

THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

FIELD REPORT
ON
THE MASTER PLAN SURVEY OF THE THIRD STAGE
FOR
THE IRRAWADDY BASIN
AGRICULTURAL INTEGRATED DEVELOPMENT PROJECT

SEPTEMBER 1979

JAPAN INTERNATIONAL COOPERATION AGENCY

THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

FIELD REPORT
ON
THE MASTER PLAN SURVEY OF THE THIRD STAGE
FOR
THE IRRAWADDY BASIN
AGRICULTURAL INTEGRATED DEVELOPMENT PROJECT

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SEPTEMBER 1979

JAPAN INTERNATIONAL COOPERATION AGENCY

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| 交付 月日 | 87.3.26 | 104 |
| 登録 No. | 08397 | 80.7 AFT |

His Excellency U Ye Goung
Minister of Agriculture and Forests,
The Socialist Republic of the Union of Burma.

Dear Sir,

Re: Submission of Report on the Master Plan survey
of the Third Stage for Irrawaddy Basin
Agricultural Integrated Development Project.

It is my great pleasure to submit herewith the Field Report of 20 copies on the Master Plan Survey of the Third Stage for Irrawaddy Basin Agricultural Integrated Development Project in compliance with the Scope of Work.

This report outlines the draft idea of the project identification which will be successively furthered during home office work. After the home office work, the final draft report is scheduled to be submitted during the middle of January 1980.

All aspects of the studies conducted so far inclusive of the first and second stages will be concluded in the final draft report.

On this occasion, I would like to express my deep appreciation for sincere cooperation and assistance extended to us by you and your staff throughout the course of our study in your country.

I remain,






Yours faithfully,

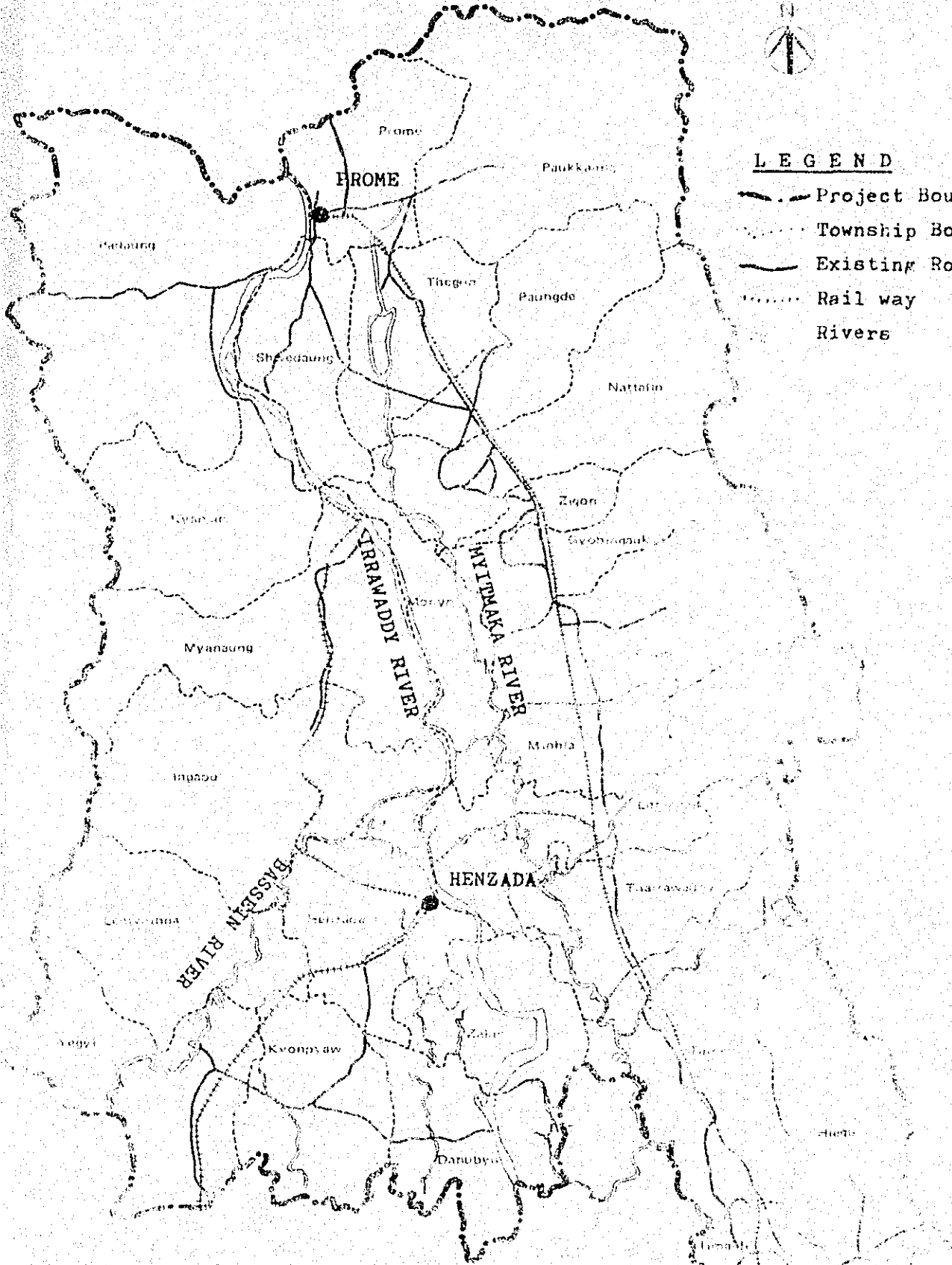
SUSUMU NISHIGAKI
Team Leader
The Master Plan Survey Team,
the Third Stage for the
Irrawaddy Basin Agricultural
Integrated Development Project

GENERAL MAP



LEGEND

-  Project Boundary
-  Township Boundary
-  Existing Road
-  Rail way
-  Rivers



SCALE

5 0 5 10 15 miles

10 5 0 5 10 15 20 25

MEMBERS OF SURVEY TEAM

| <u>Name</u> | <u>Assignment</u> |
|-------------------------|------------------------------|
| Dr. Susumu NISHIGAKI | Project Planning (Leader) |
| Mr. Kohki MITSUNOBU | Regional Development |
| Mr. Masahiro YAMADA | Hydrology |
| Mr. Masahiro IIDA | Irrigation |
| Mr. Toshinobu NAKANO | Drainage |
| Mr. Yasunori HASEGAWA | Agronomy |
| Mr. Kensuke IAIYA | Rural Development |
| Mr. Yoshitomo MIYANISHI | Agro-Economy |
| Mr. Yuya HIRASE | hydro-Power |

MEMBERS OF COLOMBO PLAN EXPERTS

Mr. Hyousaku GOTO Regional Development Expert
Mr. Makoto SHIMADA Hydrology Expert

MEMBERS OF COUNTERPARTS

U Ba Aye Executive Engineer
 Survey Section
 Irrigation Department (ID), MAF

U Wai Phyo Assistant Engineer
 Hydrology Section
 Irrigation Department (ID), MAF

U Than Tun Oo Deputy General Manager
 Land Use Department, Agriculture
 Corporation (AC), MAF

U Hla Aye Assistant General Manager
 Land Use Department (AC), MAF

ITINERARY OF THE SURVEY TEAM

| <u>DATE</u> | <u>DESCRIPTION</u> |
|---------------|---|
| 23rd Jul.1979 | The first group of the survey team (Messrs. S. NISHIGAKI, K. MITSUNOBU, H. HASEGAWA, M. IIDA, and Y. MIYANISHI) left for Bangkok with the supervisory group (Messrs. J. ABE, K. KONDO and R. GOTO). |
| 24th Jul.1979 | Visited FAO Regional Office. |
| 25th Jul.1979 | The first group and the supervisory group arrived in Rangoon. |
| 26th Jul.1979 | The first group and the supervisory group paid a courtesy call to the Embassy of Japan. The second group (Messrs. M. YAMADA, K. IRIYA, T. NAKANO and Y. HIRASE) left for Bangkok. |
| 27th Jul.1979 | The first group and the supervisory group paid a courtesy call to the Burmese Government and the Minister of the Embassy of Japan. The second group arrived in Rangoon. |
| 28th Jul.1979 | The survey team and the supervisory group paid a courtesy call to the Foreign Economic Relations Department (FERD). |
| 29th Jul.1979 | Holiday. |
| 30th Jul.1979 | Field survey of the left bank of the Irrawaddy River from Rangoon to Iromae with the supervisory group and Colombo Plan Experts. |
| 31st Jul.1979 | Field survey at the South Newin Project area with the supervisory group and Colombo Plan Experts. |

| <u>DATE</u> | <u>DESCRIPTION</u> |
|--------------|---|
| 1st Aug.1979 | Joint meeting at the Ministers' Office. |
| 2nd Aug.1979 | The agriculture group (Messrs. S. NISHIGAKI, K. MITSUNOBU, Y. MIYANISHI, K. IRIYA and Y. HASEGAWA) had a meeting with officers of the Agriculture Corporation (AC). The supervisory group left for Bangkok. |
| 3rd Aug.1979 | The engineering group (messrs. K. MITSUNOBU, M. IIDA, M. YAMADA, T. NAKANO and Y. HIRASE) and two Colombo Plan Experts (C/P Experts) (messrs. M. SHIMADA and H. GOTO) held a meeting with officers of the Irrigation Department (ID) at the head office of ID. The agriculture group held a meeting at the Agricultural and Farm Produce Trade Corporation (AFPTC), and the Veterinary and Animal Husbandry Department (VAHD). |
| 4th Aug.1979 | The agricultural group met the Director General (DG) of the Agricultural Mechanization Department (AMD) and VAHD. |
| 5th Aug.1979 | Holiday |
| 6th Aug.1979 | The Team had three meetings with the Electric Power Corporation (EPC), the Fishery Department (FID) and the Forest Department (FOD). |
| 7th Aug.1979 | The survey team had four meetings with FLRD, the Livestock Development and Marketing Corporation (LDMC) and EPC, Ministry of Planning and Finance. |

| <u>DATE</u> | <u>DESCRIPTION</u> |
|----------------|---|
| 8th Aug. 1979 | The agricultural group went to Frome. The engineering group did the office work. |
| 9th Aug. 1979 | The agricultural group made the field survey around Frome. The engineering group left for Frome. |
| 10th Aug. 1979 | The survey team went to Myangin for field survey. |
| 11th Aug. 1979 | The team went to Henzada. |
| 12th Aug. 1979 | The agricultural group went to the Upper Delta area and the engineering group went to the Phenet Chaung and the Myitnaka River. |
| 13th Aug. 1979 | The team returned to Rangoon. |
| 14th Aug. 1979 | Meeting with team members and Colombo Plan Experts at Agriculture Corporation team office. Arrangement of collected data about the field survey. |
| 15th Aug. 1979 | The engineering group visited the Paddy II Project Office, Irrigation Department. Meeting with LDMC. Meeting with AMD. |
| 16th Aug. 1979 | Office work. Meeting with LDMC. Meeting with Agriculture Corporation about cropping pattern. |
| 17th Aug. 1979 | The engineering group went to the Paddy I Project Office, Irrigation Dept. Planning and Statistics Department. Ministry of Planning and Finance. |

| <u>DATE</u> | <u>DESCRIPTION</u> |
|----------------|---|
| 18th Aug. 1979 | Office work. Meeting with Land Use Department. |
| 19th Aug. 1979 | Holiday. |
| 20th Aug. 1979 | Office work. Meeting with FiD. Meeting with Land Use Department. |
| 21st Aug. 1979 | Office work. |
| 22nd Aug. 1979 | Doing the Draft field report |
| 23rd Aug. 1979 | Doing the Draft field report Supervisory group arrived in Mawlaik. |
| 24th Aug. 1979 | Doing the Draft Field Report, M/P Team and the supervisory group had a meeting. |
| 25th Aug. 1979 | Field survey for rural development plan in Tharrawaddy Township. Supervisory and Agricultural and Engineer- ing group went for field trip. |
| 26th Aug. 1979 | Holiday. |
| 27th Aug. 1979 | Joint meeting with the Burmese Government, the supervisory group and Colombo Plan Experts. |
| 28th Aug. 1979 | Meeting with the supervisory group and doing the Field Report. |
| 29th Aug. 1979 | Doing the Field Report, the supervisory group left for Bangkok. |
| 30th Aug. 1979 | Agricultural group went to Taikkyi for field survey. |
| 31st Aug. 1979 | Meeting with the survey Department. |
| 1st Sept. 1979 | Doing the Field report |
| 2nd Sept. 1979 | Holiday. |

| <u>DATE</u> | <u>DESCRIPTION</u> |
|----------------|--|
| 3rd Sept. 1979 | Doing the Field Report The Second group left for Bangkok. |
| 4th Sept. 1979 | Meeting with the Forest Department. |
| 5th Sept. 1979 | Submitted Field Report to the Burmese Government. |
| 6th Sept. 1979 | Left for Bangkok. |
| 7th Sept. 1979 | Arrived in Japan. |

