, and hardware. The main supply sources for these building materials are Cebu and Manila. Lumber and nipa thatches are obtained primarily from Samar. Tacloban produces a small quantity of hollow blocks, bricks and wood tiles, and a larger amount of filling material.

1.5 Energy Consumption

Large amounts of fuel are needed to bring necessary building materials to Tacloban.

1.6 Institutional Factors

In the year 1945, the City of Tacloban enacted Ordinances Numbers 19 and 25 regulating building construction and the use of building materials. Both of these were amended in 1946 by Ordinance No. 17.

The National Building Code, decreed by President Marcos in 1977, standardized building regulations and fees for building permits throughout the country. Tacloban City realized increased income and greater control over the use of building materials as a result of the code's introduction.

At present there are decrees prohibiting the removal of certain trees and forest products designated for use as building materials.

The recently launched National Livelihood Movement or Kilusang Kabuhayan at Kaunlaran (KKK)

encourages people to engage in tree farming activities, such as the planting of fast growing ipil-ipil trees. The KKK program also promotes cottage and light industries such as rattan-wood building material production, and concrete hollow block and clay brick fabrication.

2. Industry

2.1 Manufacturing establishments

According to the Bureau of Domestic Trade statistics presented in Table 6, manufacturing establishments in the City of Tacloban numbered 256 in 1980. The average annual growth rate of manufacturing establishments for the period 1977-1980 was 23.8 percent. Tailoring shops comprise 21.5% of the total, bakeries and bake shops 14.8%, and furniture and upholstery shops 6.3%.

2.2 Small Business Advisory Council (SBAC) Approved and Assisted Projects

The Small Business Advisory Council, under the Office of the Ministry of Industry, is a government agency charged with providing free-of-charge assistance to selected private entrepreneurs. This office prepares feasibility studies and assists in identifying loan sources. As shown in Table 7, a total of 79 projects were approved and assisted during the period 1977-1980, and all of these projects were fully implemented.

2.3 Cottage Industries

There were 30 cottage industry establishments in the city in 1979, 50% more than in 1977. The number of cottage industry workers increased by 78.8% for the period. Capitalization increased by a remarkable 635.7%, and the annual sales volume grew by 17.5% to ₱256,460 in 1979 (see Table 8).

2.4 Commercial Establishments

There were 2,533 commercial establishments in 1980, 35.8% more than in 1977. The City's 1,234 variety stores, known locally as sari-sari stores, constitute 48.7% of the total. The motorcab for hire (MCH) sector accounts for 5.4% (see Table 9).

2.5 Commodity Flow

Tacloban City is the region's trading center. According to a 1972 analysis conducted by the National Economic and Development Authority (NEDA), 55.9% of the regional commodity flow passed through Tacloban, 15.8% through Catbalogan, and 11.4% through Borongan in Eastern Samar.

Philippine Ports Authority records show that 44.8% of all inflowing commodities come from Cebu, 18.5% from Manila, and 9.8% from Gamay in Northern Samar. Guiuan, Cebu and Catbalogan are the primary recipients of Tacloban's outflowing commodities with respective percentages of the total of 27.8%, 22.4%, and 15.5% (see Table 10).

2.6 Banking and Financing Institutions

Today there are 20 banking institutions located in Tacloban, 4 of which are government owned and controlled, and the remainder of which are privately owned and controlled (see Table 11). Among the services offered are agricultural, commercial, industrial and real estate loans, and savings and time deposit accounts.

The city's financial institutions include the Government Service Insurance System and the Social Security System, which grant loans to members, and 23 insurance companies (see Table 12).

2.7 Tourism Industry

An estimated 19,700 tourists visited Tacloban in 1980, 38.6% more than six years earlier.

Japanese, Americans, and Filipinos living or working abroad were, in that order, the most common tourists (see Table 13).

The Ministry of Tourism lists 17 points of interest in Tacloban. Recently, additional hotels and lodging houses have been constructed. Now there are 481 hotel rooms and 22 tourist cottages in the city (see Tables 14 & 15).

Supporting the tourism industry are Tacloban's 22 restaurants and coffee shops, and recreational facilities like theatres, parks, playgrounds, bowling inns and disco pads.

2.8 Energy and Resource Consumption

The National Economic and Development Authority (NEDA) and the Bureau of Employment Services surveyed 73 industrial firms in order to gather data about energy and resource consumption. Following are two of the survey's more interesting findings:

1. The majority of the cottage and smaller scale industries sampled depend on the local electrical cooperative, Leyeco II, for power. Four of the six larger scale industries surveyed, however, maintain generators to meet their electricity needs.
2. Water is acquired from the Leyte Metropolitan Water District (LMWD) and from creeks, rivers, and deep wells. Larger scale firms spend about ₱0.46 for each cubic meter of water consumed, while from ₱1.40 to ₱2.50 is spent per cubic meter by cottage and small scale industrial establishments. It is because the larger scale firms typically tap rivers and streams to a greater extent that their expenditure per cubic meter is lower. It is important to note that the sample size of this survey was small, especially for the large scale industries.

2.9 Institutional Factors

The Leyte Sab-a Basin Development Authority (LSBDA) has proposed building an industrial estate in Sab-a Basin designed to promote small scale industry, modernize existing establishments, and stimulate industrial development. The Sangguniang Panlalawigan of Leyte, through the Honorable Governor, endorsed this proposal with Resolution No. 41 on April 12, 1978. The next day the Sangguniang Panglunsod of Tacloban City, through the Honorable City Mayor, added its endorsement in Resolution No. 1.

Both resolutions were submitted to the Regional Development Council (RDC) and were approved on November 10, 1978. Originally, Barangay Tagpuro had been proposed as the site for the estate, but later Barangay Tigbao was selected. A pre-feasibility study was undertaken with the financing of NEDA and the cooperation of the Ministry of Agriculture (MA), the Philippine Rural Development and Service Corporation (PRUDASCO), a private industrial broker, and the RDC. Arrangements were made enabling the Project Administrator to coordinate with other government agencies. It was decided that the Ministry of Labor and Employment (MOLE) and the Bureau of Employment Services would be charged with meeting the employment and labor demands of the project.

3. Food Distribution and Utilization

3.1 Fish, Livestock and Field Crop Productivity

3.1.1 Area Devoted to Agricultural Production

Table 16 tallies areas in Tacloban City planted with selected agricultural crops in the years 1970, 1975 and 1980. In 1970, an area of 1,754 hectares were devoted to coconut, corn, rice, vegetable and

fruit production. This land area decreased by 21.2% in 1975 and 26.2% in 1980.

Rice ranked first in terms of area planted in 1970, followed by coconut. By 1980, more area was planted with coconut than rice, although both crops registered absolute acreage decreases.

Much agricultural land was converted to residential land during the decade. For the period 1977 to 1980, the amount of arable land decreased by 16% and the quantity of land under permanent crops declined by 4%. During the same period, residential land in the city proper increased by 5% and the amount of residential land in built-up areas outside the city proper increased by 121%. Tables included in the land use report contain more of this type of information.

3.1.2 Production of Agricultural Crops

From 1970 to 1980, rice production fell by 7.1% while coconut production declined by 1.4%. This decreasing trend characterized other food crops as well (see Table 17).

3.1.3 Livestock and Poultry Production

Livestock and poultry are produced in Tacloban both for commercial and personal consumption purposes. The quantity of carabao, cattle, and poultry raised increased for the period 1975-1980, while swine production exhibited a slight decrease (see Table 18).

3.1.4 Fish Production

Tacloban's fishermen depend on four major fishing grounds, namely, Carigara Bay, Leyte Gulf, San Pedro Bay and Samar Sea. About 355 metric tons of fish were harvested in 1975. This quantity increased in 1977 and 1978, decreased in 1979, and

increased once again in 1980 (see Table 19).

