LOCATION MAP AT TRANS-DIVERSION TUNNEL

LEGEND

Seismic Exploration Line

Drilling Point

0 100 400 m

PROPOSED TRANS-DIV. TUNNEL

DDH-T1

DDH-T2

DDH-T3

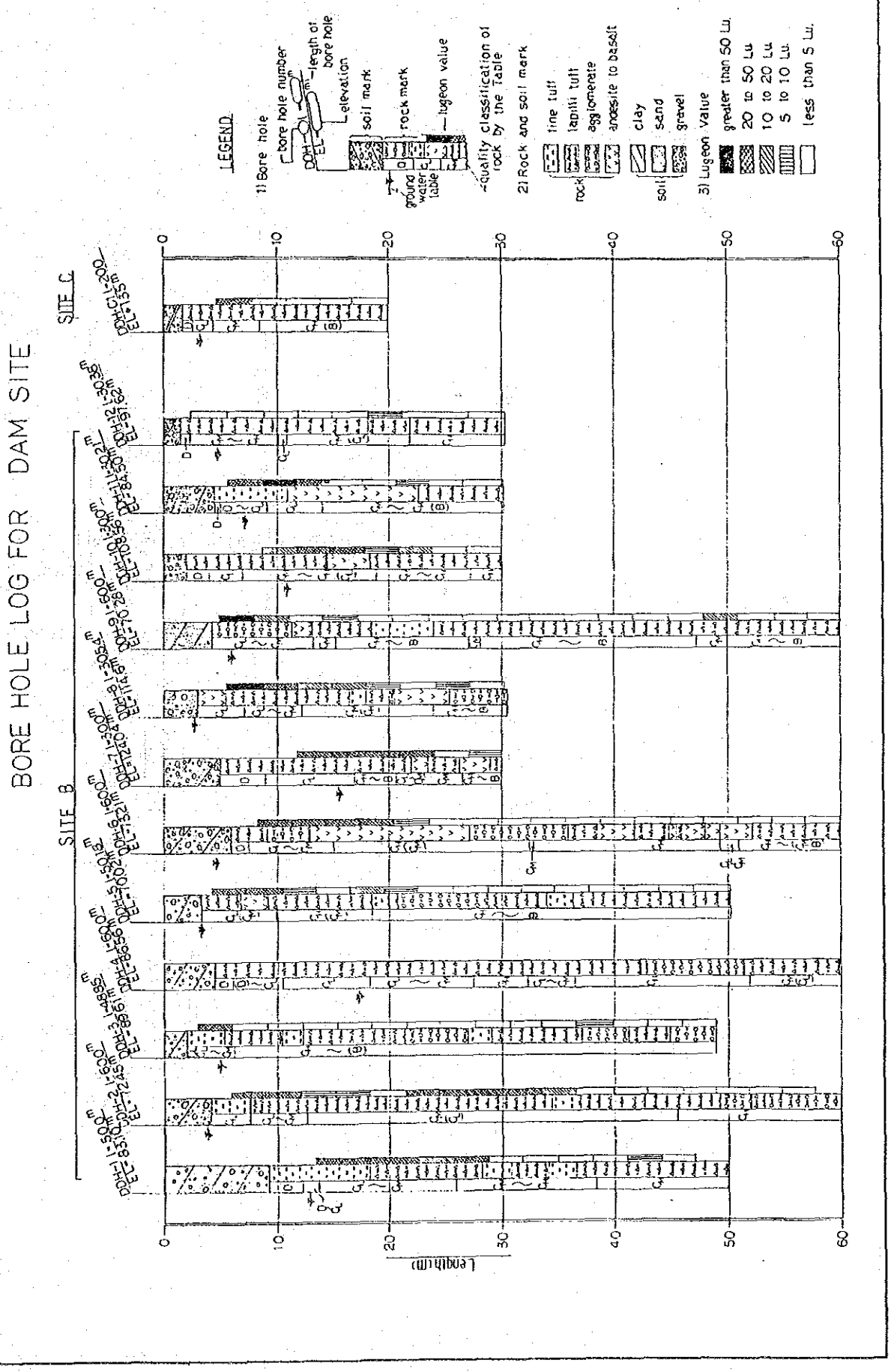
TUNNEL AREA

outlet

880 m

(FIG. III-4)

FIG. III - 5


BORE HOLE LOG FOR DAM SITE
LEGEND
1) Bore hole
bore hole number
length of bore hole
Elevation
soil mark
rock mark
lugeon value
ground water table
quality classification of rock by the Table
2) Rock and soil mark
tuff
tuffaceous rock
agglomerate
andesite to basalt
clay
soil
sand
gravel
3) Lugeon Value
greater than 50 Lu.
20 to 50 Lu
10 to 20 Lu
5 to 10 Lu.
less than 5 Lu.
SITE B
SITE C
length (m)

BORE HOLE LOG FOR QUARRY SITE

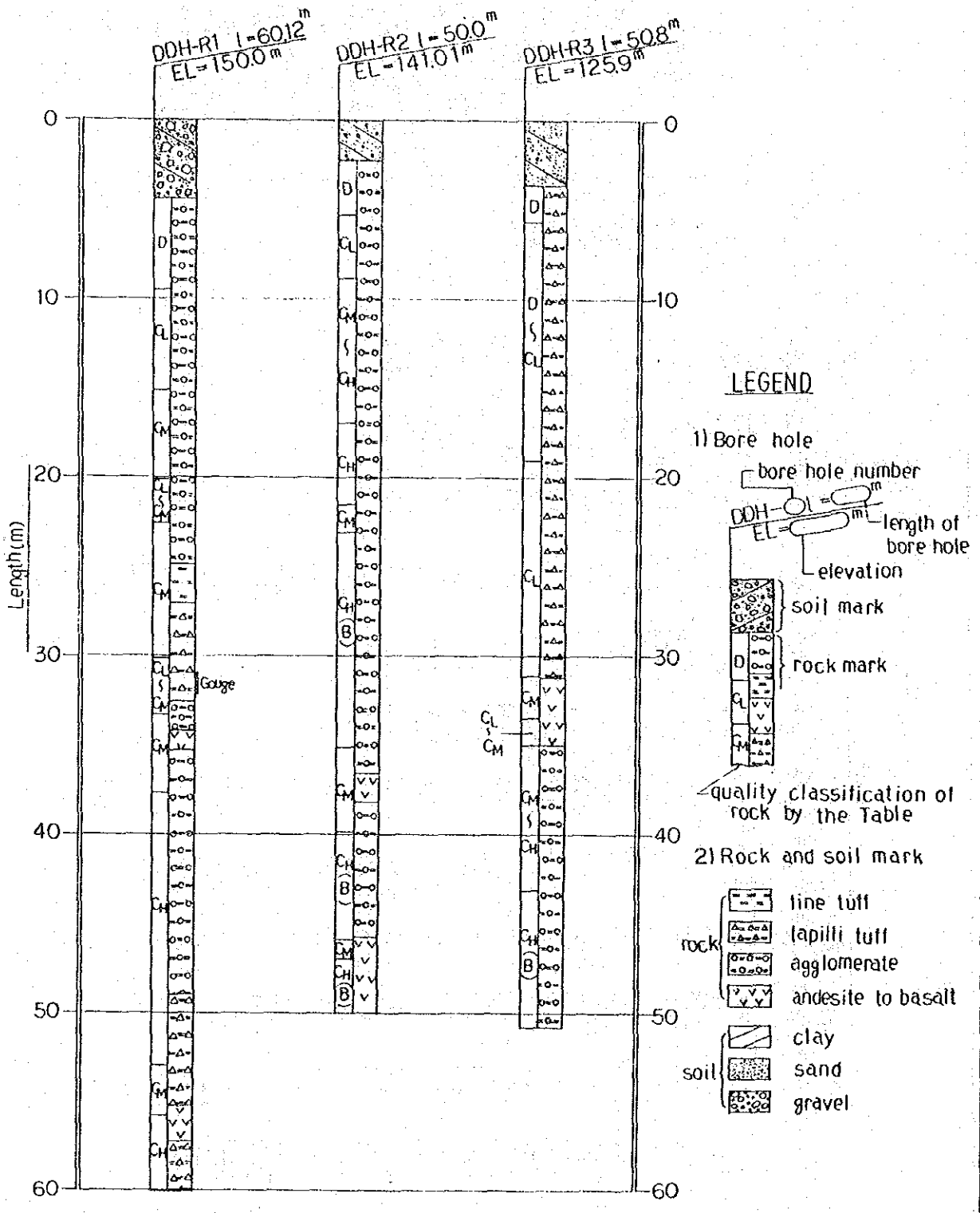
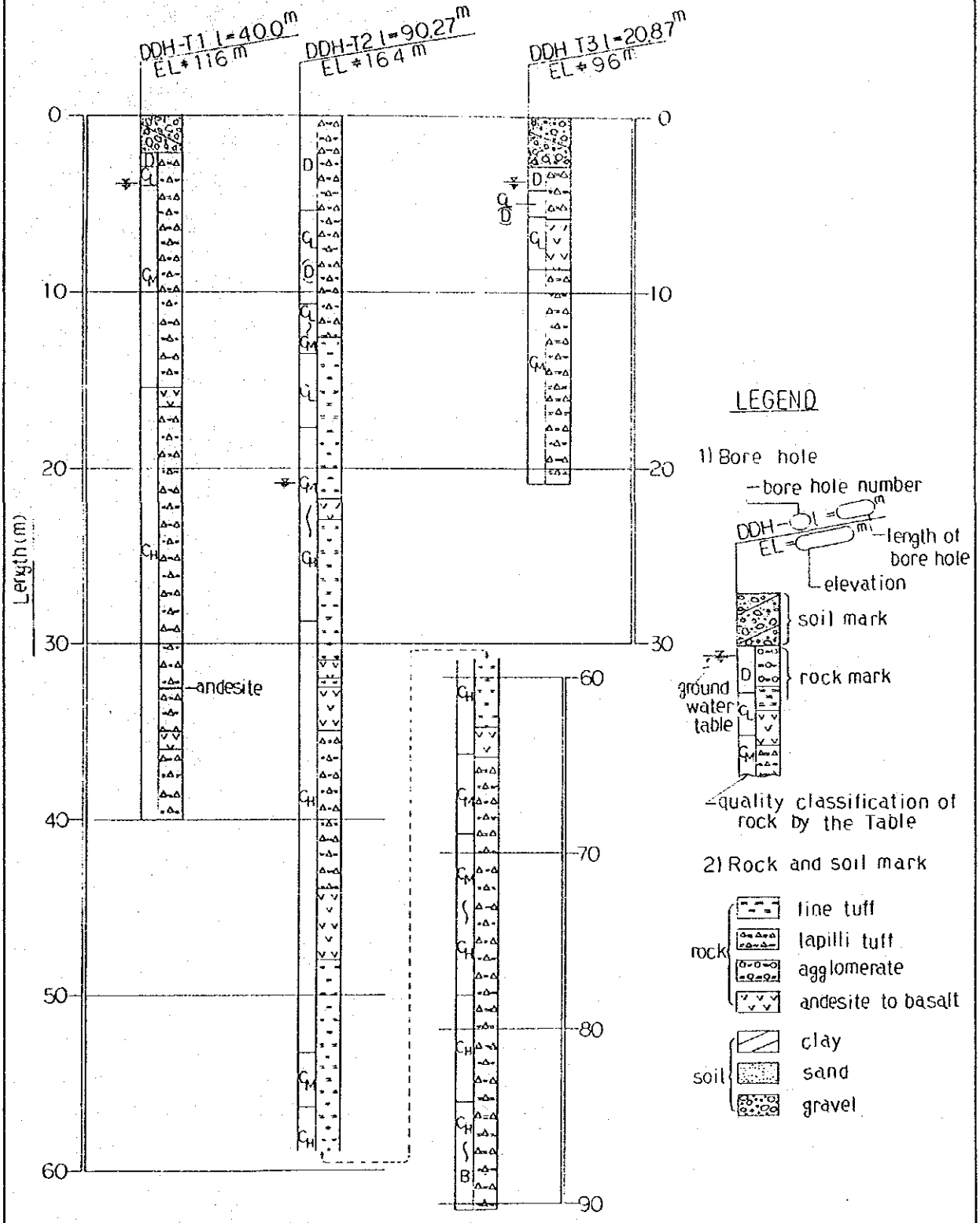
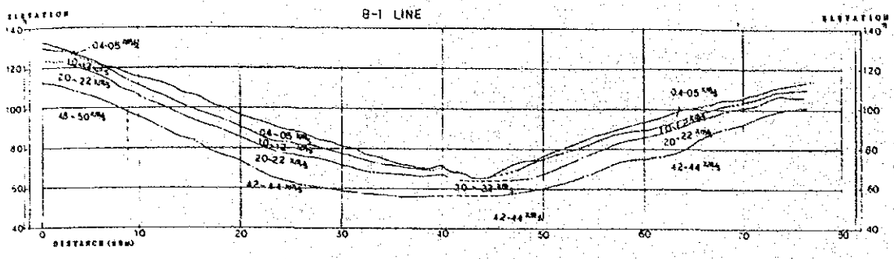


