

Basic Design Study Report
on
The Project for The Integrated Jala-Jala Rural Development
in
The Republic of the Philippines

April 1992

JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

In response to a request from the Government of the Philippines, the Government of Japan decided to conduct a basic design study on the Integrated Jala-Jala Rural Development Project and entrusted the study to the Japan International Cooperation Agency (JICA).

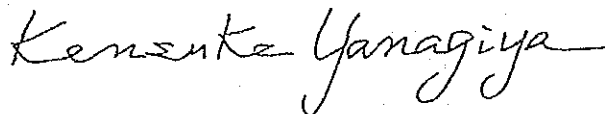
JICA sent to the Philippines a study team headed by Mr Tatsuro Katsuyama, Deputy Director, Design Division, Construction Department, Agricultural Structure Improvement Bureau, Ministry of Agriculture, Forestry and Fisheries from October 17 to November 23, 1991.

The team held discussions with the officials concerned of the Government of the Philippines, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to the Philippines in order to discuss a draft report and the present report was prepared.

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

I wish to express my sincere appreciation to the officials concerned of the Government of the Philippines for their close cooperation extended to the teams.

April 1992











Kensaku Yanagiya

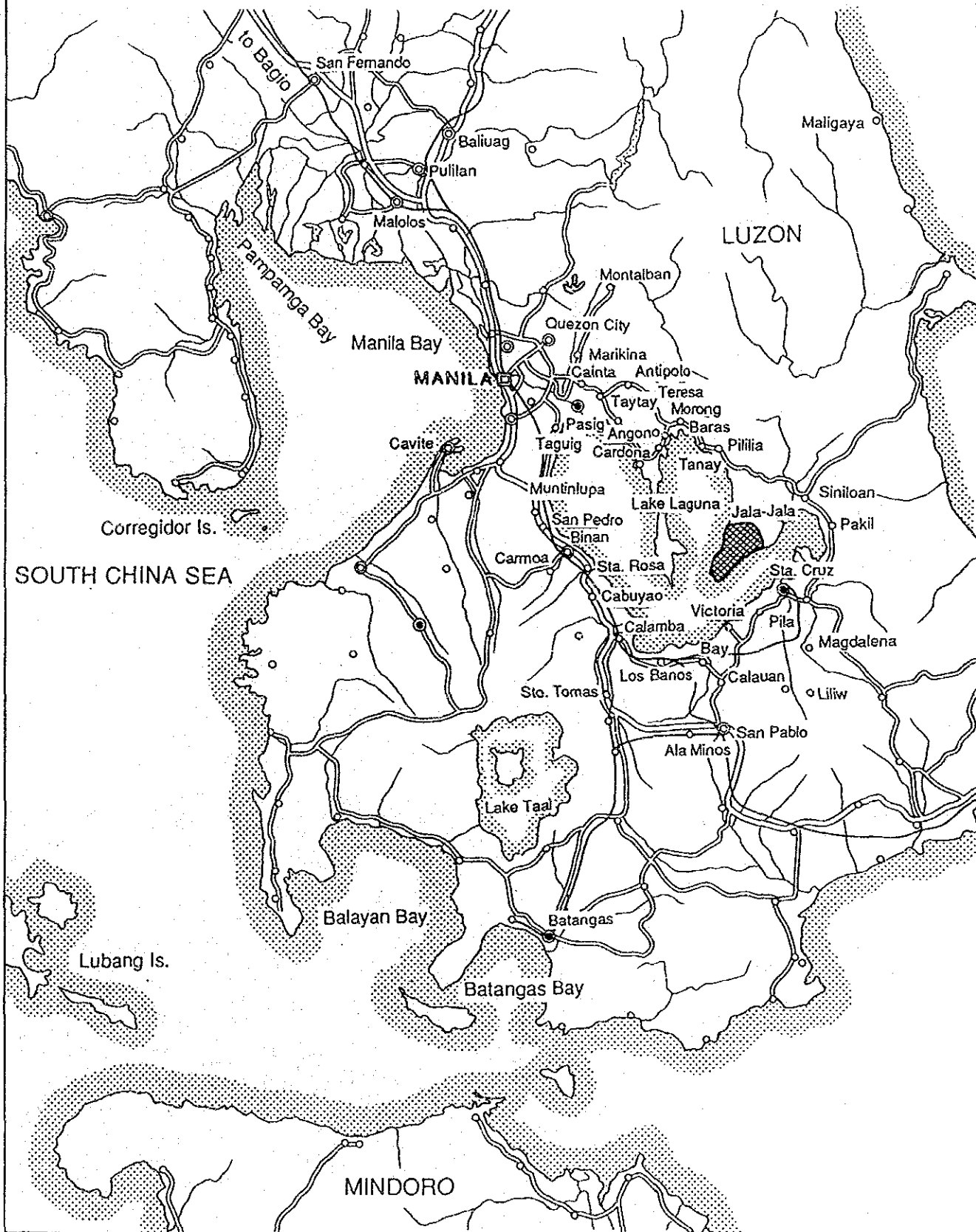
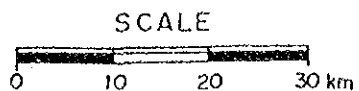
President

