

Environmental and Social Impact Assessment (ESIA) – EXECUTIVE SUMMARY

Project Name:

**Metro Manila
Flood
Management
Project**



May 1, 2017





Environmental and Social Impact Assessment (ESIA)

EXECUTIVE SUMMARY

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Prepared by:

Department of Public Works and Highways (DPWH)

And

Metro Manila Development Authority (MMDA)

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INTRODUCTION

- i. Metro Manila, the center of economy and trade in the Philippines and home to about 15 million people, has suffered recurrent flooding resulting in adverse consequences to people's lives and the economy. The effects of a changing climate, an increased frequency of stronger typhoons and storm rainfall, coupled with sea level rise, leads to a higher level of flood risk to Metro Manila. In 2009, Typhoon "Ondoy" (internationally named "Ketsana") caused substantial damage and losses, which according to the Post Disaster Needs Assessment (PDNA) was equivalent to about 2.7 percent of the Gross Domestic Product (GDP). Normal business operations were hampered by access problems, power and water shortages, damaged machinery, and absent employees. Flooding has both short and long term effects on jobs, the economy and livelihoods.
- ii. The Government of the Philippines, with the technical and financial support from the World Bank, prepared a Flood Management Master Plan for the Greater Metro Manila Area. The plan, approved by the National Economic and Development Authority (NEDA) Board on September 4, 2012, sets out priority structural and non-structural measures to facilitate sustainable flood management in the Metro Manila area. The total estimated cost for implementation of the Master Plan is up to PhP 352 billion (about US\$7.0 billion) over a 20-25 year period.
- iii. The Master Plan envisions three separate and distinct elements related to structural interventions: (1) flood protection works to reduce flooding from rivers that run through the city; (2) flood protection works along the floodplain surrounding Laguna de Bay; and (3) improvements to urban drainage capacity through modernization of existing pump stations, construction of new pump-stations serving flood-prone areas of an expanding Metro Manila, and cleaning of waterways and drainage channels that serve the pumping stations.

THE PROJECT AND YEAR 1 ACTIVITIES

- iv. The Metro Manila Flood Management Project (MMFMP) (the "Project") relates to the key element (3) of the Master Plan that addresses drainage issues in Metro Manila. Besides the interventions for the pumping stations and related waterways and drainage channels, the Project will also support improvements to solid waste management in waterways that are served by pumping stations and physical resettlement and economic rehabilitation of project affected persons (PAP) that would be obstructing the proper operation and maintenance (O&M) of the drainage systems. The majority of the PAPs are Informal Settler Families (ISF) residing within the technical footprint areas of existing pumping stations which are to be rehabilitated or upgraded.
- v. The Government of the Philippines launched in 2011 the Oplan Likas Program: Lipat para Iwas Kalamidad At Sakit (Operational Plan: Evacuation to Prevent Calamity and Sickness). The objective of the PhP 50 billion Oplan Likas Program was to relocate about

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- 100,000 ISFs in Metro Manila out of danger areas during a five year period. Prominent danger areas considered under the program included flood prone areas adjacent to and over waterways where ISFs are affected on a regular basis by flooding.
- vi. The Project is not linked with Oplan Likas as it does not meet the three criteria of paragraph 4 of OP 4.12 - Involuntary Resettlement, namely: (a) directly and significantly related to the Bank-assisted project; (b) necessary to achieve its objectives as set forth in the project documents; and (c) carried out, or planned to be carried out, contemporaneously with the project. However, some activities financed by the project overlap spatially with Oplan Likas as they are located within the technical footprint of the project. Moreover, the Bank has provided TA in support of Oplan Likas, especially focusing on issues related to in-city resettlement.
 - vii. The overlap is determined by the Project area of influence for resettlement, also referred to as the 'technical footprint'. Resettlement under the Project will be unavoidable where dwellings and structures established by informal settlers impede the flow or inhibit access for effective maintenance and operation of the facilities. The technical footprint covers the pumping station and its related facilities as well as sections of waterways serving the pumping stations. The physical limits of technical footprints for waterways are established on the basis of hydrological and engineering criteria for each drainage area. Waterway sections within the technical footprint are typically in relatively close proximity to the pumping facility. People who live or have properties within the Project's technical footprint or those who were resettled from the technical footprint under Oplan Likas are considered project-affected persons (PAP) under the Project and OP 4.12 applies.
 - viii. The assistance to be provided to PAPs by the project will depend on the time frame of resettlement. Resettlement that took place prior to Bank engagement in the Project (December 8, 2014 - the date of project identification mission) from within the technical footprint of the Project is considered a legacy issue. Resettlement before that date has to be in accordance with country legislation and consistent with objectives of OP 4.12. Should this past resettlement not have been consistent with the national legislation and the objectives of OP 4.12, remedial measures will have to be provided. This will be done at the community level for equity purposes and to avoid conflicts with persons relocated to the same resettlement sites from areas not related to the technical footprint of the Project. Remedial measures can include community-based infrastructure and community livelihood programs. The safeguard instrument to be prepared before implementation of activities in a drainage area start is a Due Diligence Report that will describe the remedial measures to be provided and an action plan if and as needed to ensure the consistency of past rehousing/resettlement with the objectives of OP 4.12.
 - ix. After the date of project identification, resettlement has to be compliant with OP 4.12. Two groups of PAPs have been identified: (i) people who were resettled from the technical footprint from a drainage area after the project identification date (December 8, 2014), but prior to the date a census is initiated in all sub-project sites during the early stage of Project implementation (cut-off date); and (ii) people who will be resettled from the technical footprint after the cut-off date during Project implementation. For the first group due diligence will have to be conducted and the individual PAPs that were resettled

- from the technical footprint will have to be traced to the extent possible. Should their current resettlement conditions not be in compliance with OP 4.12, the project will have to provide remedial measures to address the gaps, described in a Resettlement Action Plan (RAP), and measures will have to be applied retroactively to ensure compliance with OP 4.12. Remedial measures will include compensation to individual PAPs, or through community level interventions for equity purposes if this is acceptable to the PAPs.
- x. For purposes of the ESIA, the project area of influence (referred to as the 'project footprint') of each subproject can comprise the pump station and yard, drainage areas, waterways and drainage channels, and ancillary facilities such as access roads, disposal sites for dredged materials and solid wastes from pumping stations, resettlement sites, as well as temporary sites needed for equipment parks and materials stockpiles. The project footprint for ESIA purposes is different from the technical footprint for resettlement purposes (see paragraph vii). The technical footprint overlaps the project footprint, but is typically smaller.
- xi. The project development objective (PDO) is to improve flood management in selected areas of Metro Manila. This will be achieved by the following components:
- *Component 1: Modernization of drainage areas (US\$375.2 million).* The component will finance: the rehabilitation of about 36 pumping stations, its appurtenant infrastructure such as flood gates and trash racks, and associated drainage systems; construction of about 20 new pumping stations and improvements to associated drainage systems; increases in water retention capacity within drainage areas; and modern dredging and drainage cleaning equipment.
 - *Component 2: Minimizing solid waste in waterways (US\$48 million).* The component will finance improved solid waste collection services in drainage areas through provision of equipment and tools as well as awareness and behavior change information, education, and communication (IEC) campaigns; and provide equipment at tools at pumping stations for solid waste management and removal of solid waste.
 - *Component 3: Participatory housing and resettlement (US\$55.76 million).* The component will finance the resettlement of about 11,500 project affected persons from the technical footprint of about 15 drainage areas, as well as remedial measures for persons that were resettled from the technical footprint before the commencement of the Project and community-based interventions in resettlement sites.
 - *Component 4: Project management and coordination (US\$20 million).* The component will finance project management offices (PMO) responsible for the management and coordination of project activities and consulting services to support the implementing agencies with the implementation of the Project.
- xii. The Department of Public Works and Highways (DPWH) and the Metro Manila Development Authority (MMDA) will implement the Project, together with local government units, key shelter agencies, and project-affected communities.