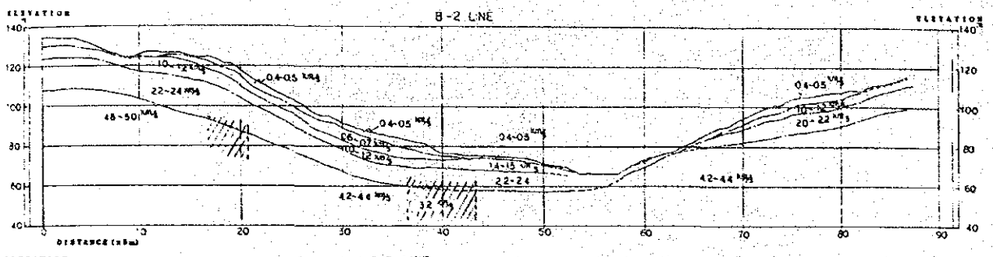
FIG. Ⅲ-7

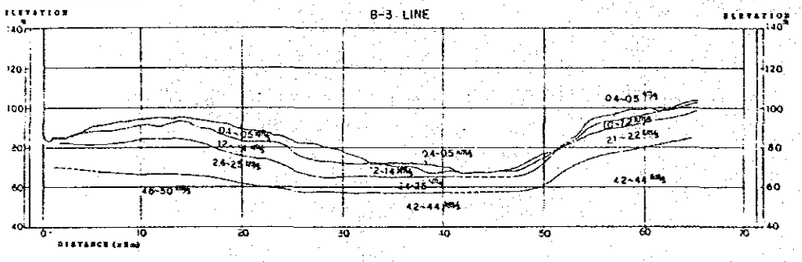
BORE HOLE LOG FOR TUNNEL SITE

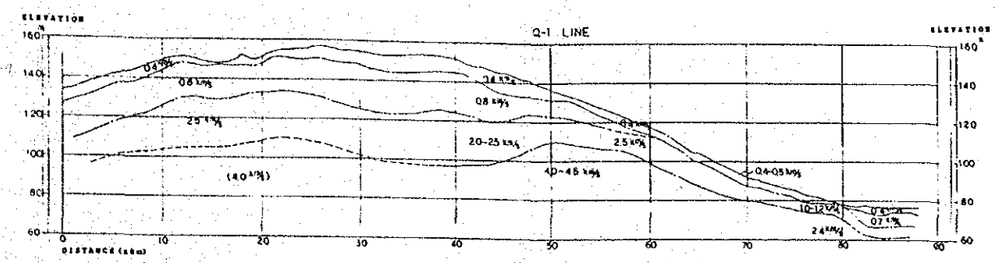


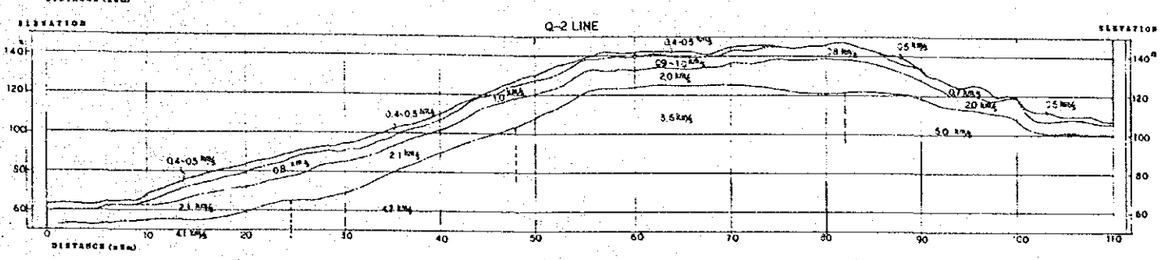
VELOCITY LAYER SECTION BY SEISMIC PROSPECTING

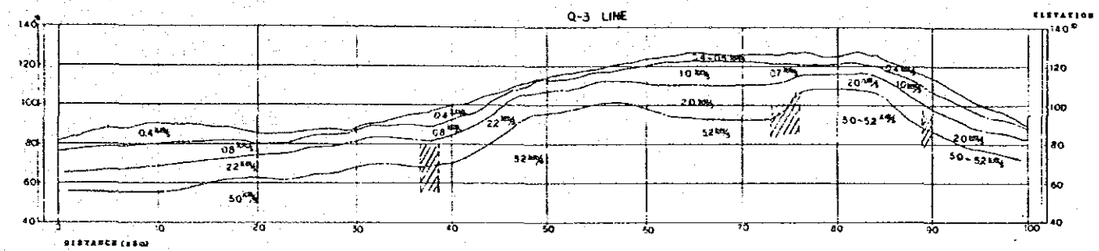


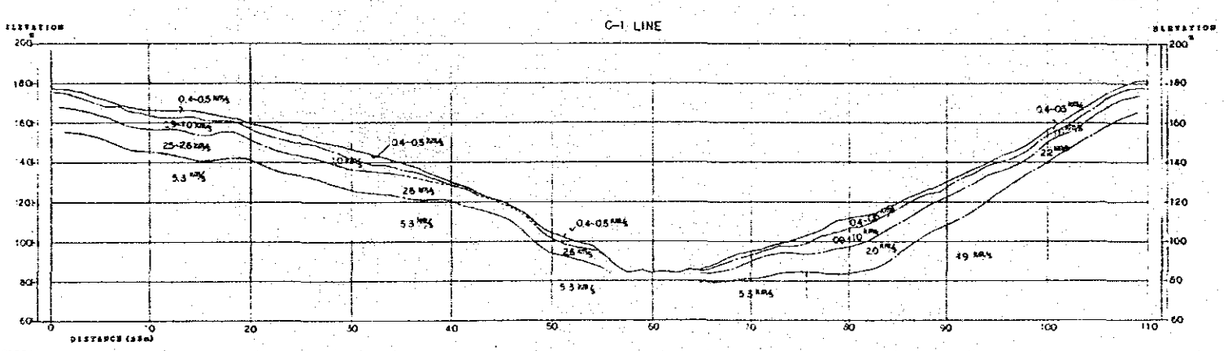


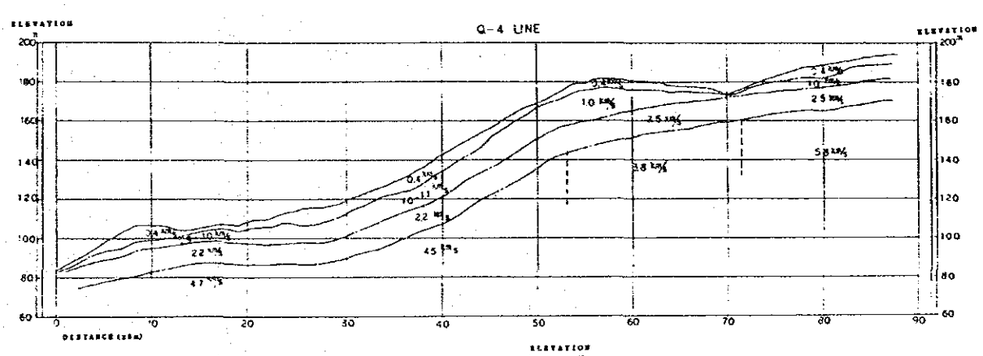


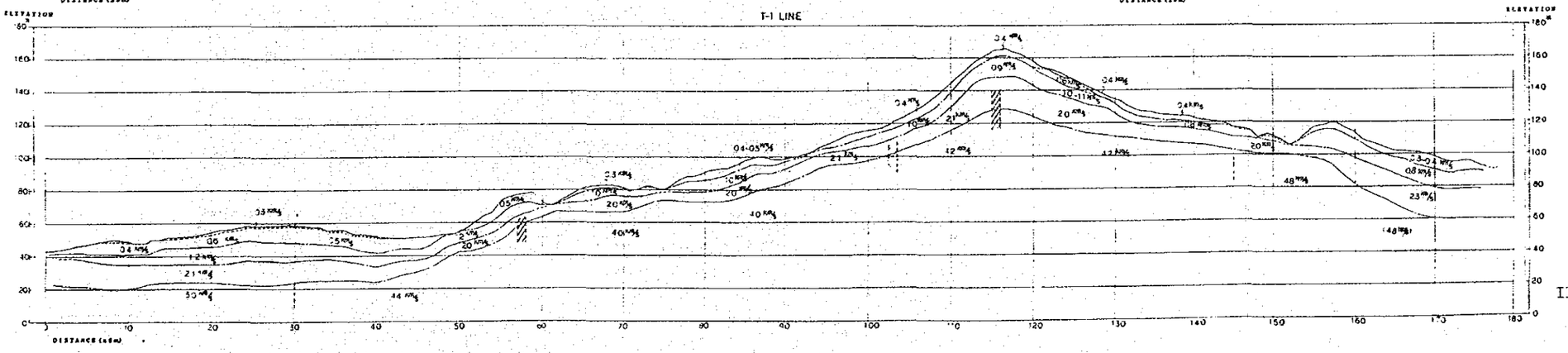


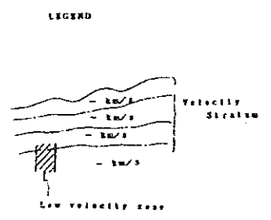




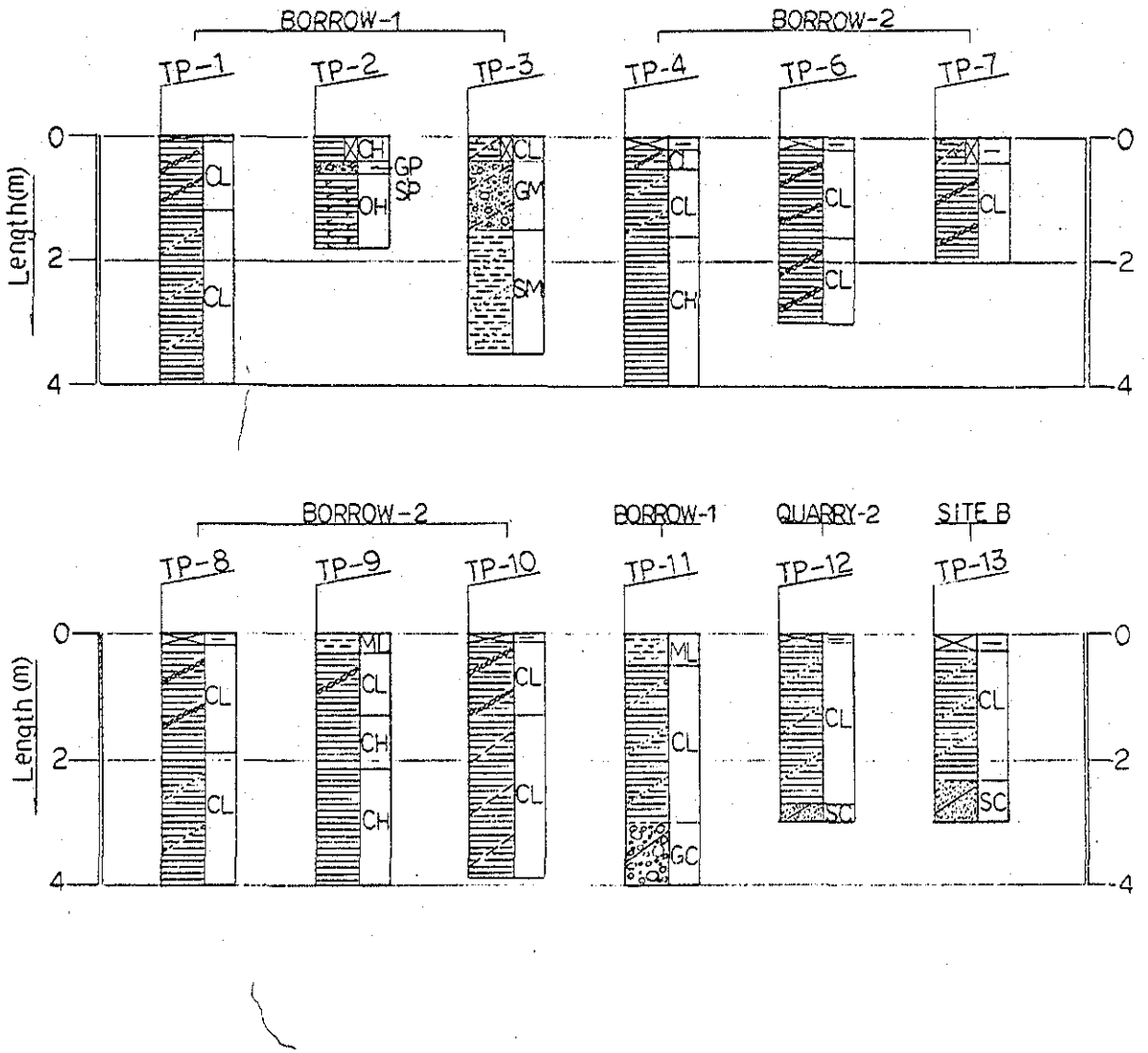






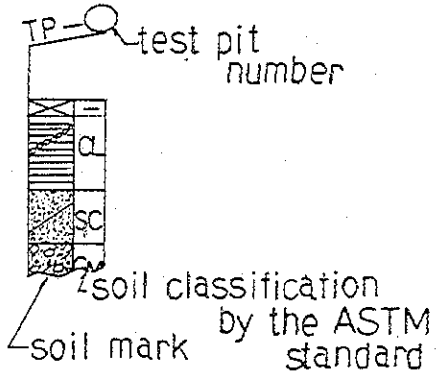


SOIL PROFILE OF TEST PIT



LEGEND

1) Pit



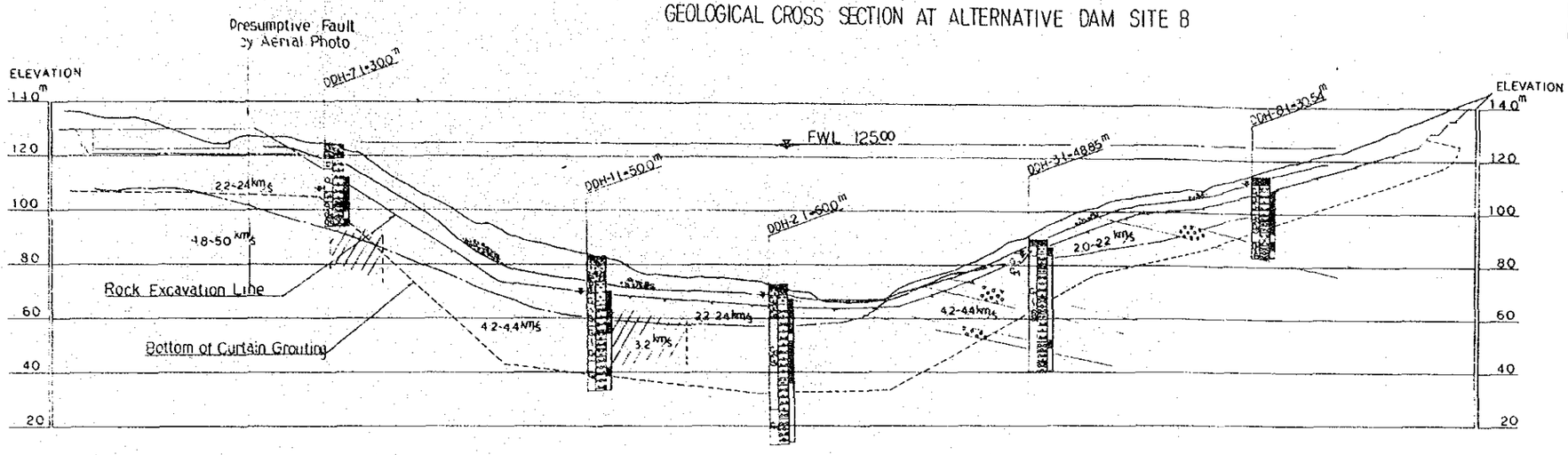
2) Soil mark

main mark		sub mark	
	clay		clayey
	silt		silty
	sand		sandy
	gravel		gravelly
	top soil		-with organic matter

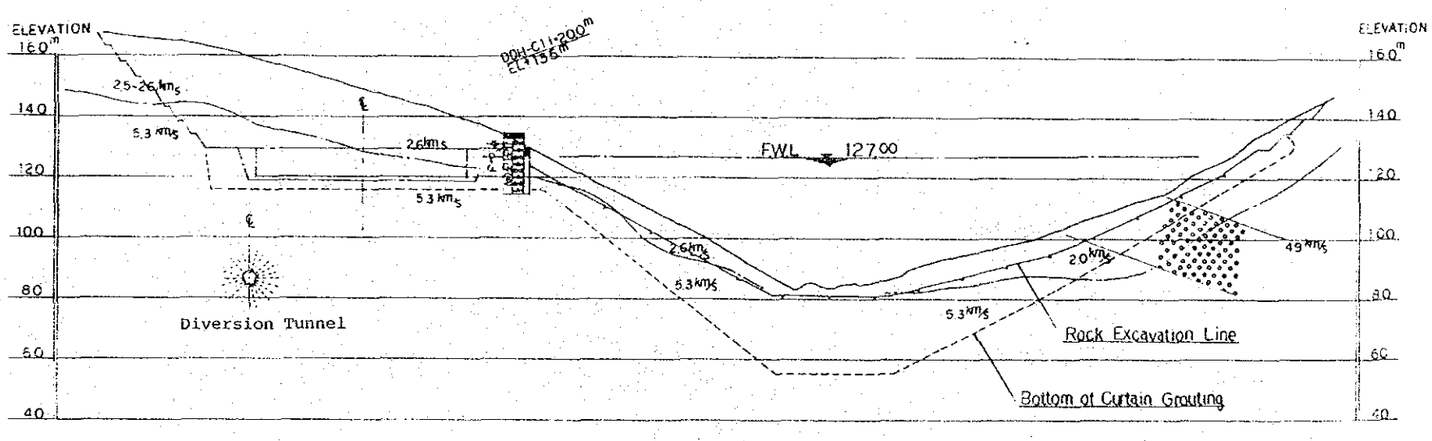
FIG. III - 9

FIG. III-10
FIG. III-11

GEOLOGICAL CROSS SECTION AT ALTERNATIVE DAM SITE B



GEOLOGICAL CROSS SECTION AT PROPOSED DAM SITE C



LEGEND

1) Bore hole
- bore hole number
- length of bore hole
- elevation
- soil mark
- rock mark
- lugeon value
- quality classification of rock by the Table

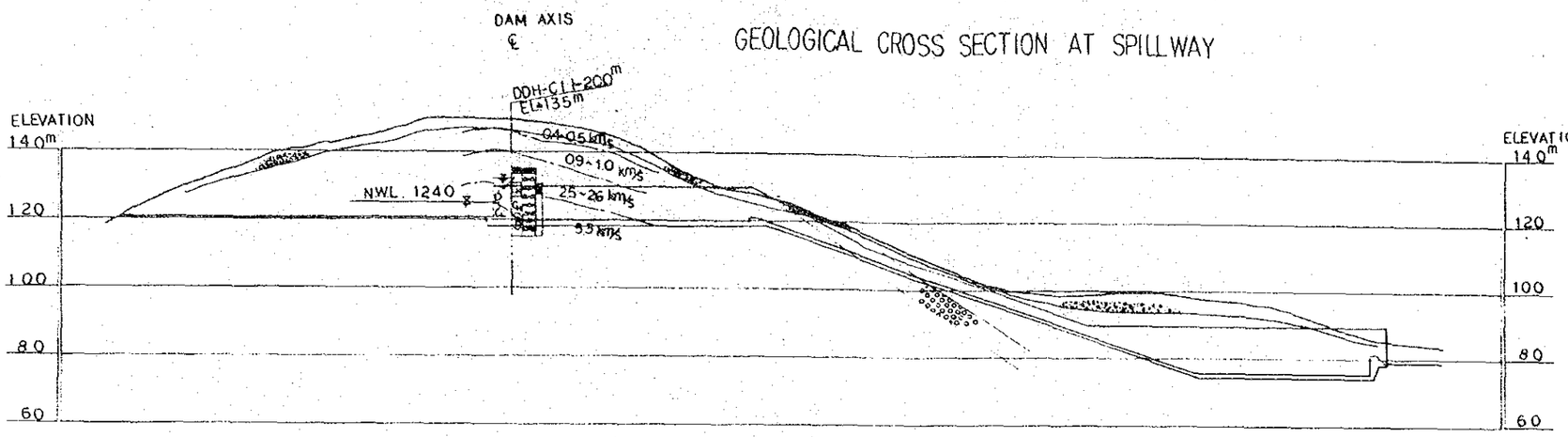
2) Rock and soil mark
- rock: fine tuff, lapilli tuff, agglomerate, andesite to basalt
- soil: clay, sand, gravel