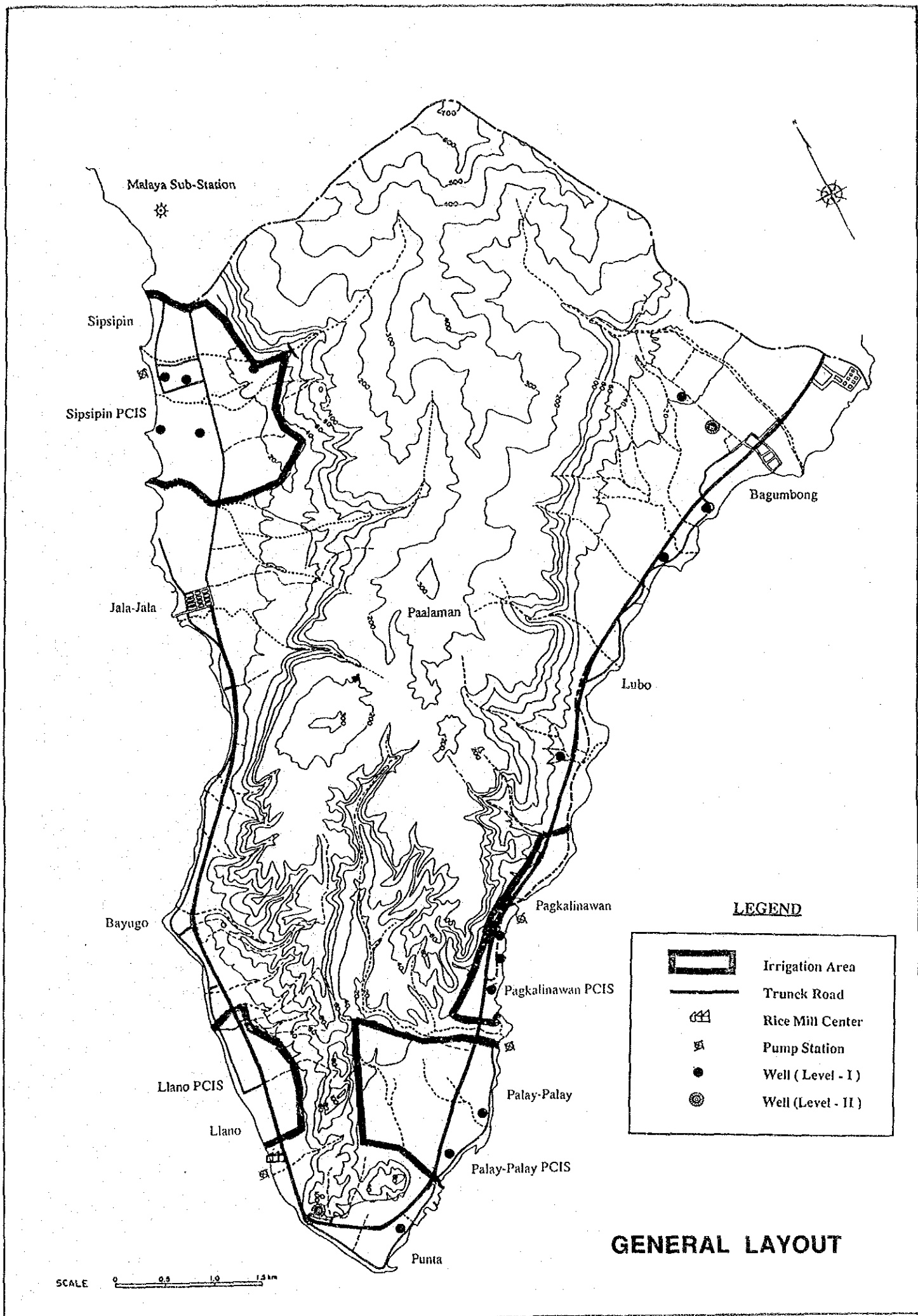
Japan International Cooperation Agency

LEGEND

-  : River
-  : Road
-  : Railway
-  : Capital
-  : Provincial Capital
-  : City
-  : Town
-  : Study Area

LOCATION MAP





GENERAL LAYOUT

SUMMARY

SUMMARY

The Government of the Philippines (GOP) commenced the Comprehensive Agrarian Reform Program (CARP) in 1987 in line with the national development program (1987-1992). To bring up self-reliant farmers with new land-ownership and to promote regional economic development, GOP intends to support the beneficiaries of agrarian reform through implementation of the integrated rural development program conceived in CARP. To efficiently implement CARP, GOP selected Jala-Jala municipality, where land reform was well promoted, as a model area for promotion of CARP. Accordingly, GOP requested the Government of Japan in early 1989 to assist in formulation of the integrated Jala-Jala rural development project.

The Government of Japan accepted this request and conducted a Feasibility Study of the project under its technical cooperation program through the Japan International Cooperation Agency. The Feasibility Study report on the project was prepared and submitted to GOP in September 1990.

The proposed development plan envisaged in the report comprises irrigation and drainage development serving 1,160 ha, social infrastructure development, agricultural development, promotion of animal husbandry, promotion of aquaculture, and establishment of rural development center. The project aims at (1) developing self-reliant farmers beneficiaries of agrarian reform, (2) increasing regional gross domestic product by improving the social economic structure and basis of production, and (3) attaining self-sufficiency in staple food (rice) in Jala-Jala municipality.

The Feasibility Study found the project to be technically sound and economically viable. Encouraged with this as well as owing to the urgent necessity of infrastructure development for support services to agrarian reform beneficiaries in Jala-Jala area, GOP requested the Government of Japan to extend a Grant Aid for the implementation of the high priority components of the project. The request consisted of construction of four (4) irrigation and drainage systems, improvement of a road network, construction of rural water supply facilities, set-up of rice mill center, and construction of a power supply system.

