Figures

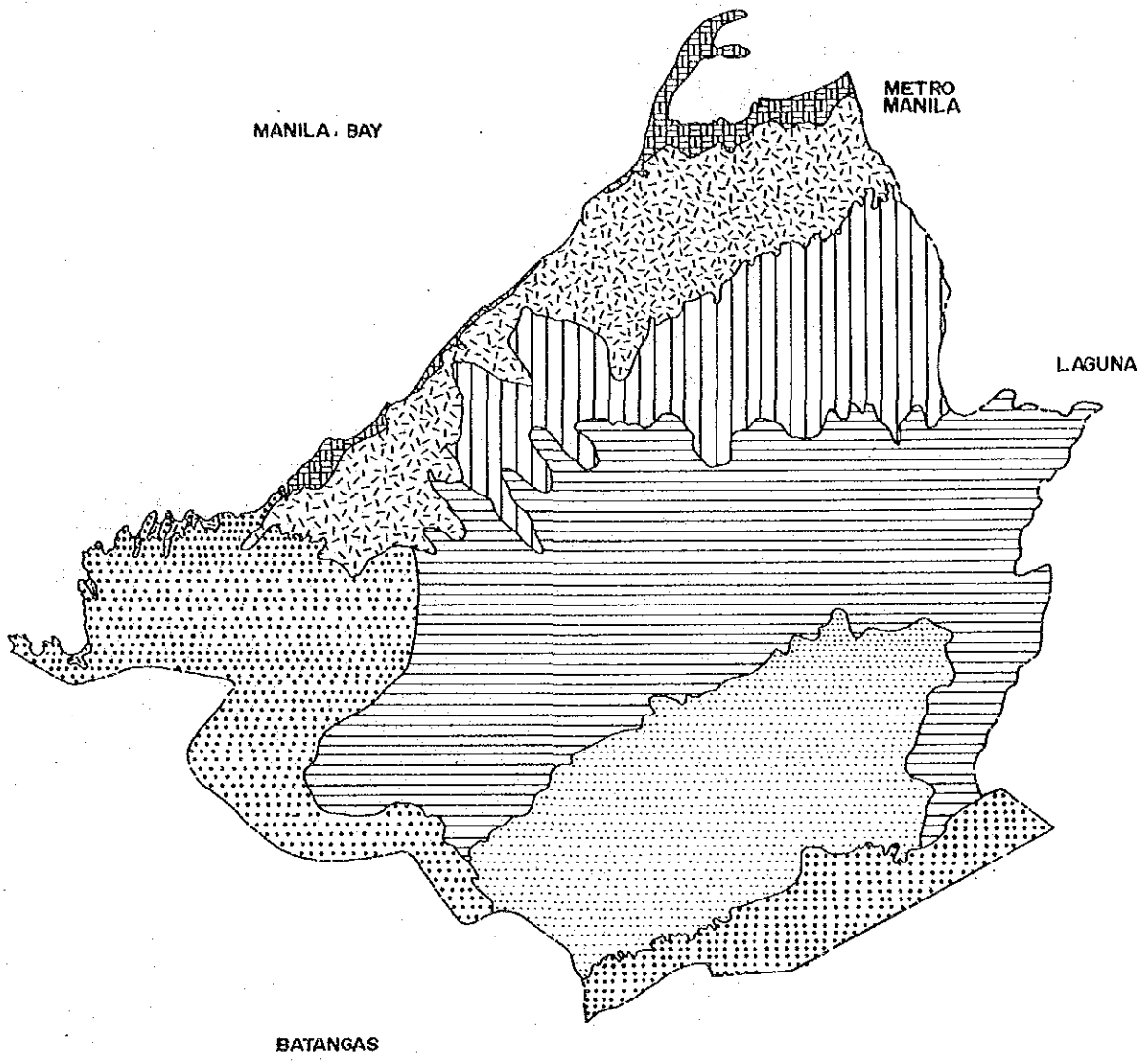


FIGURE J.1

Cavite Physiography Map

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- ALLUVIAL PLAIN
- COASTAL PLAIN
- TERRACE 1.
- TERRACE 2.
- HILLS (LOW RELIEF)
- HILLS (HIGH RELIEF)

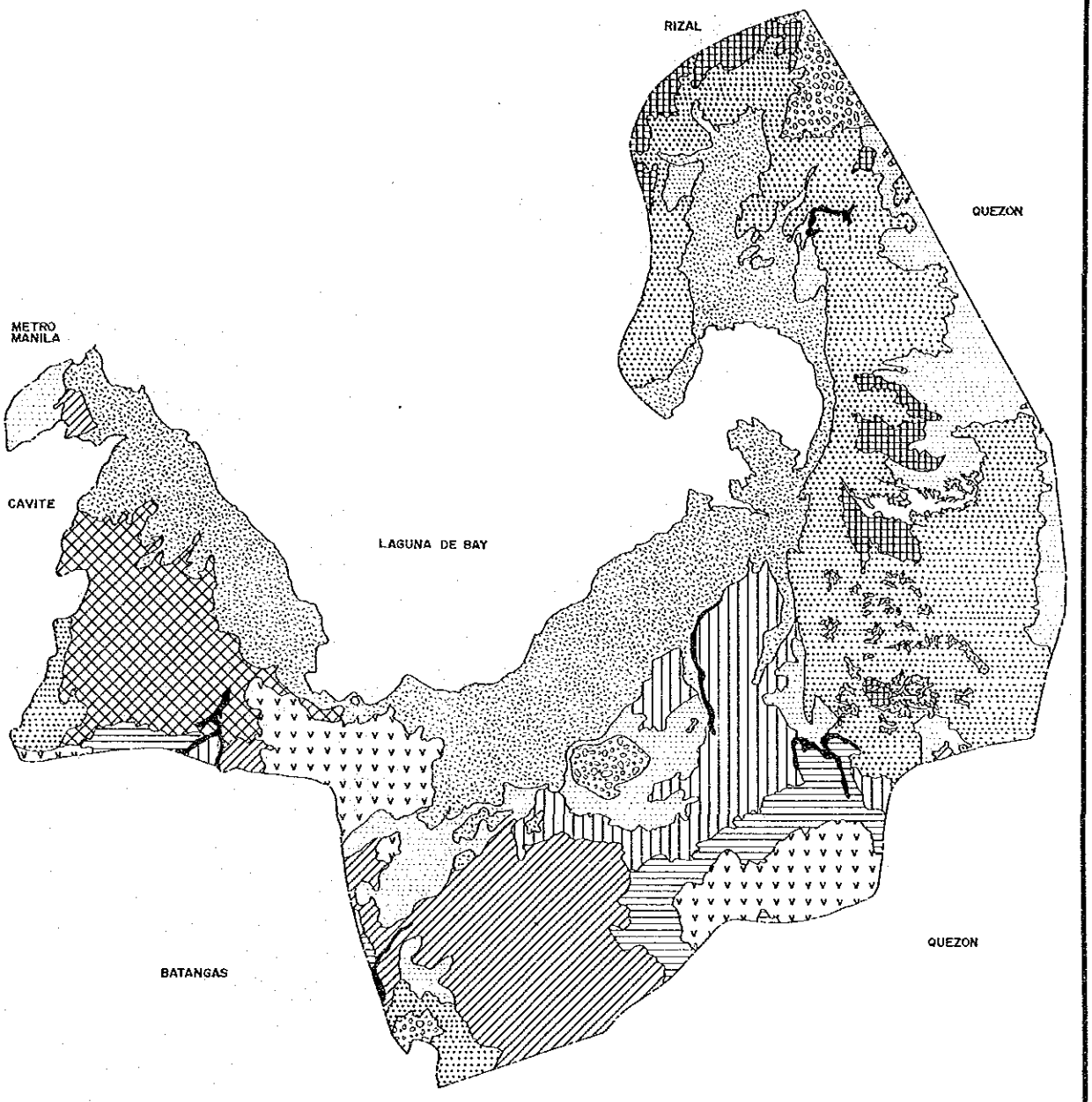


FIGURE J.2

Laguna Physiography Map

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- ALLUVIAL PLAIN
- TERRACE 1.
- TERRACE 2.
- FOOT SLOPES
- MOUNTAIN
- PLAINS
- PLATEAUS
- HILLS (LOW RELIEF)
- HILLS (HIGH RELIEF)
- VOLCANICS
- MISCELLANEOUS
- SCARPMENTS

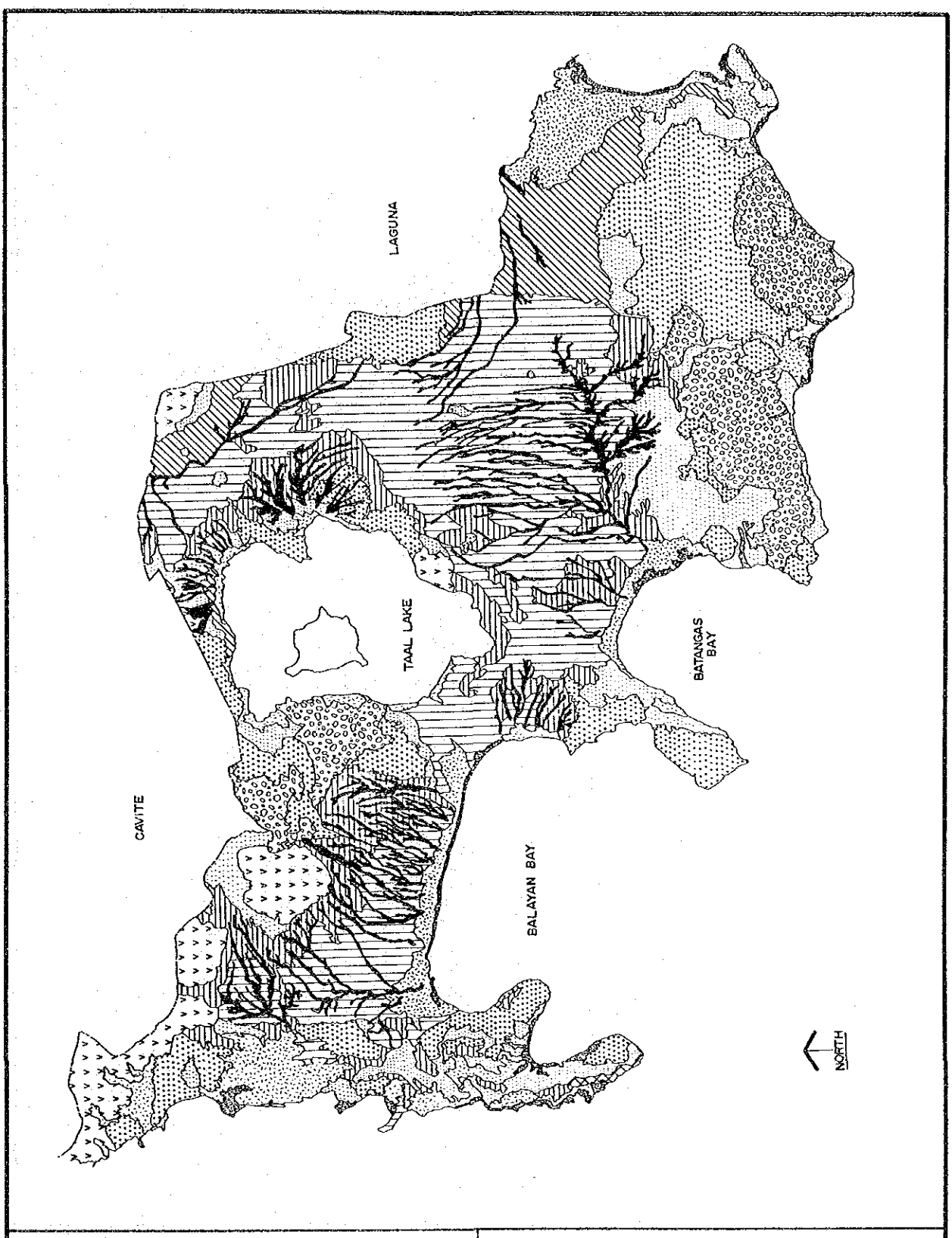


FIGURE J.3

Batangus Physiography Map

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- ALLUVIAL PLAIN
- COASTAL PLAIN
- TERRACE 1.
- TERRACE 2
- FOOT SLOPES
- SCARPMENTS
- HILLS (LOW RELIEF)
- HILLS (HIGH RELIEF)
- MOUNTAIN
- VOLCANICS
- MISCELLANEOUS
- PLAINS

