

*The Study on Comprehensive Disaster Prevention
around Mayon Volcano*

SUPPORTING REPORT (2)

(Part II: Feasibility Study)

XXII : Resettlement Site Development

SUPPORTING REPORT (2) - XXII
RESETTLEMENT SITE DEVELOPMENT

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SUPPORTING REPORT (2) - XXII
RESETTLEMENT SITE DEVELOPMENT

1. RESETTLEMENT PROJECT

1.1 Existing Resettlement Site Development

There are two types of relocation/resettlement issues to be considered in this Study. One is related to the resettlement of the people living within the 6km radius from the crater of Mayon Volcano (or PDZ: Permanent Danger Zone) and mud & debris flow danger zones as well. The other concerns the “relocation” to be caused by implementation of the disaster prevention projects including acquisition of the right-of-the way and sand pocket areas.

In connection with the two priority structural projects selected in the Master Plan : Yawa River System Sabo Project and Legazpi City Urban Drainage Project, the issues of relocation and resettlement site development in the Feasibility Study pertain to Legazpi City (Banquerohan) and Daraga Municipality (Anislag). In principle, resettlement of the people is to be done within the respective administrative divisions (city and municipalities concerned) as confirmed in the key concepts for resettlement planning of Master Plan. As to their respective locations in the Study Area, refer to Figures XXII 1.1 and XXII 1.2.

Regarding the number of dwellers within the Permanent Danger Zone (PDZ), it was estimated at 55 households (291 persons) in Legazpi City, as of March 1999. This figure is varying, especially after Mayon explosions in June and September 1999. The latest data (as of October 1999) show that the PDZs in both Legazpi City and Daraga Municipality are already “no-man land”. However, this does not exclude day-time farming of the people in PDZ, even though they do not stay overnight there.

Most of the evacuees or candidate resettlers are now lodging temporarily in the elementary schools or relative’s houses in Legazpi City and Budiao barangay (Daraga Municipality), respectively. The following table indicates the number of target beneficiaries of the resettlement site development projects to be accommodated in Banquerohan (Legazpi City) and Anislag (Daraga Municipality). Following the social development plans of each LGU concerned, the resettlement site development projects are designed to accommodate not only the Mayon victims but also “social poor”.

**Target Beneficiaries of the Resettlement Site Development Projects and
Estimated Number of Relocatees**

Items	Estimated No. of Households	Estimated Population
1. Total Number of the Target Resettlement Beneficiaries	1,695	8,984
- Banquerohan Resettlement Site (Phase I)	600	3,180
- Banquerohan Resettlement Site (Plan/Phase II)	460	2,438
- Anislag Resettlement Site (Plan)	635	3,366
2. Number of the Estimated Relocatees due to Implementation of the Sabo and Drainage Projects *	(65)	(344)
- Pawa-Burabod Mabinit Sand Pocket (To Banquerohan)	(44)	(233)
- Anoling-Budiao Sand Pocket (To Anislag)	(21)	(111)
3. Legazpi City Urban Drainage Project *	(303)	(1,606)
4. Total Number of Relocatees *	368	1,950

Note: * The numbers of households and people to be relocated due to implementation of the sabo and drainage projects are included in the above total no. (No.1) of the target resettlement beneficiaries.

1.2 Present Condition and Problems

The profiles of the Banquerohan Resettlement Site and Anislag Resettlement Site Plan are summarized below.

**Profiles of the Banquerohan Resettlement Site and Anislag Resettlement Plan
(as of November 1999)**

Name	Banquerohan (Phase I)	Anislag (Plan)
1. Location	Banquerohan, Legazpi City	Anislag, Daraga Municipality
2. Distance from former residence (km)	20 km	8 km
3. Land area (ha)	Phase I: 18.93ha (Phase II: 27.07ha)	21.35ha (Phase I: 12.57ha, Phase II: 8.78ha)
4. No. of houses	Phase I: 600 (Phase II: 460)	Planning for 635
5. Home lot size (m ²)	Phase I: 90-298m ²	100m ² (10m x 10 m)
6. House size (m ²)	Phase I: 20m ² (4m x 5m)	10.5m ² (3.0m x 3.5 m)
7. Establishment (year)	Phase I: 1994 (Phase II: Plan)	Construction started in 1998 for 80 units
8. Beneficiaries	Victims of Mayon eruption	Victims of Mayon eruption & typhoons
9. Actual no. of houses awarded	504 (No. of living households: 174)	Planning stage

Note: For more detailed information, refer to Table XXII 1.1.

Source: Data from the City and Municipal authorities concerned and JICA

(1) Banquerohan Resettlement Site (Phase I)

The profile of Banquerohan Resettlement Site (Phase I) is shown in Table XXII 1.1. From that given table and from the development plans furnished by the National Housing Authority (NHA) Region V, the site development conforms to the standards of the NHA for resettlement site and also to the “Batas Pambansa 220”, which stipulates the development guidelines for development of relocation areas.

The Legazpi City implemented Phase I of the Banquerohan Resettlement Project located about 18km from the city proper. Of the 504 houses which were constructed, 46% of them (232) were not occupied due to lack of livelihood, 30 or 12.9% (30/232) were totally damaged by typhoons and 202 or 87.1% (202/232) of the houses were partially damaged by typhoons and termites.

The following table indicates the composition of resettlers by place or origin in Banquerohan Resettlement Site (Phase I) at the opening time in 1994.

Resettlers in Banquerohan Resettlement Site (Phase I)

Place of Origin (Barangays)	No. of Families to be Resettled (as of 1995)	No. of Families Occupied the Housing Units (as of 1995)	No. of Families Permanently Residing at Reset. Site (as of 1999)	Families Often Returned to Former Brgy. due to Livelihood	Families Not Residing at Reset. Site
1. Arimbay	1	1	1	0	0
2. Banquerohan	8	8	8	0	0
3. Bagong Abre	1	1	0	1	0
4. Bigaa	1	1	1	0	0
5. Bonga	141	132	41	91	9
6. Buyoan	54	49	24	25	5
7. Mabinit	148	123	49	74	25
8. Matanag	49	46	7	39	3
9. Padang	101	100	43	57	1
<i>(Vacant Unit)</i>	<i>(1)</i>	-	-	-	-
Total	504	461	174	287	43

Source : Legazpi City Social Welfare & Development Office.

In 1994, 504 houses were constructed and awarded to eligible resettlers. Out of the 504 houses, 461 houses were occupied at the beginning, but as of December 1999, 174 families or 37.7% (174/461) are permanently residing their assigned units. 287 families or 62.3% (287/461) often return to the former barangays to sustain their livelihood. 43 units or 36.0% (98/272) are vacant and not maintained at all.

The social welfare and development office (SWDO) of Legazpi City has yet to prepare a comprehensive list of beneficiaries that are still to be relocated to Banquerohan, their place of origin, those who returned to their former barangays, and those that permanently reside in the site.

The physical conditions of about 25% of the housing units already constructed are bad and latest assessment is that these units are not conducive for habitation. This is due to the absence of staff from local government who will safeguard the housing units. Basic housing components such as doors and windows were looted on some of these completed units. Aside from looting, some people have made these housing units as animal barns and stockyards. This hastened the deterioration of basic housing parts.

Circulation (roads, alleys and paths) on the eastern side of the resettlement site has already deteriorated largely due to soil erosion. Vegetation has covered much of the right-of-way on this portion.

As a whole, the present conditions of the housing units in Phase I including the road network can not accommodate new resettlers, unless rehabilitation of basic facilities and full completion of dilapidated housing units are to be undertaken by the local government.

(2) Existing Resettlement Plans (including Expansion Plans of the Existing Site)

1) Banquerohan Resettlement Site (Phase II)

The project profile of Phase II is also shown in Table XXII 1.1. The concept for the development of Phase II site is to serve as production area for the whole Banquerohan Resettlement Site. A large portion of Phase II (8.8 ha or 32.6%) is identified as area earmarked for agricultural purposes.

According to the Phase II development plan prepared by the NHA, the subdivision survey was already implemented by a local contractor. However, housing units are still absent including power and water supply. Considerable resources are still needed to fully complete Phase II and this is to be utilized as additional resettlement site for Mayon eruption victims. About a fourth of Phase II is now being used by resettlers from Phase I as their farm lots. Many of them plant vegetables and other cash crops.

2) Anislag Resettlement Plan

The land development for this resettlement site has already been completed based on the standards stipulated under Batas Pambansa 220, a law governing the

development standards for low-cost housing projects including resettlement sites of the government.

The resettlement area can only be reached from the main provincial road through the 1.5km macadam access road. This access road is being used by both the resettlers and the residents living nearby.

The local government started constructing core housing units on some of the generated lots. The arrangement for the construction of the units is that the materials needed will be provided by the local government while constructing the 3m x 3.5m. Unit will be the counterpart share of the beneficiary. The material cost per individual unit is presently estimated to cost about PHP25,000 per unit.

The community facilities such as barangay hall, health and day care center, primary school and livelihood training centers are still absent. However, all of these facilities except the livelihood training center are already existing outside the site (in Anislag barangay) and are located along the provincial road.

The number of project beneficiaries (No. of families to be resettled) in Anislag Resettlement Site is shown below.

Project Beneficiaries in Anislag Resettlement Site

(As of November 1999)

Place of Origin (Barangays)	No. of Families to be Resettled	%	No. of Certified Eligible Families*
1) Budiao	310	48.8	80 + 40 = 120
2) Banadero	21	3.3	-
3) Banag	69	10.9	-
4) Busay	94	14.8	-
5) Tagas	105	16.5	-
6) Binitayan	26	4.1	-
7) Anislag	2	0.3	-
8) Lacag	2	0.3	-
9) Kimantong	6	1.0	-
TOTAL	635	100.0	120

Note: * The families who were officially selected by Daraga SWDO for occupation of a housing unit in the Anislag resettlement site.

Source: Daraga Municipal Social Welfare & Development Office (DMSWDO)

To date, 80 house units have been constructed, and 80 households are listed for their occupation upon completion of the basic infrastructure works. Besides, construction of another 40 units is planned to start in early 2000.

(3) Problems Encountered

1) Socio-economic Problems

From the results gathered in the People's Intention Survey conducted by the JICA Study Team, the following are the listed reasons with the majority of the respondents are not satisfied with the living conditions in the resettlement area:

- The size of the lot is small,
- The house was poorly built,
- The location is very elevated (Banquerohan),
- Water supply and drainage system are inadequate,
- Inadequacy of electricity,
- Lack of street lights,
- Absence of farm lots for farmer resettlers,
- No sources of livelihood,
- Slippery roads,
- Sanitation such as lack of comfort rooms (Banquerohan),
- High transportation cost,
- Distant location of schools,
- Illegal squatting of non-beneficiaries,
- Non occupancy of some units by beneficiaries, and
- Rampant theft.

a. Banquerohan Phase I

Of the many problems being encountered by the beneficiaries in Banquerohan Phase I, lack of livelihood opportunities ranked first. The income profile based on the result of the "People's Intention Survey for Resettlers and Candidate Resettlers in Resettlement Site Improvement and Livelihood Development" revealed that the annual income per household is PHP42,075 or a monthly household income of PHP3,506. The income figure derived from this survey is below the PHP4,800 perceived adequate income.

Some resettlers acquired their own farm lots on nearby sites. Some temporarily farm on Phase II lots as of date. Farm sites for resettlers are not yet identified yet. Other sources of livelihood are abaca weaving, buying/selling. Few go into fishing.

Lack of livelihood opportunities in the site have made life difficult for the resettled families and this problem compounded their dissatisfaction to their new homes as shown below.

Perceptions on Resettlement and Resettlement Site

Perception	Total	%
1. Satisfied with the site		
1) Yes	40	35.7
2) No	72	64.3
Subtotal	112	100.0
2. No difficulties in the site		
1) Yes	6	6.2
2) No	90	93.8
Subtotal	96	100.0
3. Good to move to the site		
1) Yes	65	67.7
2) No	31	32.3
Subtotal	96	100.0
4. Beneficiary of livelihood project		
1) Yes	7	6.2
2) No	105	93.8
5. Grand –Total of “Yes” & “No”	112	100.0
“Yes”	118	(28.4)
“No”	298	(71.6)

Source: People’s Intention Survey conducted by the JICA Study Team.

The level of dissatisfied respondent-resettlers is quite high (64.3%) and about 93.8% of the respondents met difficulties in the site. This is understandable since their former conditions at the slopes of Mt. Mayon can not be duplicated or even be surpassed in the resettlement area. Absence of livelihood program is manifested by the data that very few beneficiaries (6.2%) benefited from any income generating projects introduced in the site.

Aside from the livelihood problems, lack of health care facilities such as health care center in the area is one of the basic projects being sought by the beneficiaries. The provision of primary school is high in the priority list of the residents since the elementary school is 1.5 km away from the site.

Regarding the maintenance of the resettlement site, the city government required the resettlers to pay an occupancy fee of PHP50 per month for its maintenance and/or improvement, but this did not materialize because of their non-unanimous consensus.

b. Banquerohan Phase II

There are no identified problems which are attributed to socio-economic in nature since there are not beneficiaries yet living in Phase II at present. In Phase II site, the following facilities are to be constructed for the entire Banquerohan resettlement site development.

- Community facilities such as multi-purpose center, health and day care center and school,

- Livelihood facilities such as training centers and production areas, and
- Post-harvest facilities for storage of goods.

c. Anislag Resettlement Site

This site is still in the process of absorbing new entrants from the Permanent Danger Zones (PDZs) and the residents would most likely list the following needs:

- Multi-purpose center
- Health & day care center
- Primary school
- Livelihood facilities for cottage industries
- Handicraft and training

2) Basic Facilities

From the list of problems cited by the respondents in the People's Intention Survey, majority of them is attributable to physical development of the resettlement site. As shown in the following table, the improvement of basic infrastructure ranked second (24.5%) most needed project that should be implemented in the site.

The upgrading of housing accounted for 12.8% of the total respondents and ranked number five, should also be given emphasis especially the size of the floor area and the quality of works and materials used. Of the five major projects needed, job creation or livelihood opportunities still ranked high (26.2%) in the list.

Kinds of Projects Needed to be Implemented

Kinds of Projects Expected	Total	%	Order
1. Job creation	170	26.23	1
2. Improvement of basic infrastructure	159	24.54	2
3. Social services	128	19.75	3
4. Provision of available land	99	15.28	4
5. Upgrading of housing	83	12.81	5
6. Others	9	1.39	6
Total	648 *	100.00	-

Most Beneficial Kind of Livelihood Projects	Total	%	Order
1. Agro-industry and manufacturing	111	38.28	1
2. On-farm production	105	36.21	2
3. Tourism promotion	27	9.31	3
4. Others	24	8.28	4
5. Marine production	23	7.93	5
Total	290 *	100.00	-

Note : * Multiple answers (total number of samples = 180)

Source : People's Intention Survey conducted by JICA Study Team in September - October 1999.

a. Banquerohan Phase I & II

In the aspect of basic facilities, the following are the listed requirements being felt by the resettlers:

- Lack of sufficient water supply
- Installation of toilets for each family
- Access to the coastal areas
- Poor structure of housing units

To develop the Banquerohan resettlement site as a whole integrating the established Phase I area with Phase II planned site, the following are the basic infrastructure and utilities to be constructed in this expansion area.

- Sufficient water supply
- Power supply
- Housing units
- Roads and paths
- Sanitary units

b. Anislag Resettlement Site

For Anislag resettlement site, the following are required by would-be resettlers :

- Sufficient water supply system
- Reliable power supply
- Improved drainage system

2. BASIC CONCEPT

2.1 Purpose of the Project

The Resettlement Sites Development Project in Banquerohan (Legazpi City) and Anislag (Daraga Municipality) aims to improve the existing resettlement sites for the people already settled and/or develop the new resettlement sites for the people still residing in mud & debris and flood danger zones, and likewise for those to be relocated due to implementation of the Yawa River Basin Sabo Project and Legazpi City Urban Drainage Project.

As mentioned in the previous Subsection, the Banquerohan resettlement site (Phase I) was established in 1994 and 504 houses were awarded to the eligible resettlers at the beginning. Despite it, presently only 174 families (35%) are occupying them. The results of the People's Intention Survey conducted by the JICA Study Team revealed that in addition to the lack of livelihood, this is partly due to dilapidation of the houses and lack of basic infrastructure such as water supply and sanitary facilities and so on. As to the resettlement site development at Anislag where the construction work has just started, the original plan also lacks in comprehensive approach to establish an integrated community.

Consequently, this Resettlement Sites Development Project proposed in this Study is designed to cope with the problems the resettlers are actually facing, and satisfy the requirements of the resettlers to some extent to ensure their basic human needs or living environment.

(1) Economic Development in the Resettlement Sites

For a long time, the cause and effect relationship between disasters and social and economic development has been ignored. Taking into account the relationship described in Section 2.2 (5) (Main Report), the "concept of integrating disasters into development" is becoming a major philosophical underpinning around the world. For this respect, it is essential to formulate the development projects and programs in the context of disaster prevention/mitigation, and design the disaster recovery programs based on the long-term or far-reaching development needs.

As the major problems in the existing resettlement sites are pointed out due to the fact that the sites provide little job opportunity, a wide range of job creation opportunities will be provided to the resettlers considering their adaptability and background.