- xiii. There is a long-list of 139 drainage areas, identified by MMDA, DPWH, and Local Government Units (LGU). Out of this long-list five (5) drainage areas (sub-projects) have been identified for modernization during Project Year 1 (PY1). These are drainage areas served by: (i) Vitas Pumping Station; (ii) Balut Pumping Station; (iii) Paco Pumping Station; (iv) Tripa de Gallina Pumping Station; and (v) Labasan Pumping Station. Vitas, Balut, and Paco are located within the City of Manila, Tripa de Gallina is located in Pasay City, and Labasan Pumping Station is located in Taguig City (see Map at the end of this Executive Summary).
- xiv. A program of rehabilitating and augmenting the capacity of each of the five pumping stations will be implemented, starting in PY1. This will involve the replacement of pumps and related equipment with new, more efficient, and higher capacity units. There will also be clearing of waterways through dredging and removal of solid waste.

OBJECTIVES AND SCOPE OF ESIA

- xv. The Project triggers the World Bank's Operational Policies on Environmental Assessment (OP 4.01) and the Involuntary Resettlement Policy (OP 4.12) and has been classified as Category A in accordance with the World Bank's Operational Guidelines. Therefore, an Environmental and Social Impact Assessment (ESIA) is required as part of Project financing.
- xvi. The objectives and scope of the ESIA are to: (i) assess the current environmental and social conditions; (ii) identify key environmental and social issues; (iii) assess the magnitude of impacts; (iv) develop mitigation measures through an Environmental and Social Management Plan (ESMP) and Environmental Codes of Practice (ECOP) that address the potential impacts and risks of the sub-projects; and (v) determine the environmental monitoring and reporting requirements, emergency response procedures, institutional or organization arrangements, and capacity development measures to ensure the implementation of the ESMP.
- xvii. The Social Impact Assessment (SIA) which forms part of this ESIA aims to examine the potential social impacts (positive and negative) of the proposed Project and to propose ways to avoid negative impacts while exploring ways to improve and ensure sustainability of the project through the following five entry points: (i) gender and diversity; (ii) institutions, rules, and behavior; (iii) stakeholder analysis; (iv) stakeholder participation; and (v) social risks. A Social Management Plan, which includes elements of the Resettlement Policy Framework (RPF), Resettlement Action Plan, grievance redress system (GRS), and communication and participation framework, has been prepared to ensure that impacts of land acquisition, resettlement, and physical or economic displacement of people in influence areas are addressed.

ESIA METHODOLOGY

- xviii. The information presented in this ESIA report is based on field visits and assessment of the project sites, focused group discussions with government agencies and sectoral

- groups, and from related studies and available secondary information. Discussions were carried out among representatives of flood-prone communities across economic classes, age, and gender in Makati, Manila, Pasay, and Taguig while key informant interviews were done with local government officials, pumping station engineers, and representatives of civil society organizations such as youth groups, homeowners associations, and organization of senior citizens. The assessment was carried out following the Project's draft Environmental and Social Management Framework (ESMF) and RPF.
- xix. Several site visits and informal interviews with potential PAPs were conducted jointly by MMDA and World Bank between February and November 2015. Visits were also undertaken to off-city and in-city resettlement sites and interviews conducted to understand their situation and assess significant differences between off-city and in-city resettlement. Dialogues with the National Housing Authority (NHA), Social Housing Finance Corporation (SHFC), and people's organizations engaged in resettlement were also conducted to understand the opportunities and constraints encountered.
 - xx. Demographics relevant to analyzing the social impacts of flooding were gathered. The main contention by people living in danger zones is that flooding affects different segments of society differently. Social dimensions with vulnerable groups such as women, children, the elderly, the unemployed, and the poor are considered when drawing up resettlement programs. As such, impacts were evaluated across gender, age, schooling, employment, livelihoods, and poverty rates.
 - xxi. Since the PY1 subprojects involve existing pumping stations and waste disposal systems, due diligence on the offsite waste disposal facilities of solid waste collected at the pumping stations and at the existing pumping station facilities was conducted to assess the environmental performance and the management measures that are being undertaken and to recommend, as needed, measures to improve the current environmental management system.
 - xxii. A screening was carried out using the Environmental and Social Screening Matrix in the ESMF which confirmed that the environmental impacts are not expected to cause significant adverse environmental impacts and that negative impacts can be managed by implementation of appropriate mitigation measures. Particular attention was given to the effects of dredging activities, effects on floodplain ecology, water quality, construction impacts, waste disposal, occupational and community safety and hazards, and socio-economic impacts on populations in the impact areas.
 - xxiii. Water quality and sediment samples were collected from the various waterways where the five pumping stations are located. The samples were analyzed for the physico-chemical characteristics, total coliform, oil & grease, nitrate, phosphate, and heavy metals. The toxicity characteristic leaching procedure (TCLP) was used to determine the sediment toxicity. In addition, ambient noise monitoring at each pumping station site was conducted to determine baseline noise levels and the impacts of noise on workers and adjacent communities.

- xxiv. A number of impact assessment criteria were used to determine the significance of the impact. These include impact balance, spatial extent, temporal context, and magnitude and level of confidence. For every Project activity identified, expected impacts are identified and rated for their significance using these criteria.
- xxv. Environmental Codes of Practice were prepared that will apply to all pumping stations that will undergo modernization or rehabilitation, require construction of resettlement sites, and other activities that may potentially result in construction-related impacts. Guided by the results of the environmental screening, other impacts that are not covered in the ECOP will be addressed in the ESMPs and RAPs. Construction contractors will be required to implement the ESMP and ECOPs as part of contract stipulations. They will also be ordered to desist from undertaking civil works in areas with PAPs until after a notice-to-proceed has been given by the Project Management Office (PMO) of the implementing agency after meeting all agreed safeguards requirements. Oversight will be provided by DPWH and MMDA to assure that the required measures are effectively implemented.