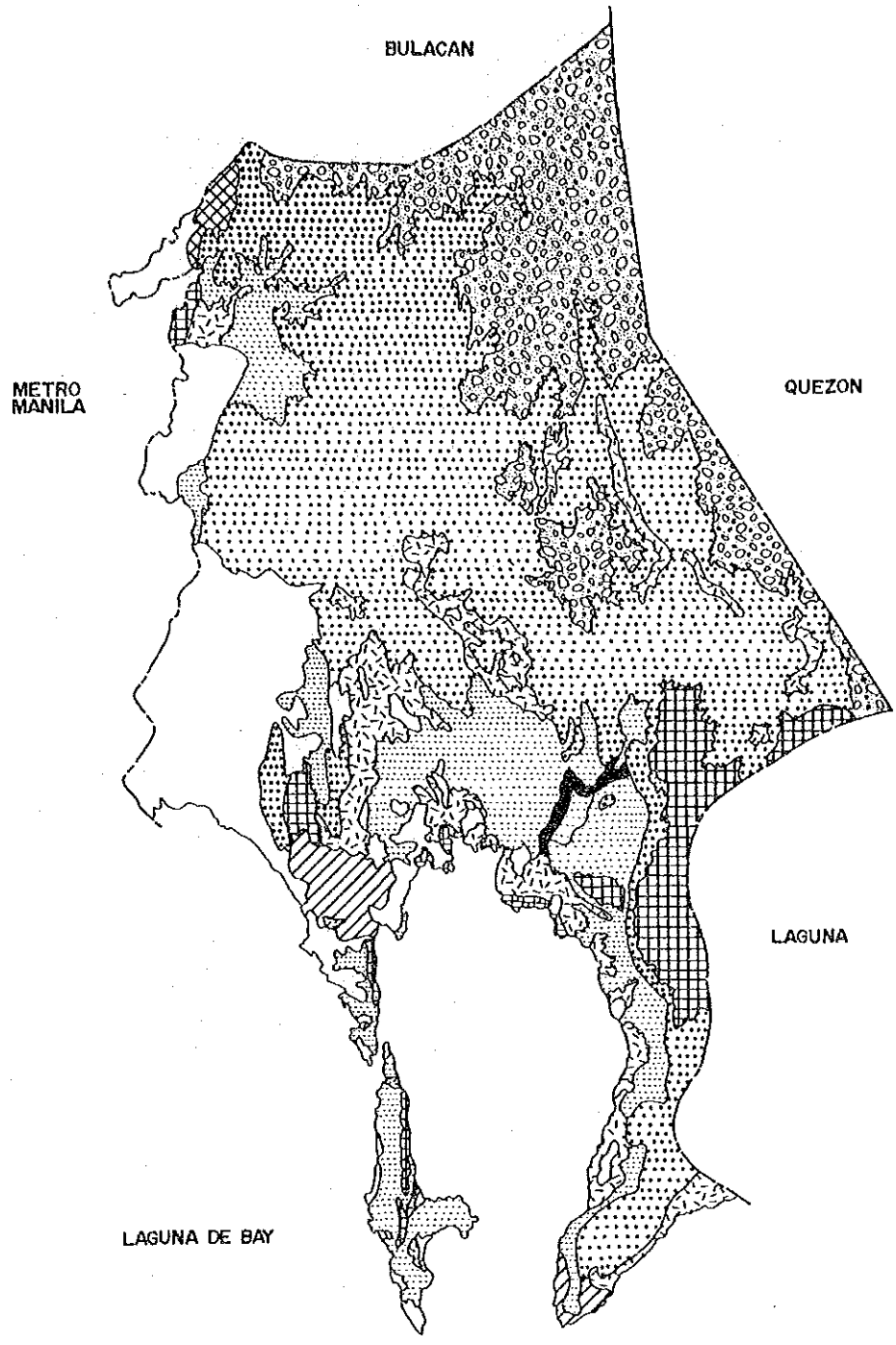


FIGURE J.4

Rizal Physiography Map

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

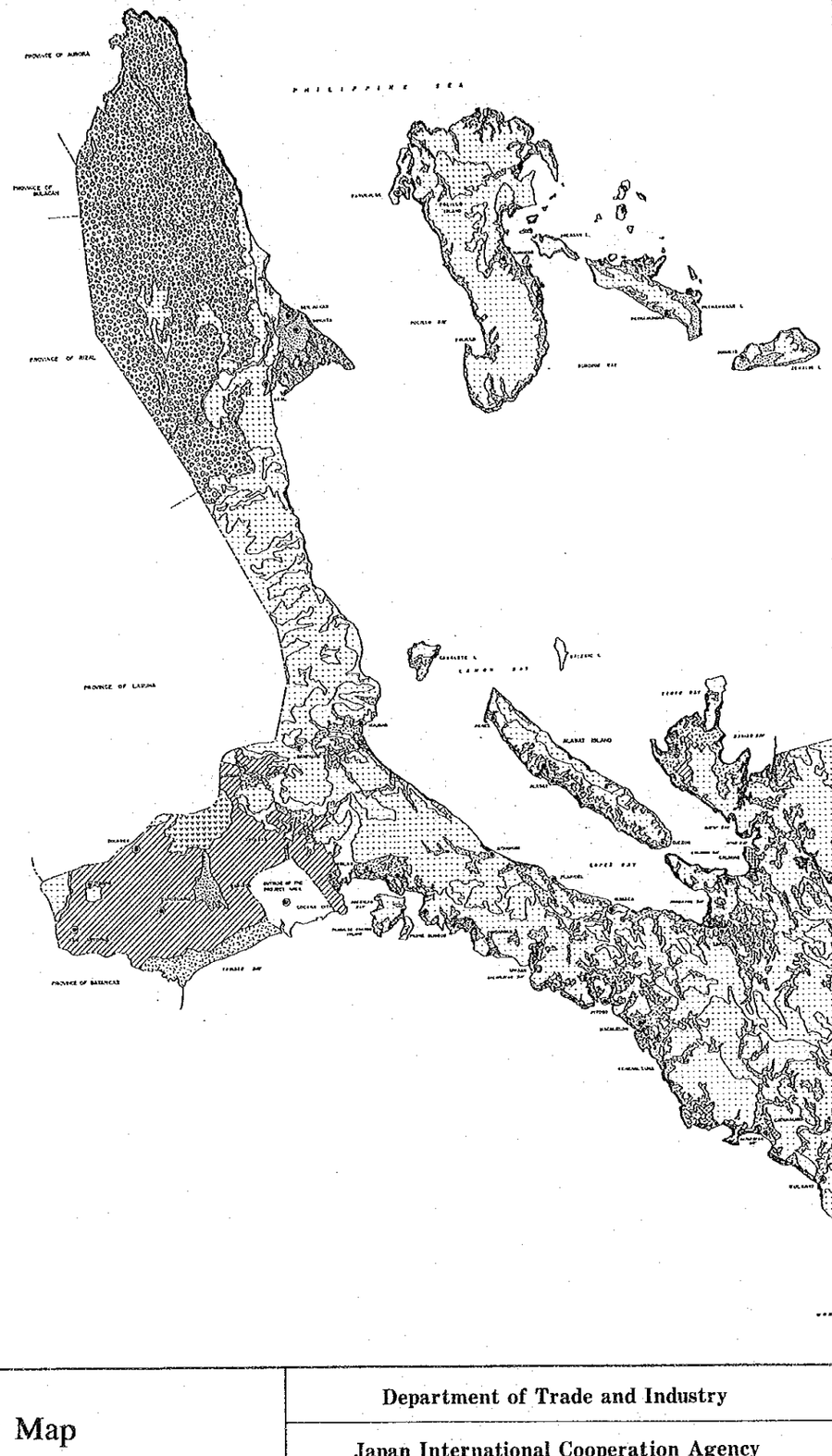
LEGEND :

- ALLUVIAL PLAIN
- COASTAL PLAIN
- FOOT SLOPES
- PLAINS
- PLATEAUS
- HILLS (LOW RELIEF)
- HILLS (HIGH RELIEF)
- MOUNTAIN
- MISCELANEOUS (BUILTUP AREA)
- SCARPMENTS

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

Legend	Figure J.5



ALLUVIAL PLAIN
COASTAL PLAIN
PLAINS
PLATEAUS
FOOT SLOPES
VOLCANICS
HILLS (LOW RELIEF)
HILLS (HIGH RELIEF)
MOUNTAINS
MISCELLANEOUS

Figure J.5

Quezon Physiography Map

Department of Trade and Industry

Japan International Cooperation Agency

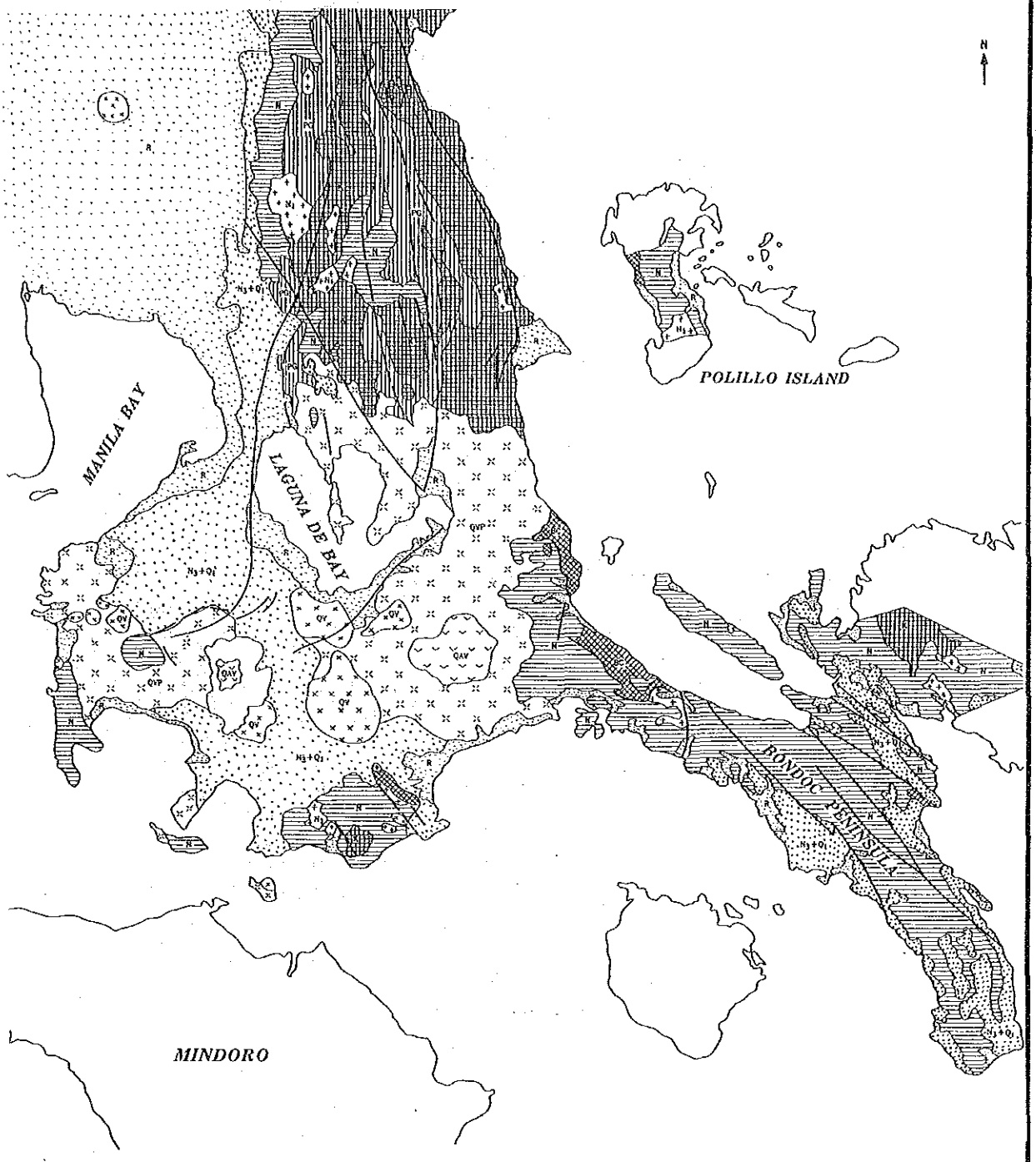


FIGURE J.6

Geology in CALABARZON

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

R	:	RECENT
N3+Q1	:	PLIO-PLEISTOCENE
N	:	UPPER TERTIARY
PG	:	LOWER TERTIARY
K	:	CRETACEOUS
PC	:	PRE-JURASSIC
Nd	:	MIOCENE QUARTZ DIORITE
QAV	:	ACTIVE VOLCANO
QV	:	NON-ACTIVE CONE
QVP	:	VOLCANIC DEPOSITS
	:	FAULT

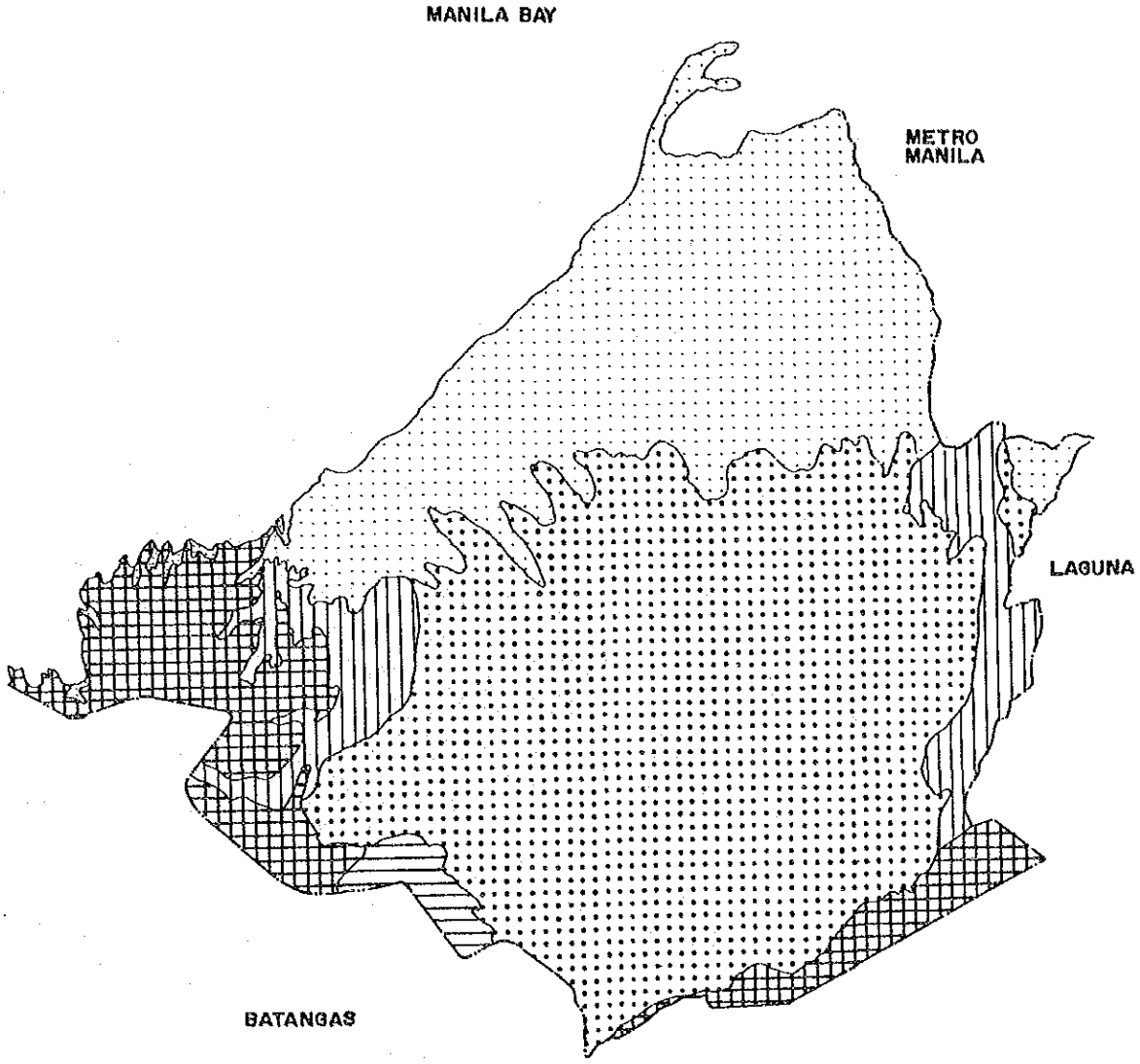


FIGURE J.7

Slope Map(Cavite)

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- 0 - 3%
- 3 - 8%
- 8 - 18%
- 18 - 30%
- OVER 30%

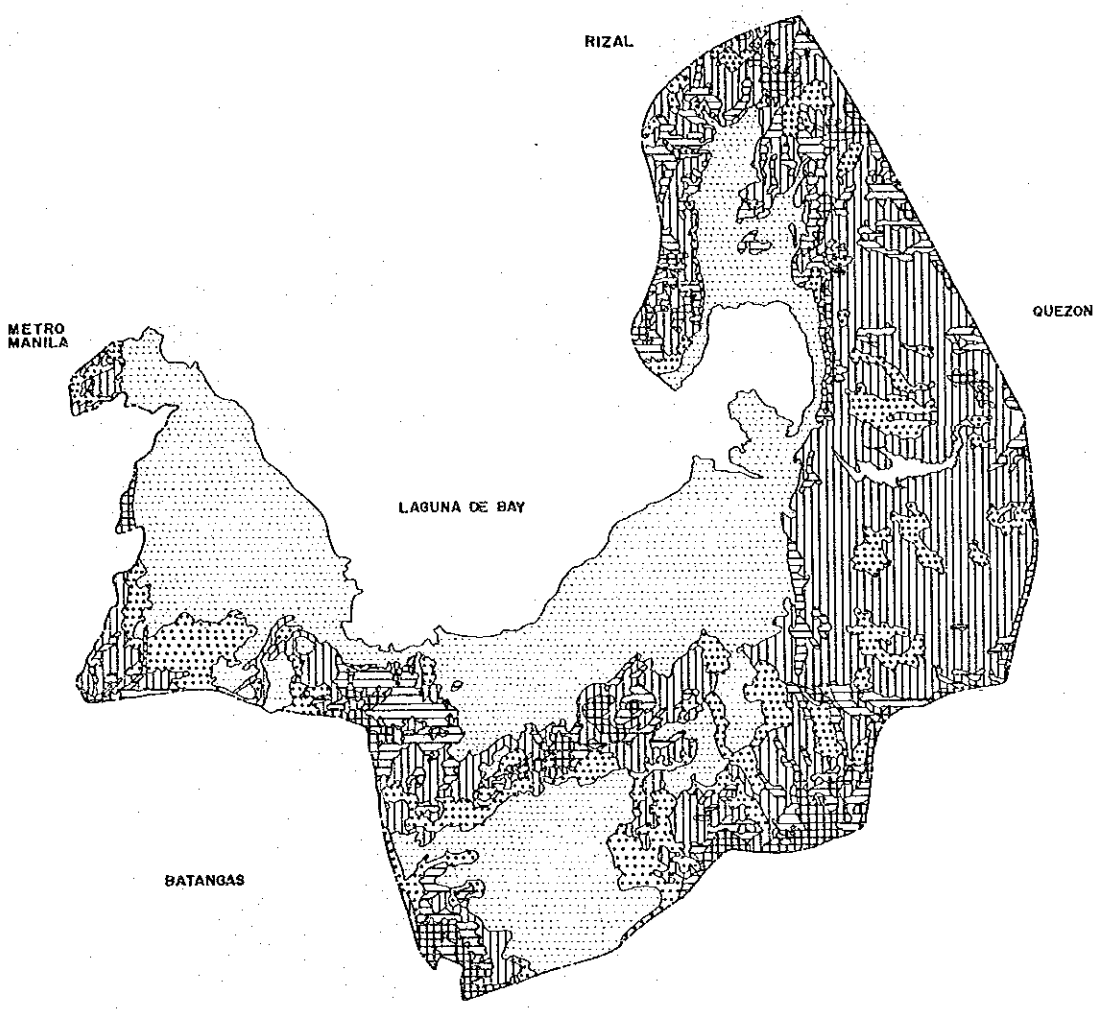


FIGURE J.8

Slope Map(Laguna)

