



DEPARTMENT OF  
PUBLIC WORKS AND  
HIGHWAYS  
THE REPUBLIC OF THE  
PHILIPPINES



JAPAN INTERNATIONAL  
COOPERATION AGENCY

# **SURVEY ON BASIC ENVIRONMENTAL AND SOCIAL CONSIDERATIONS FOR FLOOD MANAGEMENT PLAN IN METRO MANILA**

## **IN THE REPUBLIC OF THE PHILIPPINES**

### **FINAL REPORT**

August 2013

**GYROS CORPORATION  
PACET CORP.**

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## ABBREVIATIONS and ACRONYMS

AKPF	<i>Abot Kaya Pabahay</i> Fund (Affordable Housing Fund)
CCEP	Construction Contractor's Environmental Program
CDA	Cooperative Development Authority
CMP	Community Mortgage Program
COC	Certificate of Compliance
CSO	Civil Society Organization
CSWD	City Social Welfare and Development
DA	Department of Agriculture
DAO	Department Administrative Order
DBM	Department of Budget and Management
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DOF	Department of Finance
DPWH	Department of Public Works and Highways
DRRM	Disaster Risk Reduction and Management
DSWD	Department of Social Welfare and Development
ECC	Environmental Compliance Certificate
ECEA	Eastwood City Estates Association, Inc.
EFCOS	Effective Flood Control Operation and Warning System
EIS	Environmental Impact Statement
EMP	Environmental Management Program
ESSO	Environment Social Services Office (DPWH)
FMC	Flood Management Committee
GFI	Government Financing Institutions
GOP	Government of the Philippines
HCDRD	Housing Community Development and Resettlement Department
HRC	Housing and Resettlement Committee
HRU	Housing and Resettlement Unit
IASC	Inter-Agency Standing Committee
IROWR	Infrastructure Right of way and Resettlement (DPWH)
ISF	Informal Settler Families
ISF-NTWG	Informal Settler Family-National Technical Working Group
JICA M/P	Study on Flood Control and Drainage Project in Metro Manila (1990)
JMC	Joint Memorandum Circular
LARRIP	Land Acquisition, Resettlement, Rehabilitation and Indigenous People's Policy
LGU	Local Government Unit
LIAC	Local-Inter Agency Committee in LGU
LiDAR	Light Detection and Ranging Aerial Survey Data
LLDA	Laguna Lake Development Authority
LPMT	Local Project Management Team
LSSC	Livelihood Support Sub-Committee
MCGS	Marikina Control Gate Structure
MDFO	Municipal Development Fund Office
MERALCO	Manila Electric Company
MFW	Mangahan Floodway
MGB	Mines and Geosciences Bureau
MMDA	Metropolitan Manila Development Authority
MOA	Memorandum of Agreement
MRB	Medium Rise Building
MWSS	Metropolitan Waterworks and Sewerage System
NAMRIA	National Mapping and Resource Information Authority



NAPC	National Anti-Poverty Commission
NCR	National Capital Region
NDCC	National Disaster Coordinating Council
NEDA	National Economic and Development Authority
NGO	Non-Governmental Organization
NHA	National Housing Authority
NLDD	Livelihood Development Department (NHA)
NSO	National Statistics Office
OCD	Office of Civil Defense
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services
PAP	Project Affected Person
PCUP	Presidential Commission for the Urban Poor
PESO	Public Employment Service Office
PHRU	Pasig Housing and Resettlement Unit
PHIVOLCS	Philippine Institute of Volcanology and Seismology
PHRU	Pasig Housing and Resettlement Unit
RMF	Risk Mitigation Facility
PMO-MFCP	Project Management Office for Major Flood Control Projects (DPWH)
PMRCIP	Pasig-Marikina River Channel Improvement Project
PMRCIM	Pasig-Marikina River Channel Improvement Project
PO	People's Organization
PP	Project Proponent
PRDP	Pasig River Development Plan
PRRC	Pasig River Rehabilitation Commission
RAP	Resettlement Action Plan
RMF Risk	Mitigation Facility
SC	Supreme Court
SNAP	Strategic National Action Plan
TESDA	Technical Education and Skills Development Authority
UPA	Urban Poor Associates
UPAO	Urban Poor Affairs Office
WB M/P	Master Plan for Flood Management in Metro Manila and Surrounding Areas (2012)



## EXECUTIVE SUMMARY

### 1. OUTLINE OF SURVEY

#### 1.1 Background of the Survey

Flood control plan for the Pasig-Marikina River including drainage in Metro Manila was prepared in 1952. The improvement works of the Pasig River mainly consist of river walls and revetments of the channel and constructed in the 1970's. Mangahan Floodway was constructed with a design capacity of 2,400 m<sup>3</sup>/s for diverting flood from Marikina River to Laguna de Bay in order to mitigate flood damage due to overflow of the lower Marikina River and Pasig River in 1988.

The Government of the Philippines has engaged in flood control for Pasig-Marikina River including drainage project in Metro Manila. "Study on Flood Control and Drainage Project in Metro Manila" (JICA M/P Study) in 1998-1990 proposed several prioritized projects for Metro Manila.

The priority was given to the "Pasig-Marikina River Channel Improvement Project" (PMRCIP). Through JICA M/P Study, which includes the Feasibility Study for the PMRCIP, it was identified that the safety level of 100-year return period could be achieved with the construction of Marikina Dam in the upper stream to store the flood discharge, the river channel improvement in the downstream, and the construction of the Marikina Control Gate Structure (MCGS) by which excess discharge will flow down to Laguna de Bay through the Mangahan Floodway. It is essential to implement the river channel improvement of the Pasig-Marikina River, as well as the construction of MCGS, which will assure the distribution of flood discharge in accordance with the distribution of design discharge in JICA M/P Study. PMRCIP was divided into four (4) phases (**Table-1 and Figure-1**).

On the other hand, after Metro Manila experienced flooding of unprecedented scale in 2009 brought about by Typhoon Ondoy, the Department of Public Works and Highways (DPWH) formulated "Master Plan for Flood Management in Metro Manila and Surrounding Areas" (WB M/P) in order to establish the vision as the blue print or road map for sustainable and effective flood risk management in Metro Manila and the surrounding areas. The final report is still being finalized as of August 2013.

Based on the background above, the Government of the Philippines and JICA agreed to conduct "Survey on Basic Environmental and Social Consideration for Flood Management Plan in Metro Manila" (herein after "this Survey" or "the Survey") this time, to examine natural and social impacts of the proposed PMRCIP Phase IV.

**Table-1 Phases of PMRCIP**

PMRCIP Phase	Engineering Stage	Subject Area	Years of Implementation
-	Master Plan	Whole Metro Manila	1988-1990
	Feasibility Study		
Phase I	Detailed engineering design		2000-2002
Phase II	Civil works: construction of flood control structure and improvement of river course		Pasig River channel (Delpan Bridge - Napindan Hydraulic Control Structure: NHCS)
Phase III		Pasig River Channel, Lower Marikina River (NHCS – Marikina Control Gate Structure: (MCGS)) MCGS is not included.	2012-
Phase IV		Upper Marikina River (MCGS – Marikina Bridge)	-

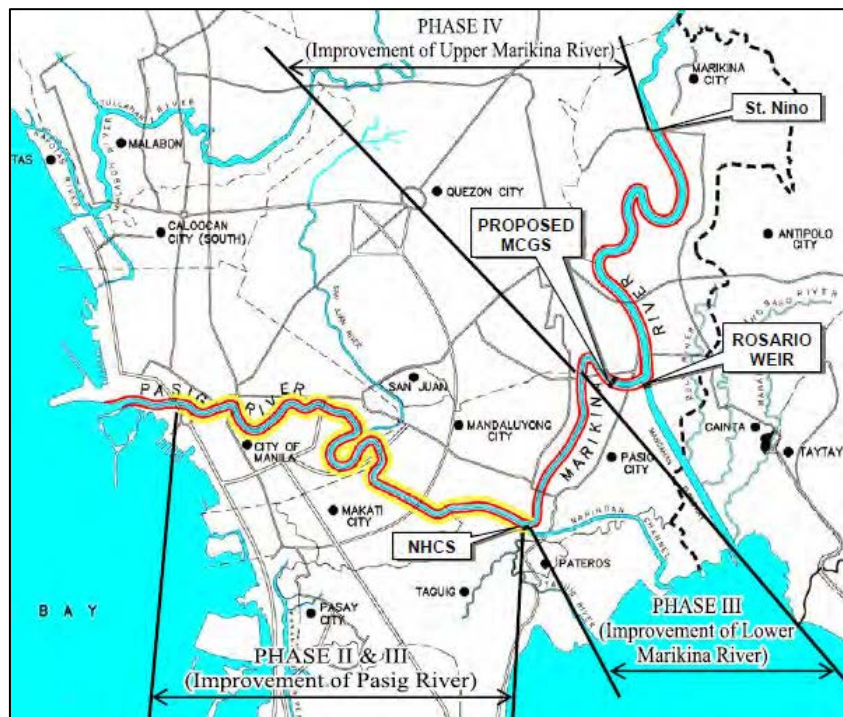


Figure-1 Subject Area of PMRCIP

## 1.2 Objectives

The objectives of this Survey are as follows:

- (i) to identify the current situation of environment and socio-economic development in the areas marked as [Area A] and [Area B] in **Figure-2**,
- (ii) to identify possible negative environmental and social impacts of “with” and “without” flood control measures in the survey area [Area A], and
- (iii) to identify the plan, policy, and current situation of land acquisition and involuntary resettlement in the survey area [Area A] and [Area C], and also of the similar practices in Metro Manila.

## 1.3 Survey Areas

This Survey covers three areas and these are described below.

- Vicinity of MCGS (1.2 km) ----- } [Area A]
- Between Mangahan Floodway and Marikina Bridge (6.1 km) --- }
- Proposed flood control dam reservoir ----- [Area B]
- Mangahan Floodway from Rosario weir to Laguna de Bay ----- [Area C]



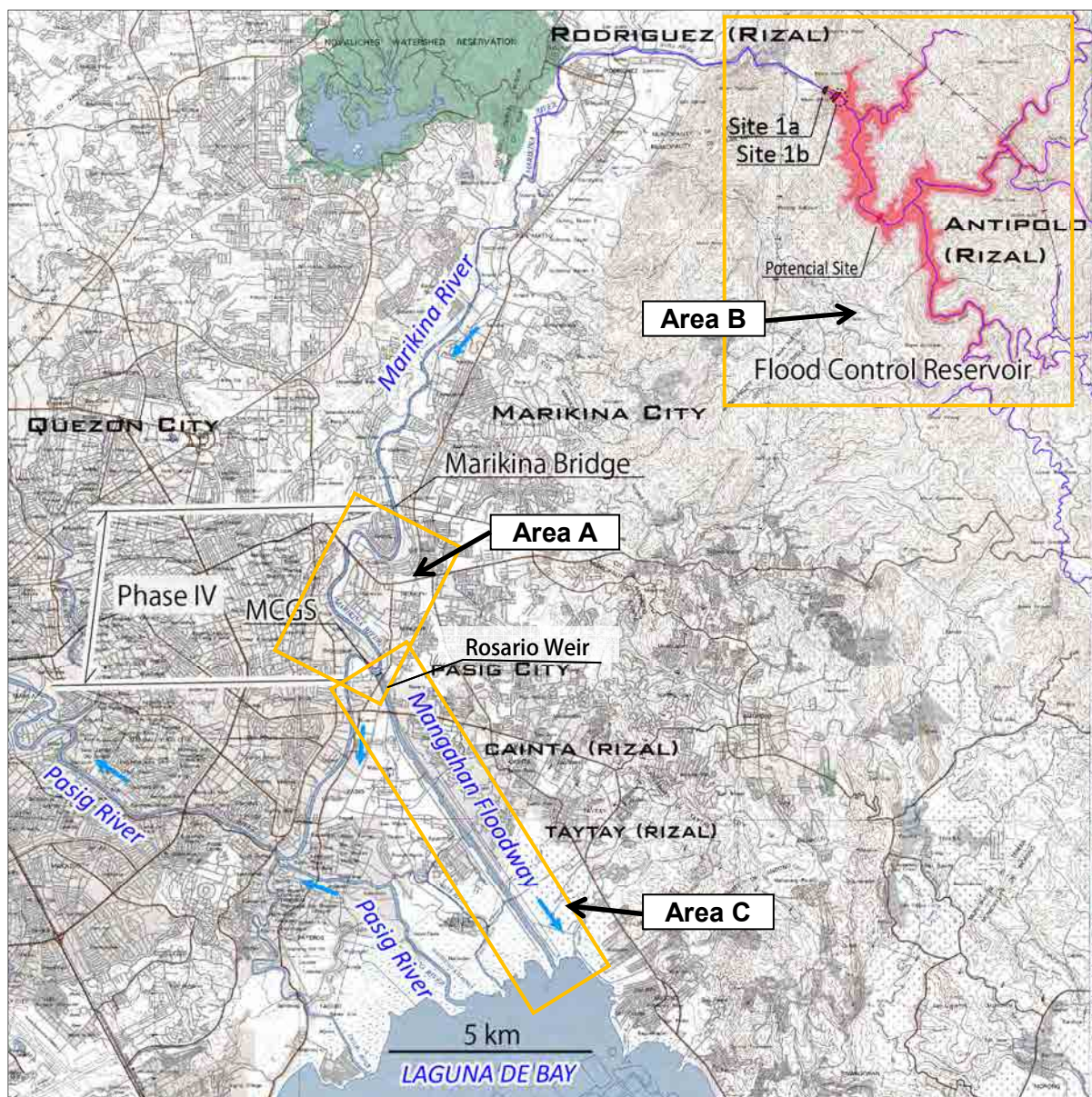


Figure-2 Study Areas

#### 1.4 Project Description

The propose structures for Phase IV are as follows. The layout plan is shown in **Figure-3**.

- Embankment and parapet construction
- River improvement (widening and excavation)
- Marikina Control Gate Structure (MCGS)

Function of MCGS is to limit flood flow to the Metro Manila (Lower Marikina River) and divert flood peak discharge to Laguna de Bay (Mangahan Floodway). Construction of MCGS was included in Phase III, which is to implement in 2013, in the original plan; however, it is transferred to Phase IV because of the impacts expected on the downstream area of Mangahan Floodway by operation of MCGS. Present Mangahan Floodway is not functioning as designed 2,400 m<sup>3</sup>/sec capacity in original plan, and the capacity is expected as only 2,000 m<sup>3</sup>/sec by

encroachment of Informal Settler Families (ISFs) inside of the floodway. See **Figure-4** for flood flow distribution plan of PMRCIP.

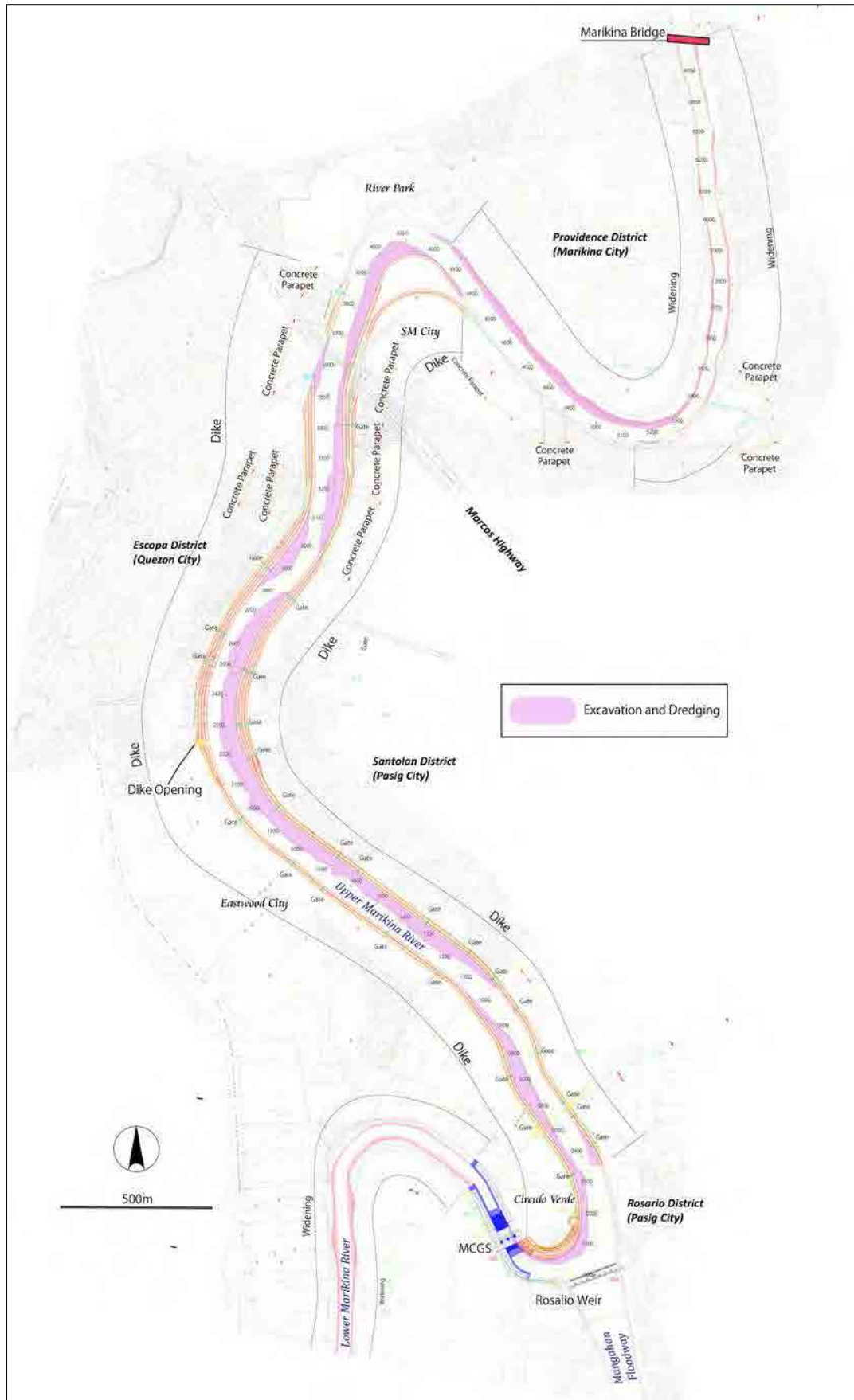
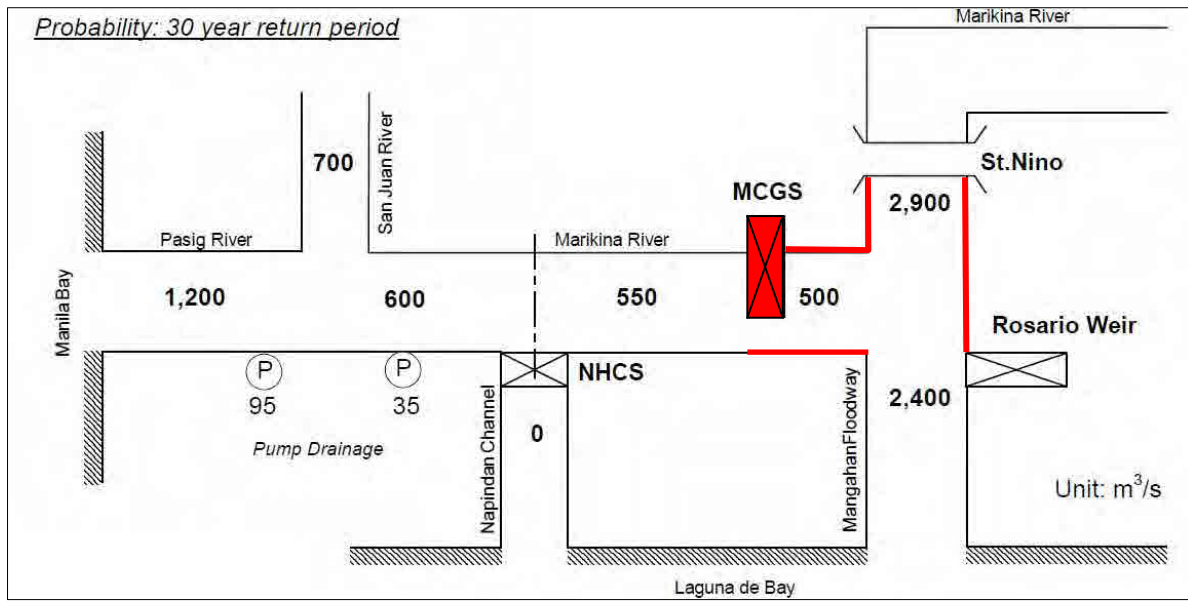


Figure-3 Layout Plan of Phase IV



**Figure-4 Flood Distribution Plan and Locations of PMRCIP Phase IV Component (MCGS, embankment/parapet, excavation)**



## 2. IMPACT ASSESSMENT RESULTS IN PHASE IV AREA

The results of Initial Environmental Examination of PMRCIP Phase IV are summarized as in **Table-2**.

**Table-2 Summary of Impact Examination**

Field	Scoping (Refer Section 3.4)		Examination results (Refer Section 3.5)		
	Impacts examined	Expected degree of Impact	Section	Findings	Expected degree of Impact
Social Environment	1. Housing and real estate (land acquisition and involuntary resettlement)	A-	3.5.1	- Land acquisition is necessary in total 96.87 ha (including 79.29 ha of easement area and 17.58 ha of non-easement area).	A-
	2. Job opportunity and livelihood	A-	3.5.2	- If all of the estimated population for resettlement is to be relocated to off-city site, 5,456 people (including 4,400 ISFs) will be impacted.	A-
	3. Land use and income source	A-	3.5.3		A-
	4. Community organization	C	3.5.4	- Disintegration of the community by resettlement which may affect the villagers' mutual cooperation system.	B-
	5. Social services and community infrastructure	C	3.5.5	- Orandes Sewage Treatment Center and Eastwood ferry terminal will be affected. - Pasig City is constructing own river revetment, and the revetment needs to be demolished for excavation of the base area for PMRCIP Phase IV. - Community infrastructures will not be affected at present site.	A-
	6. Socially weak or disadvantaged groups	C	3.5.6	- Majority of the project affected people are ISF. ISF are not eligible to receive cash compensation. - There is no information on handicapped personnel, isolated elderlies, and single headed mother's family at this point.	C
	7. Distribution of benefit and social cost	B-	3.5.7	[Phase IV area] - Beneficiaries of PMRCIP Phase IV during design flood events are the people who live inland of Santolan area (Pasig City), and residents in vast areas on the eastern and western side of Marikina City and Quezon City - Social cost bearers are the people to be displaced for the project. The majority of them are low income people in Santolan near the Marikina River.  [Upstream-downstream relationship] - Beneficiaries of PMRCIP Phase IV are the residents and land users along the Pasig River and the Lower Marikina River. - Social cost bearers will be, in addition to the people being subject of involuntary resettlement for flood control structures, the people who live near openings of the eastern side of Mangahan	A-

Field	Scoping (Refer Section 3.4)		Examination results (Refer Section 3.5)		
	Impacts examined	Expected degree of Impact	Section	Findings	Expected degree of Impact
Natural Environment				floodway, and lowland area of Laguna de Bay. - Marikina City and Pasig City expressed their anxieties on MCGS operation for the impacts on upstream and questioned the effectiveness.	
	8. Historical or cultural heritages	C	3.5.8	- No impacts are expected.	D
	9. Social conflict	C	3.5.9	- If off city resettlement plan is implemented, strong opposition against the project may arise from the community. There also are active “pro-poor” political parties who support residents for not comply with unfavorable resettlement plan.  - Rejection of recipient community against the resettlers may occur if resettlement site is designed in off-city.	C
	10. Water usage, water rights, customary use of water Intake	C	3.5.10	- There is almost no usage of the River water. No impacts are expected.	D
	11. Sanitary treatment	B-	3.5.11	- Compulsory law will be applied to PP. No impacts are expected.	D
	12. Health environment	D	-	(Not examined)	-
	13. Stability of ground (including dike)	B-	3.5.12	- Safety of hinterland against design flood water, which is more than 3 m higher than the ground. Water head is higher than 4.5 m if the flood water reaches crest of the embankment.	C
	14. Soil erosion	D	-	(Not examined)	-
	15. Groundwater supply	D	-	(Not examined)	-
	16. Natural flow and discharge function	B-	3.5.13	- All 25 gates need to be properly operated during extreme flood, and all of them should be well maintained in normal time; or the hinterland will be submerged under significant depth of flood water.	B-
	17. Coastal area	D	-	(Not examined)	-
	Pollution	18. Biodiversity	C	3.5.14	- No impacts are expected.
19. Micro climate		D	-	(Not examined)	-
20. Aesthetic landscape		C	3.5.15	- No impacts are expected.	D
21. Global warming		D	-	(Not examined)	-
22. Air quality		C	3.5.16	- Compulsory law will be applied to PP. No impacts.	D
23. Water quality		C	3.5.17	- Compulsory law will be applied to PP. No impacts are expected.	D
24. Soil (contamination)		D	-	(Not examined)	-
25. Solid waste		C	3.5.18	- Compulsory law will be applied to PP. No impacts are expected.	D
26. Noise and vibration		C	3.5.19	- Compulsory law will be applied to PP. No impacts are expected.	D

Field	Scoping (Refer Section 3.4)		Examination results (Refer Section 3.5)		
	Impacts examined	Expected degree of Impact	Section	Findings	Expected degree of Impact
	27. Ground subsidies	D	-	(Not examined)	-
	28. Odor (-offensive)	D	-	(Not examined)	-
	29. Sedimentation	D	-	(Not examined)	-
	30. Safety	D	-	(Not examined)	-

A+/-: Significant positive/negative impact is expected.

B+/-: Positive/negative impact is expected to some extent.

C: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)

D: No impact is expected

## (1) Housing and Real Estate

Land development along the Marikina River section is in rapid progress, and many of the land which is proposed for PMRCIP Phase IV structures are already been used by other organizations. Notable interference of land uses with PMRCIP Phase IV structures are as follows.

- Trunk road connecting to Marcos Highway
- Orandes Sewage Treatment Plant (Manila Water, in easement area in Marikina City)
- Residential areas in Santolan accretion area (in easement area and non-easement area in Pasig City)
- Industrial Areas in Quezon City and Pasig City near Rosario Weir (in easement area and non-easement area)
- Business development area (Circulo Verde) in Quezon City (Public and Private area, legitimacy of the land is disputed)

## (2) Job opportunity and livelihood/ Land use and income source

The estimated population for resettlement is 5,456. Among those people, 1,328 are in easement area, and the rest of the population, 4,128, is in non-easement area.

About 80% of the estimated population for resettlement is ISFs.

### 3. MAJOR ISSUES

#### 3.1 Land Acquisition Issue

One of the most significant issues in PMRCIP Phase IV is land acquisition. Flood discharge capacity must be secured in all the stretch (Marikina Bridge-MCGS); this is an absolute precondition for PMRCIP Phase IV. Without enough discharge capacity in any of this section, the whole scheme (river widening, excavation, and embankment) will not work.

Riversides of Marikina River have been developed as below, and those developments are interfering river area required for the implementation of PMRCIP Phase IV.

- Trunk road connecting to Marcos Highway
- Manila Water's Orandes Sewage Treatment Plant (Marikina City, and Quezon City)
- Residential area in Santolan (Pasig City)
- Circulo Verde (Quezon City)

In order to discharge design volume of flood water, it is required to evaluate two ways of solutions to secure land for PMRCIP Phase IV.

- To proceed land acquisition inside of the alignment of PMRCIP Phase IV structures
- To alter the river alignment of PMRCIP Phase IV and acquire land based on new alignment



**Figure-5** Developments and river alignment for PMRCIP Phase IV (near Rosario Weir)

### 3.2 Scale of Resettlement

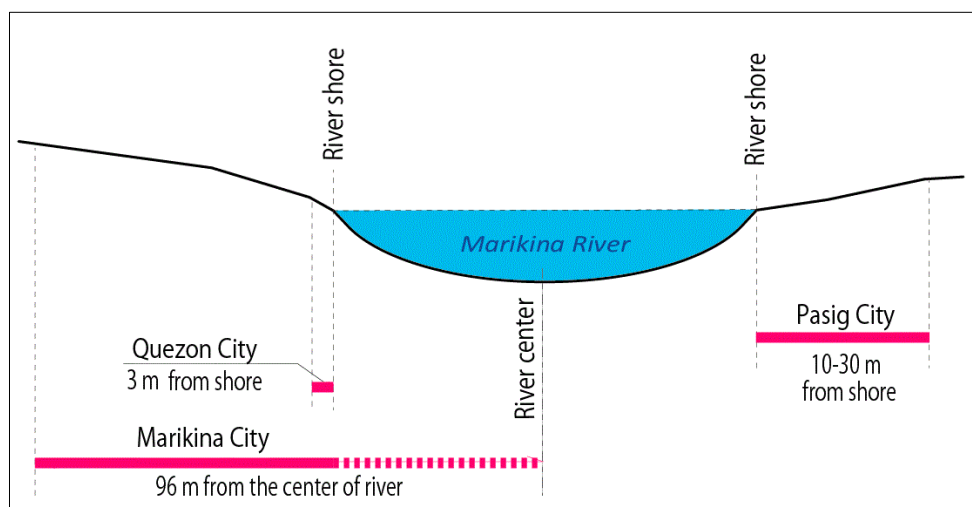
The estimated population for resettlement will be approximately 5,456 people, mostly from Santolan area of Pasig City, and can be divided into two groups: land-titled residents and residents who do not have land titles (ISFs).

ISFs are living in easement area and non-easement area, and there are over 3,000 ISFs outside of easement area in Santolan area. The government ordered to clear the easement area for safety reasons, and resettlement will be implemented by NHA and LGUs.

Among the estimated 5,456 people, 1,328 people are in inside of easement area, and the rest of the population, 4,128, is at outside of easement area (**Table-3**). Conceptual diagram of easement settings by LGUs is shown in **Figure-6**.

**Table-3 Estimated Resettlement Population**

City	Barangay	ISFs (Family w/o land title)			Land-titled Residents			Total		
		Easement Area	Non-easement area	Total	Easement Area	Non-easement area	Total	Easement Area	Non-easement area	Total
Marikina	-	0	0	0	0	0	0	0	0	0
Quezon	Bagumbayan	48	0	48	8	0	8	56	0	56
Pasig	Mangahan	304	0	304	0	0	0	304	0	304
	Santolan	968	3,080	4,048	0	1,048	1,048	968	4,128	5,096
<b>Total</b>		<b>1,320</b>	<b>3,080</b>	<b>4,400</b>	<b>8</b>	<b>1,048</b>	<b>1,056</b>	<b>1,328</b>	<b>4,128</b>	<b>5,456</b>



**Figure-6 Easement Settings of LGUs**

#### 4. MANGAHAN FLOODWAY RESETTLEMENT STATUS

Number of ISFs who live inside of in Mangahan Floodway, which is not in the scope of PMRCIP, is estimated at 23,753: the population is estimated as 94,967 (**Table-4**).

**Table-4 Estimated Affected Building Area and Population within Mangahan Floodway**

City	Barangay	Land Areas Occupied by ISFs (Sq m)	Estimated Ave. Unit Building Area (Sq m)	Estimated Number of Buildings		Estimated Number of ISFs (Household)		Estimated ISFs Population (Population)	
Cainta	San Andres	85,858	25	3,435		4,235		16,932	
	San Juan	135,511	25	5,421	8,856	6,683	10,918	26,722	43,654
Taytay	San Juan	26,284	25	1,052		1,297		5,186	
	Santa Ana	75,054	25	3,003	4,055	3,702	4,999	14,803	19,988
Pasig City	Maybunga*	98,437	25	3,938		4,855		19,411	
	Rosario	24,649	25	986		1,216		4,860	
	Santa Lucia	35,772	25	1,431	6,355	1,764	7,835	7,054	31,326
<b>Total</b>		<b>481,565</b>			<b>19,266</b>		<b>23,753</b>		<b>94,967</b>

Note: \*Figure of San Miguel is combined  
Source: LiDAR data 2011, Taytay LGU and JICA Study Team

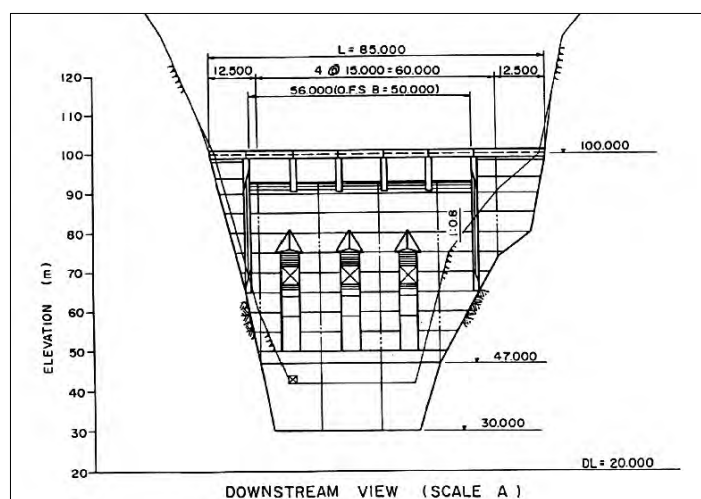
The Government of the Philippines has a policy to resettle ISFs from danger area of eight (8) major river courses in Metro Manila by the end of 2015, and secured PHP 50 Billion Fund for the resettlement. Mangahan Floodway is one of the eight major river courses designated by the Government of the Philippines.



## 5. ENVIRONMENTAL AND SOCIAL SETTINGS OF FLOOD CONTROL DAM

### 5.1 Project Description

JICA M/P Study and WB M/P, proposed its dam sites as at existing Wawa dam, abandoned water supply dam built in 1909 (Site-1a in **Figure-8**), whose catchment area for is 281 km<sup>2</sup>. The planned dimension of the proposed dam at “site-1a” is as the **Figure-7**.



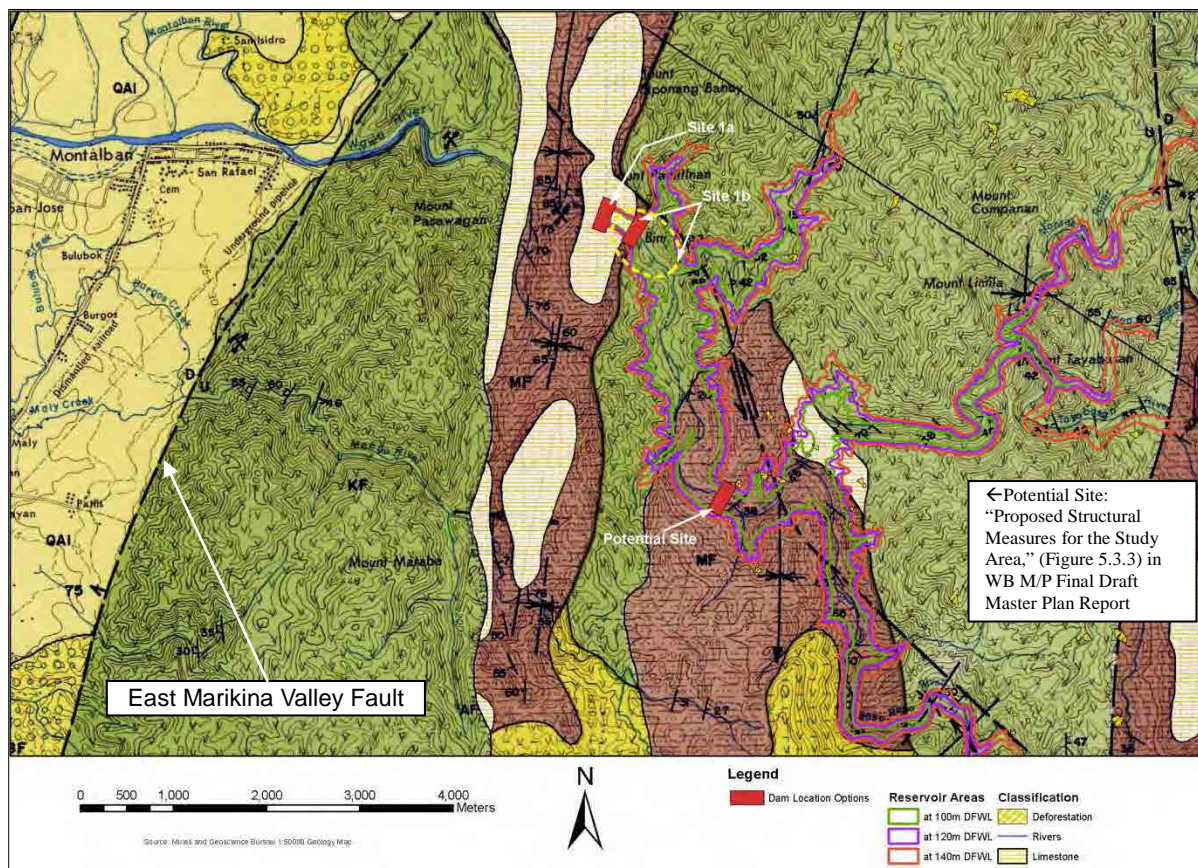
Source: JICA, DPWH: The Study on Flood Control and Drainage Project in Metro Manila, 1990

**Figure-7 The Planned Dimension of the Proposed Dam for Site-1a**

### 5.2 Natural Settings

#### (1) Geology

- Limestone is predominant in the area, other locations are also proposed at upstream (Site 1b, and another site at approximately 3.5 km upstream of Wawa dam) (**Figure-7**).
- East Marikina Valley Fault runs NE-SW direction at the 2.7 km west of the proposed dam site, and is identified as an active fault according to Philippines Institute of Volcanology and Seismology and the subordinate fault lays along the Wawa River .
- In 2010, Department of Environment and Natural Resources (DENR) had recommended and opposed the issuance of an environmental clearance certificate (ECC) for the construction of a large capacity dam of which MWSS studied possibility to construct in the Montalban Gorge, because it is within the seismic fault zone: Marikina Valley Fault System (MVFS)
- The area is recognized as highly susceptible land slide area.



Source: Mines and Geo-Science Bureau 1:50,000 Geology Map

**Figure-8 Proposed Dam Site**

## (2) Biology

- There are 326 floral species found at the Pamitinan Protected Landscape (PPL), where 30 and 45 species are classified as rare and endemic, according to Marikina Micro-watershed Ecological Profile (2008).
- The Upper Marikina River Basin Protected Land Scene was designated by President Proclamation No. 296 (2011). The area spans over 26,125.64 hectares, which encompass whole the proposed reservoir and also the catchment area.

## 5.3 Social Condition

There were also many environmentally degrading and illegal activities such as charcoal making, loggings, and mining and an unauthorized selling of property rights.

Income of household ranges from PHP 2,000 to PHP 4,000 per month (Source: RAP/ Wawa-Montalban Eco-Tourism Sub-Project). Wells supply drinking water to the residents, and the streams and creeks are used for bathing and washing clothes.

Buildings are counted according the ground elevations that the buildings are located: lower than 100 m. The results are summarized in **Table-5**. The population is estimated as 1,495.

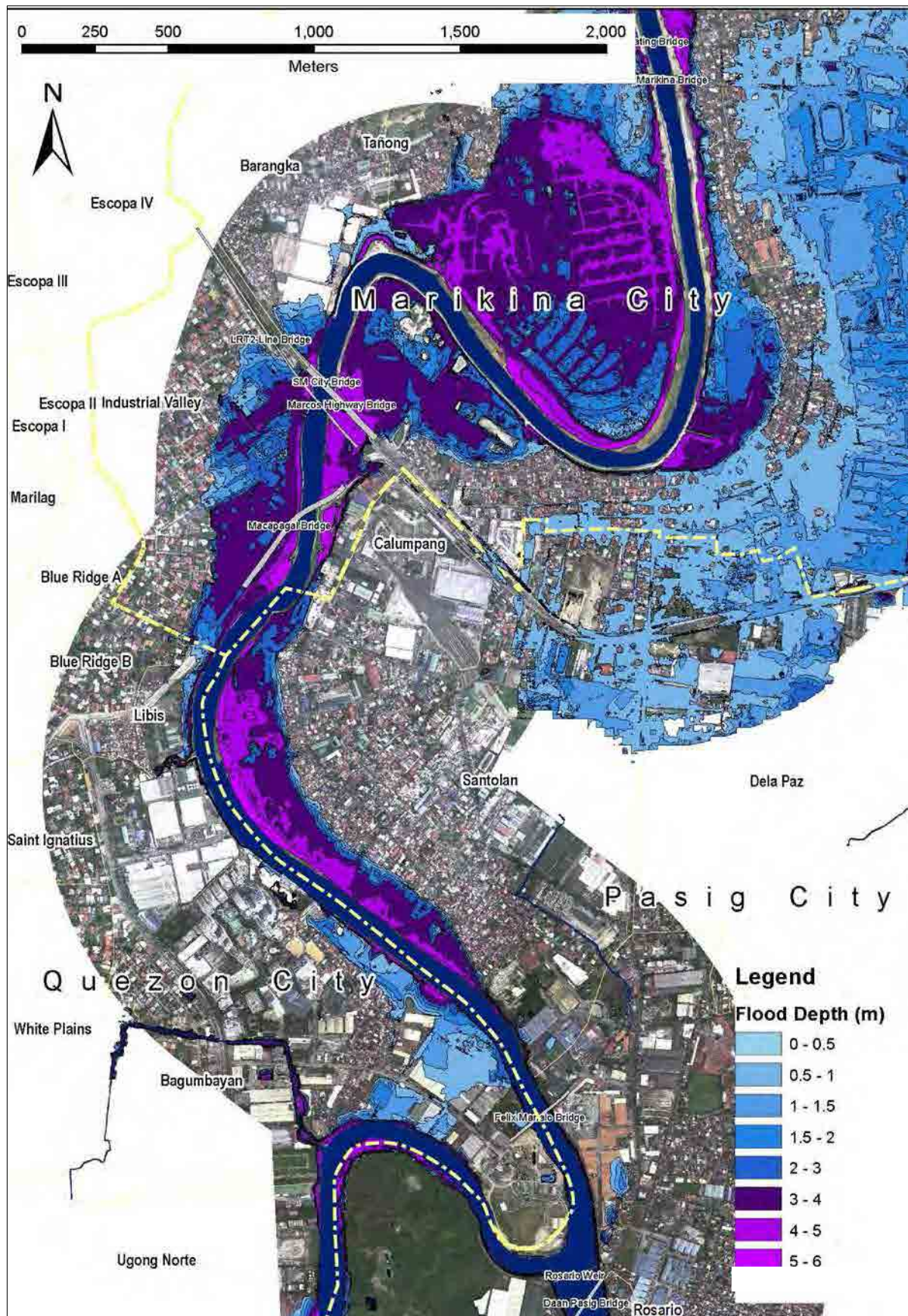


**Table-5 Inundation Estimation by Proposed Reservoir**

City/Municipality	Barangay	Building Count	Estimated Population
		<100m	<100m
<b>Antipolo</b>	Total	<b>37</b>	<b>171</b>
	(Bagong Nayon)	37	171
	(Inarawan)	0	0
	(San Juan)	0	0
<b>San Mateo</b>	Pintong Bocawe	<b>288</b>	<b>1,325</b>
<b>Rodriguez</b>	Rosario	<b>0</b>	<b>0</b>
<b>Total</b>		<b>325</b>	<b>1,495</b>

## Supplemental Figures

- S-1 Expected area covered by flood from Marikina River (under the flood discharge capacity in JICA M/P) without PMRCIP Phase IV
- S-2 After implementation of PMRCIP Phase IV
- S-3 Difference between Present and after implementation of PMRCIP Phase IV
- S-4 Major land acquisition sites



**Figure S-1** Expected areas covered by flood from Marikina River (under the flood discharge capacity in JICA M/P) without PMRCIP Phase IV







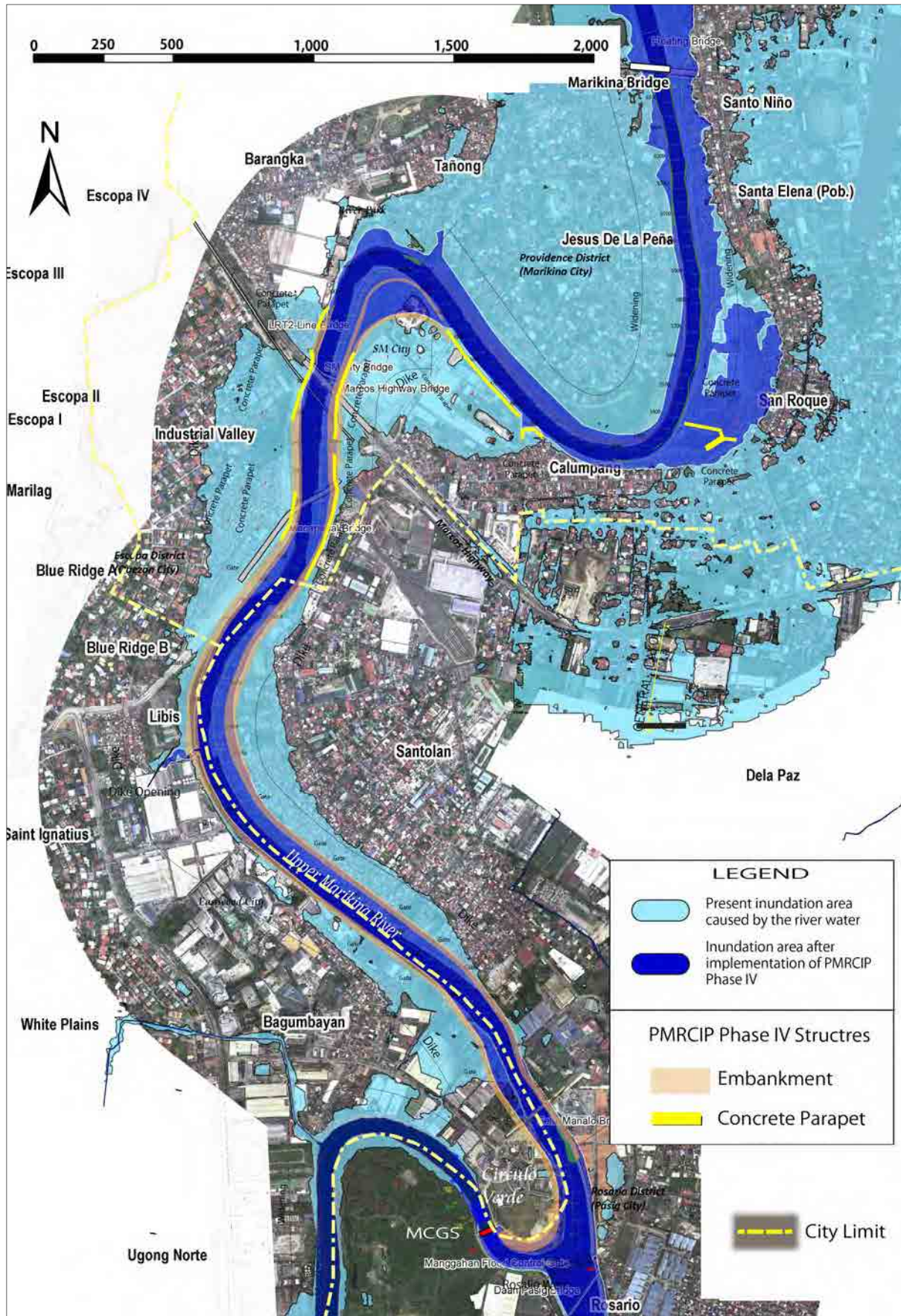


Figure S-3 Difference between Present and after implementation of PMRCIP Phase IV



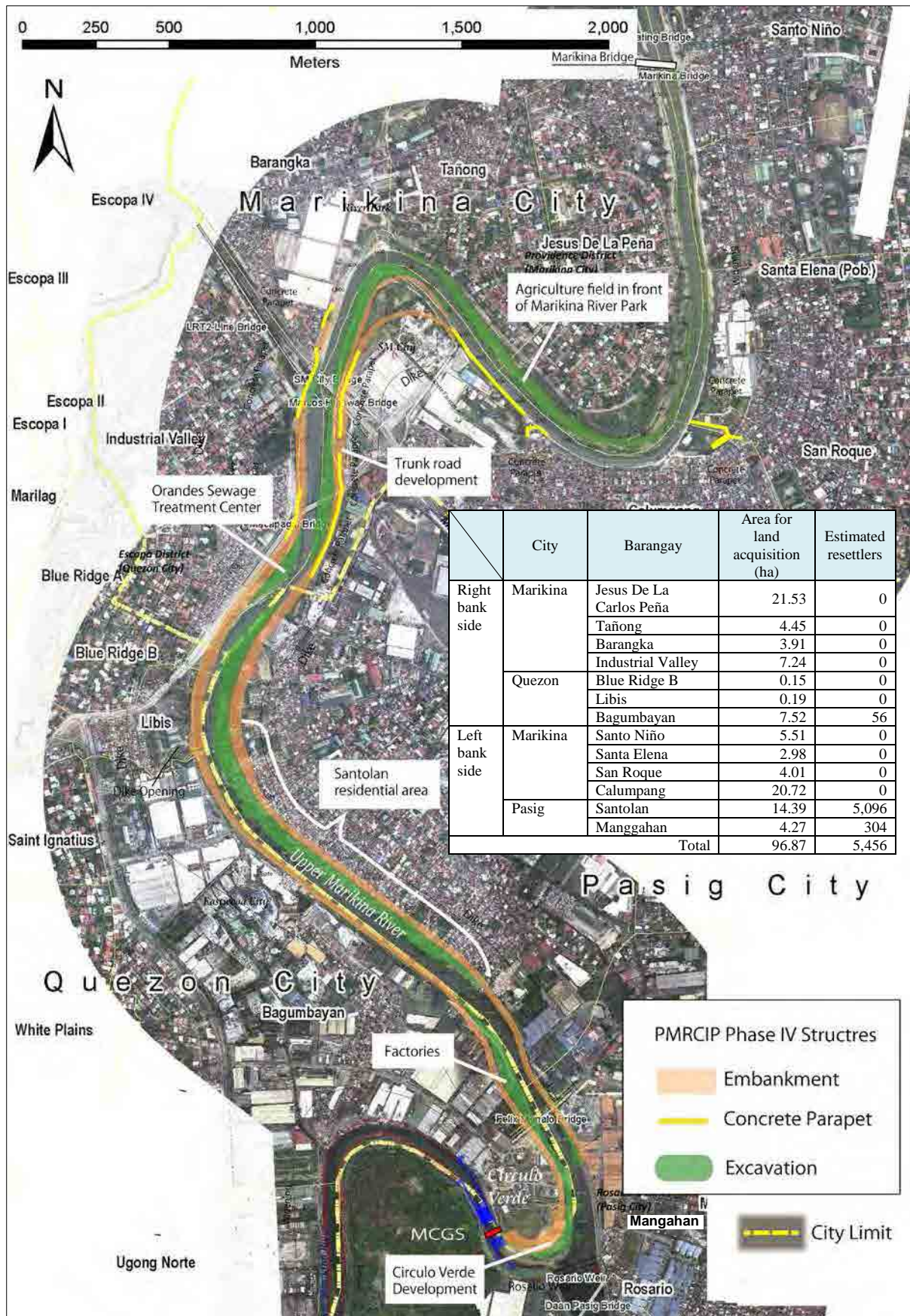


Figure S-4 Major land acquisition sites







## CHAPTER 1 OUTLINE OF SURVEY

### 1.1 Background of the Survey

Flood control plan for the Pasig-Marikina River including drainage in Metro Manila was prepared in 1952. The improvement works of the Pasig River mainly consist of river walls and revetments of the channel and constructed in the 1970's. Mangahan Floodway was constructed with a design capacity of 2,400 m<sup>3</sup>/s for diverting flood from Marikina River to Laguna de Bay in order to mitigate flood damage due to overflow of the lower Marikina River and Pasig River in 1988.