3.1.5 Volume of Livestock Slaughtered

• The average annual growth rate for the quantity of livestock (including carabao, cattle, and hogs) slaughtered during the period 1975-1980 was 10.2%. Chicken are usually slaughtered at poultry farms rather than slaughterhouses (see Table 20).

3.2 Markets

Tacloban's main market is easily accessible due to its central location. There are 4 other markets located throughout the city.

3.3 Estimated Food Requirements

Estimated food requirements based on the national government's nutritional recommendations are indicated in Table 21.

3.4 Food Deficiency

Computations using the national government's food requirement formula reveal that Tacloban has been deficient in rice, beef, cara-beef, pork, poultry and fish since 1970 (see Table 22).

3.5 Domestic Flow of Foodstuffs

Deficiencies necessitate the importation of basic foodstuffs from Cebu, Manila and elsewhere. Statistics from the Philippine Ports Authority show that for the year 1980 the inflow of rice amounted to 197,685 cavans², corn 177,055 cavans, and fruits and vegetables 126,917,000 kilograms. Leaving the city were 240,628 cavans of rice, 35,723 cavans of corn, and 1,277,000 kilos of fruits and vegetables.

² A cavan is a unit of measurement, used only with grains, equivalent to 50 kilograms.

Masbate followed by Samar, Biliran Sub-Province and Cebu are the city's major livestock suppliers (see Table 23).

3.6 Energy Consumption

As with building materials, the importing of food consumes energy and adds to the prices of the goods.

3.7 Institutional Factors

National government agencies which are directly involved in the food distribution and utilization sphere are the National Food Authority, which deals mainly with rice distribution, the Bureau of Animal Industry, the Bureau of Agricultural Economics, the Bureau of Agricultural Extension and the Bureau of Plant Industry. The local counterpart to these agencies is the City Agriculturist Office, which conducts research, initiates agricultural programs aimed at increasing productivity, and serves as a link between national government agencies and the people of Tacloban.

III. CONSERVATION PROBLEMS/OPPORTUNITIES

1. Building Materials

1.1 Increased utilization of locally produced building materials would save energy and cut costs.

1.2 Sand and gravel to be used for construction purposes could probably be produced within the city. Presently they are not.

1.3 Improved building designs could save energy by allowing more ventilation. Decreased usage of air conditioning and electric fans would be the hoped for result. Better designs could also improve drainage, increase water pressure in pipes, and permit enough light to enter building interiors to decrease dependence on electrical energy.

1.4 Incentives could be offered to encourage the construction of energy efficient buildings.

2. Industry

Cottage industries, especially those using locally available raw materials, could be promoted. Employment opportunities would be created.

3. Food Distribution and Utilization

3.1 New agricultural skills and industries could be developed. Possible activities are a) construction of greenhouses, b) propagation of herbs and spices, c) production of cut flowers, d) cultivation of high quality vegetables and fruits, and e) food production and processing.

These activities would supplement both families' diets and families' incomes. Because the people of Tacloban are not agriculturally oriented, a limited desire to learn such agricultural skills might be predicted. An extensive skills development training conducted jointly by the Local Government/City Agriculturist and the National Manpower and Youth Council would address this problem.

3.2 Marine product production and aquaculture activities could be expanded. Abalone culture, shell craft, aquaculture, and the construction of fishing storage facilities should be emphasized.

IV. PROPOSED STRATEGIES

1. Building Materials

1.1 The city can promote the utilization of certain locally available, non-conventional building materials. Coconut lumber may be used in construction. Research is currently under way on the feasibility of using resins like mango or jackfruit sap as a binder for wood products such

as wood paneling and wood tiles. Ash, the by-product of wood fuels, makes a good binder for lime-sand blocks.

1.2 Some recycled waste products can be used as building materials. Glass and metal are examples. Recycling could be promoted.

1.3 Establish cottage industries that convert the waste products of larger industries into building materials. Processing of glass and copper wastes are examples.

1.4 Develop Tacloban's potential sources of building materials. Within the city are deposits of clay, granite, and sand. Clay is the raw material for brickmaking, and granite can be crushed to produce aggregate.

1.5 The quantity of lumber consumed for construction purposes could be reduced. Seasoning either by sun-drying or kiln-drying increases the life span and durability of lumber, as does oil treatment in certain cases. Greater life span and durability mean a lower long term lumber requirement.

1.6 Council Minister Conrado Benitez of the Ministry of Human Settlements has instructed a task force to investigate modular coordination as a means of minimizing waste of building materials. The concept of modular coordination involves standardized dimensions for certain structural features like doors and windows. Appropriately sized building materials such as hollow blocks, lumber, and metal sheets would not have to be cut or trimmed but rather would fit together like the pieces of a jigsaw puzzle. Materials wastage would thereby be reduced. The potentialities of modular coordination should be investigated.

1.7 The construction of building material warehouses would reduce wastage and pilferage and would minimize supply disruptions.

1.8 The KKK livelihood program offers funding resources which should be tapped.

1.9 Energy efficient architectural designs and functional landscaping (e.g. the use of trees to shade structures) should be encouraged.

1.10 Tacloban's building code should be modified. Housing improvements and thus the economic development of the family could be stimulated by relaxing certain requirements. Also, revisions or additions to the building code could promote increased utilization of indigenous building materials.

2. Industry

2.1 Cottage industries specializing in mat weaving, bamboo craft, rattan craft, basket making, and nipa and palm product production should be encouraged. The products of these cottage industries could be exported both domestically and abroad. New businesses may, at first, require assistance in the areas of marketing, packaging, advertising, raw material production, inventory management, and quality control.

2.2 Tacloban could initiate a labor skills training program.

3. Food Distribution and Utilization

3.1 The construction of greenhouses would augment agricultural production. High quality vegetables marketable in Manila could be grown in an environment protected from climatic threats such as typhoons. Producing herbs, spices and flowers could generate income for backyard farmers.

Undeveloped tracts of arable land could be used to grow high quality vegetables and fruits. Developing food processing skills would reduce food spoilage.

3.2 Activities like abalone culture, shell craft, aquaculture, and the construction of fishing storage facilities should be encouraged.

3.3 Urban agriculture through intensive farming has energy saving potential and should therefore be emphasized.

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON

BUILDING MATERIALS, FOOD DISTRIBUTION &
UTILIZATION AND INDUSTRIAL DEVELOPMENT

OBSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS-ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IMPLEMENTING (LONG) (M)(MED) (S)(SHORT)	COST (HIGH) (M)(MED) (L)(LONG) (N)(NONE)	PRIORITY (RANK)
i. Better use of local building materials	A. Agriculturally based materials		Available agricultural waste	Acceptability of the market	Transport Land Use Energy		S	M	1
	1. Aggregates for cement products.		Locally available	Will require R & D	Un-quantified Energy amounts		L	M	3
	2. Resins from plant materials		Low cost production				S	L	2
	3. By products of wood fuel						L	L	3
	*charcoal *ash		Free	No local buyers	Water		L	N	2
	B. Waste Recycled		Free				L	N	2
	1. Scrap metal	Identify sources	Locally available	Segregation and Collection	Transportation		L	L	3
	2. Glass	quantities, processing & demands	Free				L	N	4
	3. Plastic Collection		Minimum Cost				L	N	2
	4. Paper Products						L	L	1
C. Products of Heavy Industry						L	L	1	
1. Copper Products	Identify products + industries that can utilize copper & its by-products	Accessibility & Proximity to source	Limited Local Market			L	H	1	
2. Wastes of copper smelting		Available skills &				L	H	2	

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON

BUILDING MATERIALS, FOOD DISTRIBUTION &
UTILIZATION AND INDUSTRIAL DEVELOPMENT

CONSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS- ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IM- PLEMEN- TING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORITY (RANK)
II. Efficient and Cost Effective Use of Building Materials	Rock and Aggregate Production	Identify demands on Market Out- lets	technology for smaller skill industries	None					1
	Seasoning, Drying and Treatment of Lumber		Sufficient and ready supply of better quality materials						4
	Klinker Pro- cessing		Reduced transport charges						3
	Brick Making Cottage Indus- try								2
New Agricultural Skills/ Industries	Construction of Greenhouses	Training of New Skills & Introduce Water Demands							
	Propagation of Herbs and Spices								
	Cut flowers								
	High Quality Vegetables & Fruits								