SIGNIFICANT ENVIRONMENTAL AND SOCIAL IMPACTS

Benefits of the Project

- xxvi. **Flood Reduction.** The main benefit of the Project is the reduction in flooding that affects people, roads, and property. People currently residing in flood-prone areas will directly benefit from the Project. Considering that the waterways served by the pumping stations are affected by tidal flows or high main river water levels, the pumping stations are particularly important in periods of high tide when Manila Bay and Laguna de Bay water levels or receiving river water levels are higher than the water level of the waterways served by pumping stations.
- xxvii. **Improvement of Quality of Life.** With reduced flood incidence in the sub-project areas, there is anticipated improvement in the quality of life, health, and sanitation of the people affected by flooding, ease of transport during rainy days, continuation of economic activities, increase in land values and property prices, and poverty reduction. Project benefits also include the reduction of damage to properties and infrastructure, income loss (livelihood and business), and of loss of lives and injuries. During typhoons and the rainy season, project beneficiaries composed of households, small businesses and economic enterprises, commuters, school goers, employees, and all other segments of society within the project areas will be able to carry on with their daily lives with minimal or less (short-term flooding of urban areas can never be completely eliminated, with the level of flooding dependent on the rainfall intensity) disruption due to evacuation, unpassable roads, and absence of utility services. Diseases that occur from exposure to flood waters such as skin rashes, gastrointestinal infection, leptospirosis, and other water-borne diseases will also be minimized. There is also a lesser need for evacuation of people to safe areas during periods of intense rainfall and typhoons and resulting floods.
- xxviii. Based on the assessment of effects of flooding on gender and diversity, risk of flooding around the house, concerns many women, mostly for living in constant danger and for

fear of their children's safety. Men, on the other hand, are more exposed to health risks than women as they often have to venture out in flooded areas. Poor families take more time to fully recover their asset base. With the proposed Project, that will lead to reduced flood conditions, men will have less exposure to health risks, while women have more opportunity to carry on with their normal household routines. Those living in poor areas need not reestablish their asset base as frequently as before, allowing them to have a steadier economic growth path while the elderly and children will have less trauma from flooding as experienced during past devastating typhoons in Metro Manila.

Impacts during Construction Works

- xxix. **Construction wastes.** Demolition and removal of equipment and facilities at the pumping stations will result in the generation of wastes consisting of old equipment, scrap metal, wires, lighting fixtures, aggregate, and other construction spoils. Part of this waste is considered as recyclable, but the Project will produce residual waste materials that require appropriate disposal to prevent adverse environmental impacts. Solid waste will also be generated from the installation of equipment and facilities. These wastes generally consist of scrap metal, aggregates, empty cement bags, and other construction spoils. These materials should also be disposed properly to avoid negative impacts to land and waterways.
- xxx. **Solid wastes.** The presence of construction workers at the site will generate solid wastes that consist of biodegradable wastes (food waste, paper) and non-biodegradable wastes such as plastics, food containers, glass, bottles, and aluminum cans. These wastes will have a negative effect on the environment when improperly disposed on land and in waterways.
- xxxi. **Oily wastes.** Waste oil and lubricants from the dismantling of motors, pumps, and other auxiliary equipment may result in negative impacts to land and waterways when disposed inadvertently. There are no anticipated PCB-containing transformers that will be decommissioned during Project implementation. The impact of waste oil will be confined to the working area and will occur during the extent of the construction activity only. In addition, the generation of waste oil and lubricants is limited in volume since most of these will be contained in dismantled motors and pumps. Adverse effects of waste oil may come from accidental spill or leaks from the dismantled equipment, but these will be cleaned up immediately and will result in a limited effect on the environment.
- xxxii. **Fugitive dust.** Dust will be generated from the movement of construction vehicles and from construction sites. Airborne dust will have a negative impact to health of workers and to communities along the access roads to the site. Dust will be mitigated through watering and dust abatement activities.
- xxxiii. **Noise.** Noise impacts to surrounding communities are expected to be limited since noise dissipates with distance from the source. Most of the impacts will be confined within the site since the rehabilitation works will occur within existing property occupied by the pumping stations. Nevertheless, noise producing construction works will not be allowed to take place at night.

- xxxiv. **Occupational safety.** Construction activities may result in negative impact to workers due to accidents and mechanical, electrical, tripping, and fall hazards at the workplace. The impact of occupational hazards is not significant because occupational health and safety measures will be implemented as part of ECOP for construction.
- xxxv. **Community health and safety.** Hazards and nuisances to the community may occur as a result of the generation of dust and noise during movement of construction vehicles. Dust generation is not expected to occur frequently and at high magnitude. This can be mitigated through the implementation of dust control measures such as watering. Haulers will also be directed to slow down when passing through densely populated areas, especially where children are playing. In addition, special precautions will be needed along access roads to pumping stations in case there are houses close to such roads. At times of truck movement on access roads, movement of children along the road may have to be restricted. The management and control of dust and noise will be undertaken through the ECOP and ESMP.
- xxxvi. **Labor.** In general, the project activities are not very labor intensive. Most labor, both skilled and unskilled, will be sourced from within Metro Manila and they will continue to live at their homes in the city. Therefore migrant labor is not expected and there will be no need for labor camps near project sites, except for some site offices.

Impacts of Dredging Activities

- xxxvii. **Resuspension of sediments.** The dredging of sediments from the waterways will result to resuspension of sediments which could cause a temporary negative impact on the water quality and aquatic life remaining in the rivers. Based on the results of secondary data review and actual sampling indicating the current poor water quality conditions in the esteros, resuspension of sediments will only have a limited and short-term effect and change to water quality.
- xxxviii. **Generation and disposal of dredged materials.** The disposal of dredged materials removed from waterways will cause a negative impact to the environment since these contain organic materials and in certain cases also contaminants such as heavy metals such as chromium (Cr+6), copper (Cu), zinc (Zn), lead (Pb), and nickel (Ni) as experienced during previous sediment sampling conducted at Manila Bay. Considering that the sediments in Manila Bay are eroded materials that were deposited from the estuaries and tributaries in Metro Manila, the dredged materials from the pumping station channels could be contaminated with these heavy metals as well. However, based on the toxicity analysis conducted on samples from the five PY1 waterways, the sediments were found not to be hazardous using the Toxicity Characteristic Leaching Procedure (TCLP) criteria. Before any desilting starts, there will be sampling to determine contamination of dredged material as part of the selection of final disposal sites.
- xxxix. **Removal of water hyacinths.** The waterway clearing operations will involve the removal of water hyacinth which proliferate in some waterways in Metro Manila. Limited impacts will occur on fisheries and other aquatic resources because of the deterioration of habitat

of fish. The removal of water hyacinth will occur sporadically over the life of the Project where absolutely necessary for the proper O&M of the drainage system. The extent of water hyacinth is expected to persist due to the presence of high nutrient conditions. This impact is not applicable to all pumping station sites but rather in selected areas near the Laguna Lake and in Pasig River tributaries.

