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R2017-0209/1

September 8, 2017

For meeting of
Board: Thursday, September 28, 2017

FROM: Vice President and Corporate Secretary

Philippines - Metro Manila Flood Management Project

Project Appraisal Document

Attached is the Project Appraisal Document regarding a proposed loan to Philippines for a Metro Manila Flood Management Project (R2017-0209), which will be discussed at the meeting of the Executive Directors.

Distribution:
Executive Directors and Alternates
President
Bank Group Senior Management
Vice Presidents, Bank, IFC and MIGA
Directors and Department Heads, Bank, IFC and MIGA

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The World Bank

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Report No: PAD1396

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$207.60 MILLION

TO THE

REPUBLIC OF THE PHILIPPINES

FOR A

METRO MANILA FLOOD MANAGEMENT PROJECT

September 1, 2017

Water Global Practice
East Asia and Pacific Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective January 1, 2017)

Currency Unit = Philippine Peso (PhP)
PhP47.00 = US$1.00

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AIIB	Asian Infrastructure Investment Bank
APCPI	Agency Procurement Compliance Performance Indicators
BAC	Bids and Awards Committee
BCR	Benefit-Cost Ratio
COA	Commission on Audit
CPS	Country Partnership Strategy
CSCAND	Collective Strengthening on Community Awareness on National Disasters
CSO	Civil Society Organizations
DBM	Department of Budget and Management
DDR	Due Diligence Reports
DENR	Department of Environment and Natural Resources
DILG	Department of Interior and Local Government
DOF	Department of Finance
DP	Displaced Persons
DPWH	Department of Public Works and Highways
ECOP	Environmental Code of Practice
EO	Executive Order
ERR	Economic Rate of Return
ESIA	Environmental and Social Impact Assessment
ESMF	Environment and Social Management Framework
ESMP	Environmental and Social Management Plan
ESSD	Environmental and Social Safeguards Division
FASPS	Foreign-Assisted and Special Projects Services
FB	Floating Bulldozer
FCMC	Flood Control Management Cluster
FCSMO	Flood Control and Sewerage Management Office
FMS	Financial Management
GAP	Guide on Audit of Procurement
GDP	Gross Domestic Product
GFDRR	Global Facility for Disaster Risk Reduction
GIS	Geographic Information System
GNI	Gross National Income
GoP	Government of the Philippines
GRM	Grievance Redress Mechanisms
GRS	Grievance Redress Service
HDH	High Density Housing
HOA	Homeowners Associations
HUDCC	Housing and Urban Development Coordinating Council

ICB	International Competitive Bidding
IEC	Information, Education and Communication
IFR	Interim Financial Reports
IMP	Integrity Management Program
IPF	Investment Project Financing
ISF	Informal Settler Families
JICA	Japan International Cooperation Agency
KSA	Key Shelter Agencies
LGU	Local Government Units
LIDAR	Light Detection and Ranging
LLDA	Laguna Lake Development Authority
MIS	Management Information System
MMDA	Metropolitan Manila Development Authority
M&E	Monitoring and Evaluation
MoA	Memorandum of Agreement
NCA	Notice of Cash Allocation
NCB	National Competitive Bidding
NCP	Neighborhood Collection Points
NCR	National Capital Region
NEDA	National Economic and Development Authority
NGO	Non-Governmental Organization
NHA	National Housing Authority
NPV	Net Present Value
NSWMC	National Solid Waste Management Commission
NTWG	National Technical Working Group
OP	Operational Policy
O&M	Operation and Maintenance
Oplan Likas	*Oplan Likas Program: Lipat para Iwas Kalamidad At Sakit* (Operational Plan: Evacuation to Prevent Calamity and Sickness).
OPMBCS	Operational Plan for the Manila Bay Coastal Strategy
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services Administration
PAP	Project Affected People
PCUP	Presidential Commission for the Urban Poor
PDO	Project Development Objective
PDP	Philippine Development Plan
PH-PTF	Philippines Development Trust Fund
PHRD	Policy and Human Resources Development
PIM	Project Implementation Manual
PMO	Project Management Offices
PY	Project Year
RAP	Resettlement Action Plans
RBF	Results Based Financing
RPF	Resettlement Policy Framework
RRAP	Resettlement and Rehabilitation Action Plan
SALN	Statement of Assets and Liabilities
SBD	Standard Bidding Documents
SCADA	Supervisory Control and Data Acquisition
SEMS	Social and Environmental Management System
SHFC	Social Housing Finance Corporation
SORT	Systematic Operations Risk-Rating Tool
STEP	Strategic Tracking of Exchanges in Procurement
SUDS	Sustainable Urban Drainage Systems
SWMO	Solid Waste Management Office
TA	Technical Assistance
UPAO	Urban Poor Affairs Office
VSL	Variable Spread Loan

Regional Vice President:	Victoria Kwakwa
Country Director:	Mara Warwick
Senior Global Practice Director:	Guang Zhe Chen
Practice Manager:	Sudipto Sarkar
Task Team Leader(s):	Joop Stoutjesdijk

PHILIPPINES
Metro Manila Flood Management Project

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PAD DATA SHEET

Philippines

Metro Manila Flood Management Project (P153814)

PROJECT APPRAISAL DOCUMENT

EAST ASIA AND PACIFIC

0000009391

Report No.: PAD1396

Basic Information			
Project ID P153814	EA Category A - Full Assessment		Team Leader(s) Joop Stoutjesdijk
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]		
Project Implementation Start Date 01-Oct-2017	Project Implementation End Date 31-May-2024		
Expected Effectiveness Date 01-Jan-2018	Expected Closing Date 30-Nov-2024		
Joint IFC No			
Practice Manager/Manager Sudipto Sarkar	Senior Global Practice Director Guang Zhe Chen	Country Director Mara K. Warwick	Regional Vice President Victoria Kwakwa

Borrower: Republic of the Philippines			
Responsible Agency: Department of Public Works and Highways			
Contact:	Patrick Gatan	Title:	Director Flood Management Cluster
Telephone No.:	304-3000	Email:	patrick_gatan@yahoo.com
Responsible Agency: Metro Manila Development Authority			
Contact:	Jose V. Campo	Title:	Assistant General Manager for Planning
Telephone No.:	0915-6961131	Email:	mdps_mmda@yahoo.com

Project Financing Data (in USD Million)					
[X]	Loan	[ ]	IDA Grant	[ ]	Guarantee
[ ]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	500.00	Total Bank Financing:	207.603205
Financing Gap:	0.00		

Financing Source	Amount
Borrower	84.793590
International Bank for Reconstruction and Development	207.603205
Asian Infrastructure Investment Bank	207.603205
Total	500.00

Expected Disbursements (in USD Million)

Fiscal Year	2018	2019	2020	2021	2022	2023	2024	2025	0000
Annual	10.50	17.50	28.00	35.00	42.00	35.00	28.00	11.603205	0.00
Cumulative	10.50	28.00	56.00	91.00	133.00	168.00	196.00	207.603205	0.00

Institutional Data

Practice Area (Lead)

Water

Contributing Practice Areas

Environment & Natural Resources, Social, Urban, Rural and Resilience Global Practice

Proposed Development Objective(s)

The project development objective is to improve flood management in selected areas of Metro Manila.

Components

Component Name	Cost (USD Millions)
1. Modernizing Drainage Areas	375.20
2. Minimizing Solid Waste in Waterways	48.00
3. Participatory Housing and Resettlement	55.75
4. Project Management and Coordination	20.00

Systematic Operations Risk- Rating Tool (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	Low
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	High
6. Fiduciary	Substantial
7. Environment and Social	High

8. Stakeholders	Substantial
9. Other	
OVERALL	High

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ] No [X]
Does the project require any waivers of Bank policies?	Yes [ ] No [X]
Have these been approved by Bank management?	Yes [ ] No [ ]
Is approval for any policy waiver sought from the Board?	Yes [ ] No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X] No [ ]

Safeguard Policies Triggered by the Project	**Yes**	**No**
Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04	**X**	
Forests OP/BP 4.36		**X**
Pest Management OP 4.09		**X**
Physical Cultural Resources OP/BP 4.11	**X**	
Indigenous Peoples OP/BP 4.10		**X**
Involuntary Resettlement OP/BP 4.12	**X**	
Safety of Dams OP/BP 4.37		**X**
Projects on International Waterways OP/BP 7.50		**X**
Projects in Disputed Areas OP/BP 7.60		**X**

Legal Covenants

Name	**Recurrent**	**Due Date**	**Frequency**
Inclusion of representatives from NHA, SHFC, PCUP, HUDCC and DBM in the SCs.		No later than six months after effectiveness.	

Description of Covenant
The Project Steering Committee (PSC) and Technical Steering Committee (TSC) shall include senior personnel and representatives from a date no later than six (6) months after the Project Effectiveness Date, from NHA, SHFC, PCUP, HUDCC and DBM. (Sch. 2 S I.A.1(b)).

Name	Recurrent	Due Date	Frequency
Adoption of the Project Operations Manual.		No later than three months after effectiveness.	

Description of Covenant

The Borrower shall, no later than three (3) months after the Project Effectiveness Date, adopt the Project Operations Manual and ensure that it shall, at all time, in form and substance be acceptable to the Bank. (Sch. 2 S I.D.1).

Name	Recurrent	Due Date	Frequency
Submission of draft annual work plan and budget for the Bank's agreement.	No later than November 15th in year 2 and after	Year 1: three months after effectiveness.	Annually

Description of Covenant

The Borrower shall furnish to the Bank, as soon as available, but in any case not later than November 15th of each year, the Annual Work Plan and Budget for the subsequent year for the Bank's agreement; except for the Annual Work Plan and Budget for the Project for the first year of Project implementation which shall be furnished to the Bank no later than three (3) months after the Project Effectiveness Date. (Sch. 2 S I.E.2).

Conditions

Source of Fund	Name	Type
	Co-financing Agreement effective and conditions of disbursement satisfied.	Effectiveness.

Description of Condition:

The Co-financing Agreement has been executed and delivered and all conditions precedent to its effectiveness or to the right of the Borrower to make withdrawals under it (other than the effectiveness of this Agreement) have been fulfilled. (S. 4.01 of the LA).

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Joop Stoutjesdijk	Team Leader (ADM Responsible)	Lead Irrigation Engineer	Drainage Area Modernization	GWA02
Dominic Reyes Aumentado	Procurement Specialist (ADM Responsible)	Senior Procurement Specialist	Procurement	GGO08
Tomas JR. Sta.Maria	Financial Management Specialist	Financial Management Specialist	Financial Management	GGO20

Artessa Saldivar-Sali	Team Member	Senior Municipal Engineer	Solid Waste Management	GSU08
Christopher Casuga Ancheta	Team Member	Senior Sanitary Engineer	Solid Waste Management	GWA02
Danielle Malek Roosa	Counsel	Senior Counsel	Legal	LEGES
David Llorico Llorito	Team Member	Communications Officer	Communication Strategy	EAPEC
Demilour Reyes Ignacio	Team Member	Senior Executive Assistant	Team Assistance	GWADR
Frederick Edmund Brusberg	Safeguards Specialist	Consultant	Safeguards	GSU03
Gerardo Pio Francisco Parco	Safeguards Specialist	Senior Environmental Engineer	Environment	GEN2B
Helene Bertaud	Counsel	Lead Counsel	Legal	LEGES
Juliet H. Villegas	Team Member	Consultant	Social Protection	GSURR
Kevin Roy B. Serrona	Team Member	Consultant	Solid Waste Management	GSUDL
Makiko Watanabe	Team Member	Senior Urban Spec.	Housing and Social Development	GSU02
Marcus John Jin Sarn Lee	Team Member	Senior Urban Economist	Solid Waste Management	GSU08
Mari Anne DL. Trillana	Team Member	Program Assistant	Team Assistance	EACPF
Mariles Navarro	Team Member	Consultant	Economic Analysis	IEGSD
Marilyn Tolosa Martinez	Team Member	Consultant	Housing	GSU12
Miles Scott-Brown	Environmental Specialist	Consultant	Environmental Assessment	GENDR
Roberto B. Tordecilla	Safeguards Specialist	Senior Social Development Specialist	Social Development	GSU02
Ronald Rubenecia Muana	Team Member	Consultant	Project Implementation Development	GWA02
Violeta Wagner	Team Member	Senior Program Assistant	Team Assistance	GWA02
Yan F. Zhang	Team Member	Senior Urban Economist	Urban Development and Housing	GSU13

Extended Team

Name	**Title**	**Office Phone**	**Location**

Locations					
Country	**First Administrative Division**	**Location**	**Planned**	**Actual**	**Comments**
Philippines	Metro Manila	National Capital Region		**X**	Metro Manila

Consultants (Will be disclosed in the Monthly Operational Summary)	
Consultants Required?	Consultants will be required.

I. STRATEGIC CONTEXT

A. Country Context

1. The Philippines has experienced strong macroeconomic fundamentals during the last decade. This has been manifested by low and stable inflation, reduced debt, a healthy current account surplus, high international reserves, and a stable banking sector. Economic growth has been robust in recent years, with real Gross Domestic Product (GDP) growing by 5.9 and 6.8 percent in 2015 and 2016, respectively, driven by household consumption, private construction, and exports of goods and services.

2. Inclusive economic growth and poverty reduction are main development priorities for the Philippines. Achieving a pattern of inclusive growth that creates jobs and reduces poverty and vulnerability is a long-standing challenge facing the country. Both previous and current administrations have shown strong commitment to inclusive reform and growth. After years of stagnation, officially measured poverty incidence by the Philippine Statistics Authority declined from 25.2 percent in 2012 to 21.6 percent in 2015. Moreover, increases in income are becoming more progressive, as the real income of the bottom 30 percent of the population has been continuously rising faster than those in higher income classes. Per capita income of the bottom 30 percent of households grew over 20 percent in 2012-2015, while the average income of all households grew by 15.3 percent. Nevertheless, vulnerability to poverty remains a concern. Many Filipinos still hover just above the poverty line ("near poor"), cycling in and out of poverty due to high vulnerability to climatic, disaster, financial, and price shocks.

3. In the World Risk Index for 2016, the Philippines ranks third among countries most at risk for disasters, including floods, storms, and earthquakes. The United Nations Office for Disaster Risk Reduction estimated that in the past 30 years more than 360 disasters befell the Philippines, with a total death toll of 33,000 people and affecting 120 million people. Direct economic damage from these disasters is estimated at US$7.4 billion. Typhoons and floods are the most devastating in terms of their economic and social impact, accounted for 80 percent of all deaths, 90 percent of the total number of affected people, and 92 percent of the total economic impact.

4. The geographic location of the Philippines makes it prone to typhoons. The number and intensity of typhoons seems to be increasing, with increasingly devastating floods resulting in larger damages to properties, infrastructure, and agriculture. A total of 94 destructive typhoons struck the country in 2011-2015, about ten percent more than the number of typhoons in 2006-2010, with almost triple the cumulative cost of damages. The Philippines is expected to be among the countries that will suffer long-term and repetitive damage from extreme weather patterns brought about by climate change. A large part of the population lacks the ability to adequately deal with natural disasters.

5. Strong growth in Metro Manila attracts an increasing number of migrants from rural areas in search of better jobs. Migrants who typically have low paying jobs are unable to afford decent housing and often end up as informal settler families (ISF) living in danger zones. Typhoons and flooding, housing, and poverty are inextricably linked. Worsening flood events, caused by climate change, exacerbate shelter deprivation and lack of decent shelter increases

vulnerability to flooding. Typhoons could render thousands homeless at once, and conversely, lack of strong shelter in safe locations exposes people to flooding. The poor are most vulnerable, not only because of their exposure in high-risk locations and the low quality of their houses, but also because of their low adaptive capacity. Poor families are less able to prepare against floods compared to better-off families. The livelihoods of many poor people are also affected by flood events, as many depend on the streets for their daily income and when streets are flooded, they cannot ply their trade.