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON

BUILDING MATERIALS, FOOD DISTRIBUTION &
UTILIZATION AND INDUSTRIAL DEVELOPMENT

CONSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS- ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IM- PLEMEN- TING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIORITY (RANK)
Cottage Industries	Food Processing and Production	Greater use and artificial propagation of raw materials							
	Mat Weaving & by-products								
	Bamboo & by- products								
	Rattan & Basket Making								
	Nipa, etc. Palm Products								
Resource Management	Modular Coordi- nation Labor Skills Training Warehousing Funding Schemes								
	Building Orientation								
	Functional Landscaping Maximizing Land Develop- ment	Cluster Mixed Use Enterprise Zone							
Site Planning and Design	Modifying Legal constraints	Building Code Modi- fication Zoning							

PRELIMINARY STRATEGY MATRIX FOR SECTOR ON

BUILDING MATERIALS, FOOD DISTRIBUTION &
UTILIZATION AND INDUSTRIAL DEVELOPMENT

CONSERVATION PROBLEM OPPORTUNITY	ALTERNATIVE	PROPOSED STRATEGY	ADVANTAGE	DIS- ADVANTAGE	RELATION TO OTHER SECTORS	IMPLEMENTING AGENCIES	TIME FOR IM- PLEMEN- TING L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LONG) N(NONE)	PRIO- (RAN.)
Financial Incentives to Encourage Energy Efficient Buildings	Abalone and other none traditional marine foods Shellcraft Fishing Storage Aquaculture from sewage wastes								
Better Production for Aqua Culture and Marine Products	Urban Agriculture through incentive farming								
Provision/generation of Employment Oppor- tunities	Expanded cottage industries deve- lopment skills training for exportable labor & future needs of the region								

TABLE I
 NUMBER OF DWELLING UNITS BY TYPE OF BUILDING
 Construction Materials Used in Walling
 Tacloban City, 1970-1980

Type of Construction Materials	Single	Duplex	Apartment: Accessoria	Barong- Barong	Commer- cial	Indus- trial	Institu- tional	Total	% of Total
1970									
Concrete	791	181	240	-	82	3	3	1,300	10.57
Galvanized Iron	92	20	5	2	2	1	-	122	0.99
Wood	6,713	691	385	88	101	3	4	8,045	65.43
Bamboo	483	6	-	19	1	-	-	509	4.14
Nipa	1,735	50	17	331	-	-	-	2,133	17.35
Others	105	2	-	80	-	-	-	187	1.52
1975									
Concrete	1,750	186	350	-	89	3	3	2,381	18.89
Galvanized Iron	20	11	2	1	-	1	-	35	0.28
Wood	6,210	708	345	79	120	3	4	7,469	59.25
Bamboo	400	13	-	14	-	-	-	427	3.39
Nipa	1,500	60	3	500	-	-	-	2,068	16.41
Others	145	5	-	75	-	-	-	225	1.79
1980									
Concrete	5,429	253	476	-	121	4	3	6,286	36.67
Galvanized Iron	15	15	3	1	-	1	-	35	0.28
Wood	5,411	963	469	107	163	4	5	7,122	41.54
Bamboo	544	18	-	19	-	-	-	581	3.39
Nipa	2,040	82	11	680	-	-	-	2,813	16.41
Others	197	7	-	102	-	-	-	306	1.78

Source: NCSO
 Tacloban City

TABLE 2

NUMBER OF DWELLING UNITS BY TYPE OF BUILDING
Construction Materials Used for Roofing
Tacloban City, 1970-1980

Type of Construction Materials	Single	Duplex	Apartment	Barong-barong	Commercial	Industrial	Institutional	Total	% of Total
1970									
Galvanized Iron	: 2,722	: 541	: 461	: 12	: 6	: 6	: 7	: 3,925	: 31.92
Asbestos	: 67	: -	: 21	: -	: -	: -	: -	: 88	: 0.72
Tile/concrete	: 51	: 21	: 5	: -	: 1	: -	: -	: 78	: 0.63
Cogon	: 260	: 7	: -	: 16	: -	: -	: -	: 283	: 2.30
Nipa	: 6,863	: 381	: 160	: 473	: 9	: 1	: -	: 7,887	: 64.14
Others	: 16	: -	: -	: 19	: -	: -	: -	: 35	: 0.28
1975									
Galvanized Iron	: 3,006	: 563	: 479	: 15	: 191	: 10	: 15	: 4,279	: 33.95
Asbestos	: 68	: -	: 26	: -	: -	: -	: -	: 94	: 0.75
Tile/Concrete	: 58	: 25	: 9	: -	: 1	: -	: -	: 93	: 0.74
Cogon	: 172	: 4	: -	: 18	: -	: -	: -	: 194	: 1.54
Nipa	: 6,811	: 396	: 150	: 490	: 8	: -	: -	: 7,915	: 62.79
Others	: 9	: -	: -	: 21	: -	: -	: -	: 30	: 0.24
1980									
Galvanized Iron	: 6,885	: 766	: 654	: 19	: 202	: 15	: 17	: 8,558	: 49.92
Asbestos	: 73	: -	: 38	: -	: -	: -	: -	: 111	: 0.65
Tile/Concrete	: 70	: 34	: 13	: -	: 1	: -	: -	: 118	: 0.69
Cogon	: 170	: 5	: -	: 22	: -	: -	: -	: 197	: 1.15
Nipa	: 6,874	: 539	: 153	: 549	: 8	: -	: -	: 8,123	: 47.38
Others	: 6	: -	: -	: 30	: -	: -	: -	: 36	: 0.21

Source: NCSO
Tacloban City

TABLE 3
 Number of Building Constructed
 Year 1979 - 1980

For the year 1979

For the year 1980

Kind of Building	Total No. of Buildings	Total Floor Area (Sq. m.)	Total Cost of Const.	Total Cost of Material	Total No. of Bldgs.	Total Floor Area (Sq. m.)
Residential	356	24,094.27	9,807,011.20	5,884,206.20	383	37,403.14
Commercial	53	15,264.39	10,251,149.00	10,150,689.40	36	9,617,215
Industrial					1	60
Government	3	271	185,000.00	11,000.00	3	5,064.50
Institutional	5	7,636.00	8,300,000.00	4,980,600.00	4	2,422.00
Agricultural	7	3,022.30	370,500	222,300.00	2	107.00

Table 3 Cont'd.

FOR THE YEAR - 1980

TOTAL COST OF CONSTRUCTION		:	TOTAL NUMBER OF MATERIALS	
Residential	27,037,173.00	:	16,222,303.80	
Commercial	5,631,387.00	:	3,378,832.44	
Industrial	37,200.00	:	22,320.00	
Government	7,800.00	:	4,680.00	
Institutional	1,684.00	:	1,018,400.00	
Agricultural	44,000.00	:	26,400.00	