Then, the resettlement site development projects need to be implemented as a package with the livelihood and area development projects as well as institutional & financial supporting programs. The economic development in the resettlement site mostly concerns the livelihood of the resettlers. The factors to be considered in formulation of livelihood projects and programs are the following:

- Labour-intensive or employment generation program
- Utilization of local resources (materials and expertise)
- Prospects of marketability
- Availability of the utilities (water and energy)

Based on the results of the Area Potential Survey carried out by the JICA Study Team in September – October 1999, the following are the key crops and promising enterprises for livelihood and area economic development:

a. Coconut-based Crop Diversification

Intercrop banana, pineapple, black pepper, ginger, peanuts, and rootcrops between coconut trees

b. Abaca

Increase abaca primary production (need for new technology and high quality, virus resistant planting materials)

c. High Value Commercial Crops

Temperate, semi-temperate and some tropical fruit (ex. Pilinuts), vegetables, flowers, and ornamental plants (exploit Mt. Mayon's higher elevations to corner the Baguio market)

d. Cutflowers and Ornamental Plants

Take lead from neighboring municipalities, an ideal livelihood opportunity for homebound individuals or those who have little access to land

e. Non-edible Agricultural Crops

Need expansion to generate livelihood opportunities because of limited supply of fiber, wood, culinary and medical herbs, ornamental plants, bamboo and roofing leaves

- f. Maize (Corn)
Expansion in northern and southern barangays, production for livestock feeds, need for mechanization if large areas are planted
- g. Rice (Rice growing)
Expansion in southern barangays need the pumps and shallow-tube wells
- h. Poultry
Eggs, broilers, quail eggs and ducks
- i. Coconut Coir and Coco dust
Establish a coconut processing facility in Banquerohan area (this capital-intensive project needs 2 ha site)
- j. Gravel and Sand
Excavation of the gravel and sand required to assure the sound operations of the sabo facilities, and their value-added products like hollow blocks and construction materials for area development
- k. Composting and Recycling Scheme
Processing of bio-degradable and non bio-degradable wastes (use of trichoderma bacterium inoculant, pilot site in San Roque)
- l. Eco-tourism
Sustainable approach to local resources and environment use (local people share in service providing and profit sharing, while tourists learn something about the local culture and its people)

(2) Criteria in Selecting Candidate Resettlers

As the criteria in selecting the candidate resettlers, there exist an useful reference : “Guidelines on the Implementation of SOLCENTAF Supported Core Shelter Assistance Program¹”. In this Guidelines, the target beneficiaries for the disaster

¹ Guidelines on the Implementation of SOLCENTAF Supported Core Shelter Assistance Program in Rehabilitating Typhoons Rosing and Pepang Victims, Department Order No.19 of the DSWD, Series of 1996 (22 July 1996).

victims like volcanic eruption, mud & debris flows, flood, typhoon, etc. would meet the following conditions/criteria:

- With totally damaged houses as a result of the typhoon and on its secondary hazards.
- Must be owner of the damaged house – not a renter or sharer.
- Has not availed of GI sheets assistance from SOLCENTAF (Southern Luzon Central Task Force).
- Income must be within poverty threshold of the area (for a family of 5.3 members, PHP4,955 per month in urban areas and PHP4,020 per month in rural areas).
- Has been living in a high risk area such as along slope, flood prone areas, etc.
- Has the capacity of providing his own counterpart in building his shelter like labor, and any of the following: savings and salvage materials.

As the above guidelines was prepared and has been applied just to cope with the imminent situations in emergency cases, the JICA Study Team proposes the following criteria and, especially with a view to upgrading the living environment of resettlers and establishing a growth center for area economic development.

- a. Those who are dwelling in the high risk areas such as:
 - Permanent Danger Zones (PDZ),
 - Slopes of the Mayon Volcano where have been repeatedly struck by the disasters of mud and debris flows, and
 - Flood prone areas.
- b. The people living in the right-of-way areas where land acquisition is required for implementation of the structural projects like sabo facility construction and urban drainage projects.
- c. The household whose house was totally damaged as a result of the natural disasters including typhoon.
 - The applicant must be owner of the damaged house – not a renter or sharer.
- d. Family of low bracket income: its monthly average income must be below the estimated monthly household income of the area² (for 5.3 members, PHP10,000 per month as of 1999).

² The monthly household income in the Study Area is set based on the data used for estimating the target per capita GRDP in formulation of the socio-economic development scenario.

- e. The beneficiary occupant who accepts to pay the occupancy and maintenance charge of the site.

In these criteria, the monthly household income (PHP10,000) is set higher (almost double) compared to the monthly poverty threshold laid down by the authorities concerned (NSO& NSCB). This is from the standpoint that the resettlement site is to be a future “development growth center” or basis for area economic development. Hence, this relatively higher criterion is set to induce the people’s motivations and give some incentives for their economic activities.

2.2 Basic Conditions for Resettlement Planning

(1) Living Condition in Structural Aspect

The living condition of the resettlers in structural aspect must at least meet the minimum requirements if not of the very ideal characteristics of a dwelling unit, and a physical environment. For the dwelling units, it must have at least the following:

- Adequate space for domestic needs such as bedroom, a kitchen and the like (Total floor area of standard Type I: 21.7m²). As to floor plan, refer to Figure XXII 3.3.
- Individual bath and toilet
- Sufficient supply for water for drinking and domestic use (150 liters/capita/day)
- Electric power connection per housing unit
- Garbage disposal and sewage
- Dwelling units must be durable enough to withstand the usual calamities like typhoons or strong winds

Taking into consideration the general situations mentioned above, the basic conditions for resettlement sites development with livelihood programs are as follows:

- a. A core house of 21.7m² (Type I) will be provided free of charge to the eligible family by the LGU,
- b. For expansion and betterment of the core house, financial assistance will be granted to the applicant resettlers (through a multi-purpose cooperative to be established in the site),
- c. To those who are going to undertake the gradual expansion of the house in group of more than 5 families, the LGU will extend assistance to supervise its construction works,

- d. Maintenance fund of the resettlement site including the public facilities and respective houses should be raised and contributed by the resettlers themselves.
- e. To form an integrated community, the resettlement site will include almost all social infrastructures like road, water supply, power supply, drainage & sewerage, elementary school, parks & open space, and even a “productivity center” for livelihood development.

(2) Livelihood Support

In addition to improvement of the structural living condition, the livelihood development support needs to be provided by establishing a “productivity center” which incorporates an area for business, trading, processing and storage activities as well as skills training area. This center will accommodate areas for community business service, training and display.

The resettlement sites development project with livelihood development program is to be formulated and promoted in close coordination with the government agencies (both national and local) and organizations concerned including supporting institutions (international donor, private sector and NGOs).

The basic conditions for supporting the livelihood development of the resettlers include the following:

- a. Institutional and legal arrangements among the implementing agencies and organizations concerned,
- b. Social preparation including briefing to the property owners and affected households, and public hearings,
- c. Establishment of community relations through community development workers,
- d. Setting-up of community organizations, especially multi-purpose cooperative and cooperative business association (CBA),
- e. Provision of micro-lending scheme to support the resettlers to open up the livelihood enterprises, and
- f. Training for livelihood development and vocational guidance
- g. Organizational set-up of a “Resettlement Committee” to coordinate/ensure the resettlement activities,

2.3 Expected Number of Resettlers and Households by Job Category

The following table shows the expected numbers of resettlers, estimated numbers of economically active persons and to be engaged in the livelihood projects in the resettlement sites.

Expected Number of Resettlers and Households by Job Category

Item	Banquerohan		Anislag
	Phase I	Phase II	
1. No. of Total Households (Total)	600	460	635
	1,060		
2. Estimated No. of Economically Active Persons (2.47 per HH)*	2,618		1,568
3. No. of Persons to be Engaged in Proposed Livelihood Projects (1.5 persons per HH)	1,590		953
(1) Abaca Handicrafts (20%)	318		191
(2) Pilinut Processing (15%)	239		143
(3) Coco Coir Production (20%)	318		191
(4) Hollow Block Making (5%)	80		48
Subtotal	955		572
% to be Engaged by the Proposed Livelihood Projects	60%		60%
4. Others (40%)**	635		381

Notes: * 2.47 persons are economically active according to the results of the People's Intention Survey.

** Others include the jobs to be generated by the above livelihood projects like trade & commerce, transportation, public services, etc.

The livelihood projects proposed in the respective resettlement sites are designed to assure the average monthly income of PHP7,000 per household. The equation for calculation of this monthly average income is as follows:

- Daily wage per worker (PHP180) × Monthly working days (26 days) × No. of persons to be engaged in proposed livelihood projects per household (1.5 persons) = Monthly average income per household (PHP7,020)

In the JICA Study, the monthly average income per household deriving from the livelihood projects is estimated to be PHP7,000 at the initial stage of operations in 2003. This amount exceeds not only the average monthly income worked out at PHP3,500 among the interviewed resettlers and candidate resettlers in the People's Intention Survey, but also the average monthly income of PHP4,800 that they want to earn monthly. To retain the resettlers in the resettlement sites, it is

important to formulate the resettlement sites development with livelihood program, especially paying attention to increase of their living standard.

2.4 Supporting System for Livelihood and Area Socioeconomic Development

As seen in the previous section, both resettlement sites are faced with the problem of inadequate of livelihood opportunities, which may have been brought about by the following factors:

- No farm lots for the households who wish to engage in farming
- Lack of employment opportunities
- Lack of necessary skills to widen employment opportunity
- Lack of capital to start or expand livelihood in the new area
- Lack of support facilities like irrigation, farm-to-market road, post harvest equipment
- Lack of functional organization

Accordingly, the following are suggested:

- a. Implementation of the more comprehensive medium and long-term resettlement site development plan with livelihood programs based on the plan proposed in JICA Study,
- b. Grouping or organizational setup of the resettlers into an association for more appropriately into a Cooperative,
- c. Financial supports to the established cooperatives through introduction of micro lending scheme which makes them easy access to needed resources like land, capital and facilities,
- d. Institutional and informational supports by establishing consumer stores or a trading center, so that the cooperatives can provide consumer goods including production inputs to members at reasonable prices and market their products at competitive prices,
- e. Promotion of both agricultural and non-farm enterprises such as processing and cottage industries to ensure the stable living standards of the resettlers.
- f. As the multi-sectoral or holistic approach is indispensable for promotion of the resettlement community development, it is suggested to organize a "Resettlement Committee" in each LGUs concerned to coordinate/ensure the resettlement activities and interventions, and
- g. To consolidate the financial basis for project sustainability, it is recommended to introduce and establish a "Social Investment Fund (SIF)" system for disaster management at provincial level. This SIF system will be designed to cover the following sectors or BHNs in resettlement community development

program: settlements, education, health, nutrition, production support, water supply and sanitation, environment, increase in productivity, etc.

Figure XXII 2.1 indicates the proposed structure for implementing the resettlement sites development with livelihood programs and promoting the socio-economy of the Study Area.

To ensure the general management and coordination, the existing Steering Committee (SC) for Comprehensive Disaster Prevention around Mayon Volcano and its Technical Working Group Committee (TWGC) (to be renamed as “Project Steering Committee (PSC)”) will be strengthened with the support of the DPWH Central Office (Manila). For overall supervision of the project implementation, a “Project Management Office (PMO)” is to be established under the control of DPWH Region-V.

For the overall supervision of the projects and programs implementation, it is recommended to establish a “Project Management Office (PMO)” under the control of DPWH Region-V. This PMO is to be supported by the Project Coordination Committee (PCC). Main functions of PMO are to be determined in detail in the Draft Final Report.

Under the PMO (DPWH Region-V), the six “Coordination Sub-Committees” will be correspondingly established to implement the respective types of projects and programs. Among the five Sub-Committees, the “Coordination Sub-Committee for Resettlement Sites Development with Livelihood Programs (SC-RSDL)” is designated to involve in coordinating arrangements among the authorities concerned, mostly at the initial stage.

Under the guidance of this SC-RSDL, a “Resettlement Committee” is to be established at each of resettlement sites to facilitate the overall coordination of the project implementation, and ensure the sustainable development of the resettlement site and also sound operations and management of the livelihood programs.

To improve and strengthen the capabilities of the existing communities at both Banquerohan and Anislag, it is recommended to start an “institutional supporting program” through establishing a viable “Multi-purpose Cooperative” in each resettlement site. This might be a must and starting point to lead the projects and programs to be a success.

3. LAYOUT DESIGN

3.1 Banquerohan Resettlement Site (Phase I & II)

3.1.1 Land Use Layout Plan (Area Development Plan)

(1) Settlement Area

1) Banquerohan Phase I

Residential lots to be generated in a particular site should have a maximum of 70% of the total project area. This area comprises the buildable area (residential and commercial lots). The remaining 30% is allocated to open spaces (circulation, parks and community facilities). This standard is prescribed in the development guidelines by the National Housing Authority (NHA).

As shown in Table XXII 1.1, the following are the lot allocations for Banquerohan Resettlement Site (Phase I & II):

Home Lot Size Profile

Name of Resettlement Site	Area (ha)	Standard Home Lot Size (m ²)
1. Banquerohan Phase I	18.93	90 - 298
2. Banquerohan Phase II	27.07	120 - 210

For Banquerohan Phases I and II, the lot sizes are variable in some parts due to topography of the place. The following table shows the land use distribution for the development of Banquerohan Phase I.

Land Use Distribution of Banquerohan Phase I

Land Use	Area (ha)	%
A. Buildable Area		
1. Residential Lots	7.89	41.68
2. Commercial Lots	0.65	3.43
Subtotal	8.54	45.11
B. Public and Common Area		
1. Reserve Lots	5.53	29.21
2. Park	0.65	3.43
3. Foot Path	1.31	6.92
4. Road Lot	1.21	6.39
5. C.D.S.(cul-de-sac)	0.13	0.69
6. Unbuildable	0.48	2.54
7. Waterway	0.07	0.37
8. Creek Lot	1.01	5.34
Subtotal	10.39	54.89
Grand Total	18.93	100.00

Source: NHA-Region V Development Plan for Banquerohan Phase I

Of the given land use in the above, NHA-Region V Office generated 604 residential lots and 24 commercial lots which are all located along the national road. Since about 80% of the lots have already been constructed with core shelters and about 504 units were already awarded. Phase I can already be considered as built-up area. The subdivision plan for Banquerohan Phase I is shown in Figure XXII 3.1.

The commercial lots designated by NHA-Region V are lots whose frontages are located along the main provincial road. They are available to beneficiaries who are capable of engaging in small-scale cottage industries or in other income generating ventures. These lots were generated to produce income for the beneficiaries and are therefore to be paid for by the awardees. The lot pricing for these commercial lots is a bit higher than the regular lots inside the resettlement site.

2) Banquerohan Phase II

Subdivision layout of Banquerohan Phase II is shown in Figure XXII 3.2. This 27.07ha of resettlement site is still undeveloped, although NHA-Region V Office pointed out that they already introduced preliminary land development such as subdivision survey, construction of reinforced concrete box culverts, macadam main roads, sanitary units, and CHB-lined open canals.

For more than five years, there were no additional development undertaken to fully complete Phase II. At present, it is hard to recognize that the initial development was introduced in the site due to thick vegetation. From the development plans furnished by NHA-Region V, land use allocation is derived and shown below:

Land Use Allocation for Banquerohan Phase II

Land Use	Area (ha)	%
A. Buildable Area		
1. Residential Lots	5.23	19.32
2. Commercial Lots	0.18	0.67
3. Reserve Residential	8.75	32.32
Subtotal	14.16	52.31
B. Public and Common Area		
1. Park	1.75	6.46
2. Circulation	2.33	8.61
3. Farm Lots	8.83	32.62
Subtotal	12.91	47.69
Grand Total	27.07	100.00

Source: NHA-Region V Development Plan for Banquerohan Phase II

The number of generated lots for residential and commercial purposes are 449 and 11, respectively. Average sizes are almost the same with those in Phase I. Of the 27.07ha land area, only 5.2ha or 19.3% (5.23ha/27.07ha) is allotted for residential purposes.

The area allotted for future residential development (reserve residential) can be used as production area. The parameter in computing the size of the production area was adopted from the existing resettlement sites of the NHA. On the average, about 60m²/household is used as factor in deriving the allocation for production area. The required land size for the production area is computed below:

$$\begin{aligned}
 \text{Production Area} &= \text{Expected number of households} \times 60\text{m}^2/\text{household} \\
 &= (600 [\text{Phase I}] + 460 [\text{Phase II}]) \times 60\text{m}^2 \\
 &= 63,600\text{m}^2 \text{ (6.36ha) for the whole Banquerohan area}
 \end{aligned}$$

With this revision, the resulting land use allocations is shown below:

Revised Land Use Allocation for Banquerohan Phase II

Land Use	Area (ha)	%
A. Buildable Area		
1. Residential Lots	5.23	19.32
2. Commercial Lots	0.18	0.67
3. Residential (Reserve)	2.39	8.83
Subtotal	7.80	28.82
B. Public and Common Area		
1. Open Space	1.75	6.46
2. Circulation	2.33	8.61
3. Farm Lots	8.83	32.62
4. Production Area	6.36	23.49
Subtotal	19.27	71.18
Grand Total	27.07	100.00

Source: NHA-Region V Development Plan for Banquerohan Phase II

(2) Agricultural Land

1) Banquerohan Phase I

As shown in the previous table: Land Use Distribution of Banquerohan Phase I, the area does not have farm lots that can be used for agricultural purposes. Since the lot sizes ranges from 90 to 298m², these lot sizes do not seem to be able to sustain a commercial level of backyard farming that can answer the daily needs of the beneficiaries.

2) Banquerohan Phase II

The area allotted for agricultural lots is 8.8ha or about 32.51% (8.8ha/ 27.07ha) of the total area of Phase II, and about 19.13% (8.8ha/46ha) of the total area for Phases I and II.

Although the agricultural lots take up a substantial portion of the development, it is still not sufficient to accommodate the farm size requirements of all the farmer resettlers which may be given at 1.0ha per farming beneficiary. The prospective beneficiaries are the farmers already in Phase I and those expected to be resettled in Phase II.

The kinds of Projects Needed to be Implemented (refer to the table at page XXII-9) revealed that the provision of available farmland (15.3%) ranked fourth among the most expected projects being awaited by the beneficiaries. The on-farm production ranked second most beneficial kind of livelihood projects being perceived by the resettlers and candidate resettlers.

For this reason, provision of farm lots to the farmer-resettlers adjacent to the resettlement site should be given emphasis. It is to be noted that the average income level of the interviewed households works out to about PHP3,500 per month, according to the results of the People's Intention Survey. The income derived from agriculture accounts for 26.8% of the total income of the sampled households.

(3) Industrial Zone

1) Banquerohan Phase I

The development done by the NHA-Region V designated this site into purely residential-commercial-institutional area. The whole area has already been constructed with core housing units. The open spaces indicated in the development plans are located in steep slopes. With this given development concept, much of the open spaces cannot be used for other purposes especially in the allocation of industrial zones of productivity centers.