B. Situations of Urgent Need of Assistance or Capacity Constraints (if applicable)

6. Not applicable.

C. Sectoral and Institutional Context

Flood Management

7. Many areas in Metro Manila are low-lying and designated as flood prone, with insufficient protection against frequent inundation as natural drainage is often restricted during rainfall events by high river and sea water levels. About 80 percent (1,700 mm) of the annual rainfall occurs during the typhoon season from June through October, when rain can be particularly intensive. Flood events are a recurrent problem in Metro Manila that causes flooding of roads, affecting traffic and movement of people, and flooding in houses and buildings. Urban drainage relies mostly on a combination of drainage channels, waterways, and pumping stations.[1]

8. Metro Manila is home to around 15 million people and contributes about 35 percent to the economy of the Philippines, and recurrent flooding has a negative impact on millions of people's lives and the economy. On September 26, 2009, one of the most severe tropical storms in history, Ondoy (internationally named Ketsana), affected Metro Manila. It caused substantial damage and losses, equivalent to about 2.7 percent of GDP. The adverse impacts on the productive sectors were largely due to damaged or lost inventories, raw materials, and crops. In addition, business operations were interrupted by access problems, power and water shortages, damaged machinery, and absent employees, which contributed to an overall reduction in production capacity.

9. After Ondoy, the Government, with technical and financial support of the Bank, prepared a Flood Management Master Plan for Metro Manila and Surrounding Areas (hereafter the Master Plan). The Master Plan, approved by the National Economic and Development Authority (NEDA) Board on September 4, 2012, proposed a set of priority structural and non-structural measures to provide sustainable flood management and safely control major flood events in Metro Manila. The total estimated cost for the implementation of the Master Plan is around PhP 352 billion (US$7.5 billion) over a 20-25 year period. The main elements of the Master Plan are:

[1] For the purpose of this Project, a drainage area is the entire area draining towards and served by a pumping station. Drainage channels are man-made channels, either surface or sub-surface. A waterway is a natural water channel that typically receives water from the drainage channels and conveys the water to the pumping station. A pumping station is a man-made structure that pumps water from the drainage area into a river, Manila Bay, or Laguna de Bay.

(a) structural measures to reduce flooding from river systems that run through the city, including as a priority measure a high dam in the upper Marikina River catchment area to reduce the peak river flows entering the city during typhoon and other extreme rainfall events;
(b) structural measures to eliminate long-term flooding in the flood plain of Laguna de Bay, including land raising or another similar development, to protect the population living along the shore against high water levels in the lake;
(c) structural measures to improve urban drainage;
(d) non-structural measures such as flood forecasting and early warning systems and community-based flood risk management; and
(e) recommendations for an improved institutional structure to deal with flood management in an integrated manner.

10. In order to improve the overall flood management conditions in Metro Manila all interventions under the above-referenced elements have to be implemented. However, each structural element can be implemented independently. For example, improvements in urban drainage areas proposed under this Project (element c) are not linked to proposals that would prevent annual flooding along the shores of Laguna de Bay (element b). Implementation of the Master Plan has started with some interventions, such as dredging and improvements to a small number of pumping stations, financed from government funds. Government deems it important to scale up such activities, which will be done under this proposed Project. In parallel, feasibility studies and designs of major priority interventions under element (a), such as a high flood management dam, river embankments, and water transfer tunnels, have to be prepared as soon as possible as they are essential for sustainable flood risk reduction in Metro Manila. Government was provided with about US$6 million technical assistance (TA) grant assistance from the Australia – World Bank Philippines Development Trust Fund (PH-PTF) and Japan's Policy and Human Resources Development (PHRD) Trust Fund, both administered by the World Bank, to prepare by the end of 2018 the necessary studies and designs for important structural interventions, including the dam, that could form the next major phase of the implementation of the Master Plan.

11. Many agencies are involved in flood management at national and local level. The aim of the institutional studies to be financed from the PHRD Grant (element e) is to determine the best institutional organization that can provide overall leadership, management, and responsibility for flood management in Metro Manila, and to bring flood management within the government's proposed integrated water resources management agenda as an integral part of river basin planning.

12. The Department of Public Works and Highways (DWPH) and Metro Manila Development Authority (MMDA) are the two main implementing agencies for the Project. DPWH is mandated to undertake country-wide planning, design, construction, and maintenance of infrastructure, such as national roads and bridges, flood control systems, water resources projects, and other public works. Historically, DPWH was responsible for the design, construction, and management of large pumping stations in Metro Manila. On July 9, 2002, a Memorandum of Agreement (MoA) was entered into by and between DPWH and MMDA to

turn over to MMDA all functions and responsibilities for flood control in Metro Manila, including all relevant programs, projects and activities, as well as personnel, funds, equipment, facilities, records, assets, and liabilities. However, even with the MoA in place, DPWH, through its Flood Control Management Cluster, continues to support flood-related developments in Metro Manila through the design and construction of pumping stations and the dredging of major rivers and waterways.

13. The Flood Control and Sewerage Management Office of MMDA has as its mandate the formulation and implementation of policies, standard, programs, and projects for integrated flood control, drainage, and sewerage services in Metro Manila. Presently, MMDA operates 57 pumping stations, located throughout Metro Manila, including 23 major stations with capacity exceeding 1 m^3/sec. The capacity of the 57 pumping stations ranges from less than 1 m^3/sec to 58 m^3/sec, draining areas in the range of less than 50 ha to over 2,000 ha. Each major pumping station has a qualified mechanical engineer and electrical engineer and an average of 15 staff, including operators and utility staff. As such, the institutional structure for proper operation and maintenance (O&M) is in place with generally capable operational staff. MMDA receives the funds for the O&M of pumping stations from the national government.

14. Proper O&M is becoming increasingly more difficult as most of the pumping stations and appurtenant infrastructure were constructed several decades ago, starting in the seventies, and are not functioning anymore up to design capacity. In addition, because of expansion of Metro Manila, there are many low-lying areas that are not served by pumped drainage systems, which can lead to long-lasting flooding at times when water levels in receiving water bodies are high. MMDA, DPWH, local government units (LGU), and other government agencies, have jointly identified 139 drainage areas, including a number of existing pumped drainage systems, for a long-list of priority intervention areas. Given limitations of the Project funding, it is estimated that about 56 drainage areas can be covered under the Project (36 existing and 20 new sites).

Solid Waste Management

15. Metro Manila generates about 9,200 tons of waste per day. The Ecological Solid Waste Management Act of 2000 (Republic Act, RA 9003) mandates barangays (lowest elected political unit in the Philippines) with ensuring waste segregation and undertaking basic waste collection, while LGUs are responsible for larger-scale collection, as well as for the transfer and final disposal of solid waste at designated landfill facilities. Most LGUs contract out collection and disposal, for which about 1,400 trucks are available as of 2016. The collection efficiency in Metro Manila is estimated at 80 percent, while the remaining 20 percent are either burned in backyards, left on the streets, or disposed into waterways. At the moment, the average recycling rate is estimated at 40 percent. MMDA is the main metropolitan government entity responsible for the identification and management of sanitary landfills, in partnership with private landfill operators. MMDA is actively looking at opportunities to reduce the volume of waste to be disposed to prolong the life of the existing sanitary landfills due to scarcity of land available within an economic hauling distance.

16. Individual and collective community behavior is a central factor contributing to weak solid waste management practices. The large volume and difficulties with collection and

disposal of solid waste from densely populated areas, leading to indiscriminate disposal practices, are important concerns for flood management in Metro Manila. Studies by the National Solid Waste Management Commission show that when solid waste collection is difficult, such as in many cramped informal settlements, nearby water bodies such as creeks and rivers become convenient dumping grounds. Some of the uncollected garbage on the streets also finds its way to water bodies through underground and open drainage systems. While most waste originates from residential sources, commercial waste affects some pumping stations as well, due to their location downstream of commercial districts. Waste operators at times dump remaining waste after sorting in waterways. Much of the waste in waterways ultimately hampers water flow and discharge during the rainy season that in turn contributes to flooding.

17. Solid waste that accumulates at pumping stations compromises the integrity of the pumping mechanisms, one of the reasons why many pumping stations in Metro Manila are functioning below their rated capacity. Most of the solid waste accumulating at pumping stations is residual (rather than recyclable), such as plastic bags, styrofoam food containers, tetra pak containers, and small single-use sachets. The collection and disposal of solid waste that accumulates at pumping stations is the responsibility of MMDA. From records of actual collection of waste at pumping stations by MMDA it is estimated that every year about 17,000 m^3 of solid waste (about 5,000 tons), mostly residual with limited recyclable value, ends up at the trash racks of the major pumping stations. Solid waste that has been collected at pumping stations often remains on-site for a significant period of time, thus encumbering the pumping stations' physical spaces and human resources, while also becoming a health hazard. Most pumping stations lack sufficient equipment, such as trash loaders, bins, and containers, to efficiently store and remove waste that has accumulated in the yards.

Informal Settler Families and Recent Relocation Efforts

18. The National Housing Authority (NHA) estimates that there are about 600,000 ISFs in Metro Manila or almost 2.8 million people.[2] This means that about one out of every five people in Metro Manila is living in informal settlements. Informal settlements are characterized by lack of security of tenure, poor living conditions, and often high exposure to natural disasters, especially flooding. Many ISFs live along and even over drainage channels and waterways that connect to pumping stations, impeding the flow of water and making access to waterways for maintenance difficult, if not impossible.

19. Over the years, the Government has implemented a number of social housing programs for the ISFs. Approaches have evolved from centrally-administered government-led approaches to more decentralized participatory ones. Past efforts to address ISF resettlement in Metro Manila, which have mainly been off-city resettlements, have been subject to criticism, mostly for lack of consideration for adverse socio-economic impacts on the affected households, such as loss of economic livelihood opportunities, lack of adequate access to basic services, and disruption of social networks. Due to absence of opportunities for livelihood restoration and/or mismatch between skills and job opportunities, ISFs resettled to off-city sites often experience a

[2] A household has an average 4.6 members.

sharp decline in incomes and many decide to migrate back to informal settlements in Metro Manila.[3]

20. During the past years, the Government has accelerated the provision of shelter, particularly for low-income groups and the urban poor. It launched in 2011 the *Oplan Likas Program: Lipat para Iwas Kalamidad At Sakit* (Operational Plan: Evacuation to Prevent Calamity and Sickness). The program that was closed at the end of 2016 aimed to relocate about 104,000 ISFs out of danger areas, including waterways, and allocated PhP 50 billion (approximately US$1.05 billion) over five years from 2011 to 2016 to finance land acquisition and housing construction costs. Taking global and national best practices into account, *Oplan Likas* advocated for in-city relocation within the vicinity of ISFs' livelihoods, leaving off-city relocation as a last resort. Yet, due to lack of affordability, land constraints, and institutional challenges, among other factors, about 67 percent of the resettlement under *Oplan Likas* undertaken by NHA has been off-city.

21. In late 2015, the Bank supported NHA with a study to take preliminary stock of the various practices used by the *Oplan Likas* program.[4] Several good practices were included in the program that allowed the relocation of tens of thousands of ISFs. Contributing factors include: (i) adoption of certain protocols, e.g. the affected families were allowed to demolish their houses themselves and take anything of value; (ii) incentives such as the transitional assistance of PhP 18,000 (approximately US$380) per family; and (iii) in general, some choices given on which site to resettle. Aspects from *Oplan Likas* that can still be improved include: (i) inadequate consultations with the hosting communities; (ii) instances of lack of preparation of a comprehensive Peoples' Plan or a Resettlement and Rehabilitation Action Plan for an affected community; (iii) insufficient information regarding the types and extent of the assistance ISFs were entitled to; (iv) lack of timely and adequate access to basic services, especially in off-city sites; (v) limited livelihood restoration measures; and (vi) insufficient use of existing grievance redress mechanisms (GRM).

22. The government has started to address such issues. Through the initiative of the Presidential Commission for the Urban Poor (PCUP) and with strong support from both Houses of Congress, short-term and long-term measures have been agreed upon by key stakeholders, including resettled ISFs themselves, to address certain issues in 18 off-city resettlement sites. One important measure has been the allocation of a PhP 1.8 billion (approximately US$38 million) social infrastructure budget from the General Appropriations Act of 2017 to be used to improve basic services and livelihood conditions at the 18 sites. The amount includes budgets

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[3] Institute of Philippine Culture, School of Social Sciences, Ateneo de Manila University (2011). "The Social Impacts of Tropical Storm Ondoy and Typhoon Pepeng". The Bank commissioned study found that up to 72 percent of the surveyed households that were resettled off-city reported decreased income up to 43 percent. They also reported increased expenditure driven by higher costs of transportation to schools, work, shops, 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.

[4] The study looked at a small number of resettlement areas and its level of compliance with the Bank's Operational Policy (OP) 4.12 – Involuntary Resettlement. The study covered four off-city resettlement sites (Golden Horizons and Sunshine Ville in Cavite Province and San Jose Del Monte Heights and Pandi Residences in Bulacan Province) under NHA, and one in-city (Bistekville 2 in Quezon City) resettlement site under the Social Housing Finance Corporation.

for livelihood programs, health, education, solid waste management, and community infrastructure. Concerned agencies are currently working on the finalization of activities for the said fund.

23. The Bank supported the Government's key shelter agencies through Bank-executed TA from 2010 to June 2016, including some tasks that focused on making in-city resettlement housing possible and sustainable for ISFs. TA studies focused for example on assessing the demand and supply for rental support to allow temporary relocation from a project site until the resettlement site is ready, subsidy design for mortgage affordability, and capacity building for key shelter agencies (KSA) and community organizations (CO). The results of these TA programs have informed the design of component 3 of this proposed Project (see details in Annex 6). The government has expressed willingness to minimize eviction before relocation sites are ready and ensure that services are provided in relocation sites prior to relocation.

D. Higher Level Objectives to which the Project Contributes

24. The recently approved Philippine Development Plan (PDP) for the period 2017 to 2022 highlights the serious issue of flooding in many parts of the country. Due to climate change, flood prone areas have increased despite flood management initiatives, and frequency and intensity of flood occurrences are increasing. The PDP states that the government is committed to implement and expand flood management programs in order to mitigate flood risks.

25. The goals of the Philippines Country Partnership Strategy (CPS, Report No. 78286-PH) for FY15-18 are to promote inclusive growth, reduce poverty, and support shared prosperity through five engagement areas. The proposed Project is aligned with engagement area 4 on climate change, environment, and disaster risk management. In particular, the alignment is consistent with strategic outcome 4.1 - increased resilience to natural disaster and climate change impacts, and strategic outcome 4.2 - improved natural resource management and sustainable development.

26. The overall objective of the Master Plan is to provide sustainable flood management and safely control major flood events in Metro Manila. The Project is the first major phase in the implementation of the Master Plan. The Project does not only respond to the commitment of the government to implement flood management programs, it will also contribute to the government's goal of promoting inclusive growth and the Bank's twin goals of reducing extreme poverty and boosting shared prosperity. Recurrent flooding has considerable impact on the poorest populations who generally live in high-risk flood-prone areas. Risk of flooding concerns many people, mostly for living in constant danger and for fear of their children's safety. Regular risks such as flooding in urban areas are considered more negatively by people than extreme risks that occur very rarely, e.g. earthquakes. The regular risks come with repeated damage to houses, furniture, and other assets, and the need to clean up property. During flood events people have difficulty going to work, thereby affecting productive capacity. Regular flooding thus restricts people's ability to exit from poverty and inhibits economic growth. Investing in the proposed Project's multi-sector interventions will reduce the vulnerability of the population to future high rainfall events and will improve people's health conditions and their ability to benefit from growth. Hence it will give them better chances to move out of poverty.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

27. The Project Development Objective (PDO) is to improve flood management in selected areas of Metro Manila.

28. This objective will be achieved by: (i) constructing new and modernizing existing pumping stations, and improving their supporting infrastructure and associated drainage systems; (ii) improving solid waste management practices within the vicinity of drainage systems served by the selected pumping stations; and (iii) supporting the resettlement of Project Affected People (PAP, mostly ISFs), affecting the proper O&M of the selected pumping stations and associated drainage systems.[5]

B. Project Beneficiaries

29. It has been estimated that with the available Project funds some 56 drainage areas in 11 LGUs, covering a total estimated drainage area of 11,100 ha or over 17 percent of the total area of Metro Manila, can be supported under the Project. The total population in these 56 drainage areas, either with existing or proposed pumping stations, is estimated at around 3.5 million or about 760,000 households. The direct Project beneficiaries, i.e. those that are adversely affected by regular flooding in the 56 drainage areas, are estimated at 1.7 million or about 370,000 households, with the exact number depending on the final selection and number of drainage areas that will benefit from funding under the Project. These numbers were derived from overlaying population and flood risk maps. About 50 percent of the direct beneficiaries will be female. Direct Project benefits include the reduction of damage to properties and infrastructure and reduction in income loss (livelihood and business). There will also be a lesser need for evacuation of people to safe areas during periods of intense rainfall and typhoons.