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ABBREVIATION, MEASURES AND GLOSSARIES

| | |
|-------|---|
| AC | Agriculture Corporation |
| ADB | Asian Development Bank |
| AE | Assistant engineer |
| AGM | Assistant General Manager |
| AFPTC | Agricultural and Farm Produce Trade Corporation |
| AMD | Agricultural mechanization Department |
| APS | Advance Purchase System |
| Ave | Average |
| BAG | Bachelor of Agricultural University |
| BKT | Basket (s) |
| CIF | Cost Insurance and Freight |
| °C | Degree Centigrade |
| DAGM | Deputy Assistant General Manager |
| DG | Director General |
| DGM | Deputy General Manager |
| Dy | Deputy |
| EE | Executive engineer |
| EL | Elevation |
| EPC | Electric Power Corporation |
| FC | Foreign Currency |
| FID | Fishery Department |
| FERD | Foreign Economic Relations Department |
| FIC | Foodstuff Industries Corporation |
| FOB | Free on Board |
| FoD | Forest Department |
| F/S | Feasibility Study |
| FY | Fiscal Year from April to March |
| GM | General Manager |
| GNP | Gross National Product |
| GWH | Giga watt Hour |
| HP | Horsepower |
| HWL | High Water Level |
| HYV | High Yielding Variety (of paddy) |
| Hz | Hertz per second |
| IBRD | International Bank for Reconstruction and Development |
| ID | Irrigation Department |

| | |
|------|---|
| IDA | International Development Association |
| KV | Kilo Volt |
| KW | Kilo Watt |
| KWH | Kilo Watt Hour |
| LC | Local Currency |
| LDMC | Livestock Development and Marketing Corporation |
| LIV | Local Improved Variety |
| LWL | Lower Water Level |
| LV | Local Variety |
| MAF | Ministry of Agriculture and Forests |
| MD | Managing Director |
| MHD | Meteorological and Hydrological Department |
| MI 1 | Ministry of Industry No.1 |
| M/P | Master Plan |
| MFF | Ministry of Planning and Finance |
| MT | Ministry of Trade |
| MW | Mega Watt |
| MWL | Mean Water Level |
| PD | Project Director |
| pH | Potential of Hydrogen |
| PPFC | People's Pearl and Fishery Corporation, MAF |
| PPM | Part (s) per million |
| % | Percent |
| PSD | Planning and Statistics Department |
| SD | Survey Department, MAF |
| SLRD | Settlements and Land Records Department, MAF |
| TC | Timber Corporation, MAF |
| TEM | Township Extension Manager |
| TSP | Triple Super Phosphate |
| UCC | University Computer Center |
| UGCF | Union Government Consolidated Fund |
| VAHD | Veterinary and Animal Husbandry Department |
| VIB | Village Tract Banks |
| WPSD | Working People's Settlement Department |

MEASURES

Length

| | |
|------|----------------------------------|
| mm | millimeter (s) |
| cm | centimeter (s) |
| m | meter (s) |
| km | kilometer (s) |
| inch | 25.4 mm |
| ft | foot (feet) = 12 inch = 30.48 cm |
| mile | 5,280 feet = 1.609 km |

Area

| | |
|---------|-----------------------------------|
| sq.cm | square centimeter (s) |
| sq.m | square meter (s) |
| sq.km | square kilometer (s) = 100 ha |
| ac | acre (s) = 4,047 sq.m |
| sq.mile | square mile = 2.59 sq.km = 640 ac |
| ha | hectare |

Capacity

| | |
|-------|--|
| l | litter |
| cu.m | cubic meter |
| MCM | Million Cubic meter |
| cu.ft | cubic foot (feet) = 28.32 l |
| cu.yd | cubic yard = 0.765 cu.m |
| AF | Acre Foot (feet) = 1,233.48 cu.m |
| qt | quart = 1/4 gl = 1.136 l (UK) = 0.946 l (US) |
| gl | gallon = 4.543 l (UK) = 3.785 l (US) |

Note : UK : British measure
US : US measure

Weight

| | |
|-----|--------------------------|
| g | gram (s) |
| Kg | Kilogram (s) |
| ton | metric ton |
| oz | ounce = 28.4 g |
| lb | Pound = 16 oz = 0.454 Kg |

Others

| | |
|------------|--|
| cm/sec | centimeter per second |
| m/sec | meter per second |
| km/sec | kilometer per second |
| mile/hr | mile per hour = 1.609 km/hr = 0.447 m/sec |
| ft/second | feet per second |
| cu.m/sec | cubic meter per second |
| cfs/cu.sec | cubic foot (feet) per second = 0.0283 cu.m/sec |
| gl/sec | gallon per second = 4.543 l/sec = 0.0757 l/min |

Glossaries

| | |
|--------|--|
| lakh | 100,000 |
| crore | 10,000,000 |
| viss | 1.633 Kg |
| Fyi | 2,127 Kg |
| basket | 20.9 Kg (paddy) |
| basket | 34.0 Kg (rice) |
| bag | 75.6 Kg (rice) |
| Chaung | River or Stream |
| kyat | Unit of Local Currency (about 30 Japanese Yen) |
| In | Lake or Swamp area |
| Yoma | mountain range |

I. INTRODUCTION

This chapter presents a very brief history of the Master Plan survey conducted so far together with the activities of the Colombo Plan Experts. Also, this chapter outlines the major operation of the Third stage survey and the work schedule up to the end of fiscal Year 1979/80, when the Master Plan is intended to be concluded.

Brief History of the Project

- 1.01 Upon the request of the Government of the Socialist Republic of the Union of Burma, the Government of Japan dispatched the seven-member Preliminary Survey Team to the field for 39 days from 21st September to 29th October 1977. The Survey Team discussed with the Burmese Authorities concerned to give basic guidelines for further survey.
- 1.02 The Government of Japan sent the twelve-member First Survey Team to the field for 53 days from 6th February to 30th March 1978 to initiate the Master Plan Study. The Survey Team reviewed the irrigation projects along the Myitmaka River basin in the course of this survey. The South Nawin Irrigation Project had consequently come up as top priority after technical and economic evaluation along with the policy of the Burmese Government.
- 1.03 In the meanwhile, the Government of Japan established a Supervisory Committee comprising 13 experts and specialists in the respective fields for supervision and guidance to the Survey Team. Under the direction of the Committee, the twelve-member Second Survey Team was dispatched to the field for 100 days from 24th October 1978 to 30th January 1979. The Second Survey Team mainly focussed on the investigation of the present situation for coming project identification.

Colombo Plan Experts

- 1.04 The Government of Japan dispatched two experts of Regional Development and Hydrology for the Irrawaddy Project under the Technical Cooperation Scheme of the Colombo Plan. The Colombo Plan Experts have devoted themselves to the successful accomplishment of the Irrawaddy Project together with the Survey Team since December 1978. The Experts play roles as a pivot among the Burmese staff, the survey Team and the Japanese Government in this Project. Further details on the activities of the Experts have been released in the form of separate reports.

Third Stage Survey

1.05 Under such circumstances, the nine-member Third Survey Team was sent to the field for 44 days from 25th July to 6th September 1979. The main issue of the Third Field Survey consists of the following items:

- (1) to present identified projects
- (2) to exchange views with the Government Agencies concerned in respect to each project of item (1)
- (3) to supplement the data collection and to obtain informations for item (1)
- (4) to conduct site investigation during wet season.

Work Schedule

1.06 The proposed work schedule after the field survey will be as follows:

- (1) Home office work : 10th Sept.1979 - 17th Jan.1980
- (2) Delivery of the Draft Report : 20th Jan.1980
- (3) Inter-Agency Coordination in Japanese Side: 23rd Jan.1980 - 8th Feb.1980
- (4) Explanatory mission on the Draft Report : 10th Feb.1980 - 16th Feb.1980
- (5) Final Arrangement of the Report : 18th Feb.1980 - 18th Mar.1980
- (6) Submittance of the Final Report : 19th Mar.1980

II. PROJECT IDENTIFICATION

This chapter sets forth the tentative project identification notwithstanding the fact that these are mostly very preliminary stages. The identified projects in this chapter cover a part of whole projects to be proposed.

Those projects which may be derived from or related to the increased agricultural production as marketing, agro-industry etc. or agricultural mechanization are not specified here, but are intended to incorporate during the home office work.

1. Name of Project

West Pegu Yoma Irrigation Project (Phase I)

- (1) Okkan Irrigation Sub-project
- (2) Thonze Irrigation Sub-project
- (3) Thegaw Irrigation Sub-project
- (4) Kadinbilin Irrigation Sub-project

2. Location

- (1) Taikkyi Township
- (2) Tharrawaddy Township
- (3) Letpadan Township
- (4) Minhla Township

3. Agencies Concerned

- (1) Irrigation Department (ID)
- (2) Agriculture Corporation (AC)
- (3) Agricultural Mechanization Department (AMD)
- (4) Electric Power Corporation (EPC)
- (5) Other Agencies concerned

4. Objectives

- (1) to increase farm outputs and farmers income
- (2) introduction of double crops farming with irrigation
- (3) stable supply of farm products
- (4) to expand culturable land from culturable waste land

5. Background

The South Nawin Irrigation Project, one of the product of the Master Plan Survey, is now under the stage of feasibility study and is also scheduled to complete by end of March 1980. Following to the South Nawin Project, this West Pegu Yoma Project is in contemplation to proceed to the feasibility stage. The Project involves four sub-projects namely Okkan, Thonze, Thegaw and Kadinbilin over four townships as stated in items 1 and 2. A provisional estimate indicates that the irrigable area may reach about 62,000 hectares. While the current progress of preliminary survey differs from sub-project to sub-project. A stage development (or sometimes called phasing development) is, therefore, proposed to tide over the constraints in respect with staff and fund.

6. Components

- (1) Four reservoirs and diversion dams
- (2) Irrigation and drainage system
- (3) Flood protection work (Lebankment work)
- (4) Farm road and access road system
- (5) Land consolidation
- (6) Water management
- (7) Farm mechanization
- (8) Agricultural supporting services such as marketing system, extension services and so on
- (9) Extension of the High Yielding Variety Project
- (10) Rural developments
- (11) Hydro power generation

7. Major Dimensions

Under study.

8. Further Investigation

Topo-map of irrigable area with scale about 1:5000
Topo-map of reservoir area, diversion dam site and dam site
Geological data
Soil map
Agricultural data
Other relative data

9. Approximate Project Cost

Under study.

1. Name of Project

Reservoir Irrigation Project

- (1) Wegyi dam
- (2) Taungnyo dam
- (3) Bawbin dam
- (4) Gamon dam
- (5) Minhla dam
- (6) Nyaungaung dam
- (7) Thani dam
- (8) Buyo dam
- (9) Kyaukphu dam
- (10) Thaledan dam
- (11) Alonmyauk dam
- (12) North Kun dam
- (13) Phatashin dam
- (14) Mamyia dam
- (15) Kyanyin dam
- (16) Mankathu dam
- (17) Nonkathu dam
- (18) Gyat dam
- (19) Lesali dam
- (20) Thida dam
- (21) South Kun dam
- (22) Kyetpaung dam

2. Location

See location map

3. Agencies Concerned

- (1) Irrigation Department
- (2) Agriculture Corporation
- (3) Agricultural Mechanization Department
- (4) Electric Power Corporation

4. Objectives

- (1) to increase yield
- (2) to introduce double cropping
- (3) to diversify crops
- (4) to stabilize crop production
- (5) to increase farmers' income
- (6) to generate hydro power

5. Background

- (1) The rainfall does not always meet with the timing of crop-water requirement deviating from month to month as well as from year to year. Thus, ill-timed rainfall or absolute scarcity of rainfall has caused recurrent drought damage to paddy production in the area.
- (2) Under such circumstances, the current farming practices are helplessly obliged to operate under such capricious natural conditions.
- (3) Thus, as a framework of overall future plans, the Tank Irrigation Project is proposed to be substantial solution to the rain-fed farming which hampers the possible agricultural production in the area.