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

	0 - 3 %
	3 - 8 %
	8 - 18 %
	18 - 30 %
	OVER 30 %

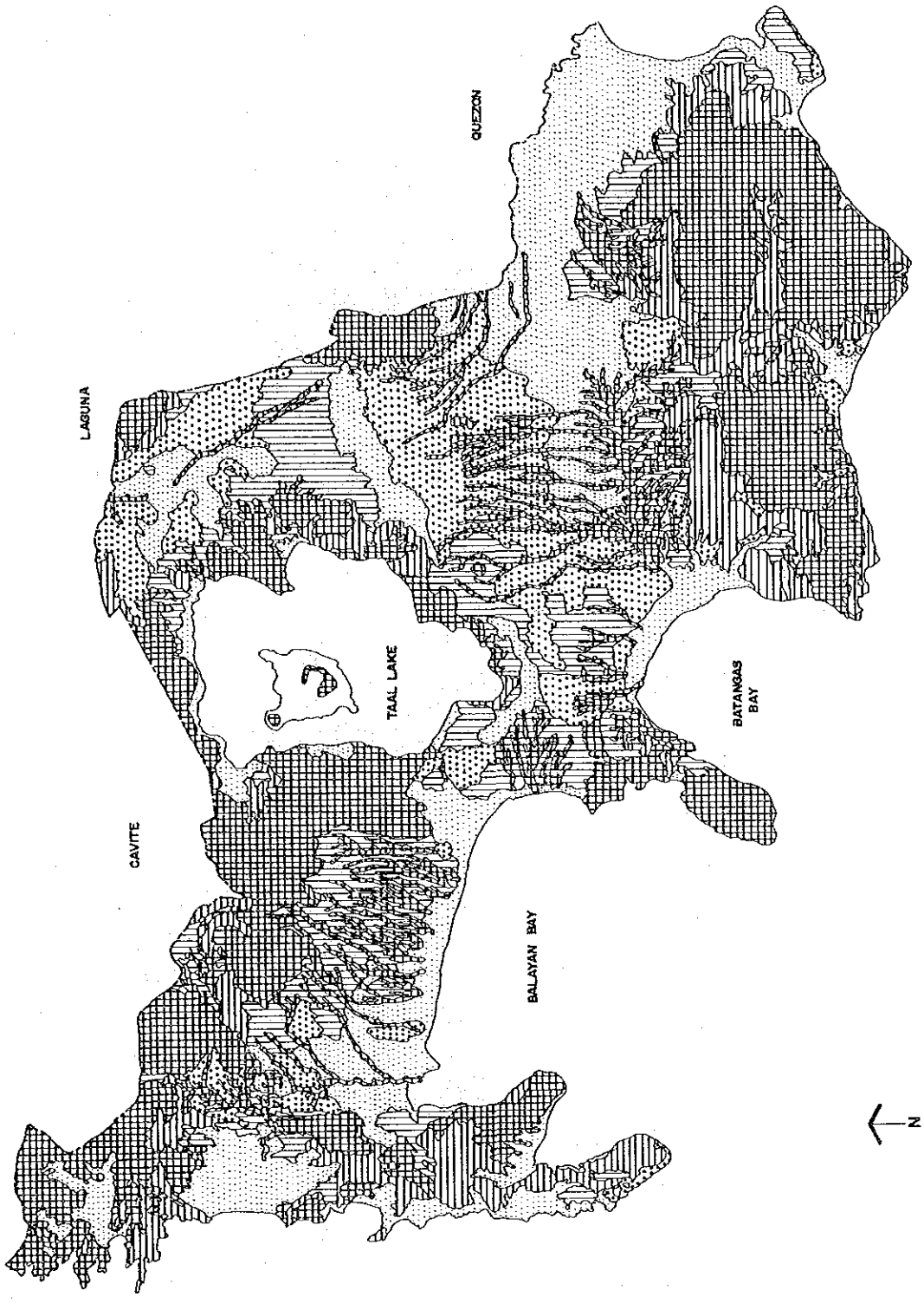


FIGURE J.9

Slope Map(Batangas)

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- 0 - 3 %
- 3 - 8 %
- 8 - 18 %
- 18 - 30 %
- OVER 30%

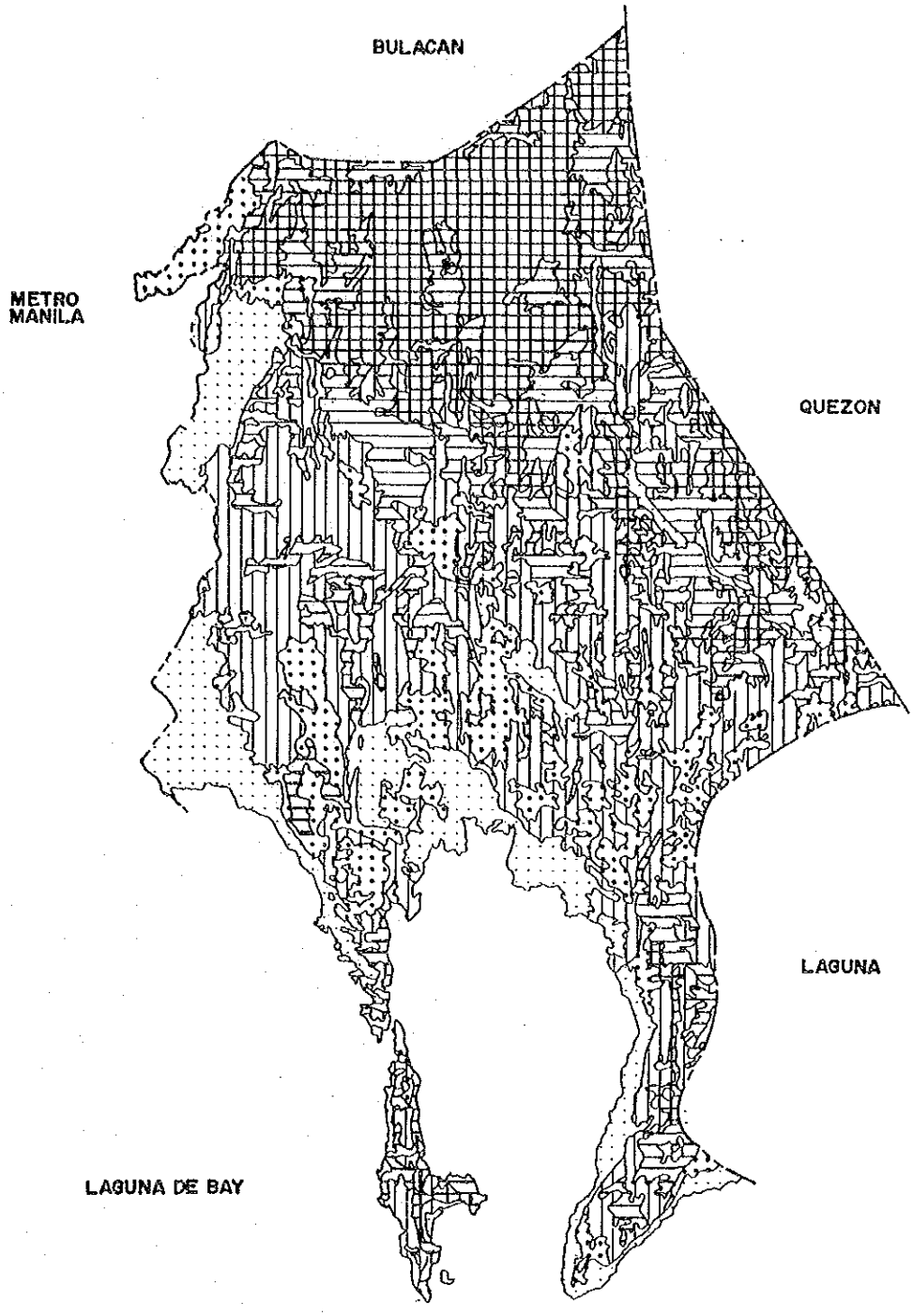


FIGURE J.10

Slope Map(Rizal)

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- 0 - 3%
- 3 - 8%
- 8 - 18%
- 18 - 30%
- OVER 30%

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

Legend | **Figure J.11**

SLOPE CLASS	SLOPE RANGE (PERCENT)	DESCRIPTION
	0-3%	LEVEL TO GENTLY SLOPING
	3-8%	GENTLY SLOPING TO UNDULATING
	8-18%	UNDULATING TO ROLLING
	18-30%	ROLLING TO HILLY
	Over 30%	HILLY TO MOUNTAINOUS

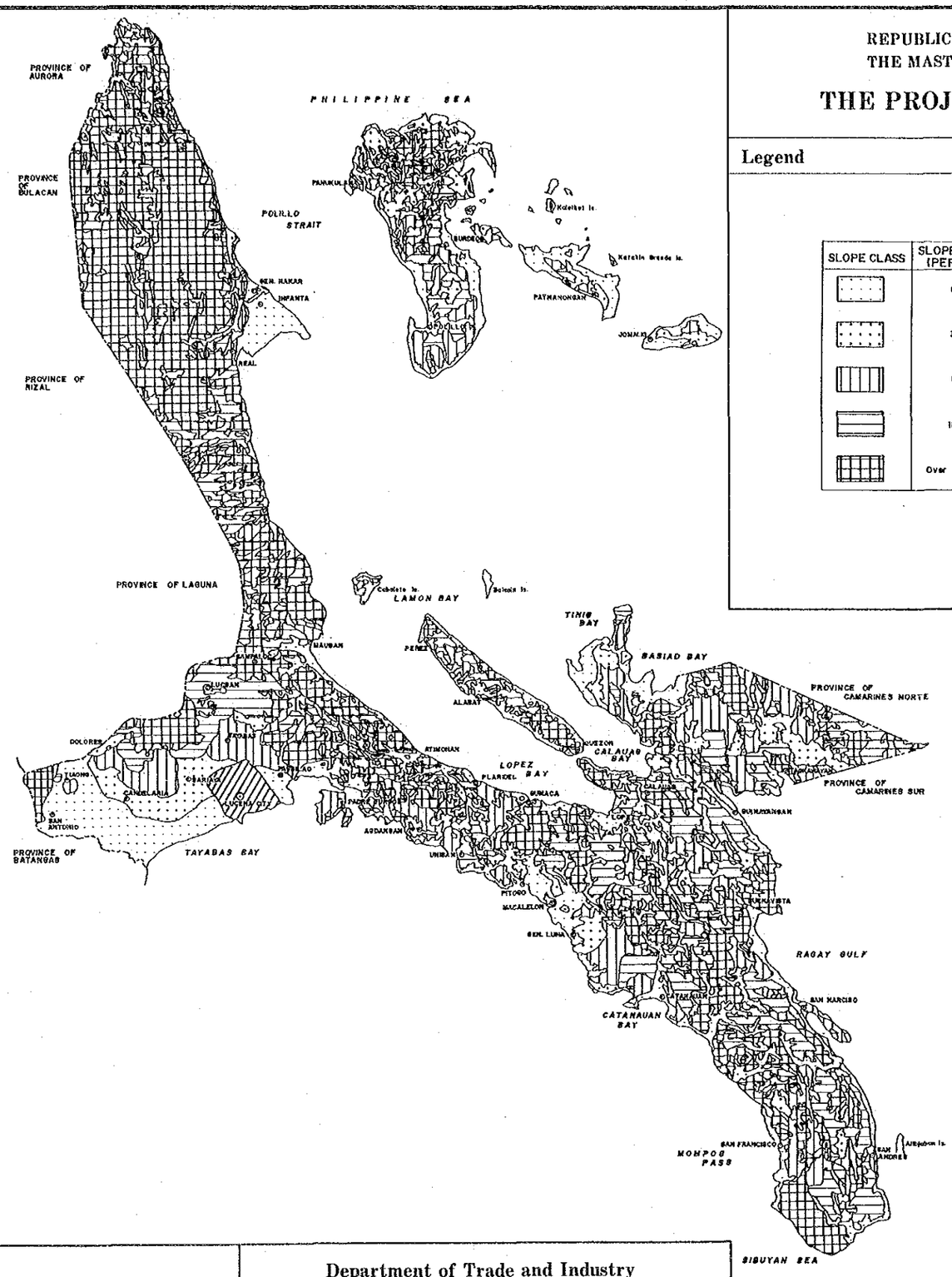


Figure J.11

Slope Map(Quezon)

Department of Trade and Industry

Japan International Cooperation Agency

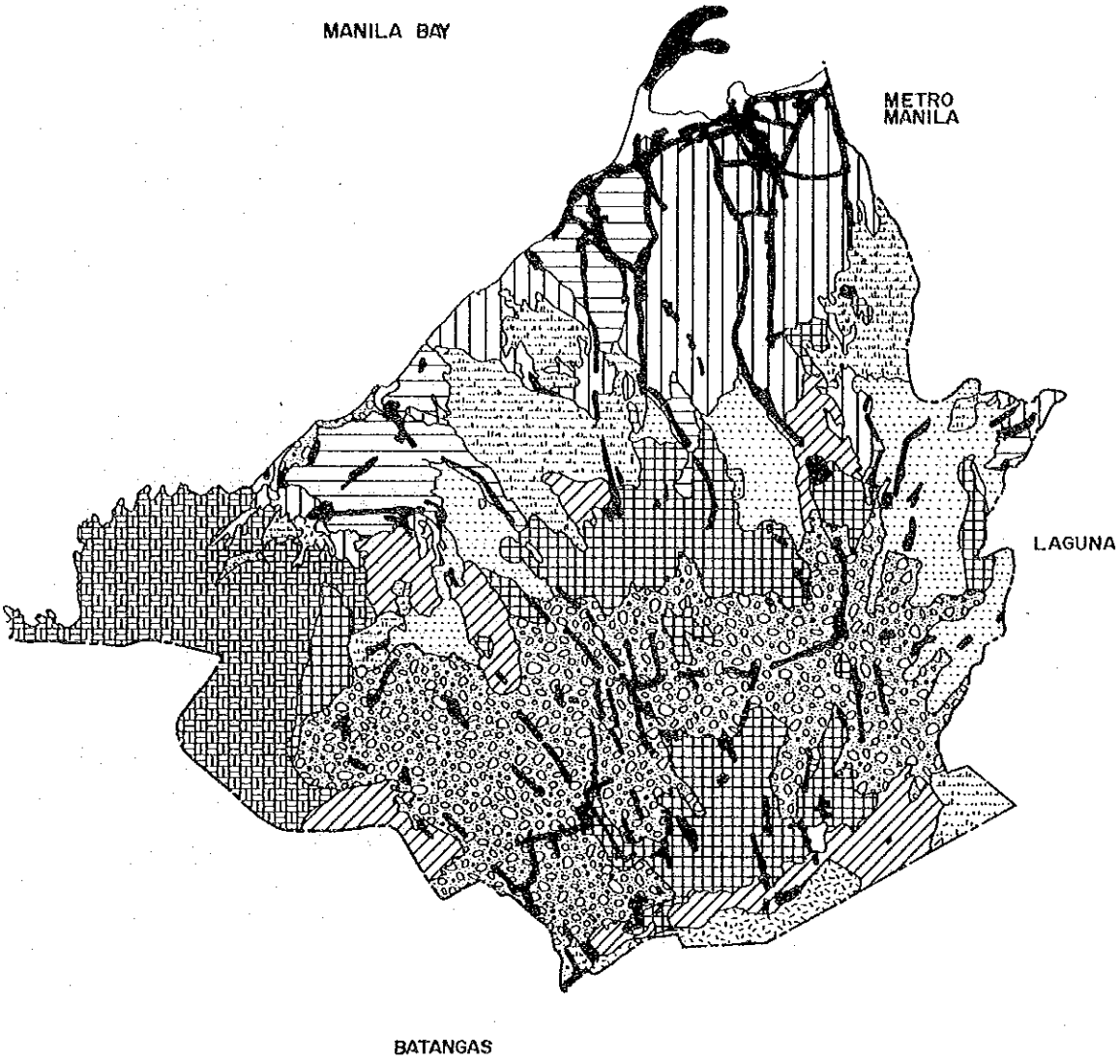


FIGURE J.12

Cavite Land Use Map

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- RICE (IRRIGATED)
- RICE (NON-IRRIGATED)
- UPLAND RICE
- TREE CROPS
- SUGARCANE
- COCONUT
- GRASSLAND
- SHRUBS
- FOREST
- BUILT-UP AREA
- MISCELLANEOUS

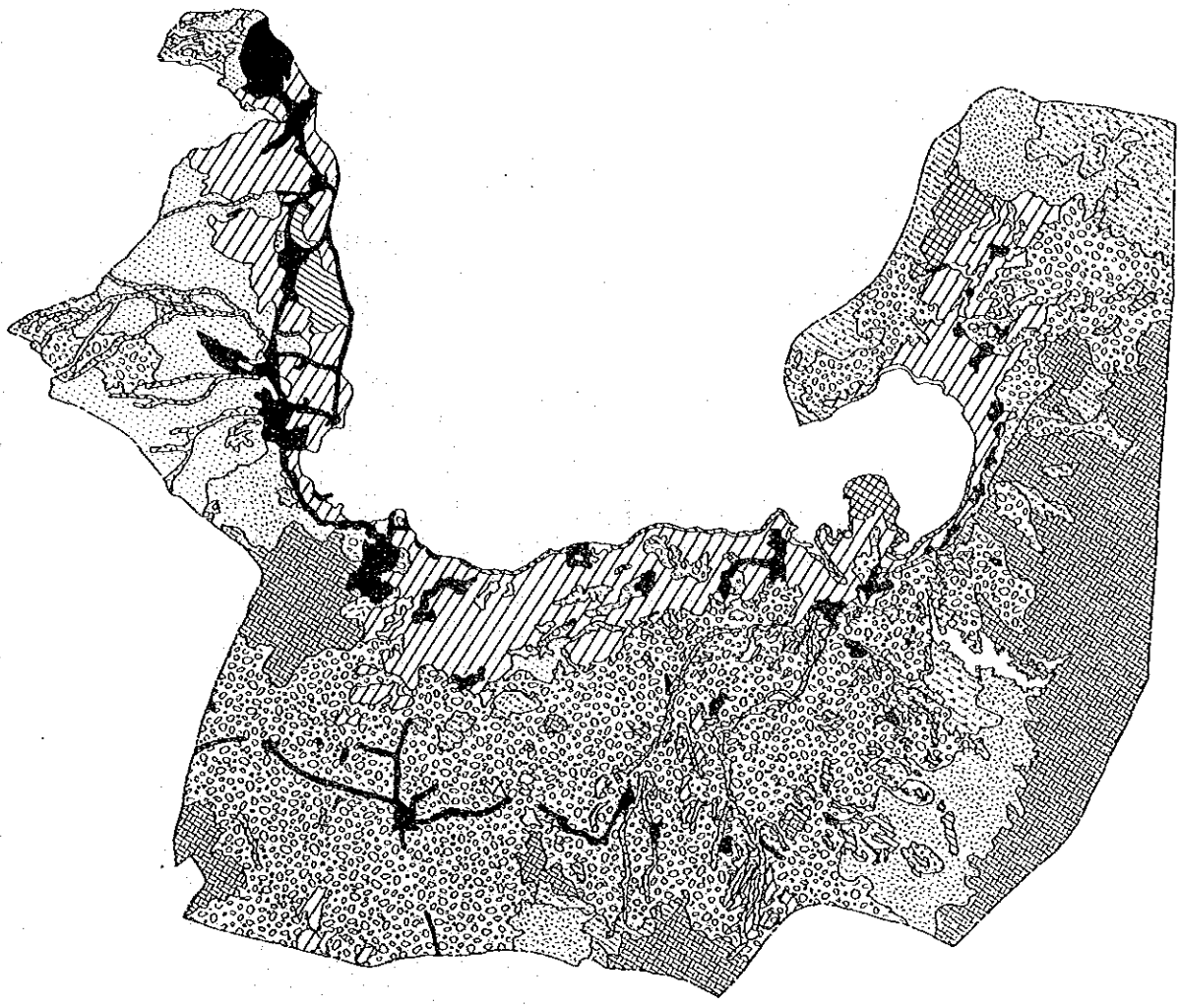


FIGURE J.13

Laguna Land Use Map

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- RICE (IRRIGATED)
- RICE (NON-IRRIGATED)
- TREE CROPS
- SUGAR CANE
- COCONUT
- GRASSLAND
- SHRUBS
- FOREST
- BUILT-UP AREA
- MISCELLANEOUS