Source: City Engineer's Office
Tacloban City

Table 4
Building Material Consumed for Vertical
Construction
Tacloban City, 1979

Kind of Const. Mtls.	:Residential: :Building	:Commercial :Building	:Agricultural :Building	:Government :Building	:Total
Cement	:112,900bag	:103,260bag	: 4,000 bag	: 12,287bags	: 232,447 bags
Structural Ste	:	:	:	:	:
Steel & Steel bar	:359,195kls.	:577,535kls.	: 20,000kls.	:109,813kls	:1,066,543 kls.
Lumber	:487,728bdft	:351,600bdft	: 15,000bdft	:591,169bdft	:1,445,497 bdft.
G.I. Sheet	: 18,300pcs.	: 3,190pcs.	: 800pcs.	: 2,035pcs.	: 24,325 pcs.
Gravel	: 10,215cum	: 2,690cum	: 90cum	: 645cum	: 13,630cu.m.
Concrete Hollow Block	:529,950pcs.	:124,700pcs.	: 5,000pcs.	: 46,240pcs.	: 705,890 pcs.
River Sand	: 8,212cum	: 2,170cum	: 60cum	: 1,128cum	: 11,570 cu.m.
Plywood	: 12,932pcs.	: 2,660pcs.	:	: 1,054pcs.	: 16,646 pcs.
Paint	: 8,345gal	: 1,970gal	:	: 700gal	: 11,015gal.
Nail & Bolt	: 59,625kls.	: 16,380kls.	:	: 1,200kls.	: 77,205kls.
Glaze tile	: 87,700pcs.	: 32,780pcs.	:	: 13,000pcs.	: 133,480pcs.
Water Closet	: 419set	: 135set	:	: 14set	: 568set
Lavatory	: 419set	: 135set	:	: 16set	: 570sst
G.I. Pipe	: 3,450kls.	: 5,970kls.	:	: 2,430kls.	: 11,850 kls.
G.I. Pipa	: 5,175kls.	: 1,350kls.	:	: 340kls	: 6,865 kls.
Roofing Clay Tile	:	:	:	: 17,000pcs.	: 17,000pcs.
T.W. Wire	: 399roll	: 135roll	:	: 20roll	: 554 rolls
	:	:	:	:	:
	:	:	:	:	:
	:	:	:	:	:

Source: City Engineer's Office
Tacloban City

Table 5
Building Materials Consumed for Horizontal
Construction
Tacloban City; 1979

	: Cement	: Gravel / Boulder	: Sand	: Comon Barrow	: Lumber	: Nail	: R.C. Culvert
1. Concrete Paving Super- market Area(2685sq.m)	: 2,821bags	: 356cum	: 178cum	:	: 500bdft	: 1 kl.	: 20@-100pcs.
2. Drainage Tacloban City (100 L.M.)	: 300bags	: 40cum	: 40cum	:	: 200bdft	: 0.2kg.	: 36@-20pcs. 30@-30pcs. 24@-50pcs.
3. Seawall (100 L.M.)	: 200bags	: 190cum	: 100cum	: 3620 cum	: 200bdft	: 0.2kg.	:
4. Concrete Paving Burgos St. (910 L.M.)	: 7390bags	: 1343cum	: 382cum	:	: 500bdft	: 2kg.	:
5. Concrete Paving J. Luna St.(364L.M.)	: 2956bags	: 308cum	: 153cum	:	: 500bdft	: 2kg	:
6. Concrete Paving El Reposo St. (300 L.M.)	: 2436bags	: 252cum	: 126cum	:	: 500bdft	: 2kg	:
7. Concrete Paving Sampaguita St.(330LM)	: 2598bags	: 269cum	: 134cum	:	: 500bdft	: 2kg	:
8. Concrete Paving T. Claudio St.(140L.M.)	: 1137bags	: 117cum	: 58cum	:	: 500bdft	: 1kg	:
9. Concrete Paving Jones St.(279 L.M.)	: 2265bags	: 234cum	: 117cum	:	: 500bdft	: 2kg	:
10. Concrete Paving Sto Niño St.(231L.M.)	: 1876bags	: 194cum	: 97cum	:	: 500bdft	: 1kg	:
11. Concrete Paving Lucente St.(100 L.M.)	: 812bag	: 84cum	: 42cum	:	: 500bdft	: 1kg	:
12. Concrete Paving Mabini St.(185L.M.)	: 1502bags	: 155cum	: 78cum	:	: 500bdft	: 1kg	:
13. Concrete Paving Lopez Jaena (150 L.M.)	: 1220bags	: 126cum	: 63cum	:	: 500bdft	: 1kg	:
14. Concrete Paving V & G Road (Approach) (250 L.M.)	: 2030bags	: 210cum	: 105cum	:	: 500bdft	: 2kg	:
15. Concrete Paving Picas Road(280L.M.)	: 1071bags	: 220cum	: 55cum	: 100cum	:	: 1kg	:
16. Concrete Paving Paterno-Apitong (2000 L.M.)	: 23126bags	: 6383cum	: 1542cum	: 700cum	: 1250bdft	: 5kg	:
17. Construction at Camansihay Police Training Center(535LM)	: 50bags	: 400cum	:	: 1000cum	:	:	: 30@-40pcs.
Total	: 53790bags	: 10881cum	3270cum	: 5420cum	7650bdft	: 24.4kg	24@-150pcs 30@-60pcs 36@-20pcs

Source: City Engineer's Office
Tacloban City

Table 6
Comparative Data on Services and
Manufacturing Establishments
Tacloban City: 1977-1980

Type of Industry	: 1980	: 1979	: 1978	: 1977
Noodle Manufacturing	1	1	-	-
Furniture Shops & Upholstery	16	16	16	16
Siopao Making	1	-	-	-
Making Coffins	2	2	2	2
Manufacturer (Viking Vetsin)	2	-	-	-
Rattan, Wooden & Bamboo Craft	10	10	10	10
Metalcraft, Handicraft, Shellcraft and Leathercraft	12	-	-	-
Wood Lamination	2	2	2	2
Guitar Making	2	2	2	2
Sculpture	2	2	2	2
Bakeries and Bakeshops	38	21	19	17
Rice Mills	12	14	13	12
CHB Manufacturing	7	-	-	-
Ice Cream, Ice Drop Factories	2	2	2	2
Ice Plant	6	2	2	2
Chicharon Making	2	2	2	2
Calamay Making	1	1	1	1
Popcorn Making	8	8	8	8
Distillery Rectifier	2	2	2	2
Soft Drink Factory	1	1	1	1
Soy Sauce Manufacturing & Coffee	3	2	2	2
Shoe & Slipper Factories	9	6	-	6
Making Figurines & Wall Decors	2	2	-	2
Printing Press	5	6	-	6
Goldsmith & Tinmith	11	8	-	8
Painting Shops	5	-	-	-
Barber Shops	8	-	-	-
Junk Shops	11	-	-	5
Floor Wax Manufacturing	-	-	-	1
Boat Building Shops	1	-	-	1
Dress Shops	15	15	12	7
Tailor Shops	55	45	32	23
Garment Manufacturing	1	1	-	1
Noodle (Miki) Factory	1	-	-	1
Total	256	173	130	144

Source: Bureau of Domestic Trade
Tacloban City: 1980

Table 7
SBAC Yearly Assisted and Approved Projects
Tacloban City: 1977-1980

Type of Industry	1977		1978		1979		1980	
	No. of Bus.	Average Project Cost	No. of Bus.	Average Project Cost	No. of Bus.	Average Project Cost	No. of Bus.	Average Project Cost
1. Food Manufacturing	2	1,800.00	-	-	2	70,000.00	-	-
2. Rattan Furniture Manufacturing	1	35,000.00	-	-	-	-	-	-
3. Manufacture of Furniture and Fixtures	1	300,000.00	-	-	2	375,000.00	-	-
4. Commercial Building	-	-	-	-	-	-	1	750,000.00
5. Medical & Other Health Service	1	750,000.00	-	-	-	-	-	-
6. Land Transportation	1	35,000.00	-	-	-	-	-	-
7. Manufacture of Agricultural Farm Machineries	1	300,000.00	-	-	-	-	-	-
8. Animal Feeds Processing	-	-	1	37,000.00	-	-	-	-
9. Printing & Allied Services	-	-	2	20,000.00	-	-	-	-
10. Fishing Industry	-	-	2	20,000.00	2	70,000.00	-	-
11. Manufacture of Machinery	-	-	2	5,000,000.00	2	70,000.00	-	-
12. Restaurant	-	-	1	100,000.00	-	-	-	-
13. Shell & Matalcraft Manufacturing	-	-	-	-	1	300,000.00	-	-
14. Manufacturing of Electrical Machine: & Appratus & Appliances	-	-	1	20,000.00	-	-	-	-
15. Piggery	-	-	1	300,000.00	2	600,000.00	-	-
16. Utilities	-	-	-	-	2	3,200,000.00	2	600,000.00
17. Manufacturing	-	-	-	-	3	80,000.00	12	5,400,000.00
18. Forestry	-	-	-	-	1	35,000.00	-	-
19. Livestock	-	-	-	-	2	2,500,000.00	-	-
20. Commerce	-	-	-	-	2	undetermined	6	3,500,000.00