The Government of the Philippines has engaged in flood control for Pasig-Marikina River including drainage project in Metro Manila. "Study on Flood Control and Drainage Project in Metro Manila" (JICA M/P Study) in 1998-1990 proposed several prioritized projects for Metro Manila.

The priority was given to the "Pasig-Marikina River Channel Improvement Project" (PMRCIP). Through JICA M/P Study, which includes the Feasibility Study for the PMRCIP, it was identified that the safety level of 100-year return period could be achieved with the construction of Marikina Dam in the upper stream to store the flood discharge, the river channel improvement in the downstream, and the construction of the Marikina Control Gate Structure (MCGS) by which excess discharge will flow down to Laguna de Bay through the Mangahan Floodway. It is essential to implement the river channel improvement of the Pasig-Marikina River, as well as the construction of MCGS, which will assure the distribution of flood discharge in accordance with the distribution of design discharge in JICA M/P Study. PMRCIP was divided into four (4) phases (**Table 2.2 and Figure 2.6**).

On the other hand, after Metro Manila experienced flooding of unprecedented scale in 2009 brought about by Typhoon Ondoy, the Department of Public Works and Highways (DPWH) formulated "Master Plan for Flood Management in Metro Manila and Surrounding Areas" (WB M/P) in order to establish the vision as the blue print or road map for sustainable and effective flood risk management in Metro Manila and the surrounding areas. The final report is still being finalized as of August 2013.

Based on the background above, the Government of the Philippines and JICA agreed to conduct "Survey on Basic Environmental and Social Consideration for Flood Management Plan in Metro Manila" (herein after "this Survey" or "the Survey") this time, to examine natural and social impacts of the proposed PMRCIP Phase IV.

### 1.2 Objectives and Survey Areas

(NOTE: This Survey is conducted in order to collect data to identify if the proposed flood mitigation measures are environmentally and socially feasible under the JICA Guidelines for Environmental and Social Considerations (April 2010). The implementation of this Survey does not imply any decision or commitment on the part of JICA to extend further cooperation.)

This study covers three areas (**Figure 1.1**).

#### [Area A] Upper Marikina River

Area along Marikina River with the elevation equal or lower than the calculated flood water level (discharge of 2,900 m<sup>3</sup>/sec. at Marikina Bridge gauging station) from Marikina Bridge to immediate surrounding area of Marikina Control Gate Structure (MCGS)

- Vicinity of MCGS (1.2 km)
- Between Mangahan Floodway and Marikina Bridge (6.1 km)

This section of Marikina River is defined as the area of "Pasig Marikina River Improvement Project Phase IV" in the JICA M/P Study.

[Area B] Upstream of Wawa Dam

Proposed flood control dam reservoir and the surrounding area to be built to the elevation of 140 m above sea level in the catchment area

[Area C] Mangahan Floodway

Both of the left and right banks inside of Mangahan Floodway from Rosario weir to Laguna de Bay

The main objective of study in this section is to identify resettlement plans and the implementation status by the Philippine government.

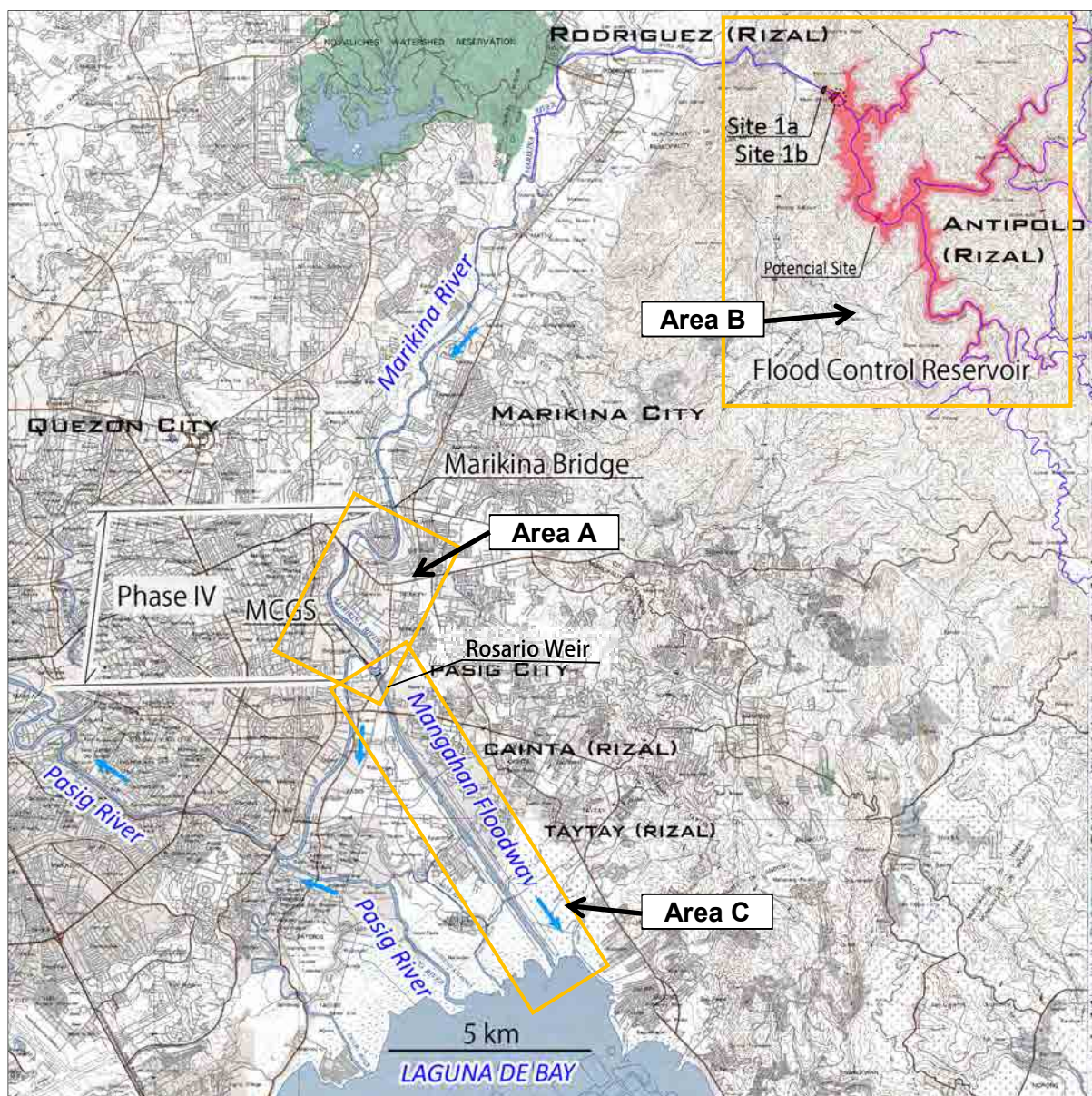
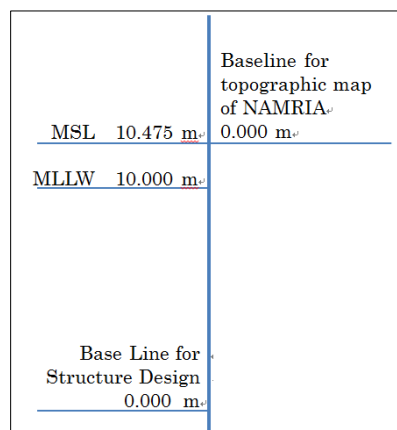


Figure 1.1 Study Areas

**Note:**

**Conversion of elevations:** figures of elevation being used in JICA D/D can be converted to topography map of National Mapping and Resource Information Authority (NAMRIA) by subtracting 10.475 m (**Figure 1.2**).



**Figure 1.2 Conversion of Baselines**

### 1.3 Output

Outcomes of this Survey are summarized in **Table 1.1**. The highest priority was given on impact assessment of the flood control structures of the Phase IV section, proposed in the JICA M/P Study, including construction and operation of the MCGS. Initial Environmental Evaluation (IEE) according to the JICA Guidelines for Environmental and Social Considerations (hereafter called JICA Guidelines) was conducted for the flood control measures in Phase IV.

**Table 1.1 Subject Area and Corresponding Output**

Output \ Subject Area	Area [A] Upper Marikina River	Area [B] Upstream of Wawa Dam	Area [C] Mangahan Floodway
➤ Project site survey			
1. Physical environment and administration boundary	X	X	—
2. Social environment	X	X	—
3. Biological environment	X	X	—
➤ Survey on land acquisition and resettlement			
4. Census, living environment, land use	X	X	—
5. Presence of socially weak groups	X	X	—
6. Land acquisition and resettlement status, and plans	X	X	X
➤ Initial Environmental Examination			
7. Information necessary to conduct IEE	X	—	—

## 1.4 Work Schedule

The work and assignment schedule for the Study is shown in **Table 1.2**

**Table 1.2 Work Schedule**

Working site	Task	Mar.	Apr.	May	Jun.	Jul.	Aug.
Philippines	Environment and social considerations		█			█	█
	Social impact study		█				
Japan	Environment and social considerations	█			█	█	
	Social impact study	█				█	
Report Submission			△ IC/R			△ DF/R	△ F/R



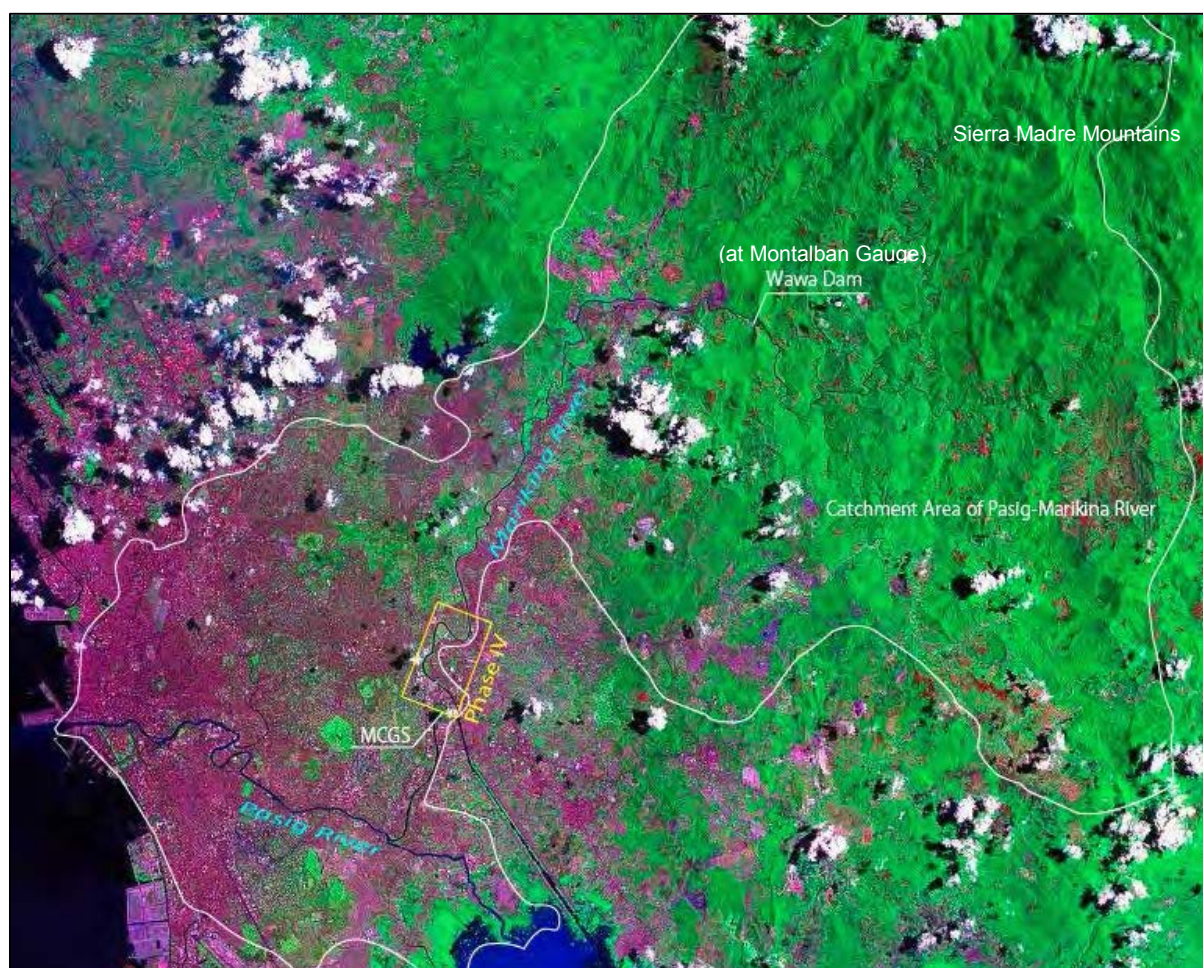
## CHAPTER 2 PROFILE OF CATCHMENT AREA

### 2.1 Characteristics of Flood in Pasig-Marikina River

#### 2.1.1 Topography and River

The Pasig-Marikina River System covers a total catchment area of 4,678 km<sup>2</sup> of which a large part is in the eastern mountain area, the Sierra Madre Mountains. Rain water from the Sierra Madre flushes out of the Montalban Gauge where Wawa Dam is located. The elevation of the downstream of Wawa Dam is already low, less than 20 m, and the flood plain has a low gradient longitudinal cross section where flushed-out flood water from the mountain area stagnates easily and causes deepest inundation in the entire catchment area of the river system (see **Figure 2.1**).

Mean annual precipitation of the Marikina River Basin is 2,486.2 mm, and 80% of the total volume falls in May to October making the area susceptible to flooding during the rainy season.



Source of satellite photo: Geology.com 2007

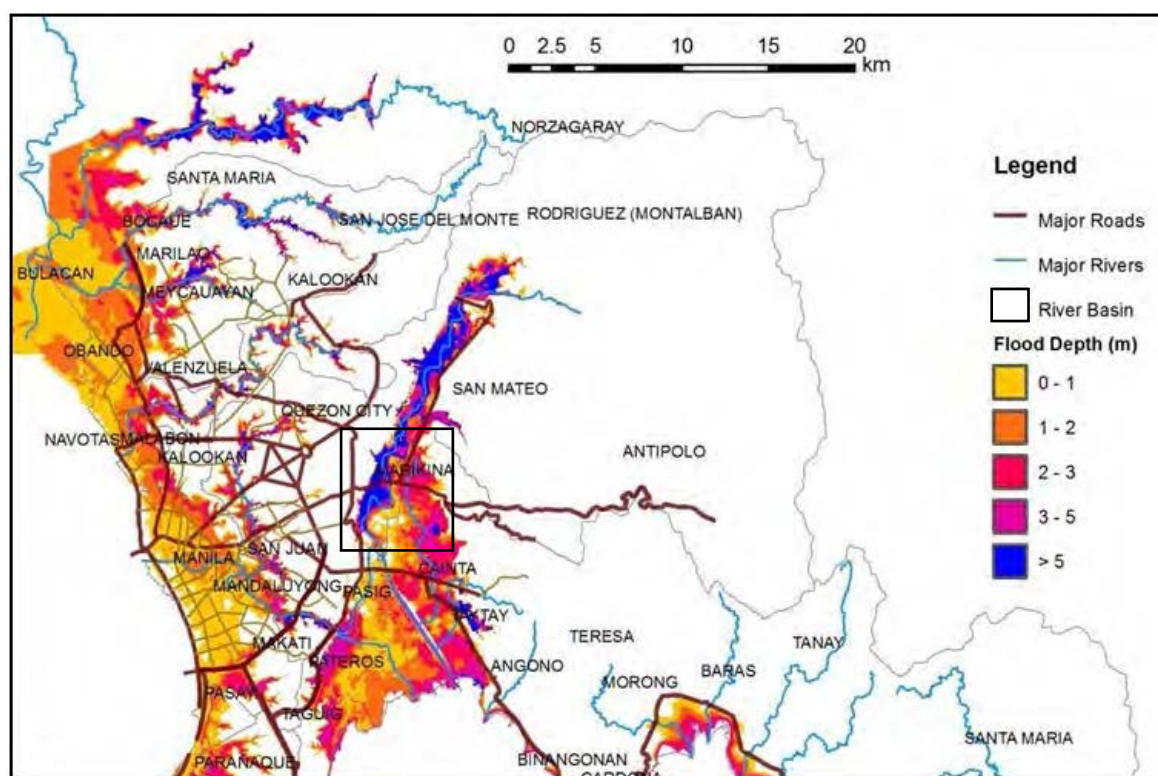
**Figure 2.1 Pasig-Marikina River System**

## 2.1.2 Flood Characteristics and Damage

### (1) Flood Characteristics

In September 2009, when Typhoon Ondoy struck southwest Luzon, the precipitation recorded at Quezon City Science Garden over a period of 24 hours was 455.0 mm, which was the largest records in 40 years, according to the Philippine Atmospheric, Geophysical & Astronomical Services Administration (PAGASA).

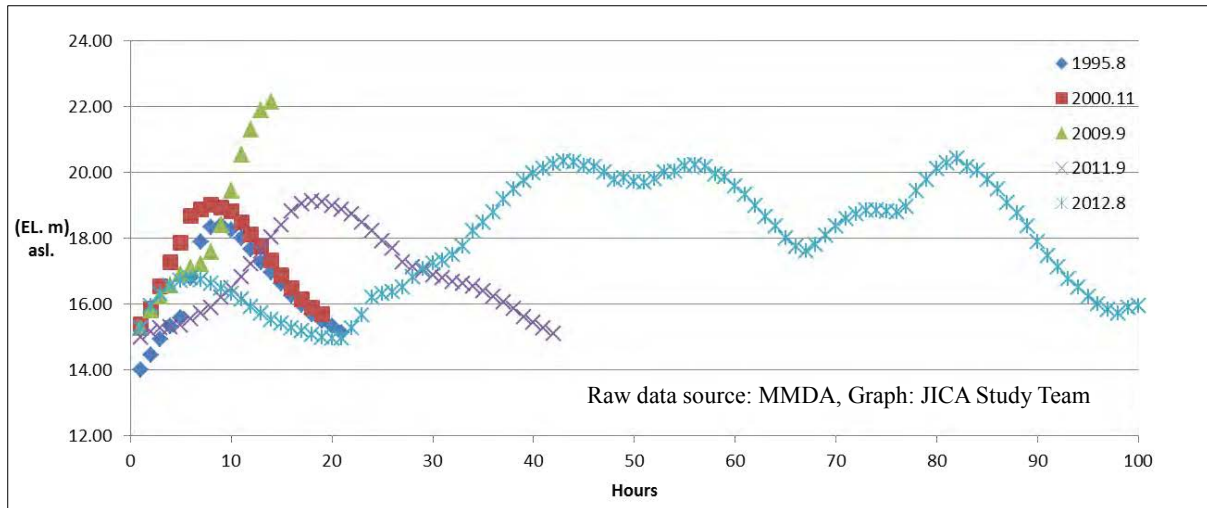
The Upper Marikina River Basin was severely inundated during Typhoon Ondoy; the depth of flood exceeded 5 meters in most of the Marikina riverine (see **Figure 2.2**). This type of inundation did not occur in either Lower Marikina River or Pasig River.



**Figure 2.2 Flood Depth During Typhoon Ondoy (2009)**

The Marikina River water level rapidly rose to 4.6 m in 6 hours at Marikina Bridge on September 26, 2009. The high flood water level in the Upper Marikina area does not persist in most cases, however. Even flood water brought by Typhoon Ondoy receded within a day after it reached its peak. **Figure 2.3** shows flood peaks of large flood events (it should be noted that gauging stations malfunctioned during Ondoy). However, in August 2012, the flood water persisted at EL.20 m level for 3 days due to the strong influence of a slow moving typhoon, Haikui.

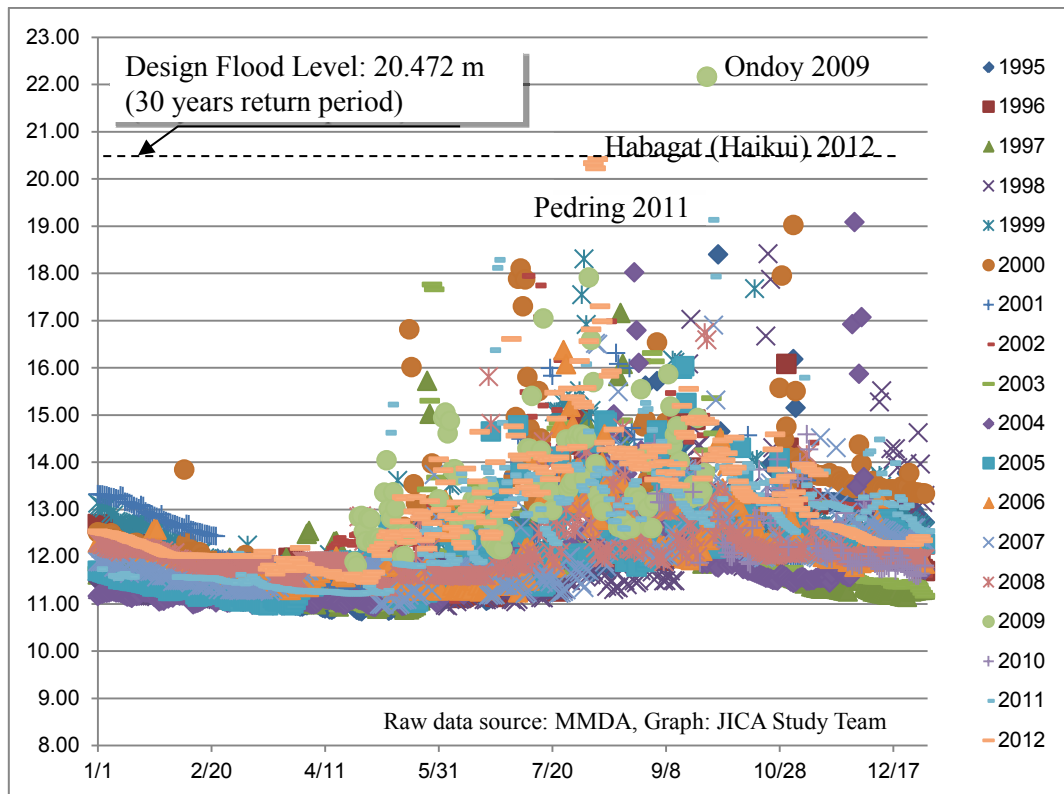




**Figure 2.3 Flood Peaks at Extreme Events at Marikina Bridge**

The largest flooding event was during Ondoy in September 2009 during which the flood water level rose above EL. 22 m at Marikina Bridge. Soon after the gauge recorded the highest water level, EL.22.26, it stopped to function. It means that the actual water level could have been higher than the recorded highest figure (see **Figure 2.4**).

The Design Flood Level (DFL) of the Implementation Program for Pasig-Marikina River Channel Improvement Project (Detailed Design in 2002) is 20.472 m (at Marikina Bridge), which is of 30 years return period; however, the flood water levels in recent years are coming close to DFL in almost every year.



**Figure 2.4 Daily Maximum Water Level at Marikina Bridge**

## (2) Flood Damage of Typhoon Ondoy

### [Damages]

According to the National Disaster Coordinating Council (NDCC), the total death toll from Typhoon Ondoy was 464 while 37 were reported missing and 529 suffered injuries. The total number of evacuees was 108,762 people, or 22,989 families.

Estimated cost of damage to infrastructure and agriculture amounted to PHP 11.06 billion (PHP 4.39 billion for infrastructure; PHP 6.67 billion for agriculture). The number of people who died in the Marikina River area was 144, which accounted for 31% of the total.

**Table 2.1 Summary of Damage in Metro Manila due to Typhoon Ondoy**

Areas near	Flood			Damage				
	Origin	Duration	Depth	City	People Affected	Dead	Destroyed Houses	Amount of Infrastructure Damage
Marikina River	River	<3 days	<2Floor	Marikina	178,985	73	1,083	39,639,300
				Quezon*	n.a.	48	n.a.	n.a.
				Pasig	n.a.	23	n.a.	n.a.
				<b>Total</b>	<b>178,985+</b>	<b>144</b>	<b>1,083+</b>	<b>39,639,300+</b>
San Juan River	River	<1 day	<Neck	Quezon*	(113,420)	57	(140)	(58,285,016)
				San Juan	2,234	3	0	24,720,000
				Mandaluyong	19,660	3	1	6,999,370
				<b>Total</b>	<b>(135,314-)</b>	<b>63</b>	<b>(141-)</b>	<b>(90,004,386-)</b>
Manila Bay	Inland	<1 week	<Chest	Manila	5,790	9	0	14,521,714
				Makati	3,395	7	0	409,490
				Pasay	8,537	0	0	9,524,500
				<b>Total</b>	<b>17,722</b>	<b>16</b>	<b>0</b>	<b>24,455,704</b>
Laguna de Bay	Inland	2 weeks<	<Neck	Pasig	127,110	23	499	37,308,780
				Pateros	32,320	0	0	0
				Taguig	132,630	0	48	10139,,500
				Muntinlupa	111,850	3	3,839	16,550,500
				<b>Total</b>	<b>403,910</b>	<b>26</b>	<b>4,386</b>	<b>63,998,780</b>

Note: \*Figures are for Marikina River and San Juan River areas

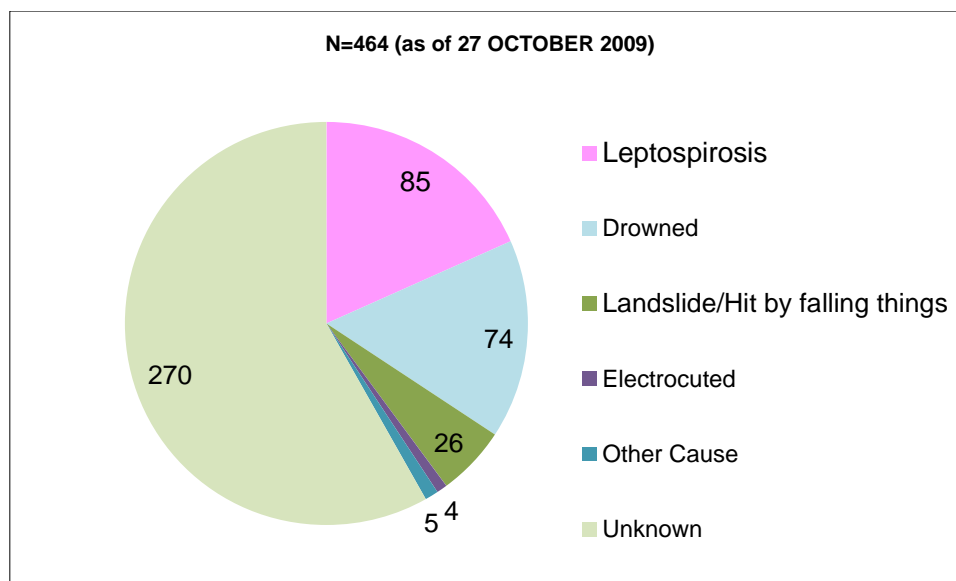
Source 1: NDCC Situation Report No.42

Source 2: Teruko Sato *et al*, 2009 Typhoon Ondoy Flood Disasters in Metro Manila

### [Danger of Water Borne Disease]

According to NDCC, approximately 44% of identified cause of death is waterborne disease, Leptospirosis. The bacteria is transmitted via water from excretes of animals to humans through mouth and skin (**Figure 2.5**).





Source: Situation Report No.42 National Disaster Coordinating Council 27 Oct.2009  
Graph by JICA Study Team

**Figure 2.5 Causes of Death by Typhoon Ondoy**

## 2.2 Flood Control Measures

### (1) PMRCIP

Pasig-Marikina River is the main source of chronic flooding in the Metro Manila area. In order to redress this problem, the PMRCIP has been implemented by DPWH, supported by JICA, since 1988. The Phase IV area of PMRCIP in the Upper Marikina area is the main focus of this study.

PMRCIP's objective is to mitigate flood damage in Metro Manila caused by channel overflow of Pasig-Marikina River thereby contributing to the sustainable urban economic development of Metro Manila. PMRCIP has progressed to completion of detailed design of Phase III as of June 2013 (see **Table 2.2**). An Environmental Compliance Certificate (ECC) is issued to PMRCIP's work in all areas by the Department of Environment and Natural Resources (DENR). The subject area is shown in **Figure 2.6**. The specification will be described in **Chapter 3**.

According to the JICA Preparatory Study for Phase III Report (2011), ECC remains valid as long as contents of project are not changed.

**Table 2.2 Project Phase of PMRCIP**

PMRCIP Phase	Engineering Stage	Subject Area	Years of Implementation
-	Master Plan	Whole Metro Manila	1988-1990
	Feasibility Study		
Phase I	Detailed engineering design		2000-2002
Phase II	Civil works: construction of flood control structure and improvement of river course	Pasig River channel (Delpan Bridge - Napindan Hydraulic Control Structure: NHCS)	2009 - 2012 (Original)/ 2013 (Additional Scope)
Phase III		Pasig River Channel, Lower Marikina River (NHCS – Marikina Control Gate Structure: (MCGS)) MCGS is not included.	2012-
Phase IV		Upper Marikina River (MCGS – Marikina Bridge)	-

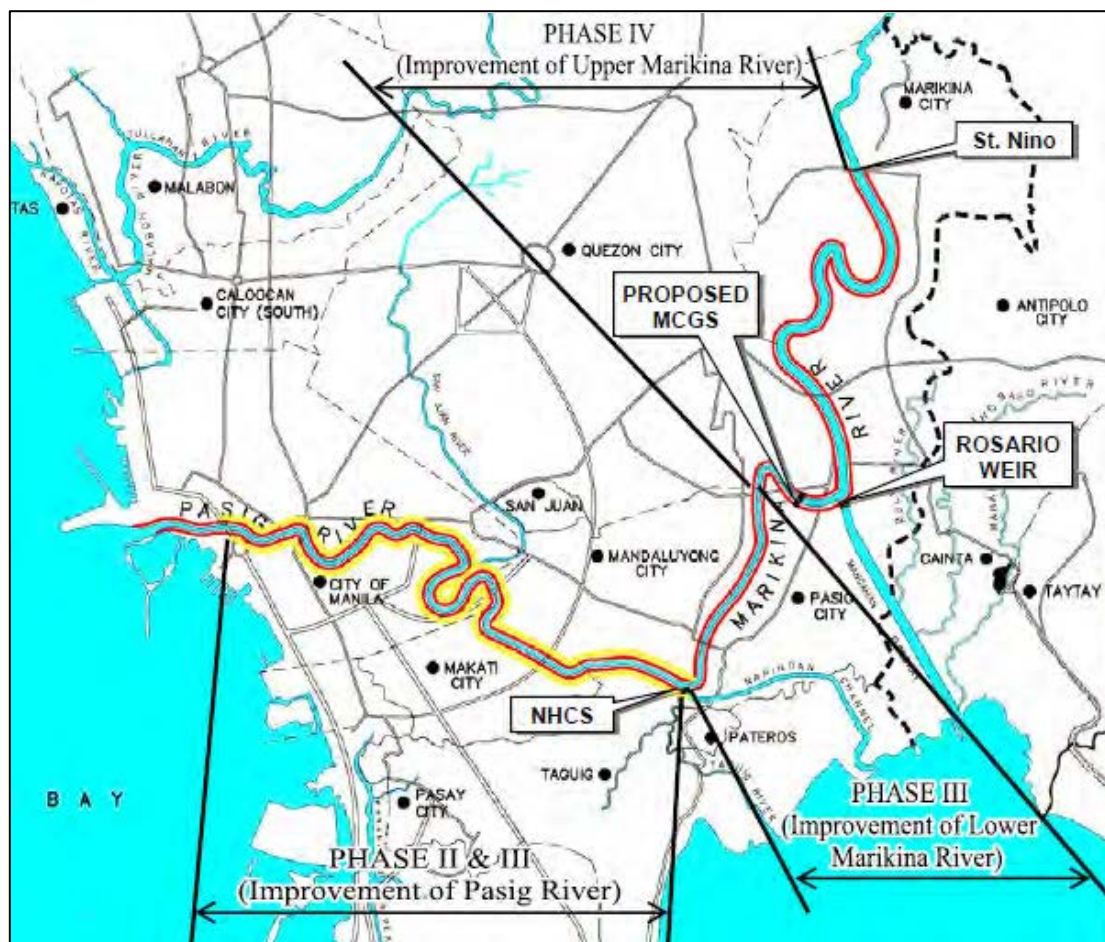


Figure 2.6 Subject Area of PMRCIP

(2) **World Bank “Master Plan for Flood Management in Metro Manila and Surrounding Area”**

After the devastating disaster wrought by Typhoon Ondoy in 2009, DPWH, with support from the World Bank, conducted the “Master Plan for Flood Management in Metro Manila and Surrounding Areas” (WB M/P) with the objective of preparing a master plan for flood control for Metro Manila and the surrounding areas.

The master plan study specifically aimed to:

- assess the flood risk;
- prepare a comprehensive flood control plan; and
- propose structural and non-structural measures.

WB M/P covers Metro Manila and the surrounding areas, with a total area of 4,373 km<sup>2</sup> (see **Figure 2.7**).





**Table 2.3 Proposed Target Flood Safety Levels for Mitigation Measures**

River / Lake / Drainage Channel	Recorded Max. (Return period)	Target Flood Safety Level	Basis
1) Pasig-Marikina River	70-year (Ondoy)	100-year	2-day rainfall
2) Malabon-Tullahan River	45-year (Ondoy)	50-year	2-day rainfall
3) Meycauayan River	40-year (Ondoy)	50-year	2-day rainfall
4) South Parañaque–Las Piñas	30-year (1986)	30-year	2-day rainfall
5) Inflow Rivers to Laguna Lake	30-year (others)	30-year	2-day rainfall
6) Laguna Lake	60-year (1972)	60-year	Water level
7) Urban Drainage	-	5- and 10-year	2-day rainfall

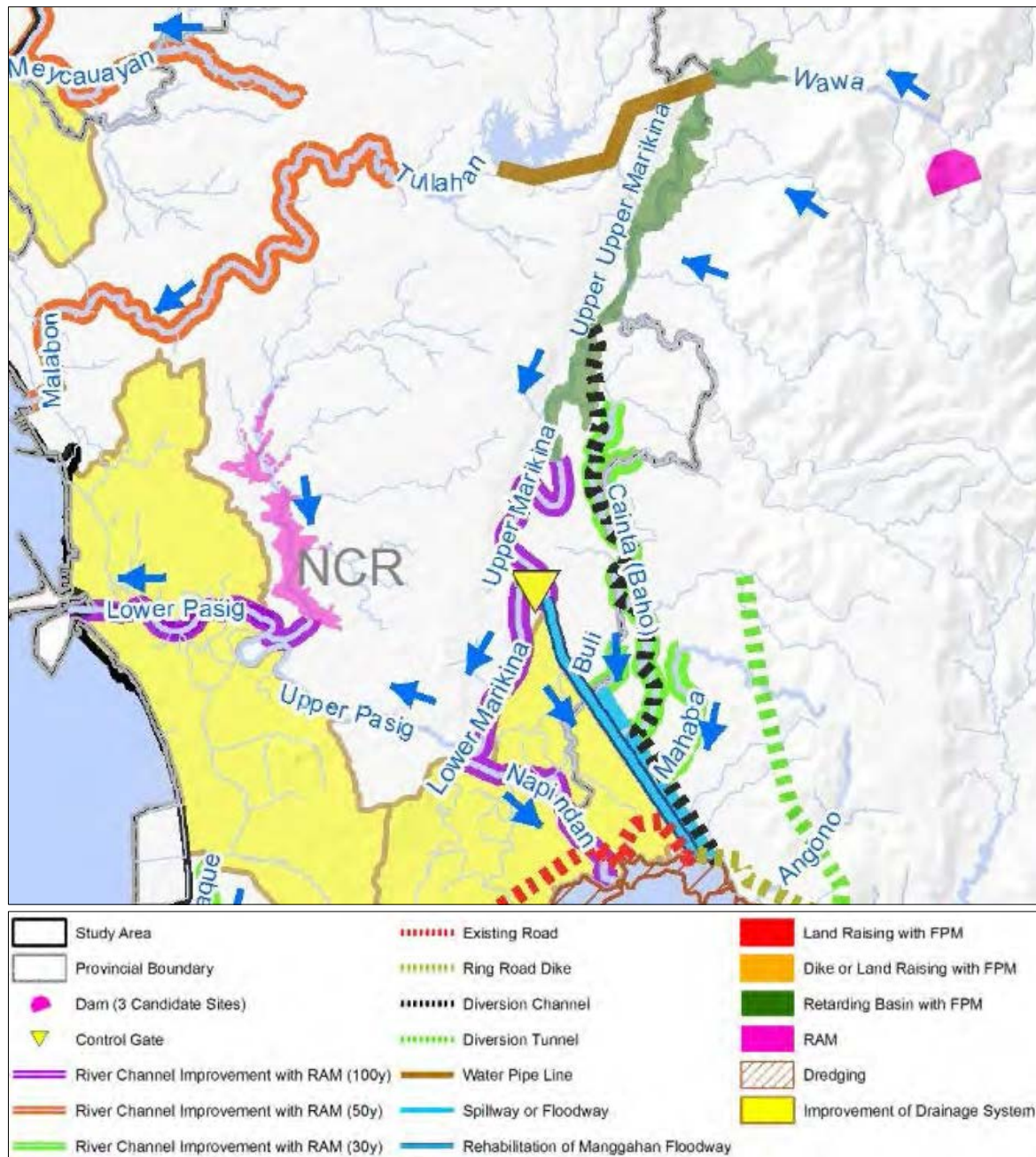
Source: Master Plan for Flood Management in Metro Manila and Surrounding Areas (Draft) 2012, The World Bank

A flood control dam, retarding basins, a control gate, and river improvement and rehabilitation of Mangahan floodway are proposed for the Pasig-Marikina River system. **Table 2.4** shows proposed alternatives for the said river system by WB M/P. Each alternative includes a combination of the measures stated earlier while **Figure 2.8** illustrates the structural measures on map.

**Table 2.4 Four Alternatives for Improvement of Pasig-Marikina River System by WB M/P**

Alternatives	Measures							Project Cost (Mil. PHP)
	Retarding Basins	Small Dam (47 MCM)	Large Dam (75 MCM)	Control Gate (MCGS)	River Improvement			
					Mangahan Floodway*	Upper Marikina	Upper Upper-Marikina	
Alt -0	✓				Excavation Widening	Excavation Flood wall Widening	Excavation	444,041
Alt-1	✓	✓			Excavation	Dike Excavation	Small concrete wall	201,094
Alt-2	✓		✓		Excavation	Dike Excavation	Small concrete wall	198,435
Alt-3	✓		✓	✓	Excavation	Dike Excavation	Small concrete wall	208,776



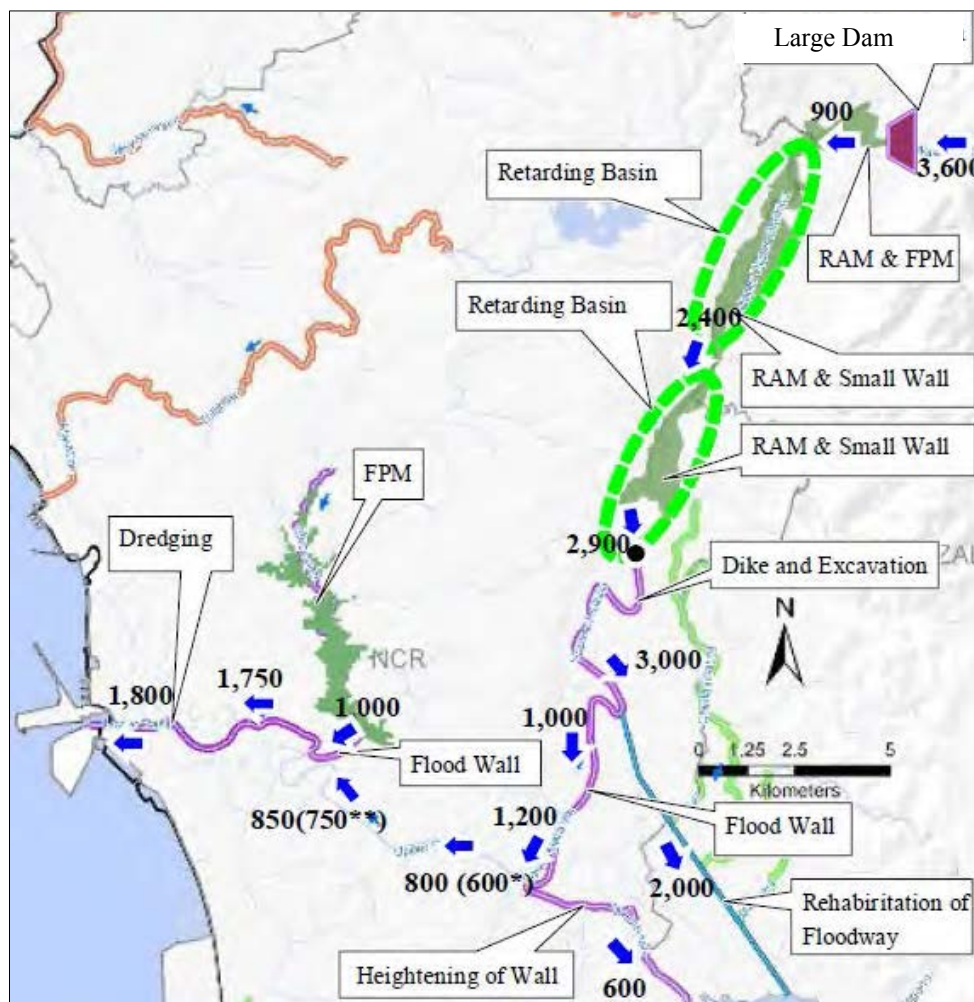


Source: Master Plan for Flood Management in Metro Manila and Surrounding Areas (Draft) 2012, The World Bank

**Figure 2.8 Structural Measures of WB M/P**

\* Design capacity is 2,400 m<sup>3</sup>/s whereas present capacity is 2,000 m<sup>3</sup>/s due to sedimentation and encroachment.  
Source: Master Plan for Flood Management in Metro Manila and Surrounding Areas (Draft) 2012, World Bank

The structural measures recommended in WB M/P are shown in **Figure 2.9**. The large dam cuts 100-year return period flood peak by 2,700 m<sup>3</sup>/s, releases 900 m<sup>3</sup>, 2,900 m<sup>3</sup>/s is expected at Marikina Bridge, Rosario Weir takes 2,000 m<sup>3</sup>/s to Mangahan Floodway, and the remaining 1,000 m<sup>3</sup>/s will be drained to Lower Marikina River, and then eventually to Pasig River.



Source: Master Plan for Flood Management in Metro Manila and Surrounding Areas (Draft) 2012, World Bank

**Figure 2.9** Combination of Structural Measures in WB M/P

## CHAPTER 3 IEE ON UPPER MARIKINA RIVER FLOOD CONTROL PROJECT

### 3.1 PMRCIP Phase IV Project Description

#### 3.1.1 Project Outline

Project which will be the subject of Initial Environmental Examination (IEE) is PMRCIP Phase IV in JICA M/P Study. Specification of the structures and operation to be reviewed in IEE are referred from Detailed Engineering Design of Pasig-Marikina River Channel Improvement Project (2002) (JICA D/D). In addition to structures of Phase IV, MCGS, which is in Phase III section, is also reviewed in this IEE.

The propose structures for Phase IV are as follows. The layout plan is shown in **Figure 3.1**.

- Embankment and parapet construction
- River improvement (widening and excavation)
- Marikina Control Gate Structure (MCGS)

Function of MCGS is to limit flood flow to the Metro Manila (Lower Marikina River) and divert flood peak discharge to Laguna de Bay through Mangahan Floodway. Construction of MCGS was included in Phase III, which is to implement in 2013, in the original plan; however, it is transferred to Phase IV because of the impacts expected on the downstream area of Mangahan Floodway by operation of MCGS. Present Mangahan Floodway is not functioning as designed 2,400 m<sup>3</sup>/sec capacity in original plan, and the capacity is expected as only 2,000 m<sup>3</sup>/sec by encroachment of Informal Settler Families (ISFs) inside of the floodway. See **Figure 3.3** for flood flow distribution plan of PMRCIP.

**Subject section of Marikina River:** from vicinity of MCGS to Marikina Bridge (approx. 7.7 km)

**Target flood scale:** 30-year return period (2,900m<sup>3</sup>/sec at Marikina Bridge, 2400 m<sup>3</sup>/sec at downstream of Rosario Weir, without flood control dam at upstream); 100-year return period with flood control dam at upstream (the target flow rate are the same in Phase IV area)

#### 3.1.2 River Improvement Works

Upper Marikina River is required to have the same or more flow capacity of the present condition by dredging or excavation of the river bed, and rising elevations of the riverbanks. In order to prevent destabilizing of embankment by dredging works, slope protections will be furnished where they are necessary.

Detail of Phase IV river improvement structures are as follows (**Figure 3.1**).

- Dike: 3.9 km
- Dredging and excavation work: 6.1 km
- Concrete parapets
- Sluice gates: 25

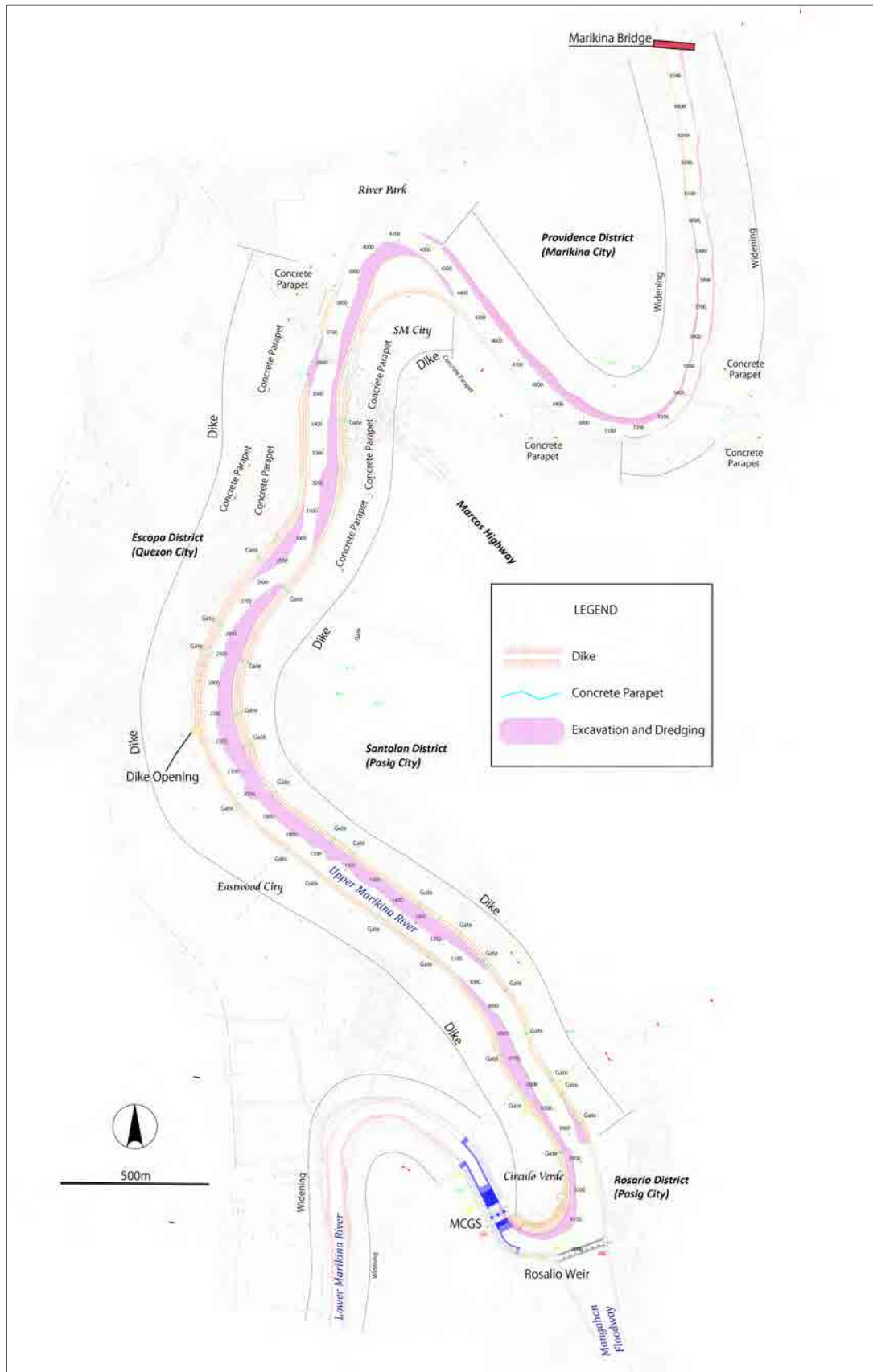
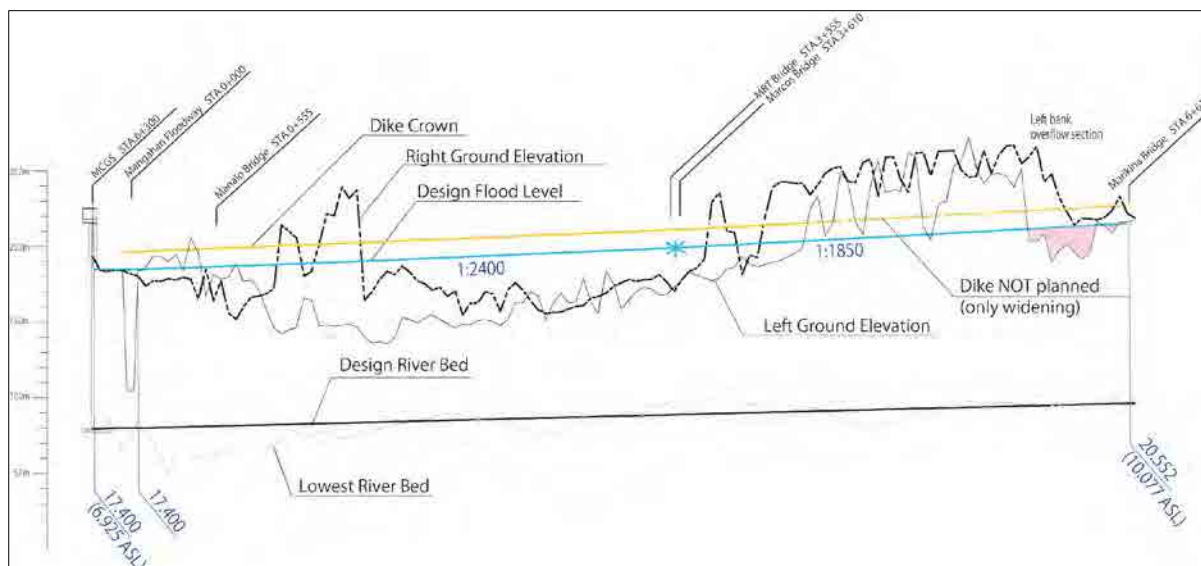


Figure 3.1 General Layout of Phase IV structures and MCGS



During 2,900 m<sup>3</sup>/sec flood, the design flood water level (FWL) at Marikina Bridge is at EL. 20.552 m, which corresponds to EL. 10.077 m above mean sea level (ASL: NAMRIA datum). FWL at the MCGS is at EL. 17.400 m (EL. 6.925 m ASL). Since dikes are not planned in Marikina City, some portion in left bank just downstream of Marikina bridge will be inundated during 30-years return period flood (**Figure 3.2**).