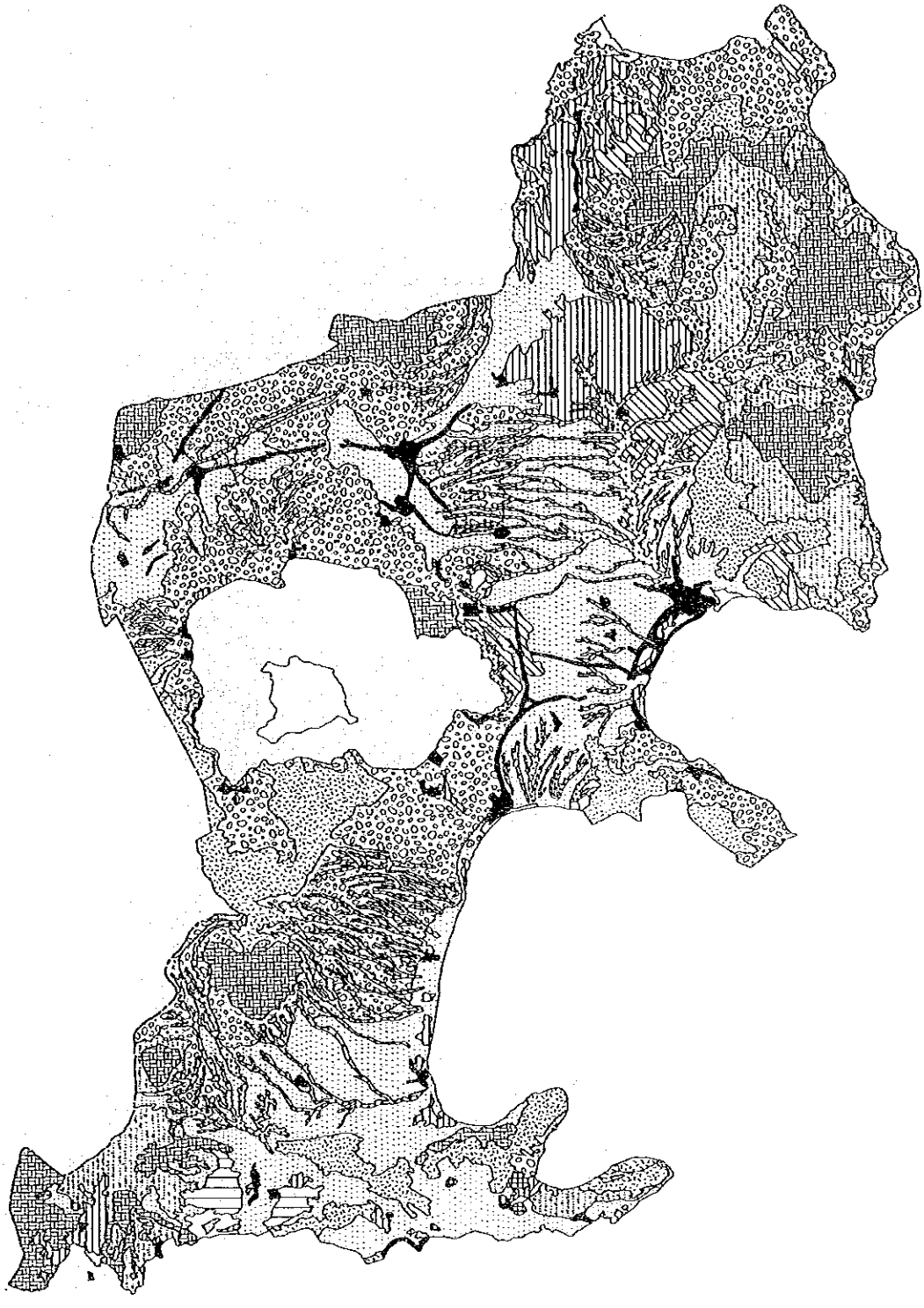


FIGURE J.14

Batangas Land Use Map

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- RICE (IRRIGATED)
- RICE (NON-IRRIGATED)
- SHRUBS
- COCONUT
- UPLAND RICE
- FOREST
- TREE CROPS
- BUILT-UP AREA
- SUGAR CANE
- BAMBOO
- MISCELLANEOUS
- GRASSLAND

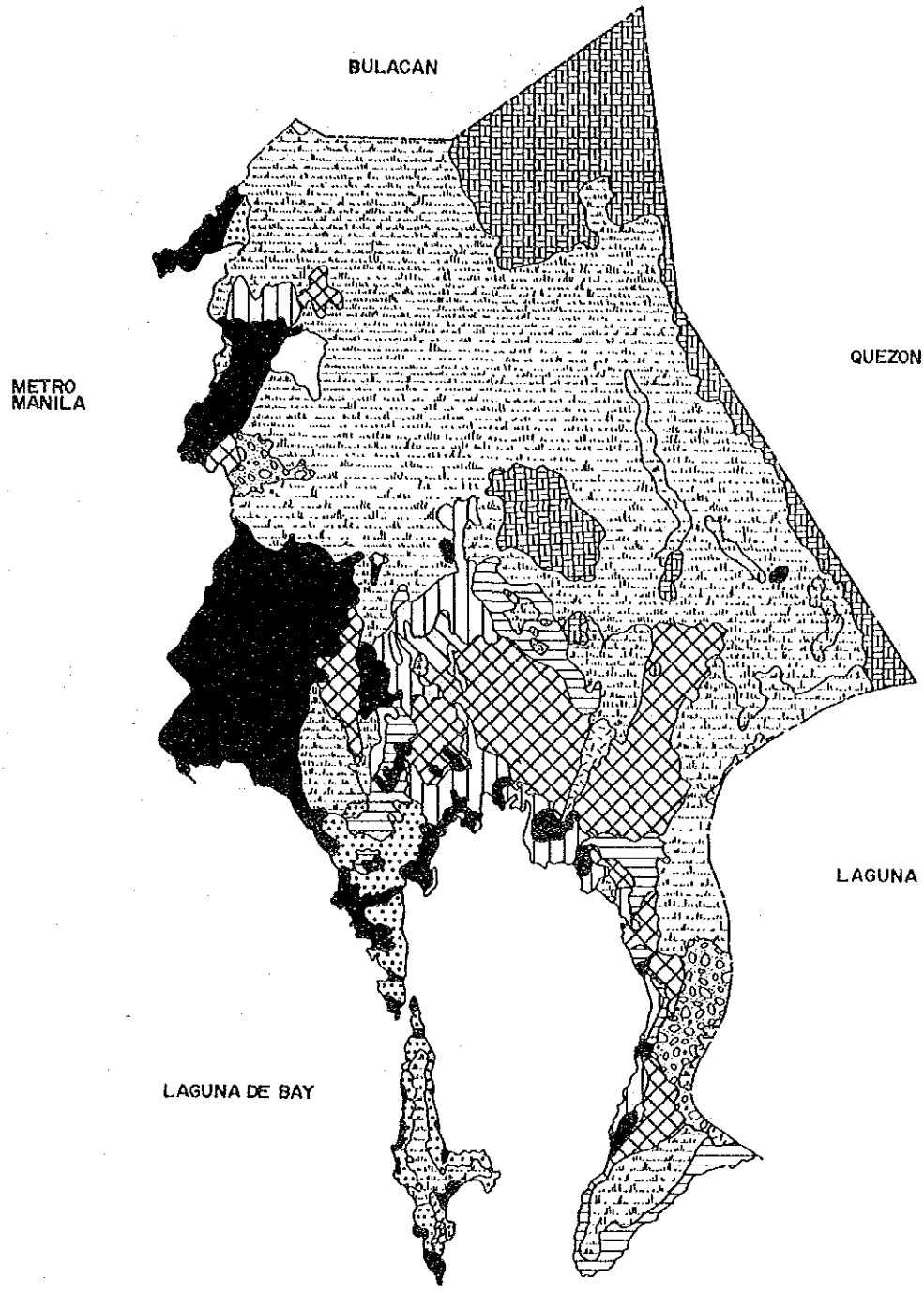


FIGURE J.15

Rizal Land Use Map

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- RICE (IRRIGATED)
- RICE (NON-IRRIGATED)
- TREE CROPS
- COCONUT
- GRASSLAND
- BAMBOO
- FOREST
- BUILT-UP AREA
- MISCELLANEOUS

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

Legend | **Figure J.16**

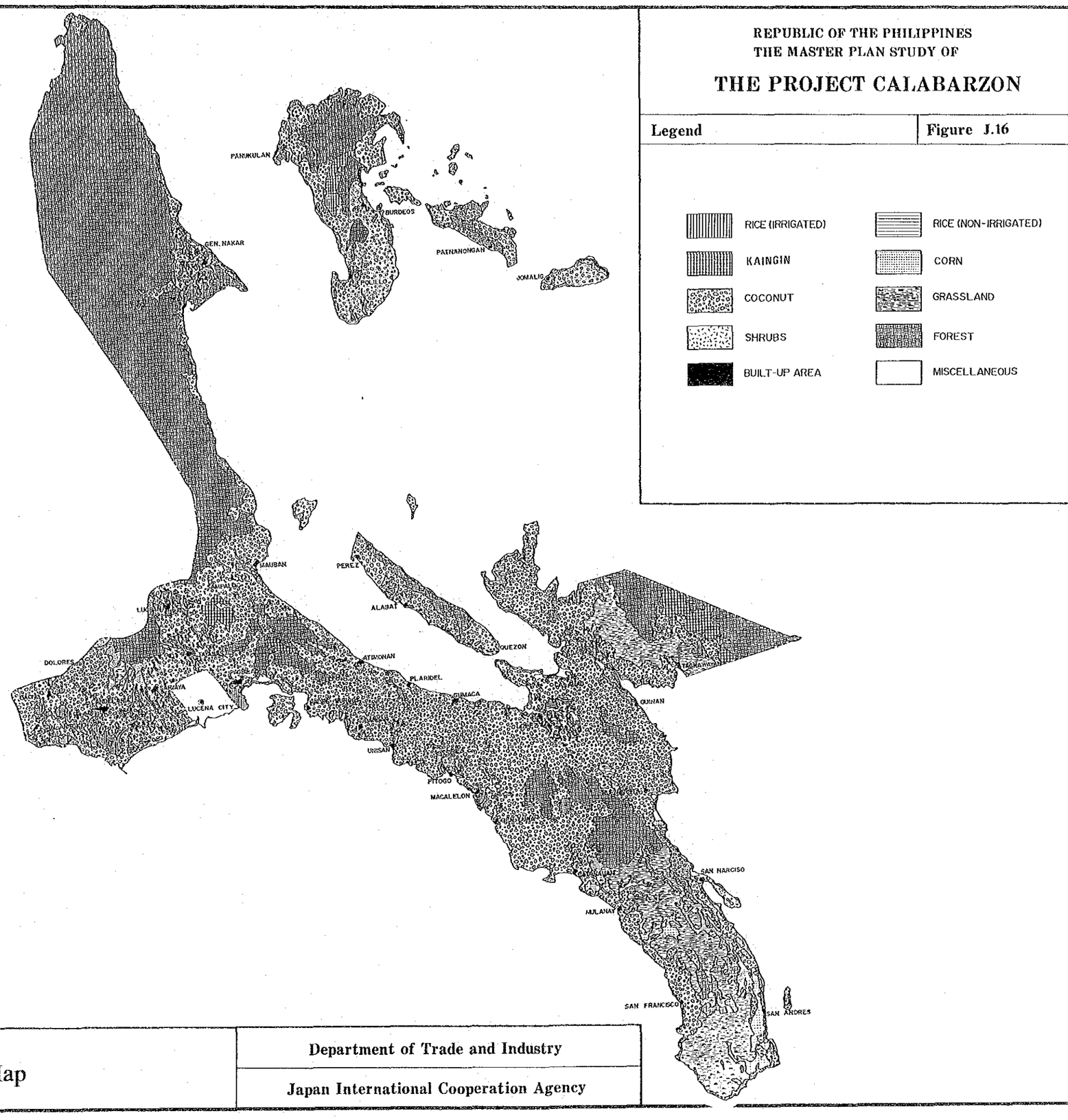


Figure J.16

Quezon Land Use Map

Department of Trade and Industry

Japan International Cooperation Agency

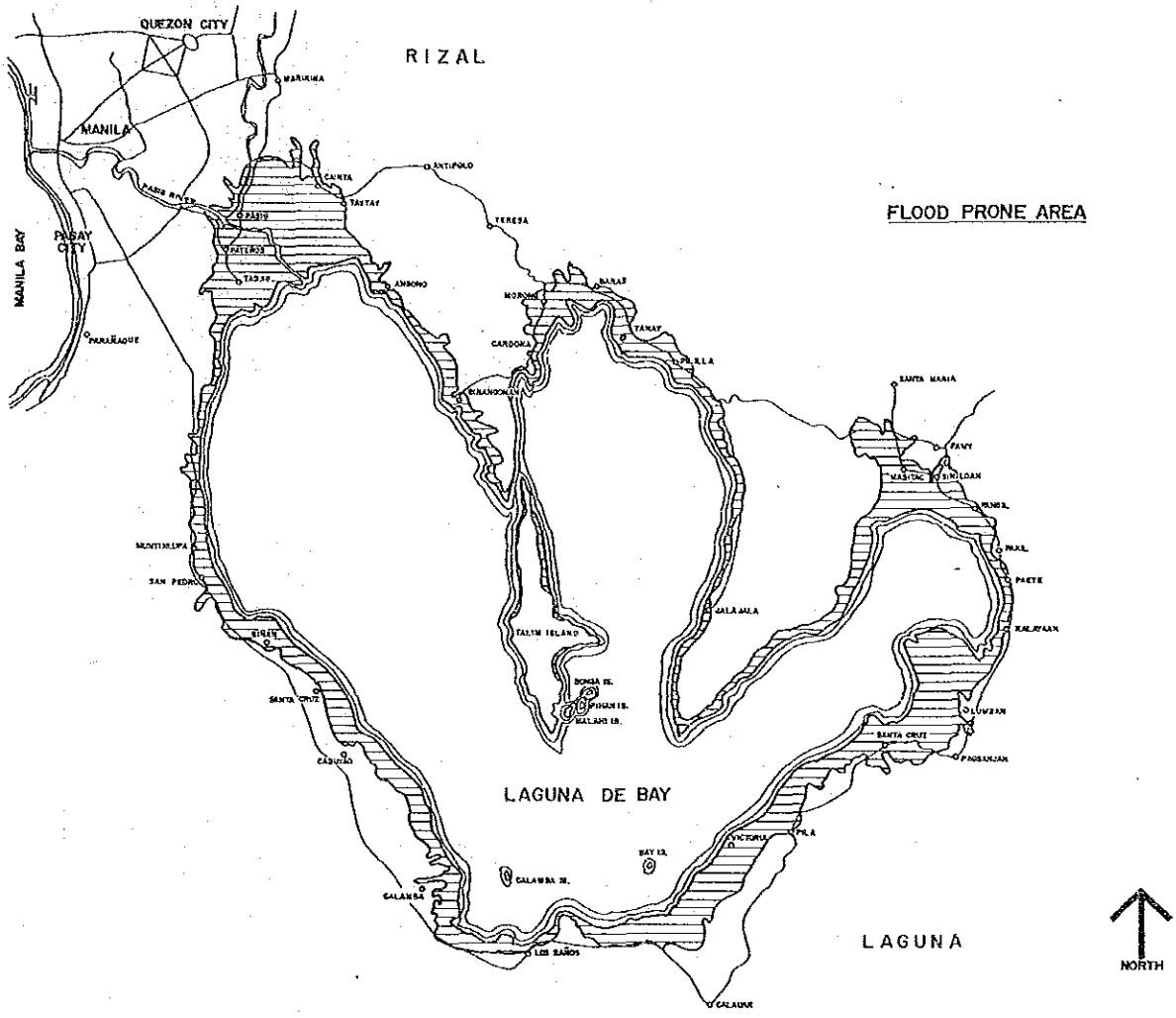


FIGURE J.17 Flood Prone Area along Laguna Lakeshores

LEGEND :