It would be noted that construction on very steep slopes would either be costly or may pose danger on lives and properties in the near future. Hence, those areas would have to be planted with trees and shrubs to prevent soil erosion. It is recommended that existing development plans be followed and if community facilities are to be constructed, they should be located at the designated public area which is still has enough space.

2) Banquerohan Phase II

Despite the absence of an area for industrial/productivity purposes in Phase I, the development of Banquerohan Phase II did not also take into consideration the said requirement. Phase II has an area allotted for school and an open area in Block 37 (refer to Figure XXII 3.8). It also has an area for commercial lots located along the national road as well as a reserve area for residential use and area for farm lots.

Based on this situation, it would be economically viable to put a single production area in Phase II which will serve the whole of Banquerohan Resettlement Site (Phase I & II). This production area will accommodate the productivity center, business center, showroom, skills training center, and other vital livelihood facilities.

The operation and maintenance would be centralized, thus minimizing on overhead and operational expenses. This one-stop center set-up would be ideal both for trade promotion staff of the Government as well as the beneficiary-producer.

(4) Public and Common Area

1) Banquerohan Phase I

The topography of Phase I dictates that much of the area would have to be open space. Steep slopes created mini-parks wherein residents use it for backyard farming or just plain vegetation area. Moreover, a considerable area of about 4,806m² which is classified as unbuildable can be considered as open space.

Much of the steep terrain are already protected by boulder rip-rap. The total area for parks and open space including unbuildable area is about 10.39 ha or 54.89% (10.39 ha/18.93 ha).

2) Banquerohan Phase II

Open spaces and pocket parks are provided in this site. Open spaces are provided in the easement of waterways that runs through the site. Steep slopes created bigger open spaces. By classifying farm lots and reserved residential areas into open spaces, the total open spaces would have a total area of 21.66ha or about 80.0% (21.66ha/27.07ha). Provision of open space is more than enough which gives the site bigger circulation and production areas for beneficiaries.

3.1.2 Infrastructures

(1) Road and Transportation Network

1) Banquerohan Phase I

The designs of roads and footpaths for the site conform to the low-cost development guidelines of the NHA. The main roads intersect the national road on two points. All lots have access either through the main roads or the footpaths.

All the main roads and the footpaths were graded and compared as per NHA standards. The total area of circulation network for Phase I is 2.52 ha or 13.31% (2.52ha/18.93ha) of the total area.

Types of Roads for Banquerohan Phase I & Phase II Resettlement Site

Sites	Type of Road	Right-of-Way (m)	Pavement	Carriage way	Length (m)
Banquerohan Phase I	Major/main	10.0	Macadam	6	478
	Minor/secondary	8.0	Macadam	6	915
	Path/alley	3.0	Compacted subgrade	3	4,367
Banquerohan Phase II	Major/main	10.0	Macadam	6	960
	Minor/secondary	8.0	Macadam	6	200
	Service/tertiary	6.5	Macadam	5	663
	Path/alley	3.0	Compacted subgrade	3	2,597

2) Banquerohan Phase II

For Phase II, the circulation network is circumferential in design and has two connecting points at the national road. The design finish and the specifications are identical to the road and path designs of Phase I. The total area of roads and paths is 2.33 ha or about 8.61% (2.33 ha/27.07ha) of the total area of the Phase II site (refer to the above table).

(2) Water Supply System

The water supply being used in Banquerohan Phase I is shallow well. Of the 24 shallow wells constructed in Phase I, only about 8 are in operation and the remaining are either destroyed or no longer capable of drawing groundwater. The residents get their water from spring which is continuously flowing in Phase II. The problem of water supply worsens during the dry season.

Since water supply is very unstable especially during the dry season, it is recommended that the drilling of deep well be done for two sites. The minimum depth of well is 150.0 m from the ground or until the aquifer in the locality is

reached. The appurtenant components of deep well such as elevated water steel tanks, pumps, pipelines and communal faucets are to be included in the upgrading of the water supply system.

The following table shows the water requirements of the two sites and the recommended capacity of the tanks and the distribution mains. The peak factor (1.5), maximum daily demand factor (1.1) and the maximum hour demand factor (1.5) used were based on the minimum design criteria being used by the NHA in the design computations for water supply for its various low cost land development projects.

Water Demand for Banquerohan Resettlement Site (Phase I & II)

Item	Banquerohan Phase I	Banquerohan Phase II
1. No. of Housing Units	600	460
2. No. of HH/Unit	5	5
3. Average Daily Demand	150 liter/capita/day	150 liter/capita/day
4. Peak Factor	1.5	1.5
5. Design Population (5 years)	$P_p = 1.5 \times 600 \times 5 = 4,500$	$P_p = 1.5 \times 460 \times 5 = 3,450$
6. Average Daily Demand	4,500 persons x 150 liters = 675,000 liters	3,450 persons x 150 liters = 517,500 liters
7. Maximum Daily Demand	$1.1 \times 675,000 = 742,500$ liters	$1.1 \times 517,500 = 569,250$ liters
8. Maximum Hour Demand	$1.5 \times 675,000 = 1,012,500$ liters per day/11.72 liters per second	$1.5 \times 517,500 = 776,250$ liters per day/9.0 liters per second
9. Requirements	2 Elevated water tank w/10,000 gal. Capacity : Water mains should be 100 mm dia. uPVC pipe	2 Elevated water tank w/10,000 gal. Capacity:: Water mains should be 100 mm dia. uPVC pipe

Notes: P_p = Population uPVC = Unplasticized Polyvinyl Chloride

Maintenance and operating costs will come from monthly dues to be collected by the community association. The water rate will be determined by the association in consultation with the Legazpi City Water District. The water distribution system layouts for the two sites are given in Figures XXII 3.4 and XXII 3.5.

(3) Electric Power Supply System

The power supply system for Banquerohan Phase I is already complete and is now operational. All the area is now being serviced by ALECO. The housing units being constructed now have yet to be interconnected to the power main grids.

For Banquerohan Phase II, power supply has not yet been installed by ALECO. The delay in installation of power lines in Phase II is due to the non-completion of its development, especially the core houses that will readily be used by immediate

relocates. The power supply system layout for Banquerohan is shown in Figure XXII 3.6.

The detailed design and analysis of the power reticulation system as well as the installation or upgrading of power supply will be carried out by the local electric cooperative. The following will be installed conforming with the design standards or provisions of the Electrical Code of the Philippines.

- Street lighting
- Utility poles and features
- Wiring system

Transformer load schedule and computations are as follows:

- T-1 Transformer = $\frac{100\text{kWh/month} \times 50 \text{ units}}{720\text{hr/month} \times 0.8\text{DF} \times 0.33\text{PF}} \times 125\% \text{ SF} = 32.881$
 - For T-1 Use: 1 to 37.5KVA, 7.62/0.24kV, single Phase, 60Hz stepped down, oil immersed, self cooled outdoor power transformer
 - For 460 lots, eight T-1 transformer and 1 with higher capacity (T-2) are needed.

- T-2 Transformer = $\frac{100\text{kWh/month} \times 60 \text{ units}}{720\text{hr/month} \times 0.8\text{DF} \times 0.33\text{PF}} \times 125\% \text{ SF} = 39.457$
 - For T-2 Use : 1 to 50KVA, 7.62/0.24kV, single phase, 60Hz stepped down, oil immersed, self cooled outdoor power transformer
 - Electrical code recommends the 2 to 100mm² aluminum conductor steel reinforced cable be used for primary line. For secondary line the Code recommends 2 to 50mm² aluminum conductor steel reinforced cable.

- For Motor Transformer : 2 sets are required for overhead water tank.
 - KVA Rating = $\frac{80\text{AMP} \times 220\text{V} \times /3}{1000} \times 125\% = 38.10\text{KVA}$
 - As per Code requirements use 2 to 25KVA, single phase 7.62/0.24kV stepped down transformer open delta, three-phase bank

- Average power consumption of a resettlement unit per month = $\frac{120 \text{ kilowatt-hour}}{\text{Month}}$

- Recommended number of units to be served by 1 transformer = 50 units

- Average number of hours power is being utilized by a household in a month = 720 hours/month
 - 0.80DF = 80% Demand Factor (Electrical Code)
 - 0.33PF = 33% Power Factor (Electrical Code)
 - 125% SF = 125% Safety Factor

(4) Public Building

The proposed public buildings which will make up the community and livelihood facilities that will serve the beneficiaries of Banquerohan Resettlement Site are presented in Figures XXII 3.7 and 3.8. The basic components and schematic layout of the basic buildings are briefly discussed in the following sections.

1) Elementary School Building

The provision of elementary school facilities for Banquerohan is a must to arrest the rising incidence of illiteracy and attract future resettlers in the site. The Banquerohan elementary school which is the lone barangay school is 1.5km away from the resettlement site. From the data furnished by DECS-Region V, Banquerohan elementary school has the following student profile and facilities:

Profile and Facilities of Banquerohan Elementary School

Level	No. of Students	No. of Classrooms
- Primary (I – IV)	704	17
- Intermediate (V – VI)	325	8
TOTAL	1,029	25

Source : DECS – Region V

This student population comes from the total barangay population of 5,412 persons according to latest DSWD-Legazpi City statistics. Correlating the data above to the expected number of families that will be relocated to Banquerohan Resettlement sites (Phase I and Phase II) is more than 1,000 families. It is recommended that a 25-classroom school will have to be constructed in the government site of Banquerohan Phase I.

In addition to the 25 classrooms, non-academic rooms will have to be provided such as principal’s office, library, faculty room and cafeteria. This school will also handle the enrollees coming from adjacent barangays who will find this school more convenient. The proposed layout is shown in Figure XXII 3.9.

2) Chapel

The chapel design and its size is likely the same with the one constructed and already being used in Banquerohan Phase I. The layout and the dimensions are shown in XXII 3.10. The floor area requirement for this chapel is 233m² (10m x 23.3m). The proposed lot area requirement for this facility is about 1,500m² (30m x 50m).

Since there is already an existing chapel in Phase I, it is worth to consider the expansion of this chapel so that it can adequately serve the residents of both Phase I & II of Banquerohan resettlement site.

3) Public Hall/Multi-Purpose Hall

This building is planned to serve as venue for the beneficiaries and the local government personnel to conduct outreach seminars, training and other important meetings. This could also serve as barangay outpost during night time. The planned size of the multi-purpose hall is about 55.0m². This floor area is the regular size of public hall being constructed by NHA in some of its developed resettlement sites. Barangay halls in rural areas have the same size as recommended.

This multi-purpose hall is proposed to be built in Banquerohan Phase II and Anislag resettlement sites. The typical building layout and its dimensions are shown in Figure XXII 3.11.

4) Others

a. Health and Day Care Center

This community facility is proposed to be built in Anislag resettlement site. This facility is planned with an area of 60m². The size adopted conforms to the existing floor area of barangay health facilities already constructed by NHA in its resettlement/relocation sites. It is provided with an office, kitchen and single toilet.

This center is dual in use. One half can be a day care center while the other half can be the clinic/check-up area to be used by visiting doctor or health worker. The health center can be installed with three hospital beds in case of emergency. The typical building layout for this type of building is shown in Figure XXII 3.12.

b. Productivity Center

The productivity center is envisioned to be the venue for livelihood and skills training for the beneficiaries. The conduct of training is in line with the local government thrust of providing livelihood opportunities to majority of the people living in the resettlement sites. The building is provided with ample floor area for training, big kitchen area for demonstration, office for livelihood officers and two big toilets. This building measures about 90m².

For the training area, large working tables (quantity: 6) and monobloc plastic chairs shall be provided for the trainees. Big display cabinets shall also be provided to showcase the quality and variety of goods being produced in the site. A 21 inches colored television including a VHS player will be provided to be used solely for skills training, demonstration and technology transfer. Floor layout and elevations are shown in Figure XXII 3.13.

c. Multi-purpose Warehouse

This warehouse will be used by recognized resettlers' cooperative or community association. They will be the one to identify goods that will be stored in every compartment. Storage fees will be paid to the cooperative/association the rate of which shall be determined by all members. The site of this warehouse shall be high enough so that flood would not reach the floor.

This building is a component of the livelihood support package for the beneficiaries. This will enable the users to place the goods safely especially during wet season and in the event of typhoons. The building is an all-weather structure and capable of withstanding super typhoons. It has three big compartments so that a variety of goods can be stored at the same time. The area of the warehouse is about 325m² including the office of the caretaker. The floor layout and elevations are shown in Figure XXII 3.14.

With a given area of 300m², the volume of warehouse is about 1,500m³ (300m² x 5.0m height) at 80% maximum allowable space, the holding capacity of the warehouse is about 1,200m³ (1,500m³ x 0.80). The required area proposed (300m²) is good enough to meet the emergency storage needs of resettlers.

3.1.3 Housing Lot Plan

The design standards for “new resettlement scheme” proposed by the JICA Study Team are the following.

(1) Standard Criteria

Considering the respective family conditions, especially the number of household members and their economic situation, the following two types of lot allocation are schemed:

1) Typical Lot Allocation

- Lot type I : 120m² (10m x 12m)
- Lot type II : 210m² (12m x 17.5m)

The lot area occupies 70% of the total resettlement site and the remaining area (30% of the gross area) will be reserved/used for communal facilities like main and access roads, town hall, plaza, school building, health center and others (referring to the standard of NHA).

2) House Size (or Floor Area)

The standard house areas proposed in JICA Study are as follows:

Standard Floor Type	Floor Area (m ²)
I	21.7m ² = (4.8m x 4.2m) + (1.4m x 1.1m)
II	33.7m ² = 21.7m ² (Type I) + 12m ² (4m x 3m)
III	42.7m ² = 21.7m ² (Type I) + 12m ² (4m x 3m) + 9m ² (3m x 3m)

The designs start with a core house (Type I) of 21.7m², with provisions for expansion. Additional bedrooms provided for the bigger models consist of 12m² room (4m x 3m). Financial assistance for construction of a core house of 21.7m² will be granted to beneficiaries resettlers. The core house (Type I) will consist of two bedrooms, multipurpose living room, kitchen, toilet and bath (refer to Figure XXII 3.3).

(2) House Building

The house (core shelter) should be structurally strong to withstand 200 kilometer per hour (KPH) wind velocity, earthquake of moderate intensity (6 Richter Scale) and other similar natural hazards.

Regarding the expansion and betterment of the respective house accommodations, modular upgrading scheme allows for the gradual improvement in the structure according to the needs, preferences, and capacity of the families.

3.2 Anislag Resettlement Site

3.2.1 Land Use Layout (Area Development Plan)

(1) Settlement Area

The resettlement site with 22ha in Anislag is the second resettlement site in Daraga Municipality, Albay Province. The average lot size is 120m². The site is divided into two major land classifications; the resettlement lots which have a total allocation of 12.57ha and community lots earmarked for socialized housing which have an area of 8.78ha.

Land Use Allocation for Anislag Resettlement Site

Land Use	Area (ha)	%
A. Buildable (Phase I)		
1. Residential	8.15	64.84
B. Public and Common Area	4.42	35.16
1. Open Space	1.41	11.22
2. Circulation	2.21	17.58
3. Earth Canal	0.23	1.83
4. Easement	0.26	2.07
5. Community Facilities	0.31	2.46
Total (Phase I)	12.57	100.0
C. Reserved for Socialized Housing (Phase II)	8.78	-
Grand Total for Phase I & Phase II	21.35	-

Source: NHA-Region V Development Plan for Anislag Resettlement Site

The total number of generated lots for the resettlement portion is 635. There are now 120 completed and unfinished core housing units being constructed in the resettlement site. The subdivision layout for Anislag resettlement site is shown in Figure XXII 3.15.

The ratio between the residential lots and the total project area is about 64.84% (8.15ha/12.57ha). This ratio is within the prescribed percentage of land use allocation by NHA. The adjacent 8.78ha socialized housing project site is still in the drawing plan. There is an urgent need to accommodate hundreds of families still living on the danger slope areas of Mayon Volcano.

The area allotted for community facilities is quite small considering the number of families expected to resettle in the area. In as much as the adjacent 8.78ha lot is still undeveloped or not yet subdivided, it is practical to re-allocate a portion of this area into productivity area. The estimated area to be allocated for production area is given below.

<p>Estimated Lot Size for Production Area = Estimated No. of Households (635) x 60m² = 38,100m²</p>
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With the re-allocation of certain portions of the area for socialized housing, the resulting revised land use is shown below:

Revised Land Use Allocation for Anislag Resettlement Site

Land Use	Area (ha)	%
A. Buildable (Phase I)		
1. Residential	8.15	38.17
B. Public and Common Area		
1. Park	1.41	6.60
2. Circulation	2.21	10.35
3. Earth Canal	0.23	1.08
4. Easement	0.26	1.22
5. Community Facilities	0.31	1.45
Subtotal (Phase I: A. + B.)	12.57	58.87
C. Reserve (Phase II)	4.97	23.28
D. Production Area	3.81	17.85
Grand Total	21.35	100.00

Source: NHA-Region V Development Plan for Anislag Resettlement Site

(2) Agricultural Land

For this resettlement site, although it is developed in terms of physical components, it will be noted that it lacks farm areas that will sustain agricultural production. The adjacent area although planted to coconut trees are privately owned.

The Farm Land Trust Management scheme hopes to provide farm lots where farmer-resettlers can cultivate cash crops. The approximate farm lot requirement for all the farmer beneficiaries is about 168 ha. This figure is arrived at by multiplying the number of beneficiaries (635 as planned) by 26.9% (assumed percentage of households which is into farming as reckoned from the People's Intention Survey) and by 1 ha per beneficiary.

(3) Industrial Zone

The industrial zones is not in the development plan of Anislag Resettlement Site either. An open space designated as area for community facilities is located in Block 46.

Areas to be used for livelihood purposes such as production areas and productivity center would most likely be situated in the still undeveloped socialized housing site or from the acquisition of adjacent private lands by the Local Government

(4) Public and Common Area

The site is not provided with ample open space and parks as compared with the two other sites (Banquerohan Phases I and II). The site is maximized in terms of lot generation for residential use. It allocated a space for community facilities at Block 46. The total area for open space is 4.42ha or 35.16% (4.42ha/12.57ha) of the total project area. This is still within the prescribed development standards of the NHA. However, this is still small when the need for socio-economic components are considered.