6. Components

- (1) Irrigation and drainage system including dam and reservoir
- (2) Land consolidation
- (3) Agriculture supporting services
- (4) Farm mechanization
- (5) Agro-industry
- (6) Hydro power generation

7. Major Dimensions

- (1) see Table 3-9 page 58
the Field Report of the second stage
- (2) The above figures are tentative and will be revised during home office work

8. Further Investigation

Under study

9. Approximate Project Cost

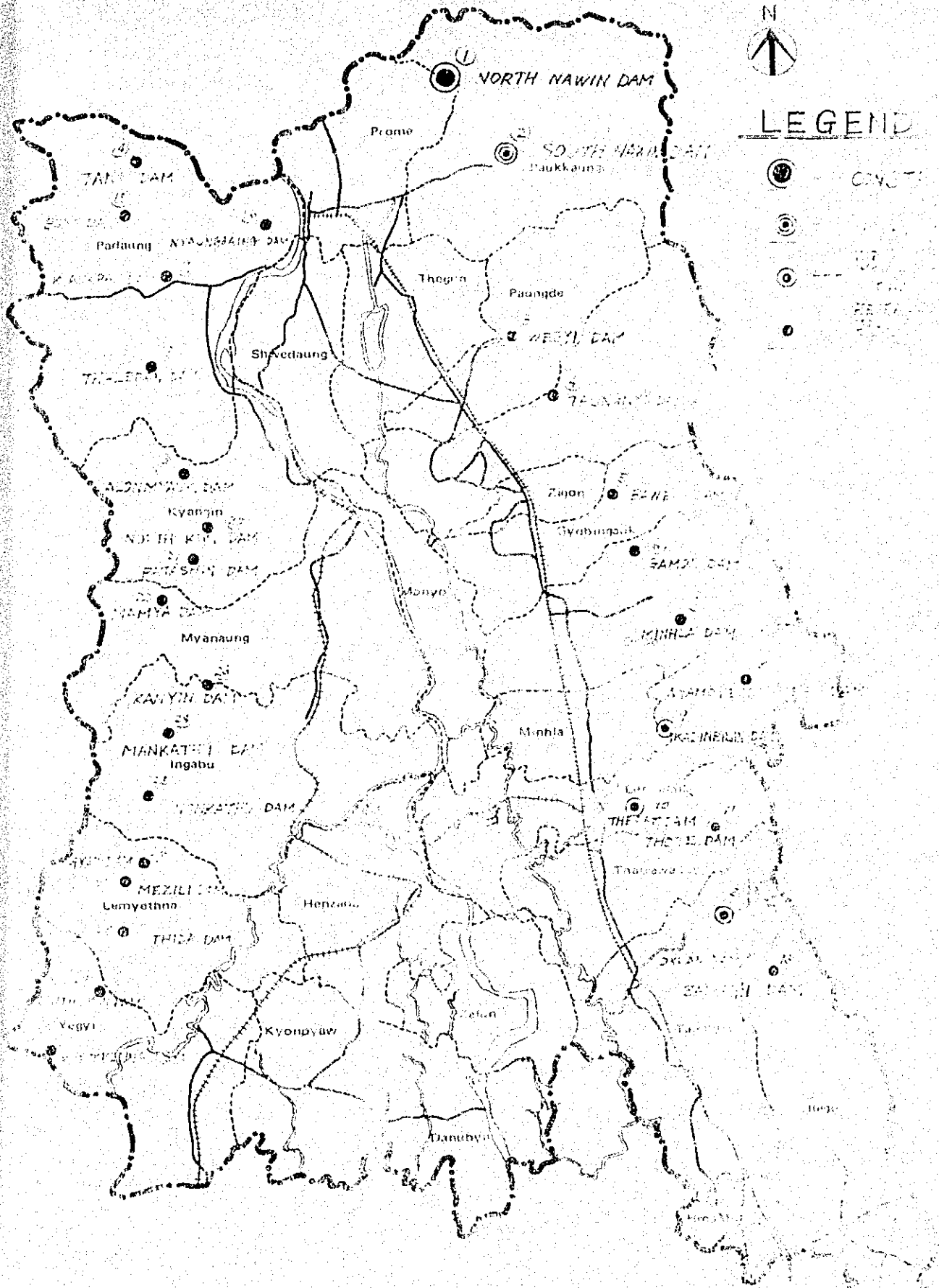
Under study.

LOCATION MAP

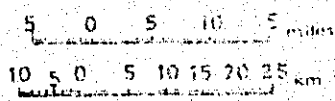


LEGEND

- CONCRETE DAM
- DAM UNDER CONSTRUCTION
- DAM UNDER DESIGN
- DAM UNDER STUDY



SCALE



1. Name of Project

Swamp Reclamation Project

- (1) Hmawbi embankment project
- (2) Monyo embankment project
- (3) Danubyu embankment project
- (4) Myanaung embankment project
- (5) Ingabu embankment project
- (6) East Side of Myitmaka River drainage improvement project
- (7) West Side of Myitmaka River drainage improvement project
- (8) West Side of Bassein River drainage improvement project

2. Location (see Location Map)

- (1) Hmawbi, Taikkyi Township
- (2) Monyo Township
- (3) Danubyu Township
- (4) Myanaung Township
- (5) Ingabu Township
- (6) Tharrawaddy, Taikkyi Township
- (7) Letpadan, Tharrawaddy, Salan Township
- (8) Ingabu, Lemyethna, Yegyi Township

3. Agency Concerned

Irrigation Department

4. Objectives

In line with the Government policy, the development of ill-drained low-lying lands around the three major rivers, Irrawaddy, Myitmaka and Bassein, contributes doubtlessly toward the expansion of farm land.

5. Background

- (1) A number of vast swampy zones developed around the three major rivers in the Project area. These culturable waste land or ill-drained areas are currently subject to abandon implying enormous development potentiality.

- (2) A drastic solution may be accompanied with a big investment together with time and man power. Thus, step by step approach but not disorder development is proposed under this project. This project may be significantly characterized by such nature as pilot project for future swamp reclamation over the entire areas.
- (3) Similar practices are also employed under the pilot Land Consolidation project which may refer to the Reservoir Irrigation project for the existing paddy areas.

6. Components

- (1) Embankment
- (2) Sluice gate
- (3) Drainage Canal
- (4) reclamation of Swamp
- (5) Land consolidation
- (6) Pumping plant for drainage and irrigation
- (7) Agricultural aspect see pilot Land Consolidation

7. Major Dimensions

| <u>Project No.</u> | <u>Area</u> (ha) | <u>Embankment</u> (cm) | <u>Height</u> (m) |
|--------------------|---------------------|---------------------------|----------------------|
| (1) | 20,000 | 20 | 2.5 |
| (2) | 6,000 | 17 | 2.0 |
| (3) | 3,400 | 32 | 2.5 |
| (4) | 6,000 | 15 | 4.0 |
| (5) | 22,500 | 71 | 1.0 - 4.0 |
| (6) | 37,500 | * | * |
| (7) | 22,500 | * | * |
| (8) | 37,500 | * | * |

Note: Under study
Other items are under study

8. Further Investigation

- (1) Topo maps with scale 1:5,000 and contour interval 0.25 m
- (2) water-stage and rainfall
- (3) result of the Hydraulic Analysis on the Irrawaddy River under the Faddy I project.

9. Approximate Project Cost

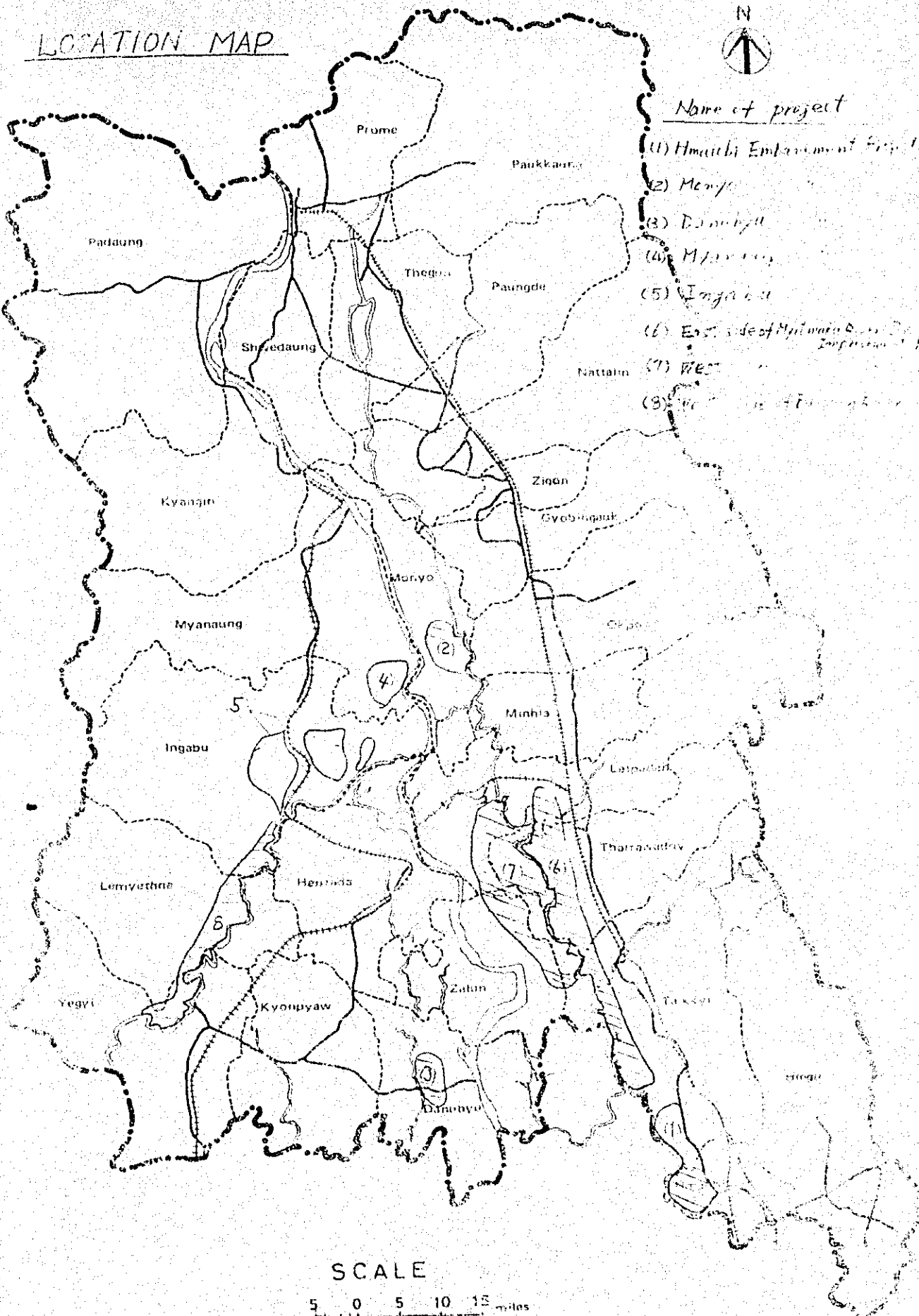
Under study.

LOCATION MAP

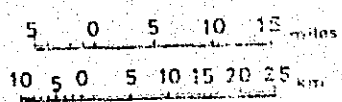


Name of project

- (1) Hmaitbi Embankment Project
- (2) Meryo
- (3) Damaung
- (4) Myingyi
- (5) Ingaba
- (6) East side of Myingyi Dam
- (7) West side of Myingyi Dam
- (8) ...



SCALE



1. Name of Project

Farm Service Road Project

2. Location

Not specified

3. Agencies Concerned

- (1) Irrigation Department
- (2) Ministry of Home and Religious Affairs
- (3) Division Council
- (4) Township Council
- (5) Village Council

4. Objectives

To improve traffic condition in rural area.

5. Background

- (1) Arterial roads such as union highway, main road, feeder road and village road are fairly developed in the Project area. However, the density of farm service road is currently too low to meet the traffic for farming operation and for daily life.
- (2) Hence, an arrangement of the farm service road network is proposed incorporating with the existing or planning arterial roads under certain criteria.

6. Components

On the basis of population distribution and traffic amount in the area, the farm service road with width of 2-4 m is conceived. The layout or route may be fixed after consultation with the respective councils during feasibility stage.

7. Major Dimensions

Under study

8. Further Investigation

Estimation of traffic amount.

9. Approximate Project Cost

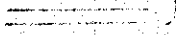
Under study.