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[5] Although the Project is not linked with *Oplan Likas*, certain activities financed by the Project overlap spatially with *Oplan Likas* (see Section VI.E and Annex 7 for more details). Under the Project, certain dwellings and structures built by people along waterways are encroached on or along the waterways where their presence impedes the flow of flood waters or inhibit access for effective maintenance and operation of the facilities, especially the waterway immediately upstream of pumping stations. Such dwellings and structures would thus result in an ineffective operation of the infrastructure developed under the project with less impact on flood reduction. The overlap is determined by the Project's area of influence related to resettlement, also referred to as the 'technical footprint', 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. Those who live within the Project's technical footprint or those who were resettled from the technical footprint under *Oplan Likas* are considered PAPs under the Project. The timing of resettlement that has already taken place will determine whether it will be considered a legacy issue with resettlement to be in accordance with country legislation and the objective of OP 4.12 or be compliant with OP 4.12 (See Section VI.E). It is noted that the technical footprint for resettlement purposes is smaller than the Project footprint for environmental and social impact assessment (ESIA) purposes. The Project Area of Influence for the purposes of the ESIA for subprojects (project footprint) comprises of the pump station and yard, drainage area, waterways and drainage channels, and ancillary facilities, such as access roads, disposal sites for dredged materials and solid wastes from pumping stations, and resettlement sites.

30. Direct beneficiaries include the families who will benefit from investments in relocation under the Project. This number is estimated to be about 2,500 families or 11,500 people. These are predominantly informal settlers, some of whom are residing in the areas where new pumping stations will be constructed, but mostly those living in the Project's technical footprints.

31. The Project will have several institutional and technical benefits. It will benefit DPWH and MMDA with improvement in planning and implementing large, multi-sectoral projects. The same agencies will benefit from capacity building in planning, designing, and implementing modernization of drainage areas, including in particular pumping stations, as well as use of modern waterway cleaning equipment. MMDA and participating LGUs will benefit from strengthening their capacities to plan and implement solid waste management programs in high density areas. Finally, NHA, Social Housing Finance Corporation (SHFC), and LGUs will benefit from planning and implementing participatory in-city housing programs and piloting of progressive and transparent subsidy programs.

C. PDO Level Results Indicators

32. The proposed PDO level results indicators include: (i) flood-prone areas that are free of water within 24 hours after a major rainfall event (measured in hectares); (ii) direct Project beneficiaries, of which females (measured in number of beneficiaries); (iii) solid wastes collected at targeted existing pumping stations (measured in cubic meters); (iv) households successfully resettled from areas where they would obstruct proper O&M of the drainage systems (measured in number of households); and (v) beneficiaries satisfied with reduced vulnerability to flooding in Project areas (measured as percentage). Annex 1 provides definitions and other information.

III. PROJECT DESCRIPTION

A. Project Components

33. The combination of rainfall events leading to excess water in urban areas, underperforming pumping stations and drainage systems, solid waste causing obstructions of drainage channels and waterways, and at pumping stations, and people living over waterways exacerbates flooding in urban areas, even during moderate rainfall events. Water recedes slowly out of the drainage areas, impacting the living conditions of many people. Improvements will require a multi-sectoral approach of simultaneously improving or constructing physical flood management infrastructure, improving solid waste management, and where needed relocating ISFs living within technical footprints. This assessment has resulted in the three main components discussed below. Five drainage areas have been selected for implementation to start in Project Year 1 (PY1). Details of the components and the proposed activities in these five areas are described in Annex 2, while Section IV and Annex 3 describe the selection and approval processes for subsequent years.

Component 1 - Modernizing Drainage Areas (US$375.2 million)

34. *Pumping Stations and Related Infrastructure.* Under this component, the Project will construct an estimated 20 new and modernize an estimated 36 existing pumping stations and

appurtenant infrastructure, improve the associated waterways and drainage channels, including secondary and tertiary ones as needed, and develop new drains when required. Modern, efficient, and high capacity pumping units will be installed. The design discharge determination will be underpinned by hydrological studies of the drainage areas and the best type of pump will be selected for each given site. Improvements to appurtenant infrastructure such as flood gates and trash racks will be carried out as necessary. The energy source will, where needed and possible, be changed from diesel to electricity. The component will also finance dredging, including accumulated sediments and buried solid waste.

35. *Asset Management Plans and Maintenance Equipment.* The component will develop asset management plans, as a minimum for the major pumping stations, and operational manuals will be prepared or updated for all pumping stations and associated waterways to guide MMDA towards proper O&M of the pumping stations and other drainage infrastructure and to determine the budgets required for this. The component will provide specialized modern waterway maintenance equipment, such as floating dozers, couple pontoons, and remote controlled cleaners for closed drains and interceptors, not only to enable DPWH and MMDA to carry out emergency cleaning operations, but also to test and show private contractors what equipment is available for efficient waterways cleaning. Modern equipment for removal of water hyacinth will be introduced, as well as programs that encourage processing for reuse of hyacinth products as community livelihood activities, which are especially practiced by women, and production of biogas on a pilot basis.

36. *Water Retention.* A program of increasing the water retention capacity within the project drainage areas will be developed and implemented, where suitable. This can include green and other infrastructure such as rooftop rainwater collection, green roofs, permeable pavements, and temporary retention of drainage water in public areas such as basketball courts and parking garages. As part of the design of specific interventions in each drainage area there may be activities related to for example community-based flood risk management and setting up of local warning systems.

Component 2 – Minimizing Solid Waste in Waterways (US$48 million)

37. *Improving Solid Waste Management in Project Drainage Areas.* The component will carry out neighborhood-level activities near the pumping stations and waterways and drainage channels targeted under Component 1 of the Project through: (i) improved solid waste collection services; (ii) community mobilization and awareness creation; (iii) incentive-based improved waste collection with independently verified results; and/or (iv) neighborhood upgrading. LGUs and barangays within the designated project areas along waterways may choose a combination of some or all these four activities, based on their local needs. Targeted solid waste collection services will involve the provision of equipment such as bins, push carts, and larger storage containers, appropriate for local-level waste collection, and according to the preferred collection system in a given barangay or LGU. Community mobilization and awareness creation will involve a combination of local-level information, education and communication (IEC) campaigns, with the involvement of local level block leaders, to raise awareness and encourage behavior change for improved solid waste management at the individual and household level. Financial incentives to barangays for small community projects (e.g. street lighting or

playgrounds) will encourage improvements in solid waste collection and management. Payments will be based on independently verified results of improved waste collection and thus reduced waste quantities at pumping stations. Investments in neighborhood upgrading will beautify selected waterways and easements where feasible, increasing the level of satisfaction with the neighborhood and thus reducing the practice of indiscriminate disposal of waste into the waterways.

38. *City-wide Waste Management Activities.* The component will carry out metropolitan-wide activities for improved solid waste management, including: (i) a large-scale metro-wide IEC campaign; (ii) the development of an integrated management information system (MIS); and (iii) preparation of a solid waste master plan for Metro Manila. The IEC campaign will focus on creating awareness about reducing solid waste, recycling, proper disposal of solid waste, and the impact on landfills. An integrated MIS is crucial for improved operation and performance of Metro Manila's overall solid waste management system. The MIS will help track the implementation of the waste management activities in the Project's drainage areas, as well as enable MMDA to better monitor city-wide waste collection activities and track performance, and thus deploy needed resources to critical sites in a more strategic, dynamic, and efficient manner. The solid waste master plan will provide the overall framework for a strategic and coordinated vision for all of Metro Manila, including assessment of innovative waste management opportunities, including waste to energy ones, and development of new landfills. In the context of existing national frameworks and guidelines, the master plan will provide specific guidance for LGUs, while strengthening the role of MMDA in managing inter-jurisdictional activities.

39. *Innovative Waste Management Opportunities.* If confirmed by the solid waste master plan, the Project will support, where feasible, MMDA's agenda to apply appropriate technologies to reduce the volume of residual solid waste from Project drainage areas that ends up in landfills. Possible solutions include shredding machines at pumping stations to reduce the waste volume and waste processing equipment such as styro-filters that transform styrofoam waste into activated carbon, which can then be utilized for purifying water. If studies show viable technical and financial solutions, loan proceeds may be used to support a number of innovative waste management opportunities. An amount of US$15 million has been preliminarily earmarked for such pilots under this component. In case viable opportunities will be pursued, a Project restructuring will take place, including as needed an update of the applicable safeguards documents.

Component 3 - Participatory Housing and Resettlement (US$55.75 million)

40. As described in detail in Section VI.E, this component will support three groups of project affected people. Group 1 refers to PAPs who were resettled before December 8, 2014 (the date of the announcement of the Project identification mission). Group 2 refers to PAPs that were resettled from technical footprints from December 8, 2014 to Project effectiveness. Group 3 refers to PAPs that will be resettled from technical footprints after Project effectiveness.

41. A number of new pumping station sites may necessitate some resettlement from the area where the stations will be constructed. There will also be resettlement from the technical footprint of an estimated 16 drainage areas. The magnitude of PAPs to be resettled as Group 3,

mostly ISFs, is expected to be around 2,500 households, but the actual number of ISFs may change based on the pumping stations that will ultimately be targeted under the Project. The Project will also finance remedial measures, as needed, for families that were relocated from the technical footprint under recent government-financed programs, in particular *Oplan Likas*, to ensure that past resettlement will be as per applicable requirements of the Bank's Operational Policy (OP) 4.12 – Involuntary Resettlement (Groups 1 and 2).

42. *Resettlement of PAPs.* The component will carry out a program of activities to resettle people away from the technical footprints of the Project by providing access to better housing and basic services, and building stronger community organizations. This includes: (i) land acquisition; (ii) site development; (iii) housing construction; (iv) rental support for an average transition period of 24 months, as needed[6]; (v) livelihood assistance programs; and (vi) technical assistance and capacity building activities to strengthen the communities, LGUs, and implementing and housing agencies to undertake resettlement programs. To allow flexibility and cater to varying needs of PAPs, up to three standard resettlement options will generally be offered, with priority being in-city resettlement in vertical housing. Other possible options are near-city resettlement and self-resettlement with cash payment.[7] Other options expressed as preference during consultations with PAPs (e.g. off-city resettlement) will be considered as requested. Screening of feasibility of the three standard options will be undertaken before consulting with PAPs, so that only affordable options will be discussed.

43. *Support to Past Resettlement.* The component will assess through due diligence processes the needs for either individual assistance activities to PAPs and/or community development activities at sites where people were resettled under government resettlement programs from the Project's technical footprint. Community development activities can include community-based infrastructure, community livelihood programs, and local economic development.

Component 4 - Project Management and Coordination (US$20.0 million)

44. The component will provide support for the operation of the Project Management Offices in DPWH and MMDA with respect to the management and coordination of their respective parts of the Project, including in each case: (i) payment of incremental operating costs; (ii) provision of office equipment and materials; (iii) provision of training and carrying out of knowledge sharing and peer-to-peer learning activities; (iv) provision of consulting services for design and supervision of Project activities, safeguards, monitoring and evaluation of the Project, etc.; (v) development and implementation of a communication strategy; and (vi) managing a grievance redress mechanism.

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[6] The average 24-month transition period is mostly expected for in-city resettlement, but may apply to other forms of resettlement as well. Rental assistance will be provided to PAPs who have agreed to vacate their current dwellings for temporary rented houses near their current area of residence so that activities in the drainage area can commence as early as possible. The Project will help PAPs find houses/rooms for rent. This measure is expected to be acceptable to PAPs as they will not be moved from their current sources of livelihood.

[7] Near-city resettlement is defined as resettlement that will result in minimal economic dislocation and with secure access to basic services, and from where people can still reasonably easy commute to their livelihoods of origin.

B. Project Cost and Financing

45. The total Project amount is US$500 million, to be financed by loan proceeds and counterpart funds. IBRD will provide a US$207,603,205 Investment Project Loan (IPF) to the Philippines. It will be a LIBOR-based Variable Spread Loan (VSL), commitment-linked with level repayments of the principal. The loan will have a maturity of 25 years, including a grace period of 14 years. A front-end fee of 0.25 percent will be applied and capitalized. The Asian Infrastructure Investment Bank (AIIB) will provide a joint co-financing in the form of a Loan of US$207,603,205, allocated to the same expenditures and on a 50 percent basis with IBRD. The joint co-financing is to be implemented in accordance with the Co-Financing Framework Agreement entered into between AIIB and the Bank on April 13, 2016, and a Co-Lenders Agreement to be entered into between AIIB and IBRD for the administration of the Project by IBRD, including provision of procurement, financial management, disbursement, investigative, and environmental and social services to AIIB. The Government of the Philippines (GoP) will contribute to the financing of the Project in an amount equivalent to not less than US$84,793,590 allocated to the financing of ten percent of the costs for components 1, 2, and 4. GoP will finance specific expenditures under component 3, including the costs related to land acquisition, site development, and housing construction (estimated at about US$38 million), as well the resettlement management, which are mostly costs incurred by NHA and SHFC. It is estimated that 65 percent of the component 4 costs will be managed by DPWH and the balance by MMDA. In the table below, as well as on the cover page of this PAD, the numbers above are shown in million US$ and have been rounded to the second decimal.

Table 1. Project Costs

		SOURCES OF FINANCING (Million US$)		
Components	**TOTAL**	**IBRD**	**AIIB**	**GoP**
Component 1: Modernizing Drainage Areas	375.20	168.84	168.84	37.52
Component 2: Minimizing Solid Waste in Waterways	48.00	21.60	21.60	4.80
Component 3: Participatory Housing and Resettlement	55.75	7.64	7.64	40.47
Component 4: Project Management and Coordination	20.00	9.00	9.00	2.00
TOTAL Direct Project Cost	*498.95*	*207.08*	*207.08*	*84.79*
Front-end Fee	1.04	0.52	0.52	0.00
TOTAL	**500.00**	**207.60**	**207.60**	**84.79**

Note: The exact (non-rounded) IBRD amounts are: Component 1 - US$168,839,747; Component 2 - US$21,600,000; Component 3 - US$7,644,450; Component 4 – US$9,000,000; and Front-end fee - US$519,008, for a total of US$207,603,205.

C. Series of Project Objective and Phases

46. At the time of the approval of the Master Plan, GoP made a commitment to start its implementation with substantial investments. The Project is entitled Metro Manila Flood Management Project – Phase 1 by the Borrower in all its documents. It is one of the large interventions that was identified in the Master Plan and is considered by the Bank as a stand-alone project. The Bank has entitled it as Metro Manila Flood Management Project.

D. Lessons Learned and Reflected in the Project Design

47. The following main lessons have been reflected in the Project design.

(i) Urban flood management improvements require comprehensive solutions that consider the entire drainage system from upstream to downstream and take into account climate change. Proposals have to be based on a thorough assessment of the entire drainage area. The Project design reflects this as each selected drainage area will be surveyed, investigated, mapped, etc., and specific interventions will be determined. High quality of designs, that preferably have minimum maintenance requirements, and construction is indispensable and must be achieved by using qualified and experienced government staff, consultants, and contractors;

(ii) Solid waste management requires both soft and hard interventions, including individual behavior change in addition to improvements in infrastructure and institutions. This has been successfully implemented in projects in a number of cities around the world. Lessons from solid waste management activities have been reflected in the design of component 2 that combines activities on awareness creation and training towards mentality change among the population along waterways and drainage channels how to deal with solid waste, as well as solid waste management equipment;

(iii) International and national best practices in social housing and resettlement and lessons learned from innovative initiatives supported by Bank-financed TA in the housing sector in the Philippines have been reflected in the design of component 3. Lessons include: (i) importance of an integrated and holistic approach to resettlement that not only addresses the housing, but also the broader socio-economic issues such as strengthening of homeowners' associations, improvement of livelihoods, and ensuring adequate estate management post-occupation; (ii) need for extensive community participation in resettlement design and implementation to ensure their voices are reflected and they are empowered in the process; (iii) need for upfront capital subsidies to make in-city vertical housing affordable for the ISFs; (iv) need for a resettlement monitoring and evaluation (M&E) system to keep track of progress, challenges, and outcomes of resettlement; and (v) need to incentivize LGUs to take a leading role in resettlement, considering their advantage of being closest to the communities;

(iv) A clear and comprehensive communication strategy and information campaign is critical. Key stakeholders, the people living in high-risk flood areas, those living in

the technical footprint of a drainage area, and the population at large need to be regularly informed about the Project, its progress, and main actions and decisions taken, as well as being sensitized about the need and importance of disaster risk reduction and residual risks. This has been practiced in other Bank-funded projects and a comprehensive communication plan will be developed and implemented under the Project;

(v) A clear understanding of the drainage system assets will allow putting in place effective mechanisms for sustaining the required level of O&M. This lesson is based on experiences in many infrastructure projects. As part of component 1, the Project will develop asset management plans, as a minimum for the major pumping stations and associated drainage systems. Operational manuals will be prepared or updated, where needed, to optimize the operation of the drainage infrastructure, in particular the pumping station; and

(vi) New techniques and equipment have to be tailored to the existing level of capacity, the need for specific facilities, and available funds for maintenance. This will have to be accompanied by training programs so that sophisticated equipment is used effectively and does not deteriorate for lack of use or maintenance. The Project will provide equipment, but initially for testing and demonstration purposes.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

Programmatic Approach

48. The Project is following a programmatic approach and a number of specific drainage areas will be selected during each of the first three project years, based on a set of technical, economic, and social criteria that are described in Annex 2 and the project operations manual (POM). The 56 drainage areas referred to in component 1 have been identified as priority by government, but the final selection of drainage areas will be confirmed during Project implementation. There is sufficient flexibility to include other drainage areas if these are deemed to be of higher priority at the time of applying the selection process. Also, if the Project experiences too many issues that could delay Project implementation in a particular drainage area, for example a LGU does not provide land for site development when it is known that there is land available, another drainage area could be selected for Project support. Drainage areas will be selected in each of the first three years of Project implementation, so that by the end of the third year all drainage areas have been selected. Initially the Project will focus on getting drainage areas where there is no resettlement under implementation, while in parallel DPWH and others will be working on the safeguards requirements in drainage areas with resettlement. Implementation of activities in such areas is expected to start in the third year of Project implementation. It is planned to have the final contracts signed in PY 5.