**Figure 3.2 Planned Longitudinal Section**

### 3.1.3 MCGS

Function of MCGS is to limit flood flow to the Metro Manila (Lower Marikina River) and divert flood peak discharge to Laguna de Bay (Mangahan Floodway). Under the existing condition of “without MCGS and with the Rosario Weir fully opened”

By results of hydraulic model test conducted by JICA in 1983, it is estimated that 30-year return period flood (2,900 m<sup>3</sup>/sec) flows into 1,100 m<sup>3</sup>/sec to Lower Marikina River and 1800 m<sup>3</sup>/sec to Mangahan Floodway. By installation of MCGS, the structure is designed to cut 600 m<sup>3</sup>/sec, which was flowing down to the Lower Marikina River otherwise. Releasing decreased 500 m<sup>3</sup>/sec flood flow to the Lower Marikina River, it contributes decreasing flood water in the Pasig River area (**Table 3.1**).

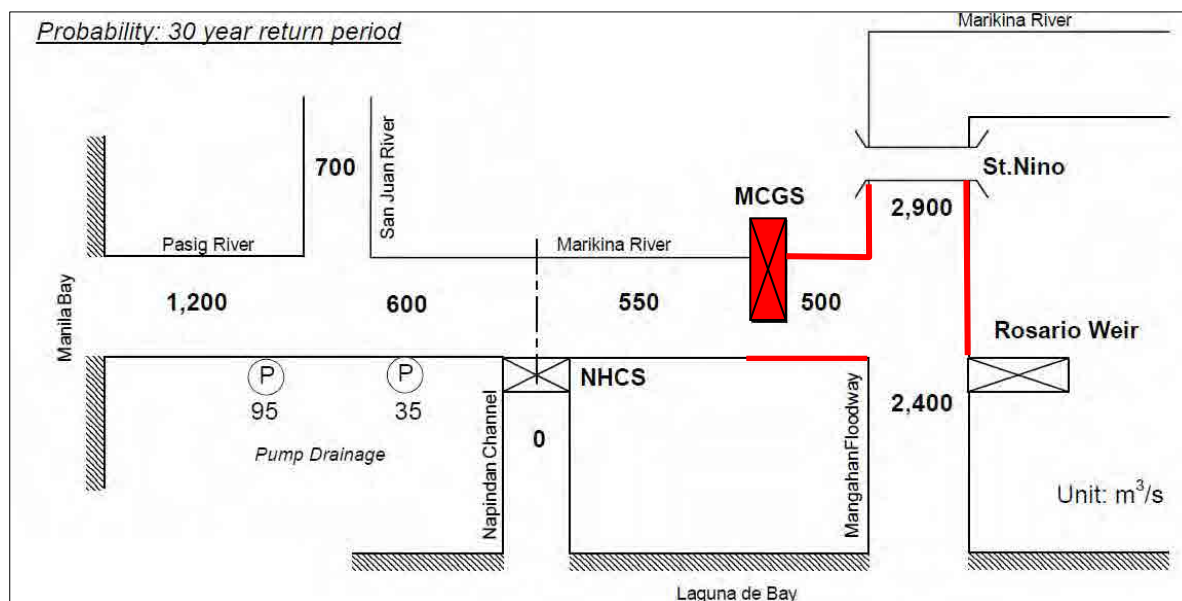
**Table 3.1 Distribution of Flood Water at MCGS**

	Mangahan Floodway	Lower Marikina River
Present condition	1,800 m <sup>3</sup> /sec	1,100 m <sup>3</sup> /sec
With MCGS operation	2,400 m <sup>3</sup> /sec	500 m <sup>3</sup> /sec

#### [Current Status]

Construction of MCGS was included in Phase III, which is to implement in 2013, in the original plan; however, it is transferred to Phase IV because of the impacts expected on the downstream area of Mangahan Floodway by operation of MCGS. Present Mangahan Floodway is not functioning as designed 2,400 m<sup>3</sup>/sec capacity in original plan, but the capacity is expected as only 2,000 m<sup>3</sup>/sec by encroachment of Informal Settler Families (ISFs) inside of the floodway. Original flood distribution plan is shown in **Figure 3.3**.

The population inside of the Mangahan Floodway is estimated, but the impacts outside of the Mangahan Floodway is not assessed in this Survey.



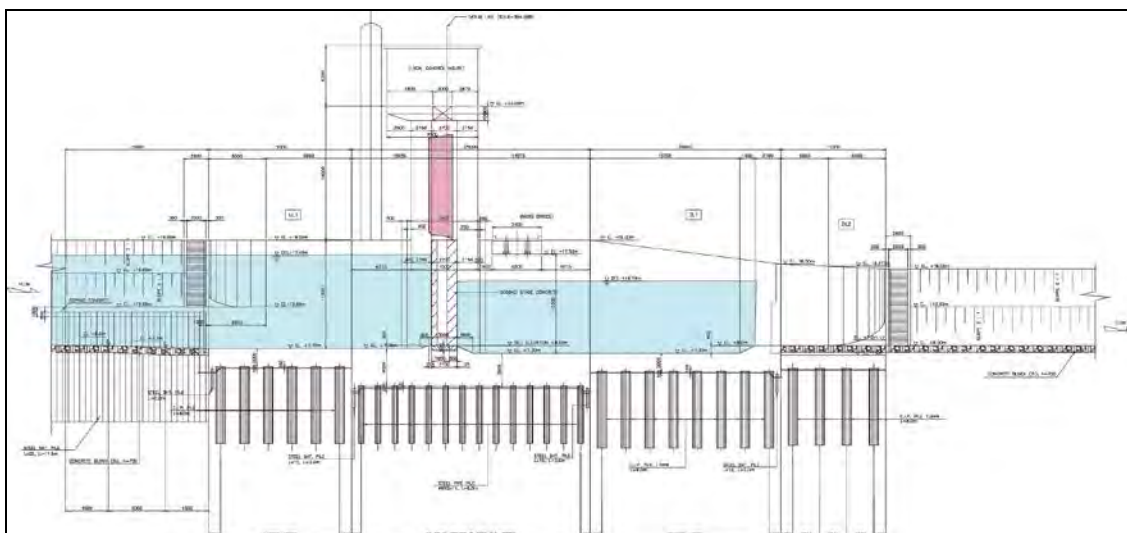
Source: The Preparatory Study for Pasig-Marikina River Channel Improvement Project (Phase III)

**Figure 3.3 Flood Distribution Plan and Locations of PMRCIP Phase IV Component (MCGS, embankment/parapet, excavation)**

**[Structure]**

Principal features of the proposed MCGS are as follows (Figure 3.4).

- Design Discharge : 500 m<sup>3</sup>/sec (into Lower Marikina River)
- Design Water Level
  - Upstream Side : EL. 17.40 m
  - Downstream Side : EL. 14.74 m
- Design River Section:
  - Bed Width : 43.5 m
  - Bed Elevation : EL. 8.00 m
- Design of Gate
  - Gate Span and Height : 2 x 20 m in width including piers and 11.0 m in height
  - Gate Type : Roller gate



Source: Detailed Design in 2002

**Figure 3.4 Profile of MCGS**

**[Operation]**

After river flow of Upper Marikina River reaches 250 m<sup>3</sup>/sec, MCGS will be activated to divert portion of flood volume to Mangahan, then it increases the discharge up to 500 m<sup>3</sup>/sec, the maximum discharge volume to the Lower Marikina River (**Table 3.2**).

**Table 3.2 Operation of MCGS**

Period	Volume of Inflow	Diverted discharge into:	
		Lower Marikina (via MCGS)	Mangahan FW (via Rosario Weir)
Ordinary case	< 250 m <sup>3</sup> /sec	100%	0% (Gate closed)
Extreme case	250 m <sup>3</sup> /sec<	Constant rate discharging (250-500 m <sup>3</sup> /sec)	Remaining Volume
	500 m <sup>3</sup> /sec<	500 m <sup>3</sup> /sec (Fully functioned)	Remaining Volume

**3.2 Physical and Natural Settings of Phase IV Area**

**3.2.1 Physical Environment**

Phase IV area is low gradient flood plain along Upper Marikina River, whose gradient is 1/1800 – 1/2,500. The lowest elevation is at below 5 m in Santolan in Pasig City, and other low laying area is Provident District (Barangay Jesus De La Pena and Tanong) in Marikina City. Relatively high elevated plateau, over EL. 12 m, is in Quezon City on the right bank of Marikina River (**Figure 3.5**).

During Typhoon Ondoy, Marikina Bridge and Marcos Bridge were over-topped by flood water, and all the areas along the Marikina River are inundated. The flood water penetrated Calumpang Barangay in Marikina City and over flowed over Marcos Highway, then reached downstream side of Rosario Weir through inland of Pasig City.

### 3.2.2 Natural Environment

#### (1) River Water Quality

According to The Preparatory Study for Pasig-Marikina River Channel Improvement Project (Phase III) Report (Phase III Report), including the results of water monitoring by JICA (1999-2008), water quality of the Marikina River is severely deteriorated. All fishing activities were stopped in the 1980's; and in the 1990's the river was declared as "biologically dead." The major sources of water pollution are suspected to be the light to heavy industries located along the Marikina rivers and regular households .

#### (2) Flora and Fauna

Upper Marikina river environment is heavily affected by urbanization of the surrounding areas. It is highly-polluted and disturbed.

The variation of aquatic plants in the Marikina River is limited, which can be attributed to river pollution and land use of the riverine. The same or similar habitat and biological characteristic can be expected throughout the river. Water hyacinths are increased the numbers uncontrollably in water body with high nutrients with slow velocity of flow, and clog up waterways.



Original plants are not grown on the sides of Marikina River (Quezon City, right, and Pasig City)



Riparian plants are diminished by high needs of land along the Marikina River (Marikina City)



*Eichornia crassipes* (Water hyacinth) is clogging waterway in front of Santolan area



*Ipomoea aquatic* (Kangkong) is harvested for commercial use

Janitor fish, *Ancistrus temminckii*, is the only fish species known to live in Marikina River. Janitor Fish is a foreign origin and expelled native species in Marikina River in 1990s. City of Marikina has issued City Ordinance, *Janitor Fish Eradication Drive* in 2007 to reduce the number of this alien fish.





*Ancistrus temminckii* or Janitor Fish



Cluster of or Janitor Fish in Marikina River

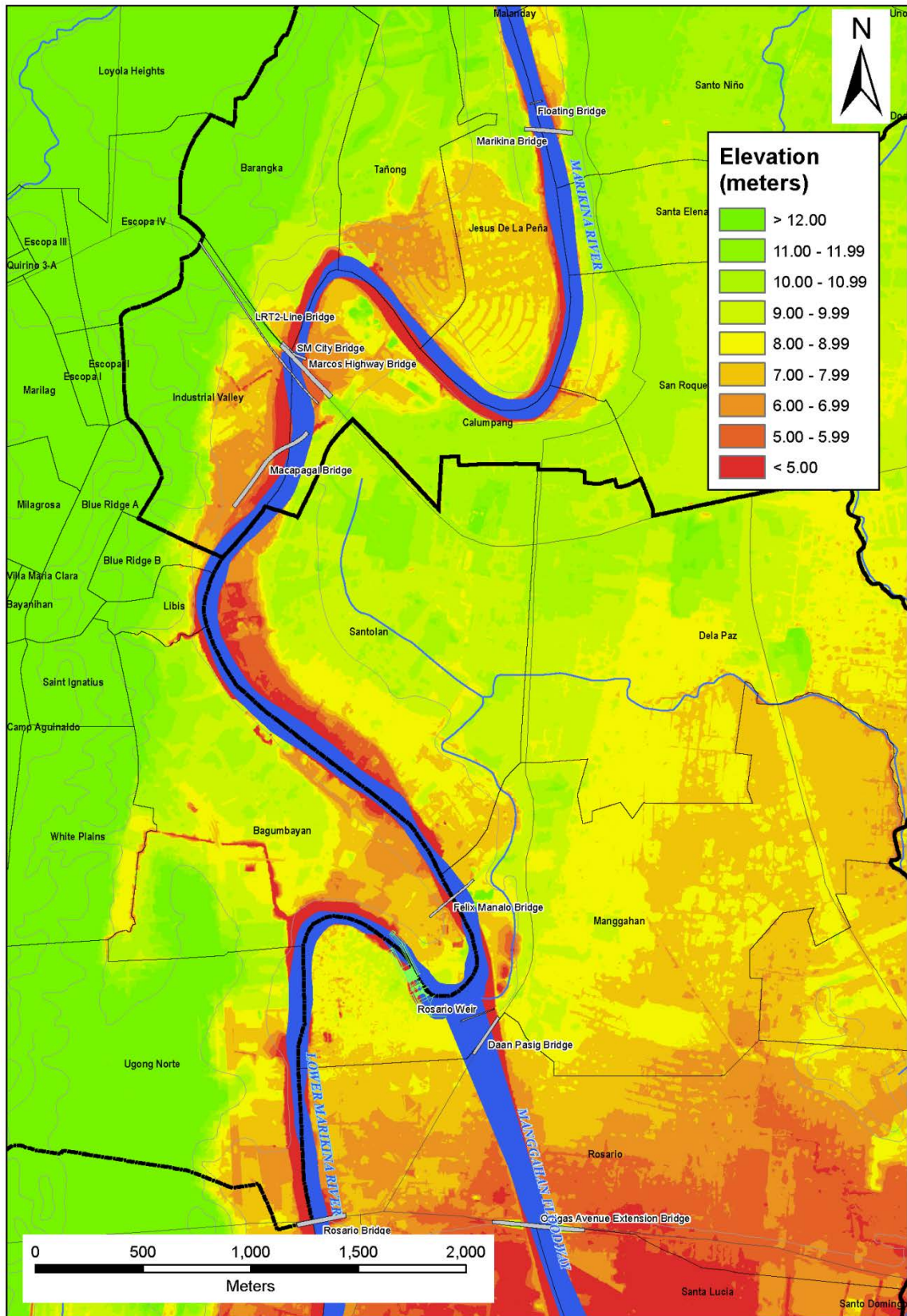


Figure 3.5 Topography of Upper Marikina Area

### 3.3 Social Settings

#### (1) Administrative Boundary and Demography

River section in Phase IV is consisted of Marikina City, Quezon City, and Pasig City (**Figure 3.6**). Demographic data including population, number of families of each Barangay is summarized in **Appendix** . Land use is indicated in **Figure 3.7**.

#### (2) Land Use and Economic Activities

##### [Marikina City Area]

Marikina City has declared easement of 96 meters from either side of the Marikina River centerline by Ordinance 10 of 1994. All ISFs along the river had been relocated already by the City. The riverine was substituted by Marikina River Park which stretches from Marikina Bridge to Marcos Bridge on both sides of the river, offering naturally looking park along side of Marikina River. River banks offer two large shopping malls namely Riverbanks Center and SM City. Small scale agriculture plots are scattered on the right bank, and residential area behind existing private river wall at Provident area. There are many kinds of industries and numerous small businesses in Marikina, and shoe and leather industries offer the biggest portion of job opportunities among them.



River Side Park at Barangka and Tanong:  
recreation area in daytime

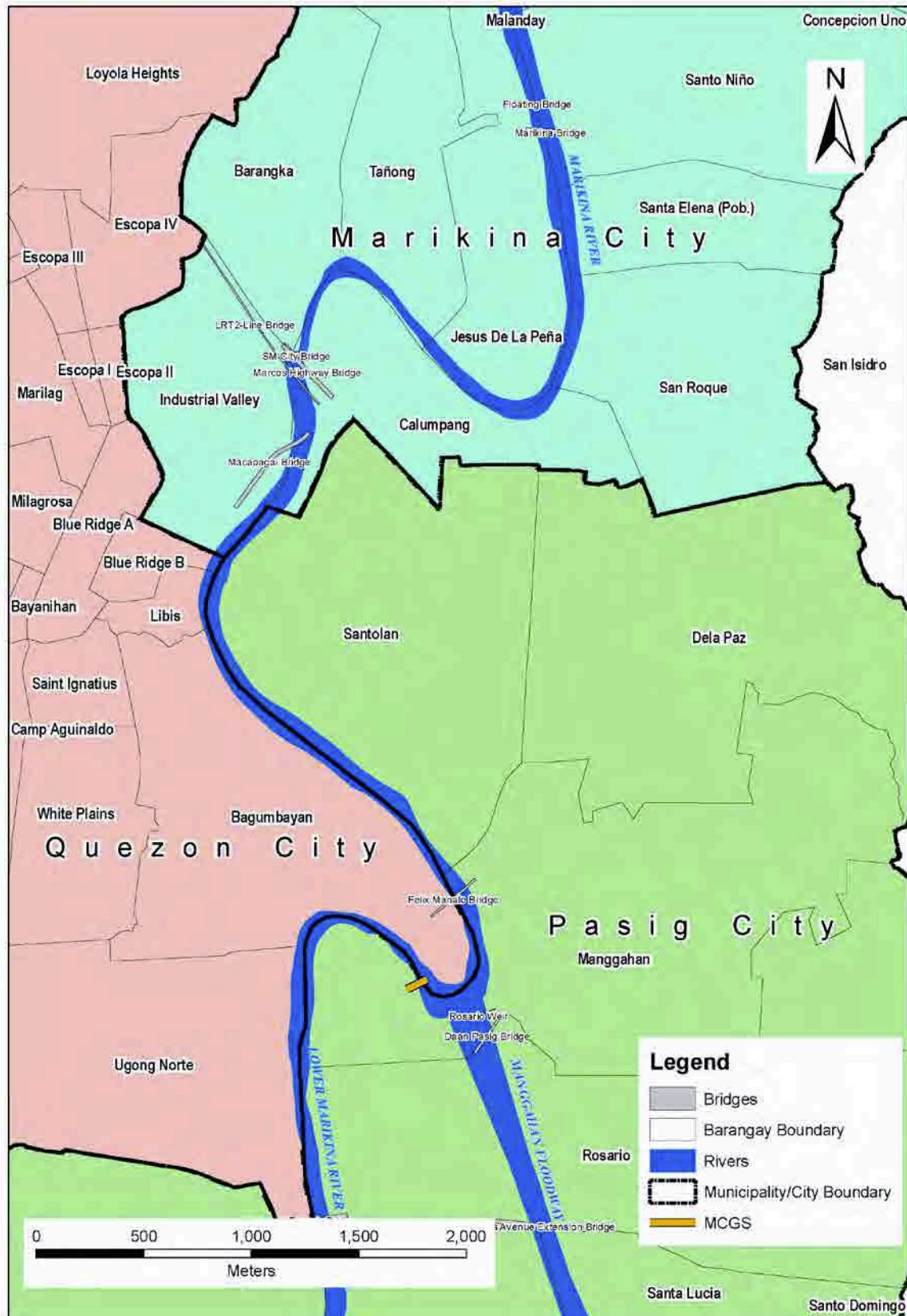


Saint Nino downstream side of Marikina Bridge: Attracting  
area for tourist in night time

##### [Quezon City Area]

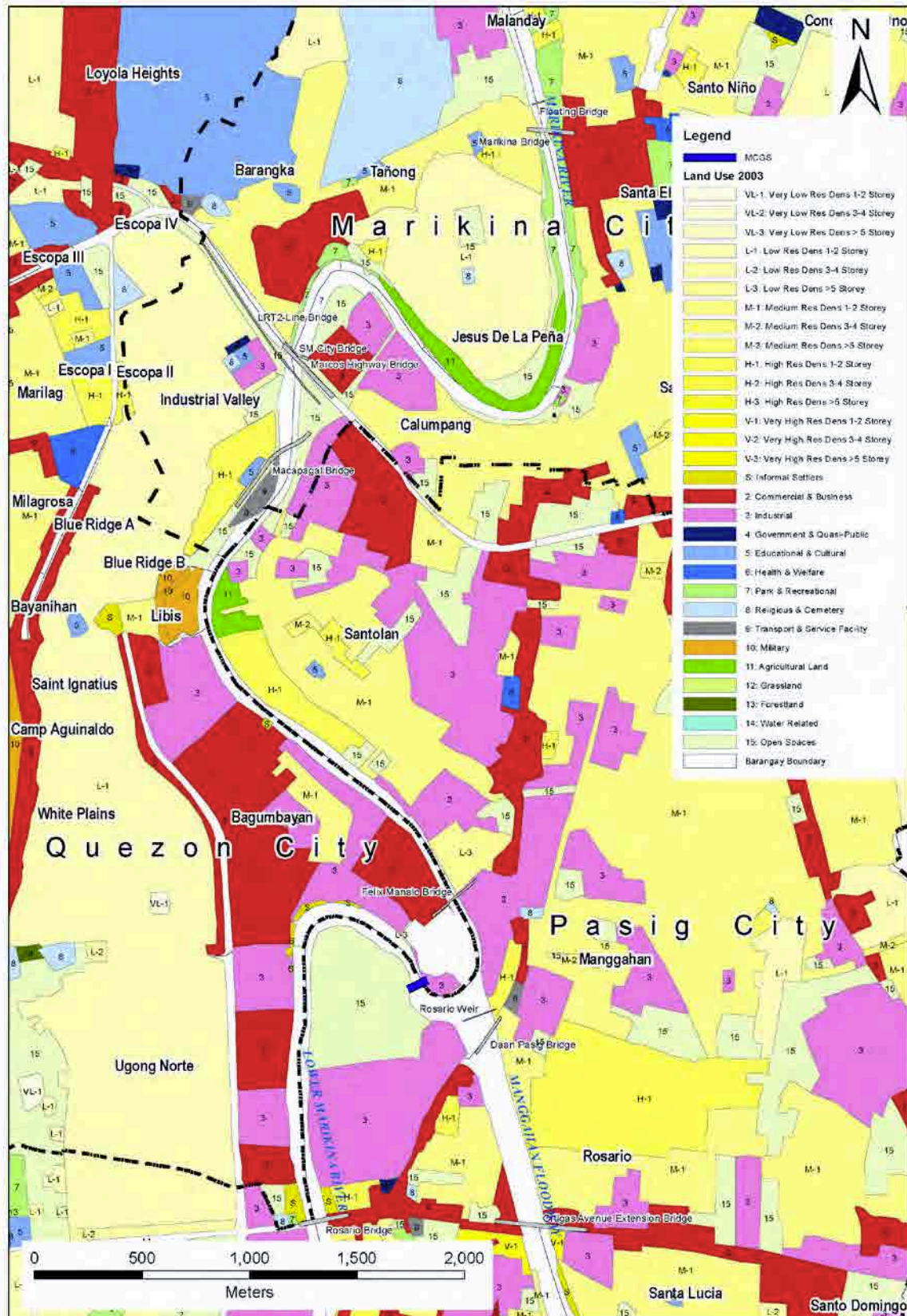
Quezon City's easement is 3 m from the riverside. Factories, residential areas, commercial development areas are the major land use of riverside in Quezon City. Agriculture activities, river use o are not practiced and there is no water intake. Commuters' ferry station at Eastwood City was existed, but was destroyed by Typhoon Ondoy and discarded; however, there is a movement to reopen the navigation route again.





**Figure 3.6 Administrative Boundary**





Updated by JICA Study Team from MMEIRS 2003  
**Figure 3.7 Land Use**



Buildings of Eastwood City beside Marikina River



Private protection walls are commonly be seen, and they sometimes obstruct river flow

### [Pasig City Area]

There are many factories, but principal use of the riverside is residential in Pasig City area. Among all, Santolan area has the lowest elevated land, which is submerged below Ondoy's flood water surface deeper than 5 m in some area in 2009.

Pasig City has set its easement as 10 m from the riverside (up to 30 m in Santolan), and has set back its protection line by 10 m from the river bank, and resettled the 612 households who lived in the easement area (danger area) by 2011.



Santolan area seen from Quezon side



Cleared riverside and new parapet in Santolan area

### 3.4 Scoping

Scoping check list (**Table 3.3**) was utilized in order to determine survey method (**Table 3.4**) for impacts expected.

**Table 3.3 Scoping Checklist**

Impacts on:		Expected Degree of Impact	Description of Expected Impacts
Social Envt.	1. Housing and real estate (Land acquisition and involuntary resettlement)	A-	<ul style="list-style-type: none"> <li>•New embankments and other flood control structures require land acquisition along the Upper Marikina River section (MCGS-Marikina Bridge); and, resettlement of the residents and removal of factories will also be needed. (a-)</li> <li>•Illegal settlement families (ISFs) who live inside of the Mangahan Floodway are subject of the National project: five-year resettlement program for ISF from endangered area (2011). The residents are aware of resettlement and the central and local governments, community organizations, NGOs are working on their resettlement plan; therefore, it is deemed that the ISFs in Mangahan floodway are no longer related to the JICA projects. The impacts on ISFs will not be the subject of the following scoping analysis.</li> </ul>
	2. Job Opportunity and Livelihood	A-	<ul style="list-style-type: none"> <li>•Since several factories are interfering with planned embankment, removal or large-scaled modification of their facilities are required. (a-)</li> <li>•New and sustainable livelihood is required for resettlers. (a-)</li> <li>•There is no impacts estimated for navigation since the planned gates of MCGS are always full-opened during normal flow level. In addition, excavation of the river bed for flood control purpose gives positive effects for the navigation since the biggest obstacle for restoration of Marikina River navigation is sedimentation of the River. (+)</li> <li>•River usage other than picking up of water spinach are not known at this point. Water spinach will not be able to collect during excavation works. (c)</li> </ul>
	3. Land Use and Income Source	A-	<ul style="list-style-type: none"> <li>•Changes of land use of the limited area written in “1. Housing and real estate” will be necessary, by converting residential areas and farms into area for flood control structures. (b-)</li> <li>•Large-scaled urbanized development project (Circulo Verde) interferes with flood control structures. Circulo Verde project has flood wall but it is not considering MCGS construction. (a-)</li> </ul>
	4. Community Organization	C	<ul style="list-style-type: none"> <li>•Large-scaled resettlement necessary, which may affect community organization, for the flood control project is only in Santolan area of Pasig City. However, approximately 600 ISFs along the Marikina River have resettled after Typhoon Ondoy (2009). The present status should be summarized. (c)</li> </ul>
	5. Social Services and Community Infrastructure	C	<ul style="list-style-type: none"> <li>•Locations of social services and community infrastructures are not known at this point. Finding of the location is necessary in order to assess impacts of flood control facilities. (c)</li> </ul>



**Table 3.3 Scoping Checklist**

Impacts on:		Expected Degree of Impact	Description of Expected Impacts
Social Evt.	6. Socially Weak or Disadvantageous Groups	C	<ul style="list-style-type: none"> <li>• Since all the subject areas are extensively urbanized, indigenous people do not exist; however, many ISFs are living along the upper Marikina River, especially in Santolan area of Pasig City (Many of them are resettled after Typhoon Ondoy but some are reported to be returned). Further survey on implementation of resettlement plans for the ISFs.</li> </ul>
	7. Reasonable Distribution of Benefit and Social Cost	B-	<ul style="list-style-type: none"> <li>• Planned flood control structures are designed to protect the houses and buildings lays in low ground level in direct hinterland from flood of 2,900m<sup>3</sup>/sec. The beneficiaries and the bearer of the social cost are of the same community. (d)</li> <li>• Social conflict between resettlers and the beneficiaries with in the same community may occur. (b-)</li> </ul>
	8. Historical or Cultural Heritages	C	<ul style="list-style-type: none"> <li>• There is a necessity of further survey due to lack of information of the location. (c)</li> </ul>
	9. Social Conflict	C	<ul style="list-style-type: none"> <li>• Implementation of the proposed project requires resettlement. Social conflicts between the recipient community and the resettlers may arise. (c)</li> </ul>
	10. Water Usage, Water Rights, Customary Use of Water Intake	C	<ul style="list-style-type: none"> <li>• Water usage of the project area is unknown. The further survey on the river water use in the stretch is required.(c)</li> </ul>
	11. Sanitary Treatment	B-	<ul style="list-style-type: none"> <li>• There is possibility that sanitary treatment of the construction yard is insufficient (direct disposal to the river may be conducted). (b-)</li> <li>• River water may be stagnant during operation of MCGS, however, duration of the time is less than six hours for most of the large flood. Thus degradation of water quality of the river water by operation of MCGS is not expected. (d)</li> </ul>
	12. Health environment (spreading of disease including STDs)	D	<ul style="list-style-type: none"> <li>• There is no significant impact expected by the construction workers because the project area is extensively urbanized, so reported by the Phase II project. (d)</li> </ul>
Natural Evt.	13. Stability of grounds	B-	<ul style="list-style-type: none"> <li>• Height of the proposed embankment are as high as 5 m from the ground level. There is a possibility that hinterland will be submerged under precipitation greater than the design level. (b-)</li> </ul>
	14. Soil erosion	D	<ul style="list-style-type: none"> <li>• There is almost no possibility that soil erosion occurs by the implementation of the project due to the low and flat topography. (d)</li> </ul>
	15. Groundwater supply	D	<ul style="list-style-type: none"> <li>• Installation of wells are not planned; and, the area's ground water supply will not get any impacts from the implementation of the plan. (d)</li> </ul>



**Table 3.3 Scoping Checklist**

Impacts on:		Expected Degree of Impact	Description of Expected Impacts
	16. Natural Flow of River and Discharge Function	B-	<ul style="list-style-type: none"> <li>• Since water flow rate will not be decreased artificially by diversion or intake during normal time. There is not any impact by the implementation of the plan. (d)</li> <li>• As water level of the river becomes lower than the inland water level, inland flood water will be discharged through gates. It also means that the flood water of inland will not be discharged as long as the water level of the river stays higher, unless pumps are to be installed and discharge the inland water artificially. Moreover, volume of sediment discharge from the upstream of Marikina River area is expected to be high, and the river bottom should always be cleared and lower than the lower portion of the gates to be functioned properly. (b-)</li> </ul>
	17. Coastal area	D	<ul style="list-style-type: none"> <li>• There is no impacts on the coastal area by the implementation of the flood control facilities.(d)</li> </ul>
	18. Biodiversity	C	<ul style="list-style-type: none"> <li>• There is no information of the biodiversity of the Upper Marikina River area for estimating the impacts of flood control structures. (c)</li> </ul>
	19. Micro climate	D	<ul style="list-style-type: none"> <li>• Construction and operation of the planned flood structure and can hardly influence the climate of the area.</li> </ul>
	20. Aesthetic landscape	C	<ul style="list-style-type: none"> <li>• Impacts on aesthetic land scape by the embankments are not known at this point (c)</li> </ul>
	21. Global warming	D	<ul style="list-style-type: none"> <li>• Construction of the embankment and changes of the land use will not have any impact since the there is no operation or release of CFC will not take place after the completion. (d)</li> </ul>
Pollution	22. Air quality	C	<ul style="list-style-type: none"> <li>• Emission from construction machines will add certain amount of pollution substances in to air during construction. (c)</li> <li>• No emission will be released after completion of the structure. (d)</li> </ul>
	23. Water quality	C	<ul style="list-style-type: none"> <li>• Turbidity of the river will be higher during excavation of the river bed for creating enough cross section of the river. Occurrences of the impacts are depending on the river usage at the downstream. Impacts are significant if fisheries are practiced at the downstream. (c)</li> </ul>
	24. Soil (Contamination)	C	<ul style="list-style-type: none"> <li>• Disposal of the soil may degrade the disposal area according to the level of contamination of the dredged soil. (c) (Study of the disposal area is out of the scope of this study)</li> </ul>
	25. Solid waste treatment (disposal of excavated river bed soil)	C	<ul style="list-style-type: none"> <li>• The same with “No. 24 Soil”</li> </ul>
	26. Noise and Vibration	C	<ul style="list-style-type: none"> <li>• The degree of impact of the noise and vibration during construction at minimal area are not clear at this point. (c)</li> <li>• Emission of noise and vibration will not be released after completion of the structure. (d)</li> </ul>

**Table 3.3 Scoping Checklist**

Impacts on:		Expected Degree of Impact	Description of Expected Impacts
27.	Ground subsidies	D	•The probable cause of ground subsidence, such as groundwater extraction are not planned during construction and after completion. (d)
28.	Odor (-offensive)	D	•Offensive odor of hydrogen sulfide may be noticed near the dredging works at limited time, and there is no smell after completion of the project. (d)
29.	Sedimentation	D	•Sediments accumulated on river bed will be removed for Marikina River improvement project. (b+)
30.	Safety of vicinity roads and yards	D	•Accidents may occur at the construction site, however, the structure is static and will not cause any accident after completion. (d)

A-/+: There is significant and irreversible impact is expected

B-/+: Less severe impacts are expected than “a” above

C: Impact is not able to expect; it will be clarified by the survey

D: No impact or the impact is negligibly small

+: Positive impact

### 3.5 Impact Assessment

#### 3.5.1 Land Acquisition and Involuntary Resettlement

Riversides of Phase IV have been densely developed and urbanized since the year 2002; the year JICA conducted detailed design (**Figure 3.8**).

##### a. Marikina River Park development

Marikina River Park is constructed and still being expanded by Marikina City for a recreational park, after clearing the riverine, which attract local families in daytime. It is being a center for nightlife events supported by riverside restaurants and night clubs. There are Roman Garden, Chinese Pagoda, Youth Camp, Animal Trail, Skating Rink and Women's Park. Trails along the river are well taken care of, and use of automobile is strictly prohibited for pedestrians.

River widening is planned in the area indicated in **Figure 3.9**. Photos below are the areas where excavation is planned. Agriculture is practiced at the accreted alluvium soil.



Widening area in Marikina River Park



Area for river widening



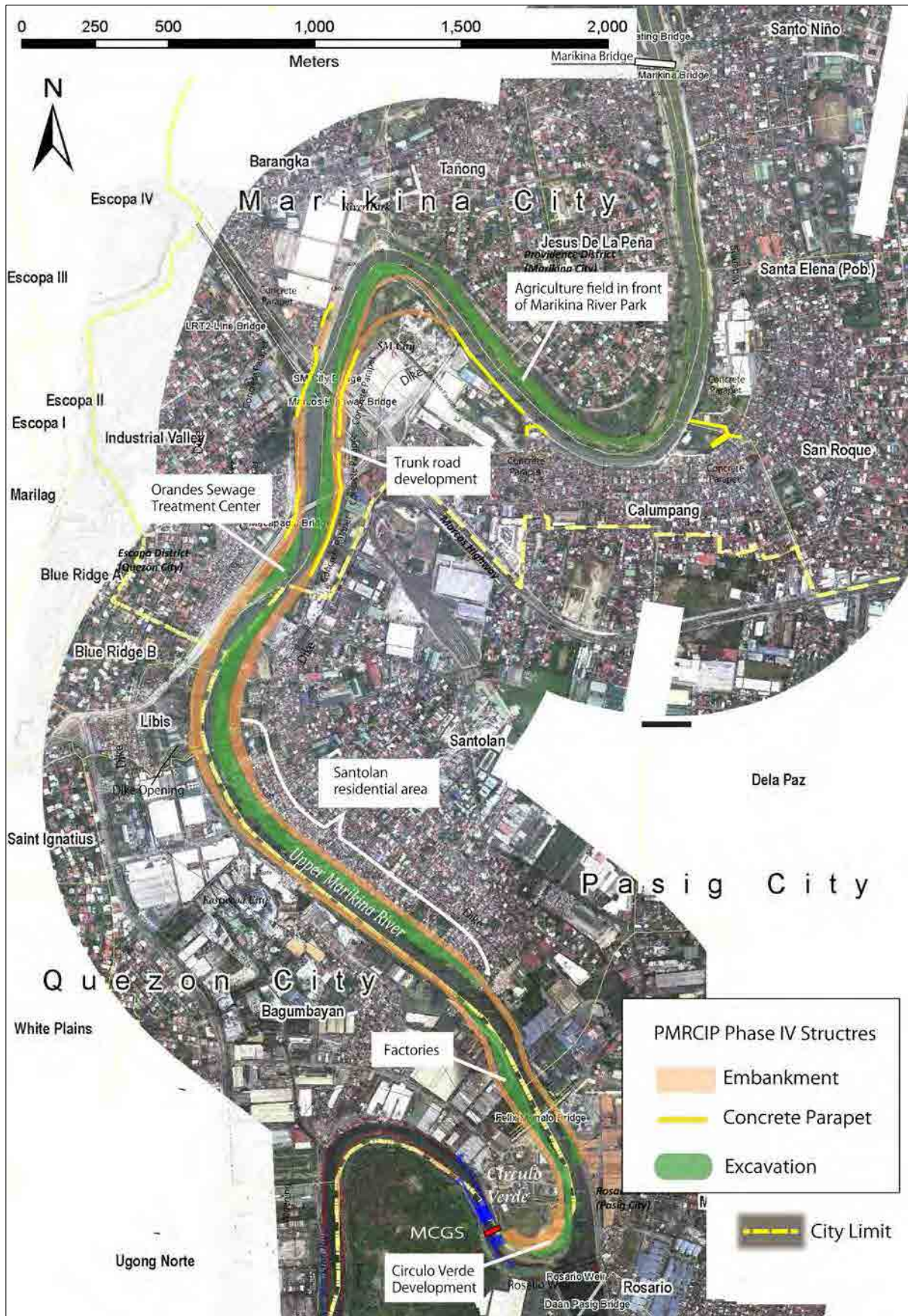


Figure 3.8 Developments along the Marikina River





**Figure 3.9 Proposed Area for Excavation in Marikina City**

**b. Trunk road development**

DPWH developed a new road underneath of junction of Marcos Highway and Fidel V. Ramos Avenue. The new road interferes with the river area required for the implementation of PMRCIP Phase IV (**Figure 3.10**).



**Figure 3.10 Road Interference at Marcos Highway Junction**



### c. Manila Water sewerage treatment plant

Manila Water constructed sewerage treatment plant in the southern end of Marikina City along the Marikina River. Most of the land is in easement area. The outline of the plant is listed below.

**Name of Plant:** Olandes Sewage Treatment Plant (STP)

**Project Owner:** Manila Water

**Project Cost:** US\$4.69 Million, financed by World Bank under Manila Third Sewerage Project (MTSP)

**Capacity:** 10 million liters per day (MLD) of 40,000 Residents in Marikina and Quezon City

**Purpose:** help reduce pollution in Marikina River, and reduce health hazards

**In operation from:** January 2011

**Process in underground facility:** to screen out solids; aeration, degradation of organic matter with microorganisms, and chlorination. Separated sludge is disposed in Tarlac.



Sewerage plant built by Manila Water



The plant was built in River Area

Manila Water's sewerage plant is injecting 85 m from the road toward the river center; its longitudinal length is 375 m (**Figure 3.11**). This accreted area is blocking the flood flow, and is planned to be excavated in PMRCIP Phase IV.



**Figure 3.11 Manila Water Sewerage Treatment Plant**



**d. Santolan residential area**

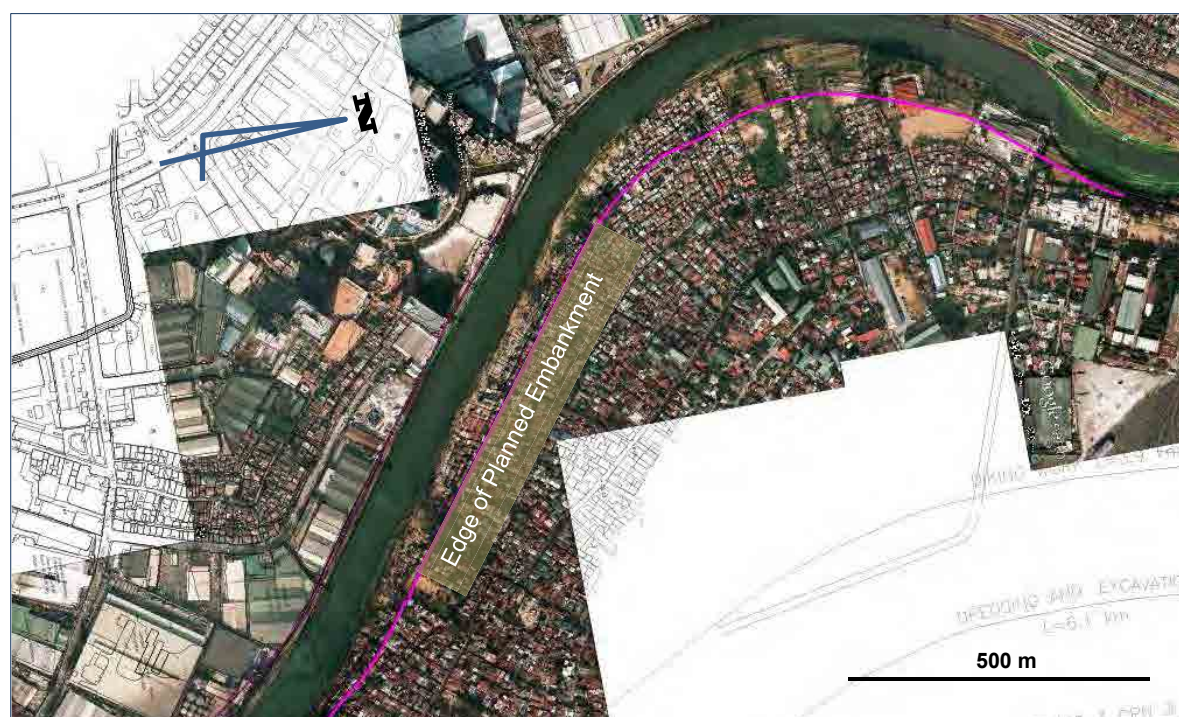
Santolan area of Pasig city is heavily damaged by Typhoon Ondoy and many residents who lived by the Marikina River had resettled soon after the typhoon under support of Pasig City and National Housing Authority (NHA). Pasig City has set easement area and constructing parapet at the border. This area is required to be excavated for implementation for PMRCIP Phase IV (**Figure 3.12**).



Pasig City has easement area of its own (10-30 m from river)



Parapet is being constructed in Santolan by Pasig City  
See **Figure 3.20** for this position



**Figure 3.12 Santolan Area and Embankment Edge**

**e. Eastwood City development area**

Eastwood City’s new parking lot is intruding into river area about 11.5 m (**Figure 3.13**). This facility is obstructing flood flow.



Eastwood City ferry terminal is merging to the bank



Parking lot is more than 10 meters to the river center

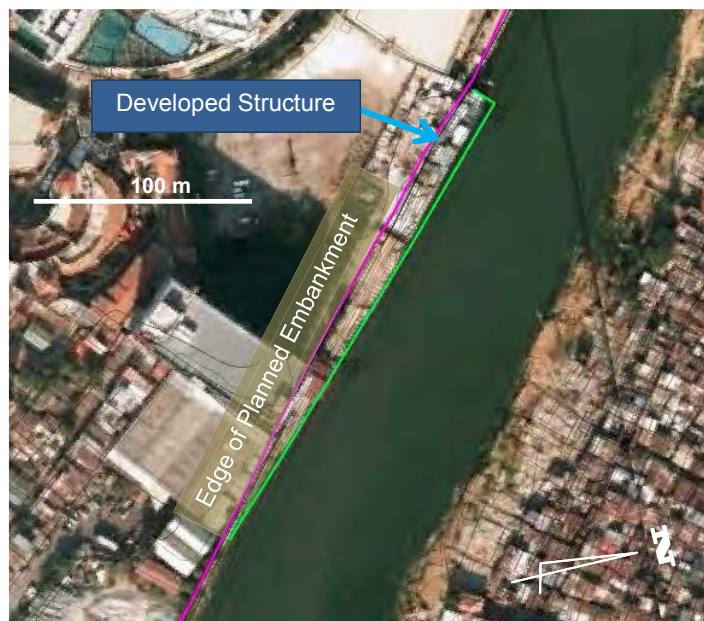


Figure 3.13 Developed Structure of Eastwood City

f. **Factories in Quezon**

Factories in Quezon City interfere with proposed embankment. These factories are narrowing the river's cross section significantly, and endangering the assets at the upstream (**Figure 3.14**).





D &L Industries, Inc. locates under the planned embankment

**g. Factories in Pasig**

If factories in Pasig City are also coming into river course, and obstructing flood flow together with factories across the river in Quezon City (**Figure 3.14**).



Readycon Trading & Construction Co. in Pasig City



Selecta RFM Factory in Pasig City



**Figure 3.14** Overlapping land use in Rosario area

#### **h. Circulo Verde Development**

Circulo Verde is a 12 hectare residential compounds, being developed by Ortigas & Co. It is at Calle Industria Street, Bagumbayan, Quezon City. The area is facing Rosario weir across the Marikina River and on ground level relatively higher than surrounding area with ever developing sand spit attached to the south-east corner (**Figure 3.15**).



This business development is interfering with the river area required for the implementation of PMRCIP Phase IV.



Circulo Verde's river wall at upstream side of Rosario Weir



Downstream side of Rosario Weir



MCGS proposed site is no longer available due to the development on the right bank: Circulo Verde Project



Rosario Weir seen from MCGS proposed site



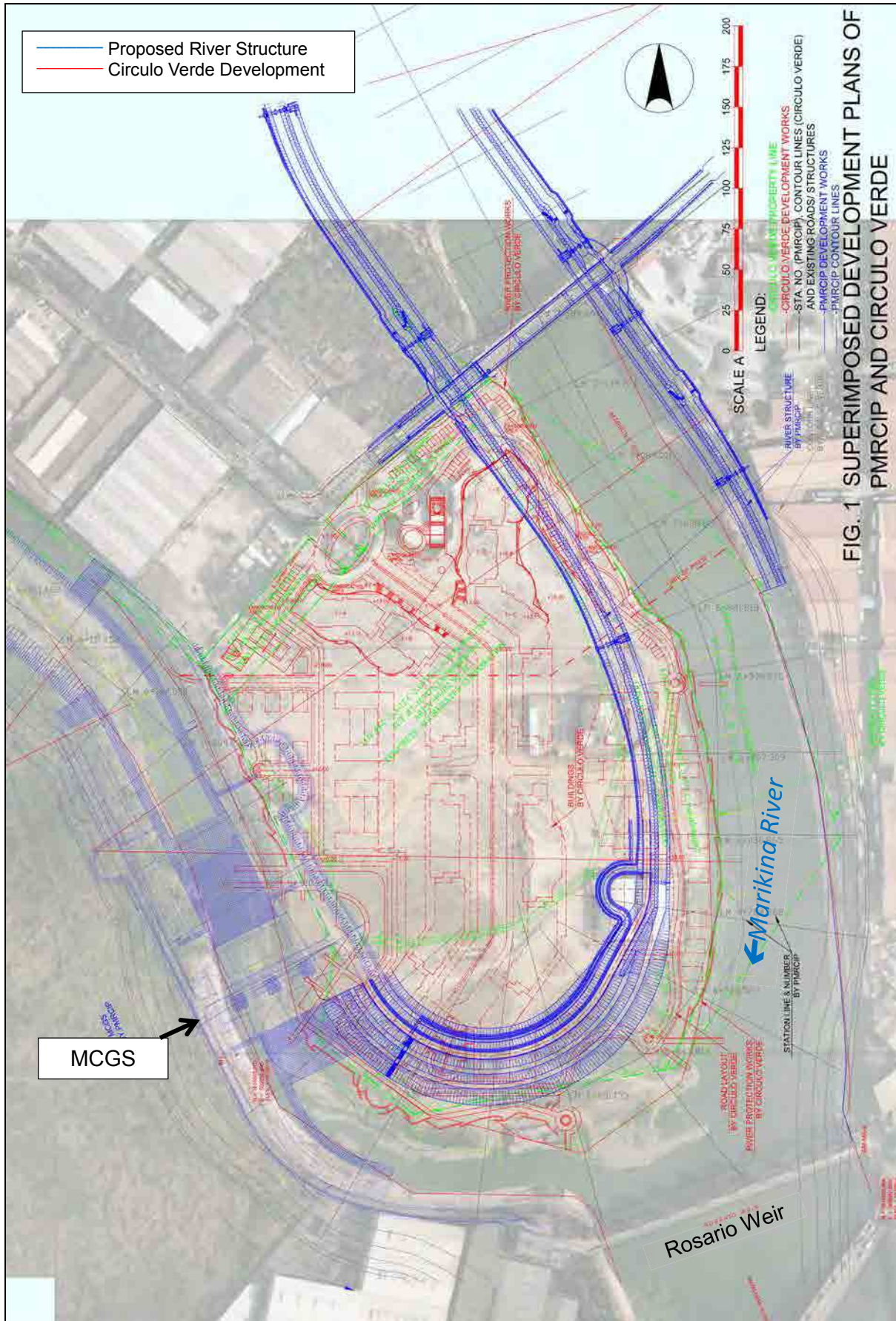


Figure 3.15 Circulo Verde Layout and Proposed Embankment Plan



Circulo Verde interferes with the embankment and MCGS layout plan, and construction has already in progress. **Table 3.4** shows areas necessary for PMRCIP Phase IV with breakdowns of public-private division.

**Table 3.4 Area Necessary for Land Acquisition**

City	Barangay	Easement (m)	Distance along river (m)	Subject area for acquisition (ha)		
				Total Area	Non-easement area	Easement Area
<b>Right Bank</b>						
Marikina	Jesus De La Carlos Peña	96 m from center of the river	3,208	21.53	-	21.53
	Tañong		574	4.45	-	4.45
	Barangka		510	3.91	-	3.91
	Industrial Valley		1,065	7.24	0.20	7.04
Quezon	Blue Ridge B	3 m from the shore	89	0.15	0.12	0.03
	Libis		292	0.19	0.10	0.09
	Bagumbayan		3,463	7.52	5.94	1.58
<b>Right Bank Total</b>				<b>44.99</b>	<b>6.36</b>	<b>38.63</b>
<b>Left Bank</b>						
Marikina	Santo Niño	96 m from center of the river	839	5.51	-	5.51
	Santa Elena		412	2.98	-	2.98
	San Roque		531	4.01	-	4.01
	Calumpang		2,557	20.72	2.18	18.54
Pasig	Santolan	approx. 30 m from the shore*	2,291	14.39	7.34	7.05
	Mangahan	10 m from the shore*	2,345	4.27	1.70	2.57
<b>Left Bank Total</b>				<b>51.88</b>	<b>11.22</b>	<b>40.66</b>
<b>Total</b>				<b>96.87</b>	<b>17.58</b>	<b>79.29</b>

\*In approving process by DPWH

### 3.5.2 Job Opportunity and Livelihood

#### [Resettlement]

The construction works will require land acquisition from factories and business development areas and residential areas in Santolan and Mangahan in Pasig City, and Bagumbayan in Queson City, none in Marikina City. Residential houses interfering with PMRCIP Phase IV structures, proposed in 2002, are counted as 1,014 in LiDAR photo data of 2011 (**Table 3.5**). A number of total household is estimated as 1,364 (**Table 3.6**), and the residents who are required to be resettled is estimated as 5,456 (**Table 3.7**). Among them, Informal Settler Families (ISFs) are counted as 1,100, and the population is estimated as 4,400, which counts about 80% of total population estimated for resettlement. **Table 3.8** shows number of non-residential buildings such as factories and storage houses.

#### [Impacts on Livelihood]

If these 1,364 subject families were to be resettled to outside of the city, they will face either changing their income sources, or commuting to the original place every day. According to Dr. A. Karaos of Ateneo de Manila University, a well-known authority in resettlement scheme in the Philippines, done by the JICA survey team, the biggest resettlement problem is livelihood recovery,

and it is very difficult to compensate for; and good practice is not been seen in Philippines. It is found that to reconstruct livelihood in off city resettlement site is not easy for many resettlers. The impact would be much less if the resettlement site is in-city area.

**[Resettlement of Residents in Easement Area]**

Phase IV area contains “Easement area” which is officially determined as river area in where residing are prohibited and the buildings are subject to be demolished with official procedures. **Figure 3.16** shows easement area of Marikina City, and **Figure 3.17** shows Pasig and Quezon City’s easement area. The buildings in easement area are counted as 175 buildings of 332 families, among total number of buildings which interfering with PMRCIP Phase IV structures: 1,014 (**Table 3.5**, **Table 3.6**, and **Table 3.7**). **Figure 3.20** shows cross section of easement area in Marikina, Quezon, and Pasig City.