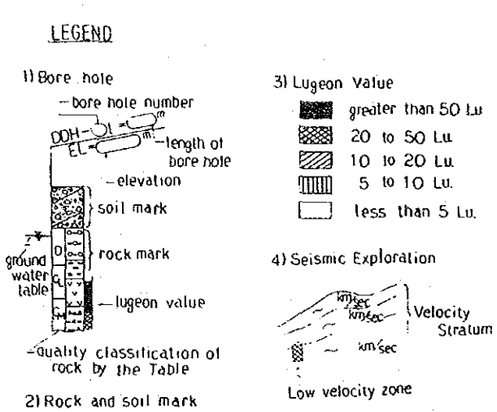
3) Lugeon Value
- greater than 50 Lu
- 20 to 50 Lu
- 10 to 20 Lu
- 5 to 10 Lu
- less than 5 Lu

4) Seismic Exploration
- Velocity Stratum
- km/sec
- Low velocity zone

GEOLOGICAL CROSS SECTION AT SPILLWAY

FIG.III-12
FIG.III-13





GEOLOGICAL CROSS SECTION AT BYPASS TUNNEL

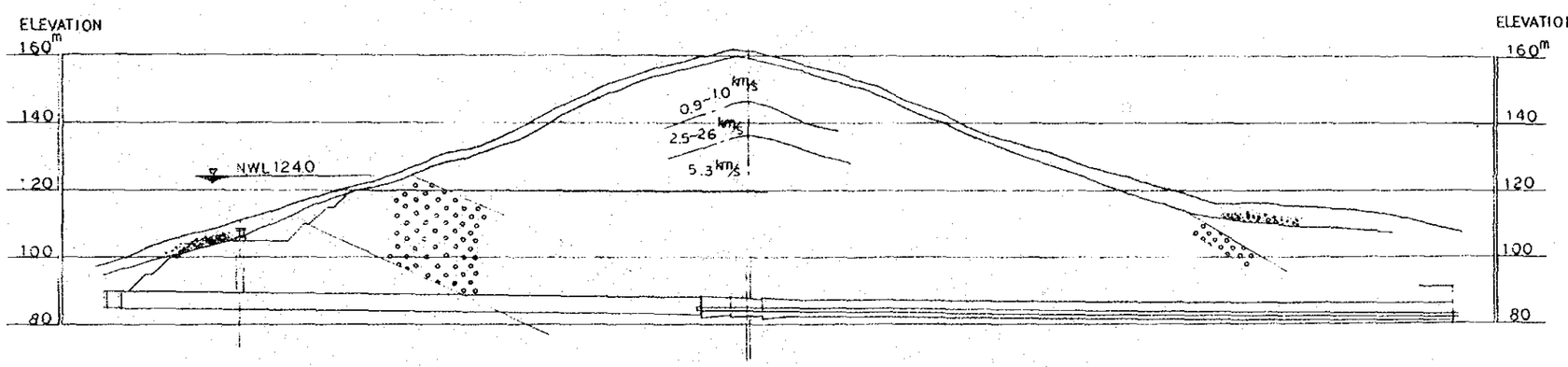
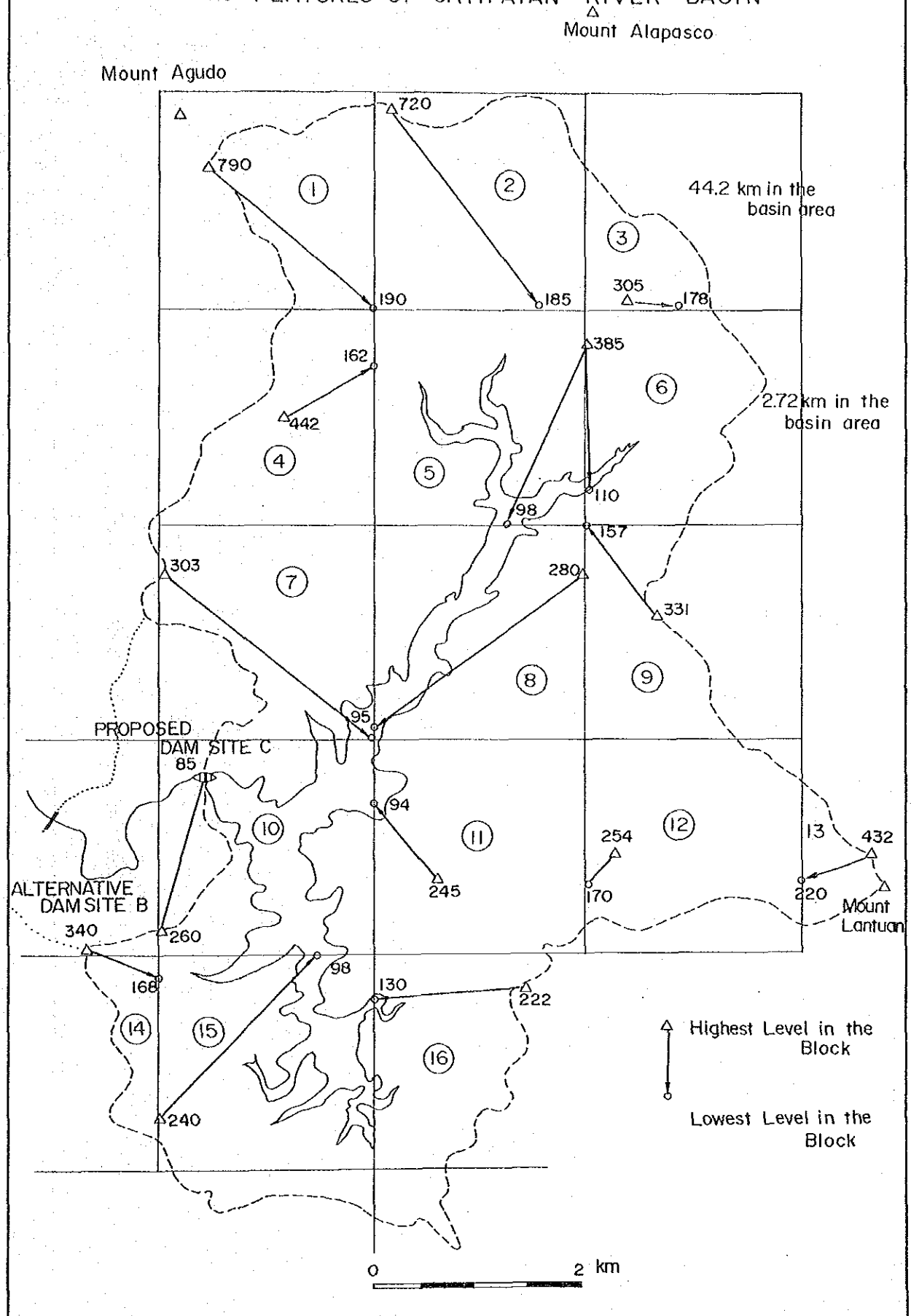