Processes for design and implementation of Activities in a Specific Drainage Area

49. Following the selection of a drainage area into the Project, surveys, investigations, and mapping will take place, under the leadership of DPWH, but with involvement of MMDA, NHA or SHFC, Housing and Urban Development Coordination Council (HUDCC), LGU, and others, as needed. Based on the identified needs, the required interventions will be determined in line with the overall scope of each of the components. Interventions will vary from drainage area to drainage area. The various components are integrated and work towards a long-term solution to improve flood management in the Project's drainage areas, but this does not mean that all components will be implemented in all drainage areas. For example, if in a particular drainage area there is no need to relocate people, component 3 will not be part of the detailed interventions for such drainage area and the involvement of NHA, SHFC, and HUDCC will stop after investigations in such drainage area. The process required for each drainage area from design to start of implementation is summarized in the next two paragraphs.

50. A feasibility report for each drainage area will be prepared that describes the surveys, investigations, and mapping, the proposed interventions, safeguards requirements, and feasibility-level costs and benefits. An inter-agency committee, chaired by the Undersecretary Operations of DPWH and the Assistant General Manager for Operations of MMDA as co-chair, and attended by technical, safeguards, and fiduciary staff of the two agencies and staff of NHA and SHFC, will meet on a bi-monthly basis, as needed, to review and approve feasibility reports. Minutes of meetings will be prepared and shared with the Bank. The Bank will also review the feasibility study to determine that it is consistent with the objective and general scope of the Project. If acceptable, the Bank will provide a written confirmation to DPWH that the Bank is in agreement to proceed with the detailed design of activities in the drainage area. A copy of the feasibility study and the minutes of the inter-agency committee will then also be sent to NEDA's Project Monitoring Office for information and use during regular monitoring activities.

51. After the Bank's formal agreement to proceed with a drainage area has been given, the identified interventions will be designed by the relevant agencies, as needed with support of consultants. At this time the required safeguards documents and tender documents will be prepared as well, in consultation with relevant stakeholders and PAPs. When draft documents are available, to be submitted to the Bank by the chair of the inter-agency committee, the Bank will carry out appraisal of the proposed activities in the drainage area, including technical and safeguards appraisal. This may require several interactions between the implementing agencies and the Bank task team to get acceptable documents. After a positive appraisal in compliance with the Loan Agreement, safeguards instruments, etc., the Bank will issue a no objection in writing to the chair of the inter-agency committee stating that the proposals in the drainage area have been appraised and are eligible for inclusion in the Project (see also Annex 4). The committee will then make a final decision to proceed with implementation, which will be through a number of contract packages that will be procured in accordance with the applicable Procurement Guidelines. Relevant safeguards documents will have to be disclosed in-country and in the Bank's Infoshop before the implementation of activities for which the documents apply.

Steering Committees

52. A high-level steering committee and a technical-level steering committee were established by DPWH Order for the overall management and coordination of the Master Plan preparation. The membership of each of the committees includes DPWH, MMDA, Department of Environment and Natural Resources (DENR), Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), Department of Finance (DoF), NEDA, Department of Interior and Local Government (DILG), and Laguna Lake Development Authority (LLDA). These steering committees will continue to operate during Project implementation, with an expanded membership, including the KSAs, PCUP, HUDCC, and the Department of Budget and Management (DBM). The high-level committee (Project Steering Committee) is expected to meet at least once per year to provide overall direction and strategic guidance to the Project Management Offices (PMO) of the implementing agencies. It will ensure efficient Project implementation and make sure that major implementation and supervision issues are adequately addressed by each of the implementation agencies. The technical-level committee (Technical Steering Committee) is expected to meet at least twice per year to provide overall technical direction and guidance to the PMOs, in particular to resolve implementation issues outside the control of the PMOs.

Day-to-day Implementation Arrangements

53. The main responsibilities for the day-to-day implementation of the components are as follows:

- component 1 – DPWH, in close cooperation with MMDA;
- component 2 – MMDA, in close cooperation and with support of LGUs and barangays;
- component 3 – DPWH for the preparation of a resettlement action plan (RAP) or due diligence report (DDR), to be implemented by either NHA or SHFC[8], in close collaboration with MMDA, relevant LGUs, DILG, and with HUDCC to act as the oversight agency for the key shelter agencies; and
- component 4 – DPWH and MMDA.

54. DPWH and MMDA will manage the loan funds and have procurement responsibilities. A Memorandum of Agreement was signed in May 2017 by DPWH and MMDA senior management to spell out the responsibilities of the two agencies for Project implementation. For example, MMDA shall closely cooperate with DPWH in the implementation of component 1 to ensure that MMDA will be ready to take over the O&M of the pumping station facilities after construction by DPWH.

55. The PMOs in both DPWH and MMDA will be staffed with qualified government staff, supplemented with consultants as needed, so that the required technical, safeguards, communications, fiduciary, grievance redress, and M&E capacity is available. Consultants will support DPWH regular staff with the implementation of the Project. It is important that

[8] A geographical division of labor between the two agencies has been agreed upon, while also agreeing that there has to be some flexibility in this, based on preference of affected communities (see Annex 3 for details).

consultants are also required to build capacity in the implementing agencies through on-the-job training.

Project Year One Drainage Area Activities

56. Five drainage areas have already been selected by MMDA and their modernization will start during the first year of Project implementation. The five pumping stations are Vitas, Balut, and Paco in Manila, Tripa de Galina in Pasay, and Labasan in Taguig. The design of the optimum pumping capacity has been completed, based on the hydrological conditions in each drainage area as well as the hydraulic and technical conditions in the drainage systems and at the pumping stations. Based on the design calculations, the pumping capacities can be increased by 29 to 255 percent from the current pumping capacities. The technical specifications have also been prepared. The total estimated cost to upgrade the five pumping stations is US$30.5 million. The necessary desilting of waterways and drainage channels leading to the five pumping stations has also been determined. The total sediment volume to be removed is estimated at 1.38 million m^3 and the cost estimate is US$9.2 million. The implementation of component 3 will start as well, as specified in the prepared safeguards documents (see Section VI.E and F). Finally, DPWH and MMDA are interested to introduce modern cleaning and desilting equipment during the first year of the Project. The total cost estimate for such equipment is US$6.7 million. Therefore, it is expected that works and goods amounting to up to US$46 million will be procured during project year one, with the works and equipment delivery to start during the first year as well.

B. Results Monitoring and Evaluation

57. Monitoring and evaluation activities related to the Project will be the direct responsibility of the PMOs, with the support of consultants, as needed. Monitoring Project progress and achievements will entail a process of reviewing continuously and systematically the various Project implementation activities. A comprehensive M&E framework and system will be established under the Project to provide stakeholders with timely data regarding the progress and results of the Project. The objectives of the M&E are to: (i) measure input, output, and outcome indicators; (ii) provide on a regular basis information on progress towards achieving desired results and to facilitate reporting to the management of oversight and participating technical agencies in government and LGUs, and to the Bank; (iii) alert government and the Bank to actual or potential problems in implementation so that timely adjustments can be made; and (iv) provide a process whereby the PMOs can reflect and improve on performance. As project sites and the specific interventions are not yet known in full detail, indicators cannot be exactly quantified. The results framework in Annex 1 provides estimates based on an assessment of the priority 56 drainage areas that will be improved and updated as the Project is being implemented. The final targets will be agreed at mid-term review when all drainage areas to be supported by the Project should have been identified and surveyed.

58. The results of relevant M&E activities will be reported in semi-annual progress reports that will be prepared by each of the PMOs, but compiled in one progress report by DPWH's PMO. These reports will cover the progress with implementation in drainage areas, the institutional activities and training, as well as updates of the performance indicators, the procurement plans, etc. A section of the progress reports will be devoted to issues identified

during project implementation and strategies and actions to be taken to resolve such issues to avoid that they negatively affect future implementation progress. To ensure accurate data collection, specialist support to help the PMOs establish a robust monitoring database will be provided to relevant PMO staff, as needed, at the outset of the Project and periodically afterwards.

59. After about one year of Project implementation, a full review of the practices and experiences with the implementation of the safeguards instruments will take place with participation of all relevant government agencies and the Bank's task team, and necessary changes and updates to the safeguards documents will be made. A mid-term review will be conducted towards the end of the third year of implementation to review the soundness of the Project design, scope, and implementation arrangements and to make adjustments, as needed, to be able to complete the Project in time and with achievement of the PDO.

60. Additionally, it is envisaged that a number of studies will be undertaken during the course of the Project to analyze and evaluate performance. Baseline surveys that capture the current physical and economic conditions of each drainage area and socio-economic status of a sample of people residing in each drainage area will be undertaken during the survey, investigation, and design stages. Mid-term and end-of-project outcome assessments will be undertaken to capture progress and changes over time. Thematic studies may also be undertaken to enhance the efficacy of key aspects of the Project. These may include among others: (i) household surveys on ISFs to be resettled before and after the relocation to gauge the changes in their socio-economic status; and (ii) beneficiary feedback and satisfaction surveys.

C. Sustainability

61. Sustainability is likely because the Project will adopt measures to ensure that: (i) each drainage area will be investigated and surveyed extensively to determine the prevailing conditions with regard to flood management, solid waste and sedimentation management, and ISFs and design a tailor-made program for each drainage area; (ii) result-based financing incentives to barangays are introduced to encourage changes in solid waste collection and management, including household participation in proper solid waste disposal; (iii) extensive community participation in resettlement planning and implementation will take place, which will increase ownership and commitment to the PDO; (iv) the housing and resettlement options will reflect the preference of communities in terms of choices and affordability; and (v) social preparation and community organization are integral parts of resettlement options, which will help communities to be more ready for actual resettlement. Finally, the Project is part of the approved Master Plan's long-term resilience and sustainability agenda for Metro Manila and as such has strong commitment from government.

62. From the technical sustainability perspective, the Project will support capacity and skill building of DPWH and MMDA staff to ensure that Project activities, including designs and construction supervision, are in line with international good practice. This will include the preparation or updating of pumping station operational manuals to effectively operate these in future. With regard to financial sustainability, at least for the major pumping stations and drainage areas, the Project will support the use of asset management tools to establish specific

needs-based O&M systems that aim to define precisely how much funds are needed for the dedicated use by the pumping station operator, thus supporting a more efficient budget allocation. Asset management systems determine in a systematic way the maintenance and related budget needs, both annually and longer-term, and monitor in a transparent manner the actual versus planned maintenance expenditures. The results can easily be publicly disclosed to enhance transparency. The introduction of modern, high efficiency, and low-maintenance pumps and maintenance equipment will improve the financial sustainability of pumping stations due to reduced O&M expenses.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

63. The summary of the Systematic Operations Risk-Rating Tool (SORT) is presented in the data sheet. The overall risk is High. Of the various risk categories, the high risks identified through SORT relate to institutional capacity for implementation and sustainability and environment and social, while substantial risks relate to fiduciary and stakeholders. These main risks associated with the Project and proposed mitigating measures are discussed in more details in the next paragraphs.

Institutional capacity for implementation and sustainability

64. Project implementation involves several implementation modalities and partner agencies and activities in many different locations that may result in implementation complexities. Especially MMDA and LGUs don't have extensive experience with implementing multi-sectoral projects that are funded by international finance institutions. Therefore, the required capacity for coordination among the various implementation and supporting agencies to implement a multi-sectoral project involving multiple stakeholders may be lacking. In addition, the activities for most of the drainage areas have not yet been fully identified and worked out, which means that there is a risk of delays in project implementation if there is not sufficient implementation capacity. Without additional support, there is thus a substantial likelihood that weak and insufficient institutional capacity for implementing and sustaining the operation may adversely impact the Project. Both DPWH and MMDA have established PMOs for the implementation of the Project. PMO staff will be trained as required. The PMOs will also engage qualified external consultants as needed to provide Project management and implementation support. Considering the programmatic approach, different activities will be carried out at a number of locations at any time. The peak of activities is expected during project years three to five when activities in up to an estimated 30 drainage areas will be at various stages of implementation. It will be ensured that the PMOs are then at full strength and that there is sufficient consulting capacity available to support the PMOs. Implementation capacity of each of the project agencies will be monitored by the Bank on a regular basis during project implementation and will be strengthened as necessary. Clear operational modalities will be established that will reduce implementation complexities. There is some uncertainty regarding MMDA's technical and financial capacity to sustain the outcomes of the operation. As part of the design of the interventions in each drainage area the required O&M staffing and funding will be determined to guide MMDA towards allocation of adequate funds and personnel for future O&M. Drainage and flood management are considered as public goods activities and O&M budgets are provided

by government and the asset management plans to be prepared under the Project will show in a detailed and transparent way the required annual budgets. The new infrastructure and equipment will be more efficient and less costly to operate and maintain, therefore even though the number of pumping stations will increase MMDA should be able to contain the overall O&M costs.

Fiduciary

65. Considering the limited experience of MMDA, NHA, SHFC, and COs with Bank processes and systems for financial management (FM), procurement, and governance and anti-corruption, and the size and complexity of the Project, the fiduciary risk under the Project is substantial, which will be mitigated through a range of measures for strengthening the FM and procurement functions. The mitigating measures to be implemented to reduce integrity risks will include support to continuing the implementation of the Integrity Management Program (IMP) in DPWH and support to rollout of the IMP in MMDA. The IMP is a department-wide integrity improvement system mandated by Executive Order (EO) No. 176, issued in December 2014 that continues to be in force under the current Administration. The EO institutionalizes the IMP as the national corruption prevention program in all departments, bureaus, offices, agencies, including government-owned and controlled corporations, government financial institutions, state universities and colleges, and LGUs. It calls for the establishment of integrity management systems by the government entity. Its main objective is to reduce the level of corruption vulnerabilities at the agency level, and to ensure that integrity measures are practiced in the public sector with the primary aim of improving public trust and confidence in government. It covers six dimensions, namely: (i) Service Delivery; (ii) Institutional Leadership; (iii) Human Resource Management and Development; (iv) Financial; (v) Procurement; and (vi) Asset Management, Internal Reporting and Investigation, and Corruption Risk Management. DPWH has started the roll-out of the IMP, and the Project will support its continuation, mainly through training activities. In addition, the Project will support training for a cohort of Young Engineers in DPWH, using materials developed under the National Roads Improvement Program II, a WB-supported program that closed at the end of 2016. Lastly, risks associated with the current FM systems will be addressed through four measures: (i) fiduciary arrangements will be covered in detail in the POM that will guide the PMOs; (ii) fiduciary specialists with relevant experience in the Bank fiduciary procedures will be engaged; (iii) the Commission on Audits (COA) will conduct annual procurement audits, alongside the financial audit; and (iv) PMO staff will receive relevant fiduciary training. Details are provided in Annex 3.