- xl. **Odor.** Foul odor is emitted during dredging because of the decomposition of organic materials that occurs in the river water and bottom sediments. When anaerobic conditions worsen, pollutants such as ammonium ions, nitrogen, phosphate, and hydrogen sulphide are released. Odor impacts will be minimized in future by removing dredged sediments from pumping stations on a regular basis and by reducing the amount of waste materials that enter the water ways, as addressed under Component 2.
- xli. **Community health and safety.** Hazards and nuisances to the community may occur as a result of the generation of noise and odor during dredging activities. Potential exposure to dredge material may also pose a health risk to the community. Noise impacts to surrounding communities are expected to be limited since noise dissipates with distance from the source. There is anticipated isolated frequency and low magnitude of the effect of odor. The management and control of noise and odor will be undertaken through the ECOP and ESMP.

Impacts during Operations

- xlii. **Generation of noise.** The operation of pumps and equipment at some pumping stations can generate noise levels that can harm hearing of workers and pose a nuisance disturbance to nearby communities. Signage and hearing protection will protect workers, while disturbance to nearby communities is expected to be minimal. Installation of modern pumps and electrification will reduce the generation of noise.
- xliii. **Disposal of Solid Wastes.** The solid waste management practices of the communities, particularly the improper disposal of garbage in waterways, has an impact on the long-term sustainability of a flood control project. A major operational concern for drainage areas is the accumulation of solid wastes trapped immediately upstream of the pumping stations and in the waterways. This affects the proper performance of the pumps and waterways and will also have a negative impact on the environment without regular collection and appropriate disposal methods. This waste will be removed by licensed contractors or directly by MMDA and disposed of in appropriate locations.
- xliv. **Health and safety issues for workers.** The operation of pumps, motors, generator sets, conveyors, trash racks and other equipment at pumping stations are potential sources of mechanical hazards due to the presence of dangerous moving parts. Mechanical accidents may also be caused by unsafe methods and the lack of safety guards that are fitted to the machine and pumping station facilities. There are open channels at the pumping stations which require adequate guard rails and fences to avoid accidents and fall hazards. Designs will incorporate the required safety features in case they are not available or insufficient. Workers will be properly trained in dealing with hazards, including the handling of hazardous materials, and provided appropriate personal

protective equipment. The operation manual will stipulate the actions needed when trucks and other vehicles travel along access roads to pumping stations, especially when there are houses adjacent to such roads. At times of truck movement on access roads, movement of children along the road may have to be restricted by MMDA personnel.

Specific Social Impacts

- xlv. **Relocation of Informal Settlers.** ISFs along waterways leading to the pumping stations are aware that their houses and structures and the waste they contribute obstruct the flow of water and affect the efficiency of the pumping stations. Those who will be found living within the Project's technical footprint at the time of census will be relocated. Respondents in Vitas said that they are willing to move out of danger zones provided that they are relocated in livable areas and their children can go to school. In Tripa de Gallina where some ISFs in Maricaban Creek have already been relocated from areas outside the technical footprint of the drainage area, respondents who used to be neighbors with them said that they were missing their neighbors, but recognized that fewer ISFs led to easier water flow and lower floodwaters in the community.
- xlvi. **Impacts on livelihood.** Under Components 1 and 2, the proposed project could potentially lead to economic displacement of marginal fisherfolk, water hyacinth pickers and weavers, and waste pickers and in the process impoverish them further. Waste pickers constitute a subgroup of ISFs relying on garbage picking as their main source of livelihood. However, almost all the recyclable garbage picked by them is done outside the waterways, so the impact of reduced garbage in the waterways on the waste pickers' livelihood would be negligible. Harvesters of water hyacinths comprise a very small fragment of Metro Manila's poor who supply dried water hyacinth stalks to buyers at very low prices. Water hyacinths will be removed from critical locations only where they affect the performance of the drainage systems, and the impact on hyacinth pickers will be negligible as there continue to be very large areas with water hyacinths where they can continue to be picked. Livelihood restoration opportunities will be offered to affected vulnerable groups, including provision of alternative job opportunities for affected solid waste pickers.
- xlvi. **Resettlement legacy issue.** This issue is specific to the ISFs who were relocated from the technical footprint of the project waterways before the project identification on December 8, 2014. A World Bank commissioned study found that up to 72 percent of the surveyed households resettled off-city reported decreased income up to as much as 43 percent. They also reported increased expenditure driven by higher costs of transportation to schools, work, and health services. About 35 percent of those resettled off-city also reported difficulties in finding assistance for their daily needs due to disruption in their social support network. Due diligence surveys are carried out where resettlement took place before the identification of the project and action plans will be developed for these resettlement legacy issues in order to ensure that past resettlement of PAPs will as much as possible be consistent with the objectives of OP 4.12. The focus of support will be on community development activities for equity purposes and to avoid conflicts with persons relocated to the same resettlement sites from other areas not related to the technical footprint of the Project. Community development activities can

include community based infrastructure, community livelihood programs, and local economic development.

- xlvi. **Compensation discrepancies.** Host communities can be existing communities or new communities of resettlers within or outside Metro Manila that will live together with PAPs in the same neighborhood. Resettlement to nearby in-city resettlement sites will be least disruptive and there would normally be few compensation discrepancies. The case is different for off-city host communities where support to PAPs may be higher than received by already resettled people. The Project will implement practical and doable interventions, such as community-based development ones, that would benefit the larger resettled community.
- xlix. **Community safety issues.** Community hazards and accidents from the movement of vehicles along narrow roads leading to the pumping stations may compromise people's safety. These risks will be minimized through the implementation of traffic control and safety measures, signage, and educational campaigns. Other related issues include nuisance and problems caused by noise, odor, and dust.

Five PY1 Subprojects

- I. Aside from the abovementioned impacts that will occur during the construction and implementation of the subprojects, there are specific impacts which are highlighted at each PY1 pumping station site.
- li. **Vitas Pumping Station.** The rehabilitation of the Vitas Pumping Station and the cleaning of the waterway of Estero de Vitas will affect 165 ISFs who are currently living within the technical footprint over the banks of the estero and underneath the bridge at Raxabago Street and Capulong Street. This bridge is in a narrow section of the estero. There is another bridge downstream of the pumping station, but this area is outside of the Project technical footprint and will not be touched by the Project. The proposed increase in pumping capacity from 32 to 50 m³/sec will result in a very small increase of the total discharge of the Estero de Vitas downstream of the pumping station for a ten year flood event that will have negligible impact on the people living along the embankments around that bridge. In compliance with WB OP 4.12, an appropriate resettlement action plan is necessary for the affected households. The Vitas Pumping Station site can be accessed through a narrow road (Raxabago St.) that is parallel to the estero. The said road is characterized by settlers encroached over the estero near the bridge. In addition, there are few families living next to the access road. The narrow access road and the presence of few families along the road may result in adverse impacts on community health and safety from the movement of large hauling trucks and other equipment by contractors and trucks transporting solid waste to the Vitas pumping station. The operation manual will stipulate the actions needed when trucks and other vehicles travel along the access road. Extra caution must be exercised by haulers to prevent accidents. At times when trucks are present on the road, movement of children along the road will have to be restricted by MMDA personnel.