**[Impacts on Factories and Business firms]**

Factories near Rosario Weir in Quezon City interfere with the river area required for the implementation of PMRCIP Phase IV. Large portion of the property of Portland Cement Corporation in Pasig City (**Figure 3.11**) is in inside of the river area.

**Table 3.5 Residential Buildings Interfering with PMRCIP Phase IV**

City	Barangay	ISFs' Houses			Land Title Holders Houses			Residential Houses Total		
		Ease-ment Area*	Non-easement area	Total	Ease-ment Area	Non-easement area	Total	Ease-ment Area	Non-easement area	Total
Marikina	-	0	0	0	0	0	0	0	0	0
Quezon	Bagumbayan	10	0	10	2	0	2	12	0	12
Pasig	Mangahan	62	0	62	0	0	0	62	0	62
	Santolan	101	626	727	0	213	213	101	839	940
<b>Total</b>		<b>173</b>	<b>626</b>	<b>799</b>	<b>2</b>	<b>213</b>	<b>215</b>	<b>175</b>	<b>839</b>	<b>1,014</b>

**Table 3.6 Estimated Number of Households for Resettlement\*\***

City	Barangay	ISFs			Land-titled Residents			Total		
		Ease-ment Area	Non-easement area	Total	Ease-ment Area	Non-easement area	Total	Ease-ment Area	Non-easement area	Total
Marikina	-	0	0	0	0	0	0	0	0	0
Quezon	Bagumbayan	12	0	12	3	0	3	15	0	15
Pasig	Mangahan	76	0	76	0	0	0	76	0	76
	Santolan***	242	770	1,012	0	262	262	242	1,032	1,274
<b>Total</b>		<b>330</b>	<b>770</b>	<b>1,100</b>	<b>2</b>	<b>262</b>	<b>264</b>	<b>332</b>	<b>1,032</b>	<b>1,364</b>

**Table 3.7 Estimated Population\*\*\*\* for Resettlement**

City	Barangay	ISFs			Land-titled Residents			Total		
		Ease-ment Area	Non-easement area	Total	Ease-ment Area	Non-easement area	Total	Ease-ment Area	Non-easement area	Total
Marikina	-	0	0	0	0	0	0	0	0	0
Quezon	Bagumbayan	48	0	48	8	0	8	56	0	56
Pasig	Mangahan	304	0	304	0	0	0	304	0	304
	Santolan	968	3,080	4,048	0	1,048	1,048	968	4,128	5,096
<b>Total</b>		<b>1,320</b>	<b>3,080</b>	<b>4,400</b>	<b>8</b>	<b>1,048</b>	<b>1,056</b>	<b>1,328</b>	<b>4,128</b>	<b>5,456</b>

\*Easement area: Quezon 3 m, Marikina 96 m from center line of river, Pasig 10 m, Pasig Santolan approx. 30 m

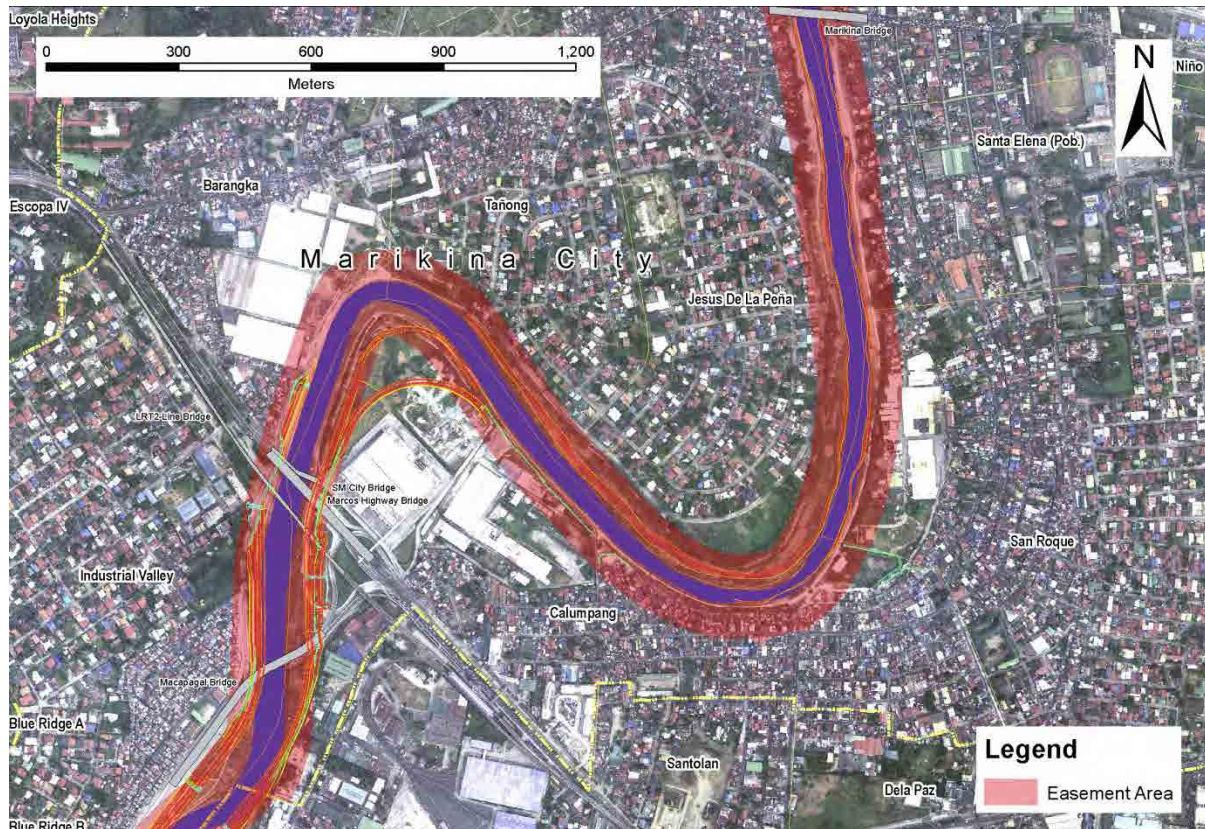
\*\* Estimated by number of building multiplied by 1.23

\*\*\* Pasig City survey data

\*\*\*\*Estimated by number of household multiplied by 4.00

**Table 3.8 Non Residential Buildings Interfering with PMRCIP Phase IV**

City	Barangay	Non Residential Building		
		Easement Area	Other project area	Total
Marikina	Calumpang	2	0	2
Quezon	Bagumbayan	10	0	10
Pasig	Mangahan	0	0	0
	Santolan	0	10	10
<b>Total</b>		<b>12</b>	<b>10</b>	<b>22</b>



**Figure 3.16 Easement Area in Marikina City section**



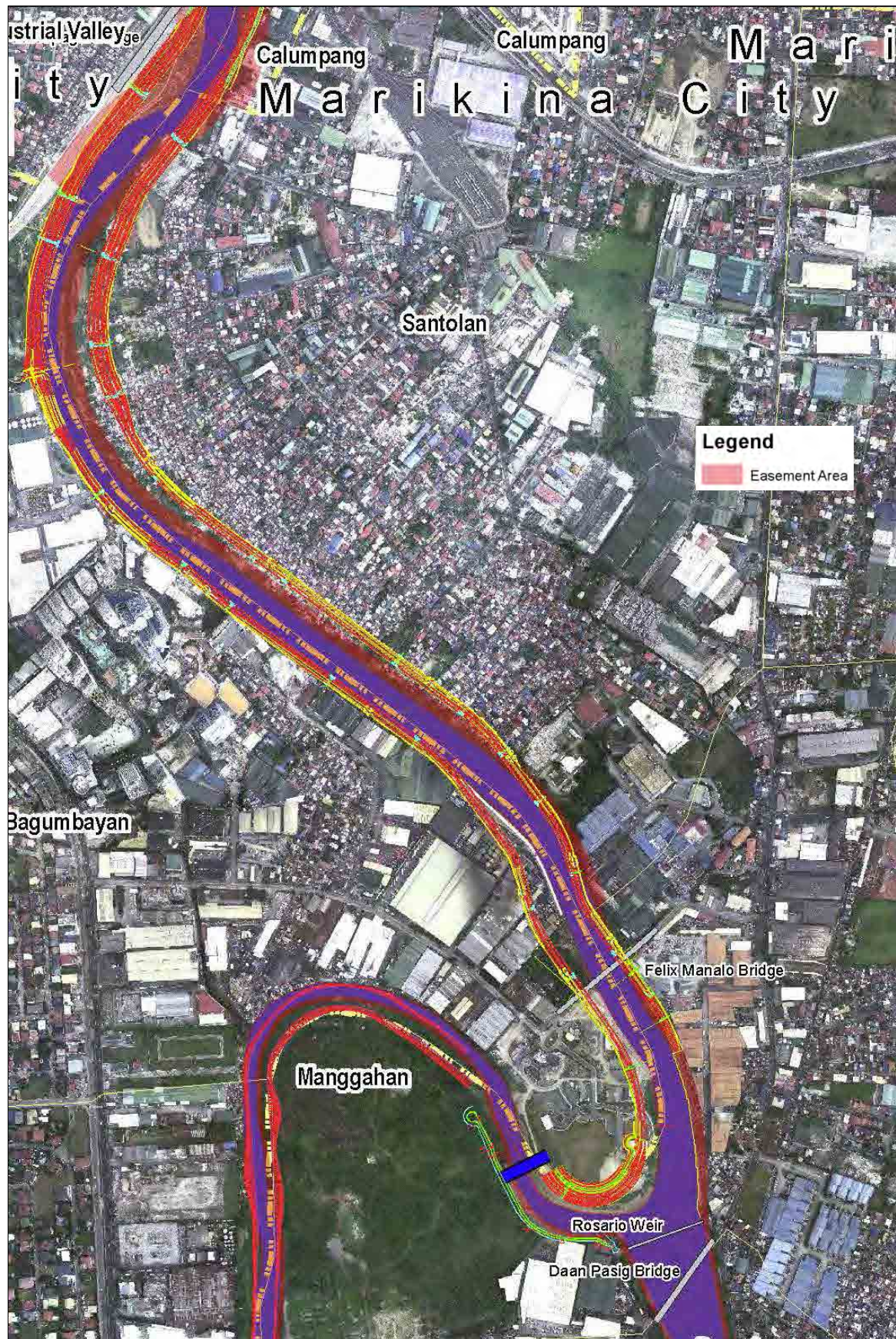
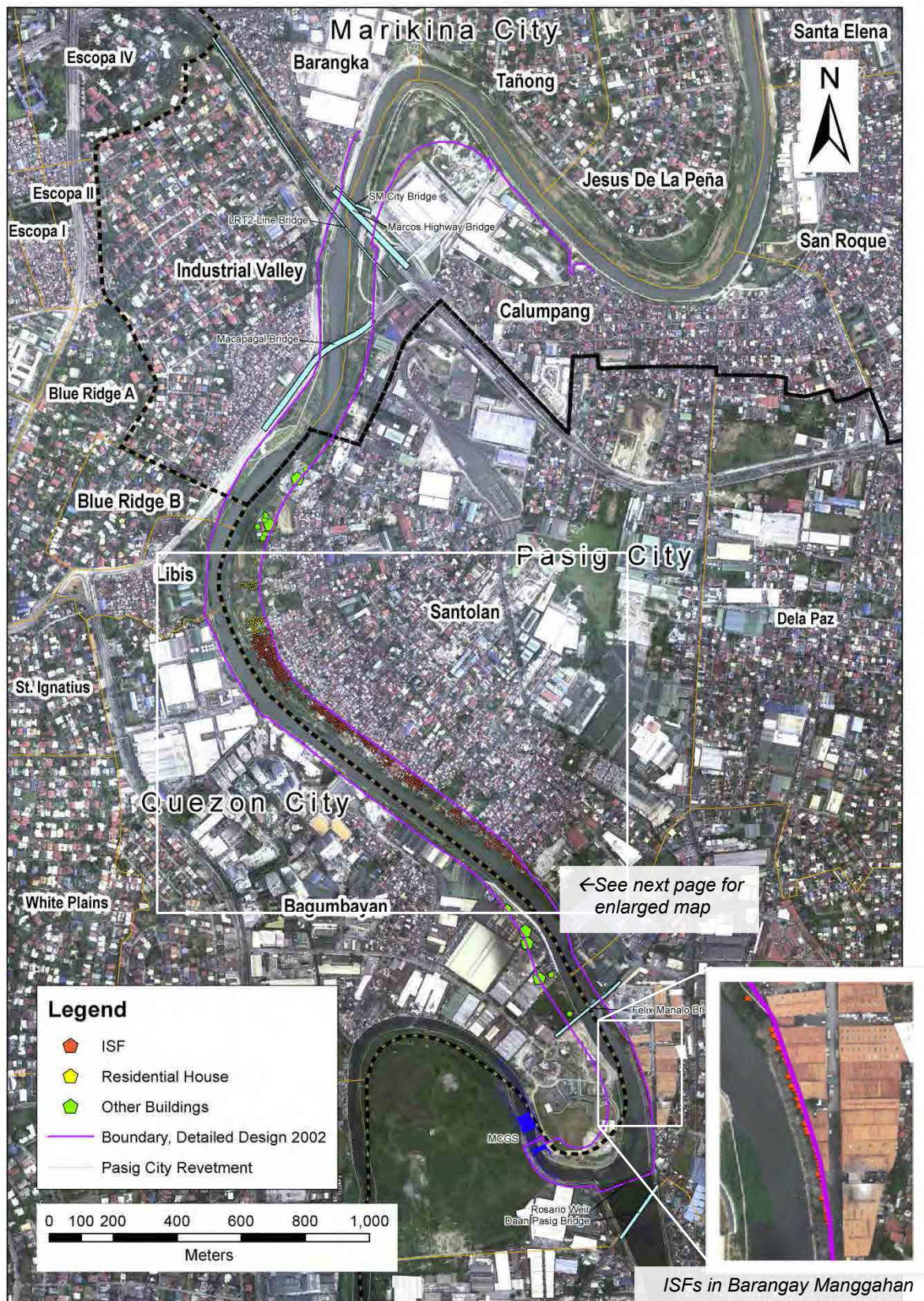


Figure 3.17 Easement area in Quezon and Pasig City section



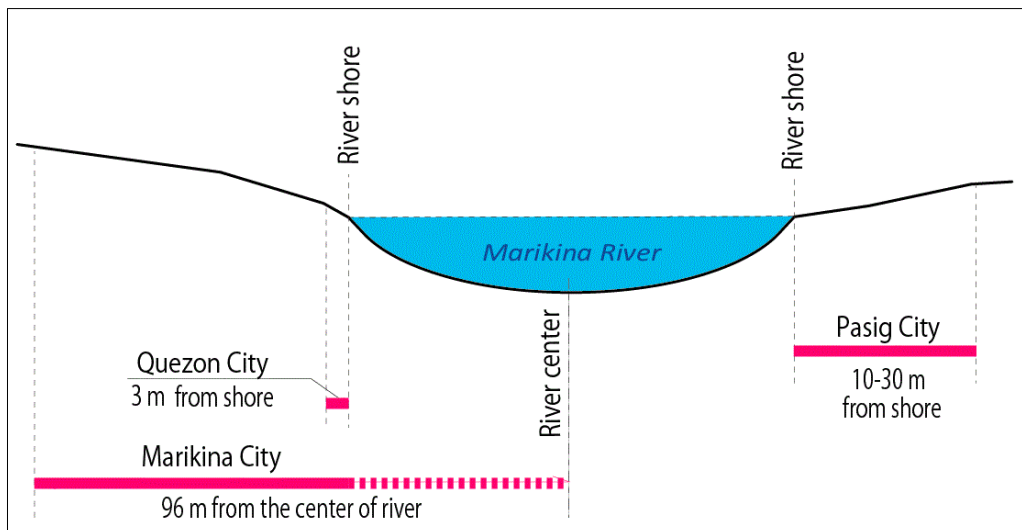


**Figure 3.18** Location of Houses and Factories interfering with PMRCIP Phase IV





**Figure 3.19** Location of ISFs' and Land Title Holders' Houses



**Figure 3.20** Easement Settings of LGUs

**[Navigation]**

There is a plan to bring back commuting ferry route to Marikina River, all the way up to the Sto Niño (**Figure 3.21**). The Pasig River Rehabilitation Commission (PRRC) and the Eastwood City Estates Association, Inc. (ECEA) already signed a memorandum of agreement for the development of the first ferry station along the Marikina River in Eastwood City in 2008.

The present issue of reviving navigation along the Marikina River is that the depth of the river became too shallow after Typhoon Ondoy, according to interview to staff of ECEA by JICA Survey



Team.



ECEA administration office at Eastwood City



Eastwood Ferry Terminal



Figure 3.21 Pasig River Ferry Service Project

### 3.5.3 Land Use and Income Source

#### [Function of PMRCIP Phase IV]

The functions of PMRCIP Phase IV structures are as follows.

- To divert flood water to Mangahan Floodway, and cut flood peak to the lower Marikina River and the downstream area.
- To protect hinterland from flood water from the river.

Design flood water will inundate large areas along the Marikina River with the present condition (**Figure 3.22**). By excavating, river widening, and constructing dikes will prevent flood water stagnation and will transport flood water effectively to the downstream (**Figure 3.23**). The differences between flood affected area of present condition (no project) and after implementation of PMRCIP Phase IV are also mapped in **Figure 3.24**.

The changes on land use practice are limited only in the project proposed area along the riverine. The impacts, therefore, are the same with “3.5.1 Land Acquisition and Resettlement”. Land use

inside of the proposed flood control facility will totally be changed.

**[Impacts on Water Level and Land Use]**

**Figure 3.25** shows differences of river water levels during design flood discharge. Water level of the Marikina River will substantially be decreased with implementation of PMRCIP Phase IV, compared to the water level at present condition (no implementation of the project).. Although PMRCIP Phase IV will raise water level near MCGS, embankments will be constructed high enough to confine flood water within the river. No impact from river is expected so as the land use surrounding area.



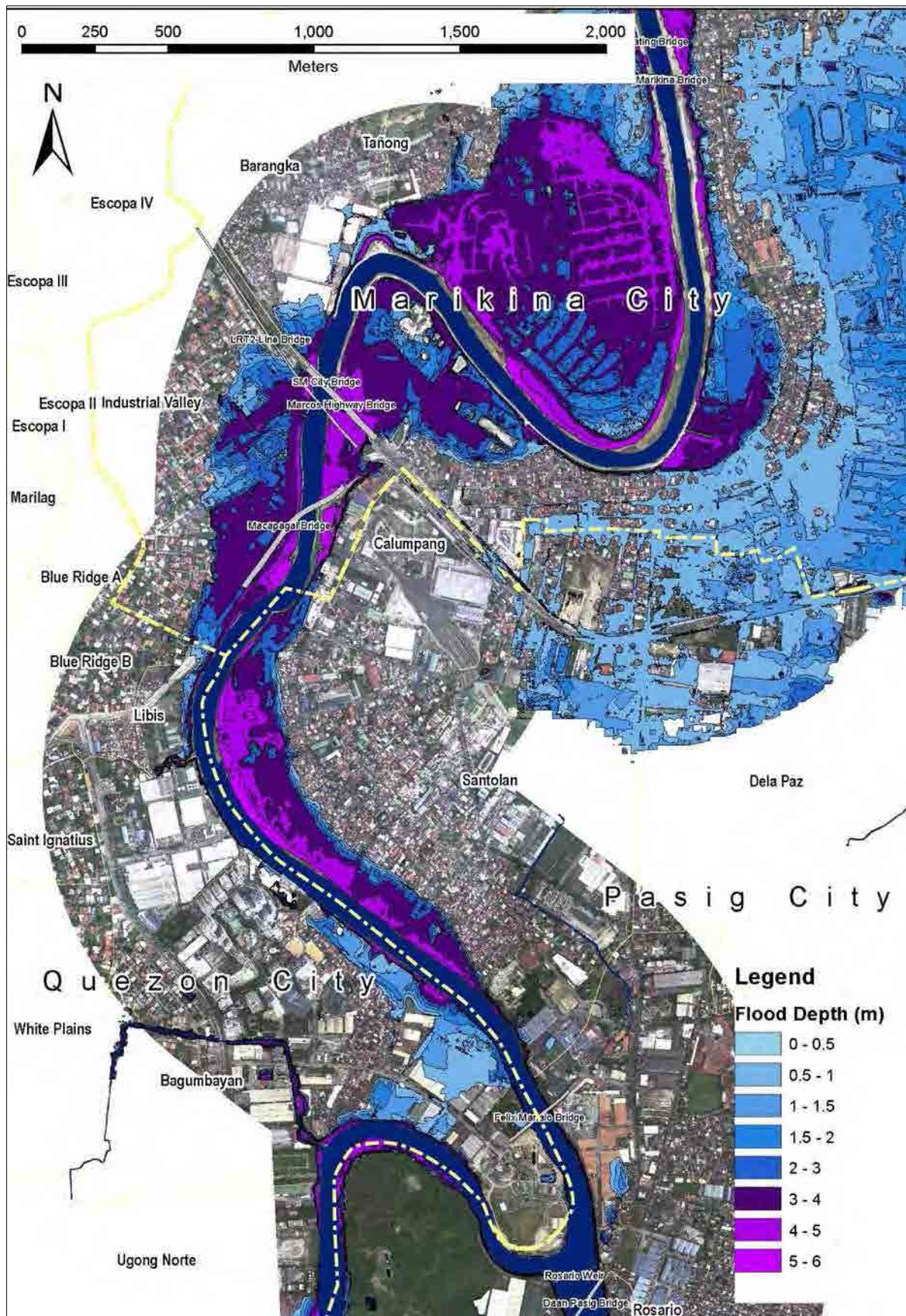


Figure 3.22 Expected areas covered by flood from Marikina River in present condition



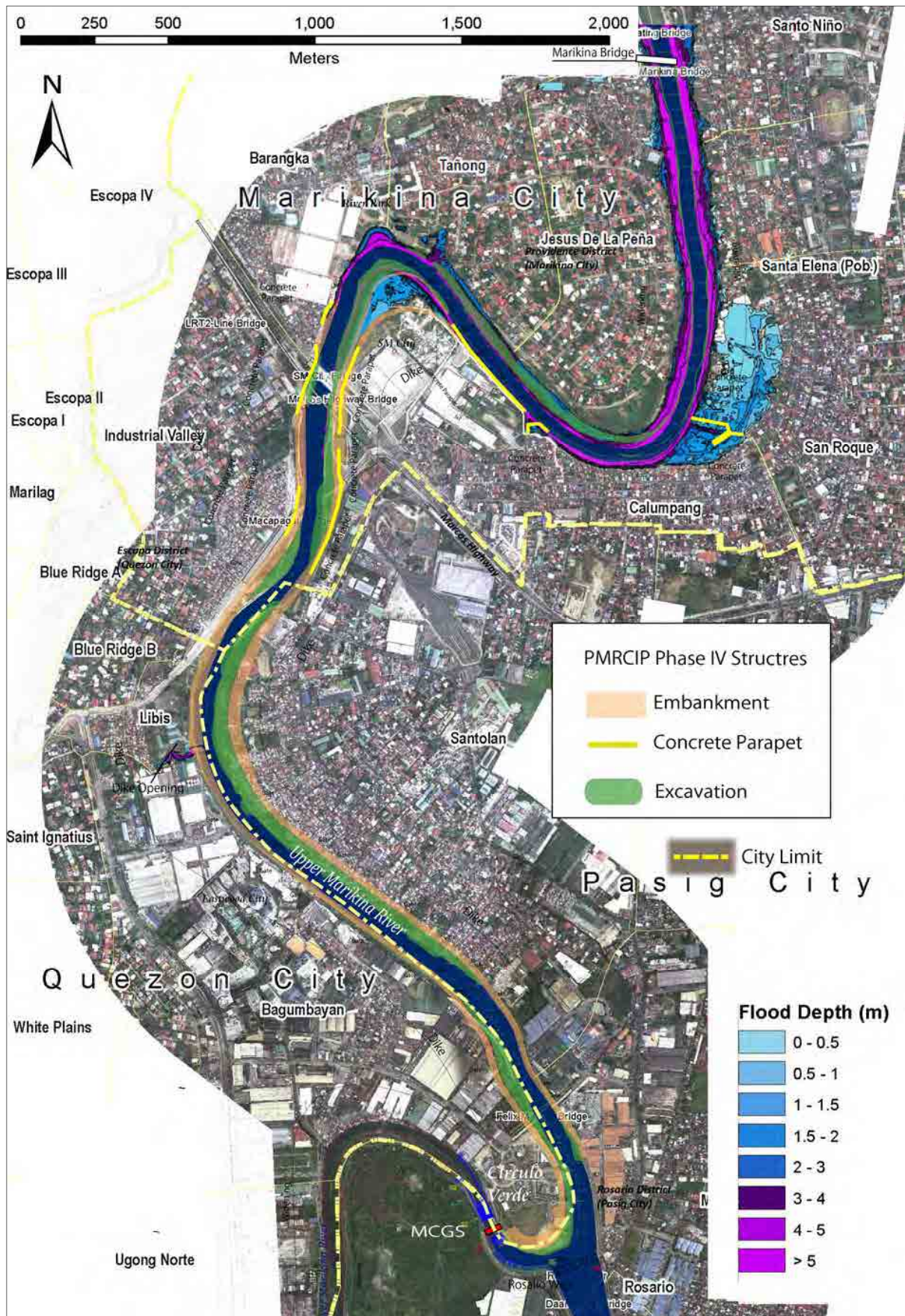


Figure 3.23 Implementation of PMRCIP Phase IV



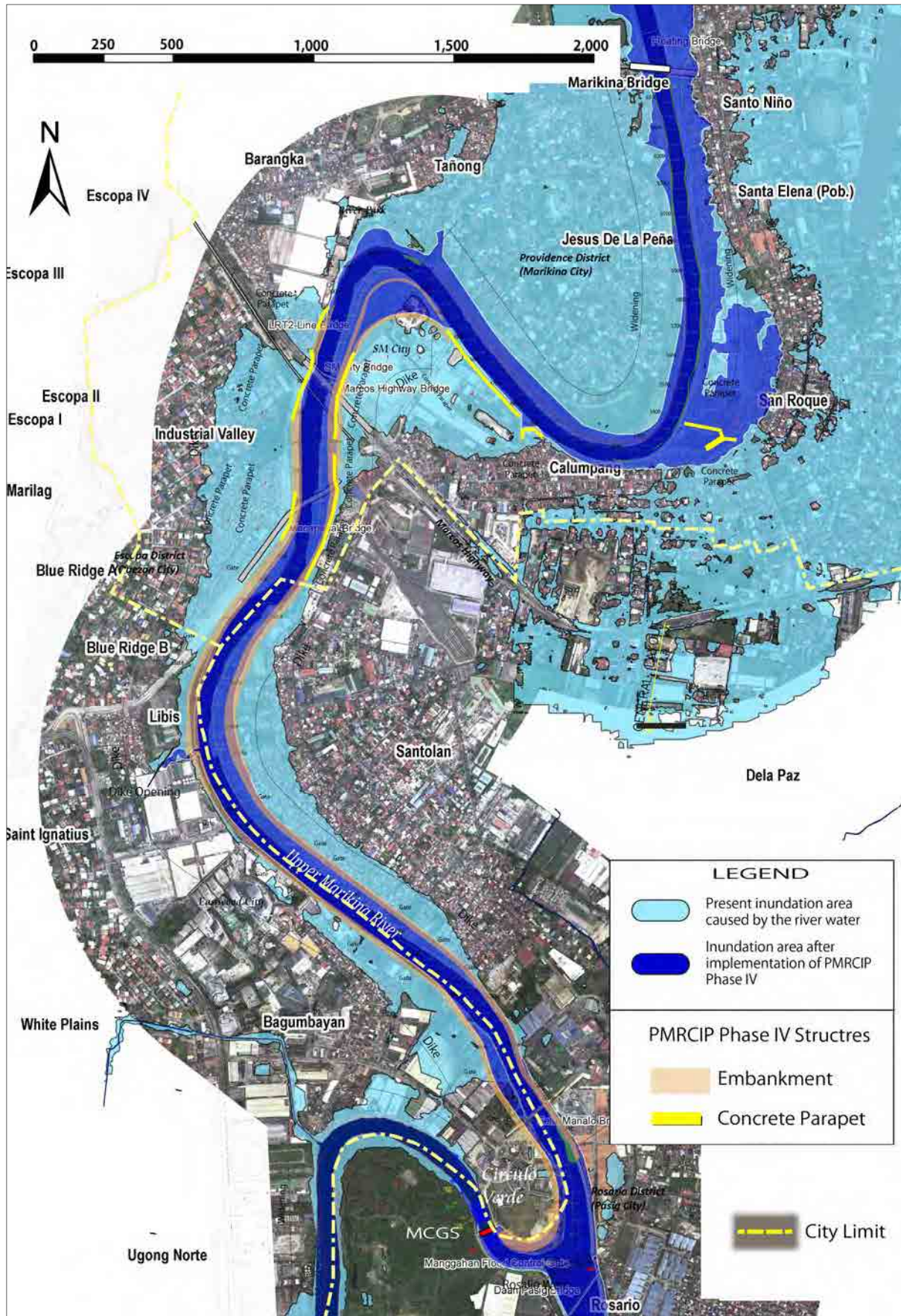


Figure 3.24 Difference between Present and after implementation of PMRCIP Phase IV

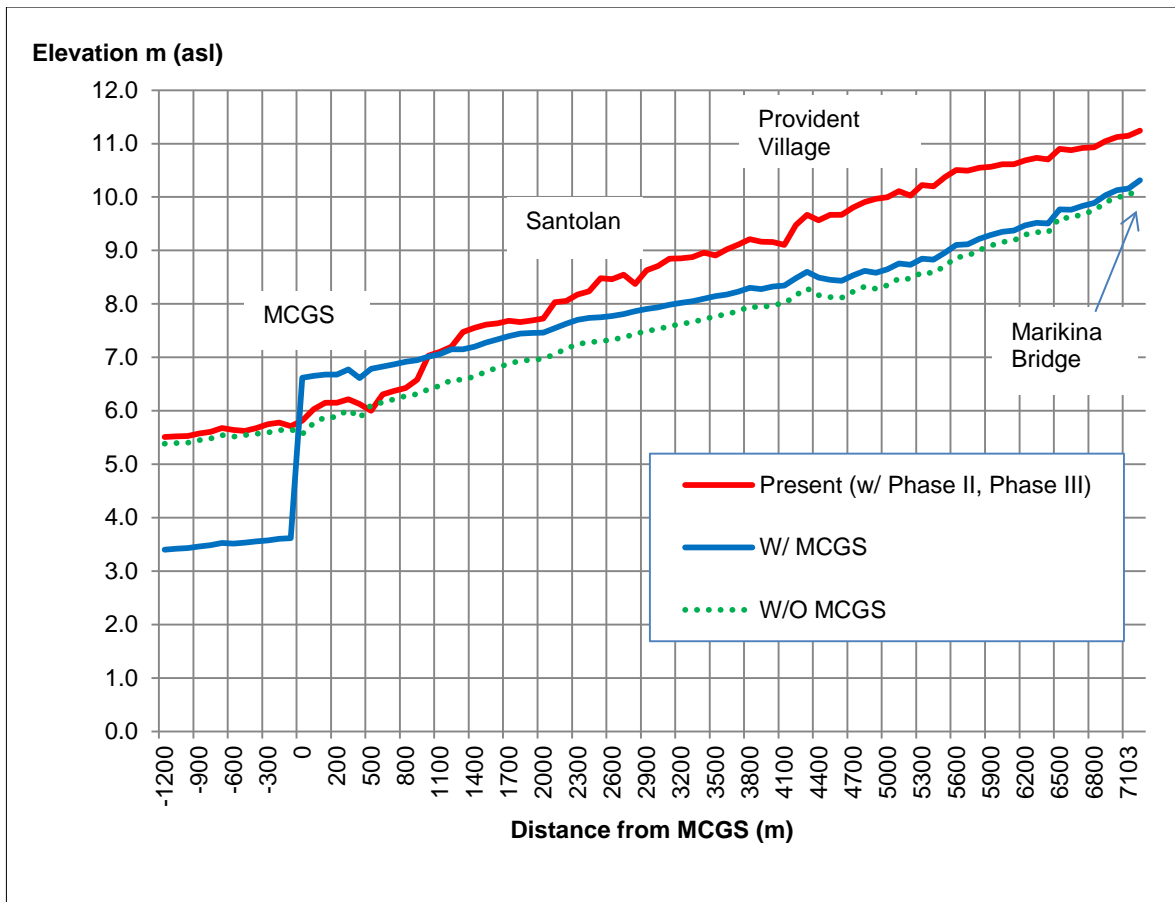


Figure 3.25 Effectiveness of PMRCIP Phase IV and impact of MCGS

[Flood Duration]

Flood water during Typhoon Ondoy receded within a day after it reached the peak. Figure 3.26 shows flood peaks of recent large flood events (gauging station went malfunctioned during Ondoy). Flood peaks will not persist for many hours in most of the cases. However, in 2012, the flood water persisted at EL.20 m level for 3 days by Habagat which was in influence of slow moving typhoon, Haikui.

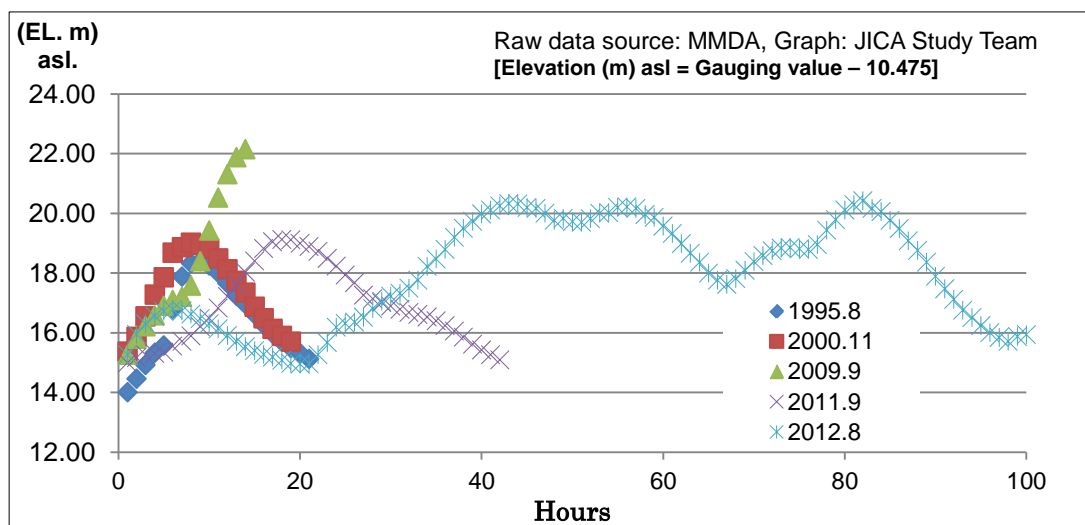
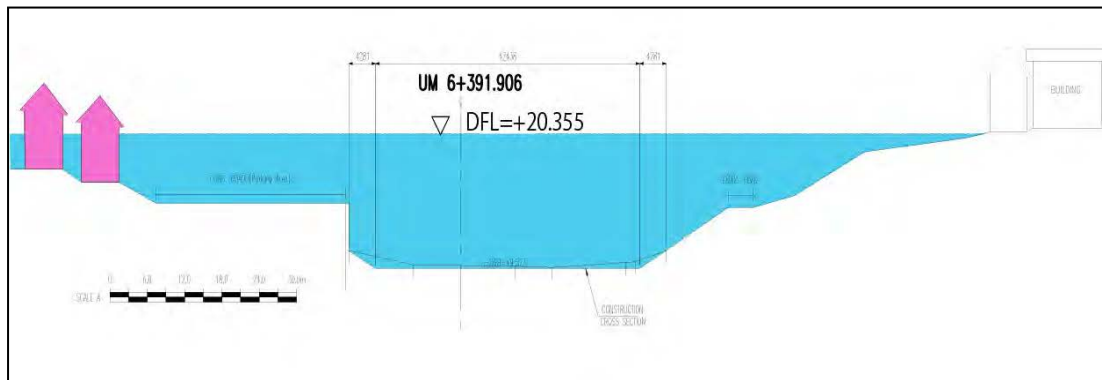


Figure 3.26 Flood Peaks at Extreme Events at Marikina Bridge



**[Consideration made for Marikina River Park]**

Marikina City and businesses in Sto Niño area chose structure-free river in Marikina River Park during Detailed Design phase. As the results, embankment is not planned, and river widening is designed instead. Two rows of buildings in front of the Marikina River in Sto Niño area will receive flood water during design flood water discharge (**Figure 3.27**). There is no impact on the land use of the Marikina City area either.



**Figure 3,27 Cross Section at River Park in Sto Niño (W:H=1:2)**



River Parks is maintained throughout Marikina City Section of the river



Embankment is not planned in Sto Niño area

**[Assessment of occurrence of inland water]**

Impact of inland water is assessed by making inundation map based on the estimated river water levels. Other conditions are described in **Table 3.9**.

**Table 3.9 Parameters for estimation of river water levels**

Bases for water level calculation	Normal operation of MCGS during design flood
Flood water discharge rate	2,900 m <sup>3</sup> /sec
Implementation of PMRCIP	II, III, IV
MCGS Operation	Full open / closed (Releases 500 m <sup>3</sup> /sec)

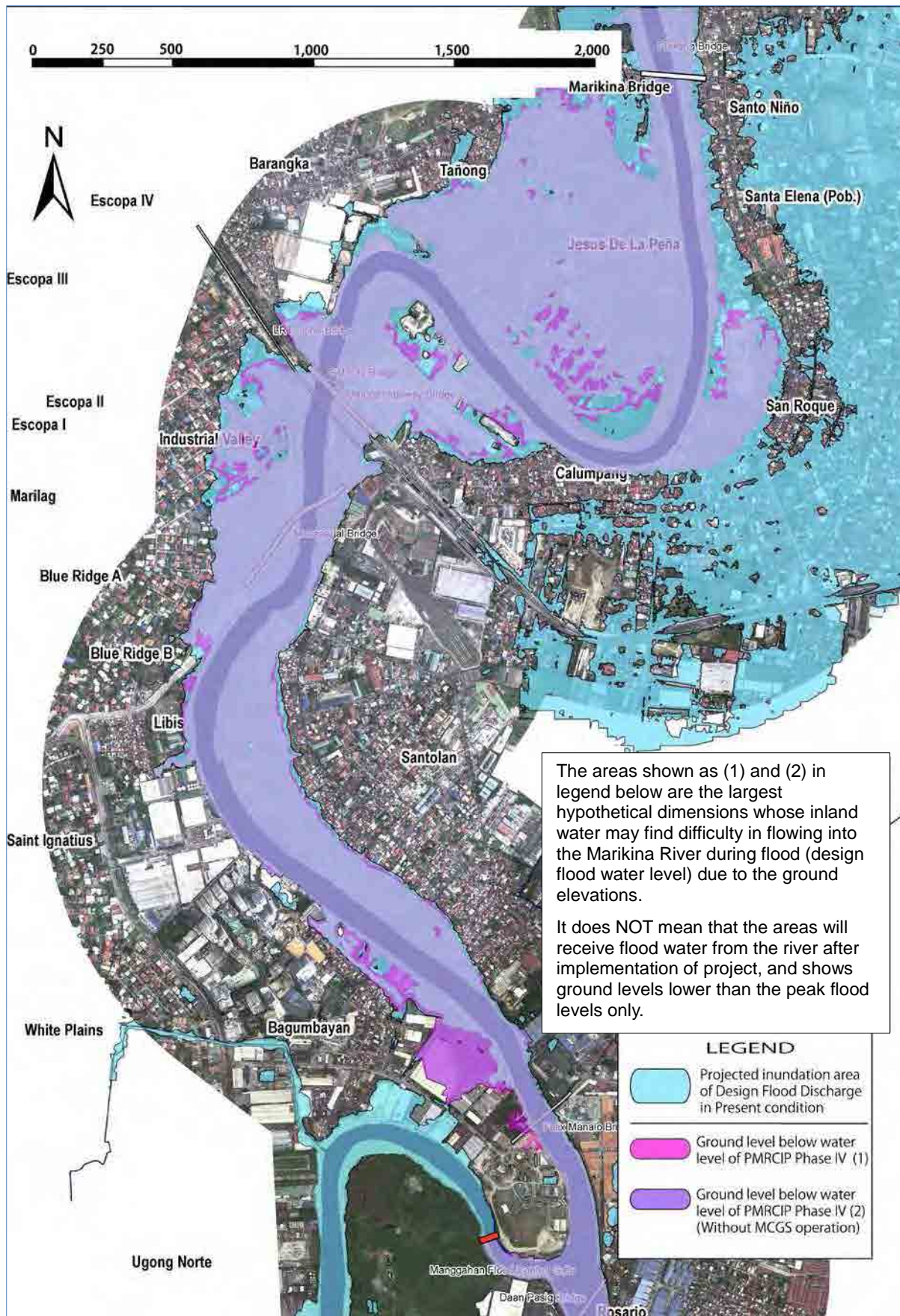
Inland water could be detained due to the discharge problem during high water level of river water. **Table 3.10** shows the summary of hypothetical inundation area influenced by water level of Marikina River at design flood discharge. **Figure 3.29** shows hypothetical area marked on the area under water levels of design flood discharge. Projected inundation area of present condition (without PMRCIP Phase IV) with 2,900 m<sup>3</sup>/sec of discharge is shown in light blue hatching. Hypothetical inland inundation area are shown as in (1) and (2) in the Figure; however, further study will be necessary for estimation of actual inundation area.

**Table 3.10 Areas under river water level during Design Flood**

Barangay	Water level 1: Without MCGS & With Embankment				Water level 2: With MCGS & With Embankment			
	Inundation Area* (sqm)	Residential area* (sqm)	Estimation		Inundation Area (sqm)	Residential area (sqm)	Estimation	
			Population**	H/H**			Population	H/H
Jesus Dela Pena	680,339	204,318	5,918	1,233	710,921	217,605	6,303	1,313
Tanong	397,738	250,019	5,169	1,149	423,870	271,710	5,617	1,248
Barangka	166,199	24,002	1,975	429	171,797	26,256	2,161	470
Industrial Valley	400,400	100,987	4,443	966	425,165	112,842	4,965	1,079
Blue Ridge B	29,717	4,066	176	36	32,388	4,066	176	36
Libis	59,951	12,824	4,347	966	61,023	12,824	4,347	966
Bagumbayan	291,585	21,210	824	201	390,454	26,528	1,030	251
Santo Nino	54,684	6,371	295	66	84,416	7,060	327	73
Sta Elena	25,780	13,807	377	80	62,136	28,885	788	168
San Roque	69,019	35,390	1,158	257	124,609	60,371	1,975	439
Calumpang	138,295	3,815	201	45	157,936	6,679	352	78
Santolan	257,527	137,840	8,447	2,011	271,287	146,349	8,969	2,135
Mangahan	64,476	12,481	841	195	77,664	15,215	1,025	238
<b>Total</b>	<b>2,635,709</b>	<b>827,129</b>	<b>34,171</b>	<b>7,634</b>	<b>2,993,667</b>	<b>936,389</b>	<b>38,035</b>	<b>8,495</b>

\*Measured based on LiDAR data by JICA Survey team

\*\*Estimated based on the area and NSO Census 2010



**Figure 3.29 Comparison of areas may be affected by inland water during peak flood**



### 3.5.4 Community Organization

It is known that the Filipino families have strong ties within the community. Borrowing and lending commodities, money and even human resources. Helping each other in the community is common and essential part of social support system mentally and physically.

On the other hand, rejection from recipient community against new comers are also commonly known behaviors, and separate segments in the new community may degrade security level of the recipient community.

The subjected 5,000 people will lose their community support if relocated separately, and the impact will be significant to each family.

### 3.5.5 Social Services, Community Infrastructure, and Infrastructure

#### [Impacts on Infrastructure]

Orandes Sewage Treatment Center (Quezon City), ferry terminal in Westwood (Quezon City) and flood protection revetment which Pasig City are constructing in the river area are required for the implementation of PMRCIP Phase IV. Infrastructures are summarized in **Figure 3.30**.

#### [Community Service]

Community facilities are shown in **Figure 3.31**. There is not community facilities affected by the PMRCIP Phase IV structures.

### 3.5.6 Socially Weak or Disadvantageous Groups

#### [ISFs]

There are many Informal Settler Families (ISFs) in the easement area, and are subject for resettlement. These illegal residents are not eligible to receive cash compensation in the Philippines, except cash amount 60 days of minimum wages for interval of resettlement.

With regard to Pasig City's 10-meter easement legalization, Pasig City officially requested DPWH through documents dated 16 August 2012 for the issuance of a certification declaring the entire stretch of Marikina River in the Pasig area as flood control area pursuant to Art. 53 of the Water Code of the Philippines (PD 1067). However, according to DPWH, there is no progress on the legalization of the 10 m and 30 m easement as of June 2013.

#### [Safe Guarding Laws]

However, ISFs are safeguarded by Republic Act 7279 (Urban Development Housing Act of 1992) as: 1) Resettlement site should be shown to the resettlers before moving in; and 2) Resettlers should be consulted well before resettlement.



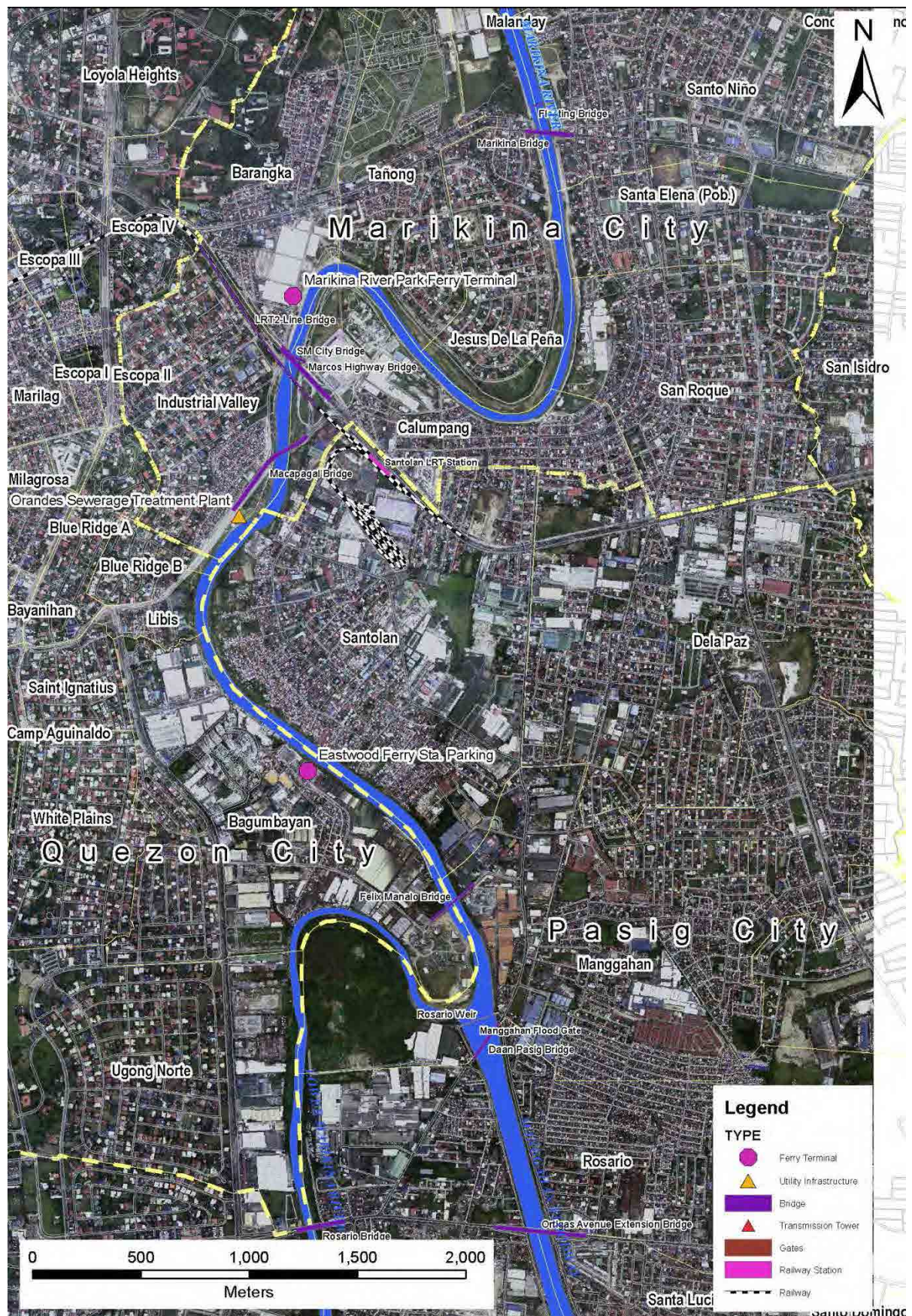


Figure 3.30 Locations of Infrastructures



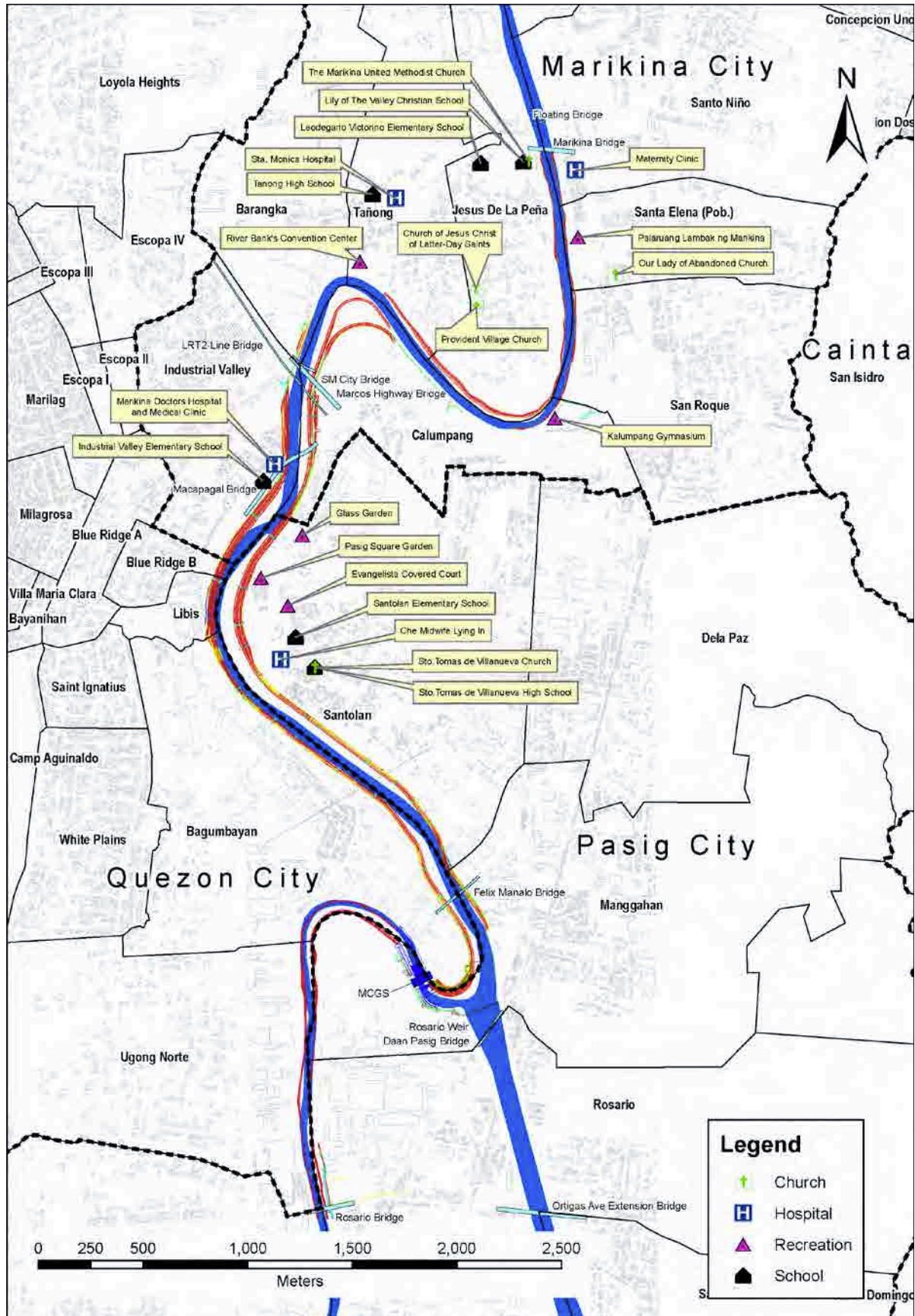


Figure 3.31 Social Service Facilities



**[Activities of Critical-Sided Political Party]**

LGU experienced strong opposition from the community against their resettlement program, communities were supported by some organized political and self-proclaimed "pro-poor" groups such as Akbayan\*, who are lobbying for a moratorium on demolition, are instigating the communities to oppose off-site resettlement.