FIG. III - 14

TOPOGRAPHIC FEATURES OF CATIPAYAN RIVER BASIN



LINEAMENTS BY AERIAL PHOTO

0 1 2km

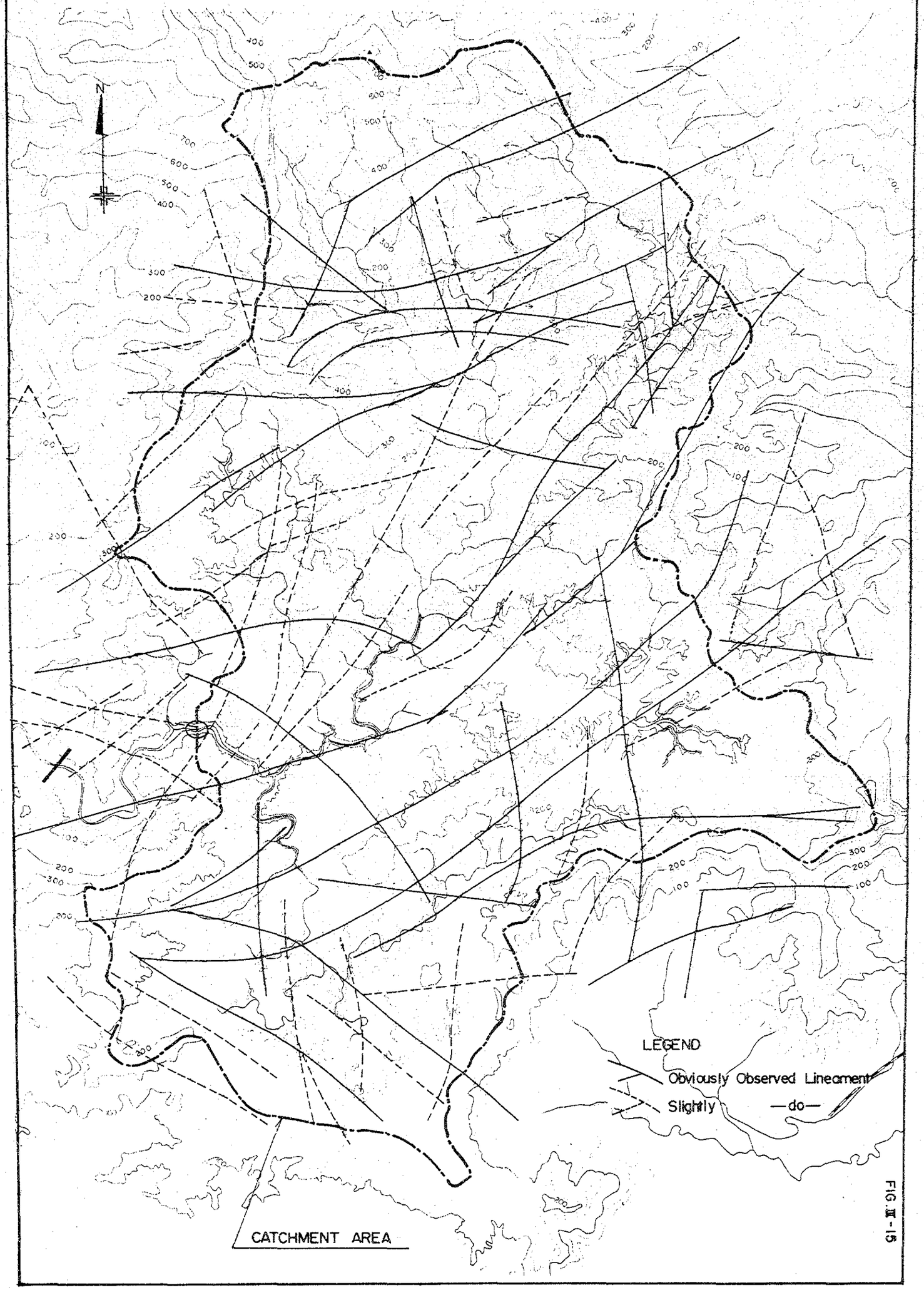


FIG. III-15

EXCAVATION PLAN OF PROPOSED QUARRY SITE

FIG. III - 16

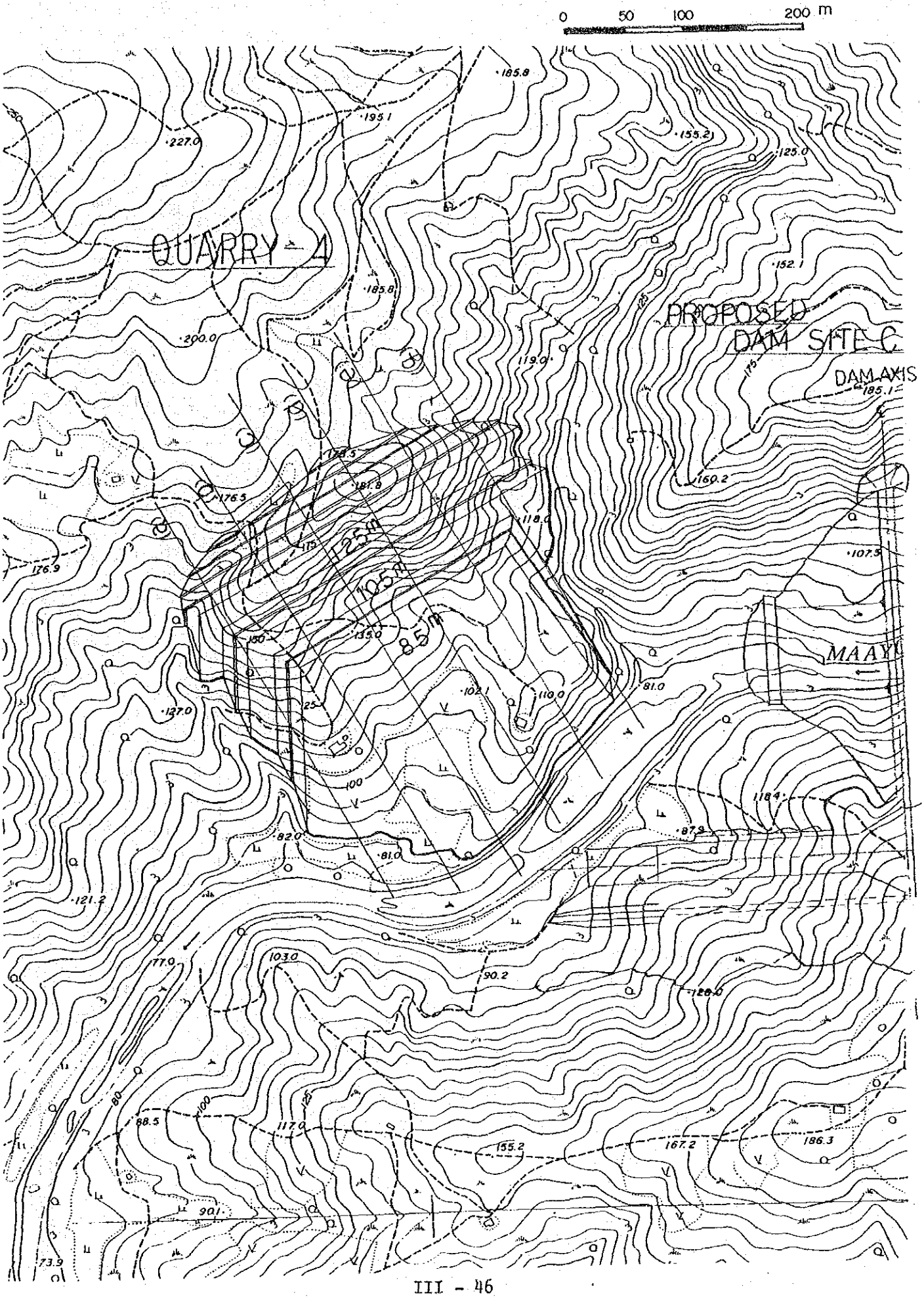


FIG. Ⅲ－17

EXCAVATION PROFILE FOR EMBANKENT MATERIAL

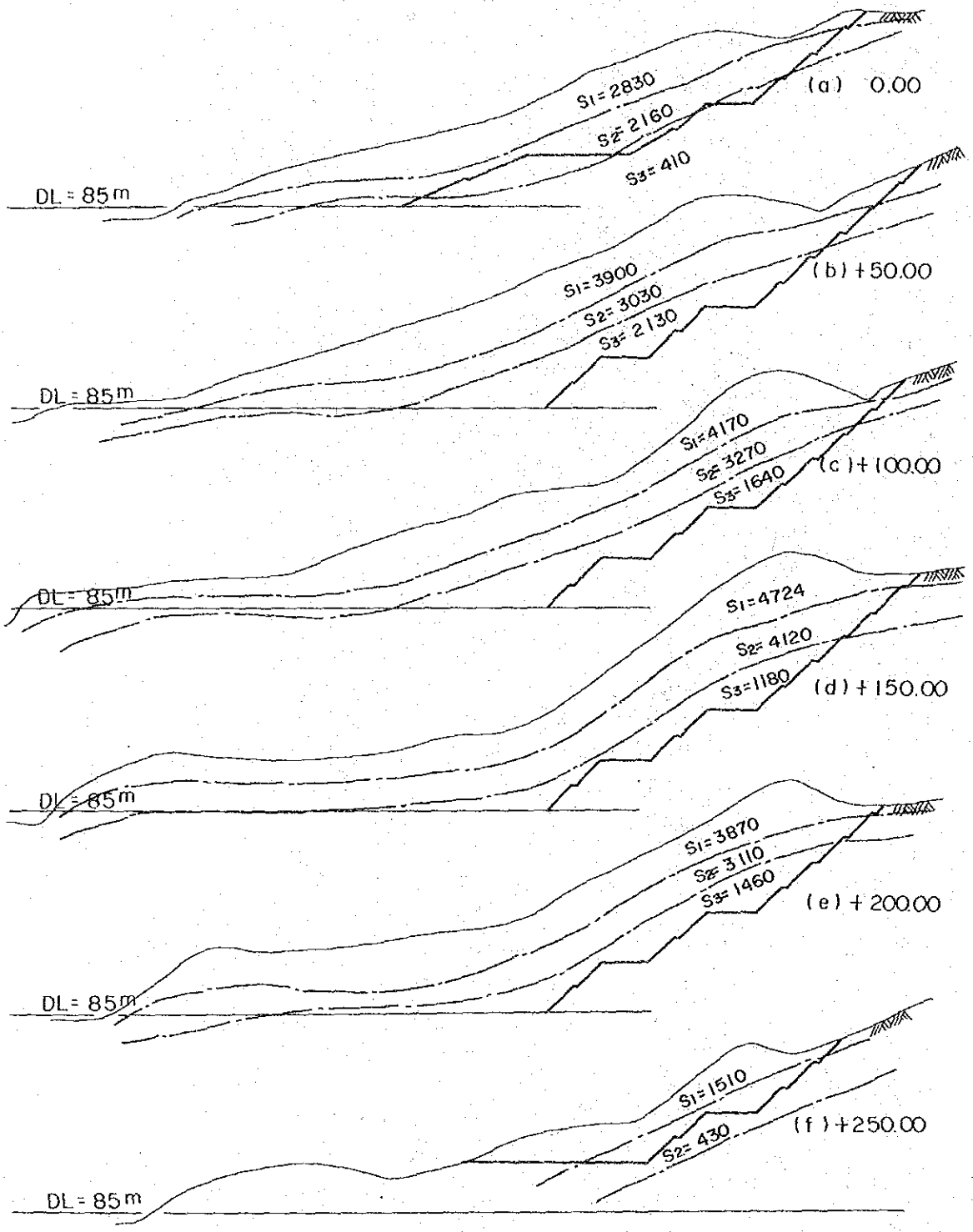
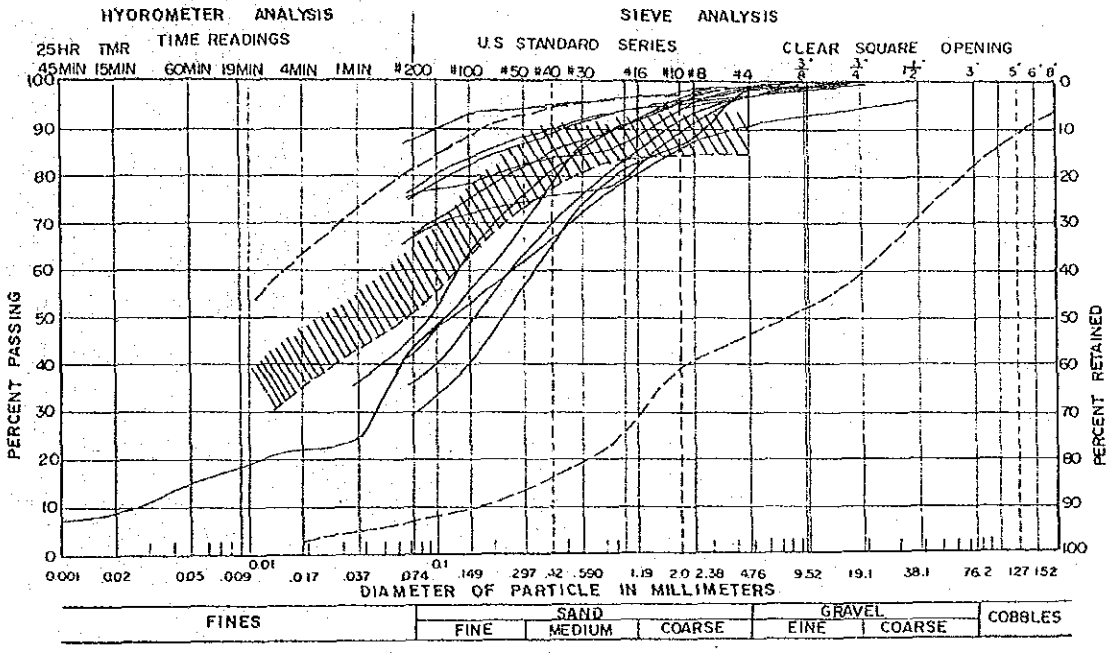


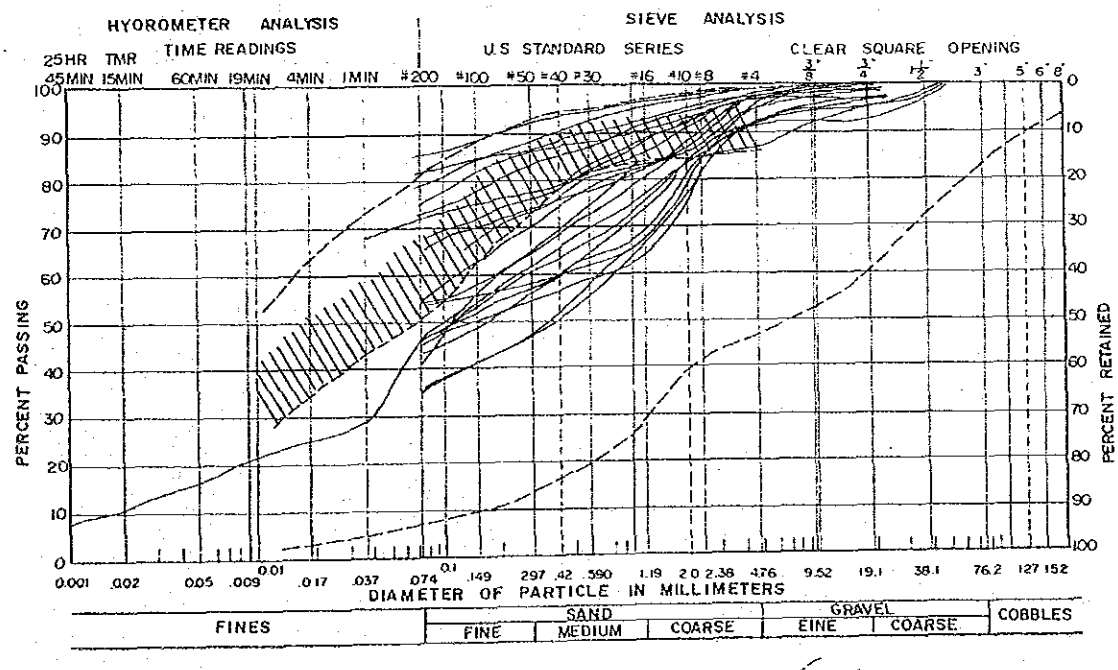
FIG. III-18

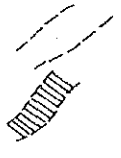
GRADATION CURVE OF IMPERVIOUS MATERIAL

a) BORROW - 1



b) BORROW - 2



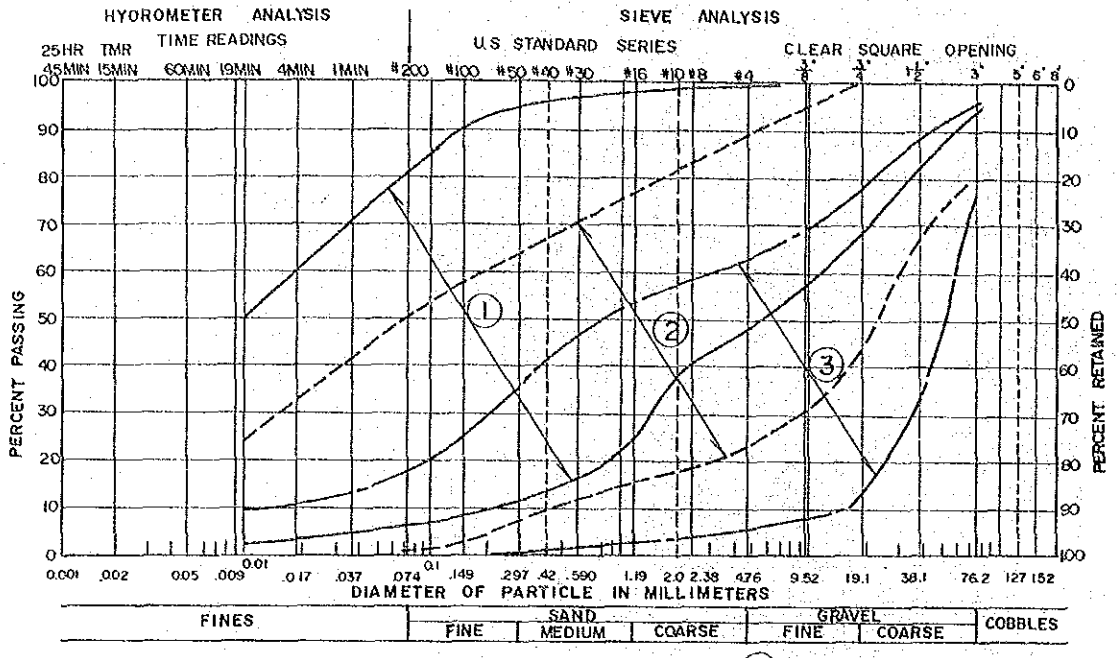


Envelop of U.S.B.R

Danger Zone
of Crack

FIG. III - 19
FIG. III - 20

GRADATION CURVE IN U.S.B.R

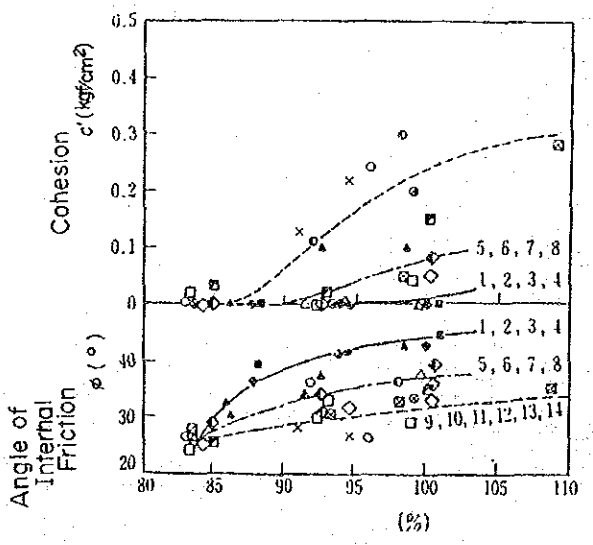


USBR

GRAIN SIZE CORRELATED WITH STRENGTH OF SAMPLE OF GRAVEL, SAND AND FINES

BY KATHUYUKI KUDARA, 1983

(a) Relation Degree of Compaction and C, ø



(b) Gradation Curve of Sample

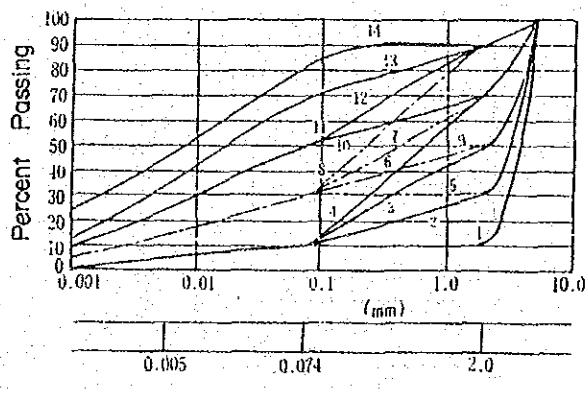
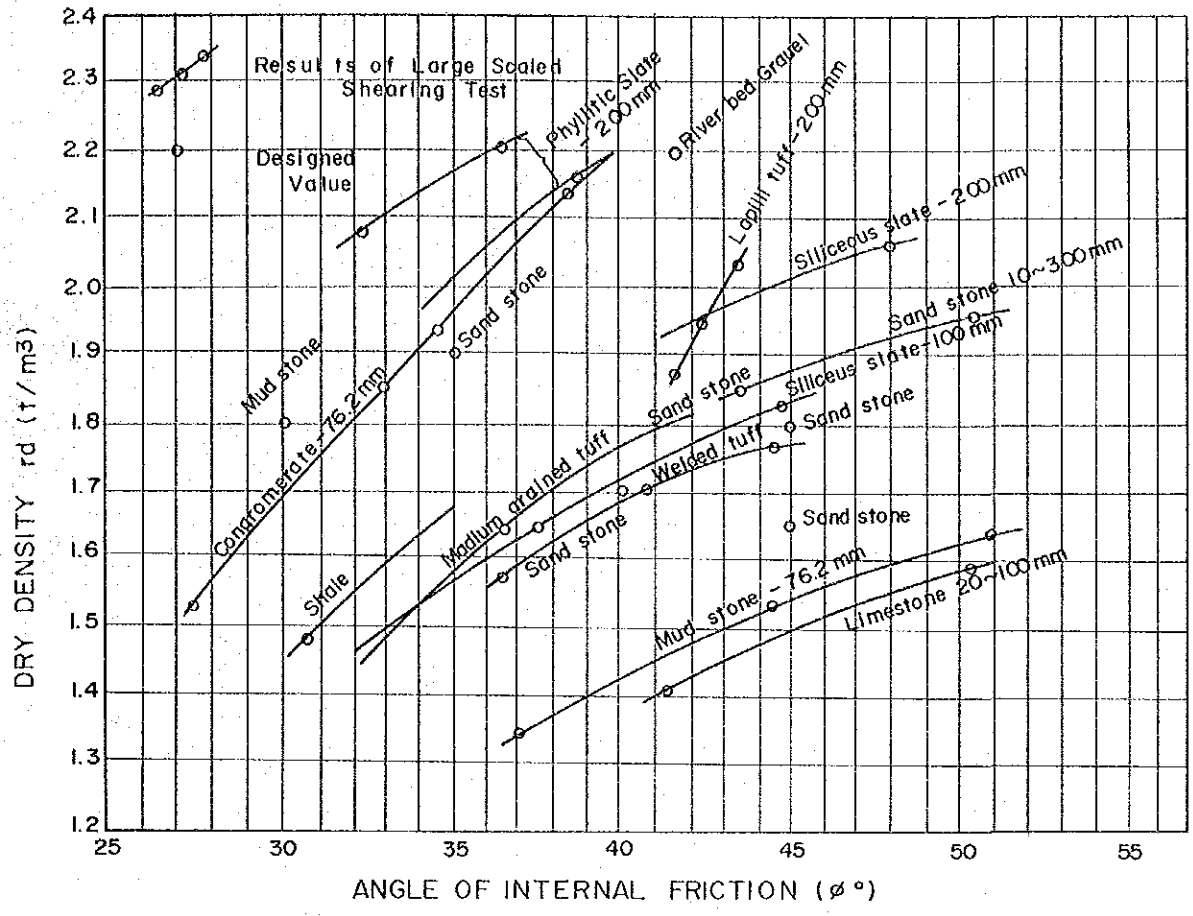
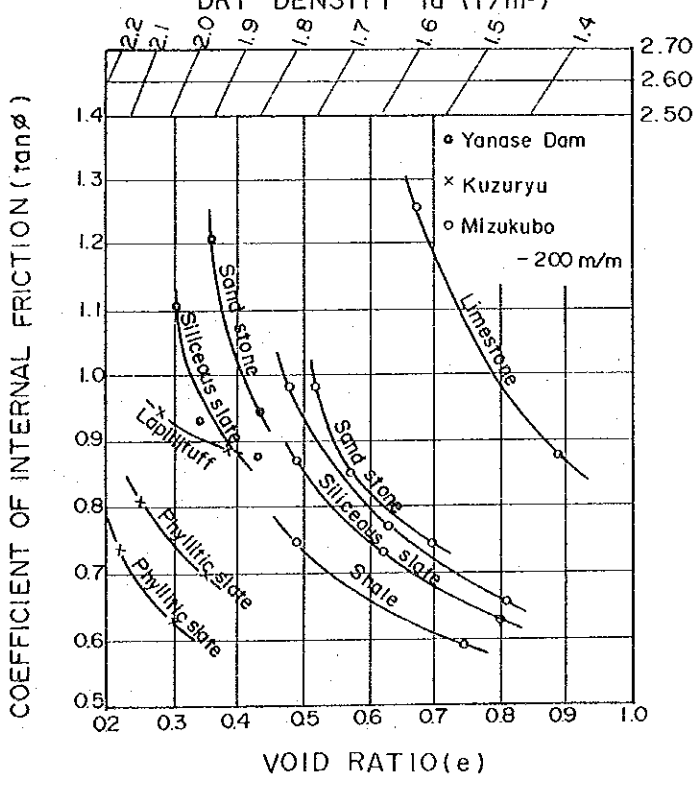