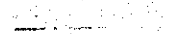
ROAD MAP



LEGEND


EXISTING ROAD

(BITUMEN )

(SURFACED )

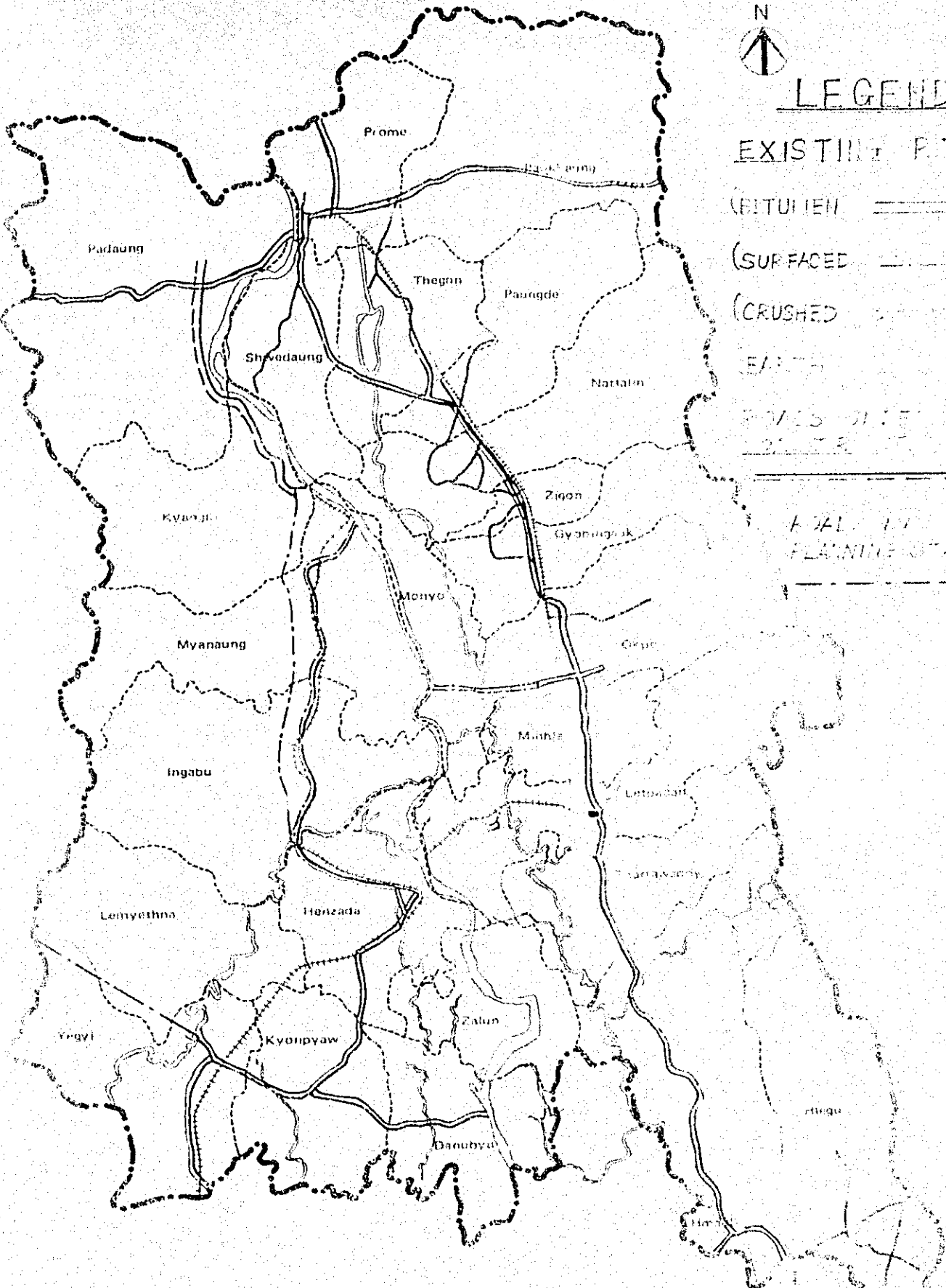
(CRUSHED )

EARTH 

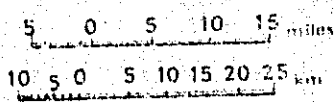
ROADS TO BE 

BUILT 

SCALE 1:50,000
PLANNING OFFICE



SCALE



1. Name of Project

Flood Interception Project

2. Location

Monyo Township (Thenet Chaung)

3. Agency Concerned

Irrigation Department

4. Objectives

For development of the Swampy zone spread vastly both sides of the Myitmaka river, prevention of flood inflow into the Myitmaka river from the Irrawaddy river through the Thenet Chaung is proposed. The inundated area along the Myitmaka river will be remarkably reduced after the provision of a flood intercepting structure at the mouth of the Thenet Chaung.

5. Background

- (1) The flooding along the Myitmaka river is caused by insufficient discharge capacity of the river.
- (2) The discharge capacity of the Myitmaka river is roughly estimated around 1,600 cum/sec at the middle reaches of the river.
- (3) Meanwhile, an inflow amount from the Irrawaddy river into the Myitmaka river through the Thenet Chaung comes up to around 5,000 cum/sec during flood period.
- (4) Hence, for the development of the swampy area along the Myitmaka river, control of the inflow is proposed.
- (5) Anticipated adverse effects due to this project should be carefully assessed.
- (6) The probable adverse effects may be as follows:
 - (a) a rise of water stage in the Irrawaddy and the Bassein rivers and subsequent strengthening of the existing embankment if required. (This item is connected with the result of hydraulic analysis conducted under Raddy I Project).
 - (b) sedimentation of the Rangoon harbour and the Alaing river.

6. Components

- (1) hydraulic model test and/or simulation
- (2) embankment
- (3) control gate

7. Major Dimensions

Under study

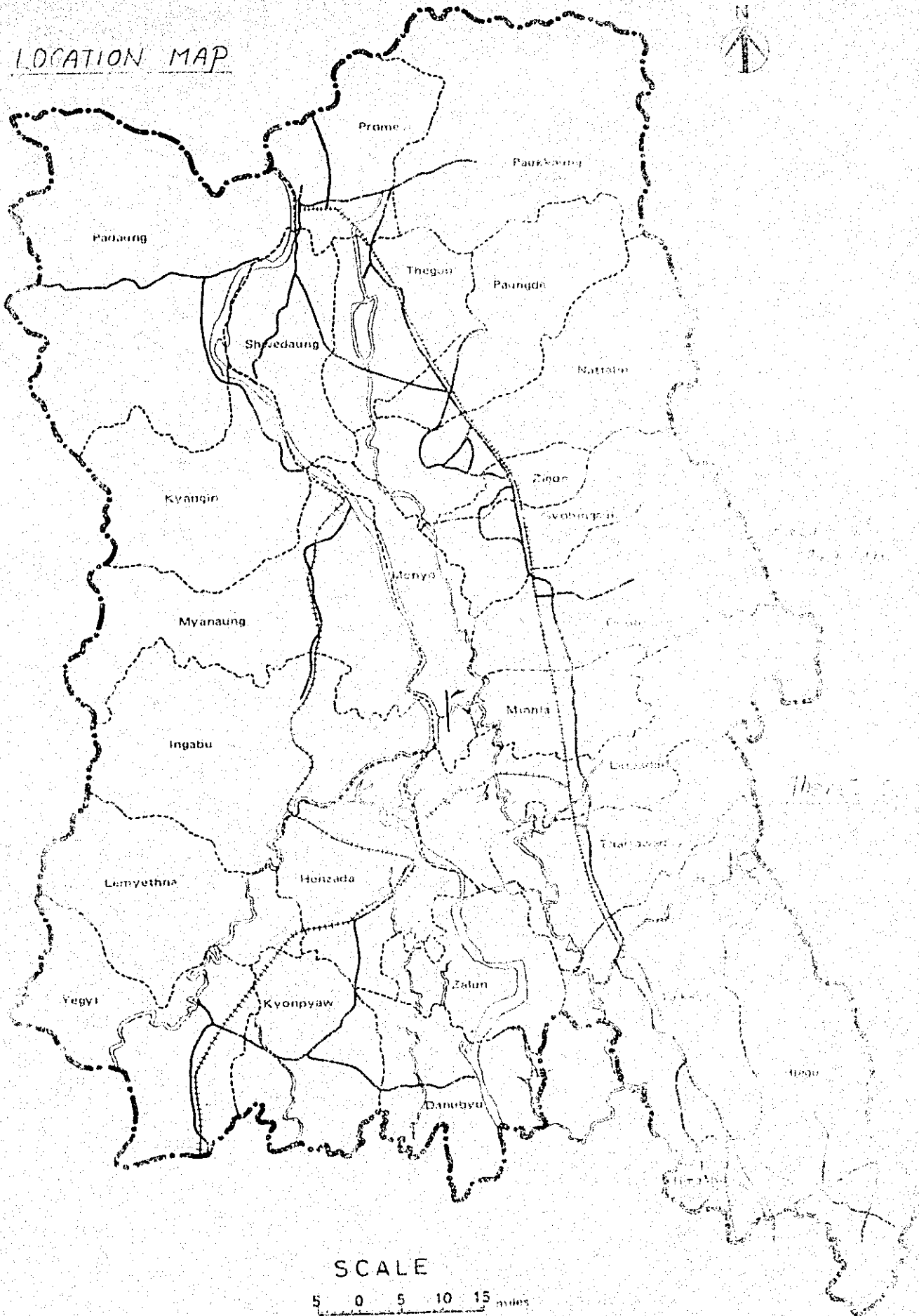
8. Further Investigation

Under study

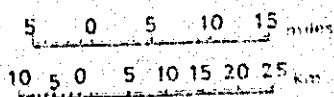
9. Approximate Project Cost

Under study.

LOCATION MAP



SCALE



1. Name of Project

Pilot Land Consolidation Project

2. Location

- (1) In South Nawin Project Area
- (2) In Okpo Township
- (3) In Okkan Township
- (4) In Hmawbi Township
- (5) In Kyonpyaw Township, Shage In
- (6) In Padaung Township, Kyaukpu

3. Agencies Concerned

- (1) Irrigation Department
- (2) Agriculture Corporation
- (3) Agricultural Mechanization Department
- (4) Agricultural and Farm Produce Trade Corporation
- (5) Veterinary and Animal Husbandry Department
- (6) Myanma Agricultural Bank

4. Objectives

- (1) to provide model cases to future agriculture development in the area
- (2) to extend modernized agricultural techniques
- (3) to demonstrate the state after the Project.

5. Background

- (1) Despite the fact that the Project area is blessed with favourable natural conditions for high crop production and forms the granary on rice production in the country, the yield per acre and cropping intensity are currently behind satisfactory status.
- (2) To cope with the above conditions, the modernized agriculture is going to be introduced over the area under this project.
- (3) Prior to implementation of large scale development project an introduction of so-called pilot project is effectively practised to seek after the goal of the Project.

- (4) Thus, various types of Pilot Land Consolidation Projects representing some patterns of local characteristics are proposed.

6. Components

- (1) pumping plant or intake facilities
- (2) irrigation and drainage system
- (3) land consolidation
- (4) water management
- (5) extension of modernized farming technology
- (6) farm mechanization
- (7) buildings and facilities for management, research and demonstration.

7. Major Dimensions

about 1,000 hectares each
further detail under study.

8. Further Investigation

- (1) plan map (scale 1:2,000 contour interval 0.5 m)
- (2) soil survey
- (3) groundwater investigation
- (4) farm management survey, opinionarie survey for concerned farmers.