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

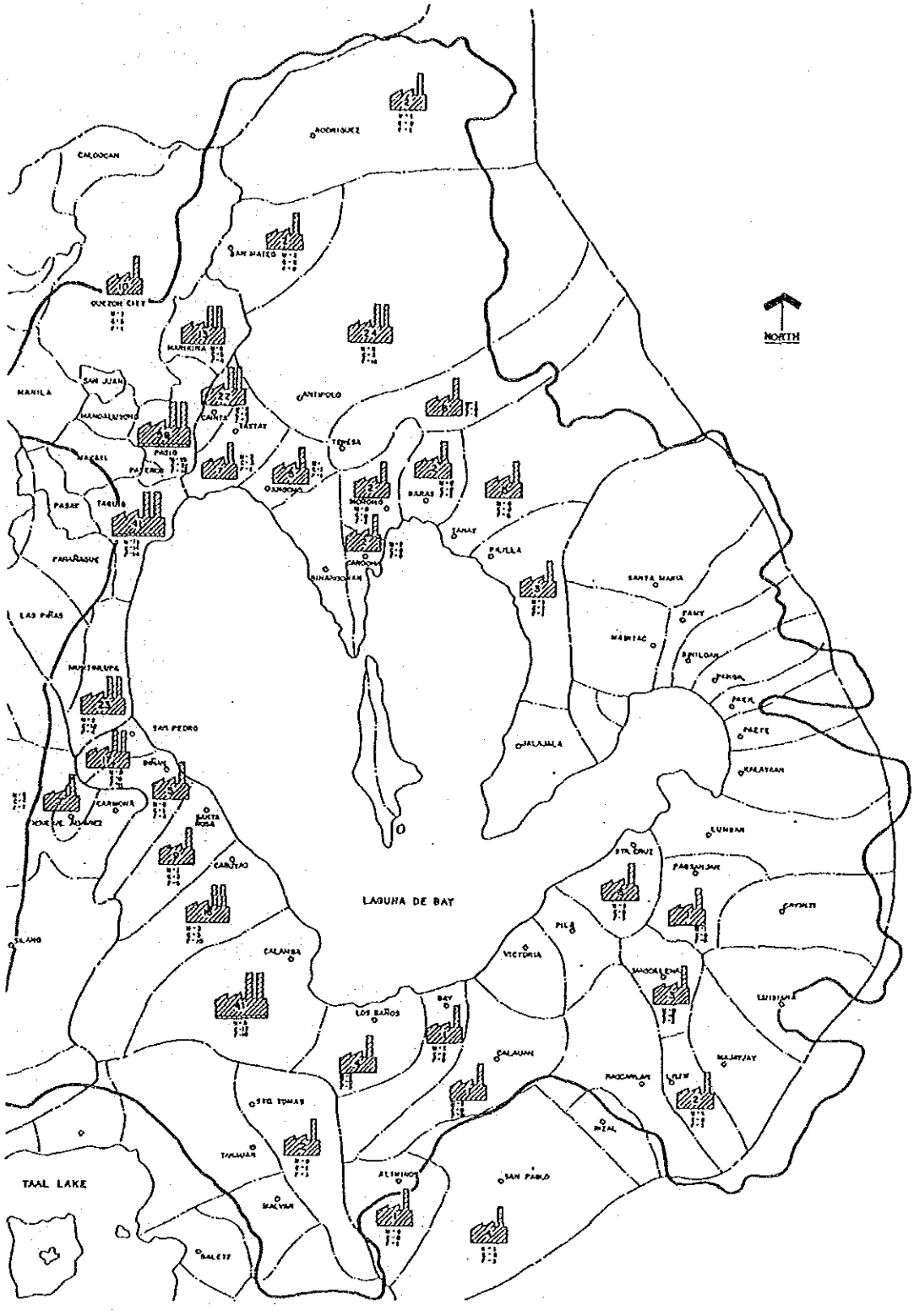


FIGURE J.18
Wet Industries in Municipalities in Laguna de Bay Basin

LEGEND :

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

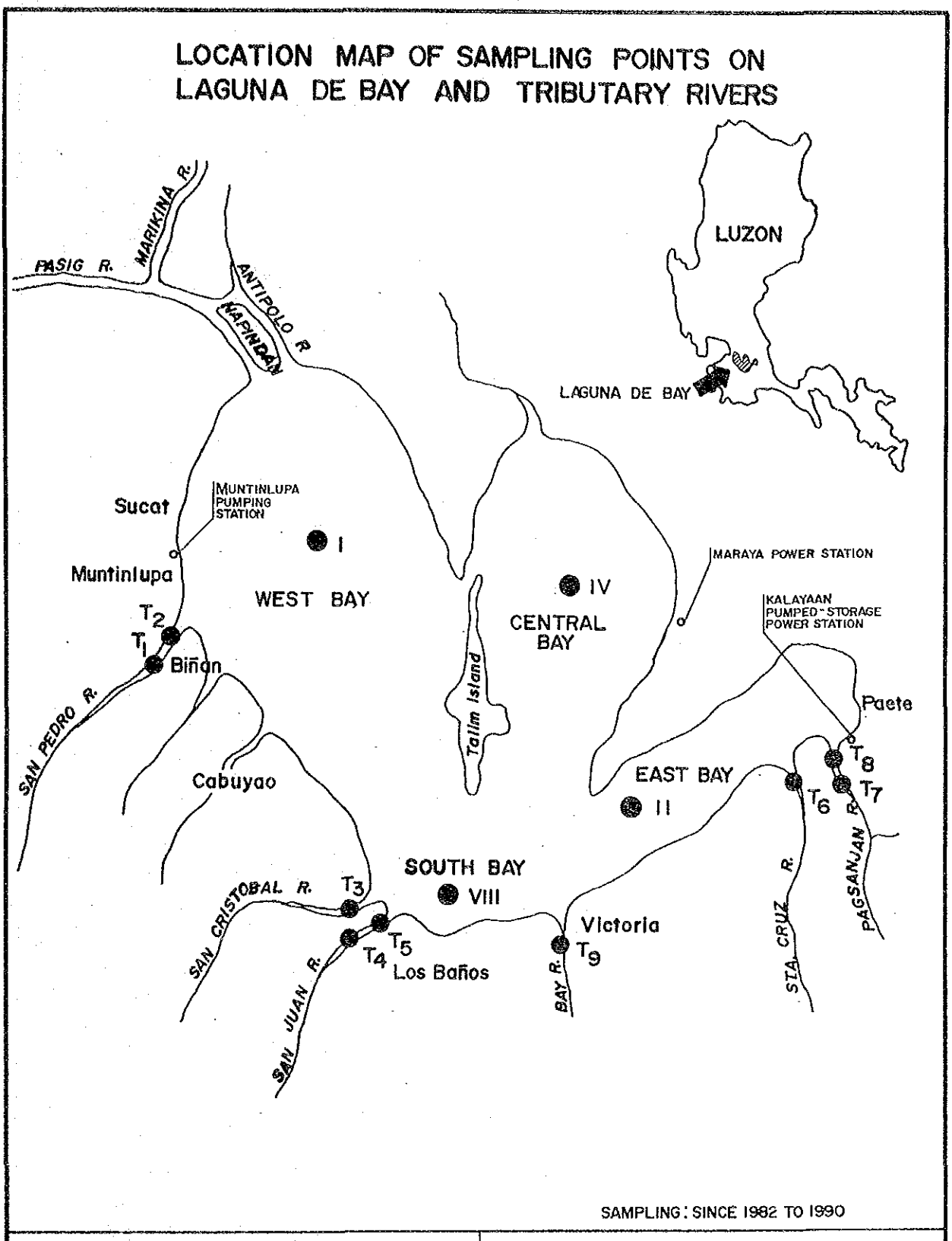


FIGURE J.19 Sampling Points on Laguna de Bay and Tributaries

LEGEND :

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

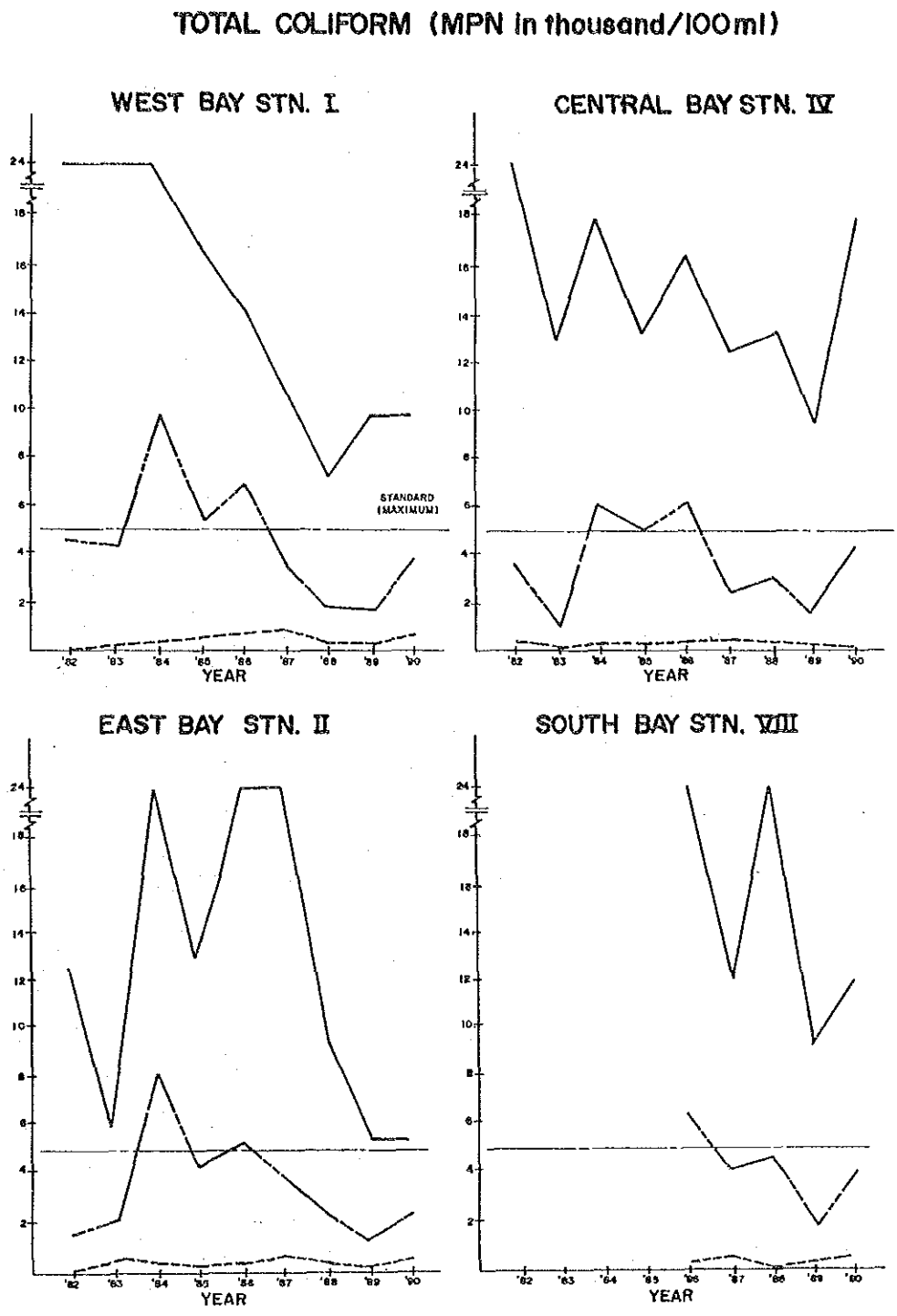


FIGURE 3.20
Changes in Total Coliform Measurements in Laguna Lake Water

LEGEND :

MAXIMUM ————

MINIMUM - - - - - -

AVERAGE ——— - ———

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

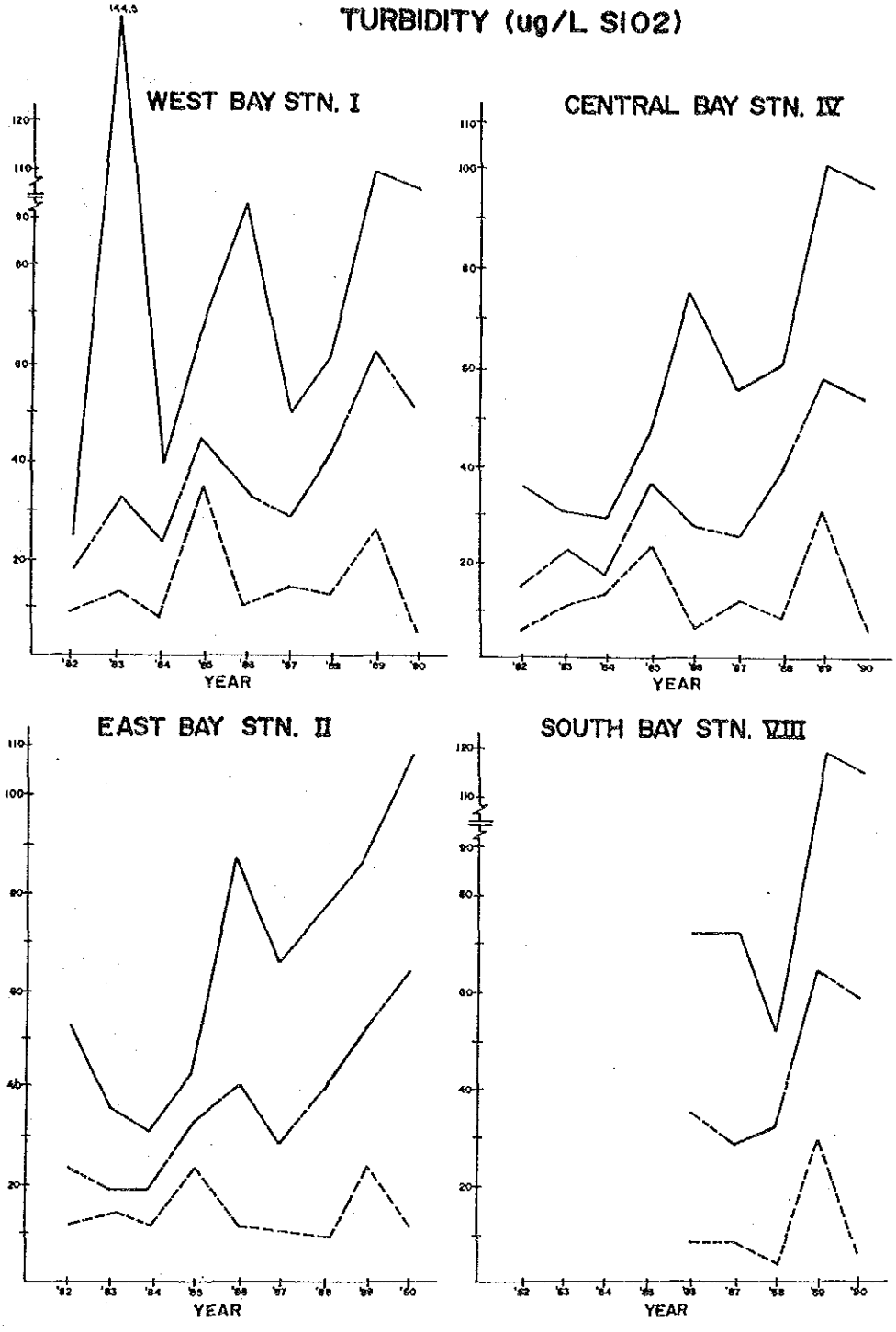


FIGURE J.21 Changes in Turbidity in Laguna Lake Water

LEGEND :