FIG. III - 21
FIG. III - 22

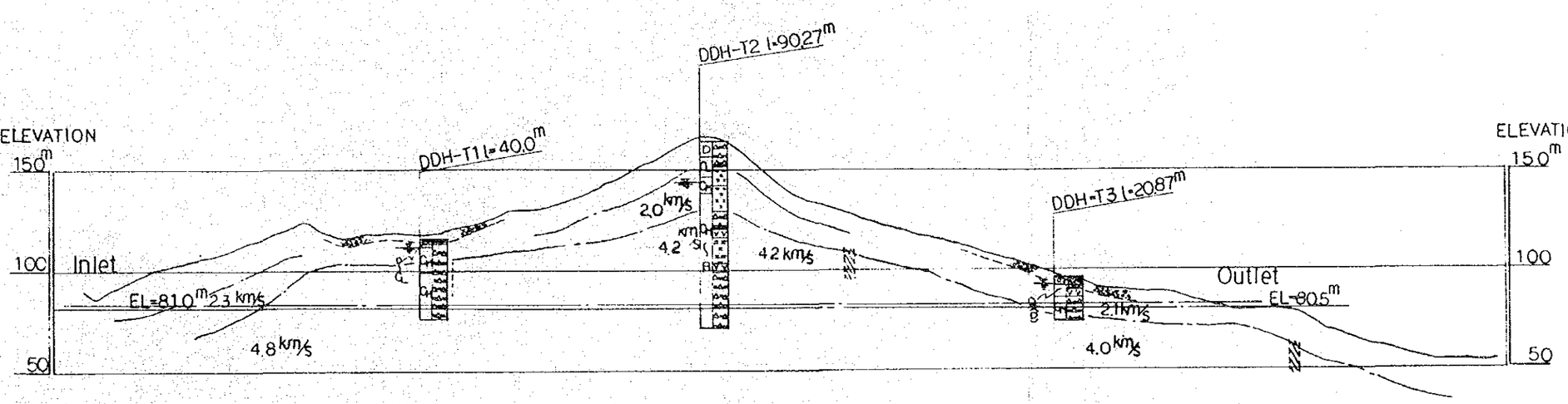
rd AND ø OF ROCK MATERIAL IN JAPAN



RESULT OF ROCK SHEARING TEST IN JAPAN

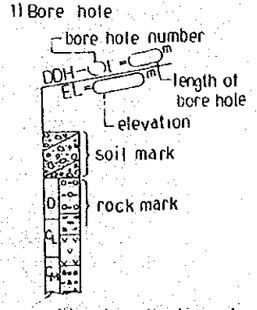


GEOLOGICAL CROSS SECTION AT TRANS-DIVERSION TUNNEL

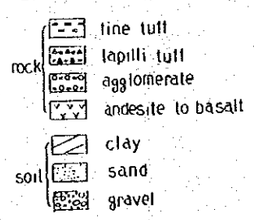


LEGEND

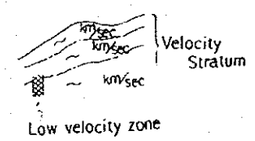
1) Bore hole



2) Rock and soil mark



3) Seismic Exploration



LOCATION AND GEOLOGICAL MAP OF MAJOR IRRIGATION FACILITIES

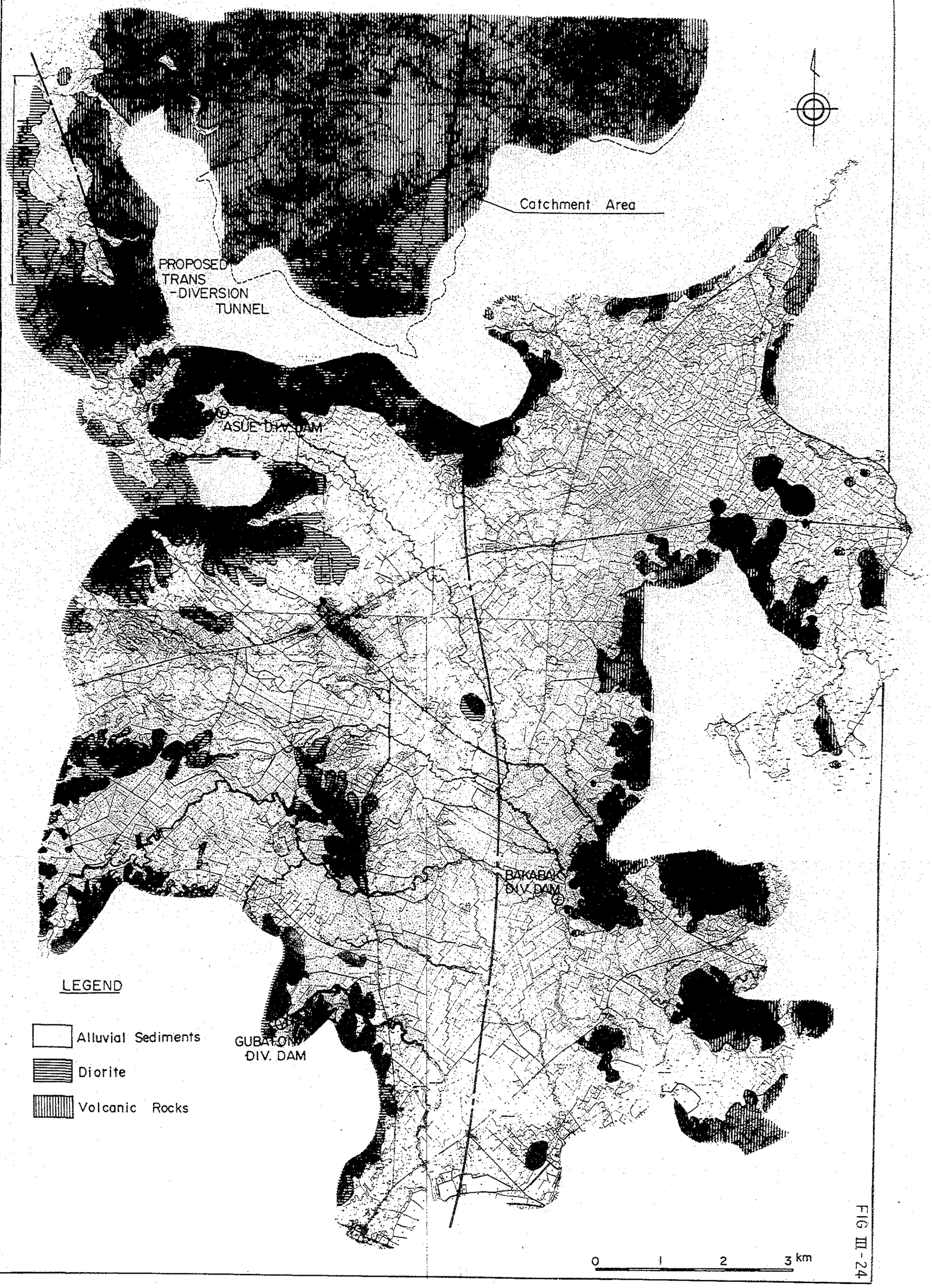


FIG III-24

APPENDIX IV

SOCIOECONOMY

APPENDIX IV

SOCIOECONOMY

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDIX IV

SOCIOECONOMY

1. NATIONAL AND REGIONAL BACKGROUND

1.1 Land and Population

The Philippines is composed of over 7,100 islands covering a total land area of 300,000km^2. About 80.5% or 24,446,822ha of the said area is classified area. According to the 1980 Census, the total population of the Philippines is 48,098,460 with a density of 160.3 persons per km^2, while the rate of population increase was 3.1% from 1961-70 and 2.7% from 1971-80. Although the rate of increase has been declining in recent years, it is estimated that the total population of the Philippines will increase to a minimum of $65.946 10^6$ and a maximum of $74.984 10^6$ by the year 2000.

The Philippines is administratively divided into 13 Regions. The proposed Project area is a part of Region VI, also known as the Western Visayas Region. The said region consists of 5 provinces; namely, the 4 provinces on Panay Island, and another on Negros Island. The region covers a total area of approximately 20,223km^2, representing 6.7% of total national area, and consists of 61.9% cultivated land, 15.6% openland, 10.2% non-economical forest, 4.2% bushland and 1.7% mangrove and swamp. Based on the statistical yearbook (NEDA) the population of the region as of 1980 is 4,525,615 or 9.4% of the national population. Population density is almost 224 persons per km^2 and the annual rate of population increase was 1.63% from 1960-70 and 2.26% from 1971-80. Population for the year 2000 is estimated to reach 5.75 to $6.55 10^6$. The above information is tabulated on the following page.

LAND AND POPULATION (1980)

Location	Area (km^2)	Population (1,000)	Density (persons/km^2)
Philippines	300,000	48,098	160.3
Region VI	20,223.2	4,526	223.8
Panay Island	12,297.1	2,596	211.0
Iloilo Province	5,324.0	1,434	269.0

Source: 1984 Philippine Statistical Yearbook (NEDA)

1.2 Gross Domestic Product

Domestic product in the Philippines in 1983 totaled ₱380,821$10^6$ at current prices and ₱100,125$10^6$ at constant 1972 prices. This is 1.78 times the Gross Domestic Product (GDP) in 1972 which was ₱56,075$10^6$. The annual growth rate during this period was approximately 5.4%. Annual growth rate from 1982 to 1983 on the other hand, was only 1.1%. Gross National Product (GNP) per capita was ₱1,898 at constant 1972 prices, and growth rate of GNP per capita from 1972 to 1983 was 2.6%.

Agriculture sector related product comprised 22.5% of Gross Domestic Product in 1983 at current prices and 24.8% at constant 1972 prices. In 1972, the same comprised 28.6%. The annual growth rate of agricultural product during this period was 4.1%. Recently, the ratio of agricultural product to gross domestic product is decreasing with the development of the industrial and service sector. The following table summarizes the above data.

GROSS DOMESTIC PRODUCT

Unit: ₱ 10^6

Production sector	1972	%	1983 Current prices	%	1983 Constant 1972 prices	%
Gross Domestic Product	56,075	100.0	380,821		100,125	
Agriculture	16,040	28.6	82,084	21.5	24,845	24.8
Industry	17,442	31.1	137,374	36.1	36,048	36.0
Service	22,593	40.3	161,363	42.4	39,232	39.2

Source: 1984 Philippine Statistical Yearbook

The Gross Domestic Product of Region VI (GRDP) in 1983 was ₱29,206 10^6 at current prices and ₱8,290$10^6$ at constant 1972 prices. Of this, 35.1% or ₱10,272$10^6$ at current prices and 38.3% or ₱3,171$10^6$ at constant 1972 prices was generated by the agriculture, fishery and forestry sectors. The overall average annual growth rate of Gross Regional Domestic Product from 1978-83 was 3.2% (15.16%), while that for the agricultural sectors was only 1.6% (12.5%). This situation is caused by a recession in fisheries, livestock, lumber, poultry, farming and grain industries.

GROSS REGIONAL DOMESTIC PRODUCT

(at constant 1972 prices)

Unit: 10^6 Peso

Sector	1972	1978	1980	1981	1982	1983
GRDP	5,156	7,066	7,642	7,971	8,410	8,290
Agriculture	2,376	2,936	3,037	3,148	3,387	3,171

Source: 1984 Philippines Statistical Yearbook

1.3 Trade

Philippine exports have shown a significant increase since 1974. Main export items include such agricultural products as copra, sugar, bananas and lumber, as well as such mineral resources as gold and copper. Export earnings from the primary sector account for 45-50% of total export earnings. In recent years, the percentage of agriculture, forestry and fishery products has decreased with a corresponding substantial increase in mineral products.

Total export earnings increased from US$1,142.19$10^6$ in 1970 to US$2,724.99$10^6$ in 1974 and US$5,722.16$10^6$ in 1981, 1981 earnings being 5 times and 2.1 times greater than those of 1970 and 1974, respectively. Exports decreased somewhat to US$5,020.59$10^6$ in 1982, and US$5,005.29$10^6$ in 1983. Taking into consideration currency fluctuations, 1981 export earnings represent an increase of 3.66 and 1.82 times greater than 1970 and 1974, respectively.

On the other hand, imports have also rapidly increased since 1974, import expenditure rising from US$1,159.3$10^6$ in 1970 to US$3,143.26$10^6$ in 1974, US$7,945.68$10^6$ in 1981 and US$7,486.63$10^6$ in 1983. The latter is 2.53-2.38 and 6.85-6.46 times greater than import expenditure in 1974 and 1970, respectively.

The total volume of trade in 1983 included ₱7,486.63$10^6$ in imports and ₱5,005.29$10^6$ in exports, totalling US$12,491.92$10^6$. This total is approximately 2 times and 5.43 times greater than the trade volume of 1974 and 1970, respectively, or in real terms, 1.46 and 3.3 times greater, respectively. With the exception of 1973, the unfavorable balance of trade has continued since 1950, trade deficits for 1981 amounting to US$2,481.34$10^6$ and total trade deficits from 1978 to the 1st Quarter of 1984 reaching US$2,354.61$10^6$. The rising import surplus is directly related to increased imports of oil and related products. The same composed only 9.8% of total import expenditure in 1970 versus 22% in 1975, 29% in 1980 and 31% in 1981. In 1983 consumer goods accounted for 22% of total imports, capital goods for 24% while the remaining 54% was composed of raw materials including oil.

Main exports from Region VI are raw sugar, refined sugar, molasses and copper concentrates and, in recent years such goods as rice, frozen fish, shrimp and craft products have also been added. Total export volume of the Region in 1981 was 723.5$10^6$ tons amounting to a total of US$252.8$10^6$ in export earnings. Although export volume increased at an annual rate of 12.54% during the Five-year Plan from 1977-81 (total increase: 62.74%), export volume and export earnings of 1981 indicate a decrease of 19.72% and 14.84%, respectively in comparison to those of 1980.

Imports to Region VI, on the other hand, totalled ₱251.7$10^6$ in the five year period from 1977-81, representing roughly 8% of total export volume during the same period. Main import items included machinery, cars, medicine, and chemicals. In addition to the above, outflow of goods such as rice, livestock, fish and vegetables from Region VI to Manila and other areas within the Philippines is balanced by substantial inflow of food products such as milk, juice, spaghetti, noodles and sausages.

1.4 Labor Force

Nationwide household population 15 years of age and over was estimated at 31.676^{10^6} in 1983, 64.6% (20.462^{10^6}) of which are members of the labor force. Of the latter, 95.4% or 19.521^{10^6} were gainfully employed, with unemployment at 4.6% or 941,252 persons. In 1978 and 1979, the percentage of total employed laborers engaged in agriculture, forestry and fisheries was 52.2% and 47.6%, respectively whereas the percentage of the same rose above 50%, amounting to 52.5%, 53.7%, 51.9% and 52.2% in 1980, 1981, 1982 and 1983, respectively. Although the unemployment rate declined during the 1970s to 4% in 1978-79, an upward trend in the same recurred from 1980, reaching 5.4% in 1980, and 4.9%, 5.1%, and 4.6% in 1981, 1982, and 1983, respectively. The urban unemployment rate is greater than that in rural areas, the former amounting to 7.2% and 6.0% and the latter to 3.1% and 3.2% in 1977 and 1978, respectively.

PRESENT DEMOGRAPHIC DATA IN THE PHILIPPINES AND IN REGION VI

Unit: person, %

Year	Projected Household Population 15 Years Old and Over	Percentage of Labor Force	Number of Labor Force	Percentage of Unemployment	Percentage of Employed Agriculture
Philippines					
1977	25,787	58.2	15,008	4.5	52.1
1978	26,882	62.5	16,801	4.1	52.2
1980	28,835	62.0	17,877	5.4	53.7
1983	31,676	64.6	20,462	4.6	52.2
Region VI					
1977	2,511	64.4	1,617	5.1	64.0
1978	2,608	66.0	1,721	3.7	63.4
1980	2,700	71.1	1,920	2.4	67.3
1983	2,927	70.6	2,066	3.1	63.1

Source: 1983 Philippine Statistical Yearbook (NEDA)

Increase in the labor force from 1977-83 in Region VI totalled 27%, expanding from 1.617^{10^6} laborers in 1977 to 2.066^{10^6} in 1983. Of these, 2.002^{10^6} or 96.9% were gainfully employed and 1.263^{10^6} or 63.1% of the

latter were engaged in the agriculture, fisheries and forestry sector. The remaining 36.9% were employed in manufacturing and service industries.

1.5 Agricultural Production

With the development of the industrial and service sectors over the last few years, the percentage of agriculture, forestry and fisheries products comprising the gross domestic product has correspondingly decreased. However, production from the same in 1983 still accounted for 21.5% of current prices, or 24.8% at 1972 constant prices, of gross domestic product employing 52.2% of the labor population for the same year. Moreover, the main export goods were primary and secondary manufactured goods derived from the agriculture, forestry and fisheries sector, comprising about 34% of total export earnings in 1983. These data indicate that agriculture continues to be the mainstay of the Philippine national economy.

In 1983, the agricultural sector faced difficulties as a result of production setbacks and external adversities. The combined output of agricultural crops, livestock, fishery and forestry products in terms of real gross value fell by 2.1%, lower than the annual growth target of 4.9%.

As shown in the following table, total harvested area in the Philippines in 1983 was 11,656,300ha, of which 3,239,600ha or 27.8% was palay. Said area contributed approximately 28.4% of total agricultural production, about 38.4% (7,730,500t) of food crop production, and about 40.1% (₱10,721.9$10^6$) of revenue from total food grain production.