In response to this, the Government of Japan decided to conduct a basic design study on implementation of the project to be executed under Japan's grant aid, and

JICA sent a Basic Design Study Team to the Philippines to conduct field investigations for 38 days from October 17 to November 23, 1991. Using the results of the field investigations and discussions with GOP, the Basic Design Study Team examined the rationale and viability of the project and carried out a basic design study of the project works, including selection of required equipment and materials, estimate of implementation cost, formulation of a basic plan of operation and maintenance of the facilities. This report is based on the results of the basic design study including the result of discussions on a draft report with the officials concerned of GOP.

The result of the basic design study and the general features of the Project formulated for a Japan's grant aid are described below.

In Jala-Jala area, the agrarian reform has been performed and achieved land distribution of about 2,736 ha, and has registered 1,753 new farmers as of October 1991, which correspond to about 95 % achievement of the program. These beneficiary farmers have started farming operation. In reality, however, agricultural production as well as farm economy still remains as low as at subsistence level, since agricultural production basis and socio-economic structure are not sufficient. Under these situations, the agrarian reform beneficiaries are confronted with a difficulty in attaining self-reliance. The proposed Project consists of irrigation and drainage development, road network improvement, rural water supply facilities improvement, and construction of post-harvest processing facilities for paddy. The Project contributes much to bring up self-reliant farmers early for agrarian reform beneficiaries, increase regional domestic production by improving the socio-economic structures and foundations, and increase self-sufficiency of food production within the municipal area. GOP has designated the integrated Jala-Jala rural development Project as a model project of CARP, and put emphasis on the early realization of the Project. Thus the implementation of the Project exactly meets the intent and scope of the national plan and contributes largely to the promotion of the CARP implementation

The general features of the Project are as summarized below.

1) Irrigation and Drainage Development

Irrigation area in the Project area counts for 1,440 ha or 31% of the total farm land, and irrigation service in the dry season is limited to 50 ha due mainly to the lack of irrigation water. The Jala-Jala area is presently short of the paddy

production for self-consumption within the area. To attain self-sufficiency of rice as well as ensure settling down of the farmers in the Project area, the promotion of paddy production is of urgent necessity.

The unit farm size under the present agrarian reform is a little smaller than 1.0 ha/household and the gross farm income of the standard farm is Peso 29,100 per annum or 75% of the average in the Rizal province. That is not sufficient to achieve financial self-reliance of the beneficiary farmers and to raise their living standard. To improve farm economy, increase of farm production and upgrading of farm productivity should be realized through introduction of irrigation farming and promotion of intensification of farming and diversification of crops.

It is judged viable to implement four (4) irrigation systems of 430 ha under the Project, which are requested by GOP, with respect of urgency, comparatively large area and high expected benefits. Since after implementation those areas will function as a model development of pumping irrigation in Jala-Jala area, the irrigation plan should aim at easier operation and maintenance and economical construction of the facilities.

Under the Project, the following irrigation and drainage works will be executed:

Irrigation system		Sipsipin	Llano	Palay-Palay	Pagkalinawan
Irrigation Area	(ha)	170	65	140	55
Pump station	(no)	1	1	1	1
Irrigation canal	(km)	9.93	0.94	9.56	3.94
Drainage canal	(km)	5.25	4.18	1.18	2.83

Four (4) irrigation systems will be improved under the Project, which will allow double cropping of paddy in the irrigation areas to be introduced. The annual rice production in four irrigation areas of the Project is about 1,480 ton at the present time. With the Project implementation, it will increase to 4,200 ton or 2.8 times the present. The unit yield per ha will also increase to 10 ton/ha or 3 times the present yield of 3.5 ton/ha. The Project contributes significantly to the self-sufficiency of the staple food in the Project area. Further, the gross income

of the paddy farm is expected to increase from Peso 29,100 per ha to Peso 62,300 per ha, and the capacity to pay is also expected to increase significantly from Peso 8,200 per ha to Peso 33,900 per ha. This will lead to enhancing living standards of 430 farm households and to the financial self-reliance of the farmers, and thus it will contribute to extension to the other CARP implementing area as a demonstration model project.

2) Road Network Improvement

Most village roads in the Jala-Jala area are hard to pass during the rainy season due to muddy conditions and serious erosion. This restricts farm production and socio-economic activities to a large extent. The link road along the lake shore should be improved to link all villages and to join the national road. The link road will function as a trunk road which will greatly improve the inhabitant economic life and save transportation time for them. The feeder roads should also be improved to connect farm land/villages with the trunk road in line with the trunk road improvement plan.

Since the link road will connect all villages with population of 18,800 and function as a trunk road in the Project area, high priority should be given to improving a link road with respect of urgency and the expected large effect. Improvement of feeder roads should be limited to the existing village roads which will have a large traffic, large benefitted areas, and low maintenance cost.

Under the Project, the following road improvement works will be executed:

Trunk Road	Length 18.1km, 1 no,	Concrete pavement
Feeder Road	Length 14.0km, 21 nos,	Gravel metalling

Through the improvement of the trunk road and feeder roads, the farm-to-market road network will be established. It will contribute to activation of farming and socio-economic activities through ensuring smooth transportation of farm input, output and agricultural supporting services and improvement of daily transportation conditions.

3) Rural Water Supply System Improvement

The domestic water in the Jala-Jala area is taken from a shallow aquifer through shallow tubewells. The villagers confront a low quality of water which does not meet the national standard for drinking water and a decreasing quantity of water in the dry season.