3.2.2 Infrastructures

(1) Road and Transportation Network

The types of roads to be constructed for Anislag resettlement site are shown below.

Types of Roads of Anislag Resettlement Site

Sites	Type of Road	Right-of-Way (m)	Pavement	Carriage way	Length (m)
Anislag Resettlement	Major/main	10.0	Macadam	6	333
	Minor/secondary	8.0	Macadam	6	338
	Service/tertiary	6.5	Macadam	5	718
	Path/alley	3.0	Compacted subgrade	3	3,800

This resettlement site also followed the minimum circulation design requirements. The macadam main road is now serviceable. The total area of road lots and footpaths is 2.2ha or equivalent to 17.50% (2.2ha/12.57ha) of the total project area (refer to the above table).

(2) Water Supply System

The existing water being used in the area is supplied from a shallow well with a pitcher type pump. The 28 shallow wells at the site have good water quality and some of them are being used by the first batch of resettlers. However, 24 hand pumps have to be temporarily removed to avoid rampant theft of jetmatic pumps.

The 28 shallow wells are more than enough for the early resettlers but as the site becomes filled up, water resources would be difficult. It is thus recommended that deep wells be constructed in the site so that water supply would be stabilized

especially during the dry season. Below is the table for the computed water demand for Anislag Resettlement Site.

Water Demand for Anislag Resettlement Site

Item	Anislag Resettlement
1. No. of Housing Units	635
2. No. of HH/Unit	5
3. Average Daily Demand	150 liter/capita/day
4. Peak Factor	1.5
5. Design Population (5 years)	Population = $1.5 \times 635 \times 5 = 4,763$
6. Average Daily Demand	$4,688 \text{ persons} \times 150 \text{ liters} = 703,200 \text{ liters}$
7. Maximum Daily Demand	$1.1 \times 703,200 = 773,520 \text{ liters}$
8. Maximum Hour Demand	$1.5 \times 703,200 = 1,054,800 \text{ liters per day} / 12.21 \text{ liters per second}$
9. Requirements	2 Elevated water tank w/10,000 gal. Capacity: Water mains should be 100 mm dia. uPVC pipe

Note: uPVC = Unplasticized Polyvinyl Chloride

The proposed water development layout for Anislag Resettlement Site is shown in Figure XXII 3.16.

(3) Electric Power Supply System

The site as of the moment does not have power lines that will supply electricity. The nearest power main grid is along the main provincial highway which is about 1.50km away. However, inquiry from ALECO (Albay Electric Cooperative) revealed that the power supply will be made available this year and design and layouts have been finalized.

(4) Public Building

1) Elementary School Building

The provision of elementary school facilities both for Anislag is a must to attract future resettlers and to be able to complete the basic community facilities being called for by the future residents.

The elementary school which is the lone barangay school is 1.5km away from the resettlement site. The estimated future residents of 635 will exceed a thousand beneficiaries when the second phase of the site is developed and will be completely filled up. Thus, the requirement for elementary school facilities is almost the same to the one being proposed for the Banquerohan Phase I and II. Adopting this design of the school building is justifiable since residents from the adjacent area would get to avail of public education which is adjacent to their present houses.

2) Chapel

The chapel design and its size is likely the same with the one constructed and already being used in Banquerohan Phase I. The layout and the dimensions are shown in Figure XXII 3.8. The floor area requirement for this chapel is 233m² (10m x 23.3m). The proposed lot area requirement for this facility is about 1,500m² (30m x 50m). As to the dimensions, they are based on the existing chapel in Banquerohan Phase I.

3) Public Hall/Multi-purpose Hall

This building planned to serve as venue for the beneficiaries and the local government personnel to conduct outreach seminars, training and other important meetings. This could also as barangay outpost during night time. The planned size of the multi-purpose hall is about 55.0m². This floor area is the regular size of public hall being constructed by NHA in some of its developed resettlement sites. Barangay halls in rural areas have the same size as recommended.

4) Others

a. Health and Day Care Center

This community facility is proposed to be built in Anislag resettlement site. This facility is planned with an area of 60m². The size adopted conforms to the existing floor area of barangay health facilities already constructed by NHA in its resettlement/relocation sites. It is provided with an office, kitchen and single toilet.

This center is dual in use. The other half can be a day care center while the other half can be the clinic/check-up area to be used by visiting doctor or health worker. The health center can be installed with three hospital beds in case of emergency.

b. Productivity Center

The productivity center is envisioned to be the venue for livelihood and skills training for the beneficiaries. The conduct of training is in line with the local government thrust of providing livelihood opportunities to majority of the people living in the resettlement sites. The building is provided with ample floor area for training, big kitchen area for demonstration, office for livelihood officers and two big toilets. This building measures about 90m².

The productivity center is proposed to be constructed on the open area which is part of the Phase II of Anislag. Refer to XXII 3.17 for the proposed layout of basic community and livelihood facilities for Anislag Resettlement Site.

c. Multi-purpose Warehouse

As discussed in the proposed warehouse to be used for the Banquerohan resettlement sites, this design can be adopted to enable farmers to have a durable storage space especially during strong typhoons. This warehouse will be used by recognized resettlers' cooperative or community association. They will be the one to identify goods that will be stored in every compartment. Storage fees will be paid to the cooperative/association, the rate of which will be determined by all members. The site of this warehouse will be high enough so that a flood would not reach the floor. It should also be accessible to farmers and also to buyers.

3.2.3 Housing Lot Plan

The design standards proposed by the JICA Study Team for Banquerohan Resettlement Site development will be also applied to Anislag Resettlement Site development. For detailed information, refer to the previous Section 3.1.3. As to the standard housing layout plan, refer to Figure XXII 3.3.

4. PRELIMINARY STRUCTURAL DESIGN

4.1 Banquerohan Resettlement Site (Phase I & II)

(1) Infrastructures

1) Road and Transportation Network

The existing roads and alleys for the resettlement sites are all made up of compacted subgrade with no all-weather pavement on it. The macadam roads are the most easily adopted type of road being implemented in any relocation site of the government. Though it wears easily, repair can be easily done by the barangay since the materials are available within the site.

However, the fast development of the community warrants the introduction of an all-weather asphaltic-based paving material for the main roads (10.0m R.O.W.) which will help reduce the erosion of subgrade base of the road and enhance the flow of traffic within the relocation site.

For the paths and alleys, concrete paving blocks can be easily manufactured by the barangay. The ideal size of the paving block is about 0.3m x 0.3m x 0.05m thick. This paving block can then be laid on compacted subgrade of the path walks.

2) Water Supply System

The layout plans for the water supply for Banquerohan Phases I and II are presented in Figures XXII 3.4 and XXII 3.5. The deep wells to be drilled in the site will be used as water source for the elevated water tanks. Centrifugal pumps will be used for drawing underground water and raise it to the elevated tanks.

Stored water in the tanks will then be distributed using plastic pipes (Polyvinyl Chloride pipes). Cast iron fittings such as gate valves, tees, cross tees will have to be used to control water flow.

Communal faucets will then be installed from which the residents can get their supply of potable water. At least 10 residents will be using one communal faucet for their domestic water needs.

3) Electric Power Supply System

The layout plans for the electrical power supply is presented in Figure XXII 3.6. The layout shows the transformer requirement as well as the pole and wires to be used.

The electric power layout plans was made to ascertain the cost of energizing the Banquerohan Phase II site.

4) Sanitary System

The existing sanitary layout for Banquerohan Phase I and II needs upgrading and rehabilitation respectively. The toilets constructed in Phase I were proposed to serve four residents per toilet. The toilets were therefore communal in use. The problem with this kind of set up is the quick deterioration of the facility and the manner of the usage among the beneficiaries.

Whereas for Phase II, the constructed septic tanks were already destroyed beyond repair. Complete rehabilitation will have to be done for the sanitary system to be functional and become useful for future resettlers.

5) Access Roads

Residents of Banquerohan Phase I have no direct access to the coastal areas. Those that wish to engage in fishing have to traverse a 1.0m. wide trail leading to the coastal area. The path is about 1.5km long and bringing of goods to and from

the coastal area is rather difficult and does not encourage residents to venture in aquaculture development.

It is recommended, therefore, to provide wider access roads connecting the resettlement site to the coastal area. This will open up new avenue for the residents contemplating of going into fishing business or any related endeavors. The government can therefore establish training facility for aquaculture development.

(2) Housing Lot

The recommended lot size to be able for a family to have ample space for improvement is about 120m². This lot area may have dimension of 10m x 12m on the average.

(3) House Building

The (Type I) core house with an area of 21.7m² provisions for expansion. Additional bedrooms provided for the bigger models consist of 12m² room (4m x 3m). Financial assistance for construction of a core house of 21.7m² will be granted to beneficiaries resettlers. The core house (Type I) will consist of two bedrooms, multipurpose living room, kitchen, toilet and bath.

Regarding the expansion and betterment of the respective house accommodations, modular upgrading scheme allows for the gradual improvement in the structure according to the needs, preferences, and capacity of the families.

(4) Work Volume

Banqurohan Resettlement Site (Phase I & II)

Item	Phase I	Phase II
Community Facilities		
1. School Building	1 unit	-
2. Chapel	-	-
3. Multi-purpose Hall	-	1 unit
4. Health & Day Care	-	-
5. Productivity Center	-	1 unit
6. Warehouse	-	1 unit
Infrastructure		
1. Core housing units	96 units	460 units
2. Water Supply	Refer to Table XXIV 3.6	Refer to Table XXIV 3.6
3. Power Supply	-	Refer to Table XXIV 3.7
4. Circulation	-	
- Major road	Refer to Table XXIV 3.9	Refer to Table XXIV 3.9
- Alleys	Refer to Table XXIV 3.9	Refer to Table XXIV 3.9
5. Drainage	8,000m	6,700m
6. Site Clearing	-	5,640m ²
7. Sanitary System	474 units	460 units
8. Access Roads	Refer to Table XXIV 3.9	-

4.2 Anislag Resettlement Site

(1) Infrastructures

1) Road and Transportation Network

The existing roads and alleys for the resettlement sites are all made up of compacted subgrade with no all-weather pavement on it. The macadam roads are the most easily adopted type of road being implemented in any relocation site of the government. Though it wears easily, repair can be easily done by the barangay since the materials are available within the site.

In order to provide easy and smooth access from the main provincial road to the resettlement site, it is recommended that the barangay access road which leads to the site be paved with all-weather asphaltic-based paving materials. This will help neighboring barangays as well and delivery of goods to and from the site more conveniently. Living conditions of the residents in the site as well as the adjacent communities will be benefited.

For the paths and alleys, concrete paving blocks can be easily manufactured by the barangay. The ideal size of the paving block is about 0.3m x 0.3m x 0.05m thick. This paving block can then be laid on compacted subgrade of the paths.

2) Water Supply System

The layout plans for the water supply for Anislag resettlement site is presented in Figure XXII 3.16. The deep wells to be drilled in the site will be used as water source for the elevated water tanks. Centrifugal pumps will be used for drawing underground water and raise it to the elevated tanks.

Stored water in the tanks will then be distributed using plastic pipes (Polyvinyl Chloride pipes). Cast iron fittings such as gate valves, tees, cross tees will have to be used to control water flow. Communal faucets will then be installed from which the residents can get their supply of potable water. At least 10 residents will be using one communal faucet for their domestic water needs.

3) Electric Power Supply System

The layout plans for electrical power supply system will be provided by ALECO.

The costing and the materials requirements for the project is already prepared and just awaiting the actual implementation by the concerned agency.

4) Sanitary System

The sanitary system for Anislag resettlement site is already complete and is now being used by the residents themselves. Each unit has its own toilet unlike in Banquerohan Phase I where about 4 residents share the use of 1 toilet.

The development of sanitary system for Anislag is a septic tank type wherein the residents will just provide a toilet bowl and construct their own toilet. With this mode of construction, residents will have a closer maintenance of their respective units.

(2) Housing Lot

As recommended for Banquerohan Phase I and II, the lot size of 120m² is the lot area which was adopted in the lot distribution for Anislag site.

The (Type I) core house with an area of 21.7m² provisions for expansion. Additional bedrooms provided for the bigger models consist of 12m² room (4m x 3m). The core house (Type I) will consist of two bedrooms, multipurpose living room, kitchen, toilet and bath.

Regarding the expansion and betterment of the respective house accommodations, modular upgrading scheme allows for the gradual improvement in the structure according to the needs, preferences, and capacity of the families.

(4) Work Volume

Anislag Resettlement Site

Item	Total
Community Facilities	
1. School Building	1 unit
2. Chapel	1 unit
3. Multi-purpose Hall	1 unit
4. Health & Day Care	1 unit
5. Productivity Center	1 unit
6. Warehouse	1 unit
Infrastructure	
1. Core housing units	505 units
2. Water Supply	Refer to Table XXIV 3.6
3. Power Supply	-
4. Circulation	-
- Major road	-
- Alleys	-
5. Drainage	-
6. Site Clearing	-
7. Sanitary System	-
8. Access Roads	Refer to Table XXIV 3.9

**Table XXII 1.1 Profile of the Banquerohan Resettlement Site and Anislag Resettlement Plan
(as of October 1999)**

Name	(1) Banquerohan Resettlement Site	(2) Anislag Resettlement Plan
1. Location	Banquerohan, Legazpi City	Anislag, Daraga
2. Distance from crater (km)	25 km	15 km
3. Distance from former residence (km)	20 km	8 km
4. Land area (ha)	Phase I : 18.93 ha (<i>Phase II Plan : 27.07 ha</i>)	21.35 ha (Phase I: 12.57ha, Phase II: 8.78ha)
5. No. of houses	Phase I : 600 (<i>Phase II Plan : 460</i>)	Planning for 635
6. Home lot size (m ²)	Phase I : 90 - 298m ² (<i>Phase II : 90 - 290 m²</i>)	100m ² (10m x 10m)
7. House size (m ²)	Phase I : 20 m ² (4m x 5m)	10.5m ² (3.0m x 3.5m)
8. Establishment (year)	Phase I : 1994	Construction started on May 1998 and to be completed in 1999.
9. Total Investment Amount (Million Pesos)	Phase I: 38.9 / Phase II: 8.0	19.4 Millions Pesos
10. Beneficiaries	Victims of Mayon Volcano eruption	Victims of Mayon Volcano eruption and typhoon Rosing, and those living in danger areas
11. Actual no. of houses awarded	504	80 houses are under construction.
12. Estimated no. of household living in the resettlement	174	None
13. Profile of the beneficiaries	Farmers, laborers & employees (Coconut, vegetables such tomato, cucumber, squash, pechay, beans and rootcrops such as cassava)	Farmers and laborers (coconut, paddy rice and vegetables)
14. Name of former Barangay	Arimbay, Bagong Abre, Bigaa, Bonga, Boyoan, Mabinit, Matanag, Padang	Budiao(all HH), Banadero(21/300), Busay(91/300), Banag(69/400), Binitayan(128/1,000), Kimangtong and Tagas(100/1,000)
15. Project Administration	LGU-Legazpi City	LGU-Daraga
16. Land development	LGU-Legazpi City, NDCC, NHA	LGU-Daraga, NHA
17. Construction of houses	LGU-Legazpi City, NDCC(P20M), NHA	NHA, Donation from NGOs
18. NDCC Calamity Fund	None	9.57 Millions Pesos
19. Water supply	18 deep wells	28 units shallow wells
20. Other Facilities	Administration building, training hall, chapel, multi-purpose hall, recreational park, integrated family life resource center, ALECO power line	Concrete road, drainage system, individual septic tank, power lines by ALECO
21. Other remarks	Some resettlers acquired farm lots in nearby sites. Some temporarily farm on Phase II lots. Other livelihood means are abaca weaving, trading and so on. Few are engaged in fishing.	Adjacent to the resettlement area, construction of houses for government employes is planned. Irrigation system is availbale nearby.
22. Issues	Various technical and financial assistance were given but still resettlers face livelihood problems. Illegal squatting of non beneficiaries, insufficient potable water supply, lack of sanitary facilities (toilets), no farmlots for them and abandonment of some units by beneficiaries.	Technical assistance in livelihood generation is needed by acquiring farmlands and/or generating job opportunities.
23. Land Acquisition	Purchased by LGU	Purchased by LGU
24. Type of constructed house	Mayon model type II & III	Core shelter type
25. Livelihood assistance	National DSWD-Self Employment Assistance (SEA) "Kaunlaran" Program	None

Sources: Data from the City and Municipal authorities concerned and Results of the Area Development Potential Survey conducted in October 1999 by JICA Study Team .