9. Approximate Project Cost

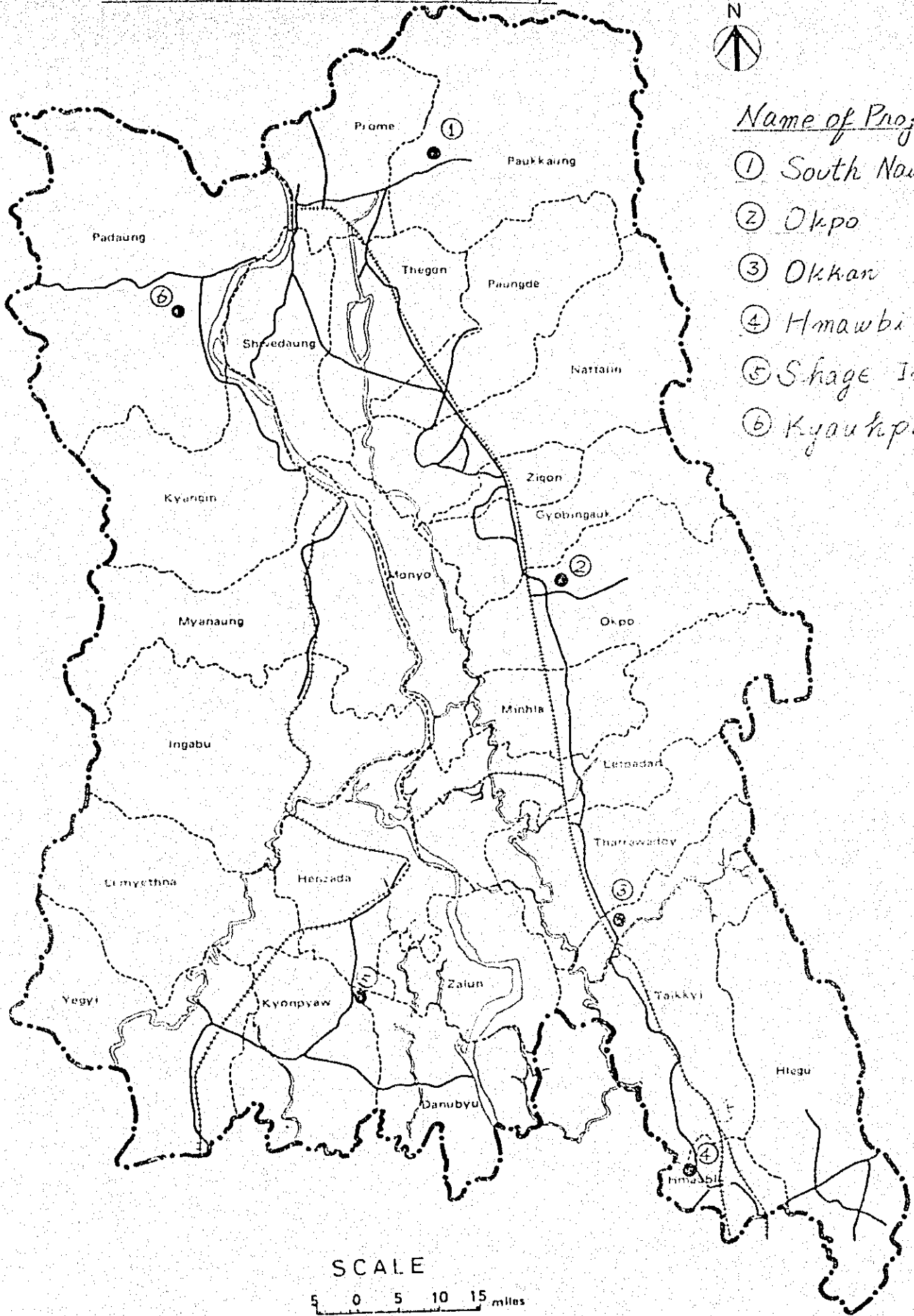
Under study.

PILOT LAND CONSOLIDATION

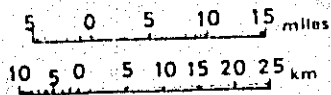


Name of Project

- ① South Nawin
- ② Okpo
- ③ Okkan
- ④ Hmawbi
- ⑤ Shage In
- ⑥ Kyaukpou



SCALE



1. Name of Project

Regional Experiment Station Development Project

2. Location

- (1) Establishment of Central Farms: Irome, Henzada and Minhla or Okpo
- (2) Strengthen of Existing Central Farm: Hmawbi

3. Agency Concerned

Agriculture Corporation

4. Objectives

- (1) to develop applied research to cope with development plan of modernized agriculture
- (2) to provide training services for extension workers and research staffs.

5. Background

- (1) Establishment of new central farms in Irome and Henzada are under planning by the Burmese Government
- (2) Another central farm is proposed in the midway between Irome and Hmawbi from the aspect of its locality.

6. Components

- (1) construction of experimental farms and buildings
- (2) supply of equipment for experiment

7. Major Dimensions

Under study

8. Approximate Project Cost

Under study.

1. Name of Project

Seed Production Development Project

2. Location

Letpadan, Paungde, Henzada seed farm and other more two or three locations.

3. Agency Concerned

Agriculture Corporation

4. Objectives

- (1) to supply quality seeds of paddy rice and other crops
- (2) to provide training for concerned staff

5. Background

A big amount of quality seed will be needed with the progress of agriculture development.

6. Components

- (1) provision of seed processing facilities, dehumidified warehouses and ordinary warehouses.
- (2) provision of training for concerned staff (inclusive of oversea training courses).

7. Major Dimensions

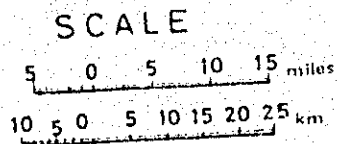
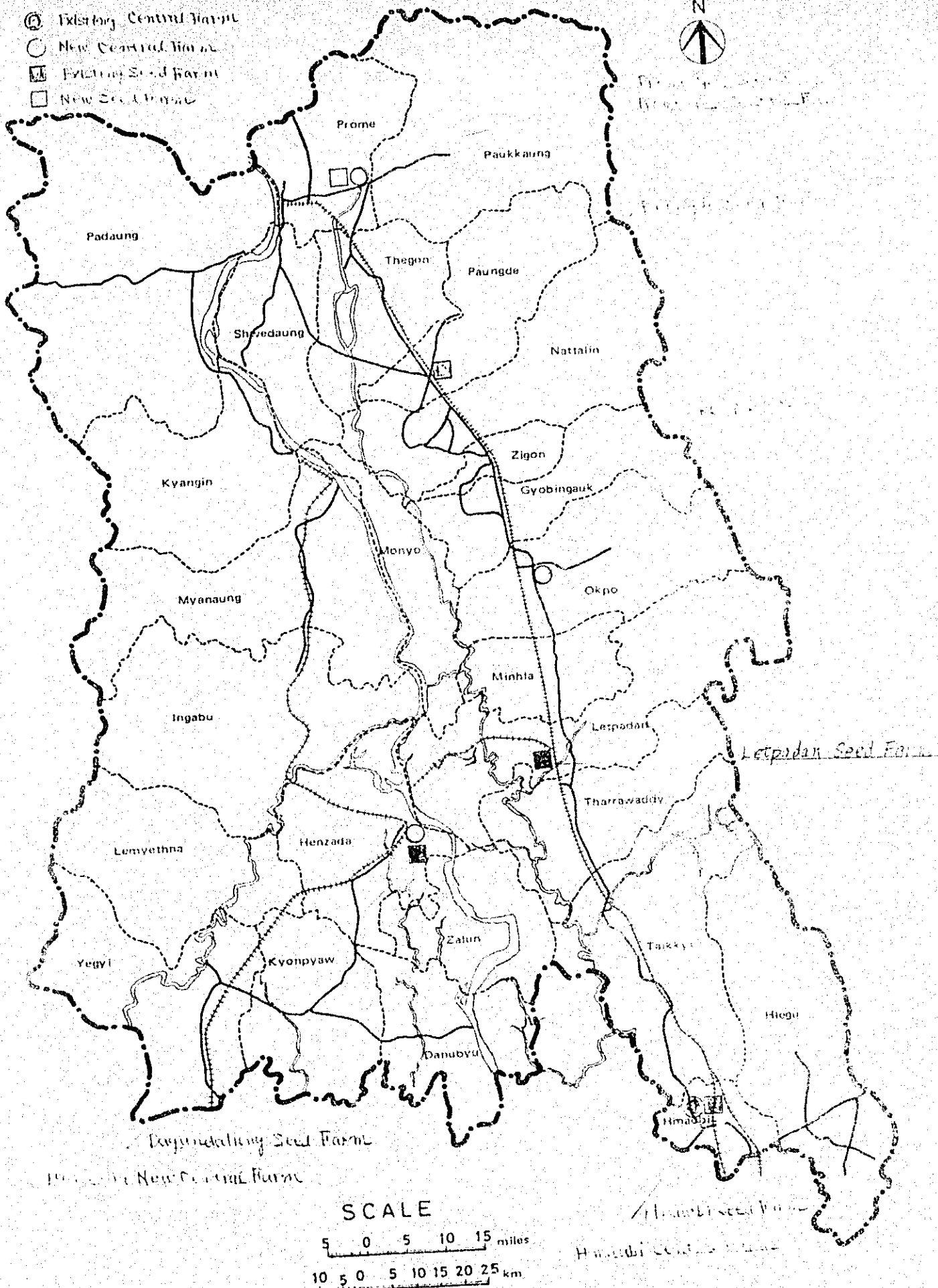
Under study

8. Approximate Project Cost

Under study.

LOCATION MAP

- ⊙ Existing Central Farm
- New Central Farm
- ▣ Existing Seed Farm
- New Seed Farm



1. Name of Project

Pilot Center Project

2. Location

In the Master Plan Project Area

3. Agencies Concerned

- (1) Agriculture Corporation
- (2) Irrigation Department
- (3) Agricultural Mechanization Department

4. Objectives

- (1) to implement trials for modernized farming techniques to be extended to the proposed irrigation area.
- (2) to provide training for extension staff and farmers
- (3) to demonstrate the modernized farming techniques.

5. Background

See the Pilot Land Consolidation Project (page 19)

6. Components

- (1) Construction of trial farms with irrigation and drainage facilities as well as such buildings as office, laboratory, lecture room, warehouse, workshop, living quarter and so on.
- (2) Establishment of two demonstration pilots in the farmers' field, having about 100 ha each, apart from the trial farms in the center.
- (3) Supply of instruments and materials necessary for trial farming and extension work.
- (4) Supply of farm machineries.

7. Major Dimensions

Under study

8. Further Investigation

Under study

9. Approximate Project Cost

Under study.

1. Name of Project

whole Township Paddy Production Supporting Project

2. Location

Under study

3. Agencies Concerned

Agriculture Corporation

4. Objectives

to support the on-going whole Township Paddy Production Project (WTPP).

5. Background

The proposed irrigation projects do not cover whole cultivated land in the M/P area, and it takes a lot of time to complete the irrigation projects. On the other hand, the Burmese Government is now promoting so-called quick return project on yield increase of agricultural products, for which the government faces constraints on supply of such farm inputs as fertilizers and agricultural chemicals. Since WTPP had commenced and obtained good result in Taikkyi in 1977/78, the project has been extended for 23 townships in 1978/79, and is being implemented for 43 townships in 1979/80. For the project, the following items were provided under the food-aid fund given by the Japanese government as well as the other sources.

- Fertilizers
- Agricultural Chemicals
- Farm machinery
- Construction machinery for small scale land improvement work
- Vehicle, motor cycle, bicycle, audio-visual instruments, etc. for extension works.

On the other hand, the Burmese government will expend necessary cost for the following items:

- delivery under the Four Year Plan
- necessary cost for strengthening extension staff
- construction of pioneer camp.

6. Major Components

- (1) supply of fertilizer, agro-chemicals and farm machinery
- (2) supply of transportation facilities, audio-visual instruments and others for extension activities
- (3) supply of construction machinery

7. Major Dimensions

Under study

8. Approximate Project Cost

Under study.

1. Name of Project

State Farm

2. Location

| <u>Name of Farm</u> | <u>Name of Township</u> |
|---------------------|-------------------------|
| (1) Sabutaung | Hlegu |
| (2) Tayagone | Hlegu |
| (3) Thitcho | Nattalin |
| (4) Saipoke | Okpo |
| (5) Monyo | Monyo |

3. Agencies Concerned

Working People's Settlement Department (W.P.S.D.)
Agriculture Corporation (A.C.)
Irrigation Department (I.D.)
Settlements and Land Records Department (SLRD)
Agricultural Mechanization Department (A.M.D.)
Forestry Department (FoD)

4. Objectives

By reclaiming and developing virgin land/culturable waste land, semi-mechanized farming will be operated under the special organization of which main body is Working People's Settlement Department. In the state farm(s), necessary farm labour will be supplied by landless farmers surrounding the farm(s) as a hired labourer.

5. Background

Under the instruction of ministry of Agriculture and Forests, the land selecting team, consisting of 10 members from W.P.S.D., A.C., I.D., S.L.R.D., A.M.D., and FoD. has been organized, of which main objective is to search and to survey virgin land culturable waste land suitable for the state farm(s).

Criteria for land selection which the team has applied are as follows:

- a. Condition of communication (Accessibility)
- b. Soil Suitability
- c. Availability of Water Resources
- d. Vastness of Plot (not less than 5,000 acres)
- e. Labour Availability

The team has targeted to search total 100,000 acres during the Third Four Year Plan period starting Fiscal Year 1978/79.