To those areas, rural water supply facilities will be provided to assure safe and stable water supply. First priority is given to the construction of the Level-I system for the rural area where the domestic water is insufficient in quantity and quality, second priority is given for Level-II where the safe and stable water can not be obtained by Level-I system, the houses are densely clustered enough to justify a pipe distribution system and the capacity to pay the operation and maintenance cost of the constructed facilities is confirmed.

Under the Project, the following rural water supply works will be executed:

Level-I	Deep well with manual-operated pump :16 nos.
Level-II	Communal faucet type water supply system with deep well, submersible pump, water tank, distribution pipeline : 2 nos.

Improvement of rural water supply will ensure the safe and stable domestic water supply, and significantly help improve the sanitary condition to 1,300 households or 7,790 beneficiaries and enhance the living conditions in the rural area.

4) Rice Mill Center

Jala-Jala area has 20 rice mills owned by individual farmers or independent entrepreneurs at present. These rice mills are small in capacity and mostly superannuated. Since farmers have no sufficient drying yards, storehouses and transportation means, much losses and degrading of harvested paddy are occurred. Farmers are individually selling paddy to the dealers without sufficient processing.

With the Project implemented, the present milling capacity of 1200 ton is not sufficient for the increased paddy production of 4,200 ton. In this regard, there

is a need to establish a rice mill center under the Project. A complex type of rice mill is desirable to raise the quality of rice, reduce losses in milling, enhance more benefits through systematic marketing and establish an agricultural support system. Facilities and equipment to be provided should be suitable for easy operation by the farmers organization.

Under the Project, the following rice mill center will be executed:

Receiving, Weighing, Classifying Facilities	: Truck, table scales, testing equipment
Drying Facilities	: Drying equipment, sun-drying yard
Milling Facilities	: Rice mill equipment (2.5 t/hr), one pass type mills (0.3 t/hr)
Administrative and control office, warehouse and other facilities	
Warehouse	: Paddy and rice storage, rice husk and bran storage, husk ash storage
Office	: Administrative and control office, office management equipment and vehicle
Other Facilities	: Garage, toilet, water supply facilities

The rice mill center will be effective for enhancement of profitability of paddy farming and improvement of farm economy of about 800 farm households in the Project area. The rice mill center requires continuous and seasonal employment. Thus, it will increase employment opportunities in the rural area and provide a favourable effect on the rural economy. The constructed rice mill center will be transferred to the associations to be organized by the beneficiaries. They will own, operate and maintain the constructed facilities. The actual participation of the farmers associations in operation and management of the rice mill center will accelerate a synchronized linkage of farmers associations and it will contribute much to promotion of the sustainable rural development of the Project area.

5) Power Supply System

It was confirmed that the power supply system to supply the power to irrigation pumps, rural water supply pumps and rice mill center of the Project is to be constructed by GOP. Therefore, the power supply system is excluded from the Project under a grant aid.

The constructed facilities of the Project except roads will be operated, maintained and managed by the beneficiaries. Such operation and maintenance bodies will be assisted in securing loans for their operating capitals, such as irrigation pump operating costs, purchasing cost of paddy in the rice mill center. The loans are expected to be extended from the agrarian reform fund. The technical operation guidance of the facilities is also expected to be rendered from the CARP line agencies of GOP. It was made clear that GOP made appropriate arrangement of the operation and management of the Project facilities and the objective of the Project was well agreed with the scope of a Japan grant aid. From these facts, the implementation of the Project under a Japan's grant aid is judged practical and justifiable.

The Project works will be executed in two stages, taking into account the scale of the construction works, work quantity, time required for completion of the works, and climatic conditions of the Project area. The time required, the contents of the works, and work quantity of each stage are described as follows:

Stage	Construction	Works
Stage-I	12 months	Irrigation and Drainage Facilities - Sipsipin and Llano irrigation systems 235 ha Improvement of Road Network - Trunk road from Jala-Jala to Llano 6.5 km - Feeder roads in villages Sipsipin, Jala-Jala, Bayugo 14.0 km Village Water Supply Facilities - 5 Level-I systems (Sipsipin) Rice Mill Center
Stage-II	12 months	Irrigation and Drainage Facilities - Palay-Palay and Pagkalinawan irrigation systems 195ha Improvement of Road Network - Trunk road from Punta to Bagumbong 11.6 km - Feeder roads in villages Punta, Palay-Palay, Pagkalinawan, Lubo, Bagumbong 9.08 km Village Water Supply System - 11 Level-I systems (Punta, Palay-Palay, Pagkalinawan, Lubo, Bagumbong) - 2 Level-II systems (Punta, Bagumbong)

Through the field investigations and the subsequent analysis and studies in Japan, it was clarified that the Project would significantly contribute to the promotion of CARP in the Jala-Jala area as well as in the Philippines, including the numerous agricultural and socio-economic development. Further, it was confirmed that GOP intended strongly the implementation of the Project and made appropriate arrangement

of the Project implementation, and operation and management of the Project facilities. Under these situations, the early implementation of the Project is eagerly desired.

To ensure the smooth implementation of the Project and the proper operation and maintenance of the Project facilities, the following recommendations are made to GOP:

- 1) Securing the land necessary for the Project facilities and temporary works, and for borrowing and disposing soils before the start of the construction;
- 2) Completion of construction of the power supply systems to be executed by the Philippines side within one (1) year after signing of the Exchange of Note between the Government of Japan and the Government of the Philippines;
- 3) Arrangement of budget necessary for the implementation of the Project and the operation and maintenance of the constructed project facilities, and guidance and training of the staff of operation and maintenance organizations;
- 4) Guidance on regular maintenance and repair of the constructed project facilities and installed plant and equipment after the completion of the Project;
- 5) Government subsidy to cover the operation and maintenance cost of the constructed project facilities for the first operation year; and
- 6) Reinforcement of agricultural supporting services such as agriculture extension, training of farmers, supply of farming equipment and materials.