The pumping station serves a large catchment area and most of the drainage laterals and mains are open channels which are prone to garbage accumulation. As such, the pumping station receives a significant volume of garbage that requires regular collection and disposal. Part of the waste is picked from the waterways by waste pickers. Under component 2 of the project, waste pickers will be provided employment opportunities to collect household waste and bring it to collection points for disposal. If needed, social preparation measures for them to transition smoothly into their new role will also be given, e.g. seminars on waste segregation, what time they need to collect the garbage and where to bring them, how they get paid, etc. Formal employment will need to maintain some flexibility in terms of work arrangements, e.g. payment for amount of garbage collected instead of number of hours worked, so it is easier for waste pickers to adjust.

- l. **Balut Pumping Station.** The Balut Pumping Station serves the catchment area of Estero Sunog Apog where most of the drainage mains and laterals are closed canals. As compared to the other pumping stations with open drainage canals where garbage is readily deposited or thrown by the community, solid waste entrapment and accumulation at the Balut pumping station is not a major concern. A potential impact of the operation of the pumping station is the noise and dust from the construction activities as well as the odor emanating from the cleaning of the retention pond at the site. Affected communities include the residential houses in front of the site along Buendia St. and the Paez Integrated School on the northwest. There are currently no people in the drainage area's technical footprint and there has not been any resettlement since 1996. The proposed increase in pumping capacity from 2 to 7 m³/sec can be received by the downstream river without any negative impacts.
- li. **Paco Pumping Station.** This pumping station receives the water from the Estero de Paco and the Estero de Concordia. The proposed increase in pumping capacity from 7.6 to 12 m³/sec can be received by the Pasig River without any negative impacts. A concern specific to the rehabilitation of the Paco pumping station is on the proper disposal of solid wastes with water hyacinth and the noise that may disturb the residential area right beside the waterway near the pumping station. There are currently no people living in the technical footprint of the Project. A total of 74 ISFs were resettled under Oplan Likas in 2011. In the survey for the Due Diligence Report for the resettled families within the Paco Pumping Station technical footprint, 60 percent of the respondents claimed they are still working in or near Paco, Manila. Of these, 59 percent travel to Manila on a weekly basis, 26% travel daily, and remaining 15% travel once or twice a month.¹ Apart from increased transportation costs, daily commuting a 40 kilometer distance characterized by poor public transportation and massive traffic gridlock. People who travel weekly or monthly have to bear the impact of temporary separation from their families and additional expenses to rent a small place close to the work place.
- lii. **Tripa de Gallina Pumping Station.** The impacts that would occur during the rehabilitation of the Tripa de Gallina pumping station are due to dredging activities and the generation of dredged materials and solid wastes which requires proper management and transport

¹ Due Diligence Report (DDR) for Paco Pumping Station. The DDR was prepared as part of the appraisal requirement of the proposed Project.

to disposal sites. The pumping station serves a large catchment area and most of the drainage laterals and mains are open channels which are prone to garbage accumulation. As such, the pumping station receives a significant volume of garbage that requires regular collection and disposal. The Tripa de Gallina pumping station is located adjacent to the facilities of the Light Rail Transit Authority on the east and residential communities across the estero on the north. There are currently no households underneath the bridge downstream of the Tripa de Gallina pumping station and the proposed increase in pumping capacity from 58 to 75 m³/sec can be received by the downstream river without any negative impacts. Temporary impacts will occur during the physical works and dredging activities such as increased dust, odor, and noise nuisance in the residential area across the pumping station site. There are currently no people in the drainage area's technical footprint and there has not been any past resettlement.

- lv. **Labasan Pumping Station.** The pumping station is located in the Laguna lakeshore area and functions to control habitual inundations caused by rising of water level of the lake during the typhoon season. The pumping station receives water from the Taguig River and attenuation pond before it is channeled into Laguna Lake. Sections of the flood plain of Laguna Lake and the attenuation pond of the Labasan pumping station are characterized with water hyacinth which clog the waterways that has affected the efficient operation of the pumping station. Proper collection and disposal of water hyacinth will be necessary for this subproject. Water hyacinth pickers do not come to this area to harvest, but the Project will coordinate with them how they can benefit from the water hyacinths to be disposed. There are currently no people in the drainage area's technical footprint and there has not been any past resettlement. The proposed increase in pumping capacity from 9 to 32 m³/sec can be received by Laguna Lake without any negative impacts.

Induced and Cumulative Impacts

- lvi. **Induced Impacts.** The induced impacts are expected to be positive. Floods disturb the normal course of life and pose a real threat to human life and property. As a result of flood mitigation measures, there will be positive effects to the communities because of reduced incidence and impact of annual flooding. There are other anticipated induced positive impacts to the community because of flood control and improvement measures, including possible changes in land use, increase in land values, and development of more business opportunities.
- lvii. **Cumulative Impacts.** The scope of this ESIA involves the assessment of the potential environmental effects at a Project level assessment. A cumulative impact assessment (CIA) will be done during the second half of the Project after all drainage areas to be improved under the project have been identified, based upon the ToR attached to the ESMF. The CIA will be part of broader impact assessment studies to consider the impacts of cumulative improvements in a large number of drainage areas scattered throughout Metro Manila in a defined spatial and temporal framework. The CIA will assess these impacts on key valued components and identify management measures to be undertaken by the Government and other project proponents to provide collaborative solutions to minimizing cumulative negative impacts, if any.