AGRICULTURAL AREA HARVESTED, QUANTITY AND VALUE OF AGRICULTURAL PRODUCTION IN 1982

	Harvested Area (1,000ha)	Quantity (1,000t)	Value (10^6 ₱)
Total	11,656.3	27,261.4	43,457.8
Food Crops	7,727.7	20,116.9	26,739.3
Rice	3,239.6	7,730.5	10,721.9
Other Food Crops	4,488.1	12,386.4	16,017.4
Commercial Crops	3,928.6	7,144.5	16,718.5

Source: 1984 Philippine Statistical Yearbook (NEDA)

Total harvested area, harvest quantity, value, and unit production of palay are shown in the table below (with 1950 designated as the base year: 1). Total harvested area including palay had increased 2.3 times by 1983, harvest quantity more than 4.6 times, nominal production value 29 times and actual production value 3.3 times.

As for palay, although some fluctuations occur, including occasional decreases of 3-5% in comparison with the previous year, by 1983 total harvested area had increased 1.46 times, harvest quantity 2.97 times, nominal production value 14 times and actual value 1.6 times. Although unit production of palay decreased in '72, '73 and '75, in general, the same has shown a steady increase reaching 2.386t/ha in 1982 which is almost 2 times and 1.4 times the unit production of 1950 (1.177t/ha) and 1971 (1.716t/ha), respectively. The table below summarizes this data.

INCREASE IN AGRICULTURAL PRODUCTION

Unit: Ratio to 1950

	1950	1960	1970	1975	1980	1982
Total Area Harvested	1	1.50	1.75	2.12	2.39	2.40
Quantity	1	1.77	2.58	3.36	5.06	5.07
Value	1	1.37	5.41	13.45	25.36	27.77 (6.6)1/
Palay Harvested Area	1	1.493	1.41	1.60	1.64	1.55
Quantity	1	1.43	2.01	2.17	3.01	3.11
Value	1	0.93	2.70	6.95	10.90	14.17 (3.3)1/

1/: consideration of exchange rate in US Dollars

Production value of food and commercial crops is as shown in the table on the following page.

CROP PRODUCTION VALUE

Unit: 10^6 ₱

Year	Total	Food Crops	Commercial Crops	Palay	Palay/Total (%)
1975	20,147.5	13,421.2	6,726.3	5,345.5	26.5
1980	37,992.1	23,568.4	14,423.7	8,376.6	22.0
1983	42,368.1	26,539.9	15,828.3	9,304.5	22.0
1982	41,595.0	28,946.9	12,648.6	10,907.9	26.22
1983	43,457.8	26,739.3	16,718.5	10,721.9	24.6

Source: 1984 Philippine Statistical Yearbook

With the expansion of irrigation development and the introduction and extension of new cultivation techniques and high yielding varieties under the Five Year Economic Development Plan to achieve self-sufficient food supply, rice productivity and yield were increased and self-sufficiency in the same was accordingly attained. Consequently, rice imports were no longer necessary from 1976, and in 1980 and '81 rice was actually exported to Indonesia and other countries. In 1984, production of palay decreased due to a typhoon and emergency rice supply was imported.

As aforementioned, the agricultural sector in the Philippines employs more than 50% of the labor force and accounts for 25% of GDP and 37-40% of annual export earnings, playing a major role in the national economy. Agriculture forms one half of what is known as the Philippines dual economic structure; it not only fulfills the nation's basic food requirements but also contributes to national economic development, modernization and improvement of living standards. Accordingly, the Government of the Philippines has focused on agricultural development in the National Economic Development Plan.

Similarly, agriculture is the mainstay of the rural economy in the Western Visayas Region, comprising 38.3% of GRDP in 1980 and 67.3% of the labor force of the same. In 1979, rice cultivated area in the region was 468,360ha with a yield of 937,755t, while sugarcane yield was 143^{10^6} tons or 63% of total national production. Approximately 92,600ha of coconut were cultivated in 1978 with a total yield of 73,844t. In addition, crops

such as mango, cacao, coffee, and fodder crops are also cultivated. In 1981, livestock in the Region consisted of 298,898 carabao, 177,833 head of cattle, and 627,398 pigs. Region VI also has the richest marine resource area in the Philippines, where fish farming is widespread. Total fish harvest, including that from fish farming, was 361,694t in 1980. Total production from agriculture, forestry and fishery in Region VI was ₱260$10^6$ in 1978 and about ₱280$10^6$ in 1980 at 1972 constant prices.

Region VI has clearly achieved a production level greater than self-sufficiency levels in food crops and marine products, while at the same time it is a leading producer in the nation of such commercial crops as sugarcane and coconut. The most critical constraint to further development of the agricultural sector in the Region at present is the lack of post-harvest facilities, such as go-downs and an inadequate post-harvest marketing system. A related problem is achieving increased production per person or household area in consideration of envisioned future population increase and consequent reduction of per capita land area. Accordingly, a variety of development schemes and projects are being promoted as a part of the overall national development plan formulated by the Government.

1.6 Food Supply and Demand

In the early 1970s, the Philippines suffered from a severe food shortage, rice imports increasing from 250,000t in 1963 to 570,000t in 1965. Subsequently, with the introduction and extension of high yielding varieties, new farming technology and application of fertilizer, etc., yields increased and by 1968 rice imports were no longer necessary. In 1972 and especially 1973, however, poor climatic conditions and crop disease caused extensive damage to steadily increasing rice production, resulting in rice shortages and resumption of imports. From 1973-75, annual rice imports reached 360,000-460,000t. By 1976, however, national rice production had been re-stabilized and only 33,821t were imported. Rice yield in the same year exceeded national demand and a surplus of 52,900t was stored for future use.

Palay production in 1980 was 7,835,800t. Allowing approximately 10.8% for seeds, livestock feed, loss, etc., the volume remaining for food supply was 6,989,534t or 145.3kg/person for the total population of

$48.098 10^6$. Applying a conversion ratio of 63%, palay production in 1980 represented a food supply volume of 92.9kg/person.

According to the Philippine Ten Year Development Plan (1983-92), per capita rice consumption in 1980 was 86.5kg while that for 1985, 1990, and 2000 is estimated at 87.8kg, 89.4kg and 94kg, respectively. Supply and demand projections for rice as reported in the NIA Corporate Plan (1983-92) are presented in TABLE IV-1. In calculating supply and demand projections, the annual population growth rate was projected to decrease from 2.62% in the 1980-85 period to 2.13% from 1990-95 and further to 1.89% from 1995-2000. The annual national income growth rate was assumed at 5.5% and the annual per capita income growth rate was estimated to increase from an average of 2.8% from 1980-85 to 3.06% from 1990-95 and to more than 3.5% in the 1990s.

The elasticity of rice demand was designated at 0.1 while the annual per capita consumption growth rate is expected to rise from 0.28% to 0.35%. The portion of palay production for seeds and livestock feed, or less, was held constant at 10.8%.

The area irrigated by national irrigation systems (run-of-river type) is 80% of the service area in wet season and 55% in dry season. Irrigated area for communal irrigation systems on the other hand is 80% in wet season and 50% in dry season.

Rice supply and demand projections and sensitivity analysis, considering the uncertainties in several production and consumption variables, indicate that a new irrigation development program is necessary to maintain long-term food security. The results of the sensitivity analysis are presented in TABLE IV-2. The same is expected to peak in 1990 after which the ratio of rice surplus may decline.

According to the Five Year Plan for Region VI (1983-87), on the other hand, rice production over the next five years is expected to increase at an annual rate of 2.3%, growing from 1,394,699t in 1983 to 1,564,200t in 1987, while the unit rice production objective is 4.10-5.53t/ha as summarized in the following table. This increase is expected to arise as a result of irrigation expansion and facility rehabilitation in rainfed irrigation areas under the KABSAKA Project and improvement and extension of cultivation technology under MASAGANA 99.

PROJECTED RICE SUPPLY - REGION VI 1983-88

Unit: 10^6 tons

Year	1983	1984	1985	1986	1987
Rice	1,394.6	1,436.5	1,493.9	1,528.6	1,564.2

1.7 Road Conditions

The entire road network of the Philippines covers a total length of 155,540km, of which 23,961km (15.4%) is national road while the remaining 131,578.42km is local access road. The percentage of unpaved national roads is comparatively low with only 2.52% or 603.79km remaining unpaved. More than half of paved national roads, however, are surfaced with macadam. As for local roads, approximately 7.4% (9,747km) are unpaved, while 86% (113,093km) are paved with macadam and the remaining 6.6% with asphalt or concrete.

Total road length in Region VI is 7,625km or 8.19% of the national total. Types of road within Region VI include national roads (24.3% or 1,855km), provincial roads (41.3% or 3,152km), municipal roads (26.0% or 1,985km) and city roads (8.3% or 633km). Only 8.2% or 622km of the total road network in Region VI is concrete, while bituminous roads represent about 10.7% or 813km, unsurfaced roads 17.9% or 1,366km, and gravel roads 63.3% or 4,824km, the latter accounting for the largest road kilometerage. Road density per 1,000 population is 1.84km and, in terms of land area, 2.79km per 1,000ha.

2. DEVELOPMENT PLAN

2.1 General

At present, the Philippine Government is promoting the current Five Year Development Plan (1983-87). The said plan was formulated on the basis of evaluation of the 1978-82 Five Year Plan results, the present world economic situation, and future prospects. The development plan establishes the following major national goals:

a) sustained economic growth;

b) more equitable distribution of the fruits of development; and

c) total human development.

The Kilasong Kabusayan at Kaunlarn (KKK) was planned as a major program to achieve these goals.

With the predicted moderate world economic recovery and implementation of domestic adjustment measures to improve the economy's capacity to grow despite unforeseen global circumstances, real Gross National Product (GNP) is expected to achieve an average annual growth of 6.5% in 1983-87. GNP at current prices is expected to be ₱749,109 by 1987, resulting in per capital income of ₱13,199 as shown Table IV-3.

However, actual GNP in 1983 was ₱379.5 per capita. Therefore considering the present situation of the Philippines, the GNP growth rate projection was revised in the latest updated development plan as shown in TABLE IV-4.

2.2 Agriculture Development Plan

Based on the assessment of the 1978-82 plan period, the objectives for development of the agricultural sector in the next five year development plan are established as follows:

a) To accelerate the pace of agricultural development and improve agricultural productivity;

b) To attain food security and maximize the agricultural sector's contribution to economic recovery particularly in improving the country's balance of payments; and,

c) To increase the contribution of the agricultural sector to the national effort directed toward poverty reduction, better nutrition, enhanced welfare of small farmers and land-less rural workers, and the general improvement of the welfare of the majority of the Philippine people.

Moreover, strategies and policies have been established for reform in the areas of production, pricing and marketing, credit, land resources development and utilization, irrigation, rural welfare, institutional arrangements, technology and post harvest facilities, in order to realize the above mentioned objectives.

Production and growth rates for crops and commodities are projected as shown in TABLE IV-5 for the period from 1983-87. In order to realize the objectives and goals of agricultural development, major implementation programs and projects for the realization of agricultural development

goals which are presently being promoted under the Five Year Plan are tabulated in TABLE IV-6.

2.3 Irrigation Development Plan

2.3.1 Present Status of Irrigation Development

The accelerated irrigation program has raised irrigation coverage from 708,040ha in 1974 to around 1,476,416ha in 1983 which represents about 47.2% of the total potential irrigable area, more than doubling the same in one decade. The present irrigated area consists of about 549,118ha under national systems, 702,214ha under communal systems, and 225,084ha under predominantly individual (pump) systems. This has greatly contributed to the attainment of national self-sufficiency in rice, with a marginal surplus for export.

Aside from lowland area development centering on irrigation, the integrated farm services concept has been introduced in upland and coastal area development. Institutional development efforts have led to the organization of 2,472 Integrated Service Associations with more than 100,000 farmer-members.

There were 44 on-going projects outlay in 1982 including expenditures of P2,044 million, 89% of which were for foreign-assisted and 11% for locally funded projects.

2.3.2 Irrigation Development Plan: 1983-1992

Irrigation development under the Five Year Plan (including a 10 year plan) aims to increase rice yields in order to sustain self-sufficiency and reduce regional deficits, and to expand the irrigation of other crops such as sugarcane, bananas, vegetables, and feed grains in order to improve exports and substitute imported agro-based products. The plan also aims at rapid increase in farm incomes especially in less developed areas. Increased participation of the farmer beneficiaries and local governments in planning, cost-sharing, implementation, and operations and maintenance is likewise a program goal.

To achieve these objectives, considering the abnormal rise in project costs, greater emphasis will be given to the rehabilitation and improvement of existing irrigation systems, as well as to improved water

management and system operation. Moreover, irrigation development projects should be multipurpose rather than single purpose schemes, with particular emphasis on small-scale gravity irrigation such as communal irrigation projects which cost less and can be completed quickly. To avert shortages of irrigation water, especially during prolonged dry periods, and to strengthen headwater conservation capacity in the watershed area, watershed management will be intensified.

The 1984-87 program for irrigation and related projects will generate an additional area of about 192,000ha, rehabilitate existing irrigation systems covering 137,948ha, reforest 16,209ha of watershed, develop 22,883ha of tree farm, undertake 25 coastal area resources and enterprise development projects, and carry out 550 gasifier conversion projects.

In the NIA Corporate Plan (1983-92) presented on March 1, 1983, the following physical targets for irrigation development were adopted in consideration of external factors.

a) For the plan period, generation of about 581,120ha is planned, out of which new areas to be incorporated into national irrigation systems are estimated at 424,490ha or 73.0% of the planned area. This new area represents about 29.7% of the undeveloped potential irrigable area for national systems. Communal irrigation projects will be generated in 156,630ha, representing 32.6% of undeveloped area.
b) Rehabilitation will be undertaken in a total area of about 405,060ha with 56% for the improvement of national irrigation systems.

Funding requirement for the above is estimated at ₱23,564$10^6$, at 1983 prices, with ₱20,391$10^6$ for national projects and ₱3,173$10^6$ for communal projects.

2.4 Water Supply Development Plan

As of 1983, about 53% of the population is served by public water supply systems with the service coverage being 82% in Metro Manila, 55% in other urban centers, and 47% in rural areas. The rest of the population rely mainly upon wells and rivers. According to the Five Year Development Plan, the program objective is to raise the coverage of public water supply systems to about 70% of the total population by 1987 and to around 90% by 1992.

Under the 1984-87 water supply program, about 55,158 Level I facilities will be built and 6,410 existing ones rehabilitated, 4,553 Level II systems will be installed, and 259 Level III systems will be constructed or improved. Around $8.8 10^6$ persons will benefit from Level I facilities, $2.8 10^6$ persons from Level II systems, and $7 10^6$ from Level III systems, or a total of $18.6 10^6$ persons.

Immediate, intermediate and long-range objectives are outlined below.

1) Immediate

By the end of 1985, i) all barangays in the country will have a minimum of Level I service; ii) about 50% of poblaciones and 10% of rural barangays will have at least Level II service; and iii) about 25% of the poblaciones will have Level III service.

2) Intermediate

By the end of 1987, i) about 30% of the rural barangays will have a minimum of Level II service; ii) the incremental demand for repair and rehabilitation of wells will be satisfied; iii) all sitios or clusters of population with 50 households or more will have a minimum of Level I service; and iv) all poblaciones will have a minimum of Level II service.

3) Long-range

i) By the end of 1992, about 50% of all barangays will have a minimum of Level II service; ii) by the end of 2000, 70% of the sitios or clusters of population will have a minimum of Level II service, while 30% will maintain the Level I service; and iii) by the end of 2000, all poblaciones will have Level III service.

Level I, which is a point source, usually a protected well or a spring with an outlet, with no distribution system, will generally be adopted in rural areas where houses are thinly scattered, the well/spring outlet being not more than 250m from the farthest user, with a coverage of around 15-50 households. Level II, which is Level I plus a communal

faucet system, will generally be used in rural areas where houses are clustered densely enough to justify a simple piped distribution system with public standpipes at not more than 25m from the farthest house, with one faucet per 4-6 households, and an average coverage of 100 households. Level III, which is a piped system with individual house connections, will generally be adopted in densely populated urban areas.

2.5 Power Development Plan

In the power sector, over the last ten years, some 2,567Mh of additional power capacity was put on-stream bringing the total generation capacity to 5,564MW by the end of 1983. The commissioning of new non-oil fueled plants has resulted in the reduction of oil-based generation capacity from 80% of total system installations in 1973 to just over 51% at present.

The shift to alternative domestic energy sources is particularly being accelerated in the power sector where oil will be displaced mainly by geothermal and hydro (including minihydro) resources. Consequently, the share of these resources will increase substantially, precipitating the drop in the share of oil-generated electricity from the present 61% to 15% by 1987. With the expansion of the electrification program, at least 62% of total potential households in the rural areas will have access to electricity as an alternative energy form by 1987.

Energy projects are aimed at increased independence of government funds. The NPC in fact aims to be fully independent of annual government equity contributions by 1986. Public sector financing is expected to provide no more than 50% of annual investment expenditures for power and electrification projects by 1987.