Environment and Social

66. Environmental risks are manageable, but there are high social risks, especially related to past relocation of people from the drainage areas under recent government resettlement programs, including *Oplan Likas*. Although these risks may not directly impact the achievement of the PDO, they may have adverse impacts on Project implementation. As part of due diligence to be conducted, the Project may have to provide additional support to people that were relocated to off-city sites to ensure that their resettlement was consistent with national legislation and the relevant provisions of OP 4.12, in particular with regard to livelihood restoration. The targeted support to a small select group of people in large resettlement sites may create resentment among people who were resettled from non-Project areas and who will not receive direct Project

support, which may result into complaints. To mitigate this to a certain extent, the Project includes community-based support activities that can benefit a larger group of people residing in resettlement sites.

67. There is a risk that land acquisition may be delayed, as land for in-city resettlement may not be readily available in every participating LGU, may be too costly, or may be encumbered. This in turn can delay Project implementation. As the number of PAPs to be resettled comprise only about 2,500 families, the amount of land needed compared to available land in most LGUs is not substantial, especially considering the proposed high-density housing solutions. The Project design is such that mostly drainage areas without resettlement are targeted for implementation during the first two years of Project implementation (with the exception of Vitas, with land for resettlement already identified, and Paco with past resettlement), to give time for land identification and development for drainage areas with resettlement. However, given the risks involved in achieving in-city resettlement within the Project time frame, the Project will screen the eligibility of communities for in-city resettlement with strict readiness criteria such as community readiness, land identified, etc. during PY1. There is also a risk that counterpart funding for land acquisition, site development, and housing construction may not be provided in a timely manner to the KSAs, which may result in delays in resettlement activities and subsequently in required interventions in drainage areas. To mitigate the risk, the Project will plan the full resettlement program early, in close coordination with key shelter agencies and concerned LGUs, so that funding can be appropriated as required on an annual basis.

Stakeholders

68. There are substantial risks related to stakeholders who may have ground to object to certain activities under the Project, especially related to how successfully the Project will address issues related to past resettlement. Such stakeholders could include Civil Society Organizations (CSO), people in existing resettlement sites, and other members of the general public, and their actions could delay Project implementation. The risk will be mitigated through a comprehensive communication strategy that will focus on detailed and transparent messaging as well as a good grievance redress mechanism. It is also important that complaints are not seen as a threat by implementing agencies, but as opportunities to improve the Project design and implementation.

69. There may be lack of willingness of communities in some of the drainage catchments to participate in solid waste reduction efforts and effect the proposed solid waste management changes. Component 2 has been designed to be in line with, and fully complement initiatives of the LGUs. The component will be implemented in close cooperation with the communities and will include awareness raising about the Project in general, community mobilization, incentives-based approaches, and ensuring that people understand the tangible benefits of improved solid waste management in their communities.

VI. APPRAISAL SUMMARY

A. Economic and Financial (if applicable) Analysis

70. Cost-benefit analysis was applied on the economic analysis, based on data collected during Project preparation by visiting drainage areas and analysis of maps and remote sensing

data. Monetized benefits that have been used for the analysis include avoided or reduced flood damages and productivity loss due to disruption in traffic and other services. Damages from urban flooding cover the costs of repairs on house structures, household appliances, and vehicles, plus the cost of cleaning up after each flooding event. This damage due to flooding was assumed to be five percent of the estimated average cost per square meter of floor area. Based on available data from the National Mapping and Resource Information Authority (NAMRIA) maps of the target drainage areas, the affected area without the Project is 45 percent on the average, of which 80 percent was assumed to be built up. Estimated annual damages are for a rainfall event with a 10-year return period. The value of damages was assumed to grow by two percent a year in real terms inasmuch as flood damages are expected to increase in the future in a non-project scenario. As a conservative estimate, it was assumed that the reduction in flood damages attributable to the Project is 30 percent of total estimated damages. Benefits from avoided productivity loss were estimated using as proxy gross national income per capita, and assuming five days a year when economic activities are disrupted due to traffic interruption and inaccessibility of roads during flooding events.

71. The base case, accounting for only avoided or reduced flood damages as a benefit, shows positive results. The Project has an economic rate of return (ERR) of 34.3 percent, using a discount rate of 15 percent (normally used by NEDA for its economic analyses), a positive Net Present Value (NPV) of PhP 12.6 billion, and a benefit-cost ratio (BCR) of 1.9. Adding the benefit of avoided productivity loss raises the ERR to 44 percent. Sensitivity analysis was applied on the base case to determine the impact of changes on key variables on the economic viability of the Project. The scenarios are as follows: (i) reducing benefits by 20 percent; (ii) increasing costs by 20 percent; and (iii) a combination of these two scenarios. The Project remains viable under all scenarios with ERR ranging from 21 to 27.6 percent (see Annex 5 for details, including on key assumptions, costs, and benefits).

72. With regard to employment creation and income generation during Project implementation, contractors will be encouraged, through provisions in the bidding documents, to source unskilled labor required by the Project, e.g. for civil works, dredging, cleaning of waterways, and collection of solid wastes, from local communities within the vicinity of the Project areas. This will generate employment opportunities as well as downstream economic activities, e.g. provision of transportation to and from Project sites and food services. During operation, skilled labor will be needed to operate and manage the pumping stations and implement solid waste programs. Similarly, this will create economic opportunities that will generate income for communities close to the Project areas. The targeted flood prone areas are densely populated, consisting of mostly low and medium income communities where the majority of households are involved in the informal economy with low paying jobs. The Project will improve their employment during the rainy season as well as minimize interruptions in economic activities with the possibility of increasing their productivity from improved physical conditions.

B. Technical

73. Modernization and rehabilitation of pumping stations and appurtenant infrastructure will focus mostly on structural measures, but as needed also on non-structural measures. Hydrological assessments, solid waste and sediment management, and other measures required

to improve the operation of the drainage infrastructure will be carried out. Support will be provided for the preparation of asset management plans for the major pumping stations. DPWH and MMDA engineers will be supported with the development of appropriate skills and modern design and operational tools, while information of the drainage areas will be captured in a combined MIS and Geographic Information System platform.

74. Appropriate technologies will be used for the design and construction of the needed physical interventions under the various components. It will be ensured that final designs are sound, suitable for local conditions, that the proposed works will serve the intended purpose, and will be sustainable with acceptable level of O&M requirements. Some pumping station modernization of similar nature has been carried out by MMDA and DPWH in the recent past, although not through a multi-sectoral approach for entire drainage areas. LGUs have experience with solid waste management interventions that have also been informed by the experience of CSOs in community-based solid waste management. All this gives support to the expectation that the program can be implemented without major technical difficulties.

C. Financial Management

75. The Borrower and the Project implementing entities are required to maintain financial management systems - including budgeting, accounting, internal controls, financial reporting, and auditing systems - adequate to ensure that Project funds will be used in an efficient and economical way to enable Project development objectives to be met. The Bank carried out an assessment of the implementing agencies' FM systems. The conclusion of the assessment is that the FM systems at DPWH and MMDA meet the Bank's requirements. During implementation review and support missions, the Bank will review, as needed, status/progress of actions taken by DPWH and MMDA to address findings and recommendations of CoA on the audits of DPWH and MMDA financial statements.

76. The Project is jointly co-financed with the AIIB. There are separate loan agreements, but the two lenders will jointly co-finance all contracts on an equal basis. The Bank will review the Withdrawal Applications and the eligibility of the amount requested under both loan agreements and, as the case may be, notify AIIB that the withdrawal application is in order. If it agrees, AIIB proceeds to make the requested disbursement

D. Procurement

77. The bulk of the procurement will be implemented by DPWH and to a lesser extent by MMDA. However, there are also some procurement activities under component 3, which NHA, SHFC, and COs will be implementing. The Bank carried out a procurement assessment of DPWH and MMDA. DPWH has good experience with the implementation of Bank-financed projects and has acceptable procurement capacity. MMDA has previously implemented a Bank-financed project and has gained some experiences with the Bank's procurement. NHA, SHFC, and COs are not very familiar with the Bank's procurement and will require assistance from DPWH's PMO, with the support of consultants as needed, during Project implementation.

78. Procurement weaknesses especially in the MMDA, NHA, and SHFC procurement system relate to: (i) lack of experience with the Bank's Procurement Guidelines and processes; (ii) lack

of internal manuals and clarity of the procurement process; and (iii) inadequate procurement planning. Risk management measures include: (i) training of procurement specialists; (ii) preparing a Project operational manual with specific procurement section detailing, among others, the procurement arrangement based on the Loan Agreement and procedures and processing timelines within the various implementation agencies; and (iii) conducting procurement training, including procurement planning and strategic tracking of exchanges in procurement (STEP). Other improvements in the public procurement system will be adopted under the Project, as needed, including: (i) performance monitoring using the Agency Procurement Compliance Performance Indicators (APCPI); (ii) professionalization of procurement practitioners; (iii) CSO, Non-Governmental Organizations (NGO), and private sector involvement as procurement observers; (iv) the use of geo-tagging in identifying specific locations of pumping stations and other critical interventions; and (v) conduct of annual procurement audit by CoA, following the Guide on Audit of Procurement (GAP), as part of the regular financial audit.

E. Social (including Safeguards)

79. Many ISFs are occupying land along drains and associated waterways that are considered danger zones. Since 2011, ISFs have been resettled to physically safe locations under *Oplan Likas*. 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* as explained in Annex 6.

80. OP 4.12 applies to the PAPs who were or will be resettled from the technical footprint. The assistance to be provided to PAPs by the Project will depend on the time frame of resettlement. Resettlement activities that took place prior to Bank engagement in the Project (December 8, 2014 - the date of Project identification mission) within the footprint of the Project are considered a legacy issue. Resettlement before that date has to be in accordance with country legislation and consistent with objectives of OP 4.12 (Group 1 in the Table below). 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 under the Project. This will be done at the community level for equity purposes and to avoid conflicts with persons relocated to the same resettlement sites from other areas not related to the Project. The safeguard instrument to be prepared is a Due Diligence Report that will describe the remedial measures to be financed by the Project and an action plan as needed to ensure the consistency of past rehousing/resettlement with the objectives of OP 4.12.

81. After the date of Project identification, resettlement has to be compliant with OP 4.12, including compensation at full replacement cost for loss of assets and other resettlement assistance. Two groups of PAPs have been identified (Groups 2 and 3 in the Table below): (i) people who were resettled from the technical footprint after the Project identification date (December 8, 2014), but prior to the date a census is initiated in all drainage areas during the early stage of Project implementation (cut-off date) (Group 2); and (ii) people who will be

resettled from the technical footprint after the cut-off date during Project implementation (Group 3). For Group 2, 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 finance remedial measures to address the gaps, described in a 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.

Table 2. Different Categories of Project Affected People

Category	Treatment
Group 1: People who were resettled from the technical footprint prior to the Project identification date (December 8, 2014). – "Legacy Group".	• Conduct due diligence and trace individual PAPs. • Should resettlement not be consistent with national legislation and the objectives of OP 4.12, provide remedial measures to address the gaps, described in a DDR. • Remedial measures will be provided at the community level for equity purposes, as explained in the Resettlement Policy Framework (RPF).
Group 2: People who were resettled from the technical footprint after the Project identification date (December 8, 2014), but prior to the date the census is initiated in all drainage areas during the early stage of Project implementation (referred to as the cut-off date for eligibility).	• Conduct due diligence and track individual PAPs that were resettled from the technical footprint to the extent possible. • Ten pumping stations out of the initially identified 56 stations (five existing and five new) potentially have resettlement activities that fall under this category, affecting an estimated 1,270 households, but with the exact number dependent on the final extent of the technical footprint in each of the drainage areas. • Should their current resettlement conditions not be in compliance with OP 4.12, provide remedial measures to address the gaps, described in a RAP. Measures will 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, as articulated in the RPF.

Group 3: People who will be resettled from the technical footprint *after* the cut-off date.	• Conduct census of PAPs within the technical footprint. • Estimated PAPs are 11,500 people (2,500 households). • Resettlement to be carried out in compliance with OP 4.12, as articulated in the RPF and to be implemented through component 3.

82. Except for five PY1 drainage areas, the specific interventions in drainage areas are not known and these will be different for each drainage area, with varying social and environmental implications. After a drainage area has been selected for inclusion in the Project, detailed technical, environmental, and social assessments will be carried out in order to determine the most optimum interventions that can achieve the PDO. Since specific activities in each drainage area and at the pumping stations can only be determined during Project implementation, an Environment and Social Management Framework (ESMF) and a Resettlement Policy Framework have been prepared to define the process in addressing safeguards concerns during Project implementation. The RPF has been formulated as a stand-alone document. The ESMF and the RPF, which include the description of a grievance redress mechanism, describe the process for the environment and social assessment of the anticipated impacts of all activities taking place within the drainage areas. For each selected drainage area, proposed activities will be screened during Project implementation and, as required, an Environmental and Social Impact Assessment (ESIA) and corresponding management plans, such as an Environmental and Social Management Plan (ESMP), Environmental Code of Practice (ECOP), Resettlement Action Plan, or Due Diligence Report Action Plan will be prepared for such interventions.

83. For each drainage area where involuntary resettlement took place from the technical footprint after December 8, 2014 or that will require land acquisition resulting in involuntary displacement during Project implementation, a Resettlement Action Plan will be prepared by DPWH in cooperation with the potentially displaced community, with commitments of assistance from a KSA and CSO/NGO. All RAPs will be reviewed and cleared by the Bank's Regional Safeguards Advisor as part of the appraisal process described in Section IV.A. To avoid that construction works are delayed by the implementation of a RAP, rental support can be part of the RAP, to be provided to affected ISFs as needed as a transitory measure until such time that the permanent relocation can take place. If compliance cannot be achieved, for whatever reason, the drainage area will be dropped from the Project.

84. MMDA and DPWH have prepared three site-specific social safeguards instruments for the five PY1 drainage areas, namely a RAP for Vitas, a DDR for Paco, and a combined DDR for Balut, Tripa de Galina, and Labasan pumping stations and drainage areas. The RAP for Vitas was prepared for the 165 ISFs living within the technical footprint based on a validation census conducted by MMDA in November 2015. The PAPs have already decided that they will move to two resettlement sites, expected by the end of 2017 or early 2018. A group of 88 PAPs will move to a newly developed site about 30 km from Vitas, while a group of 77 PAPs will move to a NHA site (Pandi in Bulacan Province) about the same distance from Vitas. Available in-city choices for resettlement discussed with the ISFs were said to be unsafe as they were proposed at densely populated sites characterized by criminality and related social problems. Therefore, in

this particular case off-city choices were preferred by the PAPs. Pandi is one of the 18 resettlement sites that will benefit from the PhP 1.8 billion social infrastructure budget. It will be used for additional water facilities, classrooms, day care centers, and health centers, as well as multi-purpose facilities that can be used for livelihood development activities. These measures have been incorporated in the RAP. DPWH will work with concerned agencies to ensure that the resettlement of these 165 ISFs is compliant with the requirements of OP 4.12.

85. A total of 74 PAPs were resettled from Paco's technical footprint in 2011 to Towerville 6 Resettlement Site in San Jose del Monte, Bulacan Province. Due diligence of the site showed that, in general, access of the ISFs to basic services is acceptable. The remaining challenge faced by the relocated people is finding adequate sources of income or jobs within and around the vicinity of the relocation site. Part of the PhP 1.8 billion social infrastructure budget will be used to implement a livelihood program in Towerville 6. 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. The DDR for Balut, Tripa de Galina, and Labasan found that the sites are free of settlers and no land acquisition or resettlement has taken place since 1996. The latest resettlement was recorded in 1996 to give way to the construction of the Balut pumping station.

86. In compliance with the requirements of OP 4.12, DPWH and MMDA conducted several public consultations where the following documents were shared and discussed: (i) Project background (including objective, components, benefits, etc.); (ii) ESIA; (iii) ESMF; (iv) RPF; and (v) the three PY1 safeguards documents. Project briefs and flyers highlighting the key sections of the safeguards documents written in Tagalog were provided to the five communities prior to the consultations. English versions of the documents were placed on DPWH's website, were available at the DPWH-Unified Project Management Office, DPWH-Environmental and Social Safeguards Division (ESSD), and at the MMDA-Planning Office, and were also provided to the barangays located near the waterways in the PY1 drainage areas to ensure that interested individuals could easily have access to the full versions of the documents. Draft safeguards documents were first disclosed by the World Bank on February 8, 2016, with disclosure of final draft documents on November 1, 2016, and final documents on May 1, 2017. DPWH disclosed draft safeguard documents on its website on November 10, 2016 and disclosure of final documents on July 4, 2017.