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CHAPTER 1
INTRODUCTION

CHAPTER 1 INTRODUCTION

The Government of the Philippines (GOP) commenced the Comprehensive Agrarian Reform Program (CARP) in 1987 in line with the national development program (1987-1992). To bring up self-reliant farmers with new land-ownership and to promote regional economic development, GOP intends to support the beneficiaries of agrarian reform through implementation of the integrated rural development program conceived in CAPR.

To efficiently implement CARP, selected Jala-Jala municipality as a model area for promotion of CARP and for implementation of the integrated rural development. Accordingly, GOP requested the Government of Japan to assist in implementing the subject rural development in early 1989. The Government of Japan accepted this request under its technical cooperation program and the Japan International Cooperation Agency (JICA) despatched a Feasibility Study team and conducted the investigation and study. The Feasibility Study report on the integrated Jala-Jala rural development project was prepared, and submitted it to the Government of the Philippines in September 1990. The proposed development plan envisaged in the report comprises irrigation and drainage development serving 1,160 ha, social infrastructure development, agricultural development, promotion of animal husbandry, promotion of aquaculture and establishment of rural development center, aiming at the following:

- 1) Early development of self-reliant farmers,
- 2) Increased regional gross domestic product by improving the socio-economic structure and foundation, and
- 3) Attainment of self-sufficiency in staple food (rice) within the municipal area.

The Feasibility Study found the project to be technically sound and economically viable. Encouraged with this and intending to set up a model project of CARP implementation, GOP requested the Government of Japan to extend a grant aid for the implementation of the Project. The request consisted of construction of four irrigation and drainage systems, improvement of a road network, construction of rural water supply facilities, set-up of rice mill center and construction of a power supply system.

In response to this request, the Government of Japan decided to conduct a basic design study on the Project, including studying and assessing the scope of works and their significance, effect and priority as a project to be executed under Japan's grant aid, and JICA sent a Basic Design Study Team to the Philippines for this purpose for 38 days from October 17 to November 23, 1991. The Team was headed by Mr. Tatsuro Katsuyama, Deputy Director, Design Division, Construction Department, Bureau of Agricultural Infrastructure Improvement, Ministry of Agriculture, Forestry and Fisheries.

The Team investigated and surveyed the Project area to clarify the present agriculture and rural infrastructure conditions, and to confirm the background of the Project. The members of the Basic Design Team, itinerary for the Team and list of personnel contacted are given in Appendix 1, 2 and 3, respectively. The Team held discussions with the concerned officials of GOP on the scope of the Project. The agreed minutes of these discussions are given in Appendix 4.

Using the results of the field investigations and discussions, the Team examined the rationale and viability of the Project and carried out a basic design study of the Project works, including selection of required equipment and materials, estimate of the implementation cost, formulation of a basic plan for operation and maintenance of the Project. This report presents the comprehensive results of this basic design study.

CHAPTER 2
BACKGROUND OF THE PROJECT

CHAPTER 2 BACKGROUND OF THE PROJECT

2.1 Background of the Project

2.1.1 Current Situation of the National Economy

The Republic of the Philippines consists of numerous islands with a total geographical area of approximately 299,410 km². The total population was estimated to be about 60.7 million in 1990 with a population density of 202 persons/km². The population growth rate has been 2.4% per annum during the past decade. The population, over 15 years of age, participating in the labour force is about 38 million (or about 62.6% of the total population). Real employment is, however, limited to only 37.1% of the total population or 59.3% of the total labor force. The majority remaining are unemployed and/or under-employed. Accordingly, creation of labour employment opportunities is essential and urgently needed in the current socio-economic development in the Philippines. The share of agricultural labor force in total labor force declined marginally from 50.0% in 1986 to 45.2% in 1990.

The main source of revenue was taxes amounting to 88%, which tended to increase. The tax revenue was characterized with a low proportion of the taxes on income and profits but a high proportion of indirect taxes such as customs, sales taxes, etc. corresponding to more than 60%. The total debt service still accounted for a large proportion of the total Government expenditures, although it dropped from 35.3% in 1986 to 29.3% in 1991.

The whole sale price index and consumer price index rose 7.8% and 60% annually for four years from 1986 to 1989 but those for the year of 1990 showed rapid annual increase of 19.5% and 16.6% respectively. The increase in the prices in the recent year is remarkable.

Economic development of the Philippines was depressed to a serious extent during the early 1980s because of less buoyant export markets. However, economic growth has accelerated since 1986 with the main impetus coming from a strong recovery in personal consumption as the result of tax reforms, higher wages and the spending program of the Government. Despite the efforts of the Government, the economic activities tend to be slowing down since 1990. The GNP attained in 1990

amounted to Peso 1,132,400 million at the current market prices or Peso 128,400 per capita approximately. The share of the agricultural sector in the GDP came down from 24.0% in 1986 to 23.2% in 1990 with marginal variation.

2.1.2 National Development Plan

GO is executing a medium term development plan for national economic development covering the specific period of 1987 to 1992 with the following development targets:

- 1) To alleviate rural poverty,
- 2) To reinforce existing employment and to create further employment opportunities through development of the rural economy,
- 3) To realize social justice as well as to regulate fairness, and
- 4) To achieve sustainable economic growth.