3. REGIONAL DEVELOPMENT PLAN

The major themes of the Five Year Plan (1983-87) in the Western Visayas Region (Region VI) include improvement in income and living standards in rural areas and increased employment and employment opportunities for rural residents, encouragement of private investment, development and maintenance of basic economic infrastructures, and elimination of occupational or regional discrepancies in development

effectiveness. The overall objective of the same is improvement of the quality of rural life through strengthening of the Region's socioeconomic structure, maintenance of a high standard of living, and education for the enhancement of individual standards and lifestyle.

The annual GRDP growth rate is 7.3% due to the implementation of development schemes and enterprises, and the 1983 GRDP of ₱8,130$10^6$ at 1972 constant prices is expected to reach ₱10,645$10^6$, rising from a per capita GRDP of ₱1,682 to ₱2,037. The annual growth rate for agricultural production is 4% and production is expected to increase from ₱3,273$10^6$ to ₱3,824$10^6$ by 1987.

Although agricultural production accounted for 40.2% of GRDP in 1983, the same is expected to account for only 35.9% in 1987. However, the present percentage of total workers engaged in agriculture is 65% and the same is expected to continue to play a fundamental role in the life of rural people in the Region.

Economic growth patterns in the Western Visayas Region underwent major changes in the latter half of the 1970s. This was due to the sudden increase in oil prices and the resultant decrease in international demand for traditional agricultural products. Economic recovery and attainment of development objectives will depend on continued production from profitable traditional industries in addition to increased emphasis on the development of non-traditional industries and agro-industries.

Agricultural development in the region is restricted in terms of available cultivable area and, with the increasing population, farm-scale is steadily decreasing. Surplus production of food crops such as rice, vegetables, sugar and fish has already been attained. The major emphasis in agricultural development therefore is on improvement of local productivity, quality, post harvest management technology, management facilities, and marketing of agricultural produce.

As in the Jalaur Irrigation Project, development projects for the region should involve expansion of important basic facilities such as connecting roads between markets and rural areas, storehouses, processing centers and other service facilities. Forestation and community development schemes should be both compatible with improvement of living conditions in rural mountain areas and, at the same time, preserve forest and watershed conservation areas.

4. PROVINCIAL STATUS

4.1 Land

The Province of Iloilo has an overall area of 532,397ha, representing approximately 26.3% of the Regional area and 1.8% of the total area of the entire country. With the exception of Iloilo City and Guimaras sub-province, the total area is 466,332ha while major land use as of June 1983 is presented below.

LAND USE IN ILOILO PROVINCE

Classification	Area (ha)	%
Commercial Forest	3,374	0.72
Non-Commercial Forest	11,118	2.38
Brush-land	22,439	4.81
Open Land	98,843	19.91
Marsh or Swamp	8,948	1.92
Cultivated	327,610	70.26
Total	466,332	100.00

Source: Bureau of Forest Development

4.2 Population

The 1980 population census registered a total of 1,433,641, equivalent to 2.98% of the total population of the country, for the whole province of Iloilo including the sub-province of Guimaras, with a population breakdown by area as follows: Iloilo City - 244,827; Iloilo Province - 1,096,432; and the sub-province of Guimaras - 92,382. The number of private households was 252,595 with an average of six (6) persons per household. Iloilo ranks second to Negros Occidental in population among the provinces in the Region and highest on the Island of Panay. The population density average is 269.3 person/km^2. The province is still predominantly rural, with 72.4% of the total population residing in rural areas and only 27.6% in urban areas.

During the last census period (1975-80), the population of the entire province of Iloilo increased by 120,592, with an average annual increase of 25,539 and an annual growth rate of 1.77%. It was noted that

population of the northern municipalities located in the Project area, such as Ajuy and Sara, tends to increase at a faster rate compared with other municipalities. Annual growth rate of Iloilo City is only 1.52%.

Immigration is a major factor in population increase in the province, accounting for 79% of the same. The male population outnumbered the female by 14% from the ages of less than 1 to 19 years, while in the age group of 20 years and over, males were outnumbered by females. The age group with the largest population was from 0-19 years, while the medium age of the population was 19.38 years. Population from less than 1 year of age to 14 years accounted for 40.53% of the total population, that from 15 years to less than 64 years for 54.54% and that aged over 65 years for 4.93%.

4.3 Labor Force

A total of 412,539 persons or 48.50% of the total private household population 15 years old and over are gainful workers. Agricultural, animal husbandry and forestry workers, fishermen and hunters still make up the biggest group of gainful workers with 56.45%, despite a decrease of 3.47 percentage points since 1975. Production and related workers, transport equipment operators and laborers constitute 16.20%. Service workers rank third with 7.52%, followed by professional, technical and related workers whose proportion has increased from 5.35% in 1975 to 6.78%. Sales workers, however, have declined to 6.73%, while clerical and related workers have grown to 3.50%. Administrative, executive and managerial workers, the least among the groups, have decreased to 0.46%. Workers not classifiable by occupation account for 2.36%.

Shown on the next page are comparative changes in the proportion of workers engaged in various gainful occupations for three census years.

GAINFUL WORKERS 15 YEARS OLD AND OVER
BY MAJOR OCCUPATION GROUP, ILOILO: 1970, 1975 AND 1980

Major Occupation Group	1980		1975		1970	
	Number	Percent	Number	Percent	Number	Percent
Professional, technical and related workers	27,968	6.78	20,673	5.35	24,618	6.40
Administrative, executive and managerial workers	1,899	0.46	2,260	0.58	4,687	1.22
Clerical and related workers	14,437	3.50	10,605	2.75	8,556	2.22
Sales workers	27,750	6.73	29,532	7.64	29,797	7.75
Service workers	31,013	7.52	26,544	6.87	28,898	7.51
Agricultural, animal husbandry and forestry workers, fishermen and hunters	232,905	56.45	231,674	59.92	196,738	51.13
Production and related workers, transport equipment operators & laborers	66,838	16.20	63,133	16.33	88,624	23.03
Workers not classifiable by occupation	9,729	2.36	2,187	0.57	2,833	0.74
Total	412,539	100.00	386,608	100.00	384,751	100.00

Source: 1980 Census of Population and Housing, NEDA

4.4 Agriculture

Total land area of Iloilo Province is 466,332ha excluding Iloilo City and the sub-province of Guimaras. Of this, 70.26% or 327,610ha is agricultural land on which commercial and food crops such as rice and sugarcane are widely cultivated. Iloilo maintained its enviable position as the premier food-production province in the entire country, ranking first in rice and mango production, second in sugar production, forth in coconut and among the top ten in other kinds of food commodities such as fruits, vegetables, rootcrops, and livestock. This production status has been consistent during most of the past decade.

Iloilo is the core of the RDAP island development scheme on Panay Island. Under this scheme, agriculture, particularly food production was

given major priority in the promotion of socioeconomic development. The Province's progress has successfully accelerated in the implementation of the continuing Five Year Integrated Agricultural Development Program.

Sectoral priority projects such as the Masagana 99, Masagang Maisan, Green Revolution, Sabog Tenim and Multi-cropping, Palayan Ng Bayan, Integrated Feed Grain Program, Operation Land Transfer, Integrated Area Development Project, and the Barangay Irrigation Service Association Program were enthusiastically received by both the government and the private sector in the province.

Since 1974, the KABSAKA Project which is being financed by World Bank, has expanded to cover the entire province. This new agricultural development strategy aims to maximize utilization of rainfed area.

4.4.1 Rice Production

Iloilo Province is the largest rice producing area in the Philippines. Total agricultural production in the province for the 1981-82 crop year was 10,686,128 cavans in a total planted area of 185,680ha. Of this area, irrigated rice fields covered 40,051ha, or about 22%, of total planted area, producing 3,257,381 cavans of rice or about 30% of total agricultural production at an average of 81 cavans/ha. Rainfed rice fields cover 145,629ha or 78% of total planted area producing as much as 7,428,647 cavans, or about 70% of total production at an average of 51 cavans/ha.

Due to an extended drought during the second cropping, rice production in 1981/82 crop year was less than production objectives. The low productivity per unit area is due to insufficient supply of high varieties of palay, and inadequate post harvest technology, facilities and extension support systems. There are also additional problems such as insufficient soil conservation, lack of instructors and facilities like irrigation, drainage, and poor credit and credit management by the recipients.

However, a surplus in total palay production was reported in the province by NFA for the same year. According to NFA data, 639,953 bags of rice weighing 50kg each were exported to neighoring provinces such as Negros, Cebu and Metro Manila in 1983, and 14,000t of rice were exported to Indonesia in 1981. Rice production within the province continues to

exceed local demand; however, unit yield of rice productivity is below the reasonably attainable limit and therefore unstable.

4.4.2 Other Crop Production

(1) Sugarcane

Iloilo Province ranks second in the country in sugar production. Weather conditions and soil are suitable for sugarcane production. According to the latest report by PHILSUCOM, in the crop year 1982-83, sugarcane delivered to four sugar centrals reached 1,122,108.8t. Sugar production for the same crop year totaled 1,979,359.2 piculs.

Sugarcane production, however, fluctuates widely from year to year and recently has been decreasing. The decrease in sugarcane production may be due to farmers switching from sugarcane to rice or other crops.

(2) Corn

As of 1982, only data for yellow corn is available by the Ministry of Agriculture. The province produced a total of 176,140t of yellow corn planted in a total area of 7,410ha. Presently, corn is among the crops planted in the multiple cropping strategy of the KABSAKA areas. Minimal amounts of food grains and sorghum are produced, however, these crops have been designated as priority crops in support of feed production for livestock and poultry industry in the province.

(3) Coconut

The Philippine Coconut Authority (PHILCOA) reported a total of 53,960,832 nuts harvested in Iloilo Province in 1982 covering a total area of 24,582ha. Total number of bearing palms reached 2,473,294 with every tree expected to produce an average of 24 nuts per year. Of the total plantations, 409.83ha are planted with hybrid coconuts with a total palm population of 38,033. These hybrid coconuts have a greater meat content compared to ordinary coconuts. PHILCOA registered a total of 55,818 coconut farmers for the provinces of Iloilo and Guimaras.

(4) Fruits and Vegetables

Iloilo Province has an abundance of local fruits and vegetables in certain seasons of the year. The supply is more than sufficient to meet local demand and surplus is shipped to neighboring provinces like Antique, Capiz, Aklan, Negros, Masbate and Metro Manila. Sometimes the fruit receives a higher price in external markets as compared to local markets. As of 1982, mango plantations have increased to 1,928.76ha on which a total of 82,859 mango trees are grown. Of the total, only 48,433 are fruit-bearing trees. The municipalities of Igbaras, Leon, San Miguel, Miagao and Cabatuan have always been known for mango production and a large volume of market supply comes from the same.

5. SOCIOECONOMIC CONDITIONS IN THE PROJECT AREA

5.1 Land Area

The Project Area is located in the four municipalities of Sara, Ajuy, Concepcion and San Dionisio in Iloilo Province.

Municipalities are composed of barangays which are the smallest units of administration. However, only 58% of the total barangays in all four municipalities are located within the proposed Project area as shown below.

NUMBER OF BARANGAYS

Province/Municipality	No. of Barangays	No. of Barangays in the Project Area
Iloilo	47	
Ajuy	34	12
Concepcion	25	4
San Dionisio	29	8
Sara	42	34
Total	130	58

The areas of the four related municipalities amount to a total of 60,021ha or 11.3% of the total area of Iloilo Province as shown in the

table below. Gross Project area is 8,320ha or 13.8% of the four municipalities.

LAND AREA BY MUNICIPALITY

Unit: ha

Municipality	Land Area
Ajuy	19,342
Concepcion	9,702
San Dionisio	12,677
Sara	18,300
Total	60,021
Project Area	8,320

5.2 Present Demographic Conditions

5.2.1 Population

The population of Iloilo Province is 1,433,641 according to the 1980 Census. Of the municipalities concerned in the Project, the population of Ajuy is 30,397, of Concepcion is 21,121, of San Dionisio is 19,410, and of Sara is 28,828, amounting to a total of 99,766 or about 7% of the total population in Iloilo Province. Population density for the said municipalities is 1.57/ha, 2.18/ha, 1.53/ha and 1.58/ha, respectively. Total population of the 58 barangays in the Project area is 30,654 or 30.7% of that of the 4 municipalities combined, and population density is 3.7/ha.

The rate of population increase in each municipality is presented on the next page. The maximum annual growth rate in Ajuy was 3.7% for 1970-75.

POPULATION GROWTH RATE

Municipality	Ajuy		Concepcion		San Dionisio		Sara	
Year	Population	Growth Rate (%)	Population	Growth Rate (%)	Population	Growth Rate (%)	Population	Growth Rate (%)
1948	17,448		9,184		11,008		16,042	
		0.56		1.65		1.19		0.89
1960	18,655		11,183		12,690		17,837	
		1.56		3.48		1.99		2.04
1970	21,770		15,743		15,456		21,824	
		3.70		3.34		1.82		2.67
1975	26,113		18,554		16,914		24,892	
		3.08		2.63		2.79		2.99
1980	30,397		21,121		19,410		28,838	

On the basis of the data from the 1980 census, the population in the Project area was estimated as shown in TABLE IV-7.

5.2.2 Age and Sex Composition

FIG. IV-1 illustrates the composition of the population in the four municipalities according to age and sex. In Iloilo Province, males outnumber females in the age bracket from less than 1 to 19 years of age while females outnumber males in the age bracket of over 20 years. Although population composition in urban areas of the Project is similar to general trends in Iloilo Province, males outnumber females up to 30 years of age in rural areas. As for age distribution, the 1 to 4 year and 5-9 year groups have the highest population while the population of the 15-19 year group is midway between the maximum and minimum population groups.

5.2.3 Population Projection in the Project Area

Using population projection data (Population Projections Province, City and Municipality: 1980-2000 Region VI - Western Visayas, NCSO, NEDA), total population in the Project area in 1984, 1995 and 2000 is estimated at 33,841, 41,720 and 44,189, respectively as shown in TABLE IV-8.

5.2.4 Labor Force Estimation

Labor force in the Project area was estimated on the basis of the data on population composition according to age, sex and school attendance.

(1) Basic Population by Age and Sex

Population by age and sex was analysed on the basis of the 1980 Census and the results are shown in TABLE IV-9.

(2) Present and Future Population Projection

Present population distribution and projections for the year 2000, the target year of the Project are shown in TABLE IV-10 and IV-11. According to 1980 Census data, females outnumber males except in Sara. In Iloilo Province as a whole, females also outnumber males; however, it is projected that males will outnumber females in another year or two.

	1980	1998	1999	2000
Male	0.497	0.506	0.506	0.507
Female	0.503	0.494	0.494	0.493

(3) Farm Household Population

Farm households which depend on farming are classified into two types; farm households and landless farm laborer households. Considering the results of the farm surveys in the First Stage Field Works, the ratio of farm households was estimated and the results, including landless farm households, are shown below.

FARM HOUSEHOLDS

Municipality	No. of Households in the Related Barangay	Farm Households	Ratio
Ajuy	1947	1316	0.676
Concepcion	833	783	0.940
Sandionisio	904	721	0.798
Sara	4,433	3,603	0.813
Total	8,117	6,423	0.791

(4) Population in the Project Area

The population in the Project area is 8,849 in Ajuy, 5,020 in Concepcion, 8,214 in San Dionisio, and 24,544 in Sara and is presented in the table below according to rural and urban population composition. As the poblacion population of Concepcion Municipality is not included within the Project area, no urban population has been recorded for the same.

POPULATION IN THE PROJECT AREA

Municipality	Urban	Rural	Total
Ajuy	2,448	6,401	8,849
Concepcion	-	5,020	5,020
San Dionisio	2,499	5,715	8,214
Sara	3,571	20,973	24,544
Total	8,518	38,109	46,627

Using the figures above, the number of farm households and farm household population for 1984 and 2000 were estimated as shown in TABLE IV-12 and IV-13, and a summary of the same is presented in the table below.

Municipality	Item	H.H.[1/] in the Project Area	F.H.H.[2/] in the Project Area	L.H.H.[3/] in the Project Area	N.F.H.[4/] in the Project Area	Remarks
1984	No. of Households	6,020	2,427	2,319	1,274	
	Population	33,841	13,635	13,036	7,170	
	No. per Household	5.6	5.6	5.6	5.6	
2000	No. of Households	7,869	3,176	3,003	1,690	
	Population	44,189	17,831	16,862	9,496	
	No. per Household	5.6	5.6	5.6	5.6	

Note: H.H.: Households
F.H.H.: Farm Households
L.H.H.: Landless Farm Labor Households
N.F.H.: Non-Farm Households

(5) School Attendance

School attendance at present and in the target year, 2000, were estimated on the basis of the Comprehensive Development Plan of each municipality. The rate of school attendance in comparison with total population is presented in the following table.