87. The Project and the ESMF and the results of the ESIA were discussed during public consultations held on September 9, 2016 and November 18, 2016. The public was invited for the latter consultation by way of an announcement in a national newspaper and on DPWH's website. Overall, the meeting 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 during the consultations did not impact the Project design, but are mostly to be considered during Project implementation.

88. A number of community consultation activities have been organized by DPWH to disclose the safeguards instruments to PAPs and other interested people in each of the five PY1 areas. A first consultation meeting was held September 23, 2016 for the PAPs in Vitas, followed by a second consultation on October 10, 2016. Community consultations were organized by

DPWH, with support from other agencies, for the other four PY1 drainage areas from October 10 to 13, 2016. During this period, a separate consultation activity was held at Towerville 6 Resettlement Site to discuss the resettlement legacy issues related to the technical footprint of Paco and to learn lessons from past Government resettlement activities. 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 reduce flooding in the communities are deemed very important. In addition to measures that reduce flooding, participants often mentioned the need to reduce solid waste in the waterways.

89. Information, education, and communication programs will target barangay officials and affected residents in Project drainage areas, especially those within the technical footprint of drainage areas, as well as CSOs operating in such drainage areas. The following are the major topics to be discussed: (i) Project description; (ii) ESIA process status and findings; (iii) resettlement and other social action plans for the identified PAPs; (iv) potential consequential impacts on the residents in the affected communities; (v) the benefits of the Project on the socio-cultural, economic, and bio-physical environment of the affected residents as they address flooding and solid waste management issues; and (vi) the Project mechanisms for grievance redress. The IEC materials and strategies that will be used should be simple and easy to be understood by all stakeholders, and presented either to groups or individuals. The materials will be illustrated in the local language. As such, the Project is expected to have extensive civil engagement, including with women.

90. *Gender Dimensions.* Resettlement could exacerbate gender disparities and inequalities. Women carry the brunt of managing the adverse impacts of relocation. For instance, the due diligence review of the Paco pumping station resettlement showed that because of insufficient livelihood opportunities in off-city resettlement many males leave their families to continue with income generating activities they were engaged in prior to relocation. They come home only every weekend or fortnight, which means that the women are left with the important task of supporting children and family.

91. The Project will utilize various gender analytical tools to ensure that the differentiated needs of men and women and boys and girls affected by the Project are properly responded to, and appropriate monitoring and reporting tools are developed to keep track of the gender-related progress of the Project. Gender analysis will be embedded in its impact assessments to identify gaps between men and women across human endowments, jobs, ownership and control of assets, and voice. The Project will: (i) generate gender disaggregated data from consultation, census, socio-economic survey, asset survey, compensation, and livelihood restoration programs; (ii) identify formal and informal arrangements that exacerbate gender inequalities and those that promote gender equality; (iii) ensure representation of women from different economic groups during consultations and meetings by ensuring consultation/meeting venues are discussed with women to promote freer and uninhibited women participation, female facilitators are mobilized and, if found appropriate, separate meetings for women are organized; (iv) exert efforts to ensure that women play an important role in analyzing and deciding on resettlement options under component 3; (v) maximize women's participation in resettlement site planning and housing and facilities designs; (vi) ensure livelihood restoration programs are informed by intensive discussions with women; (vii) provide access to training programs for at least one female

household member; and (viii) monitor gender indicators throughout Project implementation period and assess gender impacts at the end of Project.

92. *Citizen Engagement Strategy.* As part of the communication plan, the key elements of the citizen engagement strategy for this operation include the following: (i) disclosure of important Project related information by DPWH and MMDA on their websites; (ii) consultation with the key stakeholders during planning, design, and implementation of the activities in a particular drainage area; (iii) upgrading the established grievance redress mechanisms within DPWH and MMDA to meet specific grievance redress requirements of this operation; (iv) promoting community-based risk reduction initiatives with the participation of and networking with relevant stakeholders, including women, CSOs, and local bodies; and (v) neighborhood-level solid waste management interventions that involve extensive local-level IEC and local leaders to effect individual and household level behavior change related to solid waste.

93. During the investigations, surveys, and design of the interventions in a specific drainage area, consultations will be carried out with relevant stakeholders and beneficiaries. This engagement will allow implementers to understand better the drainage problems and people's expectations. Where relevant, differentiation based on gender will take place to understand the specific needs of women. These consultations will continue during the implementation of the interventions. For example, communication on construction activities that may cause traffic disruptions, excessive noise, or dirty roads will be provided to avoid dissent and lack of local support.

94. *Labor.* In general, the project activities are not very labor intensive. Most labor, both skilled and unskilled, will be sourced from within Metro Manila, as much as possible from local communities within the Project areas, 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 site offices.

F. Environment (including Safeguards)

95. While the Project targets the achievement of environmental benefits through better flood management, OP/BP 4.01 on Environmental Assessment is triggered to ensure that anticipated site-specific, but reversible environmental impacts that may occur will be addressed. Project activities with impacts can relate to modernizing existing pumping stations, constructing new pumping stations, cleaning of waterways and drainage channels that serve pumping stations, expanding solid waste management activities, and developing resettlement sites. Anticipated impacts will include collection and disposal of solid wastes, construction debris, and dredged silt; worker health and safety; disruptions to local traffic; disposal of old pumps and equipment, spent fuel, oil, and lubricants from the pumping stations; mitigation of dust, noise, domestic wastewater, run-off; loss of vegetation; cut and fill of undeveloped terrain; loose soil and debris during site development and construction; and siltation of waterways.

96. The ESMF will assist the implementing agencies in complying with the environmental safeguard requirements of the Project. The ESMF includes a screening instrument to identify environmental and social impacts of the activities in each drainage area. The screening criteria in the ESMF will determine the potential impacts on existing and new pumping stations, their

drainage areas, and ancillary facilities such as disposal sites and resettlement sites. A cumulative impact assessment will be undertaken during the second half of Project implementation, after all drainage areas to be improved under the Project have been identified, based upon the terms of reference attached to the ESMF.

97. Consistent with the ESMF, a consolidated Environment and Social Impact Assessment for activities within each of the five PY1 pumping stations and drainage areas has been prepared. The site specific and reversible nature of the impacts of the Project activities under Components 1, 2, and 3 were assessed for these five areas. Based on the possible impacts during construction and operation, the most significant impacts relate to the dredging of waterways, the generation of solid waste collected from the pumping stations and communities near the drainage areas, and the impact of relocating informal settlers. Of the three, the impact of dredging is of most concern due to the resuspension of contaminants, collection of potentially toxic and hazardous sediment material, especially heavy metals, and the generation of odor. The possible negative impacts are all reversible and temporary. Odor dissipates after a day as long as the material is sent to a proper disposal site. The resuspension of contaminants is stabilized after a few days and water quality returns to the original levels. Heavy rains also dissipate and dilute any spikes in contaminant levels. Testing of sediment from all five drainage areas has shown that heavy metals content in the sediment are below generally acceptable standards (based on Toxicity Characteristic Leaching Procedure, TCLP). An Environment and Social Management Plan has been prepared for each site, detailing the mitigating measures, monitoring parameters and frequency of monitoring, responsible agencies, and costs. Similar type of reversible impacts are expected for all other drainage areas, and similar procedures as for the five PY1 sites will be used to determine the exact impacts and measures to mitigate these.

98. Sediment from urban waterways is often contaminated and mixed with solid waste, including large pieces such as car tires, refrigerators, sofa beds, etc. Reportedly, this solid waste stems primarily from the informal settlements on the fringes of the waterways, because in formal settlements a good solid-waste collection system is in place at barangay level. If the dredged material is contaminated, by law it will be disposed in secure landfills designed to contain hazardous and toxic materials.

99. The Philippines is expected to be affected by climate change, with increased typhoon activity and rainfall intensity. The modernization of pumping stations and drainage systems includes substantial increases in pumping capacity, for example varying from 29 to 255 percent from the current pumping capacities for the five PY1 systems. Although this increase cannot prevent flooding altogether during the time of peak rainfall intensity, the flooded area will be much less with lower water depth and the water will recede quicker. With climate change the rainfall intensity is expected to increase over time, which would increase the risk of flooding. To mitigate this, the Project will where feasible also support a program of increasing water retention within drainage areas.

100. The Project has been screened for climate and disaster risks. The key risks are higher intensity rainfall and sea level rise. The proposed Project takes these risks into account by providing increased or maximum pumping capacity and designing the pumping station location and pumping head with consideration of sea level rise. As such the flood protection measures

are designed with climate change in mind. Improved drainage conditions will also address future climate change conditions.

G. Other Safeguards Policies Triggered

101. OP 4.04 - Natural Habitats and OP 4.11 - Physical Cultural Resources are triggered. The Project will not support activities that will significantly convert or degrade natural or critical natural habitats, OP 4.04 is triggered as there is a potential chance that the Project area may impact natural habitats, mostly outside the city at resettlement sites. Interventions at existing pumping stations, associated drainage areas and waterways, and related activities will take place in original locations and will not affect natural habitats. Activities related to new pumping stations and associated waterways will take place in built-up areas in urban settings, which are unlikely considered as natural habitats. Although not expected, there is a small chance that the increased discharge from few pumping stations will affect the natural habitat downstream of such pumping station. To ensure that the OP is adhered to, application of screening criteria developed in the ESMF will determine the potential impacts on existing and new pumping stations, their drainage areas, ancillary facilities and related activities such as disposal sites and resettlement sites. Screening will also be conducted for potential impacts on natural habitats for candidate relocation sites for the PAPs. No settlements will be allowed in critical natural habitats as prescribed in the OP and in accordance with the national regulations.

102. The ESMF includes the screening procedures for the presence of physical cultural resources (PCR) and specifies chance find procedures. The five PY1 drainage areas were screened for PCR and were found to have none in the area of influence. For other Project sites, the screening matrix in the ESMF will determine any possible cause of disturbance and negative impacts to PCR such as historical areas, architectural landmarks, and other cultural property, which may need to be mitigated. During construction, the landscape of the existing and new sites and off-site facilities may also be affected and structural damage to old structures may occur due to vibrations and excavation of adjacent areas. Where needed, a PCR management plan will be formulated as part of the ESMP, including chance find procedures that will be followed during construction.

H. World Bank Grievance Redress

103. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service, please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

Annex 1: Results Framework and Monitoring

PHILIPPINES: Metro Manila Flood Management Project

		Project Development Objective: To improve flood management in selected areas of Metro Manila.

PDO Level Results Indicators*	**Core**	**Unit of Measure**	**Base-line**	**Target Values**							**Frequency**	**Data Source/ Methodology**	**Responsibility for Data Collection**	**Description (indicator definition etc.)**
				YR 1	**YR 2**	**YR3**	**YR 4**	**YR 5**	**YR6**	**YR7**				
Indicator One: Flood-prone areas that are free of water within 24 hours after a major rainfall event.	☐	Hectares (cumulative)	0	0	0	400	1,500	3,000	4,200	4,900	Annually.	Progress reports from DPWH Flood Management Cluster and MMDA Flood Control Department.	DPWH, MMDA.	A major rainfall event equals a two-day rainfall with an estimated 10-year return period. Annual targets are based on the proposed implementation schedule. Actual rainfall events will be monitored, but there is no guarantee that the design rainfall event occurs during the Project duration, therefore target values are also determined through mathematical modeling and extrapolation of lesser rainfall events. Targets are cumulative values. Data based on 2010 NAMRIA

														maps, 10-year return period flood event.
Indicator Two: Direct Project beneficiaries, of which females.	☐	Number (in million) Number of females in brackets. (cumulative)	0	0	0	0.55 (0.27)	0.71 (0.35)	1.16 (0.58)	1.40 (0.70)	1.70 (0.85)	Annually.	Progress reports from DPWH Flood Management Cluster and MMDA Flood Control Department.	DPWH, MMDA.	Population provided with improved flood protection and improved drainage. Annual targets are based on the proposed implementation schedule. Targets are cumulative values. Female beneficiaries are about 50 percent, but gender disaggregation will be done during surveys. Data based on area identified by NAMRIA maps and 2010 barangay 2010 NSO, adjusted to 2015 at 2 percent annual growth.
Indicator Three: Solid wastes collected at targeted existing pumping stations.	☐	Cubic meters (in thousand)	17	17	17	17	13.5	11.4	9.5	8.5	Annually.	Progress reports from MMDA Solid Waste Department in coordination with the solid waste management	MMDA and LGUs.	Final target is 50 percent reduction of solid wastes that accumulate at the pumping stations. MMDA measures waste in cubic meters, not tons.

												office of the participating LGUs.		
Indicator Four: Households successfully resettled from areas where they would obstruct proper O&M of the drainage systems.	☐	Number of households (cumulative)	0	0	0	137	1,451	2,500	2,500	2,500	Annually.	Progress reports from MMDA Planning Department in coordination with the Urban Poor Affairs Office (UPAO) of the LGUs.	MMDA and LGUs.	Annual targets are based on the proposed implementation schedule. Households are counted when they have secure housing, basic services, and livelihoods maintained.
Indicator Five: Beneficiaries satisfied with reduced vulnerability to flooding in Project areas.	☐	Percentage	0	0	0	0	20	50	70	80	Annually.	Progress reports from MMDA Planning Department in coordination with the Urban Poor Affairs Office of the LGUs.	MMDA and LGUs.	Measured through beneficiary feedback surveys, starting one year after completion of pumping stations, including gender disaggregation.
INTERMEDIATE RESULTS														
Intermediate Result (Component One): Modernizing Drainage Areas														
Intermediate Result Indicator One: Existing pumping stations rehabilitated.	☐	Number (cumulative)	0	0	0	5	10	21	36	36	Annually.	DPWH Flood Management Cluster and MMDA Flood Control Department.	DPWH, MMDA.	This indicator will also monitor the development of asset management plans and other institutional aspects, such as staffing allocation to a pumping station. DPWH

														PMO will report on this.
Intermediate Result Indicator Two: New pumping stations constructed and operational.	☐	Number (cumulative)	0	0	0	0	0	0	6	20	Annually.	Progress reports from DPWH Flood Management Cluster and MMDA Flood Control Department.	DPWH, MMDA.	Same comment as above.
Intermediate Result Indicator Three: Drainage waterways cleaned.	☐	Km (cumulative)	0	0	8	28	48	73	94	104	Annually.	Progress reports from DPWH Flood Management Cluster and MMDA Flood Control Department.	DPWH, MMDA.	Considers waterways that lead to pumping stations.
		Intermediate Result (Component Two): Minimizing Solid Waste in Waterways												
Intermediate Result Indicator One: Barangays with improved solid waste management programs in place.	☐	Number (cumulative)	0	0	0	25	75	125	200	200	Annually.	Progress reports from MMDA Solid Waste Department in coordination with the solid waste management office of LGUs.	MMDA and LGUs.	Improved solid waste management will be measured by the following: increased number of eco aides, alternative collection points (e.g. floating bins), innovative measures in recycling of low value wastes in waterways, effective IECs, etc. It is estimated that about 80 percent of 255 barangays in Project area will see positive impact.

Intermediate Result Indicator Two: Barangays receiving results-based financing (RBF) schemes.	☐	Number (cumulative)	0	0	0	0	5	15	25	40	Annually.	Progress reports from MMDA Solid Waste Department in coordination with the solid waste management office of LGUs.	MMDA and LGUs.	Assumes 20 percent of barangays with improved solid waste management programs will benefit from the RBF scheme.
		Intermediate Result (Component Three): Participatory Housing and Resettlement												
Intermediate Result Indicator One: Community consultations undertaken.	☐	Number (cumulative)	3	3	6	12	24	30	30	30	Annually.	Progress reports from MMDA Planning Department in coordination with LGU UPAO and KSAs.	MMDA, LGUs, and KSAs.	For RAPs (minimum of two consultations per Project drainage area) and due diligence (at least one consultation).
Intermediate Result Indicator Two: Home-owners' Associations (HOA) or housing cooperatives receiving TA for community organizing, mapping, and surveying.	☐	Number (cumulative)	0	0	1	2	5	7	7	7	Annually.	Progress reports from MMDA Planning Department in coordination with LGU UPAO, and KSAs.	MMDA, LGUs, and KSAs.	One HOA/cooperative per site with resettlement.
Intermediate Result Indicator Three: In-city resettlement sites developed and ready for occupation	☐	Number (cumulative)	0	0	0	1	2	4	6	8	Annually.	Progress reports from MMDA Planning Department and KSAs.	MMDA and KSAs.	
		Intermediate Result (Component Four): Project Management and Coordination												
Intermediate Result Indicator One: Grievances registered related to delivery of Project benefits that are actually addressed	☐	Percentage	0	90	90	90	90	90	90	90	Semi-annually.	Progress reports from MMDA Planning Department.	DPWH, MMDA.	
Intermediate Result Indicator Two: Semi-annual progress reports submitted on time.	☐	Number (cumulative)	0	2	4	6	8	10	12	13	Semi-annually.	Progress reports from DPWH PMO and MMDA	DPWH, MMDA.	Excluding the Borrower's completion report.