MAXIMUM ——————

MINIMUM - - - - - -

AVERAGE ——— - - ———

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

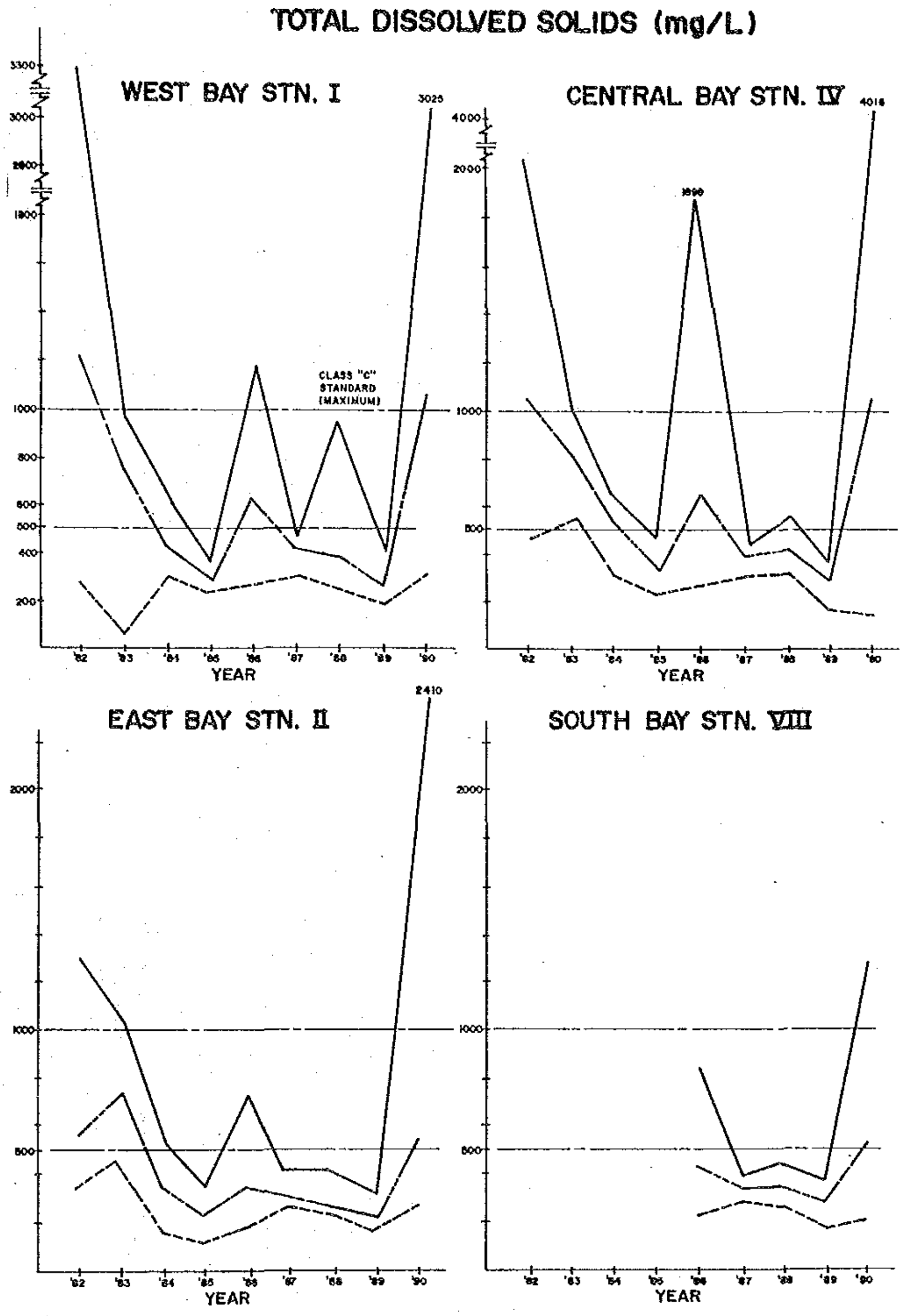


FIGURE J.22 Changes in Total Dissolved Solids in Laguna Lake Water

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :
MAXIMUM ————
MINIMUM - - - - -
AVERAGE —- —-

500mg/L : JAPANESE PROPOSED CRITERIA FOR TREATMENT PROCESS

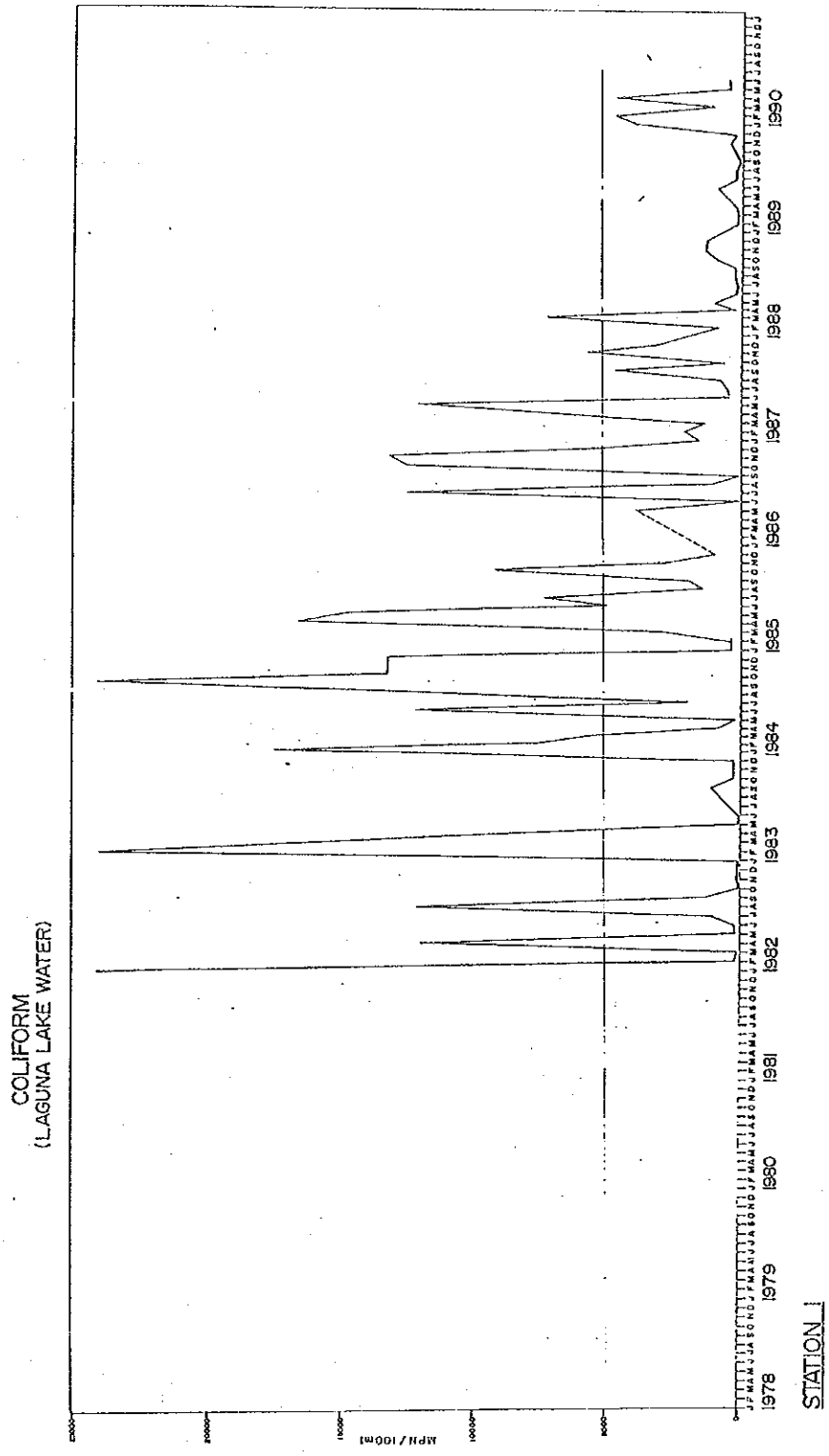


FIGURE J.23 Seasonal Variations of Laguna Lake Water Quality Expressed By Coliform Measurements

LEGEND :

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

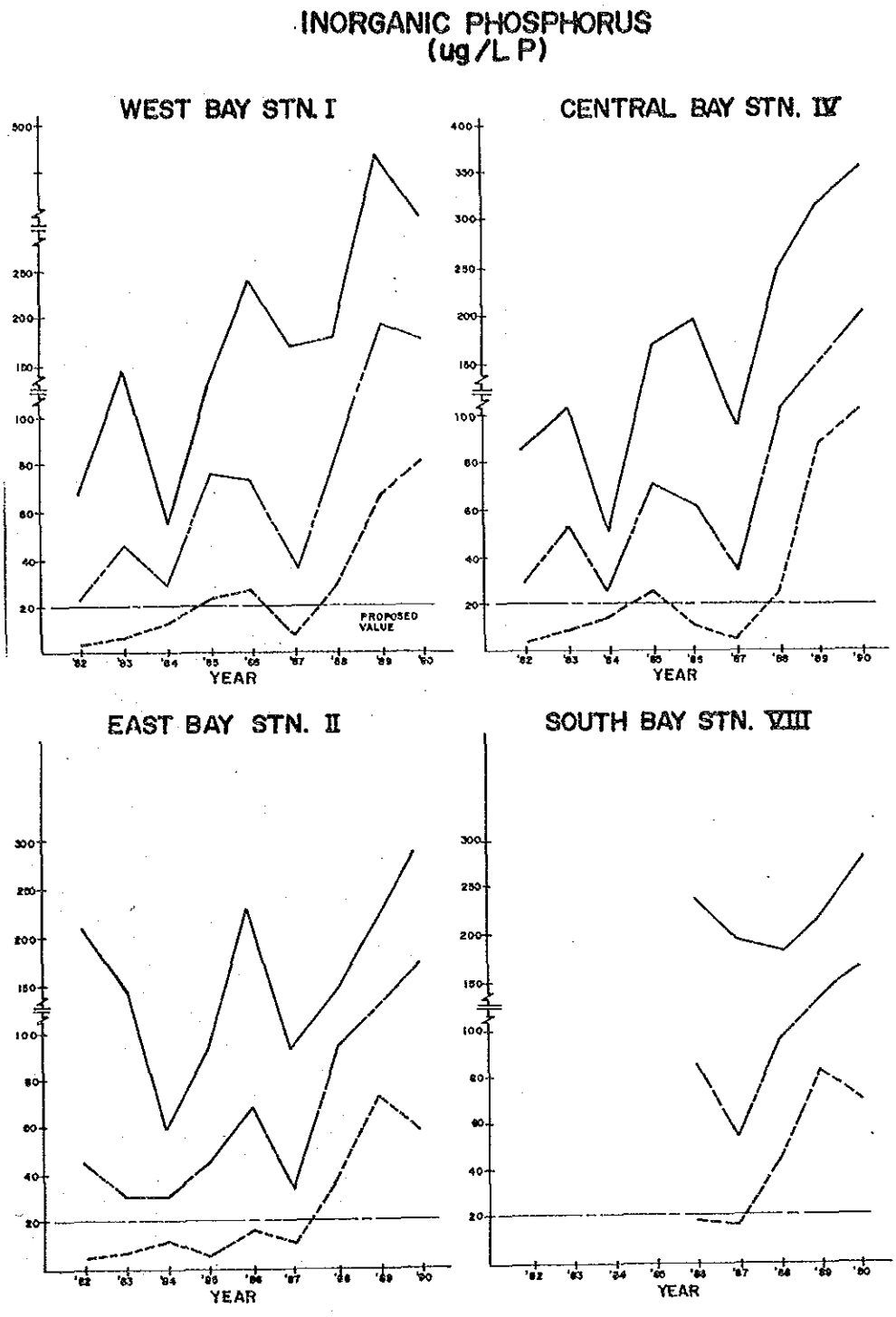


FIGURE J.24
Changes in Inorganic Phosphorus Measurements in Laguna Lake Water

LEGEND :

MAXIMUM ————

MINIMUM - - - - - -

AVERAGE ——— - - ———

0.02mg/L : PROPOSED VALUE FOR PREVENTION OF EUTROPHICATION USED IN JAPAN AND OTHER COUNTRIES

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

AMMONIA (ug/L N)

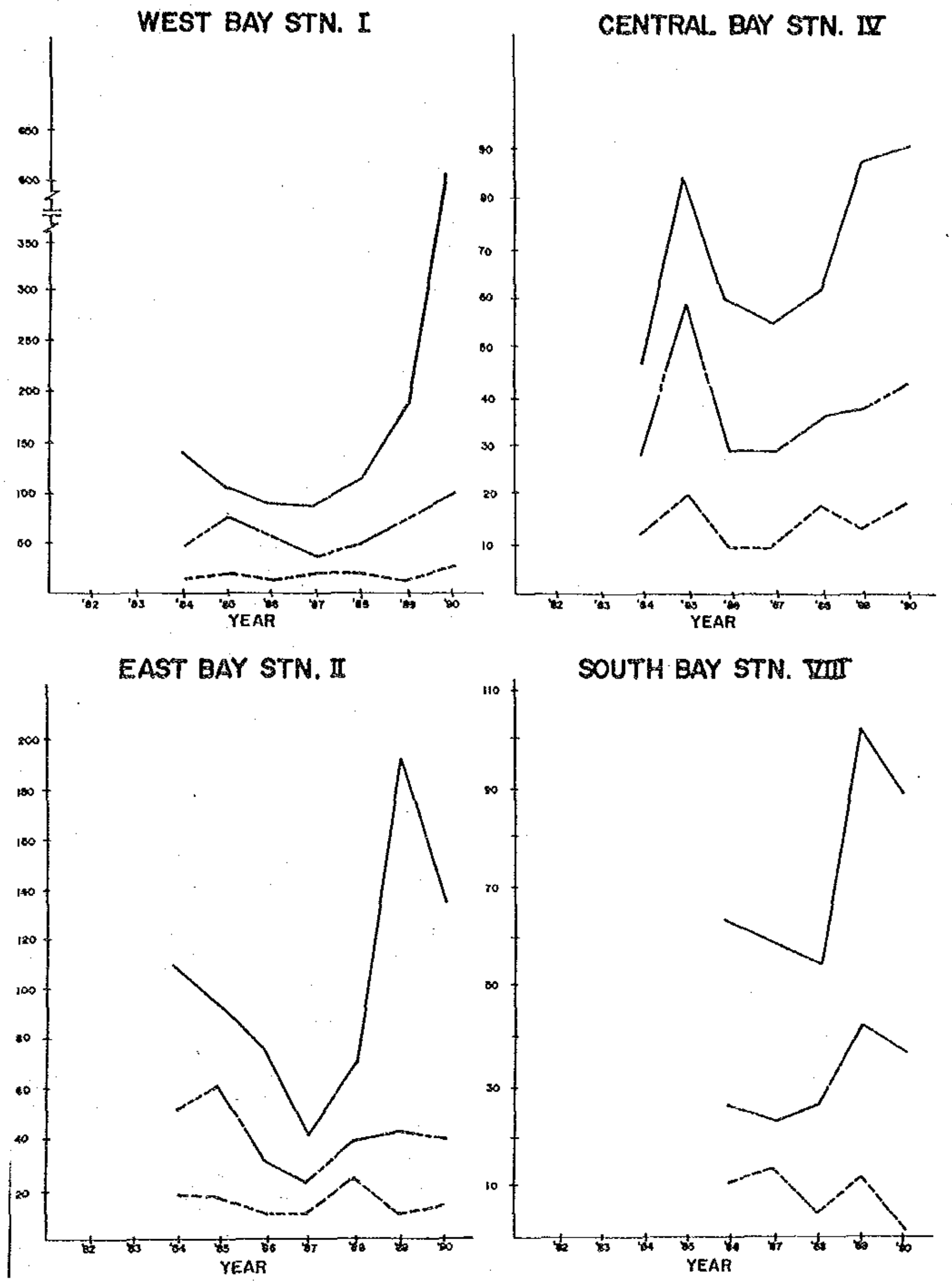


FIGURE J.25
Changes in Ammonia Measurements in Laguna Lake Water

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

MAXIMUM ————
MINIMUM - - - - - -
AVERAGE — - — - —

NOTE: NO DATA IN '84 AND '85 IN STATION VIII

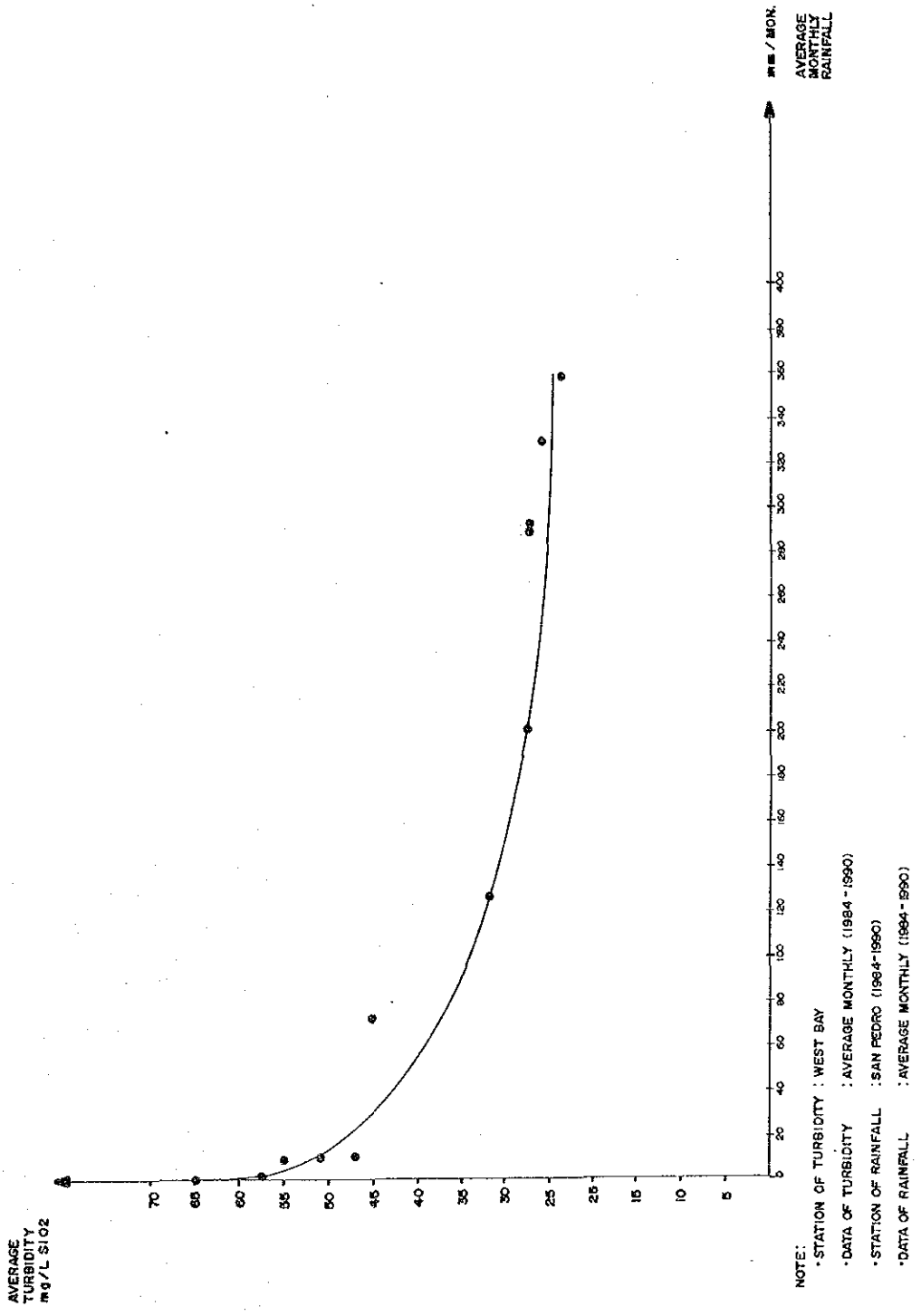


FIGURE J.26 Relationship between Turbidity and Rainfall

LEGEND :