6. Components

| <u>Name of Farm</u> | <u>Acreage(ac)</u> | <u>Suitable Crops</u> |
|---------------------|--------------------|---|
| (1) Sabutaung | 5,000 | Vegetables, Groundnuts, Sesamum, pulses, Paddy |
| (2) Tayagone | 3,000 | - do - |
| (3) Thitcho | 3,000 | Sesamum, pulses, Paddy |
| (4) Saipoke | 3,500 | Sugarcane, Jute, Groundnuts, Sesamum, Pulses, Paddy |
| (5) Monyo | 5,000 | Jute, Paddy, Pulses |

7. Major Dimensions

Under study

8. Further Investigation

Since the land selecting team has not made detailed survey for the recommended farm(s) mentioned above, the following survey and study are required:

- (1) Topographic survey
- (2) Soil survey and Present Land Use
- (3) Water Resources Availability
- (4) Proposed Organization for Farm and Staffing Plan
- (5) Proposed Cropping Pattern
- (6) Marketing Facility

Besides these five farms, there are three numbers of farm which are reserved by the land selecting team. Those farms are as follows:

| <u>Name of Farm</u> | <u>Township</u> | <u>Acreage</u> | <u>Crop</u> |
|-------------------------|---------------------------------------|----------------|---|
| 1. Chaungsauk | Nattalin | 2,000 | Sugarcane, Groundnuts, Sesamum, Pulses, Paddy |
| 2. Pyinmagone Townya | Nattalin | 3,000 | Paddy, Jute, Corn, pulses |
| 3. Myitmaka | Nattalin Okpo, minhla, Letpadan | 30,000 | Jute, Paddy, pulses, Corn, Sesamum |

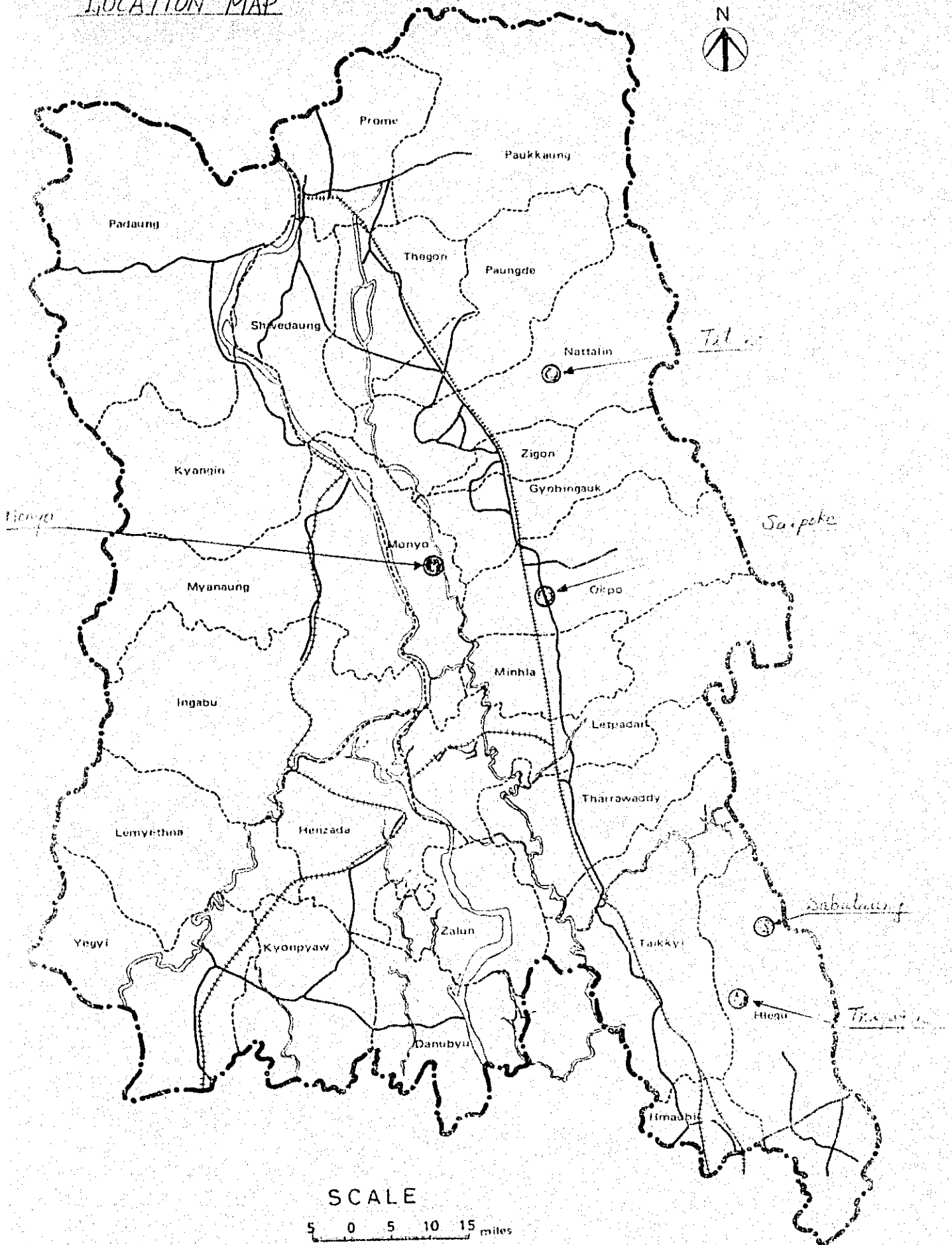
For the above three farms, it is recommendable to make the same survey and study as stated above.

9. Approximated Project Cost

Under study.

STATE FARM PROJECT

LOCATION MAP



SCALE

5 0 5 10 15 miles

10 5 0 5 10 15 20 25 km

1. Name of Project

Feed Mill Plant Project

2. Location

Henzada Livestock Development and Marketing Corporation
(L.D.M.C.) Farm

3. Agency Concerned

L.D.M.C.

4. Objectives

to supply feed for pigs and poultry in LDMC farms and of farmers.

5. Background

Henzada holds central position in pigs and poultry breeding in Irrawaddy Delta zone, hence the proposed site seems to be best-suited.

At present, two feed mill plants are under operation, but these two are small in size and low in capacity. Thus, L.D.M.C. has an intention to build a middle size (feed mill) plant with package machine. Capacity is about 100 ton per day.

6. Components

- (1) grinder and mixer of materials and pelleting plants
- (2) building for plants and warehouses of products
- (3) package machine
- (4) transportation facilities

7. Major Dimensions

Capacity of daily production (100 ton/day)

8. Further Investigation

- (1) to investigate livestock population in vicinity of Henzada
- (2) to draw up an appropriate organization and staff for plant operation
- (3) to estimate labour requirement.

9. Approximate Project Cost

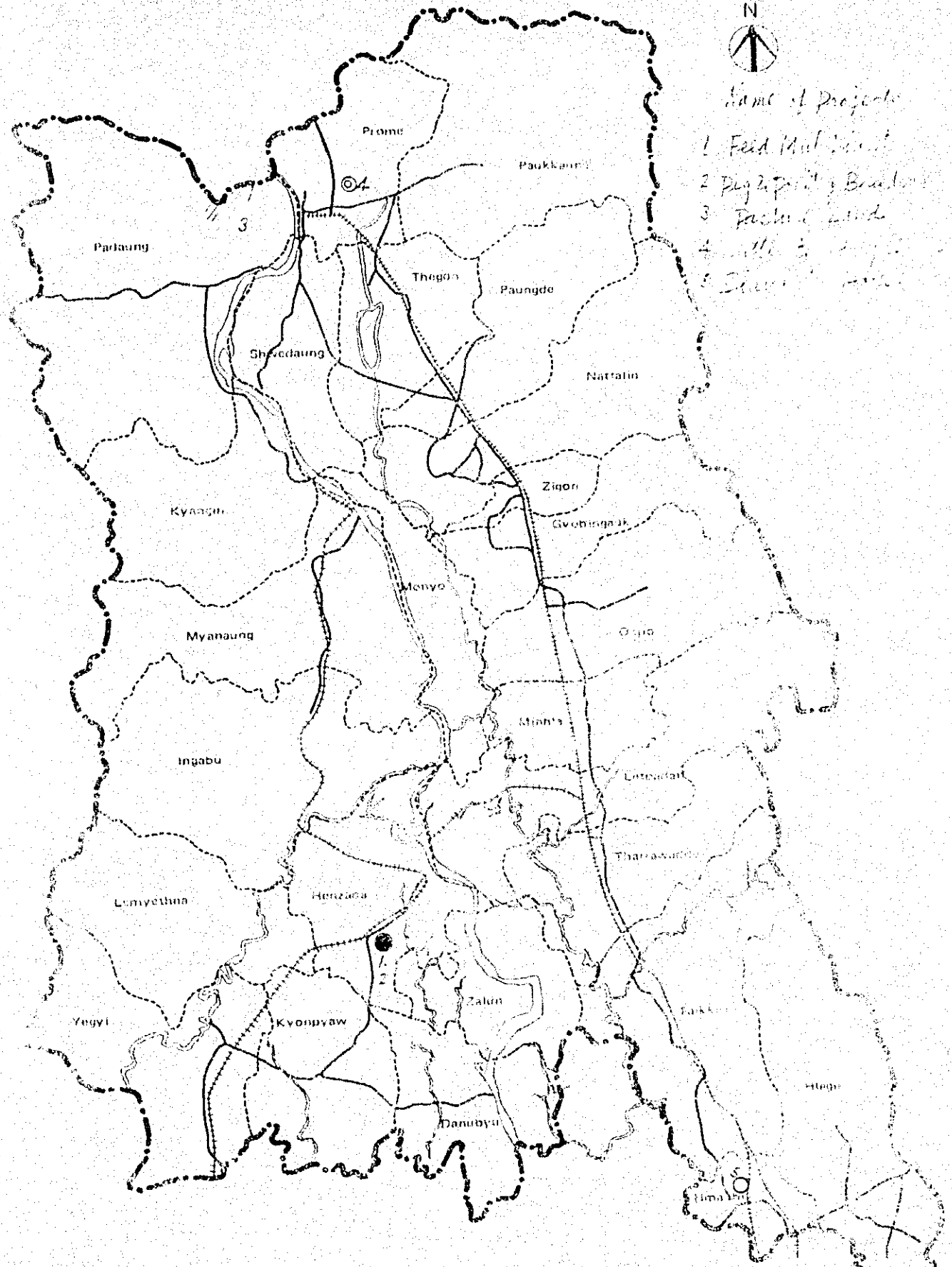
Under study.

LOCATION MAP

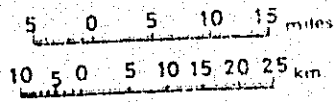


Name of Projects

- 1 Field Mark
- 2 Pig 2 Field Boundary
- 3 Field Mark
- 4 Field Boundary
- 5 Field Mark



SCALE



1. Name of Project

Pasture Land Development Project

2. Location

Padaung Township

3. Agency Concerned

Livestock Development and Marketing Corporation (L.D.M.C.)

4. Objectives

- (1) to develop grazing land for cattle
- (2) seed production for distribution to farmers

5. Background

At present, there is no pasture land for grazing and forage production. Cattle and buffaloes grazes wild grass only during wet season but now wild grass production cannot afford to supply sufficient forage. Particularly during dry season scarcity of the natural forage is a limiting factor to the cattle breeding. All of cattle and buffaloes are consequently forced to be small, thin and late maturity. Pasture land development will give a solution to higher productivities of livestock improving also the late maturity.

6. Components

- (1) establishment of pasture land
- (2) Seed production

7. Major Dimensions

- (1) seed production pasture 250 acres
- (2) grazing pasture 2,000 acres

8. Further Investigation

- (1) selection of suitable grass and legume
- (2) water supply for drinking of cattle
- (3) stock method of forage crops for dry season
- (4) selection of establishment method

9. Approximate Project Cost

Under study.

1. Name of Project

Pigs and Poultry Breeding Center Improvement Project

2. Location

Henzada Livestock Development and Marketing Corporation
(L.D.M.C) Farm (35 acres).

3. Agency Concerned

L.D.M.C.

4. Objective

to produce piglets and chicks for distribution to the farmers.

5. Background

Henzada L.D.M.C. Farm has already pig shed, fence and manager house, buildings constructed: sow house 4, manager house 2, office 1, store 1, labour house 11, pump house 1, but pigs are not introduced yet. This farm plays an important role distributing piglets and chicks to the farmers in the south of Henzada.

6. Components

- (1) Introduction of 50 sows
- (2) Construction of breeding bird and chick house.
- (3) Pigs and poultry equipment for breeding.

7. Major Dimensions

Under study.

8. Further Investigation

- (1) scale of the chick house and breeding house
- (2) varieties of pigs and chicken to be introduced.

9. Approximate Project Cost

Under study.

1. Name of Project

Cattle Breeding Center Project

2. Location

Prone Township

3. Agencies Concerned

- (1) Livestock Development and Marketing Corporation
(L.D.M.C.)
- (2) Veterinary and Animal Husbandry Department (V.A.H.D.)

4. Objectives

- (1) production of frozen semen for artificial insemination
- (2) improvement of cattle

5. Background

Since cattle and buffaloes are used for draughting in Burma, farmers put less importance to female cattle. Thus, the proportion of male and female cattle accounts for 75:25. More than about 90% of male cattle are castrated for draught use. Nevertheless good quality cattle are included in this 90%, shortage of good breeding ox is the biggest problem for reproduction of cattle.