(Over)

Table 7 (con'd)

Type of Industry	1977		1978		1979		1980	
	No. of Bus.	Average Project Cost	No. of Bus.	Average Project Cost	No. of Bus.	Average Project Cost	No. of Bus.	Average Project Cost
21. Agri-Business	:	-	:	-	:	-	:	-
22. Concrete Hollow Blocks Manufacturing	:	-	:	-	1	P 300,000.00	2	P 600,000.00
23. Services	:	-	:	-	1	300,000.00	:	-
24. Rice Mill and Grains Processing	:	-	:	-	1	20,000.00	13	6,200,000.00
	:	-	:	-	1	2,500,000.00	1	2,500,000.00
Total	7	P1,421,800.00	10	P5,497,000.00	25	P10,420,000.00	37	P19,550,000.00

Source: SBAC, Tacloban City Office

Table 8
Comparative Data of Cottage Industries
In Tacloban City Registered with NACIDA
1977 and 1979

Type of Industry	Number of Registered Industry		Number of Workers		Capitalization		Average Annual Volume of Sales	
	1977	1979	1977	1979	1977	1979	1977	1979
1. Ceramics	2	6	8	29	₱ 5,400.00	₱ 64,000.00	₱ 12,750.00	₱ 23,160.00
2. Food Preservation	2	3	5	16	₱ 3,980.00	₱ 35,000.00	₱ 85,600.00	₱ 66,000.00
3. Metal Crafts	2	5	7	23	₱ 8,900.00	₱ 73,950.00	₱ 24,000.00	₱ 22,400.00
4. Needle Crafts	5	-	27	-	₱ 16,576.00	-	₱ 46,000.00	-
5. Rattan Crafts	2	1	9	12	₱ 5,823.00	₱ 18,000.00	₱ 1,350.00	₱ 24,000.00
6. Related Crafts	2	2	15	10	₱ 1,000.00	₱ 28,500.00	₱ 4,500.00	₱ 10,000.00
7. Wood Crafts	5	3	14	11	₱ 10,270.00	₱ 28,640.00	₱ 44,000.00	₱ 23,000.00
8. Garments Manufacturing	-	4	-	27	-	₱ 63,000.00	-	₱ 36,600.00
9. Other Industries	-	3	-	13	-	₱ 35,200.00	-	₱ 28,300.00
10. Shell Craft	-	1	-	5	-	₱ 19,800.00	-	₱ 6,000.00
11. Poultry	-	1	-	3	-	₱ 12,078.00	-	₱ 15,000.00
12. Piggery	-	1	-	3	-	₱ 4,000.00	-	₱ 2,000.00
Total	20	30	85	152	₱ 51,949.00	₱ 382,168.00	₱ 218,200.00	₱ 256,460.00

Source: NACIDA, Tacloban City

Table 9
List of Commercial Establishment
By Type and Classification
Tacloban City: 1977-1980

Type	:	1980	:	1979	:	1978	:	1977
General Merchandize	:	183	:	241	:	171	:	243
Sari-sari Stores	:	1,234	:	432	:	400	:	572
Grocery Stores	:		:	6	:		:	13
Dry Goods	:	46	:	85	:	75	:	85
Fresh Fruits & Vegetables	:	19	:	38	:	23	:	47
Fresh Meat Dealers	:	35	:	-	:	50	:	48
Hardware, Electrical & Electronic Equipment	:	55	:	23	:	-	:	25
Tuba Gatherer	:	10	:	22	:	18	:	22
Drug Stores	:	-	:	13	:	-	:	14
Gasoline Service Stations	:	13	:	13	:	10	:	18
Home & Appliance Stores	:	9	:	9	:	9	:	8
Schools & Office Supplies	:	5	:	5	:	5	:	5
Department Stores	:	5	:	5	:	5	:	5
Lumber Stores	:	19	:	18	:	19	:	8
Coconut Retailers	:	7	:	8	:	7	:	8
Bazaars	:	5	:	5	:	5	:	5
Mat Retailers	:	3	:	5	:	3	:	5
Rice & Corn Dealers	:	30	:	51	:	40	:	65
Gas Dealers	:	8	:	8	:	8	:	8
Poultry and Feeds Dealers	:	3	:	3	:	3	:	3
Firewood Dealers	:	3	:	3	:	3	:	6
Automobile & Honda Dealers	:	5	:	5	:	5	:	5
Agricultural Supply, Fertilizer and Insecticides	:	12	:	-	:	3	:	3
Sand/Gravel Concession	:	-	:	-	:	-	:	5
Nipa Thatches	:	8	:	-	:	-	:	2
Auto Parts Dealers	:	-	:	-	:	-	:	10
Fresh Fish & Other Seafoods Vendors	:	62	:	75	:	81	:	139
Junk, Metal, Scrap Iron Dealer	:	-	:	2	:	7	:	16
Tobacco Dealer	:	4	:	4	:	-	:	3
Record Bar Center	:	2	:	-	:	-	:	3
Dried & Salted Fish Dealer	:	34	:	-	:	23	:	23
Miscellaneous Stores	:	-	:	-	:	86	:	14
Glasswares	:	-	:	-	:	-	:	3
Copra Dealers	:	26	:	-	:	-	:	40
Abaca Dealers	:	-	:	-	:	-	:	3
MCH Operator	:	137	:	-	:	180	:	-
Restaurant, Canteen, Eatery,	:	84	:	-	:	99	:	-

(over)

Table 9 (con'd.)

Type	1980	1979	1978	1977
Carenderia, Luncheonette				
Real Estate Dealer	63	-	38	-
PUJ Operator	47	-	46	-
Boarding House	43	-	37	-
General Contractor & Engineering Construction	24	-	27	-
Tailoring Shop	23	-	32	-
Cigarette Vendor	16	-	30	-
Commercial Banks	15	-	-	-
Concrete Cement & CHB Manufacturing	-	-	14	-
Drug Stores	14	-	-	-
Sports & Recreation	20	-	8	-
Decors, Handicraft & Woodcraft	20	-	8	-
Distributors	12	-	-	-
Trucking & Hauling Services	10	-	8	-
Pensions & Hotels	19	-	7	-
Photo Studio	10	-	-	-
Nightclubs, Disco Pads and Cocktail Lounges	10	-	9	-
Peddlers	7	29	7	-
Beauty Parlors	10	-	11	-
Home Appliances	8	-	-	-
Optical Laboratory	8	-	9	-
Catering Services	8	-	8	-
Barbershop	8	-	8	-
Messengerial Services	5	-	5	-
Movie Houses	8	5	4	-
Copying Center	4	-	4	-
Popcorn Vendor	4	-	4	-
Janitorial Services	4	-	4	-
Collecting Rentals	3	-	3	-
Shipping Lines	4	-	3	-
Dental Clinics & Supplies	14	-	3	-
Funeral Services	2	-	2	-
Insurances	24	-	-	-
Watch Repair Services	-	-	4	-
	-	-	4	-
T o t a l	2,533	1,113	1,685	1,482