<p><b>*Akbayan Party</b></p> <p><b>Organization Type:</b> National party (running for party list). It advocates democratic, accountable and participatory governance. Three members are in Congress.</p> <p><b>Supporters:</b> It is made up of various sectors that traditionally have had little voice in government: youth, women, fisherman, farmers, elderly, teachers, gays and lesbians, Muslims and workers.</p> <p><b>Organization:</b> 2,000 chapters form basic building blocks of the party at the neighborhood or barangay levels.</p>
---

Other groups may have opinions on resettlement plan for PMRCIP Phase IV are summarized in box below.

<p>1) Ugnayan ng mga Samahan para sa Alternatibong Pagbabago (USAP) (formerly Post Luzon-wide Housing Summit Coordination Council)</p>
<p><b>[Description of Organization]</b> PCUP accredited Urban Poor Organization whose task is to assert the genuine representation in Local Housing Board who is mandated by law to formulate the Local Shelter Plan.</p> <p><b>[Action/Opinion]</b> LGUs in NCR are not ready to comply with stated policy of the Joint Memorandum Circular (JMC) because LGUs have no Comprehensive Shelter Plans approved in the Local Development Plan that will provide necessary information like inventory of possible on-site, in-city and near city relocation site for ISFs. -- April 27, 2013 at Quezon City Sports Club. During the Mayoralty Debate (Mayor Herbert Bautista and Contender Mr. Johnny Chang)</p>
<p>2) Bagong Alyansang Makabayan (Bayan) or New Patriotic Alliance</p>
<p><b>[Description of Organization]</b> Multi-sectoral Group struggling for national and social liberation against imperialism, feudalism and bureaucrat capitalism. It envisions a just society, free from foreign domination.</p> <p><b>[Action/Opinion]</b> The government has not even laid out a sustainable mass housing plan and continues to lag in meeting the massive national housing backlog. Aquino could not assure the relocation of the 195,000 families he wants removed from waterways and Laguna de Bay as the national housing backlog next year is pegged at a huge 3.55 million units, of which almost 1.08 million are in Metro Manila, while the target of the Aquino administration is to construct just 1.38 million units. The added that many relocatees have also left the relocation sites due to lack of livelihood and essential services like water and electricity, among others. -- August 14, 2012 – News Release</p>

3) Kilusang Mayo Uno
<p><b>[Description of Organization]</b> The Kilusang Mayo Uno is an independent labor center in the Philippines promoting genuine, militant and anti-imperialist trade unionism.</p> <p><b>[Action/Opinion]</b> The existence of so-called illegal structures is not one of the main reasons for flooding in Metro Manila. The lack of disaster preparedness, excessive logging and mining activities, dam owners' greed, failure to desilt Laguna Bay and other waterways, and unplanned urban development – these are the main reasons for heavy flooding. -- August 14, 2012 – Media Release</p>
4) Anakbayan (This is not Akbayan, another organization)
<p><b>[Description of Organization]</b> Comprehensive, national democratic mass organization of the Filipino youth. They believe that Philippine society today is not truly free nor democratic. It is under the control of U.S imperialism, along with local landlords, big capitalists, and corrupt gov't officials. The National Democratic Struggle seeks to realize true national liberation for the country and the realization of the democratic rights of the people.</p> <p><b>[Action/Opinion]</b> They cited the case of some 3,000 families who were demolished and relocated in Kasiglahan Village, Montalban, Rizal, they said relocation area stood on a reclaimed river and a substandard dike gave away following persistent rains, causing water to rise at unprecedented levels. The Funding for DPWH's flood control and mitigation master plan will just be 352 billion pesos worth of taxpayers' money to be used for violent demolitions and evictions -- Aug 16, 2012 – News Release on the issue to "Blast Their Homes" order by Pres. Aquino to DPWH</p>

**[Other Socially Weak Groups]**

LGU do not have and not planning particular plan for supporting single-mother, disabled, or elderly in resettlement plan.

**3.5.7 Reasonable Distribution of Benefit and Social Cost**

Beneficiaries of PMRCIP Phase IV will be the residents who live lowland area of the Lower Marikina River and Pasig River, by receiving less flood water and will have low river water level due to diversion of the Marikina River Water to Laguna de Bay. Residents along Phase IV section will also enjoy the effectiveness of the embankment which will confine flood water outside of the residential area.

Social cost will be bared mainly by the residents who need to be resettled from the project site, and those who live on low lands surrounding Laguna de Bay will also experience the rising water level of the lake.

In addition to above, related LGUs have expressed their anxieties on raising water level by MCGS.

a) Marikina City

The City, which also has serious flooding problems along the Upper Marikina River, demands full opening of gates of Rosario Weir during the flood season, and expressed its objection on the construction of MCGS from the viewpoint of smooth flow of flood to the downstream.(Source: The Preparatory Study for Pasig-Marikina River Channel Improvement Project (Phase III) Volume II: Main Report October 2011)

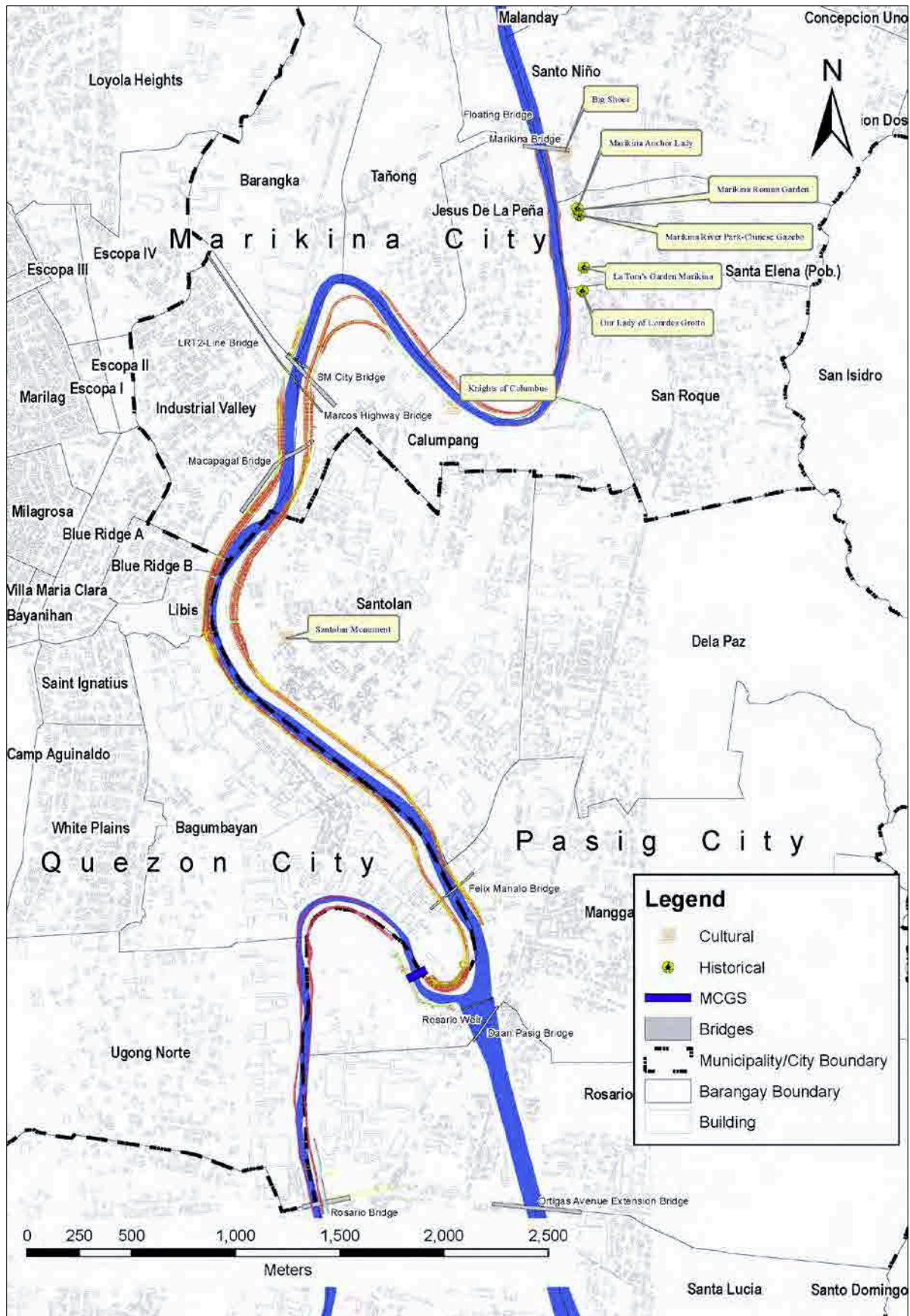
b) Pasig City

Impact is expected on the upstream area of MCGS, and Mangahan area. MCGS is no use if Circulo Verde is narrowing the river channel at the upstream. (Engr. Jose L. Reyes, Head of Office of the City Engineer, Pasig City, in interview with JICA Survey Team Jun. 2013)

### **3.5.8 Historical or Cultural Heritages**

Proposed PMRCIP Phase IV will not affect any historical or cultural heritages in the site (**Figure 3.32**).





Source: JICA Study Team

**Figure 3.32 Historical and Cultural Sites with PMRCIP Phase IV Structure**

### 3.5.9 Social Conflict

(The same with section 3.5.6 Socially Weak or Disadvantageous Groups)

### 3.5.10 Water Usage, Water Rights, Customary Use of Water Intake

There is almost no river use except few are harvesting kangkong or *Ipomoea aquatic* for livelihood. Construction of embankment and dredging will have certain impacts on the harvesting. However, the disabled period for harvesting will be limited.

Other use of water is not practiced except for small amount of irrigation by using a container.



A man harvesting naturally grown kangkong



Market price is 30 Php/bundle

### 3.5.11 Sanitary Treatment

Environmental Compliance Certificate (ECC-98-NCR-QC-301) for Pasig-Marikina River Channel Improvement Project (PMRCIP) was issued to DPWH –PMO– Major Flood Control Projects (Project Proponent: PP) by Department of Environment and Natural Resources (DNER) under the conditions attached to the ECC under Decree no. 1586. Constructor's obedience of environmental laws is addressed in the following clause.

*4. Construction Contractor's Environmental Program (CCEP) shall be submitted to this Office for approval 30 days before the start of construction which should contain among others, definite mitigation measures such as proper disposal spoils and waste materials, excess concrete and wash water from transit mixers and others;*

The ECC for PMRCIP will be revoked if EMP in approved Environmental Impact Statement (EIS) is not implemented as it is written. Environmental Management Plan (EMP) in the EIS states that proper management will be implemented to the waste water from the workers' compounds as below.

#### Environmental Pollution by Human Wastes from the Construction Workers

*Human wastes if not properly manage could not only cause pollution, but also spread communicable diseases. The workers will be provided therefore with temporary decent housing, potable water, and excreta management. Adequate number of sanitary pit latrines will be used for excreta management. These latrines will be closed down properly after the construction period.*





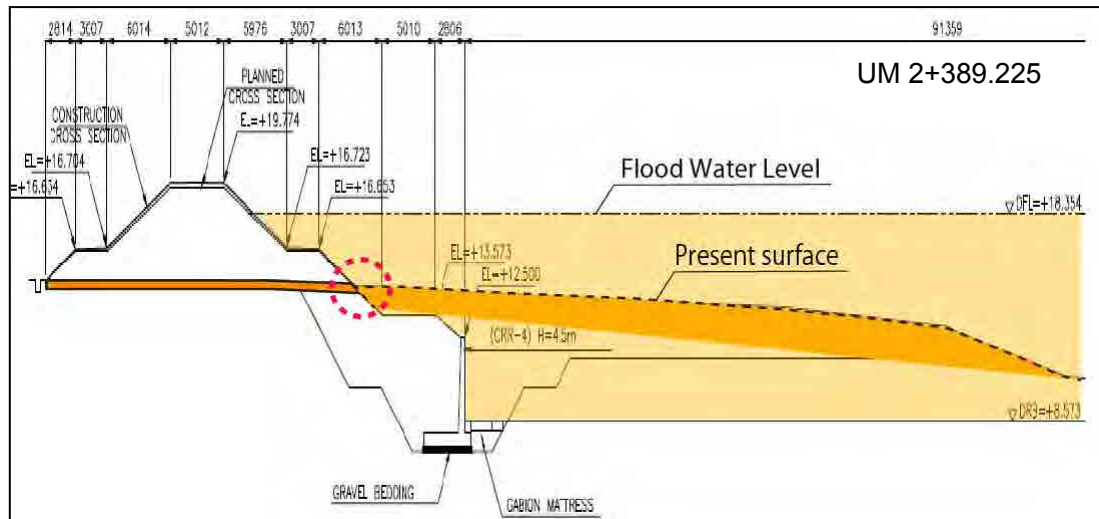
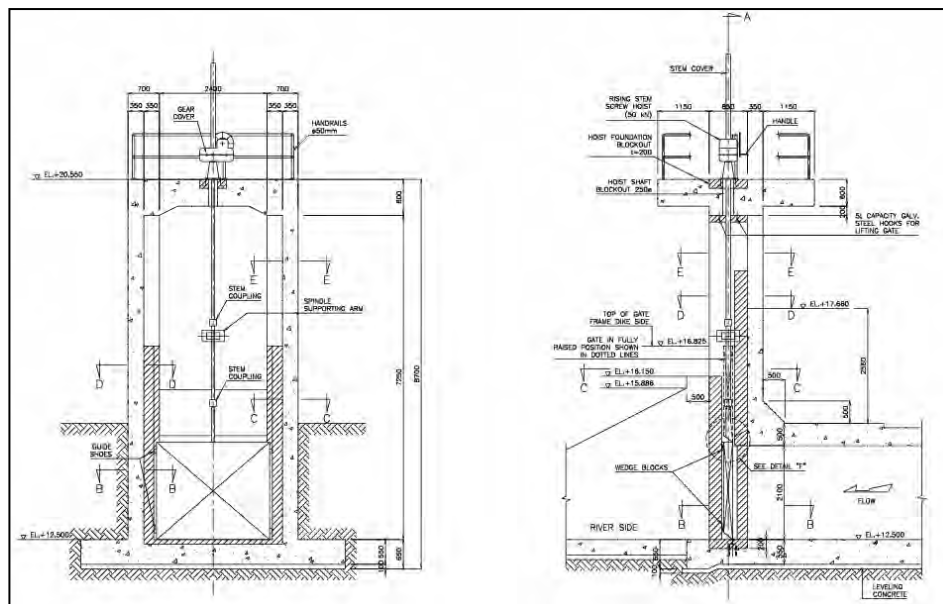


Figure 3.34 Clogging Issue of Gate Outlet Area (X:Y=1:2)

Sluice gates are designed for Upper Marikina Section to cope for larger amount of discharge whereas flap gates are designed in the Pasig River section for relatively small design discharge (Figure 3.35).



Source: Implementation Program for Pasig-Marikina River Channel Improvement Project (2002)

Figure 3.35 Standard Gate Type (Sluice Gate)

### 3.5.14 Biodiversity

According to EIS report for Pasig Marikina River Channel Improvement Project (1998), no species of plants in the project area are considered endangered, threatened, or rare species. Vegetation is now limited only to the usual vegetation in a highly urbanized city. Fauna, such as fishes, is only confined to the upper reaches of the Marikina River. Likewise, no endangered, threatened, or rare species of animals are identified in the project area.

In addition to the document above, all terrestrial and aquatic plants at both sides of the Marikina River were surveyed on June 18<sup>th</sup>, 2013. Five rare species were identified in the survey as in **Table 3.13**. These species are terrestrial plants and not interfering with PMRCIP Phase IV (**Figure 3.36**).

**Table 3.13 Rare Species of Flora found along Marikina River banks**

Scientific Name	Common Name	Family	DAO 2007-1 Threatened Species List	IUCN 2007 Red List
<i>Dracontomelon dao</i> (Blanco) Merr. & Rolfe	Dao	Anacardiaceae	VU A1cd	Not assessed
<i>Octomeles sumatrana</i> Miq.	Binuang	Tetramelaceae	Not assessed	LR/lc ver.2.3 (1994)
<i>Calophyllum inophyllum</i> L.	Bitagog	Calophyllaceae	Not assessed	LR/lc ver. 2.3 (1994)
<i>Cynometra inaequifolia</i> A Gray	Dila-dila	Fabaceae	VU A1c	VU A1d ver.2.3 (1994)
<i>Pterocarpus indicus</i> Willd.	Narra	Fabaceae	CR A1cd	Not assessed
<i>Adonidia merrillii</i> (Becc.) Becc.	Bunga de Jolo, Manila Palm	Arecaceae	EN A1c, B1+2cd	LR/nt ver. 2.3 (1994)
<i>Ficus ulmifolia</i> Lam.	Is-is	Moraceae	Not assessed	VU A1cd ver. 2.3 (1994)
<i>Vitex parviflora</i> Juss.	Molawin, Molave	Lamiaceae	EN A1cd, B2bc	VU A1cd ver .2.3 (1994)

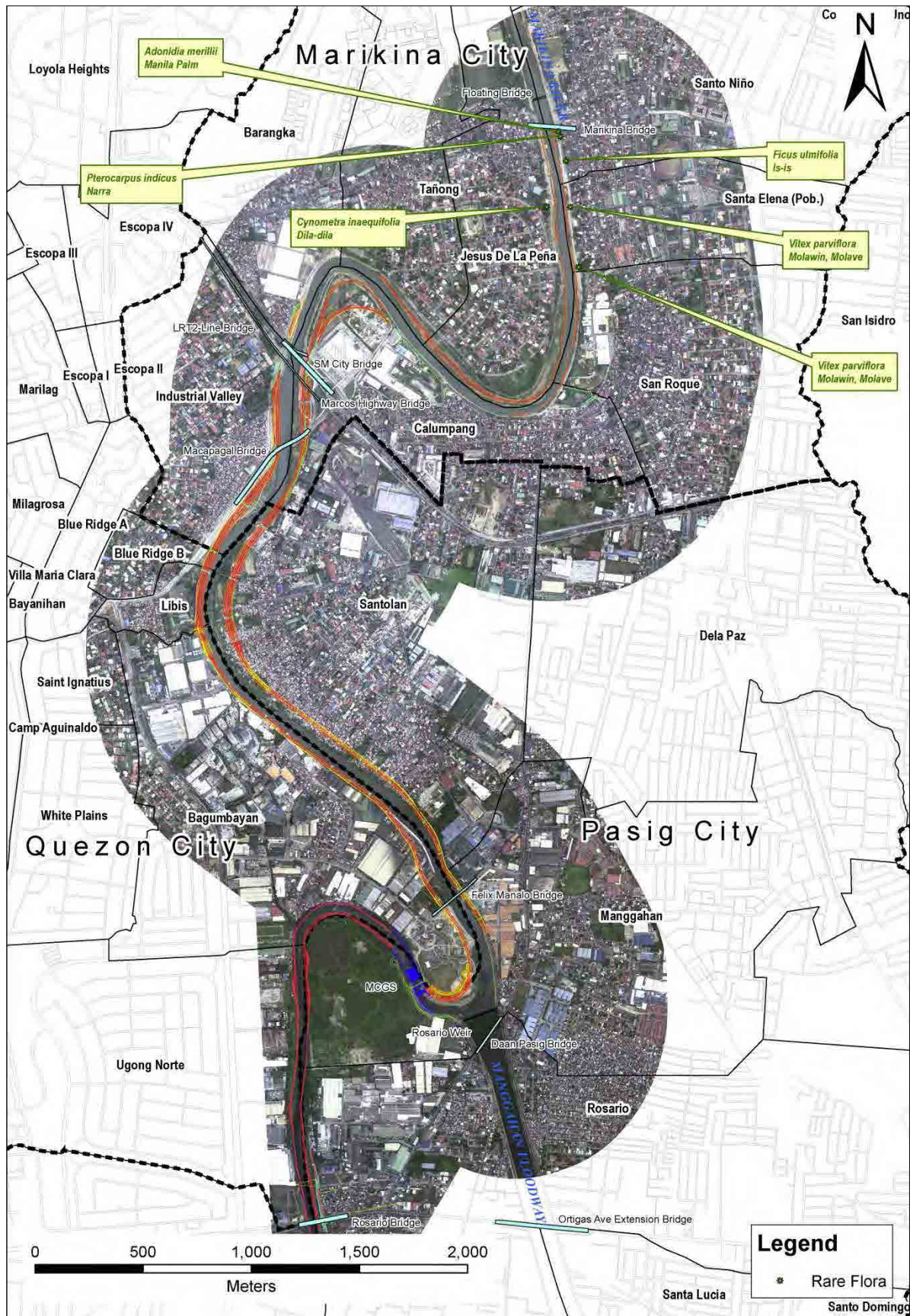


Figure 3.36 Rare Species Distribution



### 3.5.15 Aesthetic Landscape

There are few locations which require favorable aesthetic landscape for business or tourism. One location is Circulo Verde development area in front of the Rosario weir in Quezon City, and the other is Marikina River Park Area in Marikina City, including Sto Niño area.

No effects are expected to Marikina River Park, since the structures above river surface are not planned in the area.



Night of Sto Niño area in Marikina City



Image of Completed Circulo Verde Project in Quezon City

There are embankment planned in Circulo Verde area but the developer has already constructing the river wall around them, and the interference must be solved before construction of MCGS. The MCGS is not affecting the landscape of the surroundings (see images of MCGS below).

As the results, significant impacts on the landscape are not expected in the two areas.



Upstream side of MCGS originally planned



Bird's view from upstream side

Source: JICA Phase III Report

### 3.5.16 Air Quality

The ECC for whole PMRCIP projects, including Phase IV, was granted based on the Environmental Impact Statement (EIS) submitted by PP in 1998. CCEP shall be formulated by a contractor of construction works and submitted to DENR for approval including EMP addressed in EIS. The EMP on Air Pollution is stated as below.

#### Air Pollution

*During construction, the extent of air pollution would also be minimal and temporary. For the MCGS, dust discharges associated with cement storing*

*and handling at the site will be eliminated through the use of ready mixed concrete.*

*Heavy dust generation is not expected in the construction activities along the river banks. Mitigating measures are therefore not necessary for these construction activities.*

*Equipment and vehicles used during construction that show excessive emissions of exhaust gases due to poor engine adjustments and operating conditions shall not be operated unless corrective repairs of adjustments are made.*

### **3.5.17 Water Quality**

(The same with above on CCEP)

EMP on impacts of dredging are stated as following paragraph in the EIS.

#### Water Quality Change

*Dredging for the upstream section of the river will be land-based, when applicable, using cranes with buckets. Release or resuspension of sediments in this section due to the dredging activities can be minimized through the use of special dredging buckets which are watertight when raised from the water. (omit)*

*Whenever necessary, dredging near the mouth and downstream sections of the river will be through the use of a suitable suction dredger. The sediments will be unloaded to the dumping site through the use of pipes and compressed air to minimize mixing with river water.*

Revised Effluent Regulations of 1990 (DENR Administrative Order No. 35), Revising and Amending the Effluent Regulations of 1982 shall be comprised during construction phase.

MCGS may retard flow of the Marikina River in proximity area; however, flow velocity is much faster during flood event, and the gate operation will not exceed one day even in extreme case according to MMDA record of hourly flow rate at Marikina gauging station. Therefore degradation of water quality is not likely to be caused by MCGS.

### **3.5.18 Soil Disposal, Contamination**

(The same with above on CCEP)

EMP on soil disposal is stated as following paragraph in the EIS.

#### Generation of Dredged Materials

*The 3.8 million m<sup>3</sup> of dredged materials will be distributed to various disposal sites and uses. Some will be used as backfill materials for the waterfront amenity facilities, while the rest will be used for the reclamation of low-lying lands. It is therefore expected that the problem of dredged materials disposal will be handled satisfactorily.*

### **3.5.19 Noise and Vibration**

EMP on noise is stated as following paragraph in the EIS.

#### *Noise Generation*

*Noise levels as previously discussed will be tolerable. Nevertheless, equipment with less noise generation will be used during construction.*



### 3.6 Summary of Impacts Study

Items of impact examinations of PMRCIP Phase IV project were selected through scoping process, and then examined. The specific examinations are described in Section 3.5. The impacts are identified as in **Table 3.14**.

**Table 3.14 Summary of Impact Examination**

Field	Scoping (Refer Section 3.4)		Examination results (Refer Section 3.5)		
	Impacts examined	Expected degree of Impact	Section	Findings	Expected degree of Impact
Social Environment	1. Housing and real estate (land acquisition and involuntary resettlement)	A-	3.5.1	- Land acquisition is necessary in total 96.87 ha (including 79.29 ha of easement area and 17.58 ha of non-easement area).	A-
	2. Job opportunity and livelihood	A-	3.5.2	- If all of the estimated population for resettlement is to be relocated to off-city site, 5,456 people (including 4,400 ISFs) will be impacted.	A-
	3. Land use and income source	A-	3.5.3		A-
	4. Community organization	C	3.5.4	- Disintegration of the community by resettlement which may affect the villagers' mutual cooperation system.	B-
	5. Social services and community infrastructure	C	3.5.5	- Orandes Sewage Treatment Center and Eastwood ferry terminal will be affected. - Pasig City is constructing own river revetment, and the revetment needs to be demolished for excavation of the base area for PMRCIP Phase IV. - Community infrastructures will not be affected at present site.	A-
	6. Socially weak or disadvantageous groups	C	3.5.6	- Majority of the project affected people are ISF. ISF are not eligible to receive cash compensation. - There is no information on handicapped personnel, isolated elderlies, and single headed mother's family at this point.	C
	7. Distribution of benefit and social cost	B-	3.5.7	[Phase IV area] - Beneficiaries of PMRCIP Phase IV during design flood events are the people who live inland of Santolan area (Pasig City), and residents in vast areas on the eastern and western side of Marikina City - Social cost bearers are the people to be displaced for the project. The majority of them are low income people in Santolan near the Marikina River. [Upstream-downstream relationship] - Beneficiaries of MCGS are the residents and land users along the Pasig River and the Lower Marikina River. - Social cost bearers will be, in addition to the people being subject of involuntary resettlement	A-

Field	Scoping (Refer Section 3.4)		Examination results (Refer Section 3.5)		
	Impacts examined	Expected degree of Impact	Section	Findings	Expected degree of Impact
Natural Environment				for flood control structures, the people who live near openings of the eastern side of Mangahan floodway, and lowland area of Laguna de Bay. - Marikina City and Pasig City expressed their anxieties on MCGS operation for the impacts on upstream and questioned the effectiveness.	
	8. Historical or cultural heritages	C	3.5.8	- No impacts are expected.	D
	9. Social conflict	C	3.5.9	- If off city resettlement plan is implemented, strong opposition against the project may arise from the community. There also are active “pro-poor” political parties who support residents for not comply with unfavorable resettlement plan.  - Rejection of recipient community against the resettlers may occur if resettlement site is designed in off-city.	C
	10. Water usage, water rights, customary use of water Intake	C	3.5.10	- There is almost no usage of the River water. No impacts are expected.	D
	11. Sanitary treatment	B-	3.5.11	- Compulsory law will be applied to PP. No impacts are expected.	D
	12. Health environment	D	-	(Not examined)	-
	13. Stability of ground (including dike)	B-	3.5.12	- Safety of hinterland against design flood water, which is more than 3 m higher than the ground. Water head is higher than 4.5 m if the flood water reaches crest of the embankment.	C
	14. Soil erosion	D	-	(Not examined)	-
	15. Groundwater supply	D	-	(Not examined)	-
	16. Natural flow and discharge function	B-	3.5.13	- All 25 gates need to be properly operated during extreme flood, and all of them should be well maintained in normal time; or the hinterland will be submerged under significant depth of flood water.	B-
	17. Coastal area	D	-	(Not examined)	-
	Pollution	18. Biodiversity	C	3.5.14	- No impacts are expected.
19. Micro climate		D	-	(Not examined)	-
20. Aesthetic landscape		C	3.5.15	- No impacts are expected.	D
21. Global warming		D	-	(Not examined)	-
22. Air quality		C	3.5.16	- Compulsory law will be applied to PP. No impacts.	D
23. Water quality		C	3.5.17	- Compulsory law will be applied to PP. No impacts are expected.	D
24. Soil (contamination)		D	-	(Not examined)	-

Field	Scoping (Refer Section 3.4)		Examination results (Refer Section 3.5)		
	Impacts examined	Expected degree of Impact	Section	Findings	Expected degree of Impact
	25. Solid waste	C	<b>3.5.18</b>	- Compulsory law will be applied to PP. No impacts are expected.	D
	26. Noise and vibration	C	<b>3.5.19</b>	- Compulsory law will be applied to PP. No impacts are expected.	D
	27. Ground subsidies	D	-	(Not examined)	-
	28. Odor (-offensive)	D	-	(Not examined)	-
	29. Sedimentation	D	-	(Not examined)	-
	30. Safety	D	-	(Not examined)	-

A+/-: Significant positive/negative impact is expected.

B+/-: Positive/negative impact is expected to some extent.

C: Extent of positive/negative impact is unknown. (A further examination is needed, and the impact could be clarified as the study progresses)

D: No impact is expected



### 3.7 Mitigation Measures and Compensations

Mitigation measures can be proposed for the impacts identified in Section 3.5 as in following boxes.

Impacts examined	Examined in Section	Expected degree of Impact
<b>(1) Housing and real estate</b> (land acquisition and involuntary resettlement)	<b>3.5.1</b>	<b>A-</b>
<p>[Findings]</p> <p>Land acquisition is necessary in areas of residential, industry, commercial development area; and new infrastructures such as sewerage treatment plant, roads, river revetment along the Marikina River.</p>		
<p>[Mitigation/Compensation]</p> <p>a) Decreasing necessary land area for the project</p> <p>Certain land acquisitions are inevitable; however, the subject area can be decreased by changing design of the embankment, such as narrowing of the cross section of embankment by changing types of embankment.</p> <p>b) Remedies for Circulo Verde intrusion</p> <ul style="list-style-type: none"> <li>➤ Violation of Law (Presidential Decree No. 1067 The Water Code of the Philippines) can be pursued by legal action for obstructing river flow. Because other upstream LGUs are also concerned of the structure narrowing the water way.</li> </ul> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><b>Art. 50.</b> Lower estates are obliged to receive the waters which naturally and without the intervention of man flow from the higher estates, as well as the stones or earth which they carry with them. <b>The owner of the lower estate can not construct works which will impede this natural flow</b>, unless he provides an alternative method of drainage; neither can the owner of the higher estate make works which will increase this natural flow.</p> </div> <ul style="list-style-type: none"> <li>➤ Planning of other location for MCGS construction</li> <li>➤ Re-design of overall flow distribution and effective structures</li> </ul> <p>c) Clarification of ISFs in easement area</p> <p>It is LGU's responsibility to demolish illegal houses along the Marikina River. Clarification of responsibilities with LGU is necessary, together with identification of subject ISFs by DPWH.</p> <p>d) Modification of river course in order to avoid obstacles in the river course.</p> <p>Other river alignments can be sought if an obstructing entity cannot move out of the proposed river course. Securing enough dimensions for all the river stretch is essential to whole PMRCIP Phase IV scheme. Especially narrowed river section by Circulo Verde must be solved before implementation of the plan.</p>		

Impacts examined	Examined in Section	Expected degree of Impact
<b>(2) Job opportunity and livelihood</b>	<b>3.5.2</b>	<b>A-</b>
<p>[Findings]</p> <p>If a family is relocated to an off-city resettlement area, the family needs to find another job opportunity. If all subject families are to be relocated to off-city site, some 5,000 people will receive the impact. About 80% of total subject residents are ISFs.</p>		

Impacts examined	Examined in Section	Expected degree of Impact
<p>[Mitigation/Compensation]</p> <p>a) Avoiding off-site relocation and plan in-city or near-city resettlement</p> <p>Livelihood reconstruction in off-city relocation site is not easy unless it is commutable. Transportation may be provided by LGU but it has short comings as follows.</p> <ul style="list-style-type: none"> <li>➤ Duration of service is limited</li> <li>➤ Transportation cost is heavy burden to resettlers</li> <li>➤ Number of commuting bus is limited</li> <li>➤ Commuting time is wasted</li> </ul> <p>In-city resettlement will solve discontinuation of job opportunities.</p> <p>b) Business and factories</p> <ul style="list-style-type: none"> <li>➤ Planning of flood control structures in the way that they do not disturb the operation of the factories with thorough discussion with the business and factory owners. Explanation of the effectiveness of PMRCIP to the factory owners and to acquire their understandings on the operation and results are necessary.</li> </ul> <p>c) If off-City resettlement area is chosen</p> <p>If relocation to off-City site is inevitable, proper compensation procedures determined by LARRIP should be implemented.</p> <ul style="list-style-type: none"> <li>➤ Cooperation is required with LGU, recipient community, recipient LGU, NHA, MMDA, and NGOs to plan and implement effective livelihood recovery program as a part of the PMRCIP Phase IV.</li> </ul>		

Impacts examined	Examined in Section	Expected degree of Impact
<p><b>(3) Land use and income source</b></p>	<p><b>3.5.3</b></p>	<p>A-</p>
<p>[Findings]</p> <ul style="list-style-type: none"> <li>- Land use change is the same with <b>3.5.1</b> above.</li> <li>- Job opportunities in the affected factories may have to reduce production due to modification works of the plants.</li> <li>- Small business in Santolan area will be lost with job opportunities.</li> <li>- Income source may be lost due to the same reason in <b>3.5.2</b> above.</li> </ul>		
<p>[Mitigation/Compensation]</p> <p>Mitigation measures are the same with :</p> <p>(1) Housing and real estate (land acquisition and involuntary resettlement) and</p> <p>(2) Job opportunity and livelihood, above.</p>		

Impacts examined	Examined in Section	Expected degree of Impact
<b>(4) Community organization</b>	3.5.4	B-
<p>[Findings]</p> <ul style="list-style-type: none"> <li>- Disintegration of the community by resettlement which may affect the villagers' mutual cooperation system.</li> <li>- There were very strong anti-resettlement protests after Ondoy disaster in 2009 among Santolan residents, backed by pro-poor political organization. Proposed resettlement of nearly 5,000 people may face even greater protests.</li> </ul>		
<p>[Mitigation/Compensation]</p> <ul style="list-style-type: none"> <li>a) Decreasing subject area by changing earth embankment to parapet type. It will also decrease the number of resettlement.</li> <li>b) Avoiding off-site relocation, and plan in-city or near-city resettlement Mutual support system in the community will still be kept if they live close distance.</li> <li>c) If off-city resettlement is inevitable: <ul style="list-style-type: none"> <li>➤ Relocation plan should consider their ties in the community and relocate the families in the same relocation area.</li> </ul> </li> <li>d) Participation of residents in planning <ul style="list-style-type: none"> <li>➤ Disclosure of information and participation to planning at earliest possible stage.</li> <li>➤ Plan favorable resettlement scheme with the representatives of the residents.</li> </ul> </li> </ul>		

Impacts examined	Examined in Section	Expected degree of Impact
<b>(5) Social services and community infrastructure</b>	3.5.5 (3.5.1, 3.5.2)	A-
<p>[Findings]</p> <ul style="list-style-type: none"> <li>- Communities' infrastructures will not be affected at present site.</li> <li>- Orande Sewage Treatment Center (Quezon City), Ferry terminals in Eastwood (Quezon City) will have to be reconstructed in appropriate place to keep their functions.</li> <li>- Pasig City is constructing river revetment by them for protection of the land from the flood water from Marikina River. The dike location is on excavation site for securing cross section of the river, and the Pasig Revetment needs to be demolished.</li> </ul>		
<p>[Mitigation/Compensation]</p> <ul style="list-style-type: none"> <li>a) Sewage Treatment Center  Relocation of the plant is not easy since Orande Sewage Treatment Center (OSTC) is functioning as treatment of 40,000 people in Marikina and Pasig, and then releasing treated water to Marikina River. Earth embankment was planned for the section in the year 2002, it can be changed to parapet type for avoiding interference with the plant. Since OSTC is an underground facility at low elevation area, and is experiencing flood events in 2012, the facility may be designed to withstand with submergence. Discussion with the OSTC owner, Manila Water, is necessary for further clarifications.</li> <li>b) Navigation</li> </ul>		



<ul style="list-style-type: none"> <li>➤ There is a requirement for commuting ferry passage through MCGS. Water depth and the height (clearance between the gates) should be considered according to the dimension of ferry boat.</li> <li>➤ There are ferry terminals along the Marikina River. PMRCIP Phase IV should take the functions account together with depth of channel needs to be maintained. Further discussions with Eastwood City Estate Association (ECEA) and related organizations of Pasig River Ferry Service Project are necessary.</li> </ul> <p>c) Pasig City Revetment</p> <p>Demolishment of the revetment is inevitable since it is on the ground to be excavated for securing cross section for flood flow. Thorough consultation with Pasig City Planning Office is essential.</p>
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Impacts examined	Examined in Section	Expected degree of Impact
<b>(6) Socially weak or disadvantageous groups</b>	3.5.6	<b>C</b>
<p>[Findings]</p> <ul style="list-style-type: none"> <li>- Majority of the project affected people are ISF. ISF are not eligible to receive cash compensation.</li> <li>- There is no information on handicapped personnel, isolated elderlies, and single headed mother's family at this point.</li> </ul>		
<p>[Mitigation/Compensation]</p> <p>Mitigation measures are the same with:</p> <ol style="list-style-type: none"> <li>(1) Housing and real estate (land acquisition and involuntary resettlement)</li> <li>(2) Job opportunity and livelihood</li> <li>(3) Land use and income source</li> <li>(4) Community organization</li> </ol> <p>LGU's program for handicapped personnel, isolated elderlies, and single headed mother's family should be supported.</p>		

Impacts examined	Examined in Section	Expected degree of Impact
<b>(7) Distribution of benefit and social cost</b>	3.5.7	A-
<p>[Findings]</p> <p>a) <u>Inequity within Phase IV area</u></p> <ul style="list-style-type: none"> <li>- Beneficiaries of design flood events are the people who live in inland of Santolan area (Pasig City), and Provident Village and vast area of the eastern side of Marikina City.</li> <li>- Social cost bearers are the people to be displaced for the project, the majority is in Santolan area. The majority is low income people near the Marikina River.</li> </ul> <p>b) <u>Inequity in wider area with redistribution of flood water</u></p> <ul style="list-style-type: none"> <li>- Beneficiaries of whole PMRCIP are not only the residents within Phase IV area, but of low land users along the Lower Marikina River, the Pasig River, and possibly of San Juan River.</li> <li>- Cost bearers within Phase IV area are the people and land users at upstream who are to be resettled, those who live around the opening of Mangahan floodway at the eastern side, and those who live lowland area of Laguna de Bay. The people who lived along the downstream area during the implementation of past and on-going Phases of PMRCIP also contributed for overall goal of PMRCIP..</li> <li>- Marikina City and Pasig City expressed their anxieties on MCGS operation for the impacts on upstream and questioned the effectiveness.</li> </ul>		
<p>[Mitigation/Compensation]</p> <p>a) Understanding of related LGUs LGUs, such as Marikina City, Pasig City, and Quezon City need to agree on ideas of PMRCIP Phase IV for its implementation. For that, benefit and cost of the plan should be clarified, explained, and discussed with LGUs, including the impact of MCGS.</p> <p>b) Agreements Santolan Residents (The same with “(4) Community organization” above)</p> <p>c) Understanding on the PMRCIP Phase IV by Factory Managers Operation of MCGS will raise water level by approximately one (1) meter near the MCGS, and the impacts are greater without MCGS. However, the flood water will not be overtopped easily because of height of embankment which is designed to support the design flood water level.  The benefits and consequences should be explained precisely to the factories, and obtain understandings from the factories managers.</p>		

Impacts examined	Examined in Section	Expected degree of Impact
<b>(8) Social conflict</b>	3.5.9	C
<p>[Findings]</p> <ul style="list-style-type: none"> <li>- If off city resettlement plan is planned, strong opposition against the project may arise from the community. There also are active “pro-poor” political parties who support residents for not comply with unfavorable resettlement plan.</li> <li>- Rejection of recipient community against the resettlers may occur if resettlement site is designed in off-city.</li> </ul>		

Impacts examined	Examined in Section	Expected degree of Impact
<p>[Mitigation/Compensation]</p> <p>a) The mitigation measure is the same with “(4) Community organization”.</p> <p>b) Raising acceptability of host community (only if off-city resettlement is inevitable)</p> <p>DPWH should incorporate acceptance training into the resettlement plan. Study for the supporters such as specialized NGOs for supporting of resettles should be effective. There are NGOs which are offering “acceptance training” for those who need to move in to the strangers’ community. The Organizations such as: Gawad Kalinga (GKK: Give Care), World Vision, and Habitats for Humanity.</p>		

Impacts examined	Examined in Section	Expected degree of Impact
<b>(9) Stability of ground (including dike)</b>	3.5.12	C
<p>[Findings]</p> <ul style="list-style-type: none"> <li>- Design flood water will be 3 m higher than the ground at Santolan. Water head is 4.5 m higher than ground if the flood water reaches crest of the embankment.</li> <li>- The population density of the Santolan area is much higher than in 2002.</li> <li>- The design flood water level will be slightly higher than water level without MCGS; however, the control over the difference in flood water levels shown below is a given-engineering criterion and already incorporated into the embankment design. Therefore there is no significant impact by the difference in water level except obstruction of inland water discharge in to river for few hours of duration. Misleading understandings on MCGS operation including the impacts are an issue for mutual understandings. <ul style="list-style-type: none"> <li>+1.05 m at MCGS</li> <li>+0.57-0.41 m at Santolan</li> <li>+0.12 m at Marikina Bridge</li> </ul> </li> </ul> <p>[Mitigation/Compensation]</p> <ul style="list-style-type: none"> <li>➤ Obtaining of engineering verification is recommended for alternatives for presently planned earth dike section to other type of embankment</li> <li>➤ One of the alternatives is that to delay timing of implementation to after-construction of the flood control dam (Marikina Dam).</li> <li>➤ Dissemination of proper information of benefits of PMRCIP and the impacts should widely be shared by the related society. The means of information propagation should be studied.</li> </ul>		

Impacts examined	Examined in Section	Expected degree of Impact
<b>(10) Natural flow and discharge function</b>	3.5.13	B-
<p>[Findings]</p> <ul style="list-style-type: none"> <li>- All 25 gates need to be properly operated during extreme flood, and all of them should be well maintained in normal time; or the hinterland will be submerged under significant depth of flood water.</li> <li>- Some of the gate outlet elevation is lower than the present river bed. Clogging of the gate outlets at inner curved area (Santolan) may occur at the end of flood peak by sediments carried by flood.</li> </ul>		



Impacts examined	Examined in Section	Expected degree of Impact
<p>[Mitigation/Compensation]</p> <ul style="list-style-type: none"> <li>➤ Engineering study of maintaining of the gates function during flood, with level and budget of the MMDA taking into account</li> <li>➤ Consideration for alternatives gate types such as non-operation type</li> <li>➤ Formulating operation and maintenance manuals for the gates.</li> <li>➤ Installation for pumping station</li> </ul>		

### 3.8 Monitoring

Environmental Compliance Certificate (ECC-98-NCR-301, 9807-128-120) for PMRCIP requires compliance of Environmental Impact Statement (EIS) which is submitted to and approved by DNER. One of the condition attached to ECC is Environmental Monitoring Plan.

21. That the project proponent shall submit to this Office a quarterly environmental monitoring report based on the submitted/approved environmental monitoring plan

In the EIS, Environmental Monitoring Plan is addressed as follows.

Environmental Monitoring Plan

Changes in the hydrology and water quality aspects will be monitored during the operation phase. The frequency and estimated costs of the hydrology and water quality monitoring is presented below:

**Table 3.15 Monitoring Particulars in EIS**

Project Phase	Parameter	Frequency
Construction	suspended solids, COD	twice a month
Operation	river flow, COD	when MCGS is operated
	suspended solids, COD	twice a year

In addition to above, PMRCIP Phase II project is conducting monitoring on: air quality and noise, water quality (including BOD, temperature, pH, dissolved oxygen, total dissolved solids, conductivity, salinity), aquatic biota, sediment quality. These parameters should also be concerned when making EMP for Phase IV.

The prominent issue for Phase IV project, however, would be involuntary resettlement; and therefore, the social impacts should carefully be observed by following monitoring (draft) from earliest planning stage, and necessary remedies should be formulated anytime as it deemed to be necessary, and should be implemented (**Table 3.16**).

Livelihood recovery is planned to be monitored as shown in **Table 3.17**. It is as important as the implementation of fair resettlement plan, and will probably be one of the most difficult tasks to be done successfully for DPWH.

**Table 3.16 Monitoring Plan for Resettlement**

Subject	Timing of implementation/ frequency/ Duration	Report to	Contents of report
1. Consultation to the residents	Cutoff date - completion of resettlement (/mo.)	DPWH-PMO	Date, venue, participants, explanation materials, record of discussion
2. RAP formulation	Basic Study - Detailed Design stage - approval of RAP (/mo.)	DPWH-PMO	Selection of consultants, PAP census, progress of RAP formulation
3. Compensation payments	After RAP formulation- completion of payment or equivalent (/mo.)	DPWH-PMO	PAP application, evaluation of real-estate, identification of eligible personnel, payment record
4. Land acquisition	Until land clearance completes (/mo.)	DPWH-PMO	List of land owners, Status of procurement, unit prices, contract status, payment status
5. Resettlement	Until completion of resettlement (/mo.)	DPWH-PMO	Progress of preparations of resettlement sites, conditions of resettlement, agreement with each resettler's signature, resettlement status
6. Grievance redress system	Before construction – one year after completion of construction (/mo.)	DPWH-PMO	Record of claims, name of staff and redress status

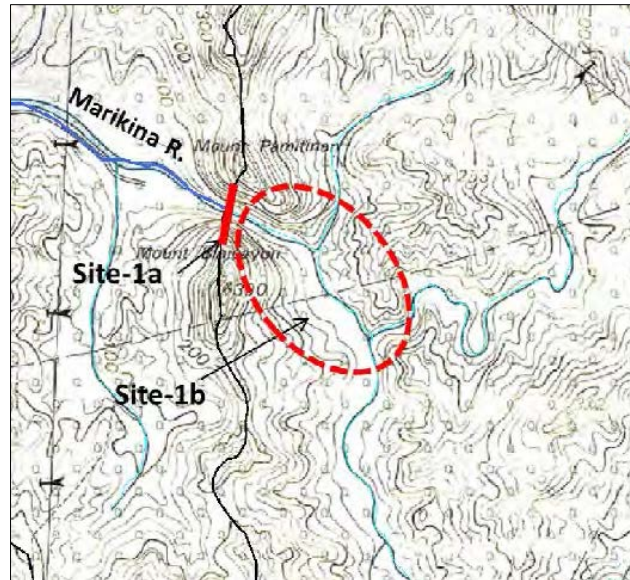
**Table 3.17 Monitoring Plan for Livelihood Recovery**

Subject	Timing of implementation/ frequency/ Duration	Report to	Contents of Report
1. Recovery of livelihood	Until three year after resettlement (/3 mo.)	DPWH-PMO	Formulation of livelihood support program, implementation status, effect of the program in individual basis
2. Recovery of living environment	Until three year after resettlement (/3 mo.)	DPWH-PMO	Preparation of living infrastructures, formation of community organizations

# CHAPTER 4 ENVIRONMENTAL AND SOCIAL SETTINGS OF FLOOD CONTROL RESERVOIR

## 4.1 Project Description

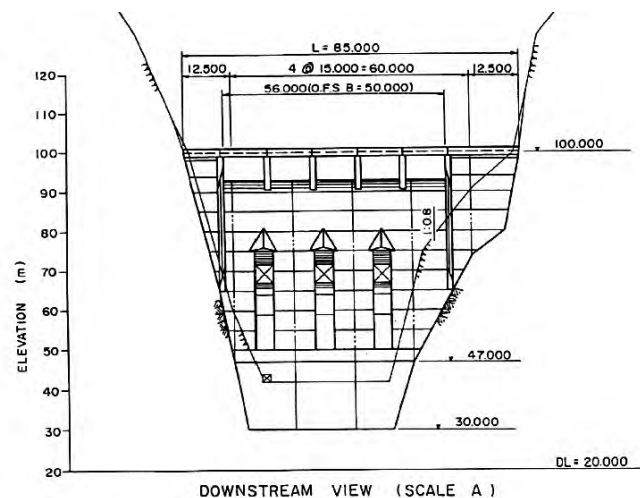
JICA M/P Study and WB M/P proposed their dam site as proposed at existing Wawa dam, abandoned water supply dam built in 1909 (Site-1a in **Figure 4.1**). Since limestone, known as to affect dam foundation, is predominant in the area, other locations are also proposed at upstream (Site 1b, and another site at approximately 3.5 km upstream of Wawa dam). Catchment area for Site-1a is 281 km<sup>2</sup>.



Source: Master Plan for Flood Management in Metro Manila and Surrounding Areas (Draft) 2012, World Bank

**Figure 4.1 Proposed Dam Site**

The dam structure for Site-1a is the one which designed by JICA in 1990. The gateless flood control-purposed dam is shown in **Figure 4.2**.