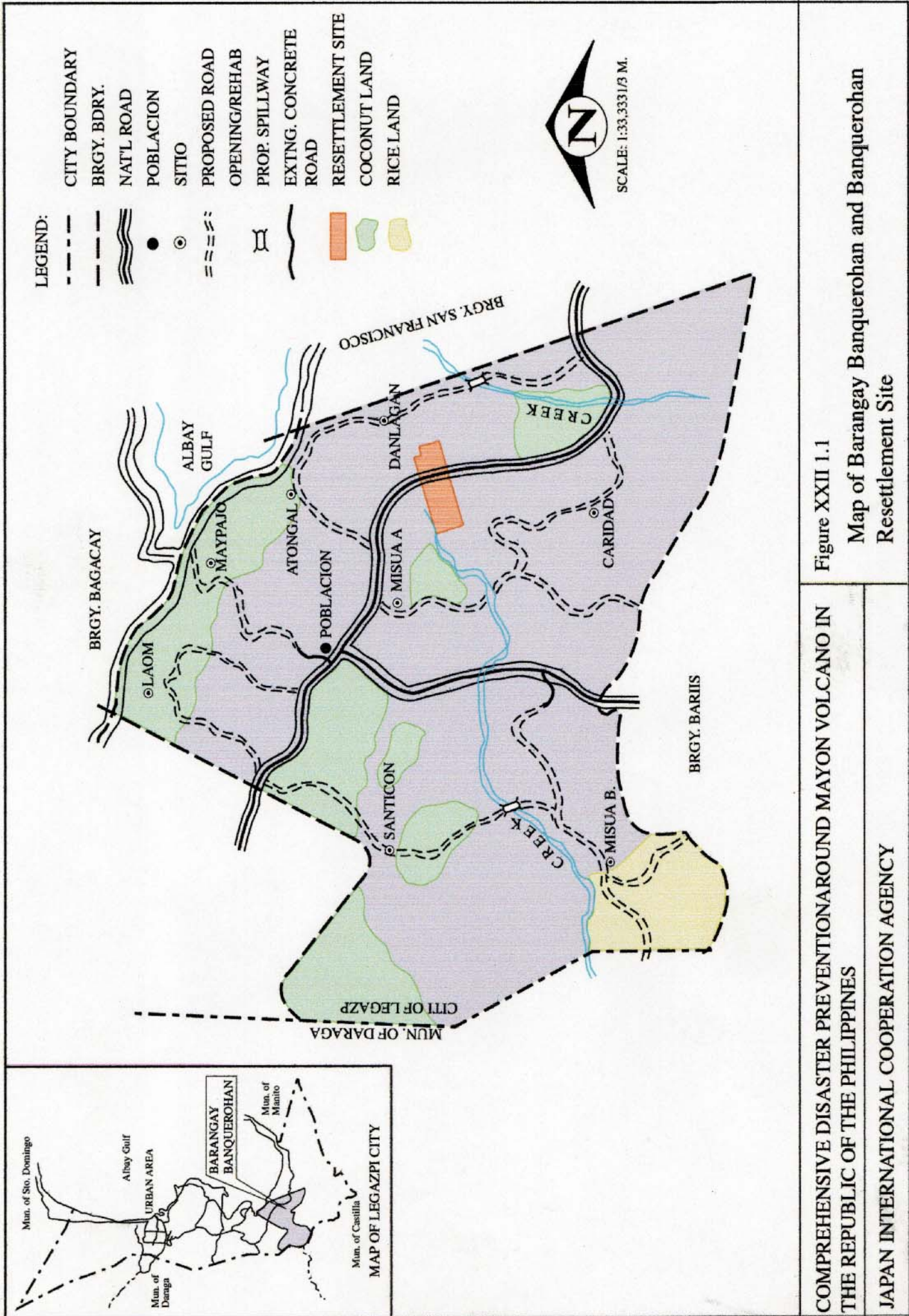
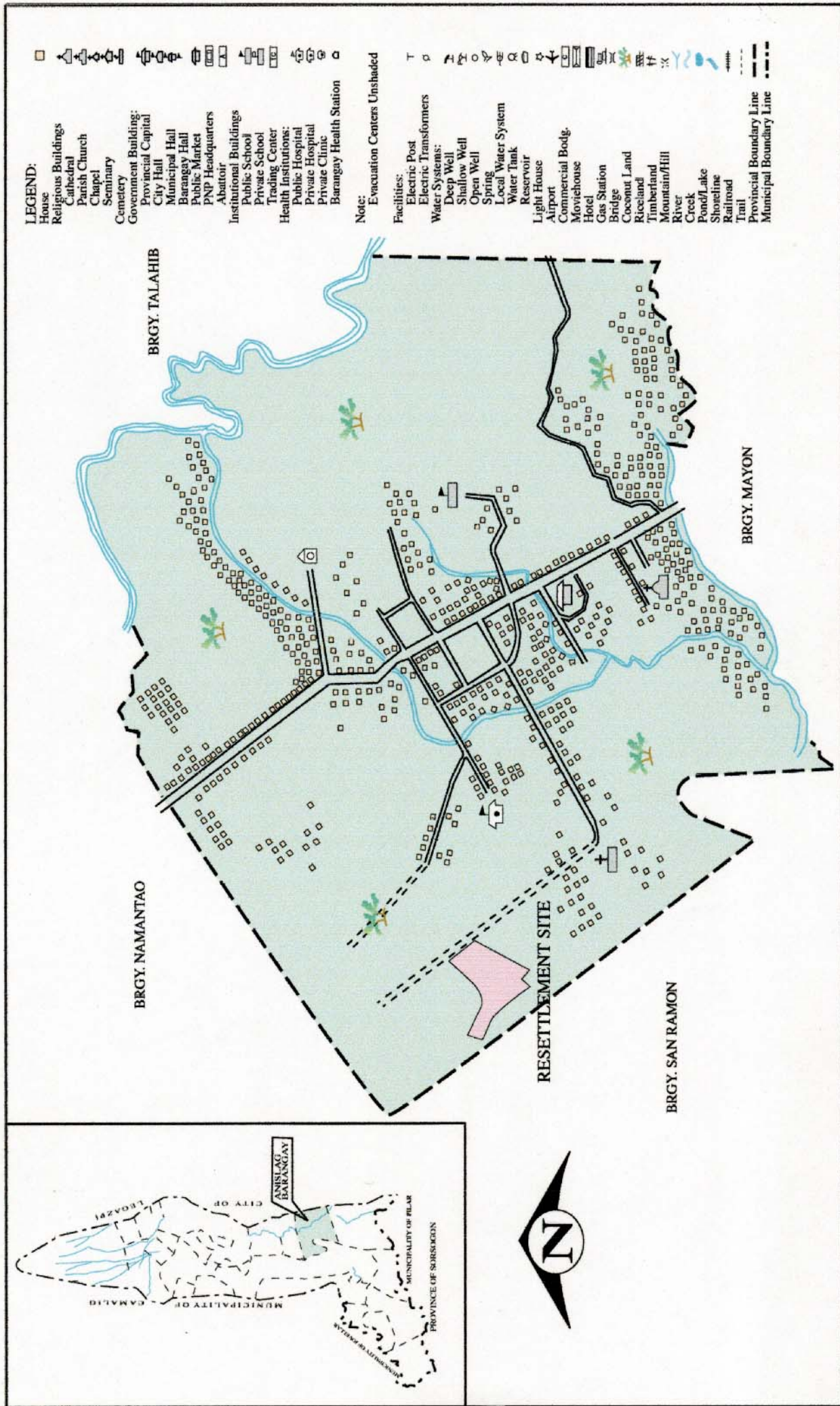


Figure XXII 1.1
 Map of Barangay Banquerohan and Banquerohan Resettlement Site

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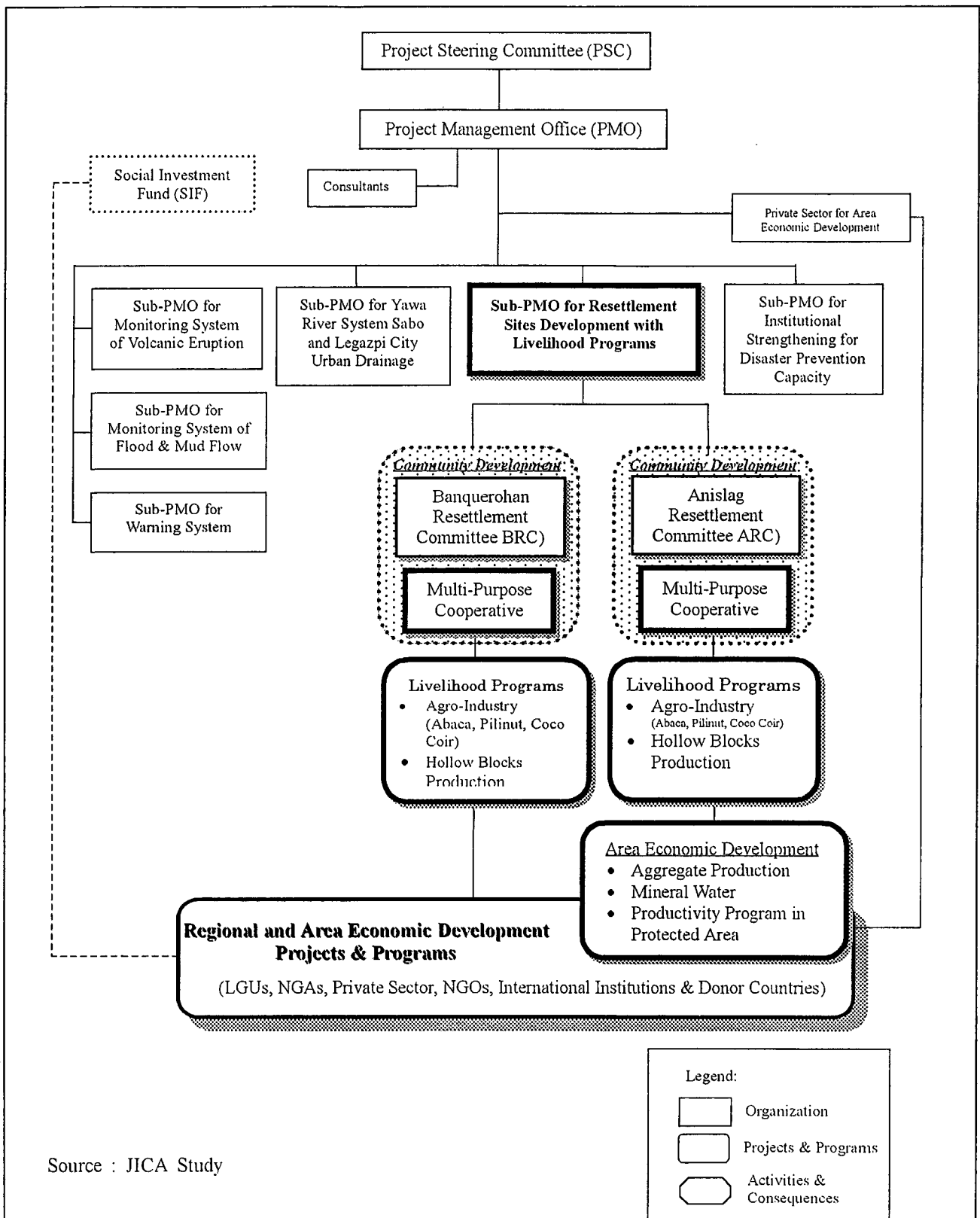


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Figure XXII 1.2

Map of Barangay Anislag and Anislag Resettlement Site



Source : JICA Study

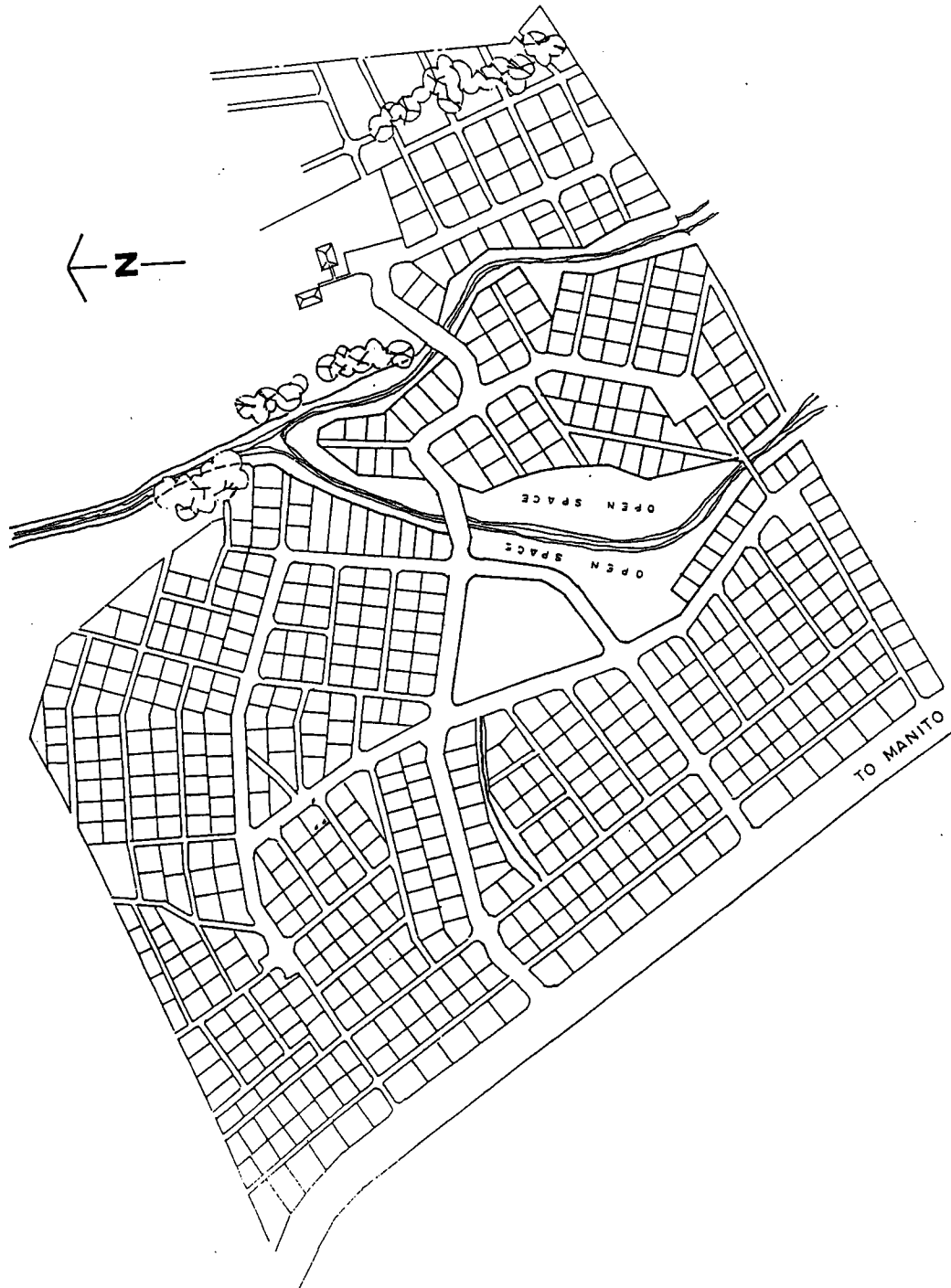


Figure XXII 3.1
Subdivision Plan for Banquerohan Resettlement Phase I

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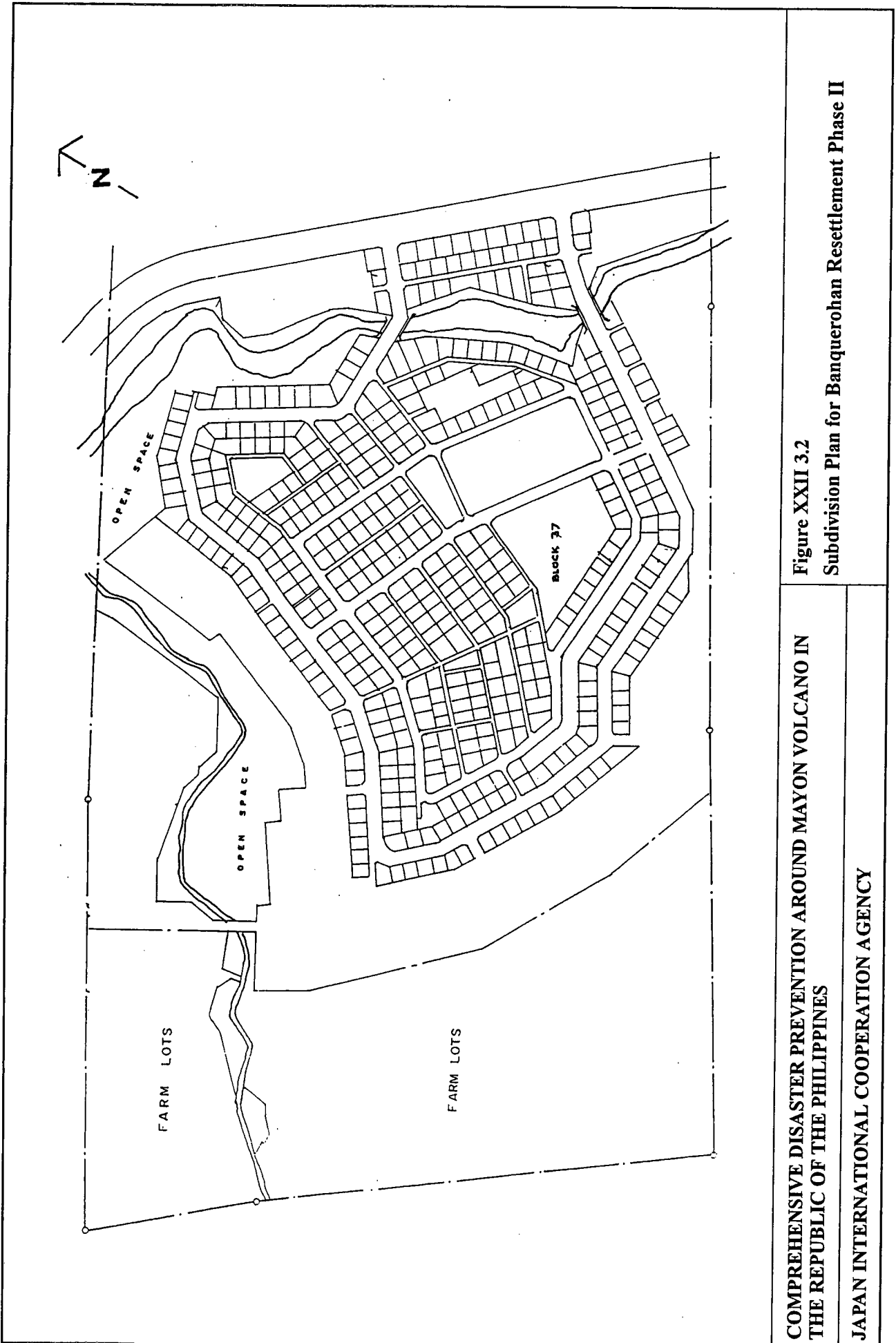
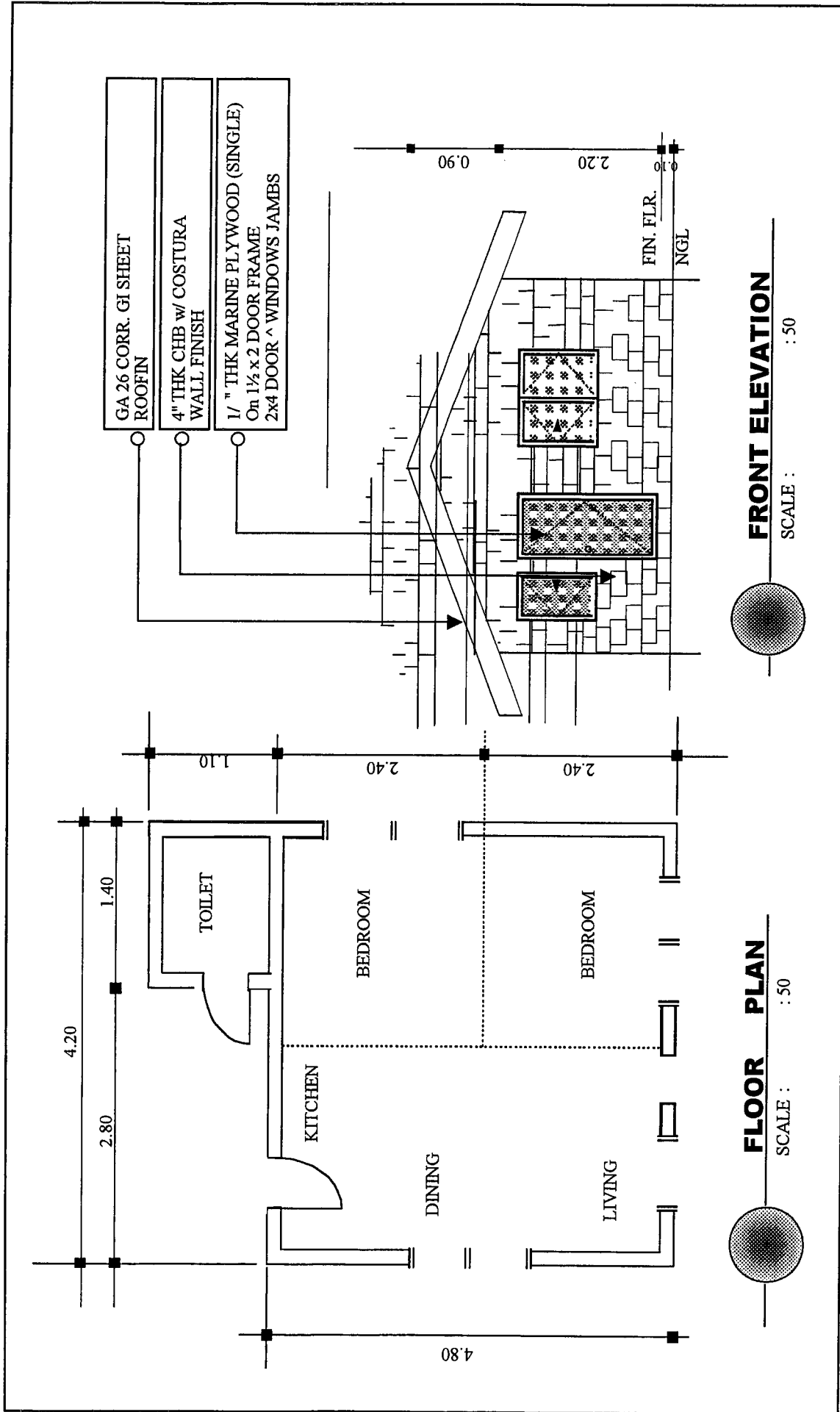