ASSESSMENTS FOR PY1 PUMPING STATIONS AND WASTE DISPOSAL SITES

- lviii. Due diligence assessments were done for the five PY1 pumping stations, disposal sites for solid waste collected at the pumping stations, and the resettlement site for the Vitas Pumping Station. Disposal sites for dredged materials will be assessed during project implementation as there are no fixed pre-determined sites, but suitable areas are often found near the dredging areas. For example, DPWH often uses reclamation sites when it is found that dredged material is not contaminated.
- lix. Two waste disposal sites were included in the due diligence. The key findings are listed below:
- a) Navotas Sanitary Landfill
 - The Navotas Sanitary Landfill is owned and operated by Phil Ecology Systems Corporation (Phil Eco) and serves the City of Manila, along with other cities such as Navotas and Malabon. The sanitary landfill has been operational since 2006.
 - Located in Bgy. Tanza, the area dedicated for the landfill is about 39.67 ha. Phase I, Phase II, and Phase III of the landfill are 11.3, 13.67, and 15.0 hectares, respectively. Phases I and II (11 cells) have already been used, while Phase III, composed of 9 cells, is currently in commission.
 - The landfill has a leachate treatment facility and a gas collection system. A lining was installed within the pond to contain the leachate. Leachate goes through a series of treatment processes (pond system).
 - The facility has an environmental compliance certificate (ECC) and other environmental permits. A multi-partite monitoring team composed of the LGU, MMDA, and fisher folks, to name a few, visits the site quarterly. Surface water and water from two deep wells on site are monitored quarterly. Air quality is monitored twice a year.
 - b) Montalban Solid Waste Disposal Facility
 - The facility is owned and operated by International Solid Waste Integrated Management Specialist (ISWIMS), Inc. It was first opened in 2002. The facility serves most LGUs of Metro Manila, including Makati, Mandaluyong, Pasay, Taguig, San Juan, Valenzuela, Muntinlupa, Pateros, Rodriguez, and Quezon City.
 - Living outside the property are a number of informal settler families. There were only a few ISFs when the landfill started operation, but the number of ISFs has grown because of migration from Payatas dumpsite. As a result, waste pickers are prevalent in the landfill.
 - There are facilities in the compound that facilitate further segregation of solid waste and leachate treatment. Plastic and paper, among other combustible materials, are extracted in the Refuse-Derived Fuel (RDF) Processing Plant that converts these wastes into pellets that can be used as fuel.

- The facility has an ECC. A multi-partite monitoring team visits the site quarterly. Environmental monitoring is conducted with water and leachate monitoring is done every quarter. Air and noise levels are monitored twice a year.
- ix. There are possible sites for disposal of dredged materials in Taguig and in Catmon, Malabon that have been suggested during the consultations with DPWH and other agencies. However, these sites are indicative and are not yet specified by DPWH. Site-specific ESMPs will be prepared prior to commencing any works. These plans will include sufficiently detailed dredged materials management plan and solid waste management plan, as needed. An existing dredge disposal site near Lupang Arrienda that was constructed and is being used by DPWH was visited as part of the ESIA preparation. The disposal site is currently mostly used for JICA-financed dredging operations. From the site visit it was validated that DPWH can properly establish and manage a dredge disposal site. It is noted, however, that DPWH does not intend to use this site for the project.
- ixi. Many ISFs are occupying land along and over easements for drains and associated waterways. Since 2011, ISFs have been resettled and continue to be resettled to physically safer locations under an ongoing government program (Oplan Likas) that is to be completed in 2016, except for sites where resettlement planning is already well-advanced. With the concerns on potential legacy issues that come out of resettlement activities that took place prior to Bank engagement in the project (December 8, 2014 - the date of the announcement of the project identification mission), MMDA has prepared three site-specific social safeguards instruments for PY1 drainage areas, namely a RAP for Vitas, a due diligence report (DDR) for Paco, and a combined DDR for Balut, Tripa de Galina, and Labasan pumping stations and drainage areas.
- a) The RAP for Vitas was prepared for the 165 ISFs living within the technical footprint based on a validation census conducted by the MMDA in November 2015. The zone of impact has been limited to those areas which must be clear of encroachments to ensure unimpeded flow and maintenance, which are essential for optimal and sustainable operation of the rehabilitated pumping station and associated waterways. The RAP was prepared in the context of a complex and fluid situation in the area of the technical footprint. At the time of validation census, some 88 ISFs are listed as participants in a community organization known as Ang Grupo ng Organisadong Mamamayan (AGOM), which is supported by the SHARE Foundation NGO. The AGOM members have prepared a “people’s plan” that includes relocation to a peri-urban area located at Barangay Muzon, in San Jose del Monte City, Bulacan Province. The resettlement site is located about 30 km from the Vitas PS area. AGOM has secured land for the resettlement community and financing for the project from the Social Housing Finance Corporation (SHFC). The community group is officially known as Benjamin Village 8 Home Owners Association (BV8), mostly AGOM members. Site development and housing construction is ongoing and all works are expected to be completed before the end of 2017. The Muzon Project of AGOM, under the auspices of the SHFC – AGOM agreement, have made representation to relevant national government agencies and to the LGU for the provision of social services, facilities, and project specific

livelihood programs for inclusion in the 2018 budget calendar. The LGU committed to put up the day care center facilities, including personnel that will run the center, in their budget for 2018. For livelihood programs of the AGOM members, AGOM is organizing a cooperative among its members that will be relocated to the project site. According to AGOM the cooperative's sources of funds are from the membership contributions, grants, and income generating activities as well as from accessing available credit and financing schemes facilities for their projects. The cooperative plans to provide services such as organizing skilled and semi-skilled guilds for employment placement in construction and enterprises nearby, running a community cooperative store/market, tricycles, and transport groups, and organic gardening among others as sources of income and employment. The 77 ISFs who are not AGOM members will also be moved and provided assistance under a "preventive relocation" by the Pasig River Rehabilitation Commission (PRRC) and NHA before the Project is expected to become effective late 2017. The PAPs are expected to move to the NHA relocation site located in Pandi Bulacan. In-city choices for resettlement discussed with the ISFs were considered unsafe by the ISFs as they are proposed at sites characterized by criminality and related social problems. Off-city choices were thus seen as preferable and were selected by the ISFs. Pandi is one of the 18 resettlement sites that have been allotted funds from the Ps 1.8 billion social infrastructure budget allotted from the General Appropriations Act (GAA) of 2017. It will be used to improve the basic services and livelihood conditions. These include ensuring the provision of water facilities, additional classroom, day care centers, and health and livelihood multi-purpose facilities. The social infrastructure funds has been released to NHA. Funds for livelihood programs have been allotted and will be released to various implementing agencies. Specific projects such as job creation through job fairs, livelihood projects for individuals, guilds and cooperatives are released through agencies such as the Department of Labor and Employment (DOLE), Department of Trade and Industry (DTI), Technical Education and Skills Development Authority (TESDA), and Department of Social Welfare and Development (DSWD). The social preparation and community building processes with Civil Society Organizations (CSO) will be implemented by the Presidential Commission for the Urban Poor (PCUP) and NHA project site personnel in Pandi Bulacan, which is also part of the Ps 1.8 billion program. The activities described above are incorporated in the RAP. DPWH/MMDA will work with concerned agencies to ensure that the resettlement of these 165 ISFs is compliant with the requirements of OP 4.12, either upfront or through measures determined through due diligence, as described in the RAP.