6. Components

- (1) pasture land
- (2) facility of frozen semen production
- (3) introduction of good quality male cattle and female cattle

7. Major Dimensions

- (1) pasture land 60 acres
- (2) male cattle 15, female cattle 15
- (3) cattle shed 2
- (4) hay warehouse 1
- (5) treatment house of semen

8. Further Investigation

training of the persons for frozen semen production.

9. Approximate Project Cost

Under study.

1. Name of Project

Slaughter House Rehabilitation Project

2. Location

Hmawbi Township

3. Agencies Concerned

Livestock Development and Marketing Corporation (L.D.M.C.)

Irrigation Department (I.D.)

Division Council

Township Council

4. Objectives

- (1) treatment and preservation of meat in clean environments
- (2) check of animals with harmful disease for consumer
- (3) utilization of by-products (Hide and skin, Blood, Gelatin)

5. Background

- (1) At present, there are two slaughter houses in Rangoon. These houses treat about 60% of slaughter livestock. But they have not modernized facilities. In 1977, pigs and cattles of 580 heads a day were slaughtered.
- (2) In near future, the Burmese Government expects to export pig and cattle meat as frozen meat. For export purpose, detection of animal diseases and clean treatment of the meat are essential requirements.
- (3) These slaughtered cattle and pigs should be treated separately.

6. Components

- (1) facilities of slaughter
- (2) Freezing plant of meat
- (3) Hide and skin plant nearby slaughter house
- (4) Treatment facilities for the sewages.

7. Major Dimensions

Capacity of slaughter 3,000 - 4,000 livestock a day

8. Further Investigation

- (1) utilization of the by-products
- (2) selection of the establishment place in Hmawbi
- (3) transportation method of cold meat to Rangoon

9. Approximate Project Cost

Under study.

1. Name of Project

Introduction of Grass Carp Spawns

2. Location

Hlegu Township

3. Agency Concerned

Fishery Department

4. Objectives

- (1) as a source of fish supply for the people
- (2) prevention of the flourish aquatic plant

5. Background

- (1) Due to insufficient supply of inland fish the market price of the fish is presently rising, particularly during the rainy season.
- (2) In case of major inland fish species, the artificial hatching has been successfully implemented to meet the demand except the grass carp.
- (3) The grass carp prevents an excessive growth of the flourishing aquatic plants which may cause serious obstruction for the inland fishery.

6. Components

- (1) introduction of grass carp spawns
- (2) establishment of technique for breeding of the spawns and artificial hatching of the grass carp.

7. Major Dimensions

annual number of induced grass carp spawns 10,000 - 100,000

8. Further Investigation

Under study.

9. Approximate Project Cost

Under study.

1. Name of Project

Rural Development Pilot Project

2. Location

Tharrawaddy Township

3. Agencies Concerned

Agriculture Corporation

Agricultural Mechanization Department (AMD)

4. Objectives

to improve the amenity of rural life

5. Background

There is some disparity between urban and rural lives in terms of living conditions. An improvement of the rural community is proposed by means of environmental arrangement in the rural area. Success of this Project may considerably depend on the spiritual aspects such as diligence, self support and cooperation of the local people.

6. Components

- (1) improvement of local road
- (2) water supply systems for domestic use
- (3) introduction of methane gas generating facility
(efficient use of animal output and reduced felling of fuel wood)

7. Major Dimensions

- (1) Local road
 - (i) width
3.0^m (10 feet)
 - (ii) Size of side ditch
depth 0.3^m (one foot)
bottom width 0.3^m (one foot)
 - (iii) Height of the road
0.9^m (3 feet)
- (2) Domestic water supply system
 - (i) submerged pump 1 or 2 sets
 - (ii) Water supply system (pipe line)
 - (iii) water tank 1 or 2 sets
- (3) methane gas generating facility
Under study.

8. Further Investigation

- (1) Local Road
 - (i) Detail maps (Scale 1:500)
- (2) Domestic water supply system
 - (i) Investigation of water quality
 - (ii) Layout of pipe network system
- (3) methane gas generating facility
 - (i) Selection of the most suitable animal manure for gas generation
 - (ii) Estimation of the gas production and delivery area per one set of the facility.

9. Approximate Project Cost

Under study.

1. Name of Project

Hydro power Generation Project

2. Location

See Location Map of Tank Irrigation Project

3. Agencies Concerned

- (1) Electric Power Corporation
- (2) Irrigation Department

4. Objectives

- (1) Hydropower Generation
- (2) Rural Electrification

5. Background

There are two transmission line alignments in the area along the both bank sides of the Irrawaddy river namely 66 KV line in the right bank side and 33 KV line in the left. These are connected with existing gas turbine station and hydro power stations. Less than 10% of the total population in the area is benefited from the electricity service. The electricity supply areas cover only 320 places out of 1,600 places of village tracts including municipalities.

6. Components

This hydro power generation schemes refer to preliminary study on hydro power station incorporating with the provision of dams for irrigation purpose. Dam type power generation is recommended due to less elevation of the dam sites and gentler grade in river profile. Also, the reservoir capacities are rather big comparing with the basin areas.

Therefore, most of the cases, 16 places out of 25 places the power generation is forced to suspend during rainy season, since all the inflow has to be stored in the reservoirs for irrigation use of coming dry season. A total installed capacity in the right bank side of the Irrawaddy river is estimated to be about 49 MW and left side about 4.9 MW. The annual generation comes up to about 35 GWH. Due to less average output, about 3.6 MW, throughout whole year the proposed station can hardly contribute to daily peak supply.

7. Major Dimensions

| <u>Name</u> | <u>Power Station</u> | <u>Transmission Line</u> | |
|-------------|-------------------------|--------------------------|-----------------------|
| | <u>Capacity</u> (MW) | <u>Voltage</u> (KV) | <u>Length</u> (Km) |
| South Nawin | 3.5 | 33 | 47.0 |
| Wegyi | 5.5 | 11 | 16.5 |
| Taungnyo | 1.1x2 | 11 | 20.5 |
| Bawbin | 2.5 | 11 | 17.0 |
| Gamon | 0.8 | 11 | 17.0 |
| Minhla | 8.5 | 33 | 22.5 |
| Kadinbilin | 2.3 | 11 | 18.5 |
| Thegaw | 0.8 | 11 | 11.5 |
| Thonze | 3.7 | 11 | 12.5 |
| Okkan | 2.5 | 11 | 21.5 |
| Zamayi | 14.5 | 33 | 15.0 |
| Ngamoyein | 2.2 | 33 | 22.0 |
| Nyaungaung | 0.9 | 11 | 3.0 |
| Thani | 2.4 | 11 | 27.0 |
| Buyo | 7.0 | 11 | 27.0 |
| Kyaukpau | 0.6x2 | 11 | 26.0 |
| Alonmyauk | 5.0 | 33 | 19.0 |
| North Kun | 1.3 | 11 | 20.0 |
| Phatashin | 1.3 | 11 | 21.5 |
| Manya | 5.7 | 33 | 29.0 |
| Kanyin | 3.3x2 | 33 | 23.0 |
| Mankathu | 5.6 | 33 | 23.0 |
| Nankathu | 5.8 | 33 | 21.0 |
| Gyat | 2.1 | 11 | 27.0 |
| South Kun | 3.6 | 33 | 32.0 |
| Total | 97.5 ===== | | 540.0 ===== |

8. Further Investigation

Under study.

9. Approximate Project Cost

Under study.

1. Name of Project

Arrangement of Maps

2. Agencies Concerned

- (1) Survey Department
- (2) Irrigation Department

3. Objectives

- (1) for every sorts of development plan, the arrangement of maps is materially indispensable
- (2) a planned arrangement of maps associating with the progress of development program is proposed.

4. Background

- (1) Available maps now in being are the topographic maps in scale of (a) one inch one mile (1/63,360), (b) half inch one mile (1/126,700) and (c) quarter inch one mile (1/253,400)
- (2) These are made in 1940's and scale is not sufficient for project use.
- (3) Experiences indicate that sometimes, delay of the map preparation causes bottleneck for smooth implementation of feasibility study.

5. Major Dimensions

- (1) Coverage
 - (a) over the Master Plan Area or
 - (b) over the Plain area
 - (c) detailed coverage will subject to priority of development plan
- (2) Scale and Contour Interval
 - (a) 1:50,000 (Contour interval 50 feet)
 - (b) 1:25,000 (contour interval 25 feet)
 - (c) 1: 5,000 (contour interval 0.5 m)

6. Approximate Project Cost

Under study.

1. Name of Project

Soil survey

2. Agency Concerned

Agriculture Corporation

3. Objectives

- (1) for every sort of agricultural improvement plan, the arrangements of soil maps and land classification maps are essentially required.
- (2) a planned arrangement of soil and land classification maps associated with the progress of development programme is proposed.

4. Background

- (1) soil and land classification maps now available in Land Use Division are in the scale of quarter inch one mile (1:253,400), in the Master Plan area.
- (2) These maps were made in 1950's and precision and scale is not sufficient for future project use.
- (3) The existing soil maps are showing soils only at the great Soil Groups level of soil classification, the more precise classification of soil, such as soil series, is indispensable for future projects.

5. Major Components

- (1) Coverage:
Detailed coverage will be subjected to priority of development projects in future.
- (2) scale:
 - (a) General use 1:50,000
 - (b) Land Consolidation 1:25,000
 - (c) Central Farm 1:5,000
- (3) survey Intensity
 - (a) 1:50,000 - One survey point per about 50 acres
 - (b) 1:25,000 - One survey point per about 24 acres
 - (c) 1:5,000 - One survey point per about 5 acres
- (4) Soil Texture Determination
 - (a) For all survey point : field method
 - (b) For selected survey point:
International method of sand, silt and clay separation. Nomenclature of soil texture according to International Textural Triangle.

(5) Chemical Analysis:

Accustomed common methods for selected survey point.

(6) Soil Classification and Mapping units:

Any system which can fit FAO system.

6. Major Dimensions

(For 2 Soil Survey Teams of 10 surveyors each)

- | | |
|--|----|
| (1) Soil Colour Standard (International) | 20 |
| (2) Soil Auger | 20 |
| (3) Soil Core Sampler | 2 |
| (4) Soil survey kit | 2 |

Each kit contain

- N, P, K Rapid Chemical Test outfit
- Portable electric pH meter
- Portable Oxidation - Reduction meter
- Portable Electric Conductivity meter
- Ferrous iron detecting reagents
- Manganese detecting reagents
- Soil hardness meter
- and their accessories such as scales, pocket lens etc.

- | | |
|---|---|
| (5) Land Cruiser Car | 2 |
| (6) Hand Level | 2 |
| (7) Field Camera | 2 |
| (8) Map Copying Machine (A 3 Size) | 1 |
| (9) Soil Moisture Tensio meter | 2 |
| (10) Soil Pressure Membrane Apparatus | 1 |
| (11) Centrifuge Type Soil Moisture Equivalent Apparatus | 1 |
| (12) D.T.A. Equipment | |

7. Training of Personnel in advanced Countries

At least 6 senior personnel on soil survey, classification, and land use planning should be trained at the advanced level for modern soil survey and soil series classification for 6-12 months.

8. Approximate Project Cost

Under study.

1. Name of Project

Marketing

Other items are under study.

1. Name of Project

Agro-Industry

Other items are under study.

1. Name of Project

Agricultural Mechanization

Other items are under study.

1. Name of Project

Forest Development

Other items are under study.

III. TENTATIVE CONTENTS OF THE FINAL REPORT

This chapter illustrates the tentative contents of the final report to visualize a whole picture of the Master Plan. This contents may give a guide for the final compilation of the survey inclusive of the First Stage and the Second Stage, but some necessary modifications will be made as the case may be.

- I. SUMMARY AND CONCLUSIONS
- II. INTRODUCTION
- III. BACKGROUND
 - III.1 National Economy
 - III.2 Economic Development Plan
 - III.3 Agricultural Policy
 - III.4 Agricultural General Situation
- IV. THE PROJECT AREA
 - IV.1 Physical Description
 - IV.2 Social Conditions
 - IV.3 Agricultural Situation
- V. REGIONAL ECONOMIC ANALYSIS
 - V.1 Sub-Regional Grouping
 - V.2 Future Forecast
 - V.3 Demand and Supply Analysis)
 - V.4 Commodity Flow Analysis
 - V.5 Target setting
- VI. DEVELOPMENT STRATEGY
 - VI.1 Concept of Development
 - VI.2 Necessity of Development
 - VI.3 Methodology of Development
 - VI.4 Systems Analysis
- VII. RESOURCES ALLOCATION PLAN
 - VII.1 Basic Guideline
 - VII.2 Resources Evaluation
 - VII.3 Land Use Plan
 - VII.4 Water Use Plan
 - VII.5 Cropping System

VIII. SECTORIAL DEVELOPMENT PLAN

- VIII.1 Inter-relation among Sectors
- VIII.2 Development Programme
- VIII.3 Irrigation and Reclamation
- VIII.4 Agriculture
- VIII.5 Livestock
- VIII.6 Forestry
- VIII.7 Fishery
- VIII.8 Hydro Power Generation
- VIII.9 Related Sectors
 - Agricultural Mechanization
 - Marketing
 - Agro-Industry

IX. PROJECT IDENTIFICATION

- IX.1 Basic Investigation
- IX.2 Irrigation and Reclamation
- IX.3 Agriculture
- IX.4 Livestock
- IX.5 Forestry
- IX.6 Fishery
- IX.7 Hydro Power Generation
- IX.8 Related Sectors

X. PROJECT EVALUATION

- X.1 Evaluation Criteria
- X.2 Economic Evaluation
- X.3 Priority Setting

XI. FINDINGS AND RECOMMENDATIONS

APPENDIX A.