Source: Bureau of Domestic Trade
Tacloban City: 1980

Table 10
Domestic Flow of Commodities
Tacloban City
1980

P O R T S	ENTRANCE		CLEARANCE	
	Volume	Percentage Distribution	Volume	Percentage Distribution
1. Balangiga	-	-	558.68	1.20
2. Biliran	199.72	0.27	116.98	0.25
3. Borongan	1,902.77	2.55	-	-
4. Cagayan	2,479.48	3.33	-	-
5. Caibiran	735.09	0.99	301.70	0.65
6. Calbayog	2,263.37	3.04	-	-
7. Calubian	636.69	0.85	-	-
8. Catbalogan	-	-	7,216.98	15.45
9. Cebu City	33,344.69	44.76	10,465.44	22.40
10. Gamay	7,296.62	9.79	-	-
11. Giporlos	1,430.45	1.92	1,004.65	2.15
12. Guian	-	-	13,056.46	27.95
13. Malitbog	91.64	0.12	-	-
14. Manila	21,247.19	28.52	5,214.99	11.16
15. Naval	229.82	0.31	-	-
16. Oras	990.01	1.33	2,522.00	5.40
17. San Policarpo	854.44	1.15	-	-
18. Zamboanga City	800.00	1.07	6,255.00	13.39
Total	74,501.98	100.00	46,712.88	100.00

Source: PPA, Tacloban City

TABLE 11
Banking Institutions
Tacloban City
1980

PARTICULARS	;	LOCATION
1. Philippine National Bank	:	Justice Romualdez Street
2. Prudential Bank	:	Justice Romualdez Street
3. Family Savings Bank	:	Rizal Avenue
4. Rizal Commercial Banking Corporation	:	Salazar corner Zamora Streets
5. Development Bank of the Philippines	:	Zamora corner Paterno Streets
6. Metro Bank	:	Rizal Avenue
7. Insular Bank of Asia and America	:	Salazar Street
8. Philippine Commercial and Industrial Bank	:	Zamora corner Salazar Streets
9. Bank of the Philippine Islands	:	Justice Romualdez corner M.H. del Pilar Streets
10. Philippine Veterans Bank	:	Justice Romualdez Street
11. United Coconut Planters Bank	:	Zamora Street
12. Equitable Banking Corporation	:	Gomez corner Rizal Avenue Streets
13. Consolidated Bank	:	Rizal Avenue
14. Central Bank	:	Senator Enage Street
15. Rural Bank of Tacloban	:	Marasbaras
16. Allied Bank *	:	Justice Romualdez Street
17. Banco Filipino*	:	Justice Romualdez corner Senator Enage Streets
18. Island Development Bank*	:	Marasbaras
19. Land Bank*	:	Salazar Street
20. Producers Bank*	:	Salazar Street

* Banks which started their operation after 1977.

Table 12
Insurance Services
Tacloban City
1980

Particulars	Type of Services Offered	Location
1. Loyola Life Plan Inc.	Memorialization & Assurance	Oceanic Bldg. J. Romualdez St.
2. Manila Bankers Insurance and Surety Company	Life Insurance	J. Romualdez St.
3. Phil-Am Life Insurance	Policy Loans, Accidents Hospitalization Benefits	Cor. Paterno and J. Romualdez St.
4. Great Pacific Life Assurance Corporation	Industrial Life Insurance	Rm. 40 Shopping Center
5. Filipinas Life Assurance Company	Industrial Life Insurance	J. Romualdez St.
6. Towers Assurance Corp.	Non-life Insurance	Rm. 16 Shopping Center
7. Zenith Insurance Corp.	Non-life Insurance	Rm. 47 Shopping Center
8. Travelers Life Assurance of the Philippine Inc.	Life Insurance	Shopping Center
9. Celebes Insurance Corp.	Non-life Insurance	Rm. 139 Shopping Center
10. Insular Life Assurance Company LTD	Life Insurance	Cor. J. Romualdez St. & M.H. del Pilar
11. Gen. Insurance & Surety	Non-life Insurance	Cor. J. Romualdez St. P. Paterno Street
12. Phil-Am Gen Insurance Co.	Non-life Insurance	Cor. J. Romualdez St. & Paterno St.
13. Fortune Insurance Corp.	Non-life Insurance	G. Villasin Bldg.
14. Pacific Memorial Plan	Pre-Need Plan Memorial	Oceanic Bldg.
15. Sterling Life Group Company	Life & Non-life Insurance	Oceanic Bldg.
16. Bancom Development Corp.	Money Market, Investment Financial Planning	Rovic Bldg. Cor. Zamora & M.H. del Pilar
17. Commercial Credit of Cebu	Financing & Leasing	Cor. del Pilar & Imelda Avenue
18. Radio Wealth Finance Corp.	Discounting of Notes	Cor. Salazar & Gomez Streets
19. World Wide Insurance Corporation	Non-life Insurance	Rm. 22 Shopping Center
20. Vortex Insurance Marketing Agency	Non-life Insurance	Rm. 26 Shopping Center
21. Prudential Life Plan, Inc.	Memorial Services	Mandawe Bldg. J. Romualdez Street
22. Country Bankers & Surety Company	Non-life Insurance	Cor. Zamora St. & Salazar Streets
23. Rende gem Funds and Distribution	Salary Loan Employer Lender Agreement	220 ParBurgos Street

Source: Bureau of Domestic Trade
Tacloban City

Table 13
Foreign Tourist Arrival
Tacloban City
1974-1980

NATIONALITY	1974	1975	1976	1977	1978	1979	1980
American	960	1,586	1,335	2,352	2,827	3,073	3,464
Australian	505	798	562	1,171	539	586	661
British	154	174	346	203	310	337	380
Chinese	433	433	609	1,173	2,261	2,458	2,771
Greek	14	445	-	367	126	137	154
Japanese	1,615	2,376	840	3,682	4,079	4,434	4,999
Korean	151	1,073	366	212	434	472	532
Liberian	442	9	-	633	86	93	105
Norwegian	126	64	-	128	17	19	21
Panaman	962	705	-	676	74	80	90
Russian	205	126	263	195	165	179	202
French	-	-	160	79	388	422	476
Italian	-	-	118	254	115	125	141
German	-	-	168	238	359	390	440
Canadian	-	-	191	150	286	311	351
Overseas Filipino	472	2,108	-	1,221	2,695	2,929	3,302
Balikbayan	-	-	818	-	-	-	-
Others	1,051	454	97	712	840	913	1,029
Austrian	-	-	-	22	24	26	29
Belgian	-	-	-	-	23	25	28
Dutch	-	-	-	-	3	3	3
Indian	-	-	-	18	28	30	34
Indonesian	-	-	-	35	10	11	12
Iranian	-	-	-	22	80	87	98
Libian	-	-	-	56	29	32	36
Malaysian	-	-	-	34	16	17	19
Morovian	-	-	-	496	41	45	51
New Zealander	-	-	-	126	23	25	28
Puerto Rican	-	-	-	24	-	-	-
Singaporean	-	-	-	159	82	89	100
Spanish	-	-	-	11	34	37	42
Swedish	-	-	-	12	2	2	2
Swiss	-	-	-	140	69	75	85
Thai	-	-	-	91	12	13	15
Turkish	-	-	-	6	7	8	9
Mexican	-	-	-	-	-	-	-
African	-	-	-	-	-	-	-
Denish	-	-	-	-	-	-	-
Hollander	-	-	-	-	-	-	-
Irish	-	-	-	-	-	-	-
TOTAL	7,090	10,351	5,873	14,625	16,084	17,483	19,709

Source: Ministry of Tourism
Region VIII, Tacloban City

Table 14
Tourist Spots in Tacloban City
1980

TOURIST SPOT	LOCATION	DESCRIPTION	FACILITIES
1. Marcos Bridge	Along San Juanico Strait Cabalawan	Connects Leyte and Samar province; the longest bridge in the Phil. and Asia	Scenic-viewing; lovely islets; beautiful scenery; boating and picnics
2. Price Mansion	Justice Romualdez St.	It served as the provincial capitol and the temporary seat of the Commonwealth Government from October 20-23, 1944. It is where Gen. MacArthur narrowly escaped death from a Japanese Kamikazo bomb that dropped into his room	Historic viewing
3. Provincial Capitol	Magsaysay Boulevard	Infront of Plaza Libertad and it is the seat of Provincial Government	Historic-viewing of murals depicting the First Mass and MacArthur Landing
4. Divine Word University Museum	Imelda Avenue	Contains relics and artifacts of Leyte and Samar	Cultural and historic viewing
5. Redoña Residence	T. Claudio Street	Official residence of Pres. Osmeña when he came with Gen. Douglas Mac-Arthur	Historic viewing
6. Sto Niño Shrine	Justice Romualdez St.	Contains miraculous image of Sto: Niño the Patron Saint of Leyte	Cultural viewing
7. Sto. Niño Shrine	Real Street	Contains different kinds of Sto. Niño de Leyte	Cultural viewing
8. City Hall	Kanhuraw Hill	Overlooking the City, scenic Cancabato Bay, San Pedro Bay, Samar Island and San Juanico Strait	Scenic viewing