												PMO, combined in one semi-annual report that will be prepared by DPWH PMO.		

Annex 2: Detailed Project Description

PHILIPPINES: Metro Manila Flood Management Project

Master Plan for Flood Management in Metro Manila and Surrounding Areas

1. Intensive rainfall and flooding in the Philippines are especially severe during the typhoon season from June through October when typically around 80 percent of the annual rainfall falls, which for Metro Manila is about 1,700 mm out of the approximate 2,100 mm average annual rainfall. Metro Manila is located in a delta, surrounded by Manila Bay to the west with its storm surge risks, Laguna de Bay to the south-east with annual flooding issues, and closed in to the north and north-east by mountain ranges that drain flash floods into the Pasig-Marikina River during typhoon events. Many areas in Metro Manila are designated as flood prone, with insufficient protection against frequent inundation. This includes areas along the Pasig-Marikina River and its tributaries, as well as areas bordering Laguna de Bay. Typhoons and tropical storms that affect Metro Manila on a regular basis result in flooding of many low-lying areas with poor drainage conditions, resulting in extensive localized flooding that can last for days. Close to five million people (about 1.1 million households) live in urban areas that require pumping for proper drainage.

2. On September 26, 2009, Tropical Depression Ondoy hit Metro Manila. It was a disastrous event that resulted in extensive inundation caused by water flows that were well above the capacities of rivers, floodways, and urban drainage systems. The situation was exacerbated by lack of regular maintenance of infrastructure, including dredging of silts and cleaning of solid waste from waterways, and encroachment by ISFs on the banks of rivers and waterways. Encroachment not only puts people at risk during flash flood events, but also obstructs the flow of water thereby enhancing flooding conditions. In many areas the flooding after Ondoy receded within one or two weeks, but other areas remained inundated for months, especially around Laguna de Bay. Tropical storm Ondoy was quickly followed by typhoon Pepeng (international name Parma) that affected the Philippines during October 3-9, 2009, following an irregular path which crossed over Central and Northern Luzon three times. Since Ondoy, there have been typhoons or long-duration rainfall events on an annual basis over Metro Manila, with seemingly increasing intensity.

3. Ondoy was a turning point in government's attention to flood management. It was so damaging and lasting that it renewed the focus on improving flood management and making Metro Manila, which is the main engine of economic growth for the country, a safer place for its inhabitants by implementing measures that will substantially reduce flood risks. Identified issues included:

(i) Deforestation in the upper catchment of the Marikina River, resulting in erosion that accumulates in the lower reaches of the river system, which in turn reduces the river carrying capacity within Metro Manila;
(ii) Uncontrolled disposal of solid waste in waterways and drains that reduces carrying capacity;
(iii) Lack of maintenance of existing flood management infrastructure and failure to maintain carrying capacity of waterways and drains for lack of regular desilting;

(iv) Reduced absorptive capacity of soil due to rapid urbanization, resulting in increased flash flood events;
(v) Under-designed flood management infrastructure resulting in an insufficient level of protection of a large urban area;
(vi) Flawed land use and urban planning, resulting in both legal and illegal settlements in high flood hazard areas;
(vii) Lack of adequate preparedness, early warning communication, and evacuation of typhoon-affected communities;
(viii) Climate change and sea level rise that over time may exacerbate the problem of flooding and drainage control; and
(ix) Fragmented institutional flood management arrangements.

4. The Post Disaster Needs Assessment carried out after Ondoy reviewed the above identified issues in detail and recommended that a comprehensive update of the 1990 master plan be prepared to propose detailed flood risk management plans and determine an updated set of priority structural and non-structural measures to provide sustainable flood management.

5. The Flood Management Master Plan for the Greater Metro Manila Area has since been prepared by government, with technical and financial assistance of the World Bank through a grant from the Global Facility for Disaster Risk Reduction (GFDRR) that was provided by the Australian Government. The Master Plan was approved by the National Economic and Development Authority Board on September 4, 2012 during a Board meeting chaired by the President of the Philippines. The total estimated cost for the implementation of the Master Plan is around PhP 352 billion (US$7.5 billion) over the next 20-25 years. The main elements of the Master Plan are:

a. Structural measures to reduce flooding from river systems that run through the city;
b. Structural measures to eliminate long-term flooding in the flood plain of Laguna de Bay;
c. Structural measures to improve urban drainage (addressed under this Project);
d. Non-structural measures such as flood forecasting and early warning systems and community-based flood risk management; and
e. Improved institutional structure to deal with flood management in an integrated manner.

6. The September 4, 2012 NEDA Board meeting also approved an initial allocation of PhP 5 billion to DPWH to start the implementation of the Master Plan. GoP has started working on several activities, such as dredging, river bank protection, and modernization of a small number of pumping stations that are managed by MMDA. It is important to scale up such activities in a holistic manner, which will be done under this proposed Project. However, government is also interested that other complicated priority structural and non-structural measures are prepared for investment by government, possibly with the support of development partners. It is also seeking more advice on appropriate institutional developments. Therefore, in parallel, feasibility studies and designs of major priority interventions under element (a) will be prepared that are essential for city wide improvement. Government was provided with about US$6 million TA grant assistance from the World Bank to prepare necessary studies and designs for major structural

interventions, including a high dam in the upper Marikina watershed. This TA assistance is likely to result in the next major phase of the implementation of the Master Plan.

7. From the PhP 5 billion that was allocated towards the implementation of the Master Plan in 2012, PhP 1.59 billion was transferred by DPWH to MMDA. Utilizing the recommendations of the Master Plan and subsequent detailed studies by MMDA, with Bank-executed TA support, a modernization program for 12 pump stations was developed. Estimates placed the total cost of total modernization of the 12 facilities at PhP 3.3 billion. Due to the limited funds, only select priority activities were included in the initial PhP 1.59 billion project. Pump capacity increase was uniformly pegged at 25 percent. The project was tendered through four design-and-build contracts, using national government procurement standards. The modernization of select pumps was completed towards the end of 2015. The said project was a valuable learning experience in respect to the implementation of an accelerated program of modernizing drainage areas, including pumping stations. Some of the lessons learned include: (i) need for sufficiently detailed technical specifications to ensure smooth tendering and implementation; and (ii) need for comprehensive planning of various sub-components to ensure a fully-integrated implementation of required interventions in a drainage system. The proposed Project draws upon these experiences for the design of its drainage area modernization program.

Description of Project Components

8. The Project Development Objective is to improve flood management in selected areas of Metro Manila. This will be achieved through an integrated set of interventions to modernize existing pumping stations and make improvements to appurtenant infrastructure; construct new pumping stations to accommodate urban expansion in low-lying areas; increase short-term water retention capacity in the drainage areas; reduce the volume of indiscriminately dumped solid waste into waterways; and support community-driven resettlement of project affected people (mostly ISFs) to safer relocation areas, preferably in-city. The reduction in flood risks will be specific to drainage areas that are served by pumping stations. It will not reduce flooding risks in other parts of Metro Manila as that would require investments under the other elements of the Master Plan.

9. The combination of: (i) rainfall events leading to excess water in urban areas; (ii) underperforming pumping stations; (iii) solid waste causing obstructions of drainage channels, waterways, and at pumping stations; and (iv) people living over waterways results in poor flood water management, these days even during moderate rainfall events. As a result, water recedes slowly from urban areas, impacting the living conditions of many people. Urban drainage improvements within Metro Manila are considered a priority by the Government of the Philippines to lessen the impact of rainfall events on people and the economy. Improvements will require a multi-sectoral approach of simultaneously improving physical drainage infrastructure and solid waste management, and relocating those ISFs living on and over waterways and drainage channels that affects the proper O&M of drainage systems. Metro Manila has grown rapidly during the past decades and in many low-lying areas flood waters cannot be discharged for lack of pumping stations. MMDA and several LGUs have constructed small pumping stations during the past years, but these are not enough and there is a need to construct larger pumping stations to properly serve recent urban developments. The possible

impact of climate change, which based on studies carried out by the Japan International Cooperation Agency (JICA) and World Bank for Metro Manila is expected to lead to rainfall events with higher intensity (the most likely scenario is a 12 percent increase in rainfall intensity by 2050) and rising sea level (estimated at 24 cm by 2050) that would worsen flooding conditions, will have to be taken into account as well.

10. It has been estimated that with the available Project funds some 56 drainage areas in 11 LGUs, covering a total estimated drainage area of 11,100 ha or over 17 percent of the total area of Metro Manila, can be supported, with the interventions differing by selected drainage area. The total population in these 56 drainage areas, either with existing or proposed pumping stations, is estimated at around 3.5 million or about 760,000 households.[9] The direct Project beneficiaries, i.e. those that are adversely affected by regular flooding, are estimated at 1.7 million or about 370,000 households, with the exact number depending on the final selection and number of drainage areas that will benefit from funding under the Project. Table 2.1 provides the names and summary details of the 56 existing and new pumping stations proposed for inclusion in the Project, while the map at the end of this document shows the location of all 56 drainage areas. Five drainage areas have been selected for implementation to start in Project year 1 (PY1). The details of the proposed activities in these five areas are described towards the end of this Annex.

Table 2.1. Names and Details of 56 Pumping Stations

	PUMPING STATION	LGU	Total Catchment Area (ha)*	Current Capacity (m^3/s)	Preliminary Cost Estimate (USD '000)
	Existing Pumping Stations				
1	Vitas	Manila	641.10	32.00	1,064
2	Balut	Manila	44.88	2.00	851
3	Paco	Manila	195.58	7.59	7,979
4	Tripa de galina	Pasay	2,058.01	58.00	4,255
5	Labasan	Taguig	440.78	9.00	851
6	Balete-Ermita	Manila	129.75	2.58	851
7	Escolta	Manila	-	1.50	851
8	Sta. Clara	Manila	122.98	5.30	4,255
9	Libertad	Pasay	772.19	48.00	7,447
10	Makati	Makati	110.65	7.00	2,553
11	Abucay PS	Manila	339.25	6.00	6,383
12	San andres	Manila	375.21	19.00	8,511
13	Santibanez	Manila	-	0.35	426
14	Tapayan	Taguig	281.20	15.00	1,064
15	Taguig	Taguig	1,110.04	12.00	1,064

[9] The 56 drainage areas have been identified during joint meetings by DPWH, MMDA, and LGUs as initial priority areas for which the expected interventions can be covered with the available Project funds. The final selection and number of drainage areas to be covered will be made during Project implementation when also the priorities and interventions in each Project drainage area will be determined.

16	Hagonoy	Taguig	264.52	6.00	213
17	Hulong duhat	Malabon	10.00	0.11	851
18	Magsay say	Malabon	10.00	0.11	851
19	Herrera	Malabon	10.00	0.11	851
20	Concepcion	Malabon	10.00	0.60	851
21	Balot	Malabon	10.00	0.11	851
22	Merville-dampalilt	Malabon	10.00	2.19	851
23	Tanza	Malabon	10.00	0.11	851
24	Niugan	Malabon	10.00	0.11	851
25	Artex	Malabon	10.00	0.11	851
26	Muzon	Malabon	10.00	0.11	851
27	Acacia	Malabon	10.00	1.30	851
28	Roque	Malabon	10.00	0.33	851
29	Aviles-Uliuli	Malabon	251.91	16.45	4,255
30	Beata ind.	Manila	10.00	0.11	426
31	Binondo-Escolta	Manila	252.91	11.60	2,128
32	Pandacan	Manila	152.76	4.40	426
33	Quiapo PS	Manila	218.11	10.85	2,128
34	San agustin	Manila	-	1.10	1,277
35	Uli uli	Manila	-	6.00	12,787
36	Valencia	Manila	296.27	11.85	1,066
	Subtotal Existing		**8,188.10**	**298.98**	**83,321**
	New Pumping Stations				
1	Cutcut	Pasay	114.10	12.00	21,277
2	Romualdez	Manila	-	2.50	4,096
3	Maytunas	Mandaluyong -San Juan	269.67	16.00	28,777
4	Buhangin	Mandaluyong	130.52	5.72	3,191
5	Casili	Caloocan-Manila	193.33	4.59	3,989
6	Ilugin River	Pasig	288.86	11.43	7,979
7	Isla	Valenzuela	228.50	8.27	14,096
8	Damayang Lagi	QC	120.95	13.20	8,703
9	Del Monte	QC	32.76	6.40	13,261
10	Dona Imelda	QC	51.24	2.70	7,012
11	Kalusugan	QC	88.39	4.90	5,595
12	Mariblo	QC	50.73	2.70	6,423
13	Masambong	QC	14.41	26.00	42,478
14	Matalahib-Talayan	QC	673.38	21.00	22,793
15	Progreso	QC	64.99	6.30	15,936
16	Roxas	QC	251.15	11.00	10,412
17	Sobrepena	QC	68.87	1.80	3,825
18	Sta. Cruz	QC	40.07	3.10	5,737

19	Talayan	QC	-	3.30	13,054
20	Tatalon	QC	217.99	7.50	28,047
	Subtotal New		**2,899.91**	**170.41**	**266,679**
	GRAND TOTAL		**11,088.01**	**469.39**	**350,000**

Note * - blanks are areas that are already counted in other catchments.

Component 1 – Modernizing Drainage Areas (US$375.2 million; IBRD US$168.84 million)

11. *Rehabilitation of Existing Facilities.* MMDA currently manages 57 pumping stations, many of which are over 30 years old and no longer operate at full capacity. The waterways and drainage channels that lead to the pumping stations are often heavily silted. Based on a recent inventory by MMDA of its existing pumping stations it is expected that this component will modernize about 36 existing pumping stations, but the exact number will be determined during Project implementation, based on a number of technical, economic, and social screening criteria, as well as the availability of Project funds. As part of the modernization program, pumps will be replaced with modern, more efficient, and higher capacity units. The design discharge determination will be underpinned by hydrological studies of the drainage areas and the best type of pump will be selected for each given site, including submersible pumps, possibly with variable speed drive, or horizontal axial pumps. In addition to optimizing the pumping capacity, based on the maximum volume of water that can safely flow to the pumping station per unit of time, the modernization of existing facilities will focus, as needed, on: (i) improvement to appurtenant infrastructure such as flood gates and pumping houses; (ii) changing power supply from diesel to electric, where feasible, with provision of back-up generator sets; (iii) installation of modern monitoring and control equipment, including Supervisory Control and Data Acquisition (SCADA) systems at selected pumping stations, to integrate them into the MMDA central management system; and (iv) upgrading of solid-waste management equipment at the pumping station, such as trash racks and collection areas that may include loaders and large waste containers and compactors.

12. *Construction of New Pump Stations.* MMDA and LGUs have identified 36 new pump stations, while DPWH has a long-list of 51 new pumping stations, including 27 major ones. The component will support DPWH with the construction of about 20 new pumping stations to serve flood-prone areas around Metro Manila where the population has grown rapidly over the past 10-20 years. The scope of the new pumping stations will include: (i) civil works, pumps, and electro-mechanical equipment related to the pumps, motors, and ancillary equipment; (ii) floodgates; and (iii) for selected stations, especially the larger ones, equipment for integration in a centralized monitoring and control system. After construction, new pumping stations will be handed over to MMDA for O&M as per current MoA. MMDA will as much as possible assign engineering staff to a specific pumping station when the design work starts, so that they are fully acquainted with the pumping station at the time of hand-over.