Despite the efforts of implementing the plan, the performance in 1989 reflected a slowing down of economic activities. There was widening in the trade and budgetary deficits, an acceleration in the inflation rate and interest rates and constraints due to droughts and power shortage. In 1990, due to natural disasters and the Middle East crisis, economic growth was constrained. As they were likely to undermine growth prospects in the remaining period, the Government of the Philippines has up-dated the national plan to address those obstacles and ensure sustained recovery and economic growth.

The development strategies continue to address the same concerns as the original plan: 1) poverty alleviation, 2) economic development, 3) equitable distribution of opportunities, income and wealth, including the means of production and 4) productivity and growth. The centerpiece of the development strategy is one that is employment-oriented, rural-based, and one which maximizes the complementarity between agriculture and industry. Rural development and attainment of equity distribution is pursued through the provision of infrastructures, the enhancement of social development, accelerated implementation of agrarian reform, and more committed efforts at decentralization.

2.1.3 Regional Development Plan

In line with the updated medium term national development plan, the medium term regional development plan of Region-IV was updated in 1990. For the remaining plan period the Region IV will continue to pursue the following socio-economic goals: 1) alleviation of poverty, 2) generation of more productive employment, 3) attainment of sustainable economic growth and provision of a more just and equitable sharing of the benefits of development.

These goals are expected to be realized in three areas: economic sector, social sector, and infrastructure sector. The economic sector covering agriculture and agrarian reform; environment and natural resources; industry, trade and tourism aims at sustainable increase in output. The social sector for education, health, nutrition and family planning housing, social welfare and community development, manpower development, labor and employment pursues the equity distribution of the economic development. The infrastructure sector encompassing transportation; water resources; communication; power generation and rural electrification; social related infrastructure aims to adjust the physical configuration of the region.

The development objectives and strategies of the sectors related to the components of the Project are summarized below:

(1) Agriculture and agrarian reform

The development efforts of the agriculture and agrarian reform sector will primarily address the problem of poverty alleviation in the rural areas through increased/sustained levels of agricultural production and improved livelihood from agro-industrial enterprises. To attain the objectives, the following strategies are pursued:

- 1) The profitability of rice and corn farming in the Region will be enhanced through better timing in the extension of credit, availability of fertilizers, better irrigation service and post harvest/marketing assistance through decentralized coordination of these activities under the Provincial Government.

- 2) Competitiveness of the region in other crops, such as coffee, fruits, vegetables, cashews, and fibers, will be promoted through research and commercial application of technologies related to agro-processing, adequate rural infrastructures and marketing linkages.
- 3) The implementation of CARP will be accelerated with priority to Mindoro and Palawan farmers where the number of tenant farmers is highest and to complement efforts to improve rice and corn productivity in these provinces will be given priority.
- 4) Backyard livestock production will be promoted to offset the decline in commercial livestock production due to diminishing pasture area in the Region.
- 5) Direct assistance will be provided to improve the livelihood of small fishermen in coastal areas and Laguna lake by increasing production to the level of maximum suitable yield with adequate protection of the coastal environment.
- 6) Active farmer participation through cooperatives and other grass root organizations through NGOs will be the primary vehicle for effectively implementing agricultural development programs.

(2) Water resources

Water Supply :

The objective of the sector is to provide reliable and safe water supply that is easily accessible to the majority of the households within the shortest time available and in a cost-effective manner to meet the water supply needs for the existing back log and population growth. In the implementation of the water supply and sanitation plan, the following strategies are followed:

- 1) Three levels of water services shall be provided to urban and rural communities depending upon technical and financial consideration, the need for the water districts and rural waterworks and sanitation associations, and their willingness and ability to share in the cost and responsibility of construction and maintaining the water system.

- 2) The distribution and delivery of services shall be done in an equitable manner.
- 3) Water districts, and/or rural water services association shall be organized before projects will be implemented.

Irrigation:

The irrigation plan aims to support the objectives of the agriculture sector to attain self-sufficiency in rice, extend irrigation to crops other than rice raise farmers income, speed up rural development and achieve agro-modernization through organization of farmers irrigation association. Stress shall be laid on developing more communal irrigation system in the resource sub-region. In the areas near the urban growth region, where intensive cultivation of high values crops will be utilized for irrigation purpose, groundwater and wells will be reserved for domestic and industrial use.

Flood Control and Drainage:

The main objective of this sub-sector is to prevent and reduce crop losses, urban losses, and damage on national infrastructure projects caused by floods.

(3) Road improvement

Road improvement will contribute much to promotion of the national development plan. The following road improvement works are promoted as the supporting project for the social development, self-sufficiency in food stuff, and the increasing in living standards in the economically depressed areas.

- 1) Construction of farm-to-market roads
- 2) Repair and improvement of the existing village roads
- 3) Improvement of the rural roads to be executed as supporting services of CARP

2.2 Outline of the Request

In line with the current medium term national development program, GOP has been implementing CARP since 1987. The essential objectives of CARP are:

- 1) To promote social justice
- 2) To move the nation toward sound rural development and industrialization, and
- 3) To establish owner cultivationship of economic farm size

The centerpiece of the development strategy for sustainable economic growth is an employment-oriented, rural-based development strategy. The creation of employment opportunity and the complementarity between the rural and urban areas is pursued in the implementation of the medium term development program.

Under this situation, the integrated Jala-Jala rural development project is formulated with the objective of demonstrating of the development and development effect to the CARP implementing areas.