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

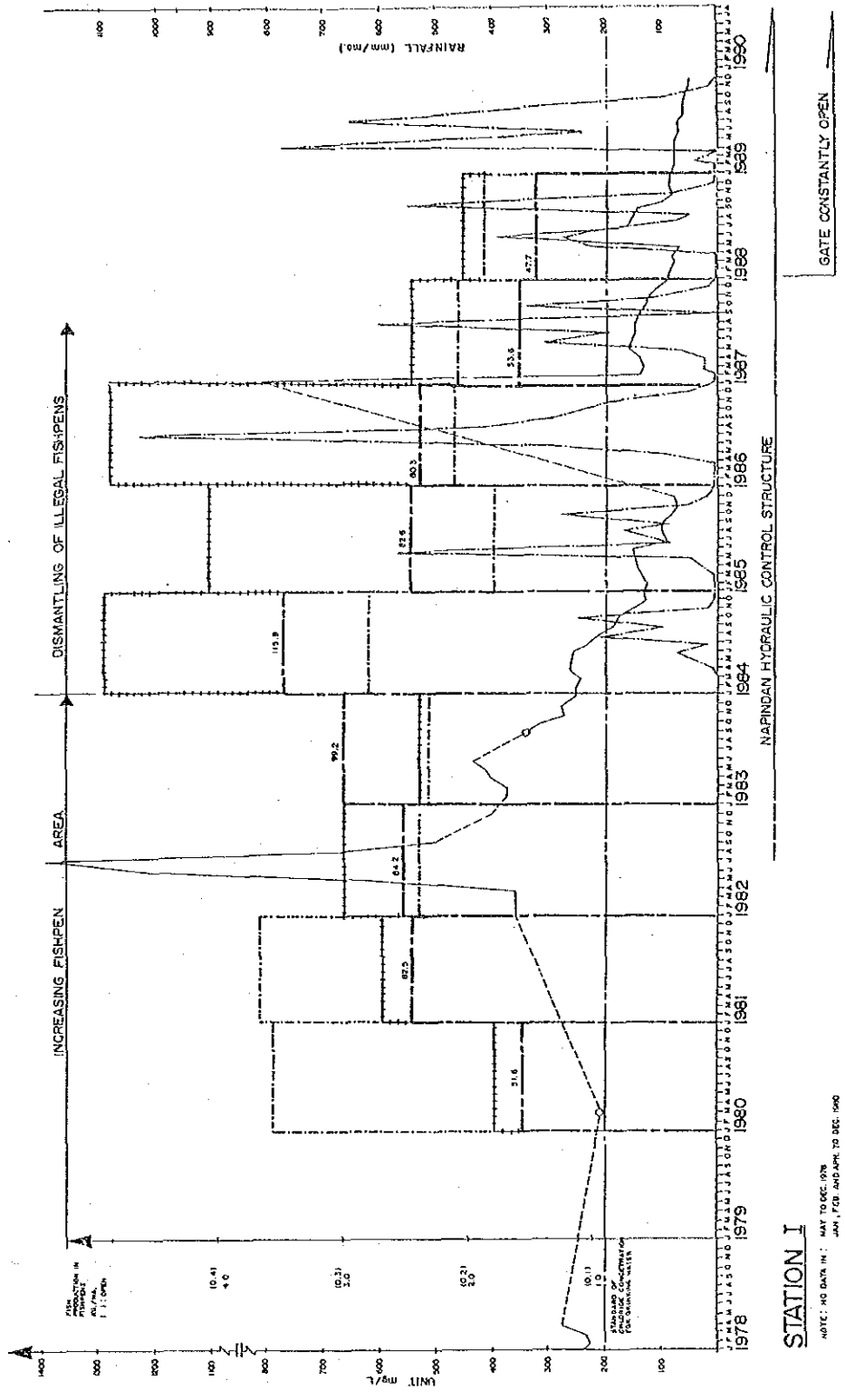


FIGURE J.27
Relationships among Chloride Concentration, Rainfall and Fishery Productivity

LEGEND :

- CHLORIDE
- RAINFALL
- OPEN WATER FISH PRODUCTION (KG/HA)
- FISHPEN PRODUCTION (KG/HA)
- TOTAL FISH PRODUCTION (IN 1000 METRIC TONS)

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

Legend | **Figure** J.28

- VERY GOOD LAND
- GOOD
- MODERATE
- FAIR
- NOT SUITABLE
- NO DATAS
- INDEX TO REGIONAL DIVISION

Figure J.28

Land Capability Map

Department of Trade and Industry

Japan International Cooperation Agency

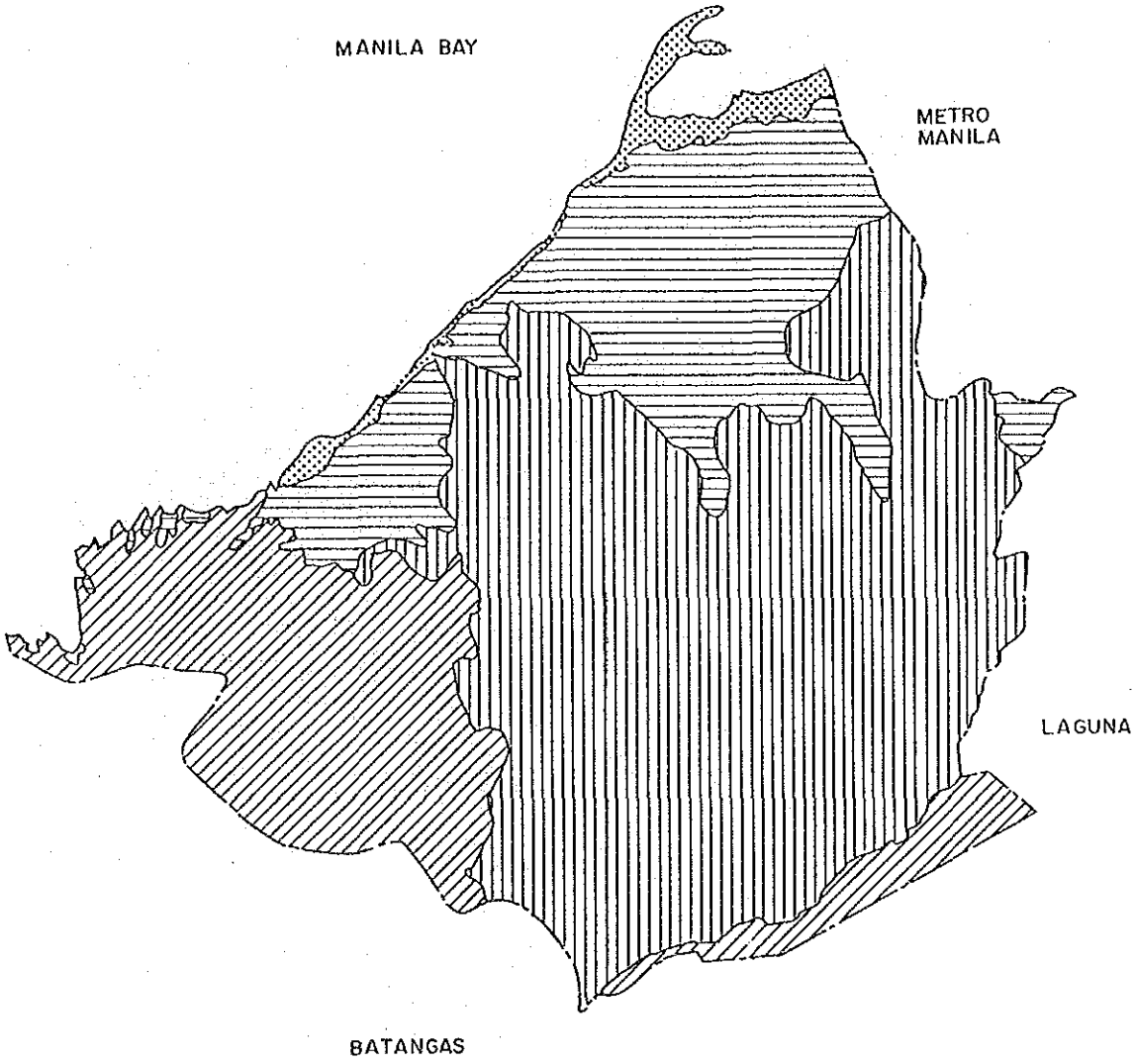


FIGURE J.29 Erosion Potential Map (Cavite)

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- NONE
- SLIGHT
- SEVERE
- MODERATE

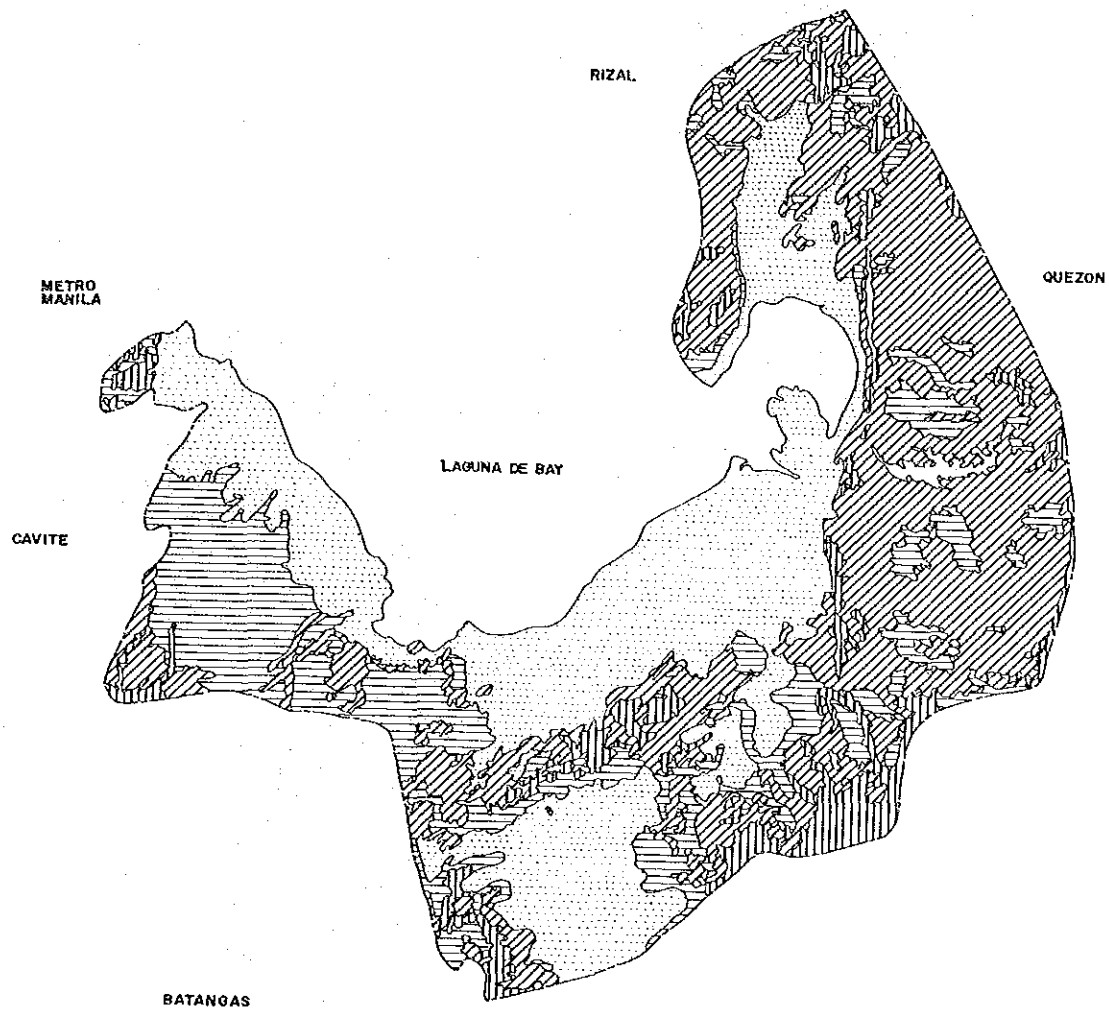


FIGURE J.30 Erosion Potential Map (Laguna)

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- NONE
- SLIGHT
- MODERATE
- SEVERE

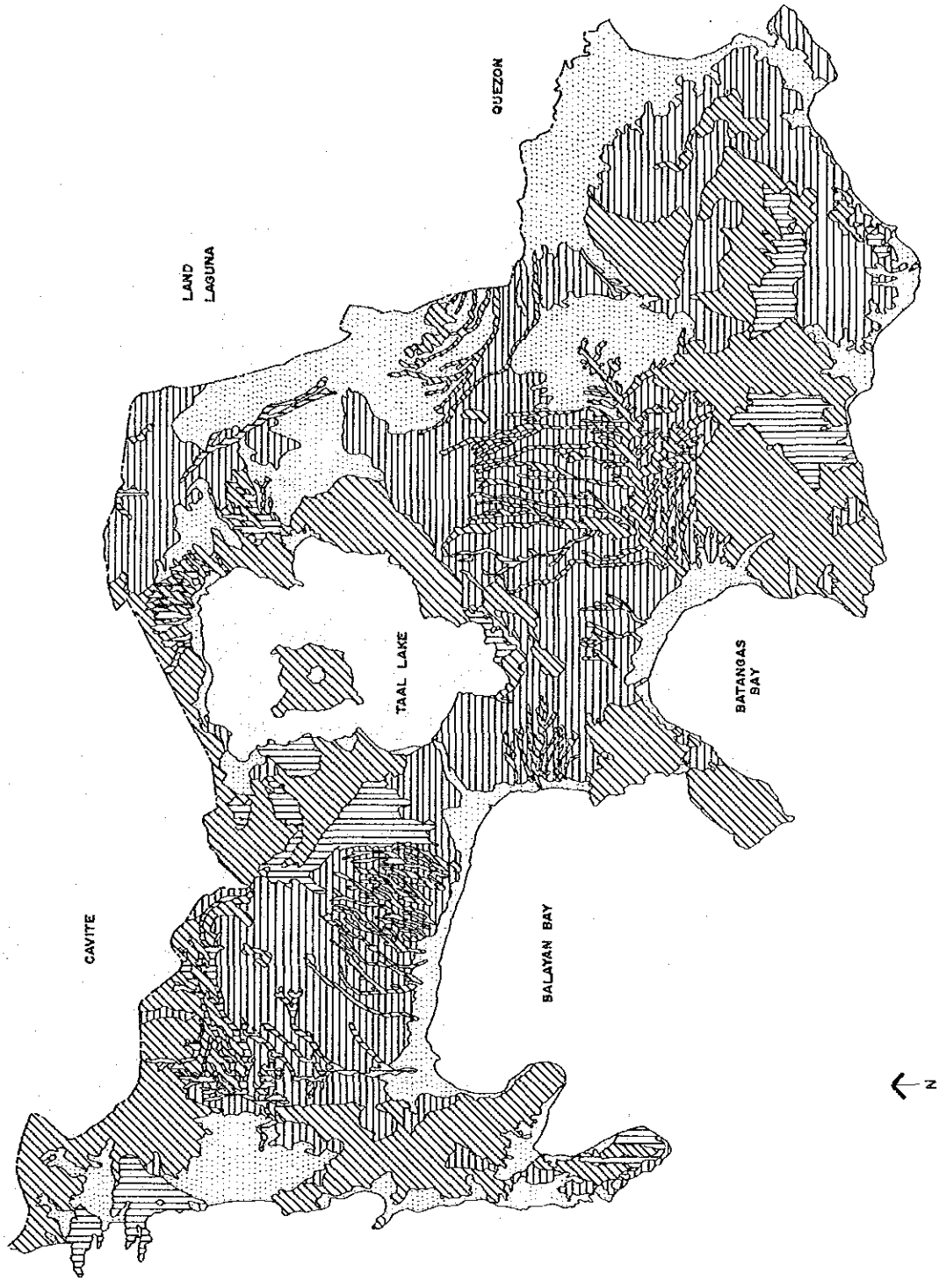


FIGURE J.31 Erosion Potential Map (Batangas)

LEGEND :