Table 14 (Cont'd)

TOURIST SPOT	LOCATION	DESCRIPTION	FACILITIES
9. San Juanico Strait	Between the provinces of Leyte & Samar	It has beautiful islets and whirlpools. The narrowest navigable strait in the world.	Scenic viewing
10. Dio Island	East of Bo. San Jose	It is 7 minutes from Tacloban Harbor serves as place for educational tours/excursion.	Beach resorts; swimming, boating, water skiing
11. White Beach	Barrio San Jose	It is 7 kms. away from the city proper and the nearest popular resort of the city complete with public and private beach houses; center of San Jose Fishing Village and DZR Airport.	Ideal for fishing, swimming, swimming surfacing and picnic
12. Redeemtorist Church	Real Street	The shrine of the Mother of Perpetual Help.	Cultural viewing
13. MacArthur Landing	Red Beach, Palo	Life size monuments of General MacArthur and party when he landed with the Liberated Forces in Oct. 20, 1944 proposed Government Center and Imelda Park nearby.	Historical and scenic viewing
14. Children's Park	Magsaysay Boulevard	The City's Disneyland	Playground
15. U.P. Botanical Park	Magsaysay Boulevard	A collection of plants with its scientific names.	Educational, scenic viewing, and picnicking.
16. Kataisan Point	Along San Pedro Bay	This was once the home base of pre-war "PATCO" aircraft and the B 29's B 24' of the USAF during the last Pacific War, and now the modern Daniel Z. Romualdez Commercial Airport.	Educational scenic viewing, and picnicking
17. Leyte-Samar People's Library	Real Street	A library with collection of books	Cultural viewing

Source: Ministry of Tourism, Region VIII
 Tacloban Field Office
 Tacloban City 1981

Table 15
Motels and Other Tourism Oriented Establishment
Tacloban City
1980

Name of Hotels	Location	Number of Rooms	Tel. No:	Classification
1. Leyte Park Hotel	Magsaysay Boulevard	100	20-65	Five Star
2. Primrose Hotel	P. Zamora Street	28	22-48	One Star Economy
3. Rovic Hotel	P. Zamora Street	28 air-conditioned	26-70	One Star Economy
4. Tacloban Plaza Pensione	J. Romualdez Street	28 air-conditioned	24-44	Pensione
5. Tacloban Village Inn	Imelda Avenue	35 air-conditioned	29-26	Tourist Inn
6. Ramar Tourist & Executive Suite	Lukban Street	11 air-conditioned	28-93	Pensione
7. Wanderer's Lodging House	Rizal Avenue	16 rooms	28-84	Lodging House
8. Allee's Lodge	Cor. Burgos & M.H. del Pilar	18 rooms	23-72	Lodging House
9. Tacloban Travelers Lodge	P. Zamora Street	9 air-conditioned	none	not classified yet
10. New Villalon Motel	San Jose, Tacloban City	7 rooms	28-82	Motel
11. San Juanico Travel Lodge	J. Romualdez Street	30 rooms	26-82	Lodging House
12. Mari Charisse Pensione	36 Dadison Street	50 rooms	none	Pensione
13. Walk-In Fastfood & Lodge	M.H. del Pilar	10 non-aircon	none	Lodging House
14. Imperial Lodging House	J. Romualdez Street	14 rooms	21-37	Lodging House
15. Central Lodging House	Cor. del Pilar & J. Romualdez Street	11 rooms	none	Lodging House
16. Benedicto Pensione	Lopez Jaena Extension	45 rooms	27-68	Pensione House
17. Iris Lodging House	Senator Enage Street	16 rooms	29-91	Lodging House
18. Tacloban Townhouse Lodge	Sagcahan District	11 rooms	22-21	Lodging House
19. Dio Island Resort	San Jose, Tac. City	14 rooms	29-00	Beach Resort
Total		481		

Note: New Villalon Motel has 12 cottages & Leyte Park Hotel has ten giving a total of 22 tourism-oriented cottages.

Consolidated By: CPDS, Tacloban City

TABLE 16
 AGRICULTURAL PRODUCTIVE AREA OF SELECTED CROPS
 Tacloban City
 1970-1980

NAME OF CROP	A R E A I N H E C T A R E S								
	1970	% of Total	1975	% of Total	Rate of Inc./Dec.	1980	% of Total	Rate of Inc./Dec.	
Coconut	603	34.38	548	39.65	-9.12	463	45.39	-15.51	
Corn	250	14.25	183	13.24	-26.8	110	10.78	-39.89	
Fruits and Vegetables	272	15.51	210	15.20	-22.79	202	19.80	- 3.81	
Rice	629	35.86	441	31.91	-29.89	245	24.03	-44.44	
T O T A L	1,754	100.00%	1,382	100.00%	(21.21%)	1,020	100.00%	26.19	

Source: City Agriculturist Office
 Tacloban City

TABLE 17
 VOLUME OF PRODUCTION OF SELECTED AGRICULTURAL CROPS
 Tacloban City
 1970-1980

NAME OF CROPS	:	1970	:	1975	:	Rate of Inc./Dec.	:	1980	:	Rate of Inc./Dec.
Rice (Cavans)	:	31,995	:	22,888	:	-28.46	:	13,075	:	-42.87
Corn (Cavans)	:	3,042	:	2,153	:	-29.22	:	1,199	:	-44.31
Fruits and vegetables (kgs.)	:	145,155	:	113,980	:	-21.48	:	105,953	:	- 7.04
Coconuts (nuts)	:	842,233	:	808,480	:	- 4.01	:	725,780	:	-10.23

Source: City Agriculturist Office
 Tacloban City

Table 18
Livestock and Poultry Population
Tacloban City: 1975-1980

Type	1975	1976	1977	1978	1979	1980	Average Annual Growth Rate By Type
Carabao	680	600	870	853	907	880	6.93
Cattle	329	385	224	437	392	234	3.94
Swine	4,181	4,340	3,500	4,910	3,894	3,510	(1.16)
Poultry	12,757	12,805	10,224	13,760	12,978	10,770	6.49
Others	2,487	2,523	2,267	3,831	3,794	3,640	11.05
Total	20,434	20,653	17,085	23,791	21,965	19,034	.40

Source: Ministry of Agriculture
Region VIII, Tacloban City

Table 19
Volume of Fish Catch
Tacloban City: 1976-1980

Fishing Ground	VOLUME OF FISH PRODUCTION (In Metric Tons)				
	1976	1977	1978	1979	1980
Carigara Bay	66.3	81.3	82.84	75.30	69.08
Layte Gulf	145.0	177.3	196.71	100.07	76.68
San Pedro Bay	140.0	148.1	168.83	192.47	222.44
Samar Sea	3.61	-	19.69	35.77	132.26
Total	354.91	406.7	468.07	403.61	500.46
% of Inc./Dec.	-	14.59	15.09	(13.77)	23.88