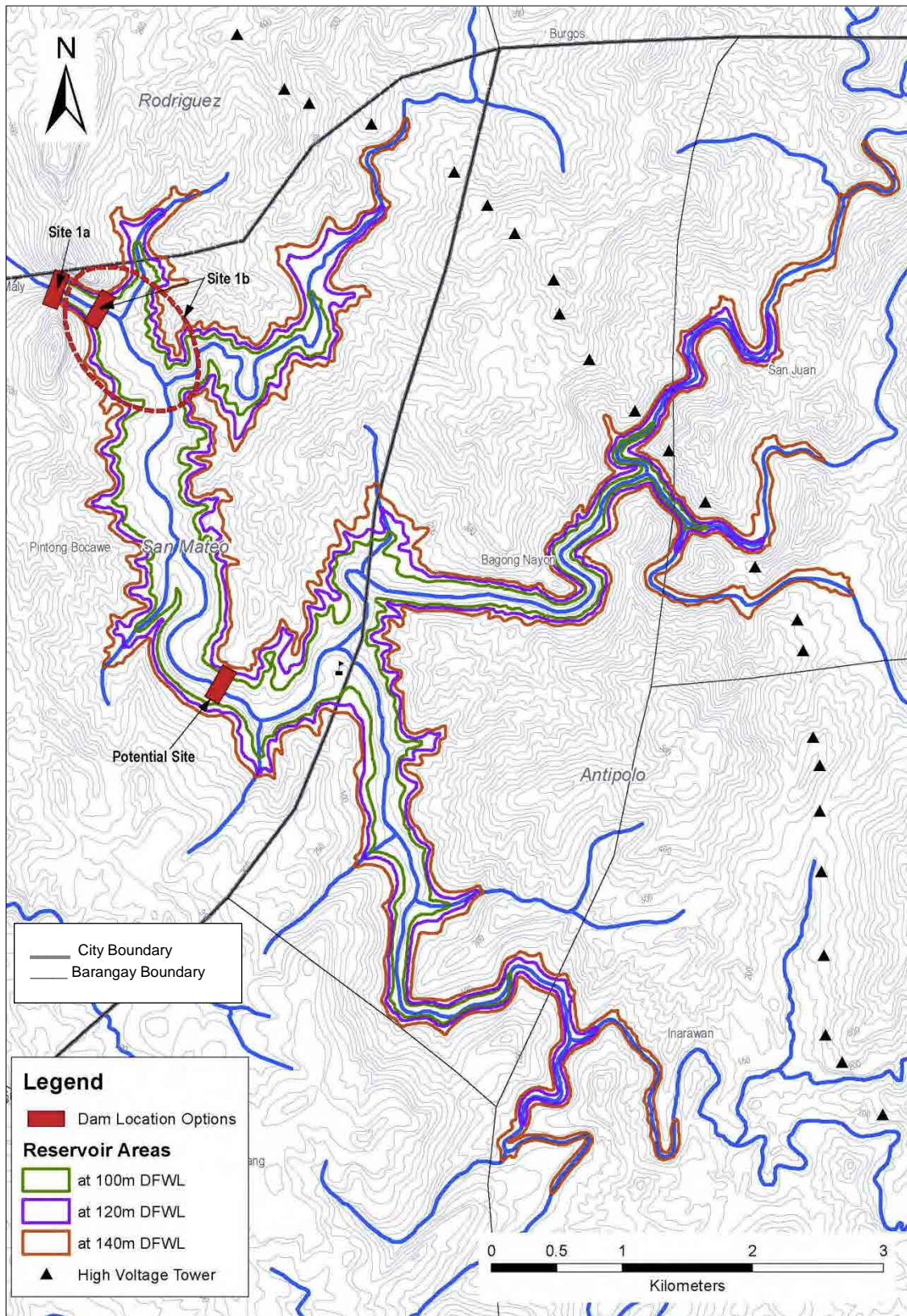


Source: JICA, DPWH: The Study on Flood Control and Drainage Project in Metro Manila, 1990

**Figure 4.2 Proposed Dam for Site-1a**



The existing Wawa dam was built in the year 1909 during American Regime, and it used to supply water to Manila until the 1960s. It is abandoned now and the reservoir is buried by sediments.



Source: JICA Study Team

**Figure 4.3 Reservoir Area and Alternatives of Dam Axis**



## 4.2 Physical and Natural Settings

### 4.2.1 Geology

The Upper Marikina River Basin is generally characterized by rough terrain, marked by deep and narrow incised channels, U and V-shaped river valleys and steep to highly steep slopes and ridges, scarps and pocket alluvial fans. Geological formation of limestone in the area formulates unique Montalban gauge. Since limestone formation does not weathered easily, it formulates cliff like topography; however, caves are frequently formulated within the rock along water seepage by chemical reaction with water. This is fatal geological characteristic as dam foundation. Geology map is shown in **Figure 4.4**.



Limestone formation formulates Monralban Gauge



Mountains of watershed area (Sierra Madre Mountains)



Sediments buried Wawa dam reservoir



One cause of sediment supply: deforestation in the catchment area

The valley and reservoir are buried by alluvium. Marikina Valley Fault System (MVFS), is developed at the western side of Wawa dam (**Figure 4.6 and Figure 4.7**). MVFS is identified as one of the major active fault lines in the country according to “The Marikina Valley Fault System” (1997) Philippines Institute of Volcanology and Seismology. Subordinate fault line connecting to MVFS runs along the proposed reservoir can be identified in **Figure 4.4**. The closest distance of the East Marikina Valley Fault is approximately 2.7 km from existing Wawa Dam (**Figure 4.5**). Sediment supply through main channels is thought to be high, due to disturbance of forest in the watershed area. The surrounding area of reservoir is designated as high susceptibility of land slide area (**Figure 4.8**).



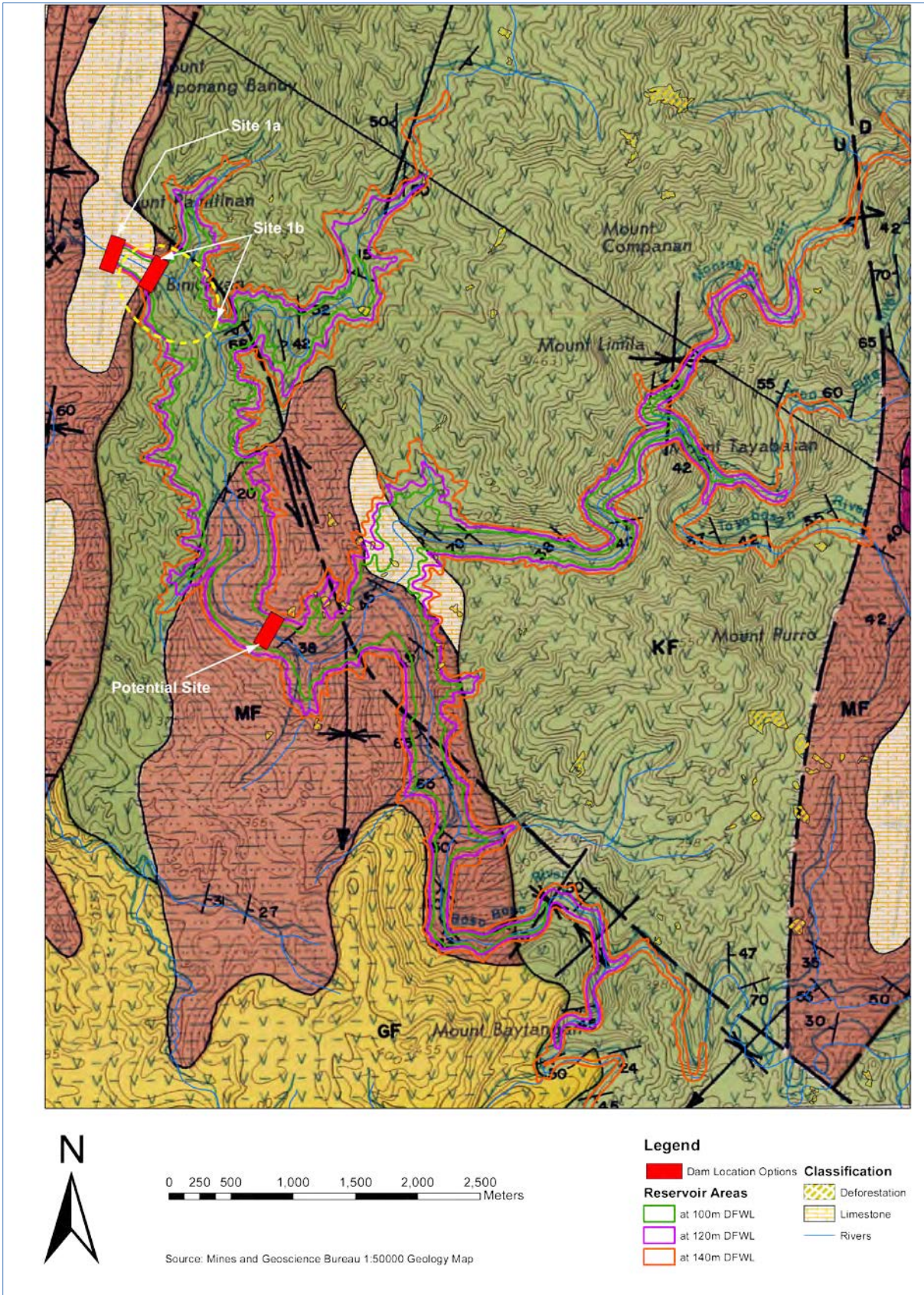
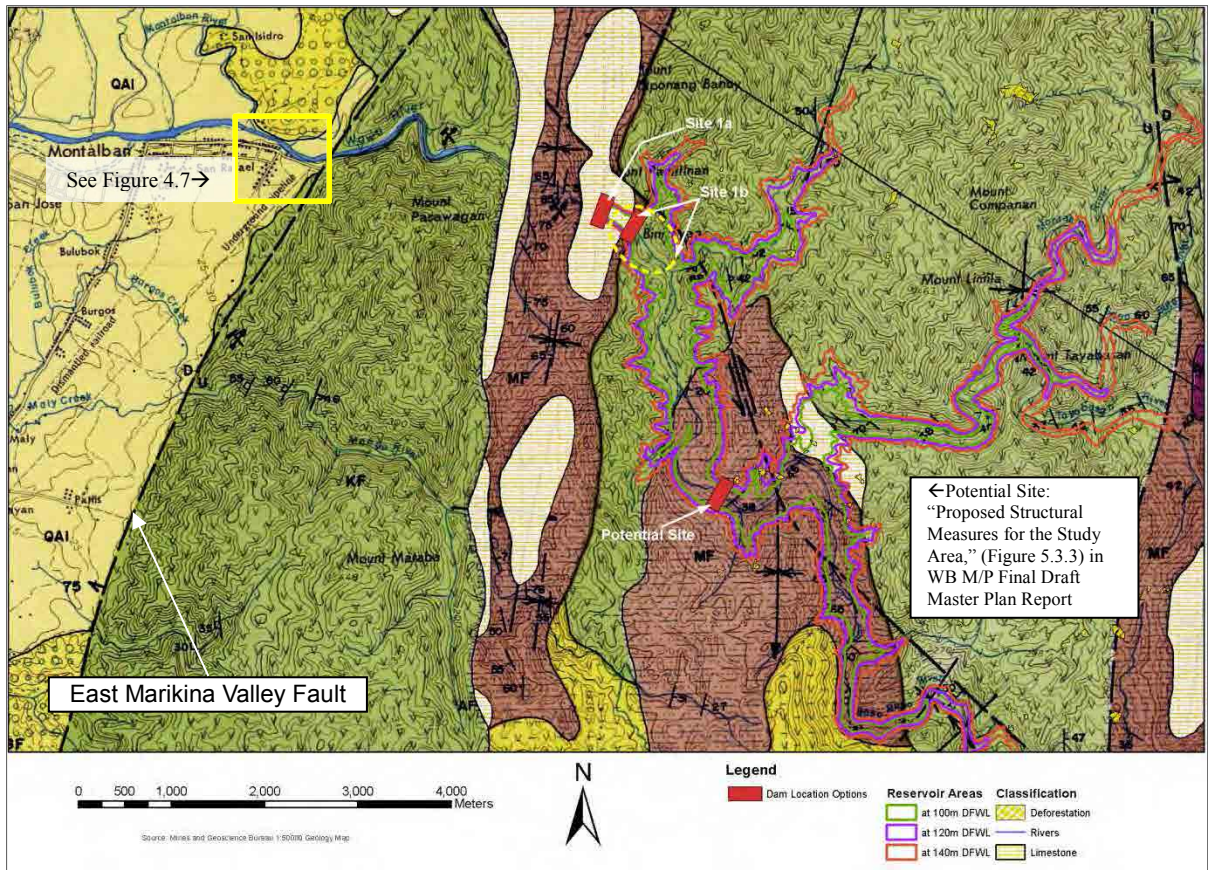


Figure 4.4 Geology Map





Source: Mines and Geo-Science Bureau 1:50,000 Geology Map



Figure 4.6 Active Fault Lines



Figure 4.7 Active Fault Lines near Wawa Dam

Figure 4.5 Reservoir and Fault System

## 4.2.2 Biology

A significant number of flora species are found in the municipality of Rodriguez. Dominant dipterocarp species in the area are tanguile, mayapis, red lauan, white lauan, bagtikan and nato and other commercial trees like akleng parang, molawin, dungon and balayong. Most of these are found in the Pamitinan Protected Landscape (PPL), 608-ha area in Barangay. San Rafael, Rodriguez, located in the eastern part of Rodriguez. The PPL is connected to the Marikina River System and its tributaries .

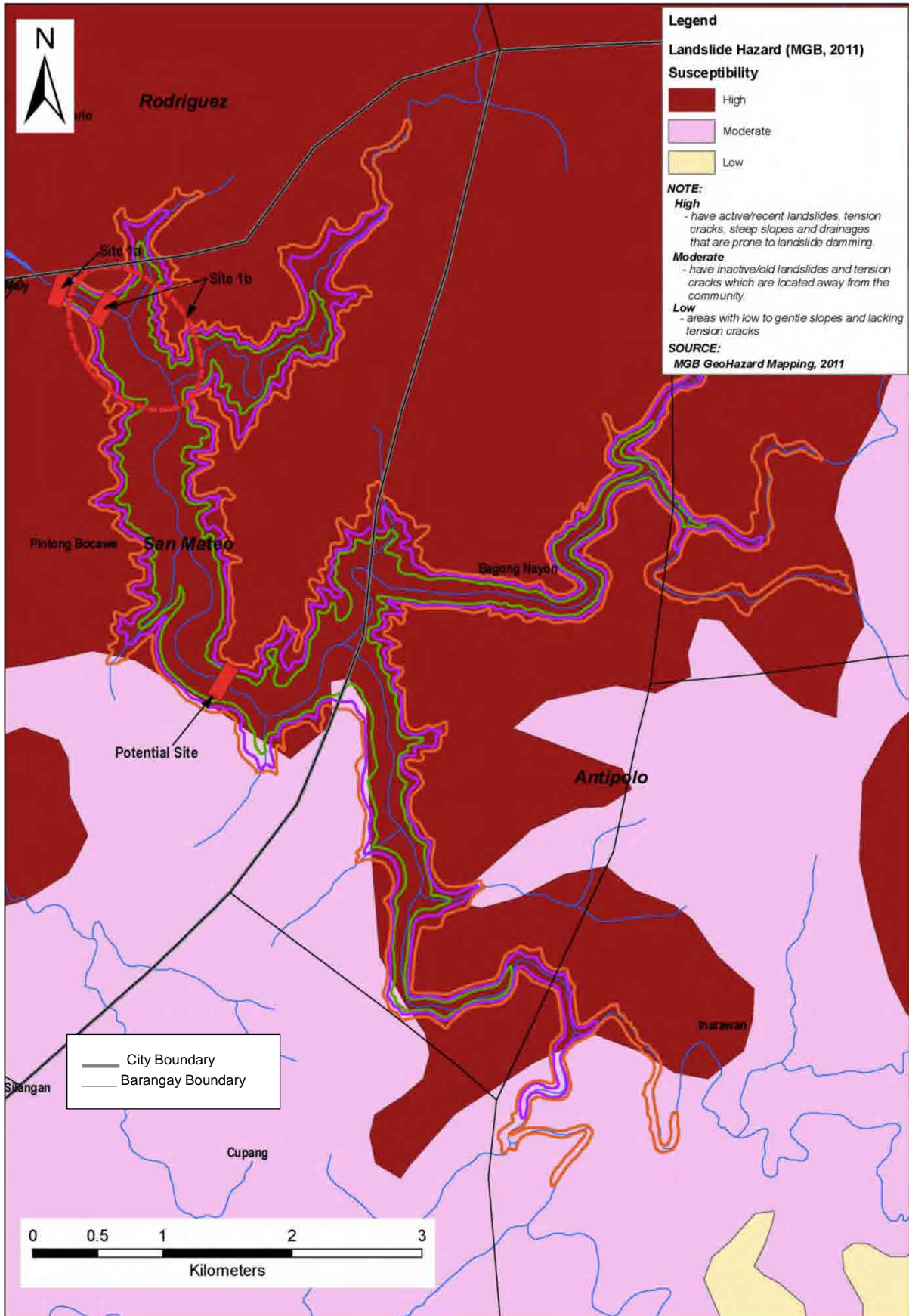
There are 326 floral species found at the PPL, where 30 and 45 species are classified as rare and endemic, according to Marikina Micro-watershed Ecological Profile (2008). There are 18 tree species with various commercial, medicinal and domestic uses and four species of bamboo at the PPL.

The Upper Marikina River Basin Protected Land Scape was designated by President Proclamation No. 296 (2011). The area spans over 26,125.64 hectares, which encompass whole the proposed reservoir and also the catchment area (**Figure 4.9**). The definition of category “Protected Land Scape” by Republic Act 7586 is: areas of national significance which are characterized by the harmonious interaction of man and land while providing opportunities for public enjoyment through recreation and tourism within the normal lifestyle and economic activity of these areas. The proposed dam area is now managed under DENR.

### **Categories of Protected Landscape in Philippines**

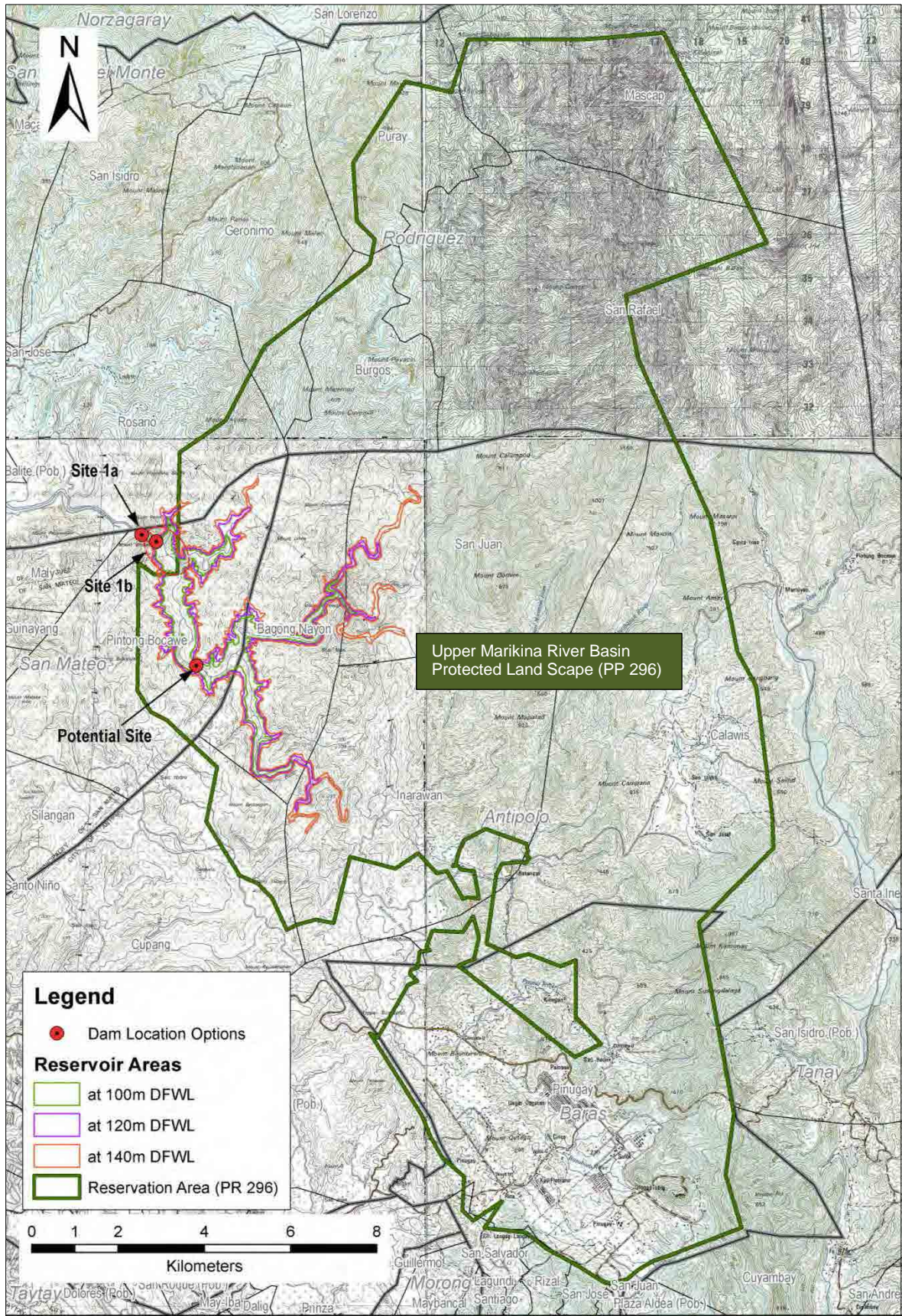
- (a) Strict nature reserve;
- (b) Natural park;
- (c) Natural monument;
- (d) Wildlife sanctuary;
- (e) **Protected landscapes** and seascapes;
- (f) Resource reserve;
- (g) Natural biotic areas; and
- (h) Other categories established by law, conventions or international agreements which the Philippine Government is a signatory.





Source: MGB Geo-Hazard Mapping 2011, modified by JICA Study Team  
**Figure 4.8 Land Slide Hazard Area**





Source: Presidential Proclamation 296, plotted by JICA Study Team

**Figure 4.9 Protection Area**



### 4.3 Social Settings

#### 4.3.1 Related Administrations and Population

Water area of the proposed reservoir covers three municipalities and 7 barangays in Rizal Province as mentioned in **Table 4.1**.

**Table 4.1 Administrations around Upstream of Wawa Dam**

Province	Municipality	Barangay	Population	Household	Avg. Household Size
Rizal	Rodriguez	Burgos	38,544	8,557	4.5
		Rosario	5,881	1,372	4.3
		Geronimo	5,417	1,236	4.4
		Total	280,773	65,630	4.3
	San Mateo	Pintong Bocawe	4,080	972	4.2
	Antipolo	Bagong Nayon	45,152	9,723	4.6
		San Juan	8,488	1,874	4.5
		Inarawan	18,026	3,937	4.6
		Total	676,444	149,517	4.5

Source : NSO 2010

Buildings are counted according the 3 ground elevations that the buildings are located: lower than 100 m, 120 m, and 140 m. The results are summarized in **Table 4.2**. Each population is estimated as 1495, 1629, and 1776 respectively (**Figure 4.10**).

**Table 4.2 Table Inundation Estimation by Proposed Reservoir**

City/Municipality	Barangay	Building Count			Population Estimate*		
		<100mL	<120m	<140m	<100m	<120m	<140m
Antipolo	Total	37	46	62	171	212	286
	Bagong Nayon	37	46	46	171	212	212
	Inarawan	0	0	3	0	0	14
	San Juan	0	0	13	0	0	60
San Mateo	Pintong Bocawe	288	306	321	1,325	1,408	1,477
Rodriguez	Rosario	0	2	3	0	10	14
<b>TOTAL</b>		<b>325</b>	<b>354</b>	<b>386</b>	<b>1,495</b>	<b>1,629</b>	<b>1,776</b>

\* number of building is multiplied by 4.6 (average population per household in 2010)

#### 4.3.2 Social Condition

Many of them became fruit & vegetable traders, seller of seedlings. There were also many environmentally degrading and illegal activities such as charcoal making, loggings, and mining and an unauthorized selling of property rights. The area's land use map is shown in **Figure 4.11**.

Income of household ranges from PHP 2,000 to PHP 4,000 per month (Source: RAP/ Wawa-Montalban Eco-Tourism Sub-Project). Wells supply drinking water to the residents, and the streams and creeks are used for bathing and washing clothes.

Based on the Marikina Microwatershed Ecological Profile, production forest is found in Brgy. San Juan, Antipolo City and Sitio Pintong Bukawe in San Mateo. A production forest is defined as forest lands managed primarily for production of timber and other tree products. This type of land includes naturally or artificially regenerated forests.



Vegetable farming



Production forest after clear cutting original forest



Plantation area by clear cutting



Slush and burn practice

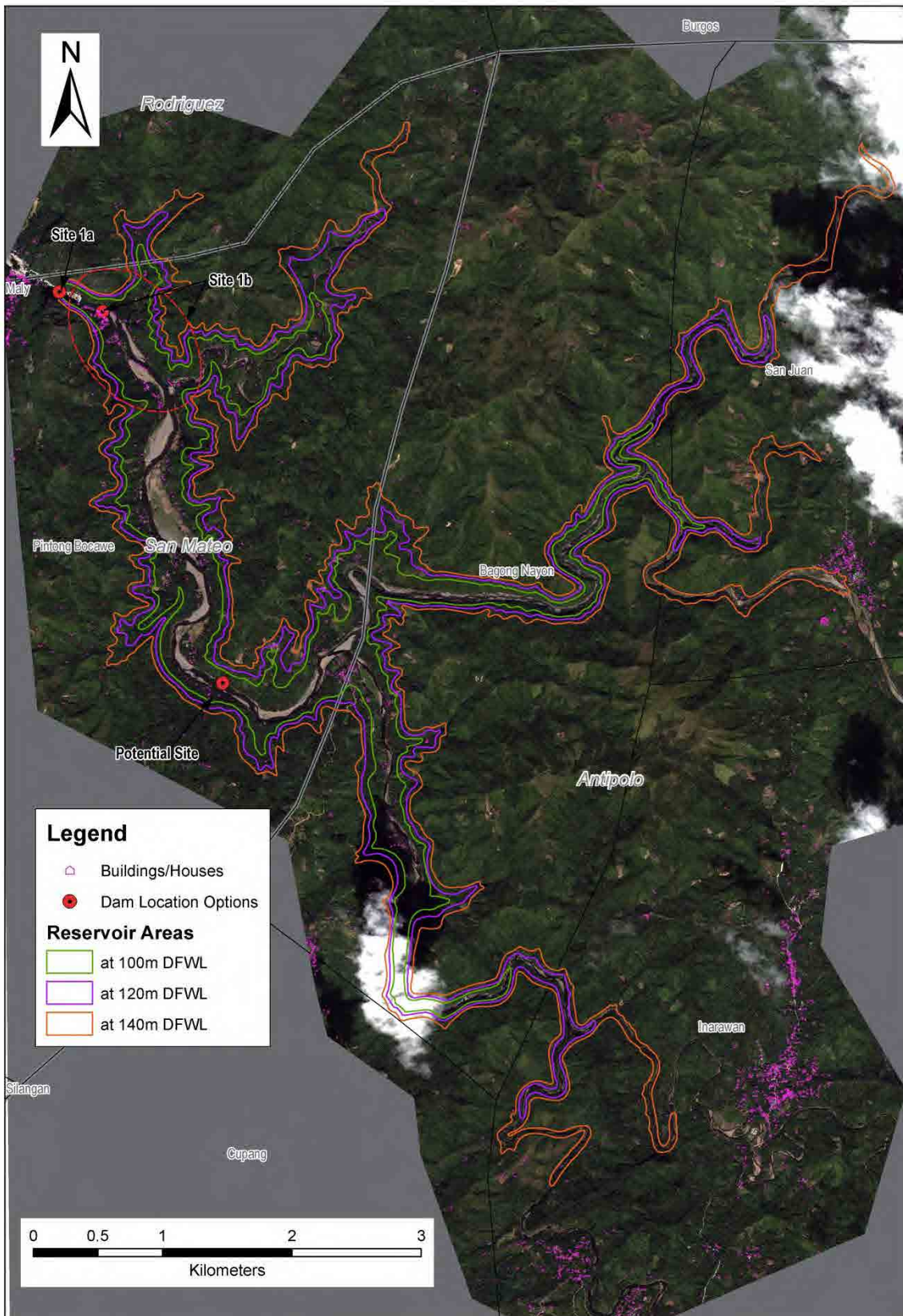


Churches



Primary school also exists at Sitio Casiri

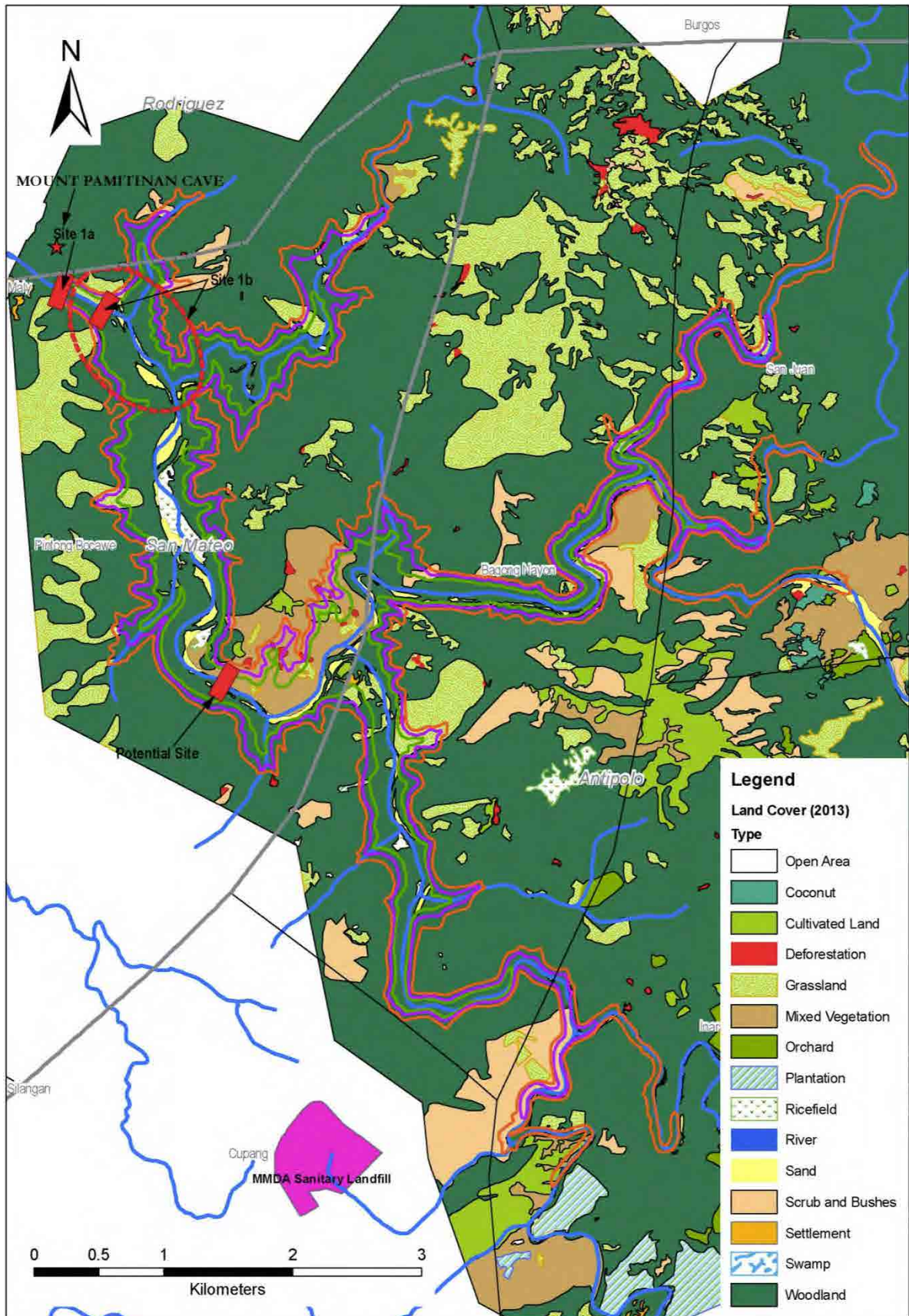




Source: JICA Study Team

**Figure 4.10 Buildings in Reservoir Area**





Source: modified by JICA Study Team

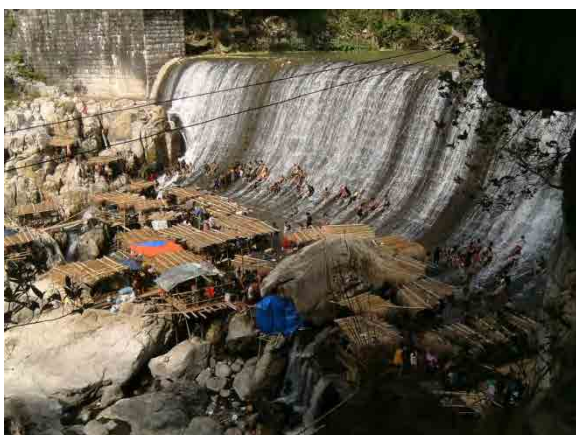
**Figure 4.11 Land Use Map of Reservoir Area**

### 4.3.3 Historical Value

The area holds many historical tales. It is known as an important place for resistance against the Spaniards; national heroes Andres and Bonifacio met and swore to fight against the Spanish regime in one of the caves; Bernardo Carpio, a Filipino legendary hero of great strength, remains trapped between the boulders. More recently, the topography of Wawa dam area offered the Japanese soldiers' strategic fighting bases in World War II, and some still think "Yamashita treasure" is remained buried somewhere nearby.

### 4.3.4 Tourism

The topography and natural resources of Wawa dam offers local tourists a recreation area especially during summer. There is almost no visitors in the area beyond Wawa dam area.



Wawa dam in summer



Trail through cave



Undeveloped riparian environment



Visitors are accommodated by local facilities

### 4.3.5 Development Plan

#### (1) Montalban Wawa Eco-Tourism Sub Project

Project Proponent: Municipality of Rodriguez

Project dimension: 4 ha in downstream of Wawa dam

Supported by: Laguna de Bay Institutional Strengthening and Community Participation Project of Laguna Lake Development Authority (LLDA-LISCOP), World Bank & Municipal Development Fund office of





Department of Finance (MDFO-DOF) (Figure 4.12)

Implementation Schedule

Start Date: April 1, 2013

Date of Completion: October 1, 2013

Cost of Project: PHP 31 million

Project Components

Facilities: administration building, restaurant, covenant hall, kiosks, Crafts Center

Civil works: Riverbank protection, landscaping, parking, gorge walk,

Number of Resettlement Family: 397

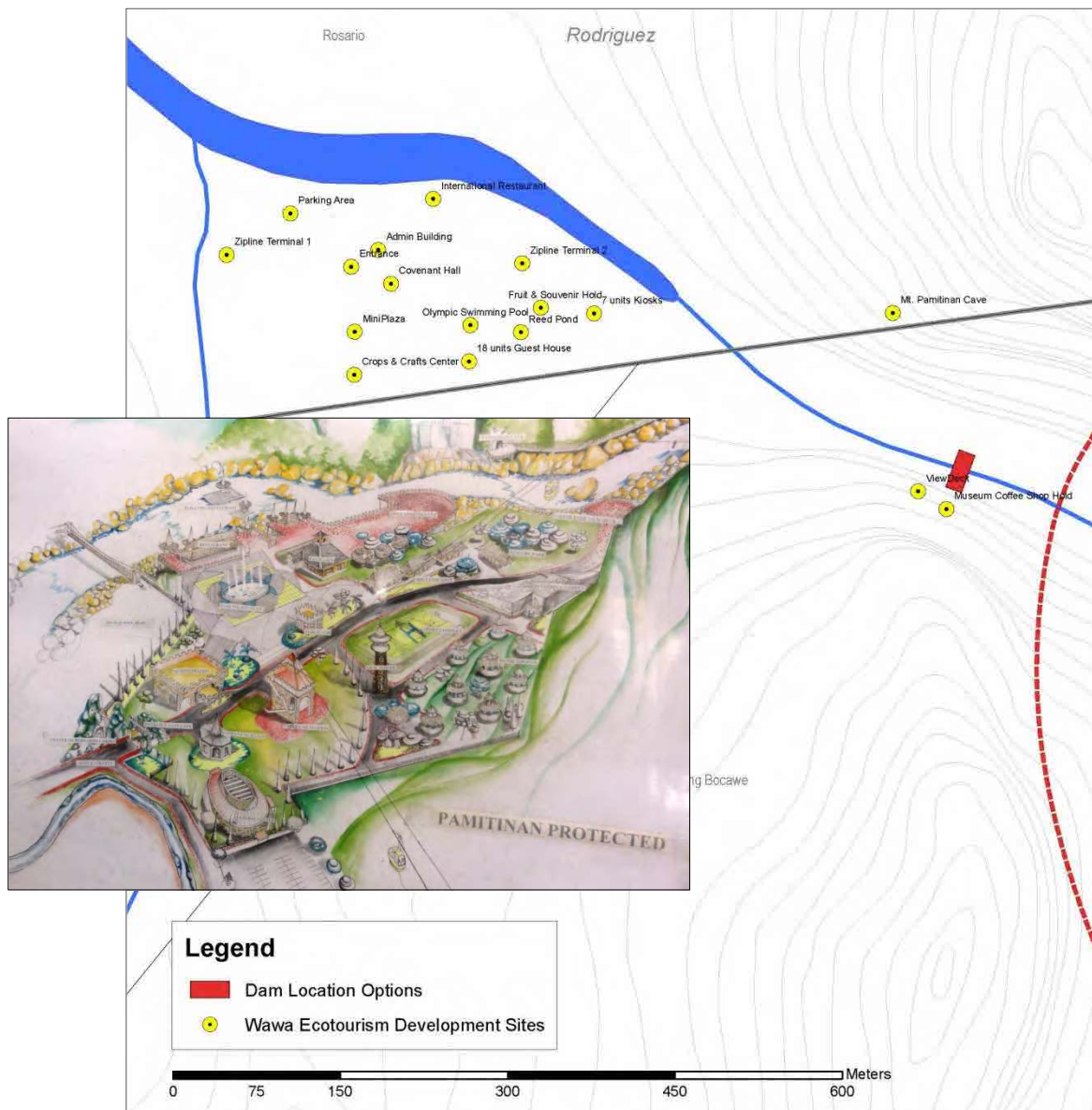


Photo and Figure by JICA Study Team

Figure 4.12 Montalban Wawa Eco-Tourism Sub Project

(2) Re-building Plan of Wawa Dam by MWSS

Metropolitan Waterworks and Sewerage System (MWSS) studied possibility of a reservoir, with

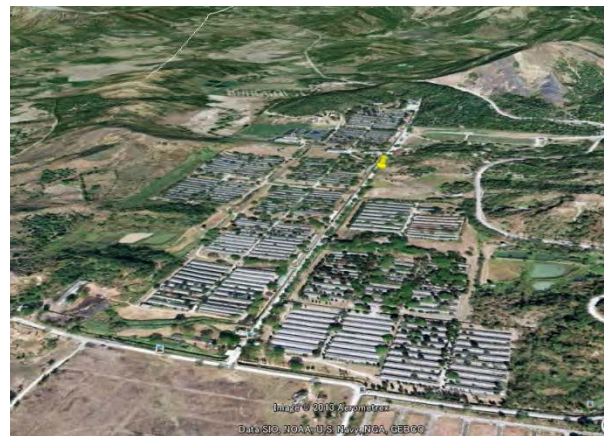
capacity of 50 million liters per day in Wawa dam area, and found serious concerns as follows, according to MWSS Administrator Diosdado Jose Allado said in 2010 (Source: PhilStar.com).



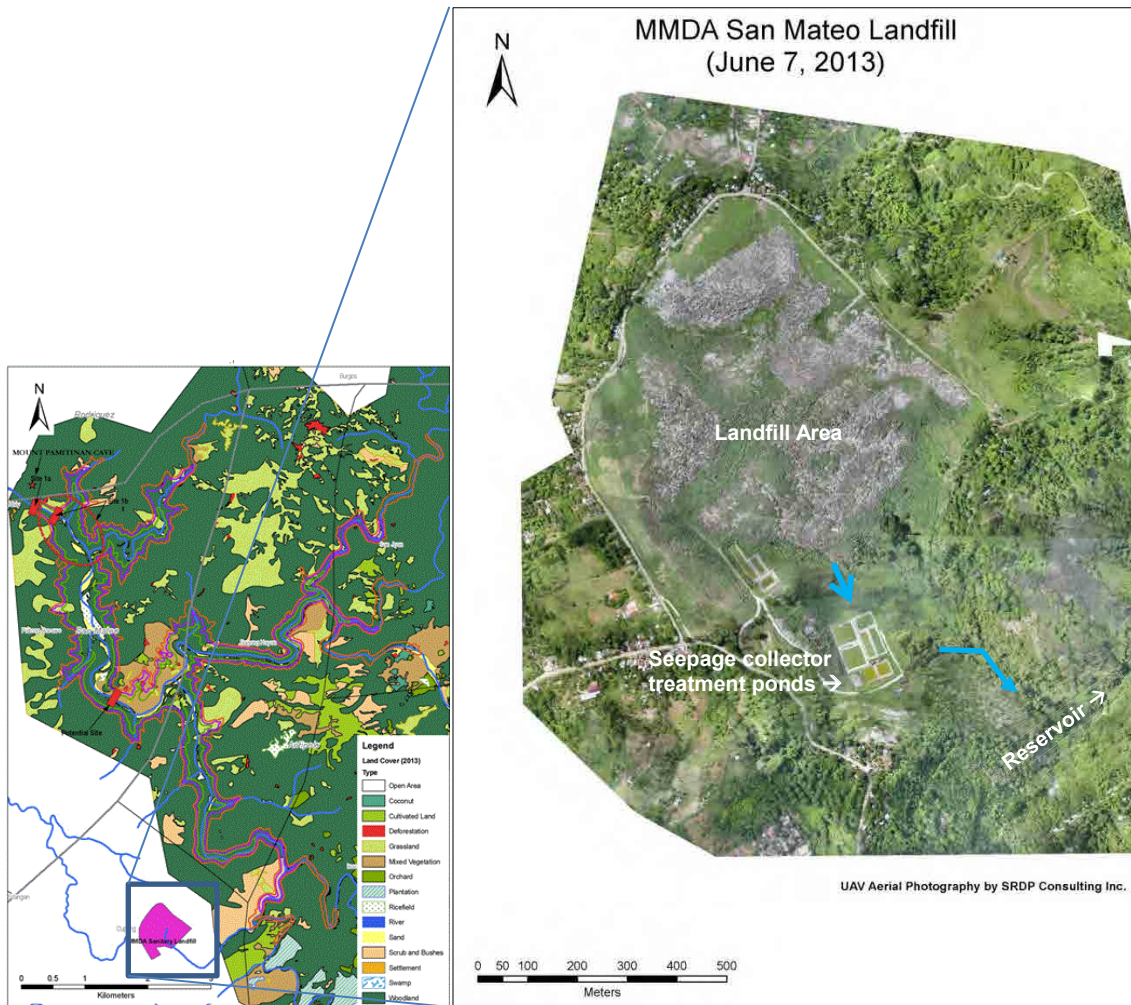
- Construction of a high dam structure will present a negative perception to people living downstream of the Marikina River, including Pasig River;
- Department of Environment and Natural Resources (DENR) had recommended and opposed the issuance of an environmental clearance certificate (ECC) for the construction of a large capacity dam in the Montalban Gorge because it is within the seismic fault zone: Marikina Valley fault line;
- Difficulty in controlling seepage/leaks through the limestone mass even with the use of expensive grouting;
- Poor quality of water quality from big piggery farms, highly urbanized communities and the presence of sanitary landfills at upstream, which overflows during heavy rain; and
- Sourcing 50 MLD from the Wawa River is not feasible for the whole year.



Vast MMDA sanitary land fill at upstream area (see **Figure 4.11**)



Large scaled piggery run by an agro-business firm



**Figure 4.11 Recent Aerial Photo of MMDA Land Fill**



## **CHAPTER 5 LAND ACQUISITION AND RESETTLEMENT OF PEOPLE RESIDING IN FLOOD-PRONE AREAS IN METRO MANILA**

### **5.1 Legal Background for Governmental Resettlement Plans for Flood Hazard Areas in Metro Manila**

There are mainly three laws that pertain to the resettlement of people living in flood hazard areas in Metro Manila; namely, Republic Act No. 7279 (RA7279), Supreme Court Writ of Mandamus, G.R. Nos. 171947-48, dated December 18, 2008, and Supreme Court Resolution to Grant the Privilege of the Writ of Continuing Mandamus (G.R. Nos. 171947-48), dated February 15, 2011.

#### **5.1.1 Republic Act No. 7279**

This Act is known as the Urban Development and Housing Act of 1992 (UDHA). One of its objectives is to “uplift the conditions of the underprivileged and homeless citizens in urban areas and in resettlement areas by making available to them decent housing at affordable cost, basic services, and employment opportunities.” Under this objective, socialized housing is the primary strategy to provide shelter for the underprivileged and homeless.

According to this Act, socialized housing is defined as programs and projects covering houses and lots or home lots only undertaken by the Government or the private sector for the underprivileged and homeless citizens which shall include sites and services development, long-term financing, liberalized terms on interest payments, and such other benefits in accordance with the provisions of this Act.

##### [Eligibility]

Local government units (LGUs) identify and register all beneficiaries in their respective localities. Section 16 of this Act states the eligibility criteria for socialized housing program beneficiaries. These are as follows:

- Must be a Filipino citizen;
- Must be an underprivileged and homeless citizen;
- Must not own any real property whether in the urban or rural areas and
- Must not be a professional squatter or a member of squatting syndicates.

##### [Resettlement Site]

LGUs implement the relocation and resettlement of persons living in danger areas such as esteros, railroad tracks, garbage dumps, riverbanks, shorelines, waterways, and in other public places such as sidewalks, roads, parks and playgrounds in coordination with the National Housing Authority (NHA). LGUs also provide relocation or resettlement sites with basic services and facilities and access to employment and livelihood opportunities sufficient to meet the basic needs of the affected families in coordination with NHA.

To sustain livelihoods, socialized housing and resettlement projects are located near areas where employment opportunities are accessible to the extent feasible. The government agencies dealing with the development of livelihood programs and grant of livelihood loans give priority to the beneficiaries of the Programs.

##### [Basic Services]

The socialized housing or resettlement areas are provided by LGUs or NHA in cooperation with the private developers and concerned agencies with basic services and facilities such as potable water, power and electricity and an adequate power distribution system, sewerage

facilities and an efficient and adequate solid waste disposal system, and access to primary roads and transportation facilities.

LGUs and concerned agencies also plan and provide other basic services and facilities such as health, education, communication, security, recreation, relief and welfare, in cooperation with the private sector and the beneficiaries themselves.

[Eviction and Demolition]

Eviction or demolition as a practice shall be discouraged; however, either may be allowed under the following situations when:

- persons or entities occupy danger areas such as esteros, railroad tracks, garbage dumps, riverbanks, shorelines, waterways, and other public places such as sidewalks, roads, parks, and playgrounds;
- government infrastructure projects with available funding are about to be implemented;  
or
- there is a court order for eviction and demolition.

Mandatory execution of eviction or demolition is carried out under the following conditions:

- Notice upon the affected persons or entities at least thirty (30) days prior to the date of eviction or demolition;
- Adequate consultations on the matter of resettlement with the duly designated representatives of the families to be resettled and the affected communities in the areas where they are to be relocated;
- Presence of local government officials or their representatives during eviction or demolition;
- Proper identification of all persons taking part in the demolition;
- Execution of eviction or demolition only during regular office hours from Mondays to Fridays and during good weather, unless the affected families consent otherwise;
- No use of heavy equipment for demolition except for structures that are permanent and of concrete materials;
- Proper uniforms for members of the Philippine National Police who shall occupy the first line of law enforcement and observe proper disturbance control procedures; and
- Adequate relocation, whether temporary or permanent is provided, however, that in cases of eviction and demolition pursuant to a court order involving underprivileged and homeless citizens, relocation shall be undertaken by the local government unit concerned and the National Housing Authority with the assistance of other government agencies.

[Prohibition Against New Illegal Structures]

Barangay, municipal or city LGUs shall prevent the construction of any kind of illegal dwelling units or structures within their respective localities. The head of any LGU concerned who allows, abets or otherwise tolerates the construction of any structure in

violation of this section shall be liable to administrative sanctions under existing laws and to penal sanctions provided for in this Act.

### **5.1.2 Supreme Court Writ of Mandamus, G.R. Nos. 171947-48, dated December 18, 2008**

This writ of mandamus directs the government agencies concerned to undertake clean-up operations and to preserve the quality of water at the ideal level of Manila Bay, other major rivers, and connecting waterways (Metropolitan Manila Development Authority (MMDA), et al. vs. Concerned Citizens of Manila Bay).

The writ states that MMDA as lead agency can dismantle and remove structures, constructions and other encroachment built in coordination with the Department of Public Works and Highways (DPWH), LGUs and concerned agencies under Section 28 of RA7279; furthermore, eviction and demolition may be allowed "when persons or entities occupy danger areas such as esteros, railroad tracks, garbage dumps, riverbanks, shorelines, waterways, and other public places such as sidewalks, roads, parks, and playgrounds."

The Department of the Interior and Local Government (DILG) directs concerned LGUs to implement the demolition and removal of such structures, constructions, and other encroachments built in violation of RA7279 and other applicable laws in coordination with DPWH and other concerned agencies.

### **5.1.3 Supreme Court Resolution to Grant the Privilege of the Writ of Continuing Mandamus (G.R. Nos. 171947-48), dated February 15, 2011**

This writ of continuing mandamus means that MMDA, DPWH and the concerned government agencies will continue the clean-up and rehabilitation of Manila Bay until they have fully satisfied the conditions set forth in this writ.

The concerned agencies are given until December 31, 2015 to execute the December 18, 2008 Decision that includes the removal of informal settlers and the demolition of the houses, structures, constructions and encroachments in the waterways in violation of RA7279 and other applicable laws.

## **5.2 Government Measures**

### **5.2.1 Implementation Status**

#### **(1) Present Implementation Processes**

While the government policies on resettlement of the people residing in the flood hazard areas in Metro Manila are mentioned above, actual resettlement activities have been done mainly by LGUs and NHA according to RA7279.

NHA has been mainly providing Off-City resettlement sites and housing units especially in adjacent provinces to Metro Manila such as Rizal, Cavite, and Bulacan, and even in Laguna Province. An OffCity housing unit is usually low-rise rowhouse. However, NHA has started to develop In-City resettlement sites and housing units, which are medium rise buildings with four or five stories. NHA also receives resettlement proposals prepared by LGUs or People's Organizations (POs) that it reviews and submits to the Department of Budget and Management (DBM) for budget request. A host municipality can provide lands for resettlement sites while NHA can prepare housing units and social infrastructure and services.



LGUs also plan resettlement sites and housing units usually in coordination with NHA. However, Pasig City and Quezon City are developing In-City resettlement sites with medium rise buildings (MRBs) funded by own resources while they coordinate with NHA in Off-City resettlement sites.

For POs, another process is to apply for a loan under the Community Mortgage Program (CMP), which is stated in RA7279, through the Social Housing Finance Corporation (SHFC) for financing land preparation under the concept of community ownership. A PO prepares a People's Plan that a Civil Society Organization (CSO) may support including land preparation on private lands. The PO coordinates with the landowners and gives the consent to purchase the lands. The PO can apply for a CMP loan with SHFC to finance the land acquisition. An LGU or CSO also gives support to facilitate CMP loans. However, the process tends to take a long time especially in finding the lands and negotiating with the landowners. Quezon City is the most active LGU in CMP for On-Site or In-City resettlement. SHFC can propose the CMP budget to DBM, and it can be allotted from the 50 Billion Fund.

Recently, DILG has also been active in facilitating and encouraging LGUs and POs to prepare and implement resettlement plans in coordination with NHA for providing resettlement sites and housing units, and/or other agencies such as the Department of Social Welfare and Development (DSWD), the National Anti-Poverty Commission (NAPC), and the Presidential Commission for the Urban Poor (PCUP) for social assistance. DILG organizes the Informal Settler Families-National Technical Working Group (ISF-NTWG) to advance the resettlement of ISFs residing in the danger areas in Metro Manila as mentioned in section 5.2.5.