GOP requested the Government of Japan to assist it in conducting a Feasibility Study on the subject of rural development in early 1989. In response to this request, the Government of Japan conducted a feasibility investigation and study on the Integrated Jala-Jala Rural Development Project from September 25, 1989 to August 1990 under the technical cooperation program of the Government of Japan through Japan International Cooperation Agency. With the study, the Integrated Jala-Jala Rural Development Project was formulated with the essential objectives of increase of agricultural production and improvement of rural livelihood by means of agricultural and rural infrastructures and the early implementation of the Project was recommended.

Encouraged with the favorable results of the Feasibility Study and owing to the urgent necessity to provide supporting facilities to the agrarian reform beneficiaries in the Jala-Jala area, GOP requested the Government of Japan to extend a grant aid for the implementation of the essential development components of the project. The request covered 1) construction of rice mill center, 2) construction/improvement of irrigation systems, 3) improvement of road network, 4) construction of rural water supply systems, and 5) construction of power supply system through which the electric power for irrigation pumps, rural water supply system and rice mill center was supplied. The details are given below.

- | | |
|---------------------|------------------|
| 1) Rice mill center | |
| Rice mill equipment | : 2.5 ton/hr |
| Warehouse | : 500 ton class |
| Dryer | : 4 ton/hr class |
| Weighing equipment | : 1 ton class |

2) Irrigation and drainage development		
a) Sipsipin communal irrigation system	:	170 ha
Pumping station	:	1 station
Intake	:	1 location
Canal systems	:	lump sum
b) Llano communal irrigation system	:	65 ha
Pump station	:	1 station
canal system	:	lump sum
c) Palay-Palay communal irrigation system	:	140 ha
Impound	:	1 location
Pump station	:	1 station
Canal system	:	lump sum
d) Pagkalinawan communal irrigation system	:	55 ha
Pump station	:	1 station
Canal system	:	lump sum
3) Road network		
Trunk road	:	18 km
Feeder roads	:	41 km
4) Rural Water supply system		
Level-I	:	18 systems
Level-II	:	4 systems
5) Power supply system for the project use		
Power transmission line	:	13 km
Power distribution line	:	3 km

Of these, the power supply system is not suited for the Japan's grant aid project. The Basic Design Study Team had discussions with the concerned officials of DAR, and it was mutually confirmed that GOP was responsible for execution of the power supply system and the construction of the power supply system would be completed within due time before completion of the Project works.

2.3 Outline of the Project Area

2.3.1 Location and Socio-economic Conditions

(1) Location

The Project area is located about 75 km southeast of Metro-Manila. The area lies on the Jala-Jala peninsula which juts out into Laguna lake. The geographical extent of the Project area is approximately 49.3 km² (or 4,930 ha) out of which the farm land is 1,440 ha or 30% of the total area. Access to Jala-Jala town, the capital of the Jala-Jala municipality, is facilitated by a national road route 301, which leads to Metro Manila. To village Bagumbong, the branch from a national road route 349 is available up to adjacent village Matikiw of Laguna province.

(2) Administration and population

The Project area is administered by Jala-Jala municipality in Rizal province in Region-IV. Some of the national government agencies attached to the municipal government include the offices of the Departments of Agriculture, Agrarian Reform, Local Government, Health, Trade and Industry, and Social Welfare and Development.

The population in the Project area was 18,750 in 1989. The annual population growth during the latest decade has been 2.5% on the average. The population density is estimated to be about 380 persons per square-kilometer. The population by sex is 9,640 male and 9,110 female. The labour force which is estimated by the ages of between 15 and 65 years old is about 11,440 persons (or 60% of the total population). The family size is estimated at about 6 persons per household on average.

There are about 3,156 households of which farm households are estimated to be about 2,270 (or about 72%). Out of the total farm households, the beneficiaries of agrarian reform are about 1,753 (or 77 % of the total farm households). The remaining farm households are landless farmers. The households other than agriculture are recognized to be owners of fishpens and/or fishcages for aquaculture, the employees of the owner fish cultivators and other businesses.

(3) Economic sectoral overview

The economy of the Project area is predominantly dependent on agricultural production. Other economic activities are small scale off-farm businesses, and transportation services.

The present gross value of the regional production (RGDP) of the Project area is estimated to be about Peso 66,980,700/annum. Of this value, 48.3% comes from agricultural production. RGDP by the sector is as shown below:

Regional Gross Domestic Product (Peso 1,000)

Agricultural Production	31,373
- Crop Production	19,451
- Livestock	8,470
- Fishery	3,451
Off-Farm business	18,400
Services	11,400
Others	5,807
Total	66,980

(4) Farm economy

By broad classification, five types of farms are recognized as the production units of farm economy according to the results obtained from the farm economic survey in 1990 - namely, Paddy Cultivator (43%), Upland Crop Cultivator (16%), Paddy cum Upland Crop cultivator (5%), Orchard Plantation cultivator (9%) and others (27%).

Farm size varies from 3 ha as the maximum holding as specified in the agrarian reform law to 0.3 ha as the smallest holding. The average holding size is a little smaller than 1 ha. About 77% of the farms are amortizing owners and remaining 30% are still landless farmers. These landless farmers are, at present, seasonally employed by the new owner farmers, while in off-farm season, they shall get other job outside of the Project area.

Annual farm income of a paddy cultivating farm household is estimated to be Peso 11,050 based on the farm economic survey conducted in the Feasibility Study in 1990. On the other hand, a living expenditure of Peso 18,700 has been estimated as the mean average for standard size of family consisting of 6 persons. The annual income from both crop production and side business is not sufficient to meet the above living expenditure. In fact, almost all of the farmers are being engaged in the off-farm works especially in such advanced area as Antipolo, Tay-Tay, and Metro Manila, and supplement the income to a significant extent. The major sources of sub-income are livestock grazing and free fishing in the lake.