Figure XXII 3.2
Subdivision Plan for Banquerohan Resettlement Phase II

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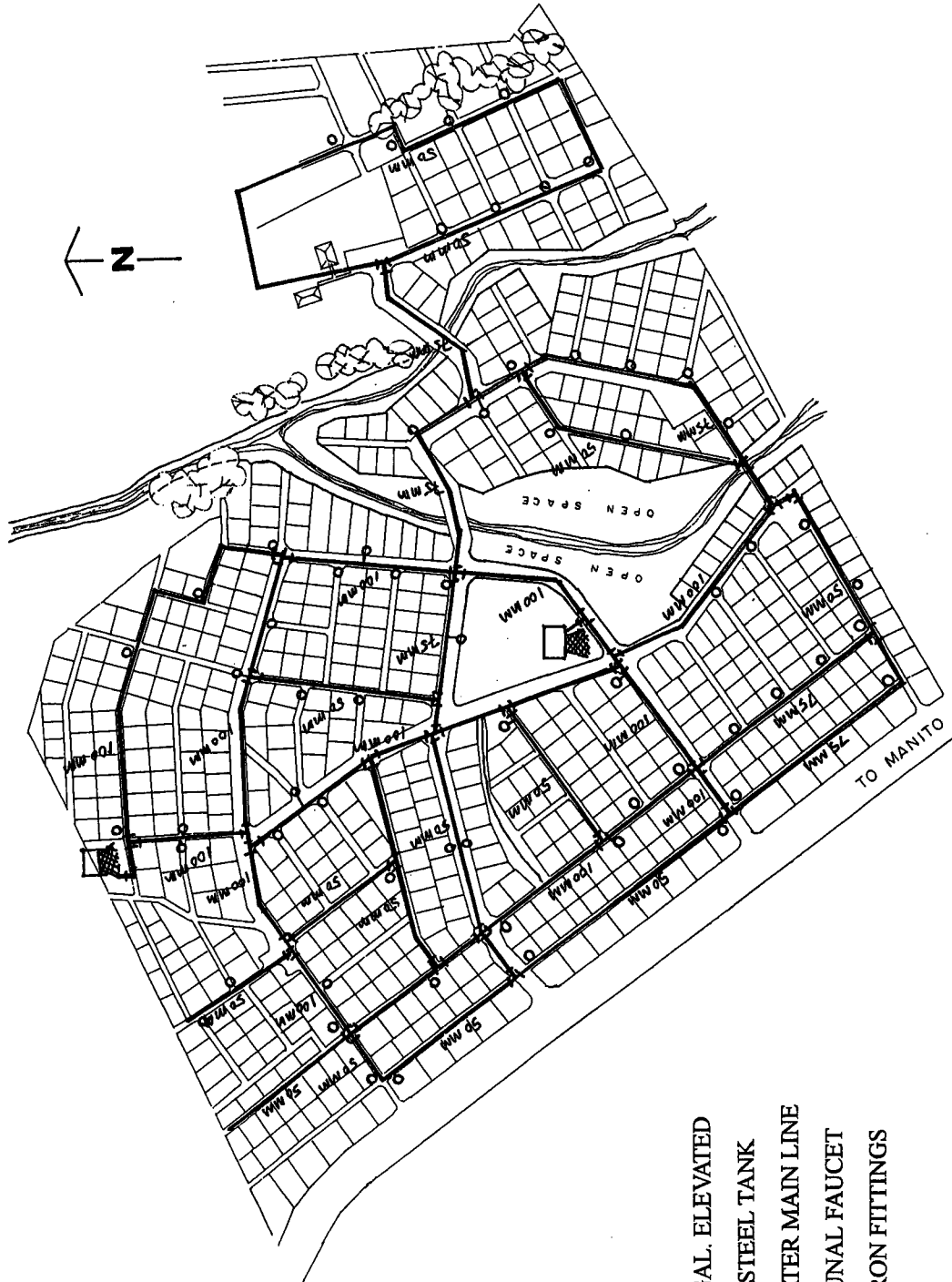
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Figure XXII 3.3
Standard Housing Layout Plan/Elevation

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LEGEND :

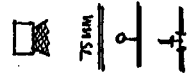
10,000 GAL. ELEVATED

WATER STEEL TANK

PVC WATER MAIN LINE

COMMUNAL FAUCET

CAST IRON FITTINGS



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Figure XXII 3.4
Water Supply Layout for Banquerohan Phase I

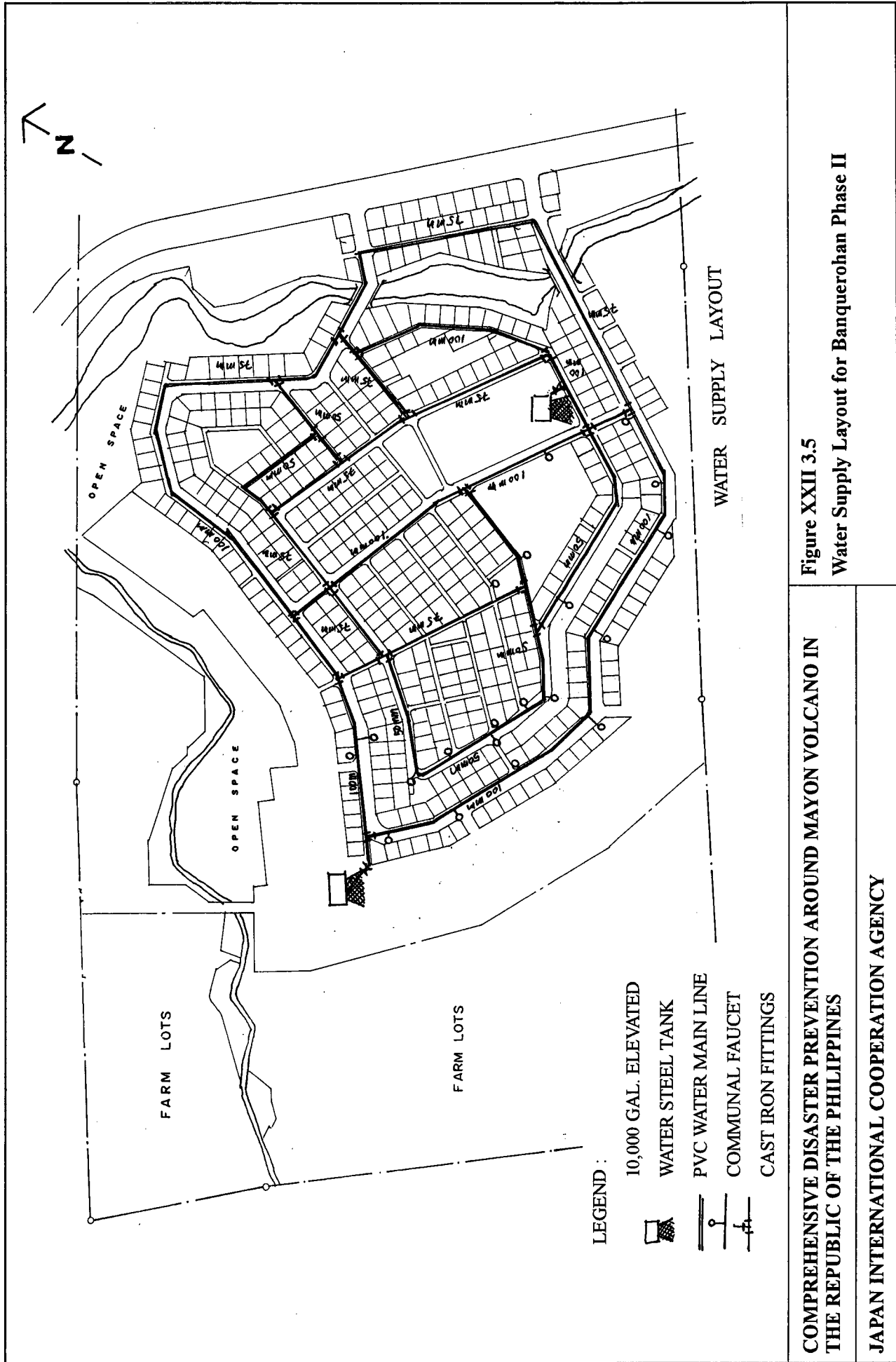


Figure XXII 3.5
Water Supply Layout for Banquerohan Phase II

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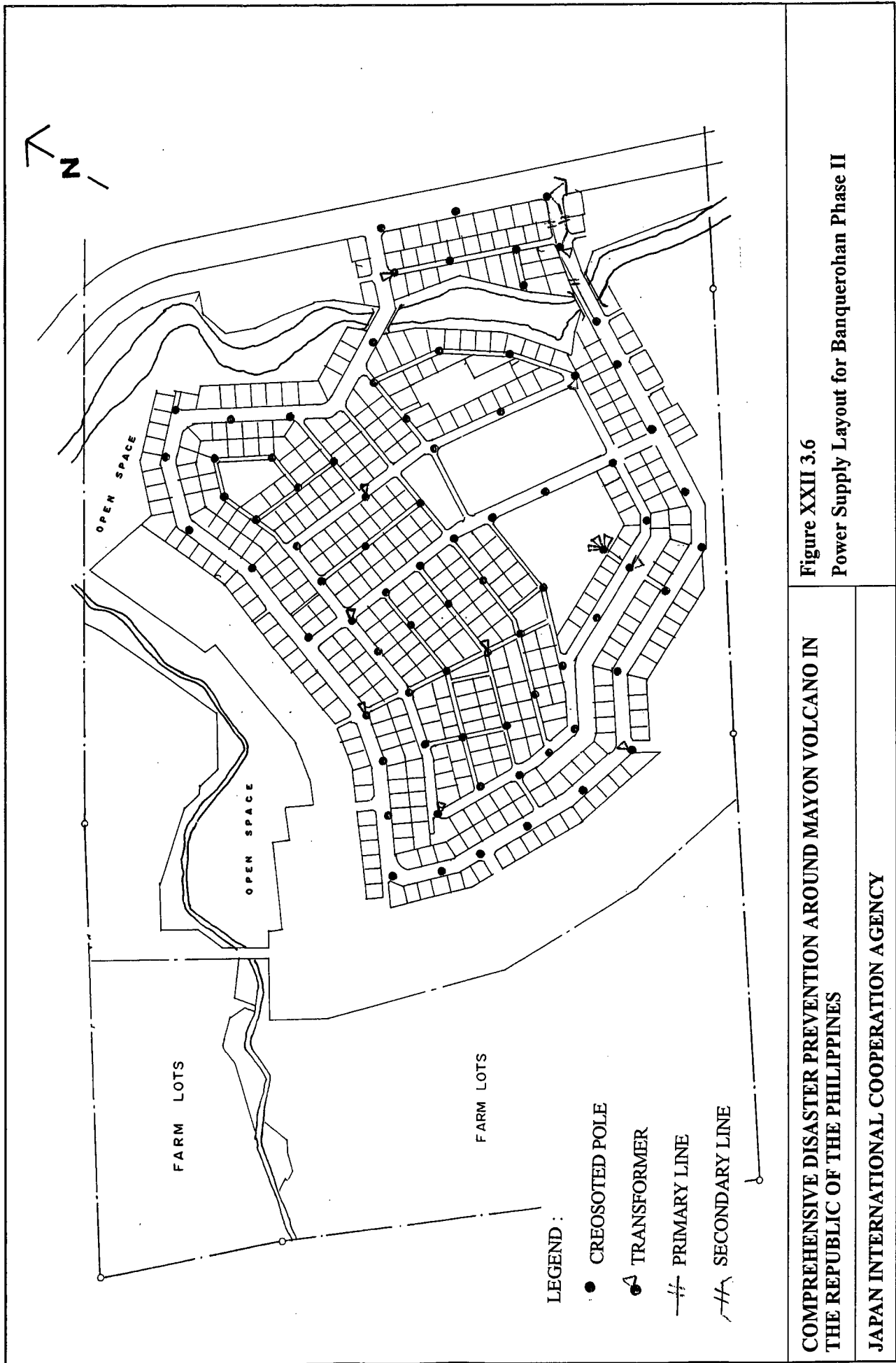


Figure XXII 3.6
Power Supply Layout for Banquerohan Phase II

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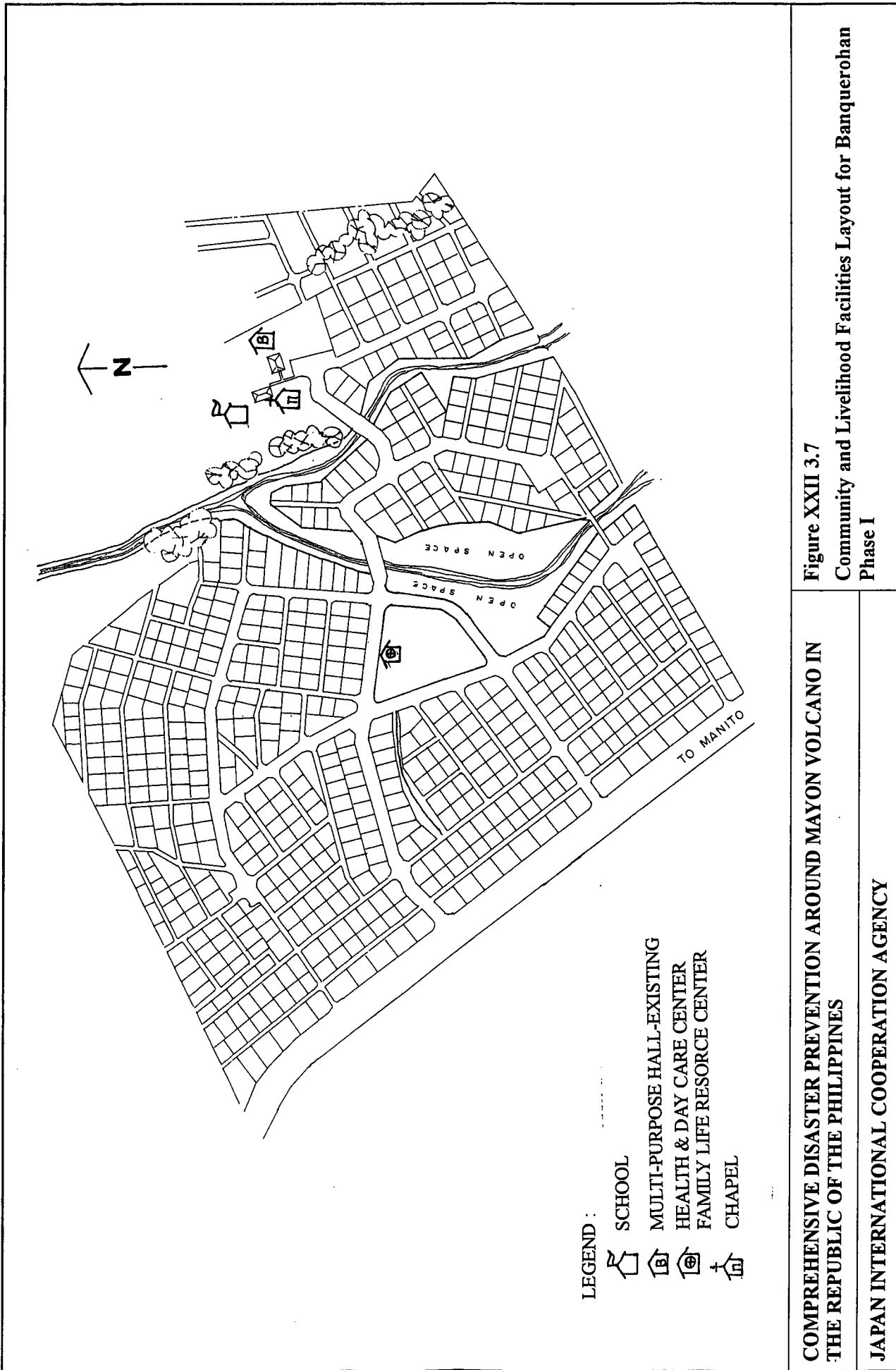