[Types of Resettlement Sites]

- In-City: Resettlement site developed within jurisdiction of city where ISFs live
- On-Site: Resettlement site developed within area where ISFs currently live which is outside of the danger areas
- Near-City: Resettlement site developed in another city in the National Capital Region (NCR) adjacent to the present ISFs
- Off-City: Resettlement site developed outside of NCR

Major actors involved in the resettlement activities are summarized in Table 5.1.

**Table 5.1 Major Institutional Roles for Resettlement Activities**

Name of Institution	Major Roles for ISFs Resettlement Activities	Original Responsibility
DILG	<ul style="list-style-type: none"> <li>- Support LGUs and POs/CSOs to prepare resettlement plans and for its implementation</li> </ul>	<ul style="list-style-type: none"> <li>- Supervise LGUs activities</li> <li>- Develop the capability of LGUs; in particular, strengthen their administrative capability</li> <li>- Assist LGUs in the formulation, implementation and evaluation of LGU plans (EO No. 777, 1982)</li> </ul>
MMDA	<ul style="list-style-type: none"> <li>- Support LGUs for ISFs census survey with NHA and compile the data</li> <li>- Give a 30-day notice to ISFs prior to removal</li> <li>- Provide transportation for ISFs when they move to resettlement sites</li> <li>- Conduct demolition and clearance with respective LGUs</li> </ul>	<ul style="list-style-type: none"> <li>- Perform planning, monitoring and coordinative functions, and in the process exercise regulatory and supervisory authority over the delivery of metro-wide services within Metro Manila without diminution of the autonomy of the local government units concerning purely local matters.</li> <li>- Flood control and sewerage management which includes the formulation and implementation of policies, standards, programs and projects for an integrated flood control, drainage and sewerage system in Metro Manila (RA7924, 1994)</li> </ul>
NHA	<ul style="list-style-type: none"> <li>- Validate ISFs in the ISF census survey</li> <li>- Provide housing units and resettlement sites with basic services and facilities and access to employment and livelihood opportunities sufficient to meet the basic needs of the affected families</li> <li>- Implement livelihood development programs</li> </ul>	<ul style="list-style-type: none"> <li>- Undertake housing, development and resettlement (RA7924, 1975)</li> </ul>
SHFC	<ul style="list-style-type: none"> <li>- Provide financial assistance to LGUs, CSOs and POs especially for land preparation of In-City resettlement sites through the CMP</li> </ul>	<ul style="list-style-type: none"> <li>- SHFC shall be the lead government agency to undertake social housing programs that will cater to the formal and informal sectors in the low-income bracket and shall take charge of developing and administering social housing program schemes, particularly the CMP and the <i>Abot Kaya Pabahay</i> Fund (AKPF) Program (amortization support program and developmental financing program). (EO NO. 272)</li> </ul>
DPWH	<ul style="list-style-type: none"> <li>- Resettlement of people affected by public projects</li> </ul>	<ul style="list-style-type: none"> <li>- As the primary engineering and construction arm of the government, DPWH is responsible for the planning, design, construction and maintenance of infrastructures such as roads and bridges, flood control systems, water resource development projects and other public works in accordance with national objectives. (EO No. 124, 1987)</li> </ul>
LGUs	<ul style="list-style-type: none"> <li>- ISFs registration with Census Tagging</li> <li>- Consultation for ISFs</li> <li>- Preparation of housing units and resettlement sites</li> <li>- Resettlement</li> </ul>	<ul style="list-style-type: none"> <li>- The city, consisting of more urbanized and developed Barangays, serves as a general-purpose government for the coordination and delivery of basic, regular, and direct services and effective governance of the</li> </ul>

Name of Institution	Major Roles for ISFs Resettlement Activities	Original Responsibility
	<ul style="list-style-type: none"> <li>- Demolition and clearance with MMDA</li> <li>- Support POs/CSOs to prepare resettlement plans and for its implementation</li> </ul>	<p>inhabitants within its territorial jurisdiction.</p> <ul style="list-style-type: none"> <li>- The municipality, consisting of a group of Barangays, serves primarily as a general purpose government for the coordination and delivery of basic, regular and direct services and effective governance of the inhabitants within its territorial jurisdiction.</li> </ul> <p>(RA7160: Local Government Code, 1991)</p>
PO including ISFs	<ul style="list-style-type: none"> <li>- Prepare People's Plans supported by CSOs</li> </ul>	<p>A People's Organization is an independent community and/or sector-based organization/association established to protect and advance their common housing interests.</p> <p>(JMC, 2013)</p>
CSOs	<ul style="list-style-type: none"> <li>- Support POs and ISFs to prepare People's Plans</li> </ul>	<p>Civil Society Organizations are non-governmental organizations (NGOs), POs, cooperatives, trade unions, other citizen's groups formed primarily for social and economic development to plan and monitor government programs and projects, to engage in policy discussions and to actively participate in collaborative activities with the government.</p> <p>(JMC, 2013)</p>

Source: DILG, MMDA, NHA, and JICA Study Team

## (2) Implementation Schedule

Government agencies and LGUs have until the end of 2015 to complete the resettlement of ISFs residing in the danger areas such as esteros, railroad tracks, garbage dumps, riverbanks, shorelines, waterways, and in other public places such as sidewalks, roads, parks and playgrounds in Metro Manila according to the Supreme Court Resolution 2011. However, the resettlement activities and their progress vary widely among LGUs.

As mentioned in section 5.2.3, Pasig and Quezon LGUs are conducting the resettlement activities forward especially in providing the MRBs for In-City resettlement. Marikina City LGU concluded that they completed ISFs resettlement from the riversides along Upper Marikina River. Conversely, Cainta and Taytay LGUs along Mangahan Floodway have just started coordination with DILG, MMDA and NHA to conduct ISFs censuses and prepare resettlement plans.

## (3) Budget and Finance

Pasig City and Quezon City, which are financially wealthy municipalities and can provide resettlement land (publicly owned land), are preparing MRBs that are usually 4-5 stories high as the In-City resettlement with own budget allocation.

President Aquino approved a 50 Billion Fund (allocation of PHP10 million annually until the end of his term in 2016) for the resettlement of ISFs residing in the danger areas in Metro Manila. The Municipalities of Cainta and Taytay located on Mangahan Floodway can avail themselves of this fund although they belong to Rizal Province.



## 5.2.2 Activities of National Housing Authority toward Providing Housing Units for Resettlement of ISFs Residing in Danger Areas in Metro Manila

### (1) Overall Status and Plans

The NHA budgets were appropriated according to the agency's project proposals pursuant to the General Appropriations Act as summarized in **Table 5.2**. Part of the annual PHP 10 billion from the 50 Billion Fund was used for the NHA budgets. A total of about PHP 10 billion was appropriated these past 2 years for about 16,800 ISFs housing units.

However, in 2013, about 14,800 housing units have been carried over from the past two years' projects. Besides, about 20,000 housing units that have approved budgets are targeted as new construction work in 2013. For 2014, NHA proposed about 22,700 housing units with an estimated total cost of PHP 9.9 billion.

**Table 5.2 NHA Budgets and Number of Housing Units for ISFs Resettlement (2011-2014)**

Fiscal Year	2011	2012	2013	2014
Total Budget Appropriation (General Appropriations Act)	PHP 4.4 Bil.	PHP 5.6 Bil.	PHP 21.4 Bil.	-
Budget for ISFs resettlement in NCR	PHP 4.3 Bil.	PHP 5.5 Bil.	PHP 10.1 Bil.	PHP 9.9 Bil.
Targeted Housing Units	16,793 units		-	-
Completed (constructed) housing Units	2,011 units		-	-
Carry Over Units (on-going)	-		14,782 units	
Planned Units	-		20,338 units (budget approved)	22,687 units (budget proposed)

Source: NHA, General Appropriations Act, and JICA Study Team

### (2) Resettlement Sites

#### [General Features]

NHA provides resettlement sites and housing units with social infrastructure such as electricity, which is provided by Meralco, and piped water, which is provided by Manila Water, if they are available to supply. NHA also provides other public facilities – schools, public market, multi-purpose halls, health/day care centers and training center.

Engaging in trade is the main economic activity in the resettlement sites. NHA's Livelihood Development Department (NLDD) supports relocatees in the sites to rehabilitate their livelihoods especially with skill trainings, job referrals and placements. They can learn skills of basic cosmetology, masonry, candle making, and coco fiber weaving, and how to establish retail stores and bottled water refilling cooperatives. With the development of the market place, the sites evolve into typical congested urban settlements.

#### [Monthly payment for NHA Housing Units]

As in all Off-City NHA resettlement sites, the monthly amortization for these units start at PHP200 for the first 5 years, which gradually increases to PHP400 from the 6<sup>th</sup> to the 10<sup>th</sup> year and then up to PHP800 from the 11<sup>th</sup> to the 30<sup>th</sup> year.

In In-City resettlement sites, the average monthly rent is PHP1,500 for a 24 sq m housing unit.

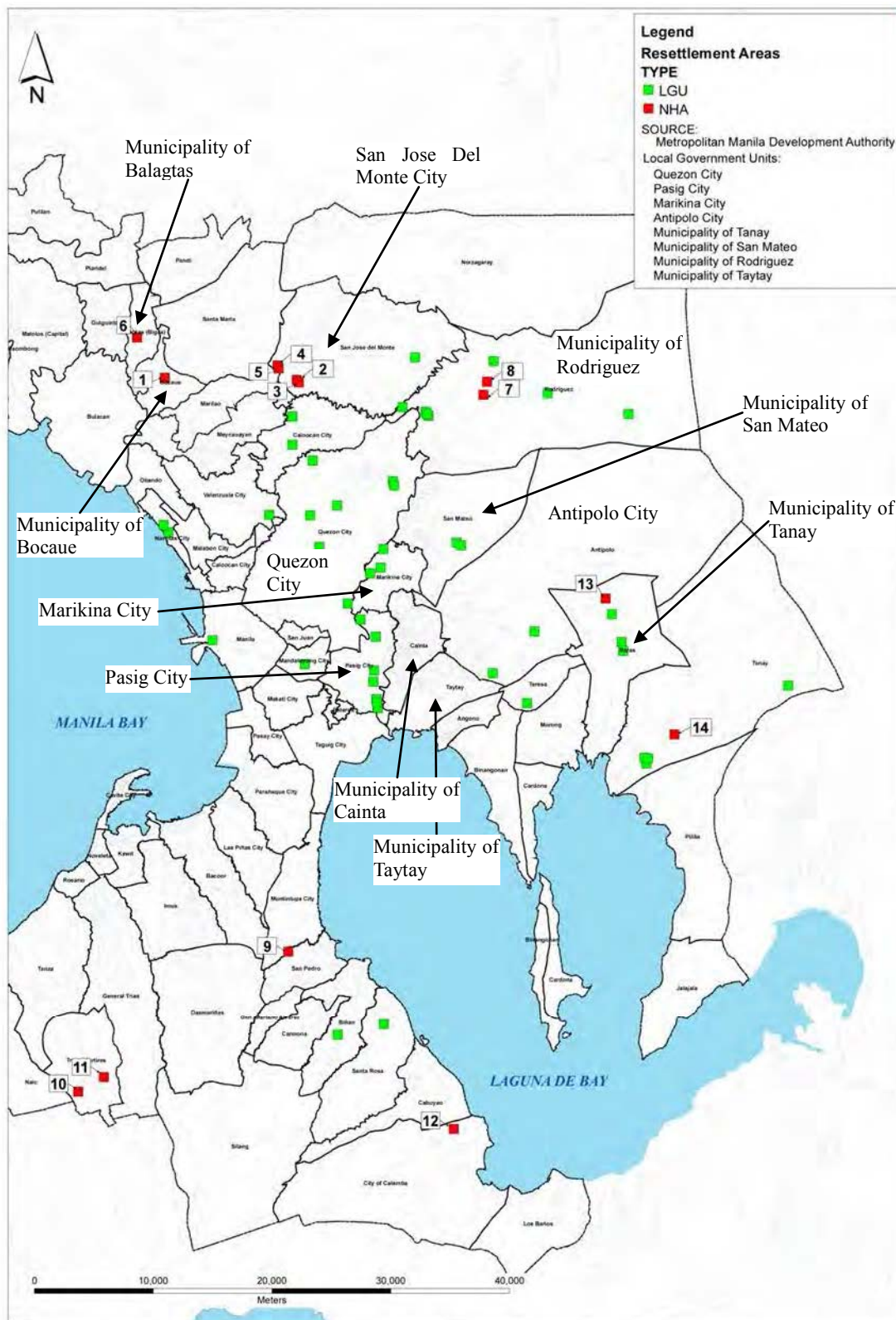
**[Locations and Housing Units]**

NHA has 14 available resettlement sites, and expansion of the sites is possible if necessary. In the resettlement sites, about 22,000 housing units have been proposed, and some are presently being constructed.

**Table 5.3 NHA Housing Units (Ongoing Construction and Proposed)**

Name of Resettlement Site	Location	Total Number of Units
1. St. Maritha Homes	Bocause, Bulacan	3,790
2. Towerville PH. 6	Brgy. Gaya-gaya, San Jose Del Monte, Bulacan	1,060
3. Towerville PH. 6 Expansion	Brgy. Gaya-gaya, San Jose Del Monte, Bulacan	1,000
4. San Jose Del Monte Heights	Brgy. Muzon, San Jose Del Monte, Bulacan	4,006
5. San Jose Del Monte Heights Exp.	Brgy. Muzon, San Jose Del Monte, Bulacan	1,000
6. Balagtas	Bulacan	1,000
7. Southville 8B, PH.4	Brgy. Laylayan, Rodriguez, Rizal	1,278
8. Southville 8B, PH.5	Brgy. San Isidro, Rodriguez, Rizal	605
9. Southville 3A Ext.	Brgy. San Antonio, San Pedro, Laguna	567
10. Southville 2, PH.3	Brgy. Aguado, Trece Martires, Cavite	1,500
11. Golden Horizon Homes	Brgy. Hugo Perez, Trece Martires, Cavite	2,500
12. Don Jose Homes	Brgy. Banlic, Calamba, Laguna	1,000
13. Southville 9, PH.3	Brgy. Pinugay, Baras, Rizal	1,000
14. Tanay 2	Brgy. Plaza Aldea, Tanay, Rizal	1,800
	Total	22,106

Source: NHA



Source: LGUs and NHA

**Figure 5.1 Locations of NHA and LGUs Resettlement Sites**

**(3) Fund Sources**

NHA has a fund source based on the General Appropriations Act (GAA). The 50 Billion Fund is the specific fund source to provide resettlement sites and housing units for the ISFs residing in the danger



areas in Metro Manila. NHA proposes an annual budget to DBM according to its programs/projects. An annual budget of resettlement programs/projects is allocated as a part of NHA’s annual budget.

The other fund source for resettlement programs/projects is from infrastructure projects funds. The funds are used for relocation and resettlement of families affected by government infrastructure projects in Metro Manila.

The above-mentioned funding sources are summarized in **Table 5.4** below.

**Table 5.4 NHA Fund Sources for Resettlement in Metro Manila**

No.	Program	Description
1.	Metro Manila Danger Areas	The 50 Billion Fund is used for relocation and resettlement of ISFs residing in or along danger areas in Metro Manila particularly those along waterways such as creeks, rivers and esteros undertaken mainly through <ul style="list-style-type: none"> <li>• In-City multi-story housing development to use government owned land,</li> <li>• Alternative In-City project schemes proposed by program stakeholders, and</li> <li>• Off-City resettlement if In-City project plans are not feasible.</li> </ul>
2.	Infrastructure Projects	Infrastructure project funds are used for relocation and resettlement of families in Metro Manila affected by government infrastructure projects

Source: NHA

**(4) Livelihood Development Programs**

NLDD works to facilitate low income families to afford decent housing through access to livelihood opportunities, development of alternative housing approaches, and provision of technical assistance. There are three key programs as follows.

**[Resettlement Cum Livelihood Programs (Resettlement with Livelihood Programs)]**

This program is a package of technical assistance to provide access to livelihood and income generating activities for the relocatees. The primary targets are families whose monthly household income is PHP 5,000 and below. Main programs are:

- Skills Training and Scholarship Program,
- Job Referrals and Placements,
- Access to Micro Financing Institutions,
- Entrepreneurship Development,
- Cooperative Development (transport, market, water system), and
- Management of Livelihood Facilities (training center, public market).

**Table 5.5 Livelihood Rehabilitation Assistances**

Program	Description
1. Skills Training	NHA programs skills training courses in coordination with government agencies and private organizations according to the interests and skills. Typical skills trainings are: i) Fancy Jewelry Making, ii) Waste Recycling, iii) Basic Cosmetology, iv) Cell Phone Repair, v) Masonry, vi) Dishwashing Liquid, Fabric Conditioner and Perfume Making, vii) Hand Wash, Shampoo, Cologne and Perfume Making, and viii) Candle Making.
2. Job Referrals and Placements	NHA coordinates with business establishments around resettlement sites to identify potential job opportunities and employments for relocatees. NHA examines job applicants whose qualifications meet the job requirements to refer to employers. The most referable job opportunities are construction companies for resettlement sites. They can be employed in the on-going construction of structures and facilities of the resettlement sites. NHA coordinates with the LGU-Public Employment Service Office (PESO) and the City Social Welfare and Development Office (CSWD).
3. Access to Micro Financing Institution	NHA coordinates with government agencies and non-government organizations in order to support relocatees to access micro-credit facilities. The Self-Employment Assistance (SEA-K) supported by DSWD is a program to provide credit assistance to qualified beneficiaries. Small loans enable relocatees to establish small businesses such as a community pharmacy and a waste recycling and junk shop operation. NHA also cooperates with CSWD in providing cooperative and credit trainings.
4. Entrepreneurship Development	NHA provides relocatees assistance packages in order to enhance their capabilities to become successful entrepreneurs for generation of employments and incomes.
5. Cooperative Development	NHA supports relocatees in organizing service or product cooperatives such as transport, market, water system, food processing, or construction workers co-ops with the cooperation of the Cooperative Development Authority.

Source: PMRCIP Phase III RAP, NHA

**[Impok Pabahay Program (Provident Housing Program)]**

The program is a financial asset-building scheme to enable housing beneficiaries to meet their housing obligations through a planned savings program. The program will redirect and upgrade the existing informal/traditional financial management and practices to be more workable, systematic and sustainable in building beneficiaries' financial resources. The concrete target is to save at least PHP10/day to meet their household needs and housing obligations.

**[Cooperative Pabahay Program (Cooperative Housing Program)]**

This is an alternative housing approach entailing partnership with financially and organizationally stable cooperatives to address the housing problems of the members, primarily, low income families. Affordable, decent and adequate housing units are planned and produced through its cooperative efforts.

**[Institutions Related to Livelihood Rehabilitation Assistance]**

Several agencies such as the Department of Agriculture (DA), the Technical Education and Skills Development Authority (TESDA), the Cooperative Development Authority (CDA), and the Department of Social Welfare and Development (DSWD) cooperate with NHA for livelihood rehabilitation assistance and trainings in resettlement sites. Some examples are as follows.

- DA: Training for growing vegetables and flowers

- TESDA: Training for carpentry, masonry, electrical work, cosmetics, crafts making
- CDA: Setting up cooperative for water bottling business with micro-finance, Training for cooperative formation and management
- DSWD: Training for basic baking as a part of livelihood cum hunger mitigation project

### 5.2.3 Resettlement Activities of LGUs

#### (1) Pasig City

Pasig City is determined to clear 10-meter easement (partially 30 m in Santolan) areas along riverbanks of Pasig River and Marikina River within their jurisdiction and to comply with the Supreme Court Mandamus to clear these and other danger areas before the end of December 2015.

#### [ISFs Resettlement in Off-City]

According to the City's Housing and Resettlement Unit (HRU), about 2,700 ISFs, mostly Typhoon Ondoy victims, were relocated to the NHA resettlement sites in the Municipality of Calauan, Laguna Province, and the Municipality of Rodriguez, Rizal Province, from 2009 to 2011. These resettlement sites are still expected to accommodate ISFs from Pasig.

- Southville 7: NHA Relocation Area, Barangay Sto. Tomas and Barangay Dayap, Municipality of Calauan, Laguna Province
- Southville 8: NHA Relocation Area, Barangay San Isidro, Municipality of Rodriguez, Rizal Province

**Table 5.6 ISFs Resettlement Status of Pasig City (2009-2013)**

Resettlement site	ISF from	Mangahan Flood Way					Total
	U. Marikina	Santolan	Mangahan	Rosario	Sta. Lucia	Maybunga	
In-City	50	45	41	18	115	206	475
- Eusebio BLISS Village II	50	0	0	0	0	10	60
- Eusebio BLISS Village III	0	20	41	18	115	92	286
- Pasig LGU-Habitat	0	25	0	0	0	104	129
Off-City	612	0	229	1,322	852	354	3,369
- NHA Southville 7 (Brgys. Dayap and Sto. Tomas, Calauan, Laguna)	612	0	229	967	777	100	2,685
- NHA Southville 8 (Brgy. San Isidro, Rodriguez, Rizal)	0	0	0	3	64	73	140
- NHA Southville 10 (Brgy. Plaza Aldea, Tanay, Rizal)	0	0	0	352	11	181	544
<b>Total</b>	<b>662</b>	<b>45</b>	<b>270</b>	<b>1,340</b>	<b>967</b>	<b>560</b>	<b>3,844</b>

Source: Pasig City LGU

In addition, 544 ISFs from Sta. Lucia, Maybunga and San Miguel, Pasig City, who were relocated from Mangahan Floodway, were relocated to an Off-City resettlement site named Southville Village 10 in Barangay Plaza Aldea, Municipality of Tanay, Rizal Province, in 2012.

Pasig LGU provided the housing units and social infrastructure and services (schools, water/electricity supply) while NHA cooperated with the Municipality of Tanay in developing the land. There are still spaces available to accommodate 1,300 housing units for ISFs from Mangahan Floodway in Pasig City.



The site consists of row houses built in 2012. The Tanay LGU provided the 12-hectare land, NHA developed the land, and Pasig City provided the funds for construction of housing units. The scheme is covered by a Memorandum of Agreement (MOA) among the three agencies. Pasig LGU also funded the on-going construction of a 3-story (15-classroom) school building to serve about 900-1000 students in elementary and high school. A 300-meter access road was also provided from a national road to the resettlement site, as well as a Material Recovery Facility, health and day care center, a community training and livelihood center, police outposts, ambulance, a multi-purpose vehicle and garbage truck. The relocatees will start the monthly amortization payments in 2014 at PHP 200/month.

### [ISFs Resettlement in In-City]

After 2011, Pasig City decided to provide more in-city resettlement sites according to the ISFs interests. Those building types are mid-rise (4-5 stories) and low-rise (1-2 stories) buildings on the LGU-owned lands. The LGU also cooperated with non-profit organizations for some of those projects.

In the case of a 5-story building with 2 floors per unit (loft type), the total floor area is 36 sq m. Monthly amortization with 0 % interest and 25 years payment vary among floors. The 5<sup>th</sup> floor is the cheapest at PHP 1,500 and the 1<sup>st</sup> floor is the most expensive at PHP 1,900 for the first 5 years. From the 6<sup>th</sup> year until the 25th year, the amortization of the former is PHP 1,500/month and the latter is PHP 2,400/month.

The Pasig LGU provided a total of 3,440 housing units; of this number, 2,233 units are occupied by the city's ISFs and 1,207 units are still available. Meanwhile, 420 units in three MRBs are under construction. Seven of the nine resettlement sites are either fully or almost fully occupied.

**Table 5.7 In-City Resettlement Sites in Pasig City (2009 – 2013)**

Name	Location	No. of Units		
		Planned	Occupied	Available
1. Eusebio Bliss Village I	Jenny's Ave., Brgy. Maybunga	436	436	0
2. Eusebio Bliss Village II	V. Caliuag St., Brgy. Pinagbuhatan	80	80	0
3. Eusebio Bliss Village III	West Bank Rd., Brgy. Maybunga (3 buildings are under construction.)	1,650	870	780
4. Eusebio Bliss Village IV	Kaayusan St., Karangalan Village, Brgy. Mangahan (3 buildings are under construction)	840	420	420
5. Eusebio Bliss Village V	Lupang Pari, Brgy. San Miguel	100	100	0
6. Pasig LGU – Habitat MRB Housing Project	F. Bernardo St., Brgy. Pinagbuhatan	120	120	0
7. Pasig LGU – Habitat 2-Storey Town Homes	Molave St., Nagpayong, Brgy. Pinagbuhatan	144	137	7
8. Eusebio Row Houses	Doroteo Ext., Brgy. Santolan	50	50	0
9. Eusebio Row Houses	V. Caliuag St., Brgy. Pinagbuhatan	20	20	0
Total		3,440	2,233	1,207

Source: Pasig City LGU

### [ISFs Census Tagging]

The Pasig LGU and MMDA joint team, in coordination with NHA, has started the Census Tagging since the end of May for the ISFs within Mangahan Floodway to register and vilify them and to make the master list of ISFs. The census team is collecting the ISFs data, names of household head and spouse, marital status, age, number of dependents, number of years living in/occupying the structure in the area, and place of origin.

The census team is also collecting biometrics data such as photos and fingerprints. The master list with the biometrics data of ISFs can help to validate and identify ISFs returnees who are not eligible for the resettlement program again. In the census, the Pasig ISFs within Mangahan Floodway were counted at 3,157 as of 17 June 2013. The Census is still in progress so the figures may change.

### [The Existing ISFs in easement area in Pasig City]

The Pasig LGU identified the existing number of ISFs in the easement areas at 4,180 as of 17 June 2013, and the distribution is shown in **Table 5.8** below.

**Table 5.8 Number of ISFs on Waterways in Pasig City**

Location		No. of ISFs
1.	Mangahan Floodway East and West Berm Area	3,157
2.	Pasig Marikina River Santolan Area	242
3.	Rosario Back of Litton ROTC Riverside – Marikina River Dr. Sixto Ave. – Marikina River Rosario Boulevard – Marikina River Sapang Malapit Creek (Jenny’s Ave.)	30 29 36 25 26
4.	Maybunga F. Legaspi St., Extension (Ditch Canal) Jackson Circle Creek Marikina River – Purok 1-6	9 12 30
5.	Sta. Lucia Kapitbahayan (Ditch Canal)	47
6.	Pinagbuhatan Ilugin – Cainta River	174
7.	Bagong Ilog R. Valdez St., (PNR Accretion Easements) Babuyan (Avis Extn. – Marikina River)	16 35
8.	Bambang Arellano Comp. (Napindan River)	26
9.	Buting Ilaya (Pateros River) Mendoza St. (Napindan River)	52 10
10.	Caniogan Kawilihan St., (Marikina River)	15
11.	Kalawaan AV Cruz (Daang Paa Creek) St. Benedict HOA (Daang Paa Creek)	44 38
12.	Kapitolyo San Lorenzo St. Creek	36
13.	San Joaquin Daang Paa Creek (Villa Munsod & Villa Hernandez HOA)	40
14.	Ugong PIMECO (Marikina River) Riverside / Marikina River	15 30
15.	Kapasigan Salandanan Compound (Marikina River)	6
TOTAL		4,180

Source: Pasig City LGU

### [Resettlement Plans]

Regarding In-City resettlement, there are two potential sites for the ISFs from Santolan and Mangahan Floodway; namely, Eusebio Bliss Village III and Eusebio Bliss Village IV, as shown in the table above. Both resettlement sites have multi-story school buildings for elementary and high school students. Other social infrastructure such as a health center, a

security office, sports facilities and a day care center are in place. There is piped water and power is supplied in individual units by the local utility companies. Another option is MRBs that NHA will construct at the MMDA depot along Mangahan Floodway.

The first option of Off-City resettlement site is in Barangay Plaza Aldea of Tanay Municipality in Rizal Province. At present, Pasig LGU has already constructed 2,000 units, and 1,800 units were intended for the ISFs from Mangahan Floodway. The other 200 units are intended for ISFs in the host LGU Tanay. A total of 544 ISFs have already been resettled in the site from Barangay Sta. Lucia, Maybunga and Rosario, and 1,256 units are available for occupancy.

(2) **Municipality of Cainta**

The Cainta Municipal Government conducted neither census for ISFs nor preparation of resettlement plans. However, the new municipal administration after the election in May 2013 has started to coordinate with MMDA in order to conduct the Census Tagging that MMDA and Pasig LGU are jointly conducting for the ISFs within Mangahan Floodway. The Municipal Social Workers Development Office will be in charge of the resettlement activities.

(3) **Municipality of Taytay**

**[Number of ISFs along Mangahan Floodway]**

The Urban Poor Affairs Office of the Municipality of Taytay conducted the ISFs census along both banks of Mangahan Floodway with the support of MMDA and in coordination with People's Organizations in 2005. The results of the censuses summarized in the table below show 7,201 house structures occupied by 8,276 ISFs, or a total population of 36,588.

**Table 5.9 Number of ISFs along Mangahan Floodway of Taytay (2005)**

Item	East (Left) Bank	West (Right) Bank	Both Banks
Total Population	24,995	11,593	36,588
Total Structures	4,633	2,568	7,201
Total Families	5,351	2,925	8,276

*Source: Taytay LGU*

**[Resettlement Plans]**

The Taytay LGU has not prepared resettlement plans because they were not able to find resettlement sites in the municipality. Similar to Cainta LGU, Taytay's new municipal administration has started coordination with MMDA in order to conduct the Census Tagging. It has also started coordination with DILG to plan an In-City resettlement site at Don Enrique in Barangay San Juan at about 15 ha area.

NHA also shows interest to support the plan of a relocation site being proposed. However, the land is privately owned and its scheme, schedule and realization are still unclear. Three other NHA resettlement sites were identified for the ISFs from Mangahan Floodway in the municipalities of Baras and Rodriguez in Rizal Province, which are under coordination with DILG and NHA to tap into the 50 Billion Fund.

(4) **Marikina City**

**[Before Typhoon Ondoy]**

During the incumbency of former Mayors Bayani Fernando and Ma. Lourdes Fernando (1992-2010), Marikina City actively pursued the resettlement of ISFs who were living along Marikina River and other danger areas.



Following the census of ISFs in 1992-1994, the danger areas, especially the riverbanks of Marikina River, were aggressively cleared. This was pursuant to a local ordinance (Ordinance 10 of 1994) enacted by the Marikina City Council declaring an easement of either side of 96 meters from the Marikina River center line, and authorizing the relocation of all residents found within the easement areas to safer areas.

The Marikina LGU was able to remove and resettle about 22,000 families to In-City resettlement sites. These housing units were built by the LGU in six different barangays with an aggregate area of 106 ha. The ISFs on the riverbanks moved to three of these sites, namely, Barangays Malanday, Nangka, and Tumana.

**[After Typhoon Ondoy]**

The Marikina Settlement Office has conducted resettlement programs which mainly involved temporary evacuation of calamity victims affected by Typhoons Ondoy and Habagat. The city government also relocated the remnant relocatees from other danger areas. As of March 2013, it has resettled a total of 2,486 ISFs to Off-City resettlement sites, as listed in Table 5-10 below.

From 2009 to 2012, the city government also immediately demolished a total of 582 illegal structures and shanties built by returnees in the previously cleared danger areas along Marikina River.

**Table 5.10 Status of ISFs Resettlement by Marikina City (2009-2013)**

Type	No.	Year	Resettlement Site	Number of Resettled ISFs
Off-City	1	2009	Binan, Laguna Province	689
	2	2009	Sta. Rosa, Laguna Province	481
	3	2010	Calauan, Laguna Province	500
	4	2011	San Isidro, Rodriguez, Rizal Province	452
	5	2012	Pinugay, Baras, Rizal Province	170
	6	2013	-	194
Total				2,486

*Source: Marikina City LGU*

To cite the most advanced case of Marikina City, the Marikina City Council has enacted many ordinances and resolutions related to emergency preparedness and disaster management as follows.

- Ordinance 59 of 1993: keeping sidewalks, alleys and public spaces clear to maximize free movement of vehicular and human traffic (essential during emergencies).
- Ordinance 10 of 1994: declaring an **easement of 96 meters** from either side of the Marikina River centerline, and authorizing the relocation of all residents found within the easement to safer ground.
- Ordinance 264 of 1998: creating a **Disaster Management Office** also known as Rescue 161, to be responsible for emergency preparedness, coordinating response, for first response skills training, and monitoring during emergencies. The ordinance defines the office personnel and their salaries, and that the city will provide the annual budget for the office.
- Ordinance 171 of 1999: **declaring** two titled lots found by the river as a **danger zone** and non-buildable area, **revoking unused building permits** for the area, and prohibiting any new construction.
- Ordinance 54 of 2005: authorizing the use of 20% of the Calamity Fund for Disaster Preparedness, specifically for disaster-related tools.

Marikina City has a Flood Alarm System based on the height of water in Marikina River (Sto. Niño). This system is widely known to the citizens and they pay serious attention to it. The city also provides real time river water levels through the City's homepage.

- Alarm Level No. 1 : 15 m – Warning
- Alarm Level No. 2 : 16 m – Prepare for evacuation
- Alarm Level No. 3 : 17 m – Evacuate

(5) **Quezon City**

Quezon City has adopted a 3-meters easement along waterways, and clears the encroachments. The Housing Community Development and Resettlement Department (HCDRD) which was established in 1986, is mandated to design and implement socialized housing and resettlement programs for Quezon City's underprivileged residents and informal settlers, and to conduct leadership training programs for urban poor communities.

**[Resettlement Situation]**

Quezon City has seven In-City resettlement sites. Bistekville 2 is fully occupied, and the construction of other sites is still in progress, although some of these have been partly occupied. Bistekville 1, 2, 3, 6 and 7 consist typically of 3-story walk-up buildings, 20-24 sq m units with loft. Bistekville 4 consists of one-story rowhouses. On the other hand, Bistekville 5 is still in the stage of land development.

The LGU gives priority to resettling ISFs from danger areas, especially those occupying the banks of San Juan River. ISFs from Marikina River come second in prioritization, but these can be accommodated in Bistekville 1, which also presently houses some ISFs from Tullahan River.

In any case, another In-City resettlement site is proposed to be developed as Bistekville 8. This area has about 2 hectares, located in Barangay Culiati, and may also be earmarked for ISFs now occupying the easements of Upper Marikina River.

**Table 5.11 On-going Projects of In-City Resettlement Sites (2009 – 2013)**

Name	Barangay	No. of Units	Status of Housing Development
Bistekville 1	Payatas	353	On-going
Bistekville 2	Kaligayahan,	1,091	Completed
Bistekville 3	Escopa 2	106	On-going
Bistekville 4	Culiati	218	On-going
Bistekville 5	Payatas	187	On-going
Bistekville 6	Fairview	290	On-going
Bistekville 7	Sauyo	800	On-going
Total		3,045	-

*Source: Quezon City LGU*

**[Fund Sources]**

NHA and SHFC cooperate with the LGU to provide resettlement sites and housing units. NHA has been actively giving support to provide housing units especially for the victims of Typhoon Ondoy. However, their assistance to Quezon City has been limited as their mandate is nationwide.

The LGU has enacted the Socialized Housing Tax Ordinance according to the mandate given highly urbanized cities under RA7279. The LGU has started to collect the Socialized Housing Tax (SHT) since 2012 in order to fund the removal of ISFs especially for the

resettlement projects. However, the SHT is still controversial, and the LGU will collect it up to 2016. The LGU also expects to avail itself of the 50 Billion Fund to finance the unfinished development of Bistekville resettlements.

## 5.2.4 Other Resettlement Programs

### (1) Pasig River Rehabilitation Commission (PRRC)

The Pasig River is one of major waterways in Metro Manila. Population, urbanization, and industrial activities have grown along the river and it caused careless discharge of untreated domestic and industrial wastewater and solid waste into the Pasig River. Consequently, the Pasig River has been seriously polluted and the riverbanks have been blighted in urban development with extensive informal settlements, downgraded residential areas and abandoned industrial land.

Then, the Pasig River Environmental Management and Rehabilitation Sector Development Program (PREMRP) was established through the ADB loan in order to improve the environment and realize the socioeconomic development of the Pasig River and adjacent urban areas. It was required to rehabilitate the river system, restore water quality, control wastewater discharges, and promote urban renewal along the riverbanks. The Pasig River Rehabilitation Commission (PRRC) was established as the executing agency (EA) responsible for overall program coordination, monitoring, implementation and capacity building.

Environmental preservation areas (EPAs) of 10-meter wide were established along the Pasig River banks in order to ensure onshore safety, access for emergency and maintenance purposes, and a pleasant riverside environment. For establishing the EPAs, about 10,000 families were estimated to be relocated.

The relocation was initiated in 1997 by a census and a socioeconomic survey of families residing within the easement areas with a resettlement action plan including provision of assistance for i) housing, ii) transport, iii) livelihood development, iv) food, and v) education.

In 2002, the resettlement activities were reviewed by ADB because the activities were not in compliance with the resettlement action plan. Social infrastructure and civic amenities were not complete. Consequently the activities were halted. To facilitate the activities, ADB agreed to finance 80% of the cost for social infrastructure and civic amenities. ADB also agreed to increase the financing of the housing costs from 60% to 100% in February 2006. Those changes worked effectively to implement the resettlement program. As of October 2008, 6,917 households were relocated to the resettlement sites mainly provided by NHA.

**Table 5.12 PRRC Project Resettlement Sites**

Name	Management	No. of Housing Units	Location	LGU	Province
1. Kasiglahan Village I	NHA	2,857	Barangay San Jose	Rodriguez	Rizal
2. Kasiglahan Village II	NHA	240	MRB Condo C-5	Taguig	NCR
3. Kasiglahan Village III	NHA	920	Barangay Osorio, Summer-fields Subdivision	Trece Martirez	Bulacan
4. Kasiglahan Village IV	NHA	1,646	Barangay San Francisco, Sunny Brooke 1, 2 and Country Meadows	General Trias	Cavite
5. Kasiglahan Village V	NHA	32	Belvedere Townhomes 2 and Belmont Hills	General Trias	Cavite
6. Others	-	1,222	-	-	-
Total		6,917			

Source: PRRC, ADB



**(2) Pasig-Marikina River Channel Improvement Project (Phase III)****[Number of Relocated PAFs (ISFs)]**

The Loan Agreement between the Japan International Cooperation Agency (JICA) and the Government of the Philippines (GOP) through DPWH was signed on December 7, 2011 for the implementation of the Pasig-Marikina River Channel Improvement Project (PMRCIP) Phase III. The Detailed Design of the Project was prepared and is going to bidding process as of June 2013.

According to the Updated Resettlement Action Plan, April 2013 (Draft), 95 families (ISFs), or a total of 452 people, are affected by PMRCIP. One resettlement site outside of Metro Manila, which is located in Barangay Gaya-Gaya in San Jose del Monte City, Bulacan Province, is considered as a resettlement site for the Project Affected Families (PAF). The resettlement site provided by NHA has available housing units for the PAF.

**Table 5.13 Number of PAF (ISFs) to be Resettled by PMRCIP**

City	Barangay	No. of Households	Population	No. of Structures	Cut-off Date
Manila	1. Barangay 894	4	8	4	Oct. 8, 2012
	2. Barangay 896	25	66	22	Oct. 12, 2012
	3. Barangay 897	8	40	9	Oct. 12, 2012
	4. Barangay 900	58	277	36	Oct. 5, 2012
Total		95	452	71	

Source: Updated Resettlement Action Plan, April 2013 (Draft), DPWH

**[Pasig River Rehabilitation Commission]**

The PRRC is the institution responsible for the resettlement of residents within the 10-meter easement of Pasig River based on an MOA with the Manila City LGU. According to the MOA, the PRRC will assist DPWH to implement resettlement activities and monitor the ISFs in Manila City through coordination with the Local Inter-Agency Committee (LIAC).

The PRRC and Manila LIAC have started social preparations for the project affected persons (PAPs) since the end of June 2013. They will conduct a meeting with barangay officials at the beginning of July and validate the number of PAPs to finalize their list before consultation for the PAPs.

**[The Flood Management Committee]**

The MOA to establish the Flood Management Committee (FMC) was signed by DPWH, MMDA, PRRC and respective LGUs of Manila, Mandaluyong, Makati, Pasig, Quezon, Marikina and San Juan on January 24, 2013. The FMC has not started concrete actions since its establishment.

The FMC will act as the inter-agency coordination body among the members. It has the following functions, roles and responsibilities:

- Facilitate and assist in the PMRCIP implementation including the Phase IV for improvement of Upper Marikina River up to Marikina Bridge;
- Facilitate and assist in monitoring the operation and maintenance (O&M) activities for the completed facilities;
- Facilitate and assist in the introduction and operation of non-structural measures;

- Facilitate and assist in the resettlement and acquisition of right-of-way (ROW) activities for the project implementation;
- Monitor, coordinate and take necessary actions for illegal activities such as encroachment and disorderly land development along the rivers in the Pasig-Marikina River Basin;
- Set-up a “Query Window” for the project;
- Act as grievance and redress committee on ROW acquisition and other matters;
- Enhance/strengthen the publicity and awareness on the flood mitigation activities; and
- Convene a meeting once every three (3) months or as necessary.

## 5.2.5 Implementation Plans and Organization Settings being Proposed

### (1) PHP50 Billion Housing Fund for ISFs in Danger Areas of the NCR

In 2010, President Aquino announced that his administration would allocate PHP10 billion every year for five years within his term of office (until the middle of 2016) in order to provide socialized housing for ISFs residing in danger areas such as esteros, railroad tracks, garbage dumps, riverbanks, shorelines, waterways, and in other public places such as sidewalks, roads, parks and playgrounds in Metro Manila. The fund, otherwise known as 50 Billion Fund, is expected to be used for in-city housing programs.

### (2) Informal Settler Families – National Technical Working Group

The Informal Settler Families – National Technical Working Group (ISF-NTWG) was established to deal with resettlement of ISFs residing in the danger areas of Metro Manila with directive of President Aquino in December 2010. The ISF-NTWG is led by DILG and MMDA; DPWH and NHA have been main actors while the other members are HUDCC, DSWD, DBM, PCUP, NAPC, DOF, DENR, SHFC and CHR.

Recently, the ISF-NTWG has been discussing the number of ISFs to be relocated from the danger areas, the priority areas, and the time schedules. MMDA provided the number of ISFs residing in the danger areas in Metro Manila of 104,219 as of 2011. In the danger areas, about 60,000 ISFs (as of June 2012) are summarized for the ISFs residing along waterways.

**Table 5.14 Number of ISFs along Waterways in Metro Manila (June 2012)**

LGU	Number of ISFs
1. Caloocan	6,012
2. Las Piñas	2,590
3. Makati	1,810
4. Malabon	3,991
5. Mandaluyong	662
6. Manila	2,249
7. Marikina	430
8. Muntinlupa	3,686
9. Navotas	6,017
10. Parañaque	914
11. Pasay	4,200
12. Pasig	7,449
13. Pateros	1,869
14. Quezon City	10,367
15. San Juan	1,375
16. Taguig	3,672
17. Valenzuela	2,837
Total	60,130

Source: MMDA and LGUs

In the waterways, 8 priority waterways are agreed in the ISF-NTWG based on i) high/very high flood risk level; ii) major channel of water within the Metro Manila River System; and iii) encroachments of ISFs and illegal structures. A total of 19,440 ISFs were identified in the 8 priority waterways including 2,997 ISFs of Mangahan Floodway. However, the number of ISFs of Mangahan Floodway covered only Pasig City and excluded the ISFs in the municipalities of Cainta and Taytay.

**Table 5.15 Number of ISFs along 8 Priority Waterways  
(As of June 2012)**

Waterway	Number of ISFs
1. San Juan River	4,217
2. Mangahan Floodway	2,997
3. Estero Tripa de Gallina	3,887
4. Maricaban Creek	1,637
5. Tullahan River	3,683
6. Pasig River	1,434
7. Estero de Maypajo	1,415
8. Estero de Sunog Apog	170
Total	19,440

Source: MMDA and LGUs

### (3) Implementation Schedule

As mentioned in section 5.2.1, the ISF-NTWG is targeting to complete the resettlement of ISFs from the danger areas in Metro Manila at the end of 2015. However, from the WG's initial target of about 100,000 ISFs residing in the danger areas for the resettlement, it is becoming to conclude that 60,000 ISFs residing along waterways is a more realistic target until the end of 2015.

A rough schedule for the implementation is as follows:

- 2013: 20,000 ISFs in 8 priority waterways
- 2014: 20,000 ISFs
- 2015: 20,000 ISFs

### (4) Joint Memorandum Circular

DILG prepared a Joint Memorandum Circular (JMC) as policy guidelines on the operationalization and utilization of the PHP50 billion housing fund for ISFs in danger areas of the NCR in April 2013 for MMDA, DPWH, NHA, HUDCC, DSWD, DBM, PCUP, NAPC, DOF, DENR, SHFC and CHR.

The JMC is promulgated pursuant to the following:

- The Ten-Point Covenant of H.E. President Benigno S. Aquino III with the urban poor (1. No eviction without decent relocation, 2. Support for area upgrading and in-city resettlement, 3. Provide basic services to poor communities, 4. Housing budget, 5. Jobs, 6. Increased cooperation with local government units, 7. Peace, 8. Post-Ondoy Rehabilitation Program, 9. Appointments, 10. Participation and stakeholdership)
- His Excellency's December 23, 2010 directive creating the ISF-NTWG under the lead of the DILG to ensure safe and flood-resilient permanent housing solutions for ISFs living in Danger Areas in NCR



- The Supreme Court Writ of Mandamus for government agencies concerned to undertake clean-up operations and to preserve the quality of water at the ideal level of Manila Bay, other major rivers, and connecting waterways (Metropolitan Manila Development Authority, et al. vs. Concerned Citizens of Manila Bay, G.R. Nos. 171947-48, December 18, 2008)

(5) **Policies of Resettlement Site**

The President stated that relocation of ISFs shall be on-site, near-city, and in-city with people's plans. Off-site is the last option in accordance with the People's Plan that ISFs are adequately consulted, or if the ISFs request it. Safe, affordable and decent permanent housing solutions are also ensured for ISFs.

(6) **People's Plan**

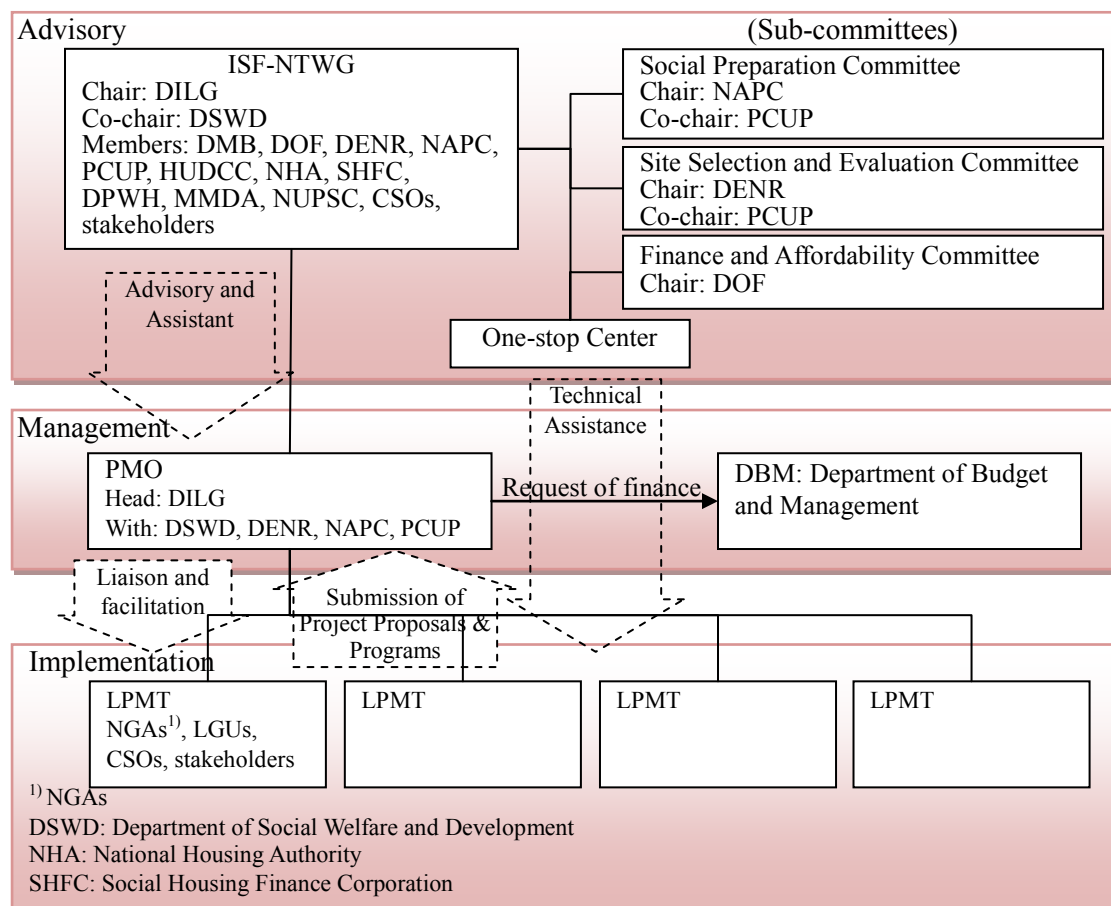
The People's Plan is prepared by People's Organizations either with or without support by CSOs including NGOs and/or government agencies such as NAPC, PCUP, NHA, DSWD, SHFC, LGUs and other relevant agencies. The People's Plan includes a site development plan, livelihood development programs and capacity building trainings.

The People's Plan also includes a Relocation Action Plan (RAP) prepared in accordance with the following legislations:

- CHR Advisory on the Right to Adequate Housing and Human Treatment of Informal Settlers (CHR IV N. A2011-003)
- RA No. 7279, the Urban Development and Housing Act of 1992 (UDHA), more particularly Section 28
- Executive Order 69
- Executive Order 708 (amending Executive Order 152)
- DILG Memorandum Circular 2008-143
- DILG Memorandum Circular 2009-005
- DILG Memorandum Circular 2010-134
- DILG Memorandum Circular 2011-182

(7) **Project Management**

The JMC states the project management mechanism as summarized in Figure 5 1. The figure shows a three-level mechanism: advisory, management, and implementation. The advisory level consists of the ISF-NTWG and three sub-committees. The Project Management Office (PMO) directly manages projects implemented by the Local Project Management Team (LPMT).



Source: JMC, JICA Study Team

**Figure 5.2 Project Management Mechanism**

**[ISF-NTWG]**

The ISF-NTWG works in an advisory capacity and assists the Project Management Office (PMO). The ISF-NTWG is chaired by DILG, co-chaired by DSWD. The members consist of DMB, DOF, DENR, NAPC, PCUP, HUDCC, NHA, SHFC, DPWH, MMDA, NUPSC, CSOs, and stakeholders.

**[Sub-committees]**

Three sub-committees are established to support the ISF-NTWG. They are as follows:

- Social Preparation Committee chaired by NAPC and co-chaired by PCUP

It conducts consultations and other social preparation activities, as well as provide the necessary support in terms of organizing the target families.

- Site Selection and Evaluation Committee chaired by DENR and co-chaired by PCUP

This committee is primarily in charge of evaluating the suitability of sites for housing development considering such essential factors as land research and geo-hazard assessment.

- Finance and Affordability Committee chaired by DOF

This committee identifies appropriate financing and affordability schemes based on assessment and analysis of affordability levels of ISFs. The schemes are approved by the ISF-NTWG.