(5) Implementation of the Comprehensive Agrarian Reform Program (CARP)

The Provincial Agrarian Reform Office (PARO) is based at Teresa, Rizal. It has four functional offices - namely, administrative and finance, operations, legal and

planning, and extends its services to agrarian reform beneficiaries through the municipal agrarian reform offices (MARO) for every municipality. The MARO of Jala-Jala has six staff, one municipal agrarian reform officer, three agrarian reform technologists, one statistician and one clerk. The main tasks of agrarian reform in the Project area are the improvement of tenure of agrarian reform beneficiaries. This covers activities such as surveys of present land occupants and the area occupied, documentation processing, and titling of lands (emancipation patents) being redistributed to beneficiaries.

As of October 1991, the agrarian reform has been performed and achieved land distribution of about 2,736 ha, and has registered 1,753 new farmers. This corresponds to about 95 % achievement of the program.

Agrarian Reform Program and Its Achievement

Description	Land Registration Units	Land Allocation	Farmer Beneficiaries
	(lot)	(ha)	(household)
Plan	2,737	2,859	1,844
Achievement	2,624	2,736	1,753

2.3.2 Physical Conditions

(1) Topography

The Project area is a narrow peninsula with both low-lying land and steeply dissected mountains and rolling hills originating from the volcanic chains formed in Plio-Pleistocene. The area has three physiographical land units. Steeply Sloped Mountains, Lower Terraces, and Alluvial Fans. These land units have the following essential features:

Physiographical Features of the Project area

Descriptions	Steeply Sloped Mountains	Lower Terrace	Alluvial Fans
Physical Extent	2,680 ha	1,340 ha	910 ha
Elevation	100 m<	100 m>	60 m>
Slope	8%<	3 - 8%	3%>
Lithology	Basaltic Andesites	Volcanic Tuff	Alluvium

(2) Climate

According to Corona's meteorological classification, the Project area is specified as Type I which is characterized by two distinct seasons, dry and rainy. In general, the dry season is from December to April and the rainy season is from May to November. The monthly mean temperature ranges from 24.8°C to 28.6°C and has little seasonal variation. Monthly mean maximum and minimum temperatures are 32.9°C and 21.5°C, respectively. The annual average evaporation is 1,637 mm. The monthly average evaporation reaches its maximum in April, about 6.1 mm/day, while its minimum in December, 3.3 mm/day. The annual relative humidity is approximately 79% with very little seasonal variation.

The annual rainfall varies widely from 1,320 mm to 3,100 mm (Tables-1, 2). Almost 90% of the annual rainfall is precipitated during the rainy season. Wide variation of annual rainfall is, in most cases, dependent on occurrence of typhoons. Irregular precipitation is one of the low crop production in this area. Frequent occurrence and attack of typhoon are also the physical constraints on economic activities in this area.

(3) Geology and geo-hydrology

The geological constitution of the Project area is of volcanic flow (lava) and pyroclastic rocks (volcanic tuff) in the Plio-Pleistocene. The volcanic flow is composed of basaltic andesites and mainly lies in the steeply dissected and/or rolled mountain area. Pyroclastic rocks are mostly found on the lower terraces particularly in the south and southwestern parts of the Project area. The recent alluvial fans developed on the lakeshore plain of Bagumbong and Sipsipin-Jala-Jala areas are alluvium and/or colluvium.

The potential aquifer in the Project area lies in sand and/or gravel layers which are interbedded in the tuff or tuffaceous rocks less than 100 m deep. The tuff and tuffaceous rocks deeper than 100 m are highly consolidated in most layers. Furthermore, sand/gravel layers interbedded in the tuff are all very thin. Thus, the groundwater potential of these layer is considered to be limited to small. The anticipated yield of ground water is 3 to 5 litres/sec. These potential yields would possibly cover a requirement for domestic water use, but would be quite marginal for irrigation purposes and/or the industrial development.

The design high and low water levels are estimated at El. +2.84 m and El. -0.40 m respectively, as shown in Table-3.

(4) Soils

The soils in the Project area can be classified into two main groups - namely, the residual soils from weathered volcanic rocks and alluvial soils from the recent alluvium and/or colluvium. The soil classification by USDA standard is as follows:

1) Typic Fluvaquents: 80 ha

These are the typical soils of the alluvial fans. They are still young in soil formation, but definitely defined as quite capable soils for intensive agricultural development.

2) Typic Hydraquents: 10 ha

They are also found in recent alluvial deposits and have no unique soil features. These soils are found mainly on the lowlying area along the lake-shore, and thus, the soils might form "gluey" under seasonal standing or perched water in the shallow profile. To develop and/or intensively use these soils, drainage improvement is essential and crucial.

3) Lithic Troorthents: 120 ha

They are mainly lying on the upper part of the alluvial fans. These soils have almost the same physical and chemical features as the Typic Fluvaquents. Generally, capability for agricultural development of these soils is low due to shallow effective soil depth.

4) Typic, Lithic Entropepts and Lithic Troorthents: 2,680 ha

These schools are the representative soils in the mountainous area.. These soils originate from weathered volcanic rocks. Since the land had been steeply dissected, and the vegetation has recently degenerated, these soils have for the most part been seriously eroded. Thus, these soils have always shallow effective soil depth. Generally, these soils have no suitability for intensive development investment. Land and soil conservation is the most essential need in this soil area.