- b) The DDR for Paco aimed at tracing as many of the 74 resettled families that were determined to have lived within the technical footprint and were resettled in 2011 to Towerville 6 Resettlement Site in order to assess the resettlement and compensation measures received and identify gaps in meeting the requirements of national legislation and the objective of OP 4.12. Due diligence of the Towerville 6 Resettlement Site in Barangay Gaya-Gaya, San Jose Del Monte, Bulacan revealed that the resettlement site is a project of NHA to eventually accommodate about 9,200 families who have been identified to be living in danger areas, affected by calamities such as typhoons and fire or from government infrastructure projects in

Metro Manila. The resettlement site covers an area of about 54 hectares and is equipped with facilities like elementary and high schools, multipurpose covered court, barangay hall, health center, open space for playground, library, material recovery facilities, and a market. According to the NHA, the project has resettled about 8,500 families as of February 2017 from various cities in Metro Manila as a result of Oplan Likas and government infrastructure projects. Due diligence of the site showed that in general, access of the ISFs to basic services is acceptable, after some early deficiencies at the time of opening of the resettlement site were rectified. Water is available through the San Jose Del Monte Water District and Maynilad Water Services, Inc., while electricity is served by the Meralco. In terms of garbage disposal, the households in the resettlement site have access to a solid waste collection scheme provided by the local government unit. The remaining challenge faced by the relocates is finding adequate sources of income or jobs within and around the vicinity of the relocation site. This has prompted a number of the resettled people to go back to Metro Manila to work and spend part of their income for transportation while other experience temporary separation from their family because of the need to rent a place to stay in Metro Manila. In view of this, NHA in cooperation with agencies (DOT, DTI, TESDA, and DSWD) tasked to assist the relocates on livelihood and employment support will implement a comprehensive livelihood program in Towerville 6 from the Ps 1.8 billion fund discussed above. This will include programs for job creation, job fair activities, and livelihood and income generating projects for individuals, guilds and cooperatives. PCUP and CSOs, in cooperation with the NHA project office in Towerville 6, will undertake the social preparation and community building process to ensure the readiness of the community for the livelihood programs that will be implemented under the approved budget. Specific projects, including the construction of a livelihood center, are expected to start mid-2017. The DDR describes the proposed program and contains some additional remedial measures to fill in any gaps in the programs currently being carried out, including improvement in the grievance redress system.

- c) The DDR for Balut, Tripa de Galina, and Labasan found that the sites are free of settlers and no land acquisition or resettlement took place after December 8, 2014. The latest resettlement was recorded in 1996 to give way to the construction of the Balut PS.

POSSIBLE ENVIRONMENTAL INSTRUMENTS

- lxii. The proposed interventions in drainage areas will create various impacts, both positive and negative. Based on environmental and social screening, it will be determined whether the environment assessment (EA) instrument for a subproject will be a full ESIA, an ESMP, or an ECOP based on the provisions of the Environment and Social Management Framework (ESMF) and Resettlement Policy Framework (RPF) of the project. The ESMF and RPF will guide the preparation of safeguards instruments for all subprojects. The EA instrument will have to be prepared and implemented to mitigate Project impacts during construction and operation and ensure that these are in compliance with WB OP 4.01 and OP 4.12. Construction impacts will thus be addressed by either an ECOP or ESMP,

including sediment control, air and water quality management, noise and vibration, solid waste management, occupational health and safety, vehicular traffic management, and community health and safety. The ECOPs or ESMP will also include institutional arrangements and roles of the DPWH, MMDA, LGU (city and barangay) for its implementation to ensure its sustainability and effectiveness. Involuntary resettlement impacts on the other hand will be mitigated and managed by site-specific resettlement plans or action plans as a result of due diligence reports. Specific measures per pumping stations are presented as follows:

a) Vitas Pumping Station

- TCLP testing, management and proper disposal of dredged materials from Estero de Vitas;
- Due diligence of disposal site of non-toxic dredged materials once identified by DPWH;
- Disposal of dredged materials with hazardous components, if any, at Clark Sanitary landfill (sample testing of material to be dredged from Vitas Estero and the waterways of the other PY1 drainage areas) did not contain any hazardous components);
- Conduct of final due diligence of identified resettlement site for ISFs;
- Coordination with LGU-Manila on the hauling of solid wastes collected at the pumping station;
- Provision of railings in hazardous work area such as bridge at the flood gates of the pumping station;
- Compliance with DENR environmental regulatory requirements such as securing the ECC and other environmental permits; and
- Coordinate with Barangay 93 in managing traffic at Raxabago St. and Capulong St. leading to the pumping station and other community concerns.

b) Balut Pumping Station

- TCLP testing, management and proper disposal of dredged materials within pump station basin;
- Due diligence of disposal site of non-toxic dredged materials once identified by DPWH;
- Disposal of dredged materials with hazardous components, if any, at Clark Sanitary landfill;
- Provision of railings or fence in hazardous work areas such as at the retention pond of the pumping station;
- Coordination with LGU-Manila on the hauling of solid wastes collected at the pumping station;
- Compliance with DENR environmental regulatory requirements such as securing the ECC and other environmental permit; and
- Coordinate with Barangay 137 in managing traffic along Honorio Lopez St. and Buendia St. leading to the pumping station and other community concerns.

c) Paco Pumping Station

- TCLP testing, management and proper disposal of dredged materials from Estero de Paco;
- Removal and proper disposal of water hyacinth;
- Due diligence of disposal site of non-toxic dredged materials once identified by DPWH;
- Disposal of dredged materials with hazardous components, if any, at Clark Sanitary landfill;
- Conduct of due diligence at resettlement site where ISFs were resettled;
- Provision of railings in hazardous work areas such as at the flood gates of the pumping station;
- Coordination with LGU-Manila on the hauling of solid wastes collected at the pumping station;
- Compliance with DENR environmental regulatory requirements such as securing the ECC and other environmental permits; and
- Coordinate with Barangay 662 in managing traffic along Cristobal St. leading to the pumping station and other community concerns.

d) Tripa de Gallina Pumping Station

- TCLP testing, management and proper disposal of dredged materials from Estero de Tripa de Gallina;
- Due diligence of disposal site of non-toxic dredged materials once identified by DPWH;
- Disposal of dredged materials with hazardous components, if any, at Clark Sanitary Landfill;
- Provision of railings in hazardous work areas such as at the bridge of the flood gates at the pumping station;
- Coordination with LGU-Pasay City on the hauling of solid wastes collected at the pumping station;
- Compliance with DENR environmental regulatory requirements such as securing the ECC and other environmental permits; and
- Coordinate with Barangay 190 in managing traffic along Bac 1-11 St. leading to the pumping station and other community concerns.

e) Labasan Pumping Station

- TCLP testing, management and proper disposal of dredged materials from Labasan pumping station basin;
- Removal and proper disposal of water hyacinth;
- Due diligence of disposal site of non-toxic dredged materials once identified by DPWH;
- Disposal of dredged materials with hazardous components, if any, at Clark Sanitary Landfill;
- Provision of railings in hazardous work areas such as at the flood gates at the pumping station and safe access to the adjacent attenuation pond;
- Coordination with LGU-Taguig City on the hauling of solid wastes collected at the pumping station;

- Compliance with DENR environmental regulatory requirements such as securing the ECC and other environmental permits; and
 - Coordinate with Barangay Napindan in managing traffic along the road leading to the pumping station and other community concerns.
- Ixiii. Institutional arrangement for the implementation of the environment and social safeguards measures will involve the DPWH, MMDA, LGUs, NHA, and the SHFC. Specifically, the DPWH will ensure proper disposal and management of dredged materials while the MMDA will ensure the implementation of safeguards measures for the operation of the pumping stations. The concerned LGUs will be involved in the contracting of solid waste haulers, identifying solid waste disposal sites, disseminating information to stakeholders about the project, and identifying relocation sites (if applicable), in coordination with the NHA and SHFC.