#### **[Project Management Office]**

The Project Management Office (PMO) is headed by DILG to ensure immediate implementation of resettlement. The PMO's responsibilities are to:

- Liaise and facilitate implementation of projects;
- Facilitate LPMTs in coordination with concerned agencies;
- Approve standard designs of housing units;
- Prescribe procurement deadlines; and
- Require regular reporting of the status of projects.

#### **[Local Project Management Team]**

The Local Project Management Team (LPMT) is established in each project locality to implement a project. It consists of national government agencies such as DSWD, NHA and SHFC, concerned LGU, CSOs and stakeholders. The LPMT submits project proposals/programs to the PMO for funding request to DBM.

#### **[One-Stop Center]**

The One-Stop Center (OSC) is established to simplify the preparation of a people's plan so it can be done in a timely manner. The OSC provides technical assistance and implementation support for people's plans for the construction of socialized housing projects.

#### **(8) Fund Source**

The 50 Billion Fund is solely used for the ISFs housing programs. The fund is provided for the housing programs at affordable cost with basic social services and creating employment opportunities. The amount of PHP10 billion is allocated every year in 5 fiscal years from 2011 to 2016 within the presidential term of President Aquino.

### **5.3 Land Acquisition and Resettlement Issues in Subject Areas**

#### **5.3.1 Upper Marikina River**

##### **(1) River Easement in Santolan**

The Pasig LGU has declared the areas within a 10-meter easement of Pasig-Marikina River as a permanent flood danger zone and is determined to clear these areas of ISFs. The city government has asked DPWH to maintain the 10-meter easement from the shore of Pasig and Marikina Rivers but DPWH has yet to respond to this request. Meanwhile, the Pasig LGU is going to maintain a 30-meter easement in Santolan because there was a border between private lands (inland side) and public land (river side). Aerial photos of the LiDAR data show several traces of demolished housing units in the 30 meters side.

The Pasig LGU has started to construct concrete revetment along the shore of Upper Marikina River from the north of Santolan. The revetment is 300 meters in length with 30 m to 20 m in width adjusted by borders of private lands. It is expected that the concrete revetment can protect the easement from encroachments. The Pasig LGU will expand the revetment to the lower stream in Santolan. There is also an idea to plant trees or install fences in order to protect the shoreline from erosion and to avoid the return of ISFs in the area (immediately after their houses are demolished) before the revetment is constructed.



Meanwhile, the Pasig LGU is not against DPWH constructing embankments after it (the City) constructs the revetment in Santolan. However, an alignment of structure of PMRCIP Phase IV will be designed on the private lands and the ROW will require land acquisition.

## (2) ISFs in Santolan

As mentioned in **Section 5.2.3**, 662 ISFs along Upper Marikina River in Santolan were relocated almost immediately after Typhoon Ondoy. Then the Pasig LGU has been conducting resettlement of ISFs to comply with the Supreme Court Mandamus in 2008 to clear a 10-30 meter-wide easement in Santolan. However, the Pasig LGU still counts 242 ISFs residing along Upper Marikina River in Santolan.

The Pasig Housing and Resettlement Unit (PHRU) mentioned that MMDA was tasked as the primary agency to clear the waterways according to SC Mandamus in 2008. MMDA and Pasig LGU have been conducting the resettlement of ISFs in Santolan. A Certificate of Compliance (COC) is required before MMDA gives ISFs notice of relocation and conduct relocation. COC is requested through the Urban Poor Affairs Office (UPAO), which was usually set up in local housing boards of LGUs and issued by PCUP. The COC of ISFs in Santolan was issued once.

Meanwhile, the ISFs group headed by AKBAYAN requested a temporary restraining order (TRO) from the SC. In the Philippines, the TRO serves as the legal remedy to temporarily suspend the relocations of ISFs. The SC denied the request and gave MMDA the right to dismantle the ISFs structures.

However, when Pres. Aquino took over the new administration, the SC issued a 4-months moratorium on demolition and the clearing of the area was stopped. Therefore, the issued COC already lapsed and the Pasig City Government is awaiting MMDA's administrative action to renew the application for the COC. On the other hand, MMDA mentioned that it is focusing on 8 priority waterways and has no clear schedule to relocate the ISFs in Santolan.

The PHRU has suggested that DPWH clarify whether Marikina River is part of the entire Pasig River system and be given priority although Marikina River was not 'namely' included in the 8 Priority Waterways in the latest information.

Due to the discontinuation of livelihood, low acceptability of off-city resettlement among Santolan ISFs is expected, such as the strong opposition which Pasig City has encountered from the community occurred during resettlement after Ondoy disaster, such as Akbayan who were lobbying for a moratorium on demolition and opposed off-site resettlement.

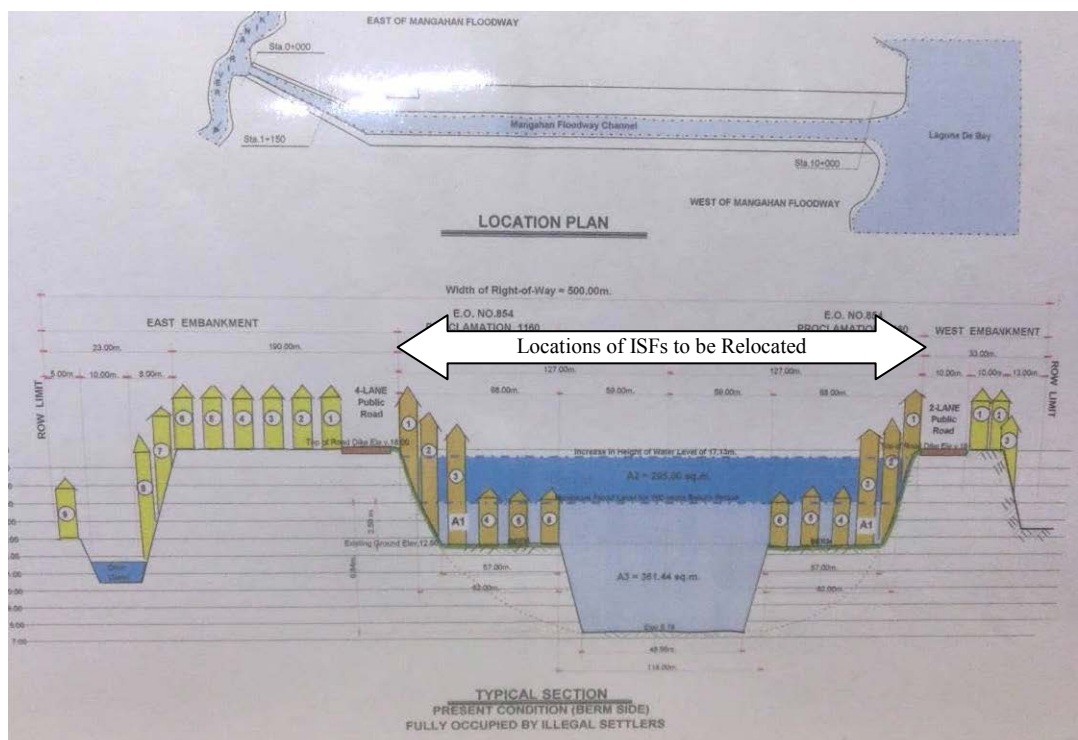
## (3) Other Relocation except Resettlement

The Pasig LGU has started to give out the financial assistance amounting to PHP 27,360 per family to relocate the ISFs on Mangahan Floodway, which is in reference to Section 28 (8) of RA7279 (UDHA). The financial assistance is equivalent to the minimum wage for 60 days (calculated at PHP 456 x 60 days), but it is not a payment for their structure. These ISFs were also provided with some options of resettlement sites or to receive the financial assistance provided by the Pasig LGU.

### 5.3.2 Mangahan Floodway

#### (1) Location of ISFs

The ISFs at Mangahan Floodway are residing inside the floodway between both east and west embankments (see **Figure 5-3**). They will have to be relocated to fully operate and maintain the Mangahan Floodway. The Pasig LGU and MMDA are conducting the Census of ISFs occupying the east and west berm areas of Mangahan Floodway.



(Source: Pasig Housing and Resettlement Unit)

**Figure 5.3 Typical Section of Mangahan Floodway**

## (2) Estimation of Number of ISFs

A considerable number of ISFs are residing within Mangahan Floodway. Of the estimated 94,967 population in Mangahan Floodway, 23,753 are ISFs. These figures were estimated based on the aerial photo of LiDAR data within Mangahan Floodway as shown below.

[Estimation of Population in Mangahan Floodway (Inside of floodway only)]

- Estimated Population : 94,967
- Estimated ISFs : 23,753

Estimation was made using the following equation:

- Estimated ISFs = (A) / (B) x (C)
- Estimated Population = (A) / (B) x (D)

Whereas:

- Total residential area (sq.m) -----(A)
- Average building area of single structure: 25 sq.m----- (B)
- (Analysis based on the aerial photo of LiDAR Data (Feb.-Apr. 2011) inside Mangahan Floodway)
- Unit number of ISFs: 1.23 ISFs/structure -----(C)
- Unit number of populations per structure: 4.93 persons/structure (do)---- (D)
- (Estimated from ISFs census along Mangahan Floodway in Municipality of Taytay shown in **Table 5.17**)

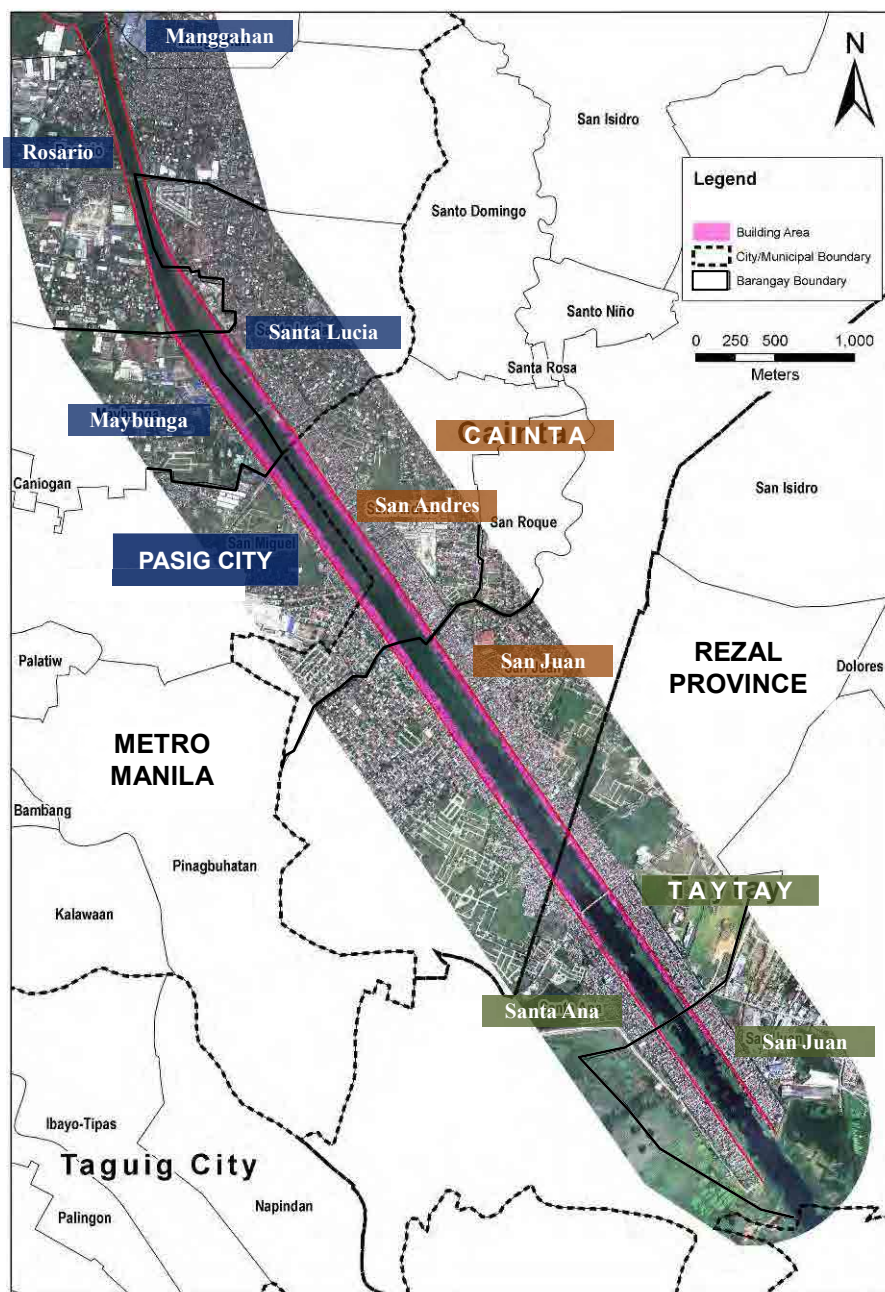
**Table 5.16 Estimated Land Occupied by ISFs and Population within Mangahan Floodway**

LGU	Barangay	Land Area Occupied by ISFs (Sq.m)	Ave. Unit Building Area (Sq.m)	Estimated Number of Buildings		Estimated Number of ISFs Household		Estimated ISFs Population (Population)	
Cainta	San Andres	85,858	25	3,435		4,235		16,932	
	San Juan	135,511	25	5,421	8,856	6,683	10,918	26,722	43,654
Taytay	San Juan	26,284	25	1,052		1,297		5,186	
	Santa Ana	75,054	25	3,003	4,055	3,702	4,999	14,803	19,988
Pasig City	Maybunga*	98,437	25	3,938		4,855		19,411	
	Rosario	24,649	25	986		1,216		4,860	
	Santa Lucia	35,772	25	1,431	6,355	1,764	7,835	7,054	31,326
<b>Total</b>		<b>481,565</b>			<b>19,266</b>		<b>23,753</b>		<b>94,967</b>

Note: \*Figures of San Miguel are added.

Source: LiDAR data 2011, Taytay LGU and JICA Study Team





Source : LiDAR Photo, modified by JICA Study Team

**Figure 5.4 Building Area inside Mangahan Floodway**

**Table 5.17 Calculated Unit Numbers of ISFs based on ISFs Census in Taytay**

Location	Taytay ISFs Census (2005)		
	East (Left) Bank Berm Area	West (Right) Bank Berm Area	Both Banks
Total Households	2,298	979	3,277
Total Population	10,308	2,794	13,102
Total Structures	1,900	758	2,658
a) Households/Structure	1.21	1.29	<b>1.23</b>
b) Persons/Structure	5.43	3.69	<b>4.93</b>
c) Persons/Family	4.49	2.85	4.00

Source: Taytay LGU and JICA Study Team

### (3) **Issues of Resettlement Projects until the End of 2015**

President Aquino has a strong determination for removing ISFs from endangered area of eight (8) river courses within his term; and secured the budgets, PHP 50 Billion, for housing and social infrastructures/services of the resettlers. Although the PHP 50 Billion Fund was made available for the LGUs' resettlement projects for ISFs, there are issues to be solved for the resettlement projects to be completed by the end of 2015.

- Unbalancing number of ISFs for the LGU's capability;
- Delay in implementation of resettlement plan especially in Cainta and Taytay;
- Identifying In-City resettlement sites;
- Increasing cost for resettlement sites; and
- Delay of budget preparation.

#### **[Delay of schedule to deliver even Pasig ISFs housing units]**

The targeted ISFs for resettlement in 2013 of Mangahan Floodway in Pasig City number 3,157 in the latest list. NHA is going to provide housing units for them but the allocation in 2013 is only 994, and these are mostly to Near-City resettlement sites in adjacent municipalities of Baras and Tanay in Rizal Province. Besides, no clear resettlement sites were stated by the Pasig LGU. Even the priority resettlement of ISFs cannot be allocated the housing units on schedule.

#### **[Many ISFs to be relocated]**

About 24,000 families are estimated to be living within Mangahan Floodway in the Study. The number is considerable to complete resettlement until the end of 2015.

#### **[Cainta and Taytay LGUs are behind in actions for resettlement]**

However, as mentioned above, the municipalities of Cainta and Taytay have been delayed in conducting the Census Tagging and preparing resettlement plans. They have just started coordination with DILG, MMDA and NHA since new administrations have taken over after the election in May 2013.

#### **[Difficulty to identify In-City resettlement sites]**

Both municipalities of Cainta and Taytay have difficulties in identifying lands for In-City resettlement sites. The Pasig LGU has actively constructed MRBs for ISFs resettlement but there is not enough land for them. Private land can be used but it will take a longer time for coordination, and total construction cost is higher. Even with Off-City resettlement, coordination with host municipality and land preparation can take time.

#### **[Increase in amount of cost for resettlement sites]**

According to NHA, the target cost to provide a housing unit is PHP400,000. However, based on proposed housing units and budget appropriations or requests, unit costs are approximated at PHP 583,500 in 2011-2012, PHP496,600 in 2013 and PHP436,300 in 2014. Even if the amount of PHP 400,000 is assumed for housing unit cost, the total cost is calculated at about PHP 6.2 billion for the housing units of 15,400 ISFs. The total amount is more than half of the annual PHP 10 Billion Fund from the 50 Billion Fund.

#### **[Delay of budget preparation]**

According to DILG and NHA, the municipalities of Cainta and Taytay can tap into the 50 Billion Fund to develop resettlement sites for their ISFs although the fund is for ISFs in danger areas in NCR. However, they are coordinating with DILG, MMDA and NHA for conducting the census tagging and preparing resettlement site plans.

Meanwhile, next year's proposed national budget is usually submitted to Congress at the midyear of the previous year as seen in the last three-year submissions below. In this context, an opportunity to propose the budgets in this year in order to develop resettlement sites for Cainta and Taytay ISFs would be lost. They could propose them next year (2014) for the budget of 2015 in order to tap into the 50 Billion Fund.

- 2013 year budget proposal submitted to Congress: July 24, 2012
- 2012 year budget proposal submitted to Congress: July 26, 2011
- 2011 year budget proposal submitted to Congress: August 24, 2010

### **5.3.3 Issues of ISFs Resettlement and Recommendations for Further Study**

#### **(1) Compensation Policies**

##### **[LGUs do not compensate ISFs in cash]**

LGUs' compensation policy for the ISFs is resettlement. They are opposed to financially compensating ISFs because of the following reasons:

- It is tantamount to "paying them for violating the law";
- It encourages squatting and the proliferation of squatting syndicates;
- It sets a bad precedent for other resettlement programs of the LGUs; and
- It is a waste of legitimate taxpayer's money.

Therefore, full options of resettlement sites should be prepared and provided for the ISFs with their preferences.

#### **(2) Resettlement Sites**

##### **[In-City or remote site]**

Most ISFs prefer On-Site or In-City resettlement, and there is low acceptability of Off-City resettlement among ISFs. They can maintain the existing living conditions in On-Site/In-City resettlement. Conversely, affordability of On-Site/In-City resettlement is low while that of Near-City/Off-City resettlement is high. A comparison of them is summarized in Table 5-18. There are differences between On-Site/In-City and Near-City/Off-City resettlement sites, and ISFs should be consulted about these.



**Table 5.18 Comparison of On-Site/In-City and Near-City/Off-City Resettlement**

	Item	On-Site/In-City	Near-City/Off-City
1.	Location	Closer to former residence	Far from former residence
2.	Commuting and its cost	Easier and cheaper	More difficult and higher cost
3.	Type of Housing Unit	Medium Rise Building (4-5 stories, loft type)	Low-rise/Row House (1-2 story)
4-1	Example of Floor Size (NHA)	24 sq.m	20-22 sq.m
4-2	Example of Monthly payment (NHA)	PHP 1,500 in average for rent	30 years amortization 5 years: PHP 200 6 – 10 years: PHP 400 11 – 30 years: PHP 800
4-3	Example of Floor Size (Pasig)	36 sq m	-
4-4	Example of Monthly payment (Pasig)	25 years amortization (loan) (5th floor case, the cheapest room) First 5 years: PHP 1,500 6 – 25 years: PHP 1,600	-
5.	Accommodated Capacity	Smaller	Larger
6.	Land Preparation	More difficult	Less difficult
7.	Schedule	More time	Less time
8.	Livelihood Development	-	Host LGU with NHA, DA, TESDA, DSWD, CDA, CSOs/NGOs
9.	Social Service Provision	By same LGU	Host LGU (Former LGU can support)
10.	Coordination with Host LGU	None	Necessary

Source: NHA, Pasig LGU, and JICA Study Team

#### [Off-City resettlement by Pasig LGU]

As mentioned in section 5.2.3, the resettlement site of Southville 10 located in Plaza Aldea, Tanay, Rizal, is constructed through a joint venture among NHA, the LGUs of Pasig City and Tanay. Pasig LGU also provides generous support to the relocatees in terms of social infrastructure and services. The site also accommodates 200 ISFs from Tanay as In-City resettlement, and they receive equal social services. Pasig LGU still continues to provide them with basic social services and to assist NHA in giving them livelihood trainings and the like.

According to interviews with some relocatees from Mangahan Floodway in Southville 10, they were happier and felt more secure in their new residence. They were also looking forward to developing a self-sustaining community market to support preferred livelihoods such as meat processing and agricultural production.

Even for very far resettlement site in the Municipality of Calauan, Laguna Province, which is located at the south of Laguna de Bay, the Pasig LGU and NHA purchased the land and partly shouldered the cost of land and housing development (row house). They also provided roads, water/power supply, drainage and social infrastructure (market building, health center, police station, schools, multi-purpose hall) and an NHA office. They coordinated with the Calauan LGU, the host LGU and gave support to provide social services such as healthcare, peace and order, education, waste management, and livelihood development.

In this manner, even Near-City/Off-City resettlements can be offered for ISFs if their former LGU host fully supports relocatees in resettlement sites.

### 5.3.4 Recommendations

#### (1) Compensation policies

Three major reasons why ISFs prefer On-Site/In-City resettlement are:

- To sustain their existing livelihoods, and it may not be easy to establish new livelihoods in the resettlement sites; then,
- To live closer to their existing income sources, and resettlement sites may be too far and the transportation cost too high to commute to these sources; and
- To receive better social services from LGUs where they live especially in education and medical care with lower cost, and it may be unclear that they can receive equal services from the host LGU.

Besides, considering that LGUs do not compensate ISFs in cash, acceptable resettlement programs that they can recover and sustain their lives including livelihood and living environment should be provided with the following basic policies:

**[Full options of resettlement sites with those conditions]**

- To provide ISFs and consult with them full alternatives of resettlement sites of On-Site, In-City, Near-City or Off-City with those physical conditions (locations, housing standards, infrastructure), social services, and amortization terms at the beginning of consultation;
- To consider On-Site/In-City in MRBs resettlement in order to sustain ISFs livelihood and social services provided by LGU of the present residence;
- To consider community-based resettlement to sustain the existing traditional community structure and mutual help system; and

**[Livelihood Development especially for Near-City/Off City resettlement]**

- To carefully craft suitable livelihood development options as an integral part of the resettlement program to make resettlement more acceptable and ensure that it does not cause the impoverishment of poor and vulnerable PAPs; and
- To require full cooperation of concerned agencies and LGUs.

**[Equivalent social services especially for Near-City/Off City resettlement]**

- To require full cooperation of concerned LGUs (especially for Pasig LGU) and host LGUs in the resettlement process.

(In case of Tanay resettlement site, the Pasig LGU is supporting the relocatees from the city in social services.)

Meanwhile, for the PMRCIP Phase IV, several business establishments are affected by the structure alignment. They should be compensated appropriately as well as PAPs with titles especially under RA8974 and the Land Acquisition, Resettlement, Rehabilitation and Indigenous People's Policy (LARRIPP).

**[Careful attention to business establishments]**

- To pay careful attention to and coordinate with business establishments for loss of assets, disturbance of their operations and displacement.

**(2) Further Study for PMRCIP Phase IV in Preparation of a Full Resettlement Action Plan**

Considering over a thousand households, a population of five thousand and other business establishments can be affected by the Phase IV project structure, a full Resettlement Action Plan (RAP) should be required for the project implementation. In the preparation of a full RAP, the following matters are recommended for further study especially for population census and socioeconomic survey.

**[Project-affected persons /families (residential)]**

- New census-tagging of affected houses and structures;
- Inventory of trees, crops, and other land-based improvements and assets belonging to PAPs;
- Socioeconomic survey to profile PAPs' demographics, tenure, living conditions, incomes and livelihood sources, educational level, skills, livelihood and skills preferences, social and economic support systems in the community, access to basic infrastructure and social services, and experience with flooding;
- Identify extremely vulnerable groups such as women-headed households, senior citizens, persons with disabilities, poorest of the poor; and
- Structural mapping to indicate location relative to ROW, type of house structure, degree of impact of the project (how much percentage of land/structure affected).

**[Business establishments (commercial and industrial business establishments)]**

- Census/Structural mapping;
- Type of trade/industry;
- Economic indicators such as business classification, level of production, number of employees, etc.;
- Degree affected by the project; and
- Relationship with the Community.

**[Inventory of would-be affected public/private social infrastructures, facilities, services]**

**[Menu of Resettlement Site Options]**

- Environmental scanning of proposed resettlement sites and receiving LGU and host communities;
- Distance to/from Santolan and affordability of transport services to and from work/school;
- Availability and carrying capacity of schools, health, and other social services;
- Preference of PAPs;
- Affordability;
- Social/civic groups and social network support systems;
- Acceptability and potential challenges to social integration with host community; and
- New Resettlement Site development not previously identified, if any.

**[Menu of Livelihood Options]**

- Livelihood and income opportunities and carrying capacity of potential employers;
- Availability and accessibility of financial intermediaries;
- Market supply and demand for goods and services applicable to PAPs;
- Suitable livelihood, employment and training support programs of receiving/host LGUs and public/private interventions; and
- Funding sources.

#### **5.4 Discrepancy between Local Practices and JICA Guidelines on Involuntary Resettlement**

DPWH prepared the Land Acquisition, Resettlement, Rehabilitation and Indigenous People's Policy (LARRIPP) based on the WB resettlement policy in 2007. Therefore, there are few gaps between the JICA Guidelines and the legislations of the Philippines although some are found in the details. A typical gap is the eligibility of PAPs without legal status.

In the Philippines, LARRIPP (2007) states that PAPs who have land titles or tax declarations are entitled. Besides, RA7279 states that underprivileged and homeless citizens who have no real property and are residing in the danger areas without legal rights to land, qualify for the socialized housing



program (resettlement). Meanwhile, RA7279 states that there is no eligibility for professional squatters including persons who have previously been awarded home lots or housing units by the Government and squatting syndicates.

**Table 5.19 Gaps between the JICA Guidelines for Environmental and Social Considerations and the Philippine Resettlement Policy Framework**

No.	JICA Guidelines	Laws/ Guidelines/ Policy, etc. of the Philippines	Gaps between JICA Guidelines and Policy Framework of the Philippines
1.	Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. (JICA GL)	LARRIPP (2007) states: to apply “E. ADB/World Bank Resettlement Policy, 1. Basic Principles of Resettlement Policy: a. Involuntary resettlement should be avoided where feasible; b. Where population displacement is unavoidable, it should be minimized by exploring all viable project options” in the policy framework in the Resettlement Action Plans.	None
2.	When population displacement is unavoidable, effective measures to minimize impact and to compensate for losses should be taken. (JICA GL)	LARRIPP (2007) states: to apply “E. ADB/World Bank Resettlement Policy, 1. Basic Principles of Resettlement Policy: c. People unavoidably displaced should be compensated and assisted, so that their economic and social future would be generally as favorable as it would have been in the absence of the project.”	None
3.	People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported, so that they can improve or at least restore their standard of living, income opportunities and production levels to pre-project levels. (JICA GL)	Ditto	None
4.	Compensation must be based on the full replacement cost as much as possible. (JICA GL)	LARRIPP (2007) states: Compensation means payment in cash or in kind at replacement cost for an asset to be acquired or affected by an infrastructure project; and Replacement Cost is the amount necessary to replace the structure or improvement based on the current market prices for materials according to RA8974 (2000)	None
5.	Compensation and other kinds of assistance must be provided prior to displacement. (JICA GL)	LARRIPP (2007)	None but: LARRIPP does not clearly state the timing prior to displacement although it states DPWH shall immediately pay the PAP.

No.	JICA Guidelines	Laws/ Guidelines/ Policy, etc. of the Philippines	Gaps between JICA Guidelines and Policy Framework of the Philippines
6.	For projects that entail large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public. (JICA GL)	LARRIPP (2007)	None but: LARRIPP does not clearly state scale criteria to require RAP and it is made available to the public.  However, it states an Abbreviated Resettlement Action Plan (ARAP) is acceptable if fewer than 200 people are affected. It is also acceptable if more than 200 people are affected so long as all land acquisition is minor (10 percent or less of all holdings is taken) and no physical relocation is required.
7.	In preparing a resettlement action plan, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. (JICA GL)	LARRIPP (2007) states: The information campaign will convey to all PAPs.	None
8.	When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people. (JICA GL)	LARRIPP (2007) states: The information campaign will be carried out by PMO with support of ESSO, Regional and District Engineering Offices through community meetings with leaflets. The leaflets are printed in language understandable to PAPs and provide a statement of purpose, project details, and procedures of compensation programs.	None
9.	Appropriate participation of affected people must be promoted in planning, implementation, and monitoring of resettlement action plans. (JICA GL)	LARRIPP (2007) states: PAPs are involved in community meetings, and monitored internally by ESSO and externally by external monitoring agent which consists of a qualified/experienced individual or consultancy firm.	None
10.	Appropriate and accessible grievance mechanisms must be established for the affected people and their communities. (JICA GL)	LARRIPP (2007) states: The PAPs will lodge their grievances by writing to the Resettlement Implementation Committee (RIC) for immediate resolution.	None

No.	JICA Guidelines	Laws/ Guidelines/ Policy, etc. of the Philippines	Gaps between JICA Guidelines and Policy Framework of the Philippines
11.	Affected people are to be identified and recorded as early as possible in order to establish their eligibility through an initial baseline survey (including population census that serves as an eligibility cut-off date, asset inventory, and socioeconomic survey), preferably at the project identification stage, to prevent a subsequent influx of encroachers of others who wish to take advantage of such benefits. (WB OP4.12 Para.6)	LARRIPP (2007) states: Cut-off Date is the date of commencement of the census of affected families within the project boundaries. Persons not covered at the time of census-taking will not be eligible for claims of compensation entitlements. The concerned PAFs were physically residing in the affected structure and land at the time of the cut-off date.	None
12.	Eligibility of benefits includes, the PAPs who have formal legal rights to land (including customary and traditional land rights recognized under law), the PAPs who do not have formal legal rights to land at the time of census but have a claim to such land or assets and the PAPs who have no recognizable legal right to the land they are occupying. (WB OP4.12 Para.15)	LARRIPP (2007) states: PAPs who have land title or tax declaration are entitled.  RA7279 states: The following persons who occupy danger areas without legal rights to land qualify for the socialized housing program a) Must be a Filipino citizen; b) Must be an underprivileged and homeless citizen, as defined in Section 3 of this Act; c) Must not own any real property whether in the urban or rural areas; d) Must not be a professional squatter or a member of squatting syndicates.	RA7279 states: There is no eligibility for "Professional squatters," individuals or groups who occupy lands without the express consent of the landowner and who have sufficient income for legitimate housing.  The term shall also apply to persons who have previously been awarded homelots or housing units by the Government but who sold, leased or transferred the same to settle illegally in the same place or in another urban area, and non-bona fide occupants and intruders of lands reserved for socialized housing.  And "Squatting syndicates," groups of persons engaged in the business of squatter housing for profit or gain. However, the term shall not apply to individuals or groups who simply rent land and housing from professional squatters or squatting syndicates.
13.	Preference should be given to land-based resettlement strategies for displaced persons whose livelihoods are land-based. (WB OP4.12 Para.11)	LARRIPP (2007) states: Land swapping if feasible, 'land for land', will be provided in terms of a new parcel of land of equivalent market value, at a location acceptable under zoning laws, or a plot of equivalent value, whichever is larger, in a nearby resettlement area with adequate physical and social infrastructure.	None
14.	Provide support for the transition period (between displacement and livelihood restoration). (WB OP4.12 Para.6)	LARRIPP (2007) states: The following assistances are provided. i) Disturbance Compensation for agricultural land; ii) PAF will be entitled to an income	None



No.	JICA Guidelines	Laws/ Guidelines/ Policy, etc. of the Philippines	Gaps between JICA Guidelines and Policy Framework of the Philippines
		rehabilitation assistance for loss of business/income; iii) Inconvenience Allowance; iv) Rehabilitation assistance (skills training and other development activities); v) Rental Subsidy; vi) Transportation allowance or assistance;	
15.	Particular attention must be paid to the needs of the vulnerable groups among those displaced, especially those below the poverty line, landless, elderly, women and children, ethnic minorities etc. (WB OP4.12 Para.8)	Indigenous Peoples' Rights Act (IPRA) of 1997 states: The IPRA sets conditions, requirements, and safeguards for plans, programs, and projects affecting Indigenous Peoples.  LARRIPP (2007) states: Indigenous Peoples Action Plan (IPAP) is written when an infrastructure project has been found through the social assessment to have potentially adverse effects on Indigenous Peoples, there is need to formulate an Indigenous Peoples Plan (IPAP).  The women and elderly who are among the PAPs shall likewise be consulted and mobilized to participate in the consultation meeting, and discussed with them the socio-cultural implication of the Resettlement Action Plan.  RA7279 states: Socialized housing shall be the primary strategy in providing shelter for the underprivileged and homeless.	None
16.	For projects that entail land acquisition or involuntary resettlement of fewer than 200 people, an abbreviated resettlement plan is to be prepared. (WB OP4.12 Para.25)	LARRIPP (2007) states: An Abbreviated Resettlement Action Plan (ARAP) is acceptable if fewer than 200 people are affected. It is also acceptable if more than 200 people are affected so long as all land acquisition is minor (10 percent or less of all holdings is taken) and no physical relocation is required.	None

Source: JICA Study Team

## CHAPTER 6 STEP FORWARD

### 6.1 Major Issues

#### 6.1.1 Land Acquisition Issue

One of the most significant issues in PMRCIP Phase IV is land acquisition. Flood discharge capacity must be secured in all the stretch (Marikina Bridge-MCGS); this is an absolute precondition for PMRCIP Phase IV. Without enough discharge capacity in any of this section, the whole scheme (river widening, excavation, and embankment) will not work.

Riversides of Marikina River have been developed as below, and those developments are interfering river area required for the implementation of PMRCIP Phase IV.

- Trunk road connecting to Marcos Highway (Marikina City)
- Manila Water's Orandes Sewage Treatment Plant (Marikina City)
- Residential area in Santolan (Pasig City)
- Circulo Verde (Quezon City)

In order to discharge design volume of flood water, it is required to evaluate two ways of solutions to secure land for PMRCIP Phase IV.

- To proceed land acquisition inside of the alignment of PMRCIP Phase IV structures
- To alter the river alignment of PMRCIP Phase IV and acquire land based on new alignment



Figure-6.1 Developments and river alignment for PMRCIP Phase IV (near Rosario Weir)

### 6.1.2 Scale of Resettlement

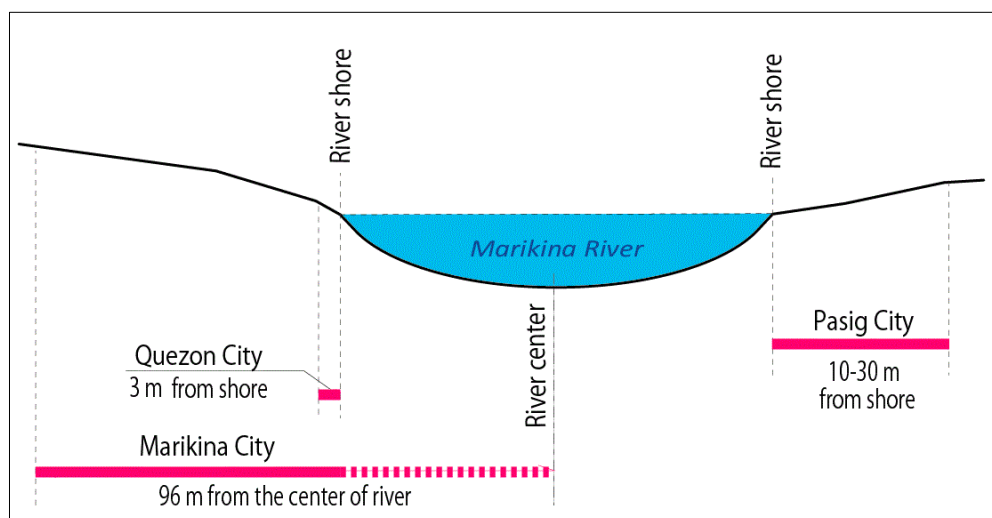
The estimated population for resettlement will be approximately 5,456 people, mostly from Santolan area of Pasig City, and can be divided into two groups: land-titled residents and residents who do not have land titles (ISFs).

ISFs are living in easement area and non-easement area; there are over 3,000 ISFs outside of easement area in Santolan area. The government ordered to clear the easement area for safety reasons, and resettlement will be implemented by NHA and LGUs.

Among the estimated 5,456 people, 1,328 people are in inside of easement area, and the rest of the population, 4,128, is at outside of easement area (**Table 6.1**). Conceptual diagram of easement settings by LGUs is shown in **Figure 6.2**.

**Table 6.1 Estimated Resettlement Population**

LGU	Barangay	ISFs (Family w/o land title)			Land-titled Residents			Total		
		Easement Area	Non-easement area	Total	Easement Area	Non-easement area	Total	Easement Area	Non-easement area	Total
Marikina	-	0	0	0	0	0	0	0	0	0
Quezon	Bagumbayan	48	0	48	8	0	8	56	0	56
Pasig	Mangahan	304	0	304	0	0	0	304	0	304
	Santolan	968	3,080	4,048	0	1,048	1,048	968	4,128	5,096
<b>Total</b>		<b>1,320</b>	<b>3,080</b>	<b>4,400</b>	<b>8</b>	<b>1,048</b>	<b>1,056</b>	<b>1,328</b>	<b>4,128</b>	<b>5,456</b>



**Figure 6.2 Easement Settings of LGUs**

#### [Resettlement Projects of LGUs]

Pasig City has resettled 3,844 ISFs already as of July 2013, and of which 662 ISFs are from Santolan. The resettlement from Santolan began right after Ondoy disaster in 2009 and ended in 2011. The rest of 3,182 ISFs are from Mangahan Floodway. 1,207 units of housings are available in city (Eusebio Bliss Village III & IV); however, there are 4,180 ISFs in Pasig City still wait to be resettled. In Phase IV area, 242 ISFs are still remaining in easement area of Santolan, and 62 buildings (76 ISFs so estimated) are counted in Barangay Mangahan which is also in Phase IV area. Pasig City is now waiting for MMDA to issue “Notice of Clearing” to the remaining 242 ISFs in Santolan. This notice is in accordance with Sec. 28 of the Urban Development Housing Act (UDHA, RA 7279), which



prescribes that a 30-day Notice be issued by authorities prior to demolition. However, the MMDA's notice may delay because the Marikina River is not designated as "8-Priority Rivers".

Quezon City has been preparing 3,045 housing units for its ISFs by the end of 2013, but they are outnumbered by ISFs' 10,367. ISF's houses in easement area of Phase IV area in Quezon City are 10 buildings as of July 2013.

## **6.2 TOR for EIA and RAP**

### **(1) Recommendations for Issues Identified**

Demanding issues were found by this Survey for implementing PMRCIP Phase IV as summarized in **Section 6.1**. Based on DPWH's decision on the solution to secure land in order to discharge design volume of floodwater for PMRCIP IV, following works are recommended.

Further clarifications necessary are as follows.

#### **[For Land Acquisition Issue]**

##### **Clarification -1: Comprehensive cadastral survey**

In order to secure land for PMRCIP Phase IV, clear and official land titles and the boundaries should be recognized, and the title holders should be identified. For that, comprehensive cadastral survey, which includes legal status of the land title, production activities, the number of employees is necessary.

##### **Clarification -2: Effective project information dissemination**

Propagation of information on necessity of flood control along Upper Marikina River and the downstream, Lower Marikina River and Pasig River, is essential. Understanding of the effectiveness and importance of PMRCIP Phase IV by the stakeholders is crucial for receiving support from stakeholders, such as LGUs, landowners, the community organizations, NGOs, and pro-poor political organizations. Effective means of dissemination of project's information should be sought as soon as possible.

#### **[For Resettlement Issue]**

##### **Clarification -3: Formulation of appropriate policy and resettlement plan**

Large-scale resettlement is estimated under the alignment of the PMRCIP Phase IV. After Ondoy disaster there are many resettlement practices such as off-city, in-city, and on-site relocations supported by various organizations. The appropriate resettlement policy and plan need to be prepared by DPWH.

##### **Clarification-4: Incorporation of Stakeholders in Planning**

In order to formulate acceptable resettlement plan, participation of the stakeholders from early stage of planning is necessary. Stakeholders meetings are needed to take place effectively at appropriate timings and from early stages of the planning process since they are the ones whose interests are at stake, and their mutual understandings of their interests and understandings on benefit of the project are utmost important for the project's progress.

The meeting could be in a form of workshop, in where the participants would understand the flood situation and express opinions for their better livings. The participants are expected to understand necessity of the integrated flood control measures and individual responsibilities through the discussions. However, definite lineages of structure outlines must be clarified and provided from engineering team before identifying the project affected people.

## **(2) Study Level in Next Phase**

In case the layout plan of Phase IV structures have to be adjusted according to the findings such as land use being development within the project site through a comprehensive cadastral survey, in the restructuring of the detailed design of Phase IV, the best engineering alternatives shall be compared including considerations of impacts on natural and social environment aspects, in a course of achieving the overall goals of PMRCIP.

## **(3) TOR for Environmental Consideration Study (Draft)**

The purpose of this Study is to compare alternative modification plans for PMRCIP Phase IV, in a form of laws and policies on environmental impact assessment of the Philippines, and also should satisfy JICA Guidelines for Environmental and Social Considerations (JICA Guidelines)..

### **[Outline of Study]**

- Assess environmental impacts and they should not be limited to the direct impact but secondary and cumulative impacts.
- Decide environmental parameters and the evaluation method
- Plan and compare alternatives
- Hold stakeholder meetings and ensure information disclosure to receive opinions from direct stakeholders, government agency, NGO, and people of academic standings

**[Survey Items]**

- a. Clarify the goal of PMRCIP and Phase IV area.
- b. Compile and summarize legal and policy frameworks.
- c. Conduct gap analysis between domestic policies and the JICA safeguard policy.
- d. Formulate alternatives.
- e. Conduct scoping, explain to stakeholders and discuss to integrate comments and feedbacks as appropriate.
- f. Assess impact for each alternatives and comparison
  - Land acquisition issues  
Identify needs and size of land acquisition and assess
    - if land acquisition of industrial development area is feasible; and
    - if excavation is feasible by demolishing Orandes sewage treatment plant and Pasig City’s embankment
  - Support of LGUs  
Explain the purpose, necessity, and benefits of PMRCIP Phase IV, and Identify if LGUs (Marikina City, Quezon City, and Pasig City) support PMRCIP Phase IV.
  - Feasibility of MCGS Construction  
Identify if MCGS can be constructed in the proposed location through discussion with stakeholders
- g. Stakeholders meetings  
Organize stakeholders meetings, and have participation of direct stakeholders at least three (3) times. The proposed agenda for each meeting are shown in **Table 6.2**.
- h. In case DPWH decides to change alignment and drastic changes occurs to the project scope, the application of strategic environmental assessment (SEA) could be considered as appropriate in line with the JICA safeguard policy.

**Table 6.2 Workshop Agenda**

No.	Agenda	Timing
1	<ul style="list-style-type: none"> <li>➤ Explanation of purpose of workshop, period of study</li> <li>➤ Understanding of flood, topography, and damage,</li> <li>➤ Proposed JICA structures,</li> <li>➤ The impacts including resettlement and land acquisition</li> <li>➤ Discussion, counter proposals</li> </ul>	Within one month of commencement of the Study
2	<ul style="list-style-type: none"> <li>➤ Answers to the opinions/ proposals</li> <li>➤ Discussion on the answers</li> </ul>	2 months later
3	<ul style="list-style-type: none"> <li>➤ Answers to the opinions/ proposals of structures and implementation period</li> <li>➤ Discussion on the answers</li> </ul>	2 months later
4.	<ul style="list-style-type: none"> <li>➤ Conclusion of the flood mitigation measures</li> </ul>	End of the Study period

**(4) Formulation of RAP**

Note: official Resettlement Action Plan cannot formulate in next phase because the structures are not fully designed yet. Basis of RAP is to be studied in next stage (**Figure 6.3**).

After dimension of structures are determined, RAP will be formulated. The contents of the RAP study is recommended as follows.



**I. Formulate reasonable entitlement matrix**

Formulate entitlement matrix according to DPWH LARRIP.

**II. Formulate appropriate method of compensation**

**(1) Socio-economic profile of the Affected Persons**

**A. Parcellary Survey**

Conduct parcellary survey on followings for identifying PAPs and calculation of compensation amount for real-estate.

- Tenure/ownership status of land and other fixed assets
- Actual land use
- Overlapping claims
- Project alignment and degree of impact on land, structures and improvements thereof

**B. Census-Tagging and Socio-Economic Survey**

Conduct census-tagging and Socio-economic survey for other compensations, and for formulation of appropriate resettlement plan, including livelihood recovery programs.

- Project-affected persons /families (residential)
- New census-tagging of affected houses and structures
- Inventory of trees, crops, and other land-based improvements and assets belonging to PAP.
- Socio-economic survey to profile PAPs' demographics, tenure, living conditions, incomes and livelihood sources, educational level, skills, livelihood and skills preferences, social and economic support systems in the community, access to basic infrastructure and social services, experience with flooding.
- Identify extremely vulnerable groups such as women headed households, senior citizens, persons with disabilities, poorest of the poor, indigenous groups (if any)
- Structural mapping to indicate location relative to ROW, type of house structure, degree of impact of the project (% of land/structure affected)

**C. Identification of business establishments (commercial and industrial)**

- Census/Structural mapping
- Type of trade/industry
- Economic indicators such as business classification, level of production, number of employees, etc.
- Degree affected by the project
- Relationship with the Community
- Inventory of would-be affected public/private social infrastructures, facilities, services
- Menu of Resettlement Options

**III. Identify Relocation Site with PAP (with support system for payment for house)**

**D. Environmental scanning of proposed resettlement sites, host LGU and communities**

- Distance to/from Santolan and affordability of transport services to and from work/school
- Availability and carrying capacity of schools, health, etc. social services
- Preference of PAPs
- Affordability
- Social/civic groups and social network support systems
- Acceptability and potential challenges to social integration with host community

**E. New Resettlement Site development effective livelihood recovery options**

- Menu of Livelihood Options

- Livelihood and income opportunities and carrying capacity of potential employers
- Availability and accessibility of financial intermediaries
- Market supply and demand for goods and services applicable to PAPs
- Suitable livelihood, employment and training support programs of receiving/host LGUs and public/private interventions
- Funding sources
- Policy /Institutional Environment

**F. Identify Updates/New resettlement Policies**

- Status of compliance with SC mandamus
- Proposed amendment to UDHA
- Moratorium on Demolition and Relocation
- Proposed Department of Housing and Urban Development
- Find if there is any new LGU Ordinance re easement, in-city resettlement, and financial assistance.
- DPWH LARRIP Policy
- Proposed ROW Acquisition policy
- Compensation Matrix
- Other new/changes in resettlement-related policy, if any

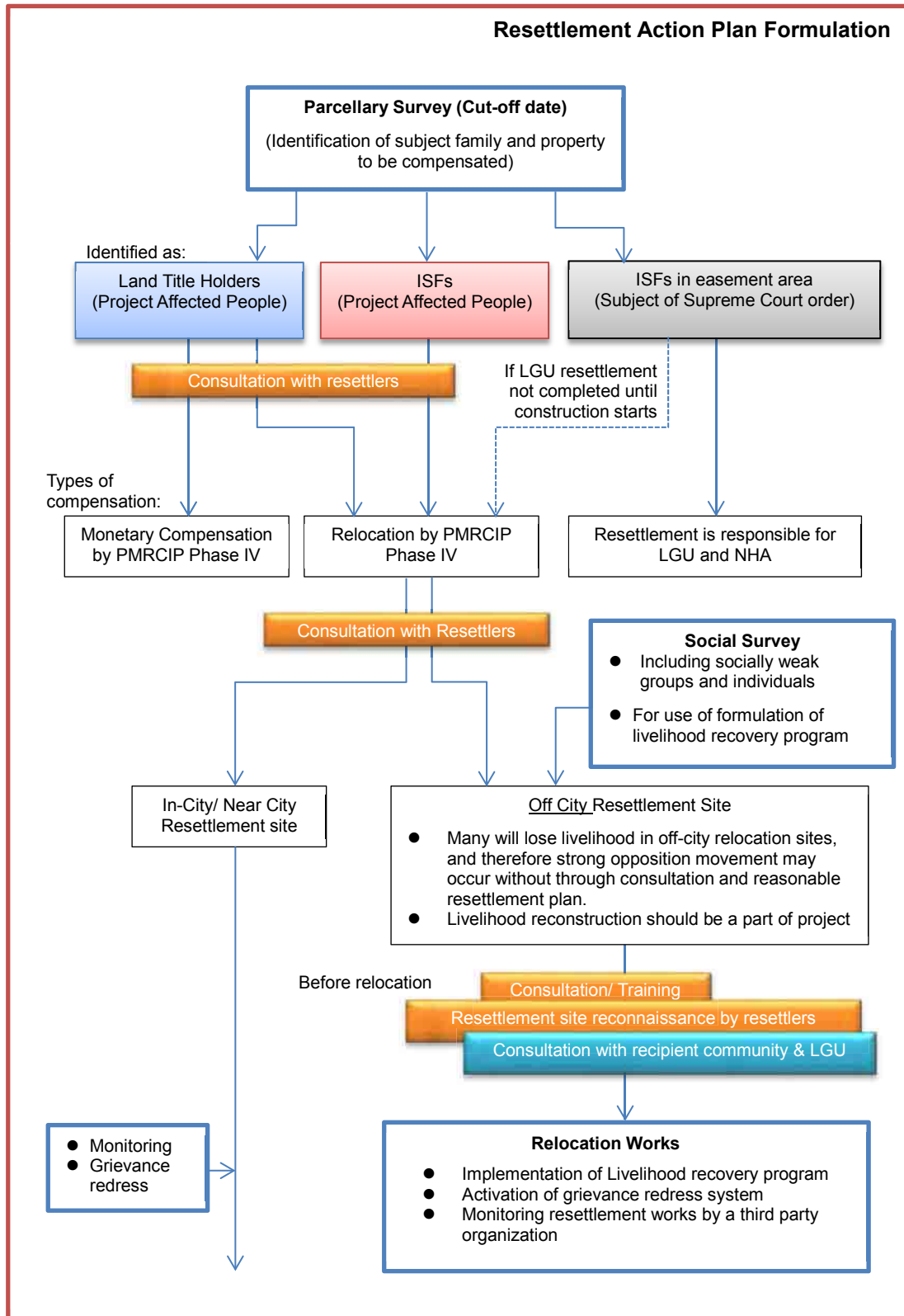
**G. Formulate RAP implementation plan (institution and implementation schedule)**

- Mandates and coordination mechanisms for resettlement planning and implementation
- LIAC/Housing Board reorganization created under new administration.
- PMO for P50-B ISF Fund
- Formulate grievance redress mechanisms
- Support creating an ad hoc inter-agency resettlement task force or committee to focus specifically on Santolan or PMRCIP Phase IV.

**IV. Calculate resettlement costs (including budget and financing status of LGU)**

**V. Manage public meetings with PAPs**

**VI. Formulate monitoring and evaluation method of project**



**Figure 6.3 Formulation Process of Resettlement Action Plan**