Municipality	Population	Enrollment	Ratio
Ajuy	30,397	7,607	0.250
Concepcion	21,094	4,599	0.218
San Dionisio	19,924	4,419	0.222
Sara	27,340	7,305	0.267

In estimation of labor force, the above figures were classified according to age group (0-14, 15-19, 20-59 and over 60) as shown in TABLE IV-14 and IV-15. On the basis of the population in the Project area, the rate of school attendance by age group and the number of school attendants in the Project Area by age group at present and in the year 2000 were estimated as shown in TABLE IV-16 and IV-17.

(6) Labor Force

A summary of the above estimations for farm household population and school attendance is tabulated in TABLE IV-16 and IV-17.

Labor force efficiency was assumed as presented below.

Age	Male	Female
0-14	0	0
15-19	0.5	0.5
20-59	1.0	1.0
60-	0.5	0.5

The number of working days per month is assumed at 20 days except for school attendance of 8 days. In the case of females, the number of working days is assumed at 75% of 20 days per month in consideration of pregnancy and childbirth. The estimated

monthly labor force in 1984 and 2000 is approximately 229,000 and 347,000, respectively and details are shown in TABLE IV-18 and IV-19. Labor force per household is estimated at 2.4 in 1980 and 2.8 in 2000.

5.3 Infrastructures

5.3.1 Transportation

From the capital, Iloilo City, at the northern end of Iloilo Province, to Balasan takes about 2.5 to 3 hours by bus. The four municipalities concerned in the Project are surrounded by mountains on three sides and are bordered by the sea on the other. The poblacion of these municipalities, excepting Sara, are located on the seacoast, and consequently, transportation to the adjoining islands is by boat.

The main means of transport used by local people within the barangay or between the barangay and urban area is the tricycle, while jeepneys or buses are used to travel to other municipalities. Movement of the above modes of transport decreases after 3:00 P.M. with regular transport continuing only within the poblacion, the center of each municipality.

(1) Roads

The main roads in the Project area consist of 3 national roads and 2 provincial roads. These roads pass through Ajuy Municipality in the southern end of the Project area and traverse the same to the northern end joining the poblacions of each municipality to national road No.2 which joins Iloilo City to Roxas City in Capiz Province.

Detailed discussions on the present condition of the roads in the Project area were made in APPENDIX IX: RURAL DEVELOPMENT

(2) Seaports

Municipal ports service fishing boats and inter-island vessels. These ports handle various types of cargoes, principally agricultural products. Bay-ang port of Ajuy in the Project area serves as a transloading station for sugar milled at Victorias,

Negros Occidental. There are several fishing ports in the three municipalities related to the Project which face the sea.

5.3.2 Water Supply

Domestic water for the Project area and surrounding residents is provided by waterworks systems in the few areas around the poblacions of each municipality. In the majority of areas, however, domestic water supply is dependent on groundwater, springs or rain water. In many barangays, communal artesian wells with hand pumps have been set-up while near the mountains, springs and open dug wells are common.

Present conditions of the waterworks for the four municipalities are presented below. Detailed information is given in APPENDIX IX: RURAL DEVELOPMENT.

(1) Sara Waterworks System

The Sara waterworks system presently derives water from two sources; Agbadiang reservoir and Cabatongas reservoir. The existing pipeline from Agbadiong reservoir is aligned with the Asue River. While the pipeline from Cabatongas reservoir to the poblacion is aligned with the municipal road from Barangay Ardemil.

The features of both existing reservoirs for domestic water supply are summarized in the following table.

Water Resources	Location	Capacity (gal.)	Elevation (m)	Required Length of Pipeline (m)
Agbadiang River	Barangay Domingo	80,000	100	4,500
Cabatongas River	Barangay Juaneza	80,000	75	2,000

As for water supply from the existing waterworks system, 940 households including all households in the poblacion and some in barangays which are located along the said pipeline are supplied by pipe with a total of 670 faucets. One faucet thus covers 2 or more households.

The remaining households, which are not covered by the waterworks system rely on water from wells, springs and rivers. Water supply conditions in each barangay in Sara are shown in TABLE IV-20.

(2) Ajuy Waterworks System

The municipality has a waterworks system, Ajuy Water District system which serves 3 barangays, Poblacion, Pantalon Nabaye and San Antonio and a total of 225 households. The Ajuy Water District is managed by the municipality and supported by the Local Water Utilities Administration (LWUA) with technical and financial assistance. Water for the system is presently drawn from the surface of the upper Ga-as stream, which is located on a hilly part of the municipality in the southwest. Water supply in the municipality is sufficient with few problems in management.

As Ga-as stream is located approximately 150m above sea level, siltation in the reservoir apparently does not occur; however, weeds growing in the reservoir should be removed more frequently.

Water sources in Ajuy consist of ground water and springs. The types of water system are pipe, artesian well, pump and open well. As shown in TABLE IV-21, 3.78% of households use ground water, 7.04% use spring water, 1.7% use rain water and the remainder use other sources. Of these households, 4.71% use pipe water, 3.51% use artesian wells, 6.84% use pumps and 10.91% use open wells. Data regarding other households were unavailable.

(3) Concepcion Waterworks System

In the municipality of Concepcion, only the poblacion is serviced by a waterworks system. A total of 100 faucets servicing 2,467 consumers in 412 households was recorded. Only 4% of these households have privately installed exclusive water facilities. The remaining 96% obtain water from communal faucets. These communal faucets are installed in the open and usually in the center of the cluster of houses using the same.

The Concepcion waterworks system was established in 1948 without much development since that time. The dam for the waterworks system is located on the slope of Mt. Apiteng 2.5km away while the reservoir is half-way between the dam site and the urban area.

Water supply from the water system is far from sufficient for the needs of the people in the poblacion. At most only 2 to 3 hours of water is available from the faucets usually starting at 6:00 a.m. This limited supply is chiefly utilized for drinking. To supplement the water shortage, 52 drilled wells with pumps and 8 other wells are operating in the poblacion area.

The 1980 census reported 3,250 households distributed in the rural area of Concepcion. These households are not serviced by government established water systems and water source varies in each different locality. Some localities, such as those located near the mountains, utilize springs; however, most localities in the farming areas use shallow or drilled wells and 536 open wells were recorded in the recent community survey.

(4) San Dionisio Water Supply System

Water is supplied to the residents of the poblacion by the municipal waterworks system which is managed and maintained by the Local Water Utilities Administration (LWUA). According to the municipal record, only 197 households, located in the town proper or poblacion and part of Barangay Santol, (population 570) have pipe installations registered in the LWUA office. One faucet is commonly shared by two or more households.

The main source of water supply is a spring which has been developed and a reservoir constructed in the same, with an average daily capacity of 40,000 gallons. As 570 households are served by the water supply with a total daily water requirement of 34,200 gallons based on standards of 60 gallons/day/household, the present source is sufficient to supply the needs of the area.

In the rural areas, the major water sources are creeks and rivers. Households in the rural area usually have their own dug

wells to provide their water needs; however, the potability of these different sources should be determined to ensure that the same are safe for domestic use.

5.3.3 Communication

There are post offices in the poblacion of each municipality concerned in the Project, with a staff composition as given in the table below.

TOTAL NUMBER OF POSTAL PERSONNEL BY MUNICIPALITY
PROVINCE OF ILOILO 1981

Municipality	Postmen	Mail Carrier	Mail Sorters	Clerks	Others	Total
Ajuy	1	2	-	-	-	3
Concepcion	1	3	-	-	-	4
San Dionisio	1	2	-	-	-	3
Sara	1	5	-	-	-	6
Total	4	12	-	-	-	16

Source: Socioeconomic Profile

Each municipal hall has a government telegraph/telex service to facilitate communication between central and local governments. In addition, there is also a private telegraph office, Rural Communication of the Philippines, Inc. (RCPI). However, there is no telephone system within the Project area.

5.3.4 Electrification

Presently, electricity is generated by four generators (two of which were being overhauled during the survey) of NPC at Dingle and transmitted through Duenasu and Passi to Sara. Electricity is subsequently transmitted from Sara to the other three municipalities, Ajuy, Concepcion and San Dionisio.

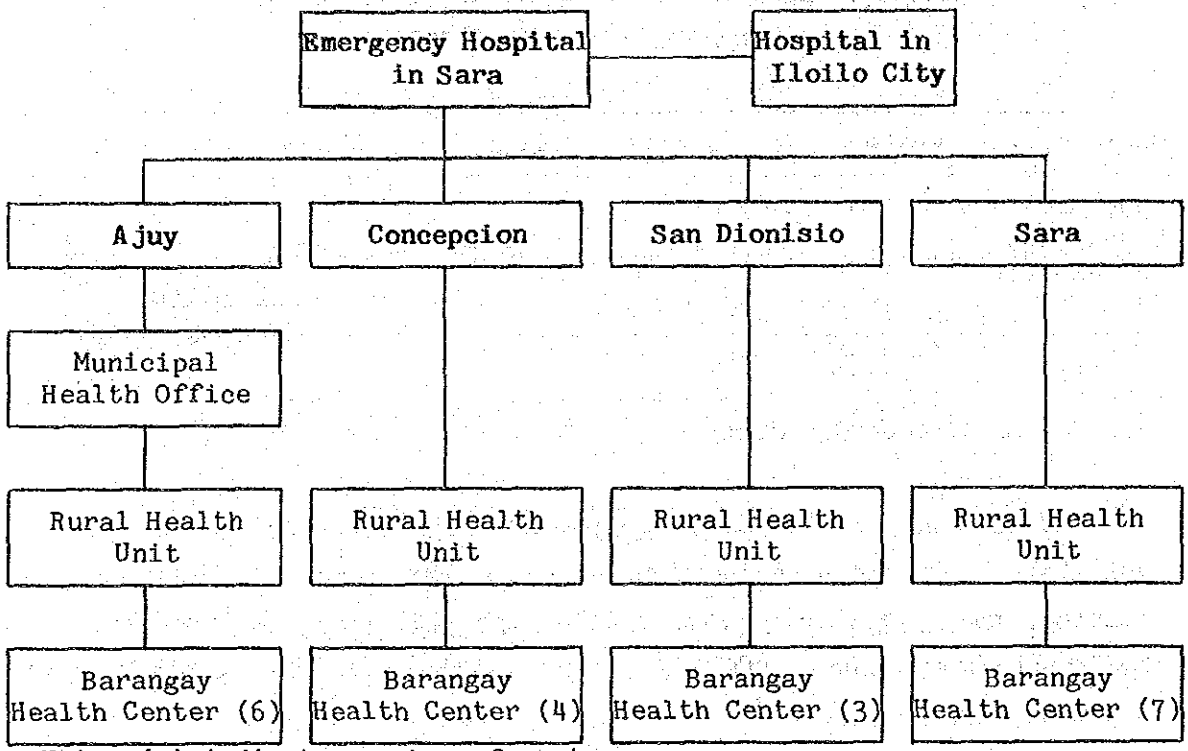
The distribution of electricity is operated and managed by ILECO II as the cooperative organization. The electrification in and around the Project Area has been carried out based on the Western Visaya Five-Year Development Plan (1984-87). The distribution line however, covers only

limited areas along the national road. The proportion of total households in the Project area which are electrified is less than 10%. Detailed discussions are presented in APPENDIX IX: RURAL DEVELOPMENT.

5.3.5 Health

The figure below shows the general health care system in the municipalities of the Project area.

HEALTH CARE SYSTEM



Note: ( ) indicates number of centers

There are no hospitals except in Sara Municipality and serious cases which need hospital care are referred to the same or to the hospital in Iloilo City. Each barangay health center serves 5-7 barangays and is managed by one rural health midwife permanently assigned to the barangay. The health center unit in the poblacion of each municipality has a nurse and sanitary inspector in addition to a midwife.

The function of the above staff is to provide basic health services including maternal and child health care, medical services, family planning, nutrition, enviromental sanitation and vital statistics.

However, the said rural health care system lacks personnel to handle the growing demand of a fast increasing population in the four municipalities (TABLE IV-22).

5.3.6 Others

(1) Schools

There are elementary, primary and secondary schools in 27.6%, 22.4% and 12.1% of barangay in the Project area, respectively. In addition, there is one tertiary school in the Project area (TABLE IV-23).

(2) Churches and Markets

Almost all barangay in the Project area have churches. Moreover, each of the four municipalities concerned in the Project have a market with a regular market day. The poblacion of Sara has the largest market of the four municipalities.

5.4 Commerce

5.4.1 Commerce, Trade and Industry

There are 654 establishments classified into industry groups in the four municipalities according to the NCSO report. The majority of these are comprised of the wholesale and retail trade with 244 establishments or 37.3%. Electricity, gas, water and construction related industry groups are the minority with only one establishment.

The details of distribution by establishment and major industry group in the four municipalities as of 1978 are shown in TABLE IV-24.

5.4.2 Wholesalers and Retailers (Rice)

A total of 97 wholesalers and retailers exist in the four municipalities. Wholesalers and wholesalers/retailers groups represent 73 units or 75.3% of the total. Details of wholesalers and retailers as of 1983 are shown in TABLE IV-25.

5.5 Land Value and Land Tax

Market values for agricultural land are as shown in TABLE IV-26. Land tax is calculated as follows:

Land Tax/year = Market Value x Assessment Level x 0.01 (1.0%)

Market value for all land is classified (TABLE IV-27).

5.6 Integrated Area Management System for Agricultural Service

Project components include not only irrigation system development but also water supply, hydropower generation, farm to market roads and integrated community centers. Agencies concerned with implementation of these various components are as follows:

- Technology and Research	MAF, Research Agencies
- Infrastructure	MPHW, NIA, FSDC
- Credit	LB, PNB, CRB, RB, PCIC
- Extension	NFA
- Marketing	NFA
- Electrification	NPC, NEA, ILECO II
- Water Supply	MPHW, MH

To facilitate smooth execution of the integrated area management program for agricultural development, the Philippine Government is providing measures for coordination of the concerned agencies. The responsible agencies for the execution of the general agricultural development program for each level and the duties of the s me are described below in accordance with E.O. 803 and the organizational chart is shown in FIG. IV-2.

(1) National Level

At the national level the Ministry of Agriculture, assisted by NFAC, is the agency responsible for agricultural development to:

a) formulate national policies and guidelines;

b) coordinate and monitor activities of different participating agencies;

c) define agricultural research programs;

d) establish guidelines for extension personnel development; and,

e) define sanctions for non-cooperation of participating agencies.

(2) Regional Level

At the regional level the Regional Development Council through its agricultural task force is responsible to:

a) formulate regional agricultural thrusts based on national priorities;

b) draw up a regional integrated agricultural development plan based on provincial development plans; and,

c) approve recommendations of the Regional Agricultural Land Classification Committee (RALCC) on land use.

The regional offices of national agencies shall retain their regular substantive and administrative functions. In addition, the Regional Agricultural Land Classification Committee (RALCC), a sub-committee responsible for indentification of specific areas for agricultural purposes and their appropriate land uses, will maintain a data base for identifying specific agricultural areas on a continuing basis.

(3) Provincial Level

At the provincial level, the Governor is responsible to:

a) coordinate and supervise the operations of various agencies involved in the delivery of agricultural services within the province in accordance with the approved PIADP;

b) organize the Provincial Agricultural Council as a committee under the Provincial Development Council;

c) head the Provincial Agricultural Council;

d) supervise and coordinate the various agencies in the preparation and operationalization of the approved Provincial Integrated Agricultural Development Plan and Program (PIADP);

e) designate city/municipal agricultural action officers from among the senior national government officials in the city or municipality: provided, that he may, with the concurrence of the Ministry of Agriculture, choose the city/municipal mayor as the action officer;

f) supervise and coordinate the city and municipal agricultural action officers in the implementation of the PIADP;

g) monitor at all levels the progress and implementation of all agricultural projects in the province, and submit reports to the MA/NFAC;

h) liaise with the regional offices, ministries and agencies of the national government for timely and adequate support to the provincial program;

i) see to the proper performance of the PAEO as action officer in the day-to-day functions of the PAC; and,

j) perform such other functions consistent with provisions of the Executive Order.

In addition, the PAEO is responsible to:

a) act as the action officer of the Provincial Agricultural Council;

b) supervise and control city/municipal action officers;

c) assist the provincial governor in effecting an integration of agricultural services in the Province;

d) maintain close consultation and liaison with city/municipal mayors;

e) provide executive assistance to CAAO/MAAO in the proper execution of the integrated agricultural programs in their areas; and,

f) evaluate and monitor the progress and extent of the implementation of agricultural projects in his area as well as the extent and degree of participation/cooperation of the respective agencies and personnel involved.

The Provincial Development Council is responsible to:

a) define provincial agricultural priorities; and,

b) approve the PIADP prepared and recommended by the PAC.

The Provincial Agricultural Council is responsible to:

a) coordinate activities of participating agencies; and,

b) act as an advisory group of the governor.

And finally, each Agency under PAED is responsible to:

a) exercise supervision and control over their own respective offices;

b) provide corresponding agricultural services and inputs as previously determined by the PIADP;

c) report regularly to the provincial governor, through the PAEO, on his agency's activities and accomplishments; and,

d) report to their respective regional directors/heads if any, on their accomplishments, to whom they will be directly responsible for the performance of their substantive and administrative functions.