PERSONNEL CONTACTED DURING THE SURVEY

| <u>NAME</u> | <u>STATUS</u> |
|--------------------|--|
| U KYAW HTAIN | Deputy Minister, Ministry of Agriculture and Forests (MAF) |
| DR. BO LAY | Deputy Minister, MAF |
| U KHIN MAUNG LATT | Director General (DG), Planning and Statistics Department (PSD), MAF |
| U HLA MOE | Director, PSD, MAF |
| U KHIN WIN | Managing Director (MD), Agriculture Corporation (AC), MAF |
| U MAUNG MAUNG KHIN | Deputy General Manager (DGM), AC, MAF |
| U HLA SHWE | DGM, AC, MAF |
| U SAN LIN | Assistant General Manager (AGM), AC, MAF |
| DR. SOE TINT | Deputy Assistant General Manager (DAGM), AC, MAF |
| U HORE KYI | DAGM, AC, MAF |
| U YI AYE | Assistant General Manager (AGM), AC, MAF |
| U MAR | Deputy Assistant General Manager (DAGM), AC, MAF |
| U HLA KHIN MAUNG | Director, Irrigation Department (ID), MAF |
| U YI | Project Director (PD), Lower Burma Paddy Land Development Project - II (Paddy II), ID, MAF |
| U THEIN TUN | Executive Engineer (EE), ID, MAF |
| U SAO AUNG MYINT | EE, Paddy I Project, ID, MAF |
| DAW KYU KYU HLAING | AE, Paddy I Project, ID, MAF |

| <u>NAME</u> | <u>STATUS</u> |
|-----------------------------|---|
| MR. J.S.A. BRICHERI COLOMBI | Hydrologist, Paddy I Project, Sir. William Halcrow Partners |
| U MYINT MAUNG | Director, Agricultural Mechanization Department (AMD), MAF |
| U NYUNT AUNG | Assistant Director, A&D, MAF |
| U FYI SOE | MD, Livestock Development and Marketing Corporation (LDMC), MAF |
| U TIN CHAING | Manager, LDMC, MAF |
| U KUN SAW LWIN | Manager, LDMC, MAF |
| U THAN HTAY | Manager, LDMC, MAF |
| U SWE TUN | Manager, LDMC, MAF |
| U HTAY AUNG | Manager, LDMC, MAF |
| U TINT HLAING | Director General, Fishery Department, MAF |
| U KYAW SAINT | DG, Forestry Department (FoD), MAF |
| U WIN HTIN | Director, FoD MAF |
| U SAW HAN | Director, FoD, MAF |
| U THA TUN SAN | Director, FoD, MAF |
| U CHN | Deputy Director, FoD, MAF |
| U HL THEIN | Assistant Director, FoD, MAF |
| U OKE SOE | Manager, Timber Corporation (TC), MAF |
| U KYAW TINT MAUNG | Director, Working People's Settlement Department (WPSD), MAF |
| U BA PHAN | Deputy Director, WPSD, MAF |

| <u>NAME</u> | <u>STATUS</u> |
|--------------------------|--|
| U KO KO GYI | Director, Veterinary and Animal Husbandry Department (VAHD), MAF |
| U THAUNG WAI | Deputy Director, VAHD, MAF |
| U THEIN MYINT | Director General, Foreign Economic Relations Department (FERD), Ministry of Planning and Finance (MPF) |
| U BA LAY | Deputy Director, FERD, MAF |
| DAW KHINE KHINE | Deputy Director (2), Planning Department (PD), MPF |
| DAW NAN NWE | Deputy Director, PD, MPF |
| U CHIT HLAING | Deputy Director, PD, MPF |
| DAW THAUNG TIN | Deputy Director, PD, MPF |
| DAW SI SI WIN | Assistant Deputy Director, PD, MPF |
| LT.-COL. MAUNG MAUNG AYE | Chief Engineer, Electric Power Corporation (EPC), Ministry of Industry I (MI.I) |
| U KYI KHIN | Deputy Chief Engineer, (DCE), EPC, MI.I |
| MR. CRISTIO R. TAIKHEL | DCE, EPC, MI.I |
| U KYAW THEIN | Superintendent Engineer, EPC, MI.I |
| U MIN KHINE | ASE, EPC, MI.I |
| U WIN KYAW | ASE, EPC, MI.I |
| U KHIN MAUNG TINT | ASE, EPC, MI.I |
| U MAUNG MAUNG LWIN | ASE, EPC, MI.I |

| <u>NAME</u> | <u>STATUS</u> |
|----------------|--|
| U BA THAN | GM, Agriculture and Farm Produce Trade Corporation (AFPTC), Ministry of Trade (MT) |
| U AUNG KYI | GM, AFPTC, MT |
| COL. TON NAUNG | GM, AFPTC, MT |
| U BA THAN | DGM, AFPTC, MT |
| U TUN NYUNT | AGM, AFPTC, MT |
| U SOE YIN | AGM, AFPTC, MT |
| U AUNG MYINT | Project Engineer, AFPTC, MT |
| U KYIN HLAING | Director, Construction Corporation (CC), Ministry of Construction (MC) |
| U MYINT | S.O III, CC, MC |
| U HLA MYINT | S.O III, CC, MC |
| U MYO MIN | Application Manager, University Computer Center (UCC) |
| U AUNG HLAING | System analyst, UCC |
| U SOE THAN | Scientific Programmer, UCC |

APPENDIX B.

LISTS OF COLLECTED DATA

I. Collected

| | |
|--|------------|
| 1. Statistical Data on Crop Production by Township (1976/77 - 1978/79) | SLRD, MAF |
| 2. Total Farm Family by Land Holding by Township | SLRD, MAF |
| 3. Standard of Recommended Crop Cultivation | AC, MAF |
| 4. Organizational Chart of Agricultural Mechanization Department | AMD, MAF |
| 5. Statistical Data on Present Farm Mechanization | AMD, MAF |
| 6. Four Year Plan concerned with AC | AC, MAF |
| 7. Outline of Development Plan on Regional Research Stations and Seed Farms | AC, MAF |
| 8. Characteristics of Recommended HIV and LIV of Paddy | AC, MAF |
| 9. Outline of the Third Four Year Plan | PD, MPF |
| 10. Brief Explanatory Notes on State Farm | MFSD, MAF |
| 11. Cross Section of Myitmaka River (15 sections) | ID, MAF |
| 12. Hourly Water Stage at South Nawin (30 June to 15 July 1979) | ID, MAF |
| 13. Hourly Rainfall at South Nawin (30 June to 15 July 1979) | ID, MAF |
| 14. Cross Section of Hlaing and Pauklang Rivers | ID, MAF |
| 15. Water Level records of Hlaing and Pauklang Rivers | ID, MAF |
| 16. Road Map | CC, EC |
| 17. Monthly Energy Generated at Lawpita Hydro Power Station for the year 1978/79 | EPC, ME.II |
| 18. Tariffs for Districts | EPC, ME.II |
| 19. Total Sales of Units | EPC, ME.II |

II. Under Collection/Request

1. Statistical Data on Demography by Township ICD 1/
2. Paddy Rice Sown Area by Variety AC, SLRD, MAF
3. Paddy Rice Sown Area divided into Transplanting and Broadcasting by Township AC, SLRD, MAF
4. Flood Damage Area of Paddy Rice by Township AC, MAF
5. Standard of Recommended Crop Cultivation AC, MAF
6. Past Performance and Evaluation Results on Whole Township Paddy Production Development Project AC, MAF
7. Land Record by Land Use Category and Township (1977/78) SLRD, MAF
8. Number and Capacity of rice Mill MFFPC, MAF
9. Number and Capacity of Paddy/rice Godown MFFPC, MAF
10. Procurement of Paddy by Township MFFPC, MAF
11. Inventory of Rice Mills concerned with MFFPC MFFPC, MAF
12. Milling Hire Charges MFFPC, MAF
13. Paddy/Rice Flow in Selected Township MFFPC, MAF
14. Free Market Price of Rice in Rangoon FD, MAF
15. Balance of Edible Oil Crop FD, MAF
16. Consumption of Animal products per capita LDMC, MAF
17. Market prices of animal products (1976/79) LDMC, MAF
18. Performances of Livestock and Poultry LDMC, MAF
19. Number of Slaughtered Livestock LDMC, MAF

- | | |
|---|-----------|
| 20. Yield of Rice Straw per acre | LDMC, MAF |
| 21. Numbers of Livestock and Poultry by Township (1978/79) | LDMC, MAF |
| 22. Numbers of Draught Cattle by Township (1978/79) | LDMC, MAF |

Note: 1/ ICD: Immigration and Census Department.

APPENDIX C.

THE MINUTES OF MEETING HELD AT THE MINISTRY OF
AGRICULTURE AND FORESTS ON JULY 27TH 1979 AT 15:00 HOURS

Participants

1. Dr. Bo Lay - Deputy Minister
Ministry of Agriculture
and Forests (MAF)
2. U Kyaw Htain - Deputy Minister (MAF)
3. U Hla Moe - Director
Planning and Statistics
Department (MAF)
4. U Aung Ba - Director General
Irrigation Department (MAF)
5. U Tha Tun Oo - Deputy General Manager
Agriculture Corporation
(AC), MAF
6. Mr. Junichi Abe - Leader
Supervisory Mission
7. Mr. Katsuhide Kondo - Member
Supervisory Mission
8. Mr. Ryounosuke Goto - Member
Supervisory Mission
9. Dr. Susumu Nishigaki - Leader
Master Plan Survey Team
10. Mr. Kohki Mitsunobu - Member
Master Plan Survey Team
11. Mr. Kazumi Ueda - First Secretary
Japanese Embassy, Rangoon.

The meeting was held at the Ministry of Agriculture and Forests attended by the above participants.

The abstracts and main points discussed at this meeting are as follows:-

Abstracts of the Main points at the meeting

- (1) The Japanese side explained the purpose and items of the final survey and studies. The Japanese side also expressed that the Master Plan survey will be concluded putting emphasis on the project identification.
- (2) The Burmese side promised to cooperate with the Survey Mission expecting that the final report will be fruitful for the agricultural development in the project area, and also requested the Japanese side to submit the draft idea of the project identification in its early stage.
- (3) In connection with the above item, the Burmese side requested the Japanese side to commence the separate investigation of the middle basin of the Myitkaka river in detail in parallel with the study of the Master Plan. The investigation may cover the agricultural development as well as the hydro-power generation and other related sectors.
- (4) In addition to the above Master Plan and in line with the agro-policy of the Ministry, the Burmese side also requested to identify a pilot land consolidation project with an area of approximately 3,000 acres. The pilot projects would cover every aspect of modernized farming system comprising strengthening of extension services, improvement of farming practices, introduction of farm machinery and other related components.

- (5) Since the Burmese Government is implementing several projects in the fields of forestry, fishery and animal husbandry based on her national development plan, the Burmese side requested the Survey Mission to study feasibility of such similar projects roughly inside the Master Plan area and to identify the definite projects.
- (6) The Burmese side requested to go into the technical details of the "High Yield Variety Project" in the course of the study which is now being actively implemented by the Burmese Government.

Recorded by

U Hla Aung
Director
Planning & Statistics Dept.,
Ministry of Agriculture and
Forests.

.....
Junichi Abe
Leader of Supervisory
Group
Irrawaddy Basin Agricultural
Integrated Development
Project.

- (5) Since the Burmese Government is implementing several projects in the fields of forestry, fishery and animal husbandry based on her national development plan, the Burmese side requested the Survey Mission to study feasibility of such similar projects roughly inside the Master Plan area and to identify the definite projects.
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Recorded by

U Hla Aung
Director
Planning & Statistics Dept.,
Ministry of Agriculture and
Forests.

.....
Junichi Abe
Leader of Supervisory
Group
Irrawaddy Basin Agricultural
Integrated Development
Project.