- NONE
- SLIGHT
- MODERATE
- SEVERE

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

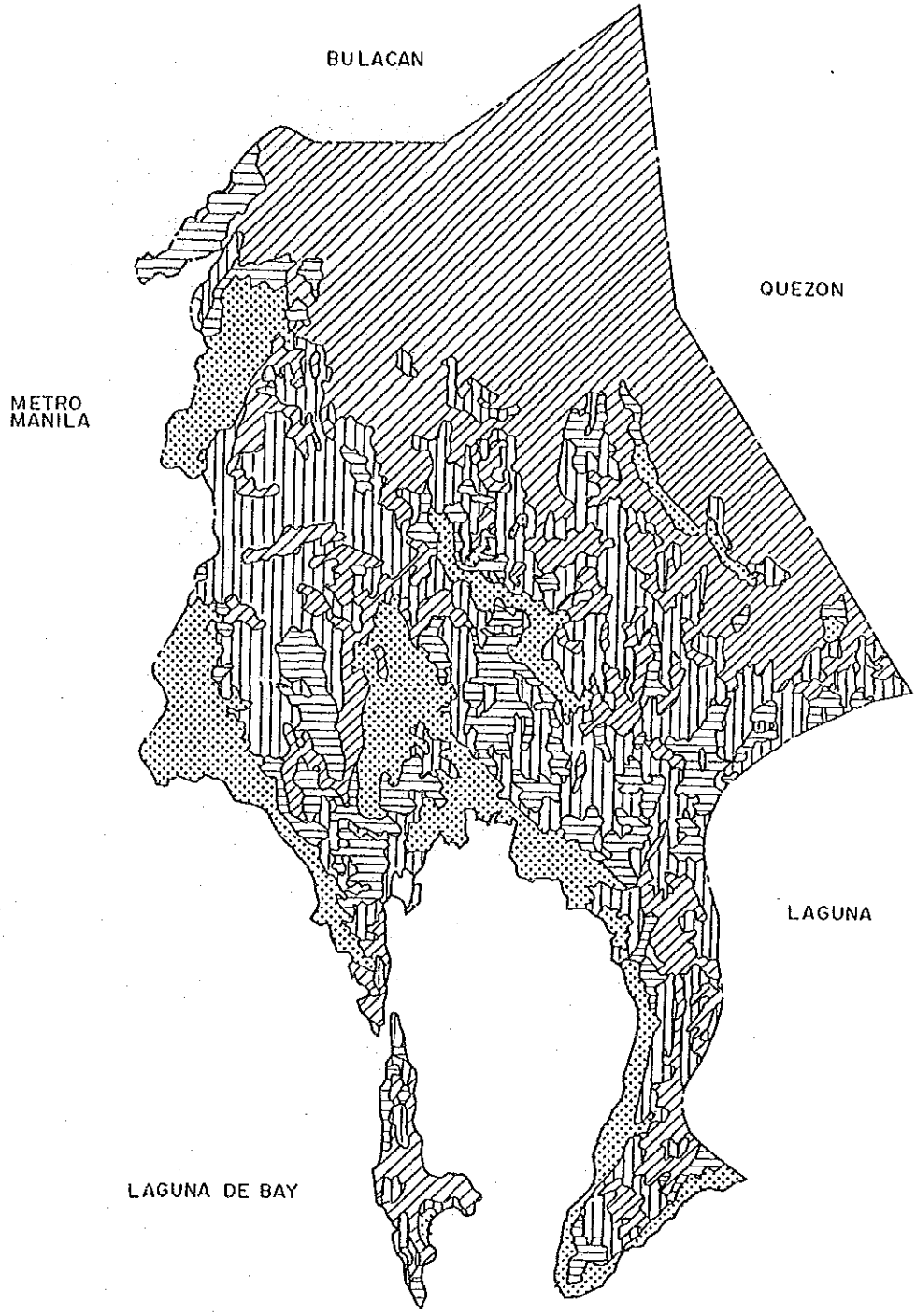


FIGURE J.32 Erosion Potential Map (Rizal)

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

LEGEND :

- NONE
- SLIGHT
- SEVERE
- MODERATE

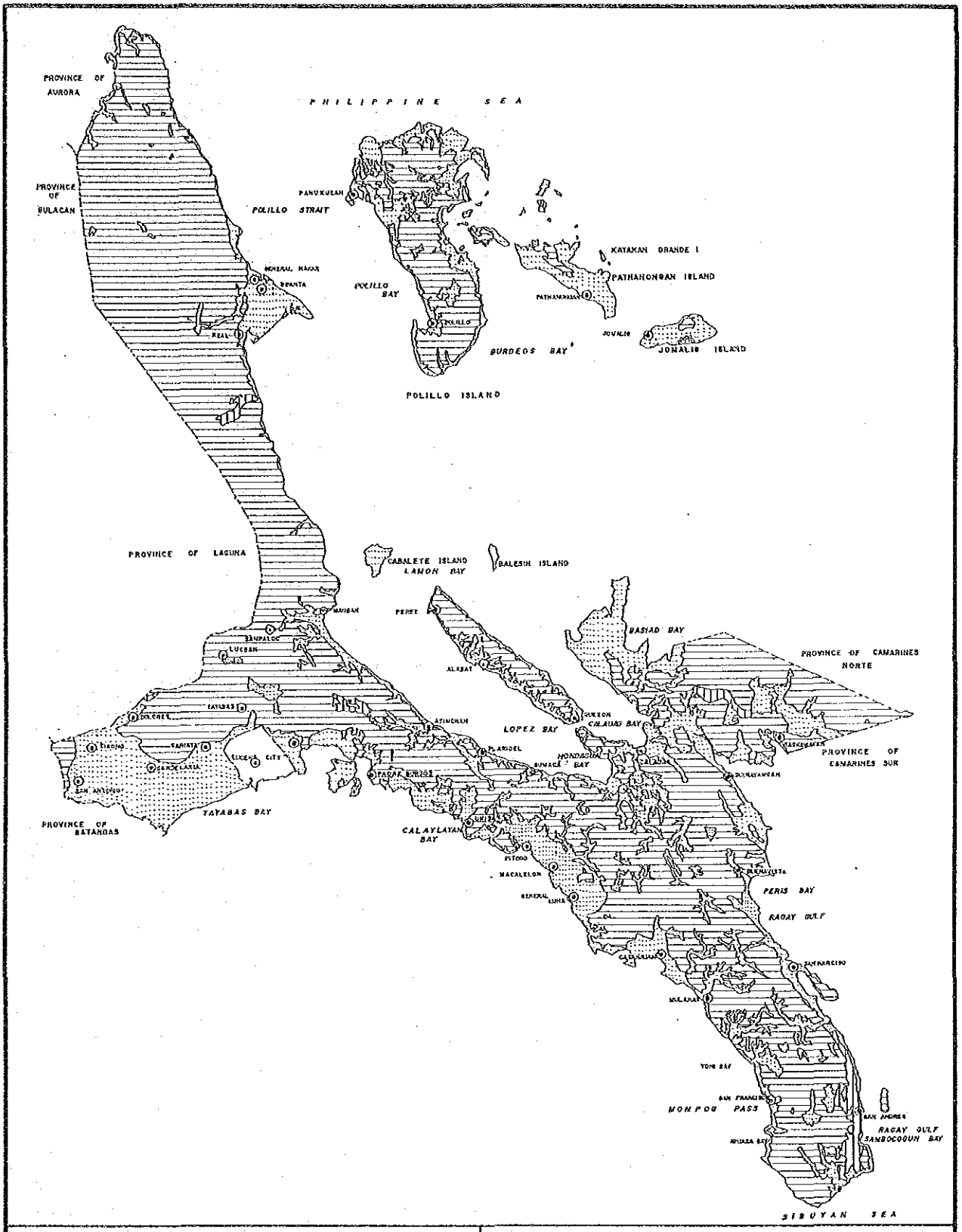


FIGURE J.33 Erosion Potential Map (Quezon)

LEGEND :

EROSION CLASS	DEGREE OF EROSION
	No apparent erosion
	Slight erosion
	Moderately erosion

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY

Annex to Appendix J

Annex to Appedix J

I. Environmentally Critical Projects

A. Heavy Industries

1. Non-ferrous Metal Industries
   a) Classified as large-scale industrial plants
   b) designed rated capacity equal to or exceeding 3,000 metric tons product
   c) Will process toxic non-ferrous metals such as cadmium, chromium and lead

2. Iron and Steel Mills
   a) classified as large-scale industrial plants
   b) designed annual rated capacity equal to or exceeding 30,000 metric tons products

3. Petroleum and Petrochemical Industries
   a) classified as large-scale industrial plants
   b) Refineries with designed capacities equal to or exceeding 30,000 barrels of petroleum per year
   c) Petrochemical Industry projects with designed annual rated capacities of 30,000 tons

4. Smelting Plants
   a) classified as large-scale industrial plants
   b) designed annual rated capacity equal to or exceeding 15,000 metric tons raw materials
   c) Will process toxic non-ferrous metals such as cadmium, chromium and lead

B. Resource Extractive Industries

1. Major Mining and Quarrying Projects
   a) Ore-processing by cyanidization, flotation, mechanized grinding and/or crushing, magnetic separation and or mechanized gravity concentration
   b) Utilization of the opent-pit method with mechanical operations and/or blasting
   c) Underground mining using blasting and/or mechanized extraction
   d) Marine or off-shore mining
   e) Extraction of oil and gas

2. Forestry Projects

a) cutting and harvesting of timber on a commercial scale

b) Major wood processing projects including

(1) saw mills

(2) plants producing veneer, plywood, wall board, blockboard, crates, etc.

(3) pulp and paper mills

c) Introduction of Fauna in Public/Private Forests introduction of exotic species of flora and fauna to private/public forests

d) Forest Occupancy

refer to the occupancy of people residing within public forests for livelihood purposes and associated management projects

e) Extraction of Mangrove Products

refer to the cutting and gathering of mangrove timber and its products

f) Grazing Projects

management of forest range resources for forage productivity needed to support livestock production

3. Dikes for/and Fishpond Development Projects

natural of artificial water impoundment involving dike construction for purposes of raising fries and harvesting the same at marketable size and quantities

Fishpond development projects shall be considered critical if such will involve utilization of areas equal to or greater than 25 hectares

C. Infrastructure Projects

1. Major Dams

all impoundment structures and appurtenances with storage volumes equal to or exceeding 20 million cubic meters

2. Major Power Plants

power generating plants utilizing or are run by fossil fuels, geothermal resources, the nuclear fission process, natural river discharge, pondage or pump storage

nuclear, geothermal, thermal power plants with rated capacities equal to or exceeding 10 megawatts and hydroelectric power plants with rated capacities equal to or exceeding 6 megawatts

3. Major Reclamation Projects
   filling or draining of areas (foreshore, marshes, swamps, lakes, rivers, etc.) equal to or exceeding 1 hectare

4. Major Roads and Bridges
   construction of all national and provincial roads and bridges and any significant extension or improvement which will:
   a) Traverse any highly developed urban areas
   b) Affect the hydrology of the traversed areas
   c) Substantially increase or impede traffic flow

II. Environmentally Critical Areas

A. All areas declared by law as national parks, watershed reserves, wildlife preserves and sanctuaries

1. National Parks
   : forest land reservations essentially of primitive wilderness character which have been withdrawn from settlement or occupancy and set aside as such exclusively to preserve the scenery, natural and historic objects and the wild animals and plants therein to provide enjoyment of these features in such a manner as will have them unimpaired for future generations

2. Watershed Reserves
   : forest land reservations established to improve the quality or condition of the water yield thereof or reduce sedimentation

3. Wildlife Preserves
   : forest lands designated for the protection of game animals, birds and fishes and closed to hunting and fishing in order that the excess may flow and restock surrounding areas

B. Areas set aside as aesthetic potential tourists spots areas declared and reserved by the Philippine Tourism Authority for tourism development

C. Areas which constitute the habitat for any endangered or threatened species of indigenous Philippine wildlife (flora and fauna)

This shall refer to wilderness areas and areas such as Mt. Bako, Mt. Apo, etc., which are natural habitats of endangered or threatened, rare and indeterminate species of flora and fauna

1. Indeterminate species
   : plant or animal species which are apparently endangered but where insufficient data are currently available for a reliable assessment

2. Threatened species
   : any plant or animal species which is likely to become endangered species within the foreseeable future throughout all or just a significant portion of its range

3. Rare species
   : plant or animal species which are not under immediate threat of extinction but occurs in small numbers

4. Endangered species
   : plant or animal species which are actively threatened with extinction and whose survival are unlikely without protective measures

D. Areas of unique historic, archeological or scientific interests

E. Areas which are traditionally occupied by cultural communities or tribes

F. Areas frequently visited and or hard-hit by natural calamities (geological hazards, floods, typhoons, volcanic activity, etc.)

1. Areas frequently visited or hard-hit by typhoons
2. Areas frequently visited and hard-hit by tsunamis
3. Areas frequently visited and/or hard-hit by earthquakes
4. Storm surge-prone areas
5. Flood-prone areas

G. Areas with critical slope
all lands with slope of 40% or more not classified in this listing as environmentally critical. This classification shall cover alienable and disposable forest lands and unclassified forests

H. Areas classified as prime agricultural lands
capability classes A, B, Ce, De as determined by Bureau of Soils

I. Recharged areas of aquifers

J. Waterbodies
cover all fresh surface waterbodies which are class AA, A, B and C as per NPCC classification, this shall include all marine turtle and fish sanctuaries

K. Mangrove Area

L. Coral Reefs

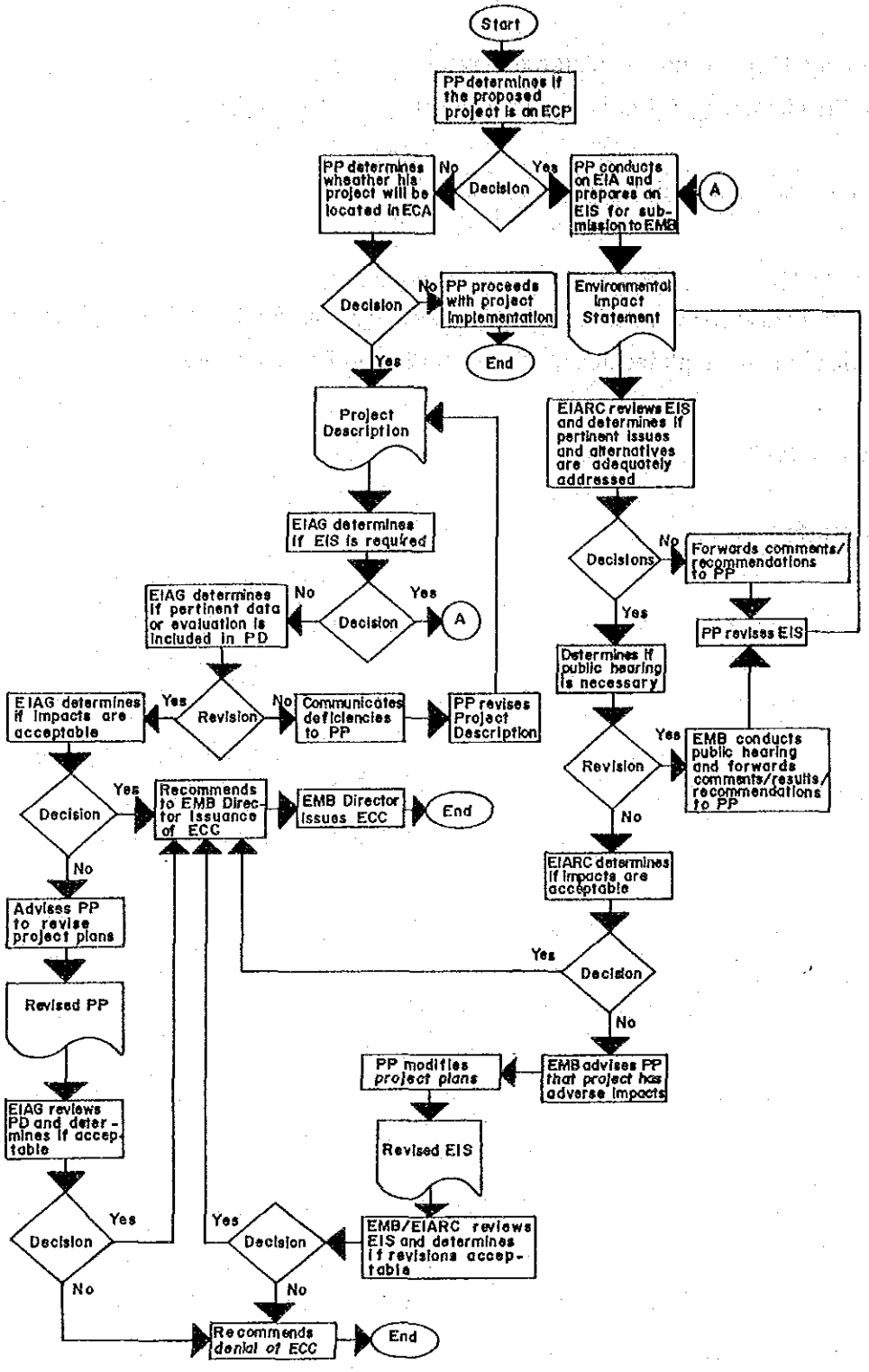


FIGURE Flowchart for the Processing of EIA Documents

LEGEND :

REPUBLIC OF THE PHILIPPINES
THE MASTER PLAN STUDY OF

THE PROJECT CALABARZON

JAPAN INTERNATIONAL COOPERATION AGENCY