CONSULTATIONS AND DISCLOSURE

- Ixiv. The proposed Project, the ESMF, and the results of the ESIA were discussed during a public consultation held on September 9, 2016. Copies of the documents that were discussed are available at the DPWH-Unified Project Management Office (UPMO), DPWH-Environmental and Social Safeguards Division (ESSD), and at the MMDA-Planning Office. A second public consultation was conducted on November 18, 2016. The public was invited for this consultation by way of an announcement in a national newspaper and on DPWH's website. Updated safeguards documents were made available to the public on DPWH's website before this meeting. The Environmental and Social Management Framework, Resettlement Policy Framework, and the ESIA, including executive summary, were first disclosed by the World Bank on February 8, 2016.
- Ixv. The consultation meeting on September 9, 2016 was attended by representatives from the local government units, Social Housing Finance Corporation, Pasig River Rehabilitation Commission, Presidential Commission for Urban Poor, MMDA, and district engineering offices of DPWH. A total of 85 participants attended the public consultation. Key issues that were raised during the consultation meeting were about the participatory and programmatic approach that will be applied in the planning of the subprojects under the project. The participants suggested studies on the integration of several small pumping stations, upgrading of the existing pumping stations in their locality, and close coordination with the local government units during planning and implementation. A suggestion was raised about the application of rainwater catchment system that will enable some communities to store rainwater and use this for other purposes instead of disposal to a waterway. The representatives from the housing sector requested DPWH to provide them the list and profile of the informal settler families to enable them to validate whether some of these families are already part of the "Oplan Likas" program. Overall, the participants fully support the project because of the benefits that flood control and solid waste management will bring to Metro Manila and issues and suggestions raised are mostly to be considered during project implementation.
- Ixvi. Participants of the public consultation meeting on November 18, 2016 supported the project and its scope. The discussion focused mostly on resettlement, with support for

- the proposed project-related participatory housing activities. The participants put emphasis to not rush the preparation for resettlement, but provide sufficient time for community organizing and community participation. Several participants mentioned that a two year preparation and development process for relocation is realistic. It will also be important to coordinate resettlement with other agencies and avoid disconnect of schedules of partner agencies, e.g. to construct classes or connect electricity. Participants from such agencies as Habitat for Humanity and Presidential Commission on Urban Poor provided commitment to support DPWH and other agencies, as required.
- lxvii. A number of community consultation activities have been organized by the DPWH to disclose the safeguards instruments to project affected persons and other interested people in each of the five PY1 areas. A first consultation meeting was held September 23, 2016 for the PAPs and other interested people in Vitas. Stakeholders that participated included the City of Manila through the Urban Settlements Office, Barangays 150 and 93, NHA, PCUP, SHFC, AGOM, Share Foundation, and PAPs. Similar community consultations were organized by DPWH, with support from other agencies, for the other four PY1 drainage areas from October 10 to 13, 2016, along with a stage two consultation for the PAPs in Vitas on October 10, 2016 to further discuss the details of the draft RPF and RAP. A separate consultation activity was held at Towerville 6 Resettlement Site in San Jose del Monte, Bulacan to discuss the resettlement legacy issues and to learn lessons from past Government resettlement activities that will help improve project-supported resettlement. Prior to these public consultations, all the safeguards instruments including a Project Information Booklet in Tagalog containing the pertinent details of the project and executive summary of the RAP and ESIA were widely distributed in advance to the stakeholders and PAPs.
- lxviii. The site-specific consultations were generally well attended, with more than 100 participants at the Paco and Vitas consultations. The participants were generally supportive of the project as measures to reduced flooding in the communities are deemed very important. In addition, to measures that reduces flooding, participants often mentioned the need to reduce solid waste in the waterways.

SAFEGUARD IMPLEMENTATION ARRANGEMENTS

- lxix. The ESIA defines the institutional responsibilities for the implementation of the ESMP and ECOPs with defined roles for DPWH/MMDA and project contractors. The DPWH through the District Engineering Offices will be in-charge of the construction and rehabilitation of the pumping stations while the MMDA will remain as the operator of the PY1 pumping stations. The LGUs are responsible for the implementation of the solid waste management program of the locality, including contracting and paying for the hauling of solid wastes in the community and from the pumping stations. MMDA will inform and coordinate with the LGU about the collection of accumulated solid wastes from the pumping stations for appropriate collection and disposal by the LGU hauler. In accordance with the ESIA, the DPWH/MMDA will ensure that the measures identified in the ESMP and ECOPs are implemented and that appropriate environmental permits are secured from the DENR prior to project implementation. Copies of the ESMP and ECOPs will be included as part of the bid documents for appropriate guidance of contractors. In

addition, regular monitoring and reporting will be done by the MMDA and DPWH PMOs and the DPWH-Environment and Social Safeguards Division to validate implementation of the safeguards measures.

CONCLUSIONS

- lxx. The Metro Manila Flood Management Project will have significant benefits in reducing flood risk and damage to residents and property along waterways. The Project will not result in significant adverse environmental impacts and the impacts are mostly confined within the site of the pumping stations and at the waterways. Environmental and social mitigation measures have been designed and these will be outlined in the ESMP and/or ECOP for each project-supported drainage area to address any adverse impacts of project implementation. A RAP or DDR action plan will address future or past involuntary resettlement impacts.
- lxxi. The following project impacts are considered significant and will require ongoing due diligence measures to ensure that they can be minimized:
 - a. Disposal of dredged waste materials from waterways. Toxicity testing will be required and a waste management plan implemented to ensure proper disposal;
 - b. Legacy issues associated with past resettlement from Project areas will require implementation of due diligence and a follow-up action plan.
- lxxii. The mitigation and management actions outlined in the ESIA shall be included in construction contract documents to be adopted by the construction contractor. Additionally, MMDA and DPWH shall implement a supervision and oversight program to assure adoption of the mitigation measures.

Figure 1: Identified Subprojects for Project Year 1