Source: Bureau of Fisheries and Aquatic Resources
Region No., Tacloban City

Table 20
Volume of Slaughtered Livestock
Tacloban City
CY, 1971-1980

YEAR	CARABAO		CATTLE		SWINE		Total No. of Heads	Rate of Inc./Dec.	Total No. of Kiags	Rate of Inc./Dec.
	Heads	(Kgs.)	Heads	(Kgs.)	Heads	(Kgs.)				
1971	1,825	370,338	1,281	105,564	13,871	405,163	16,977	-	881,065	-
1972	1,344	226,675	1,235	116,133	12,418	399,477	14,997	(11.66)	742,285	(15.75)
1973	1,855	277,246	1,614	147,041	16,500	324,112	19,969	33.15	748,399	8.80
1974	1,588	217,630	1,712	141,333	15,912	527,920	19,212	(3.79)	896,883	18.50
1975	1,223	191,567	2,775	152,196	16,191	534,820	20,139	5.09	878,583	9.94
1976	1,040	231,533	1,191	154,301	11,185	590,966	13,416	(33.55)	976,800	11.18
1977	2,195	375,345	1,758	154,704	20,937	669,984	24,890	85.52	1,200,033	22.85
1978	2,372	405,612	1,965	172,920	22,590	722,880	26,927	8.18	1,301,412	8.45
1979	2,150	367,650	1,781	156,728	20,473	655,136	24,404	(9.37)	1,179,514	(9.37)
1980	2,535	406,017	1,805	147,102	24,532	640,466	28,872	18.31	1,193,585	1.19
Average Annual Growth Rate								10.21	4.31	

Sources: Tacloban Livestock "Okayon" Market
Barangay Diit, Tacloban City

Table 21
Food Requirements of Tacloban City Population
1970-1980

YEAR	POPULATION	: 80% of Total : : Population	PER CAPITA FOOD REQUIREMENT					
			: Rice @ 4.2 : : cavans	: Fish @ 11.85 : : kgs.	: Beef @5.25 : : kgs.	: Cara-beef: : @ 11.13 : : kgs.	: Pork @ : : 19.84 : : kgs.	: Poultry : @ .53 kgs.
1970	76,531	61,225	257,145	725,516	321,431	681,434	1,214,704	32,449
1975	80,707	64,566	271,177	765,197	338,972	718,620	1,280,989	34,220
1980	103,433	82,746	347,533	980,540	434,417	920,963	1,641,681	43,855

* Only 80% is nationally considered rice, fish and meat eating population the rest (includes populace whose ages are 3 years and below) are not.

* 4.2 cavans is the nationally recommended rice requirement per capita per annum.

* The recommended fish and meat requirement is derived by multiplying 48.6 kgs. the nationally recommended fish and meat requirement per capita per annum by the percentage share of livestock slaughtered and fish produced.

Table 22
Food Deficiency of Tacloban City
1970-1980

PARTICULARS	Y E A R		
	1970	1975	1980
1. <u>Rice</u> (cavens)			
requirement	257,145	271,177	347,533
production	31,995	22,888	13,075
deficiency	225,150	248,289	334,458
2. <u>Fish</u> (kgs.)			
requirement	725,516	765,107	980,540
production	-	-	500,460
deficiency			480,080
3. <u>Beef</u> (kgs.)			
requirement	321,431	338,972	434,417
production	-	27,636	19,656
deficiency	-	311,336	414,761
4. <u>Cara-Beef</u> (kgs.)			
requirement	681,434	718,620	920,963
production	-	114,920	148,720
deficiency	-	603,700	772,243
5. <u>Pork</u> (kgs.)			
requirement	1,218,704	1,280,989	1,641,681
production	-	129,611	108,810
deficiency	-	1,151,378	1,532,871
6. <u>Poultry</u> (kgs.)			
requirement	32,449	34,220	43,855
production	-	15,308	12,924
deficiency	-	18,912	30,931

Table 23
Domestic Flow of Selected Commodities
Tacloban City
1980

COMMODITY	:	INFLOW	:	OUTFLOW
1. rice (cavans)	:	197,685	:	240,628
2. corn (cavans)	:	177,055	:	35,723
3. sugar (kgs.)	:	633,374,000	:	90,998,000
4. flour (kgs.)	:	862,547,000	:	86,553,000
5. salt (kgs.)	:	307,714,000	:	24,296,000
6. fruit/vegetables (kgs.)	:	126,917,000	:	1,277,000

* Tacloban City being the center of Trade and Commerce transports commodities from major ports like Cebu & Manila into the city but these commodities are not only consumed by Taclobanon residents but some are in turn transported to the different parts of Leyte and Samar.

V. MANPOWER PROGRAMS

There follows a Manpower Program Matrix. Many of the strategies proposed in the various committee reports would cause jobs to be created or lost. The Manpower Matrix forecasts employment implications of individual strategies.

MANPOWER PROGRAM MATRIX

SECTORAL PROGRAM/ PROJECT PROPOSAL	MANPOWER IMPACTS		MANPOWER TRAINING PROGRAM		
	JOBS CREATED	JOB LOSSES	TRAINING REQUISITES	TIME FRAME L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LOW)
I. LAND USE PLANNING					
1. Resource Efficiency Guidelines	Persons employed to prepare guidelines	none	Seminar/Workshop on Guidelines Preparation	S	L
2. Urban Farming					
2.1 Urban Farming & Fisheries	Farm workers and related jobs due to the forward & backward linkage effect Persons hired to conduct agricultural potential survey	none	Urban farming and fishing technology and skills training	M	L
2.2 Industrial Centers Identification & Development	Persons hired to undertake the studies & site development	Possible job losses can be more than offset by new jobs created	Training courses designed for the implementation of this program	S	L
2.3 Development of Export Processing Zone	Jobs for workers in the zone	none	Various skills training for Zone Workers	L	M
II. TRANSPORTATION					
1. Formulation of Integrated Transport Traffic Plan	Persons hired to do the following: 1.1 Transport Data Ranking 1.2 Preparation of the Plan	Employed persons in affected transport sub system considered no longer responsive to the needs of the over-all system	Seminar-Workshop for Researchers and Planners	S	

MANPOWER PROGRAM MATRIX

SECTORAL PROGRAM/ PROJECT PROPOSAL	MANPOWER IMPACTS		MANPOWER TRAINING PROGRAM		
	JOBS CREATED	JOB LOSSES	TRAINING REQUISITES	TIME FRAME L(LONG) M(MED) S(SHORT)	COST H(HIGH) M(MED) L(LOW)
III. ENERGY & ELECTRIC POWER SYSTEM					
1. Development of Indigenous Energy Resources	Persons employed due to backward-forward- linkage effect	none	Skills training and technology transfer	M	M
WATER, SEWER AND SOLID WASTE					
1. Design of Effi- cient Water Supply Distribution, collection main- tenance system	Persons hired to make the design Persons hired for efficient maintenance	none	Seminar workshop for the designer Training for Plumbers	S	:
2. Construction of Infrastructures and Installation of equipments for sewer and solid waste system	Persons hired for construction and installation	none	Skills training for construction	S	L
Design of Effi- cient Solid Waste Disposal	Persons hired to do the design	none	Seminar/Workshop for persons concerned	S	:
BUILDING MATERIALS & INDUSTRIAL DEVE- LOPMENT					
1. Development of Indigenous Building Materials	Persons employed due to backward-forward linkage effect	none	Training on appro- priate technology transfer	M	M

MANPOWER PROGRAM MATRIX

SECTORAL PROGRAM/ PROJECT PROPOSAL	MANPOWER IMPACTS		MANPOWER TRAINING PROGRAM		
	JOBBS CREATED	JOB LOSSES	TRAINING REQUISITES	TIME FRAME L(LONG) M(MED) S(SHORT)	COST H(H) M(M) L(L)
2. Institutionalization of Site Planning and design and building orientation	Persons hired	none	Orientation/Seminar for building planners (architects)	S	M
VI. IDENTIFICATION OF INDUSTRIAL CENTERS	Same as Item 2.2 & 2.3 of Land Use Planning				
VII. FORMULATION OF THE FIVE YEAR MANPOWER PLAN FOR TACLOBAN CITY	Planners hired	none	Manpower Planning Seminar/Workshop	S	L