Figure XXII 3.7
Community and Livelihood Facilities Layout for Banquerohan
Phase I

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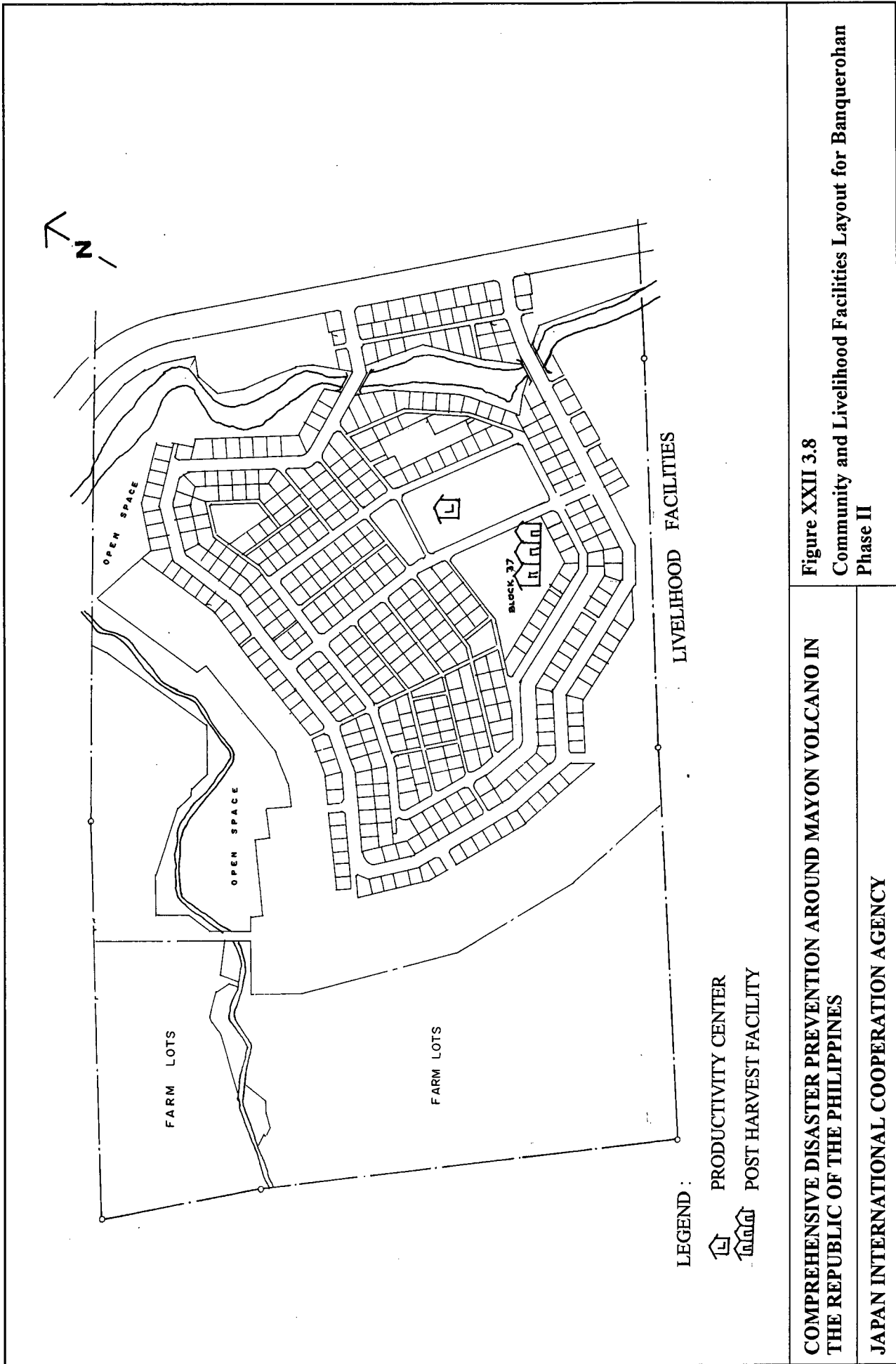
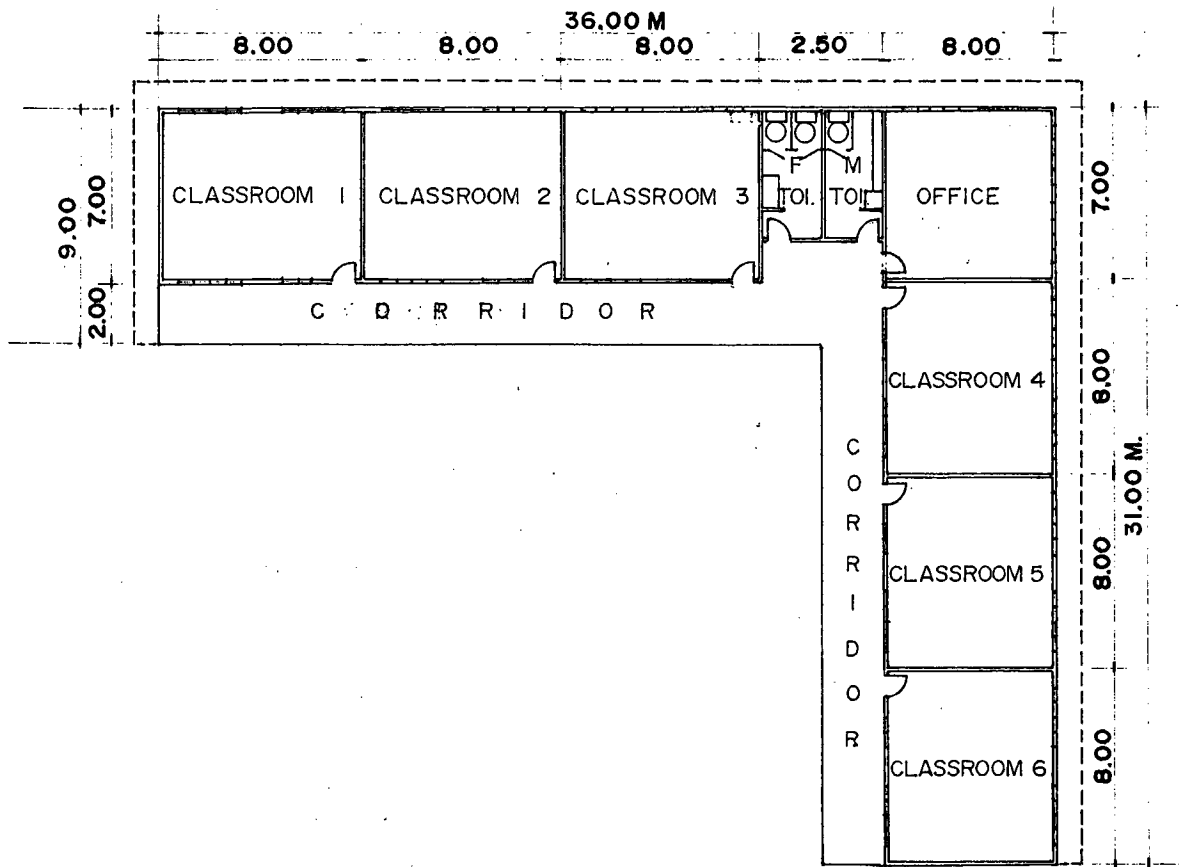


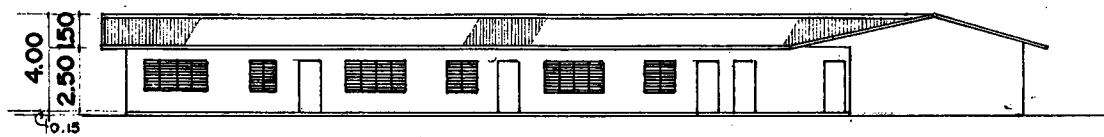
Figure XXII 3.8
Community and Livelihood Facilities Layout for Banquerohan
Phase II

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FLOOR PLAN.



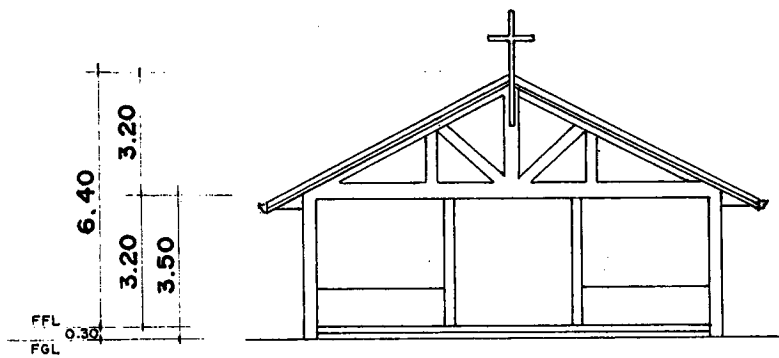
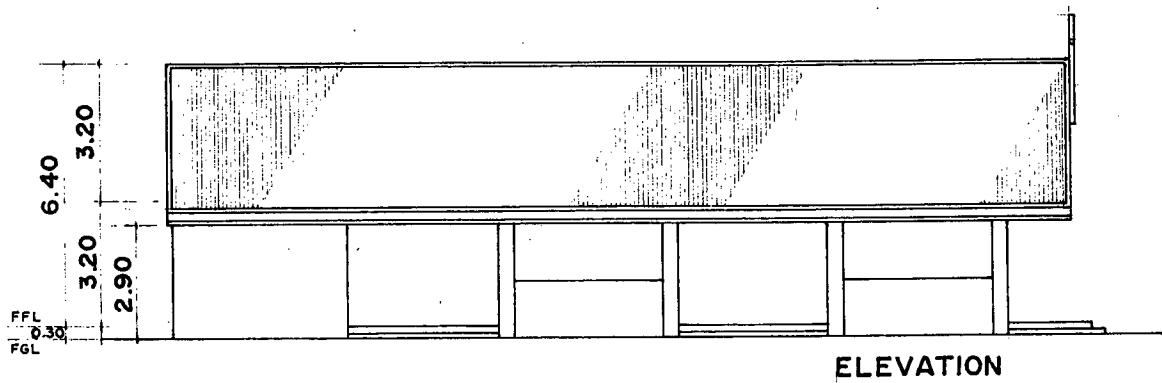
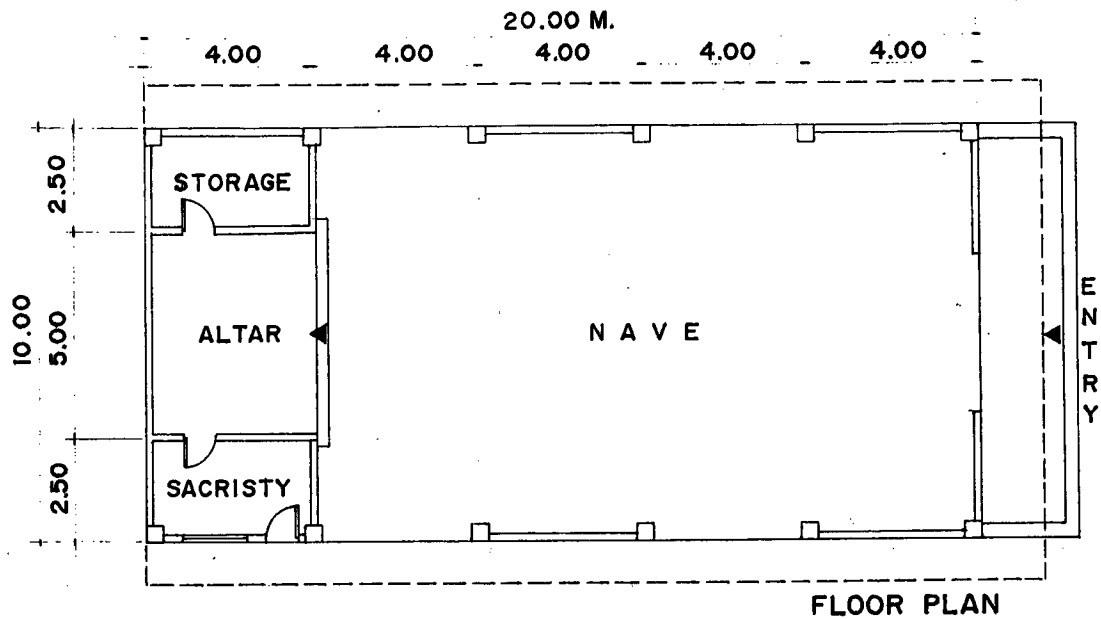
FRONT ELEVATION

SCALE: 1:250 M

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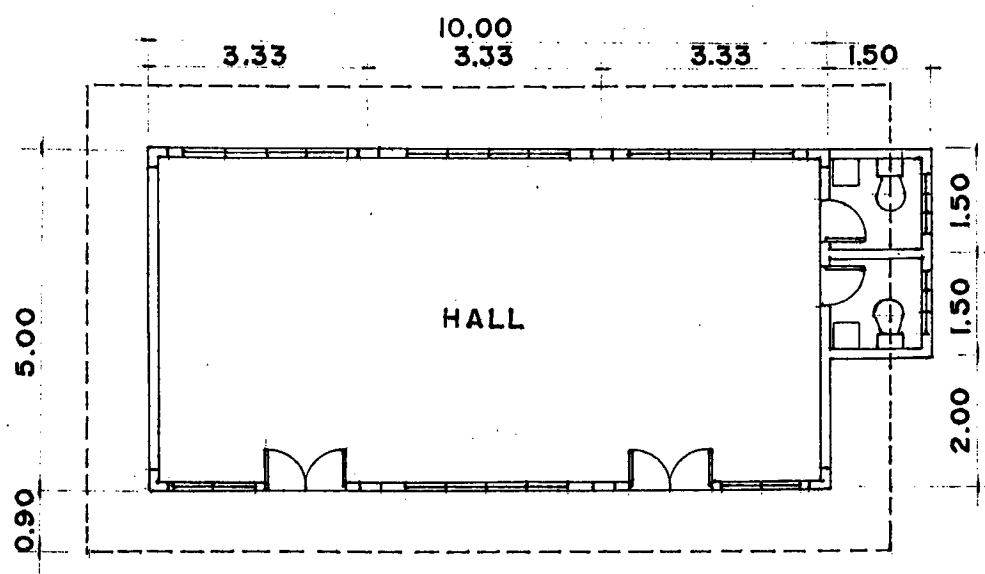
Figure XXII 3.9
School Building Layout Plan



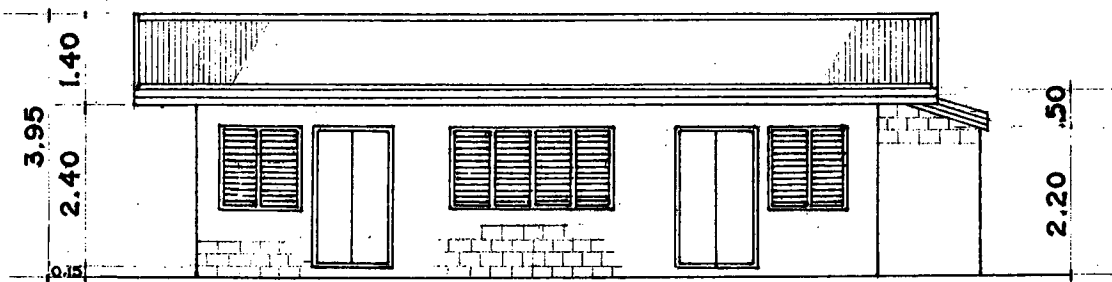
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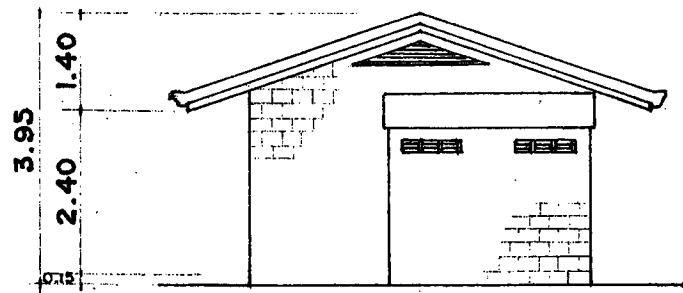
Figure XXII 3.10
Chapel Layout Plan



FLOOR PLAN



FRONT ELEVATION

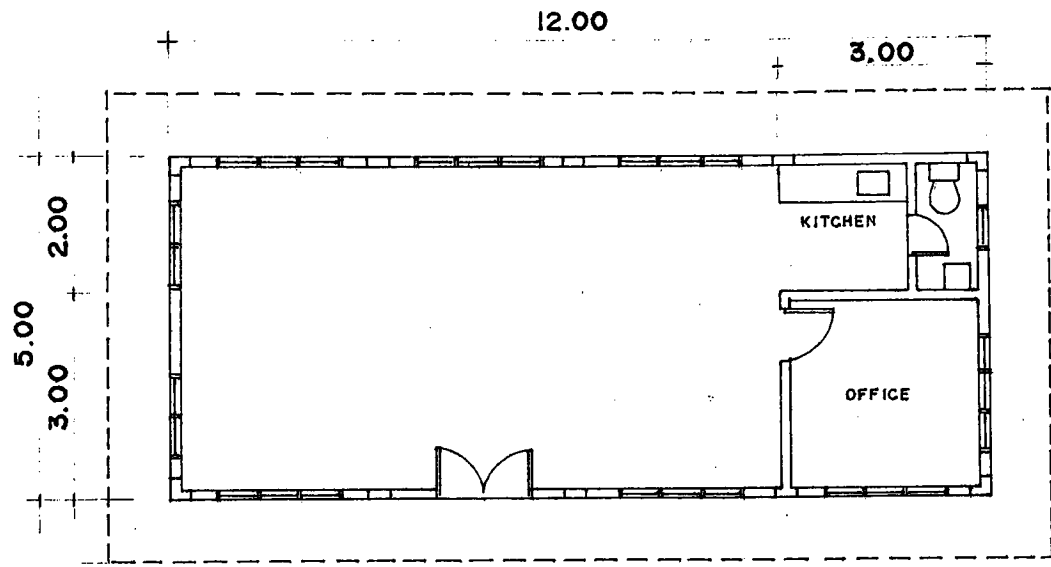


RIGHT SIDE ELEVATION

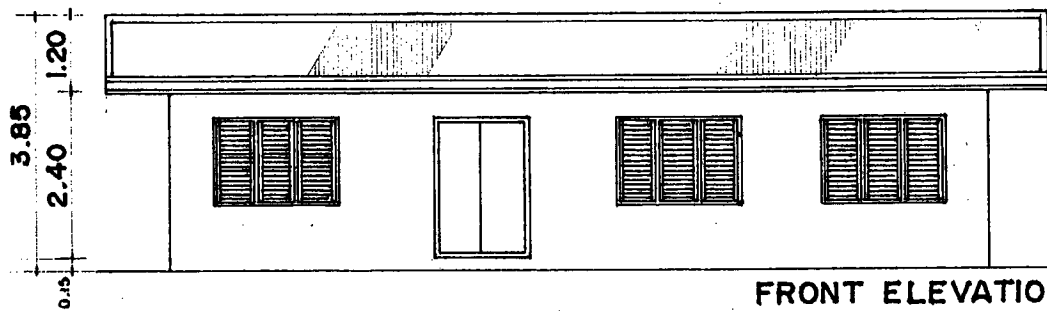
SCALE: 1:100M

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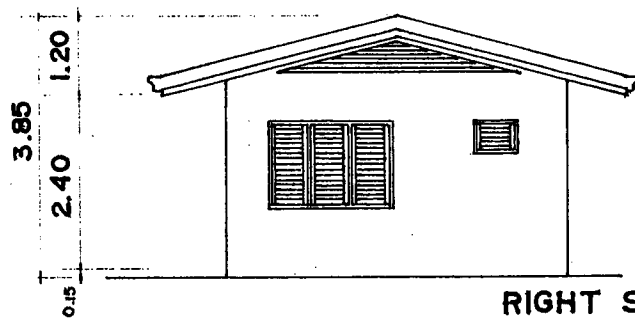
Figure XXII 3.11
 Multi-purpose hall Layout Plan



FLOOR PLAN



FRONT ELEVATION



RIGHT SIDE ELEVATION

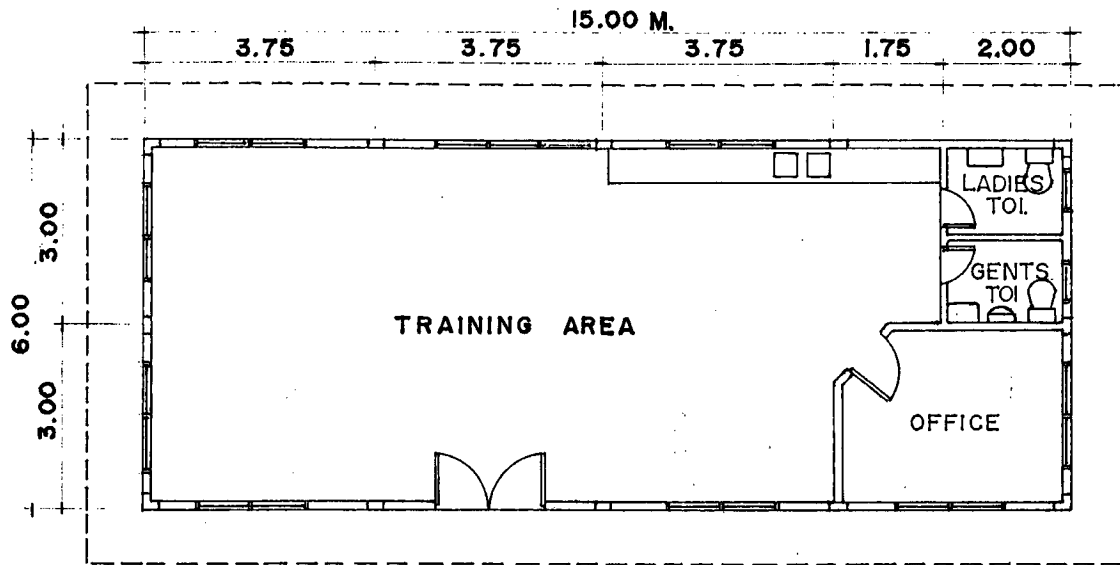
SCALE: 1:100M

COMPREHENSIVE DISASTER PREVENTION
AROUND MAYON VOLCANO IN
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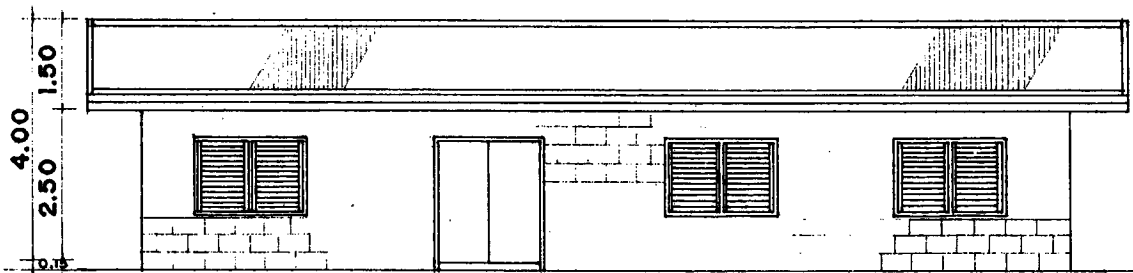
JAPAN INTERNATIONAL COOPERATION AGENCY

Figure XXII 3.12

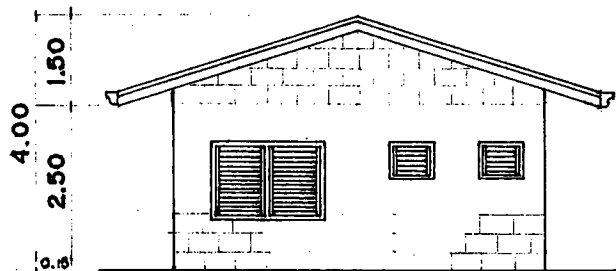
Health and Day Care Center Layout Plan



FLOOR PLAN



FRONT ELEVATION



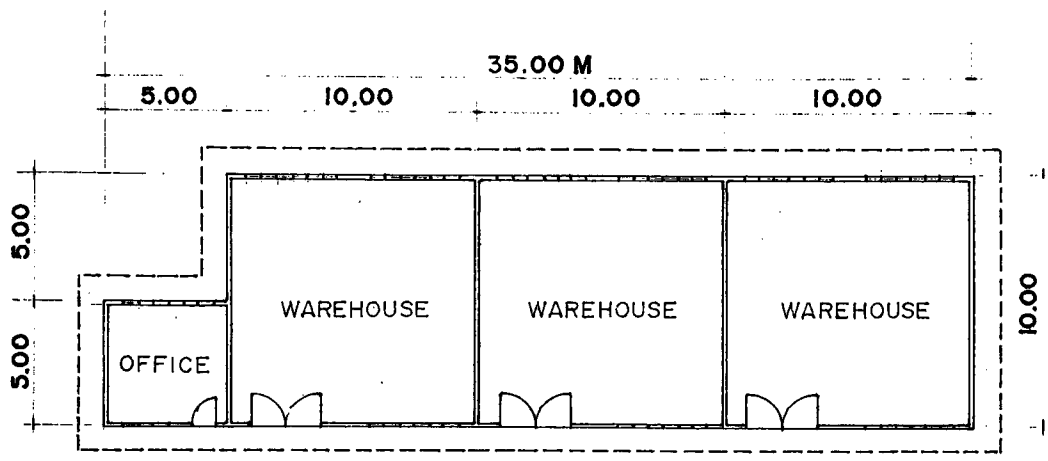
RIGHT SIDE ELEVATION

SCALE: 1:100M

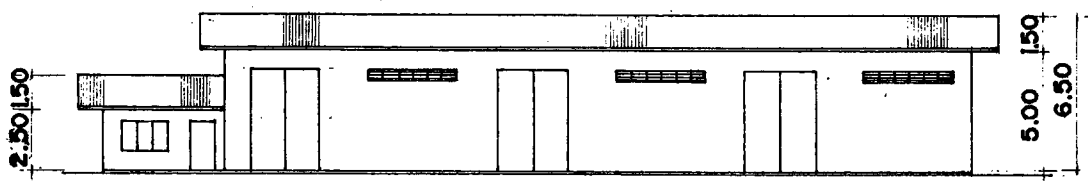
COMPREHENSIVE DISASTER PREVENTION
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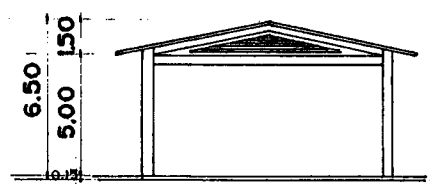
Figure XXII 3.13
Productivity Center Layout Plan



FLOOR PLAN



FRONT ELEVATION



RIGHT SIDE ELEVATION

SCALE : 1:250M

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Figure XXII 3.14
 Warehouse Layout Plan

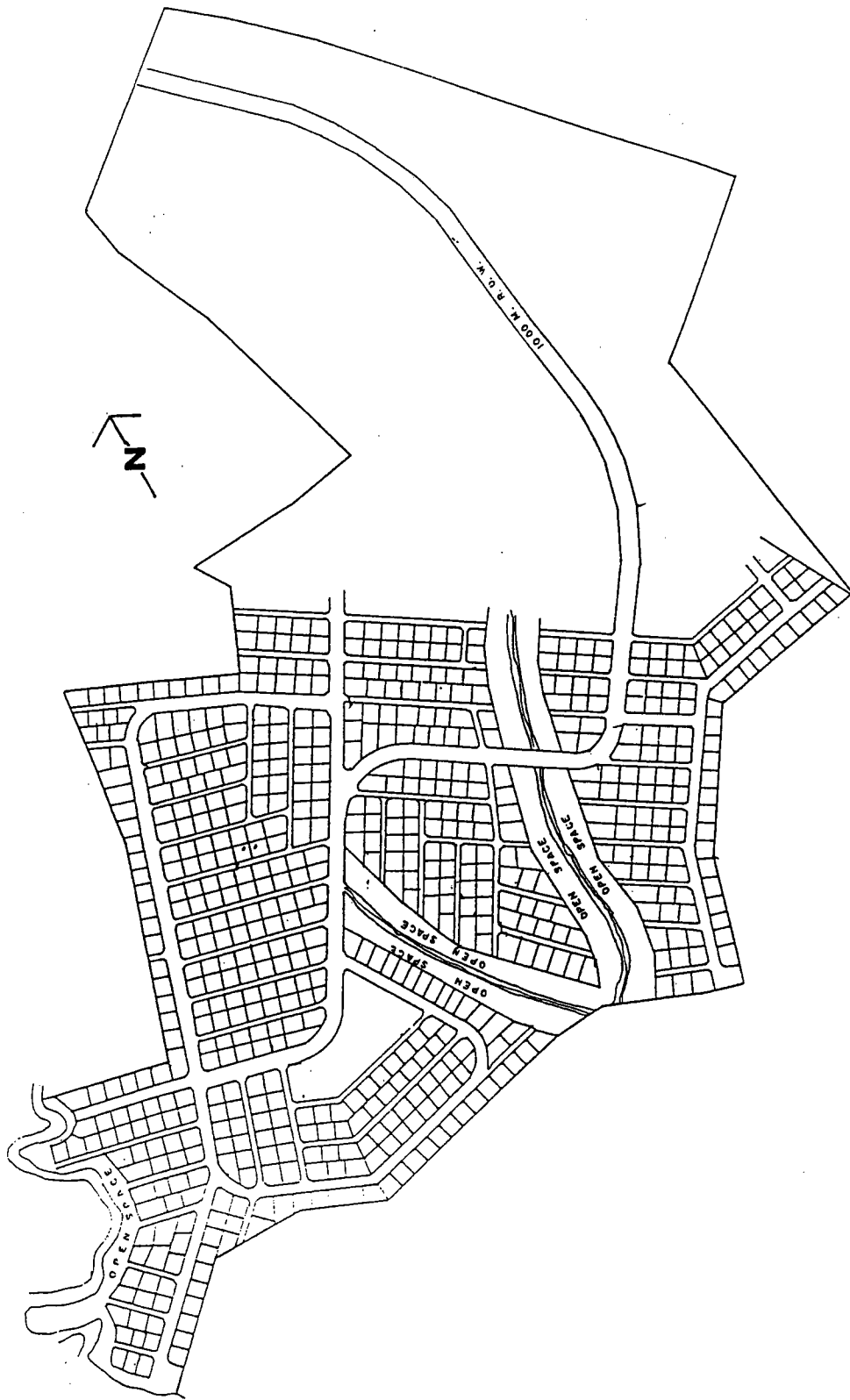


Figure XXII 3.15
Subdivision Plan for Anislag Resettlement Site

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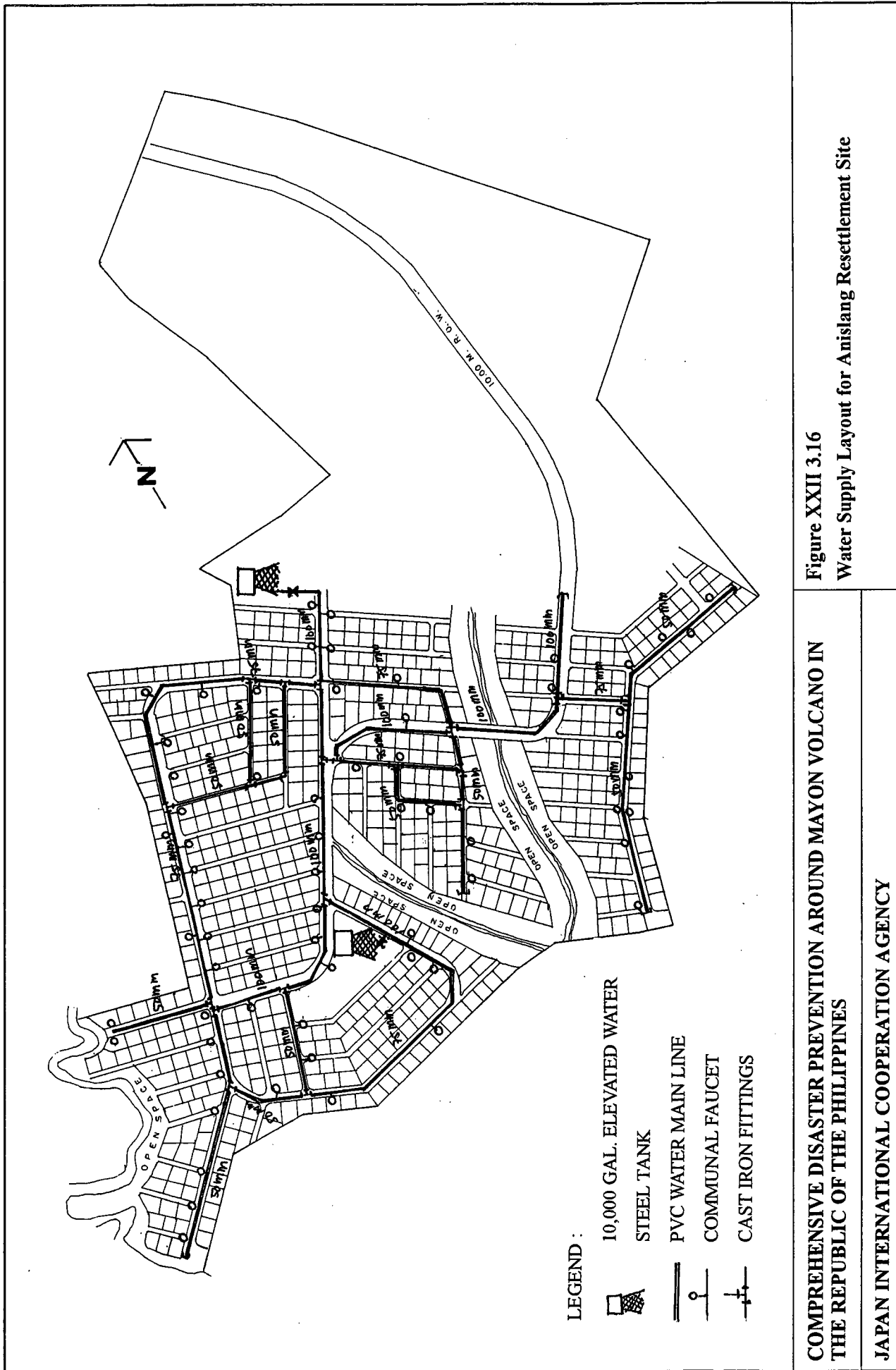


Figure XXII 3.16
Water Supply Layout for Anislang Resettlement Site

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