13. *Upgrading of Drainage Systems.* Contingent to the modernization of the pumping stations or construction of new ones is the improvement of waterways and drainage systems. For effective drainage control, the efficiency of the drainage system to bring flood waters to the pumps must be improved. Upgrading of the drainage system could include cleaning and dredging of waterways and drainage channels, cleaning drainage pipes, covering manholes with

grids, and flood walls, while it is not excluded that some new drainage channel developments will be needed to optimize the drainage of an entire drainage area. Detailed hydrologic analysis will determine the needed interventions that are drainage area specific. As determined by the feasibility studies, the Project will, where feasible and needed, support the establishment of green barriers along selected drainage areas. Green barriers are a combination of (fruit-)trees, bushes, flowers, and grass grown on and along the banks of a waterway. They will maintain the banks of the drainage areas free from structures. These green barriers may also make use of design features of engineered reed beds, which have proven to be effective in the treatment of wastewater in several examples in the Philippines. For example, green barriers have already been effectively used along a stretch of Estero de Paco. As part of the green barriers, beautifying selected waterways and paving easements will be done, where feasible, reinforcing the incentive not to indiscriminately dispose of waste into the waterways.

14. *Asset Management and Maintenance Equipment.* The Project will develop asset management plans, as a minimum for the major pumping stations, and operational manuals will be prepared or updated, where needed, to guide MMDA towards proper O&M of the pumping stations and other drainage infrastructure. MMDA typically has enough manpower in place at a pumping station to provide for mechanical and electrical maintenance and repairs. As part of the preparation of the asset management plan or operational manual the additional need for tools and equipment will be assessed and procured by the Project, not just for the pumping station, but also for the waterways and drainage channels.

15. The Project will provide modern specialized waterways maintenance equipment, such as floating bulldozers, amphi-dredge loading barges, waterproof trucks, etc. This equipment is designed to work in waterways and drainage channels that cannot be reached by standard dredging equipment. All urban channels from 2-100 meters wide as well as under low bridges from as little as 0.70 m from water level can be dredged with the floating equipment. The proposed equipment works from the water when there is no access from the adjacent banks. For example, about 90 percent of all urban channels (drains, tertiary, secondary and main channels) in the Netherlands are dredged and maintained with specialized urban dredging techniques, often floating. Most of the equipment will initially be used by MMDA, DPWH, and contractors for emergency cleaning and for testing and demonstration purposes to show how efficient dredging and cleaning can be done with the right types of equipment. DPWH intends to test and demonstrate some of the maintenance equipment also in other main cities, including Cebu and Davao.

16. Modern equipment for cleaning of interceptor drains and drainage pipes and removal of water hyacinth or water lilies will be introduced as well under the Project. Remote controlled small type bulldozers will be introduced to clean closed drains and interceptors. Management of water hyacinths or water lilies, mostly by MMDA as part of its responsibility to maintain waterways, will be addressed specifically in areas where these are prevalent. The Project will finance appropriate equipment for harvesting and preservation prior to processing, but also programs that encourage processing for reuse of products such as community livelihood activities, which are especially practiced by women, and production of biogas on a pilot basis. As it is proposed that most equipment will be procured during the first two years of Project implementation, more details are provided later in this Annex.

17. *Increasing Water Retention Capacity.* A program of increasing the water retention capacity within the Project drainage areas will be developed and implemented, where suitable, as part of sustainable urban drainage systems (SUDS).[10] This can include green and other infrastructure such as rooftop rainwater collection, green roofs, permeable concrete roads and pavements, and temporary retention of drainage water in public areas such as parks and basketball courts, and during extreme flood events even in underground parking garages.

18. *Non-structural Measures.* The need for non-structural interventions will be limited. However, as part of the design of specific interventions in a drainage area there may be activities related to community-based flood risk management, setting up of local warning systems, etc.

19. *Implementation.* DPWH, with the support of MMDA and engineering consultants, will design and procure the interventions in the drainage areas. Modern mathematical tools such as 3-dimensional interactive models may be used for the larger drainage areas to visualize flooding events and the impact of proposed interventions. It is expected that most pumping stations will be designed by DPWH either in-house by own engineers or with the support of engineering consultants. After that contractors will be responsible for custom manufacturing and installation of pumps as well as related civil works at the pumping stations and in the drainage systems. However, DPWH may also follow design, manufacture, and install practices for some of the pumping stations, especially new ones. DPWH, again with the support of MMDA staff and consultants, will be responsible for day-to-day construction supervision. A Memorandum of Agreement has been signed by DPWH and MMDA that spells out the responsibilities of each of the agencies during design, construction, and subsequent operation and maintenance.

Component 2 - Minimizing Solid Waste in Waterways (US$48 million; IBRD US$21.6 million)

20. Since the enactment of Republic Act 9003, awareness of the threat posed by solid waste to the natural environment has increased, but enforcement of the legislation varies significantly across and even within LGUs. Solid waste remains a major challenge threatening Metro Manila's waterways. Urban drainage has been hampered by the accumulation of solid waste in waterways and at pumping stations, significantly reducing the water carrying and retention capacities, which intensifies the flood hazard and increases the risk of direct damage and economic losses. Pumping stations are directly affected by the accumulation of solid waste and many pumping stations are functioning at less than their rated capacity.

21. ISF communities are key contributors to solid waste that accumulates in Metro Manila's waterways, but they are not the sole contributor. Businesses, both large and small, and residents with land tenure are responsible as well. Moreover, improperly disposed waste from other parts of drainage areas can easily find its way into the same waterways.

[10] SUDS aim to manage rainwater more naturally and are particularly useful in helping to manage small but frequent floods, just as an un-urbanized landscape would. The system has three main aims: (i) to catch and slow down the flow of water; (ii) to improve the quality of water by capturing and treating some of the pollutants it contains; and (iii) where feasible, to benefit the local community by providing a green space that people can enjoy.

22. Behaviors need to be understood in order to address the root cause of solid waste in Metro Manila's waterways. The individual actors' - residents, households, and businesses - motivations and social and environmental contexts have been taken into account in the design of the proposed activities in this component. Yet, these issues are complicated by the fact that Metro Manila's waterways usually traverse the boundaries of several barangays and occasionally LGUs as well. The inter-jurisdictional nature of waterway management and protection diffuses local responsibility. Therefore, intervention at a local level requires strong coordination with other adjacent communities. Otherwise, responsibility for waterway management, including solid waste issues, may continue to be attributed to others.

23. The specific objective of this component is to improve solid waste management practices within sections of the drainage areas that will receive support from the Project, building on the existing solid waste management systems implemented by LGUs, barangays, and households. The aim is to enhance the sustainability of the solid waste management interventions, which in turn should lead to less waste in waterways and drainage channels. This will be achieved through strengthening and complementing existing waste collection systems and facilities, as well as transport and disposal processes and raising community awareness, all aimed at reducing solid waste dumped into waterways, not just in the immediate vicinities of the targeted pumping stations, but also upstream along waterways within the catchment area of a given pumping station. Activities under this component will mainly focus on neighborhood-level activities in the area upstream of the pumping station and to a lesser extent on metropolitan-wide activities. The rationale of this approach is to ensure a comprehensive and effective set of interventions to address the challenges of solid waste in waterways, while also enabling specific activities to be customized and focused at the appropriate locations and scales. In particular, at the neighborhood level, the proposed activities are intended to complement and reinforce one another, with activities selected for relevance in each location.

24. The approaches defined under this component take account of lessons learned in past solid waste management interventions, namely, that solid waste management requires individual behavior change in addition to improvements in infrastructure, equipment, and institutions. To address these challenges, the activities also incorporate methodologies of results-based financing (RBF) that provides rewards to barangays based upon verified achievement of desired results.

25. Component 2 will support the following activities, with the exact activities to be implemented based on the actual needs in a particular drainage area. Implementation of specific activities will largely be done by participating LGUs and barangays, with oversight and coordination by MMDA, which will also manage the RBF scheme:

(i) Strengthening solid waste collection systems, including necessary equipment;
(ii) Conducting targeted IEC and awareness campaigns on solid waste management;
(iii) Implementing an incentive-based approach for solid waste management results;
(iv) Studies to improve solid waste management at metropolitan level; and
(v) If found feasible, pilot innovative waste management opportunities.

26. *Strengthening Solid Waste Collection Systems.* Under this activity, the Project will support provision of necessary equipment and training to strengthen the solid waste collection systems in selected pumping stations, LGUs, and barangays. LGUs and barangays will be

responsible for the increased staffing required to operate the tools and equipment. LGUs and barangays will be selected based on their location within the drainage areas of pumping stations that are adversely affected by solid waste. This activity will:

a) *Strengthen the Capacity of Pumping Station Solid Waste Management Systems,* including the provision of equipment at selected pumping stations (to be designed as part of component 1). The activity supports, but is not limited to, the following investments:
   - Regular collection by MMDA. More consistent waste collection will help manage the quantity of on-site pumping station waste;
   - Covered containers or compactors and large trash bins. In addition to improved collection efficiency, compactors and trash bins will contain the trash and reduce the incidence of pest and odor nuisance at the site and surrounding community; and
   - Trash loaders and other collection equipment. Equipment provisioning and upgrades will facilitate the removal of the trash from the premises of the pumping stations.

b) *Strengthen Existing LGU Collection Systems.* The Project will provide the necessary equipment, financing, and training to support the following in parts of the drainage areas where solid waste accumulation and disposal in waterways and drains is a problem:
   - Regular and efficient secondary solid waste collection from designated locations in the LGU;
   - Establishment of neighborhood collection points (NCP) at designated locations and appropriately staffed to ensure that waste is deposited correctly and not subsequently disturbed; and
   - Space-appropriate, covered containers at strategic NCP locations.

c) *Strengthen Existing Barangay Collection Systems.* The Project will provide the necessary equipment, financing, and training to support the following:
   - Regular, safe, and efficient primary solid waste collection from designated locations within the barangay;
   - Establishment of NCPs with appropriate collection equipment such as bins and push cards, and staffing; and
   - Household compliance in depositing waste at the designated collection times and locations.

27. *IEC and Awareness Campaigns on Solid Waste Management.* This activity will support targeted training to barangay captains, selected households, barangay waste collectors, and eco-patrols in effective solid waste management practices. The Project will support workshops, with emphasis on leadership, values, community ownership, and community-based monitoring and evaluation. The Project will involve recognized experts and NGOs with expertise in local community-organizing, capacity development, and conducting training on behavior change. In addition to training, communication campaigns using insights from behavioral economics will be developed for dissemination among key areas upstream of critical pumping stations. This

communication will be complementary to other IEC activities and will be deployed using SMS messaging, among other technologies.

28. *Incentive-Based Approach for Solid Waste Management Results.* Under this activity, the Project will support a results-based financing approach that provides incentives to barangays upstream of pumping stations. Incentive payments will be based on independently verified results of improved waste collection in barangays. MMDA staff with the support of external specialists will review the progress made by barangays with improving solid waste collection and then select up to 40 best-performing barangays during the life of the Project. Incentives will allow for small investments of around US$10,000 per winning barangay that will benefit the barangay population, such as street lights, bicycle paths, or playgrounds. Additionally, the Project will provide technical assistance in establishing eco-patrols and appointing and training eco-aides.[11] Barangays will designate respected leaders in the community to oversee proper individual/household-level waste disposal. The eco-patrols/eco-aides will be remunerated by the barangays, with some incentive payment, contingent upon the improvement of solid waste management within his/her community.

29. The RBF approach supported under this sub-component addresses some of the root issues that contribute to unsound solid waste management practices at the household and barangay levels. To ensure the effectiveness of the RBF approach, the Project will promote active feedback loops during implementation as a way to monitor and evaluate progress. Through proper implementation and iterative learning, RBF is an innovative approach that may prove useful in catalyzing improved solid waste collection and management.

30. *Studies to Improve Solid Waste Management.* A set of metropolitan-wide activities for improved solid waste management will provide the right enabling conditions and complement the other activities under this component. The scope of these interventions involves the entire Metro Manila area and the various solid waste actors. These interventions, to be executed directly by MMDA, are for a large-scale metro-wide IEC campaign that complements the local-level IEC; an integrated management information system; and a solid waste master plan for Metro Manila. A strong integrated MIS is crucial for improved operation and performance of Metro Manila's overall solid waste management system. The MIS will help track the implementation of other activities under this component, as well as enable MMDA to better monitor waste collection activities and track performance, and thus deploy needed resources to critical sites in a more strategic, dynamic and efficient manner. Moreover, it will improve coordination and information flow across all government levels and with other public/private stakeholders. The solid waste master plan will provide the overall framework for a strategic and coordinated vision for all of Metro Manila. In the context of existing national frameworks and

[11] Eco-aides are those who go door-to-door to collect residential wastes and bring them to designated collection points. To be inclusive of existing systems and labor markets, eco-aides are often selected from informal waste collectors within communities. The role of eco-aides may vary from LGU to another. In some LGUs, they are also tasked to do sweeping tasks, clean waterways, or document violators who will be reported to the barangay environmental police for action. They are paid by the barangay on a monthly basis, ranging from PhP 1,500 to 3,000, depending on the financial capacity of the barangay. An alternative title s River Warrior, as is being used for the staff providing these functions along Paco Waterway.

guidelines, the master plan will provide specific guidance for LGUs, while strengthening the role of MMDA in managing inter-jurisdictional activities.

31. *Innovative Waste Management Opportunities.* If confirmed by the solid waste master plan, the Project will support, where feasible, MMDA's agenda to apply appropriate technologies to reduce the volume of residual solid waste from Project drainage areas that ends up in landfills. Possible solutions include shredding machines at pumping stations to reduce the waste volume and waste processing equipment such as styro-filters that transform styrofoam waste into activated carbon, which can then be utilized for purifying water. If studies show viable technical and financial solutions, loan proceeds may be used to support a number of innovative waste management opportunities. US$15 million has been tentatively earmarked for such pilots, but the final decision on financing under the Project will be made after the results of a feasibility study have been approved by government, and the World Bank has had a chance to assess the viability of proposed interventions and has been able to provide advice, including on how best to manage such facilities. It is noted that IFC is exploring PPP opportunities in waste to energy in the Philippines. Before the Project can finance any agreed activity under this sub-component a restructuring will have to be processed, including as needed updates of the safeguards documents.

Component 3 - Participatory Housing and Resettlement (US$55.75 million; IBRD US$7.64 million)

32. The existing pumping stations to be modernized under the Project are typically located in well fenced areas and there has been no encroachment of people within the immediate pumping station sites. However, some drainage areas with existing pumping stations have PAPs, mostly ISFs, along waterways who will have to be resettled where they pose a constraint on construction or where they will affect the proper operation and maintenance of the drainage areas to ensure optimum water flow in waterways leading to the pumping stations (the technical footprint, to be determined for each drainage area by detailed technical surveys). The component aims to strengthen the affected people's resilience to external risks by providing access to better housing on safer grounds, basic public services, more stable income sources, and stronger community organizations. Initial screenings have listed an estimated 11,500 PAPs (about 2,500 households) to be resettled from the technical footprint in 16 drainage areas. The actual number of PAPs may change based on the pumping stations that will ultimately be targeted under the Project.

33. Specifically, the component will fund land acquisition, site development, housing construction, rental support (for transitional period, as needed), livelihood assistance programs, and various technical assistance and capacity-building activities that will help strengthen the communities, LGUs, and implementing agencies to successfully implement this component. In order to ensure that mortgages are affordable to all PAPs, an upfront income-based capital subsidy will be provided to qualified PAPs. In practice, the subsidy means that some of the housing construction, land acquisition, and site development costs provided by the key shelter agencies will not be recovered through mortgages and will be written-off by the government, the amount of which is not included in the total Project costs. The amount to be written-off will be scaled based on PAPs' income levels and will be reflected in mortgage contracts. Government counterpart funds will finance land acquisition, site development and housing construction, in

total estimated at around US$38 million, and the resettlement management and monitoring operational costs of the KSAs, whereas loan proceeds will be used for the remaining activities.

34. The component will also finance, as needed, remedial measures such as community development assistance (community-based infrastructure, community livelihood programs, etc.) should gaps be identified from due diligence studies for resettlement from the technical footprint under recent government programs, including *Oplan Likas*. The objective of *Oplan Likas* and the Project differ in that the former aimed to evacuate people from danger areas such as from the 3-meter easement from waterways while the latter aims to retain as many as possible by improving flood management. The feasibility of this Project does not depend on *Oplan Likas*, while the two programs are not contemporaneous in that *Oplan Likas* was initiated before the Project was conceptualized. The two programs are therefore not considered linked beyond the technical footprint. Any resettlement that took place from the technical footprint will be assessed to examine any gaps vis-à-vis OP 4.12 and remedial measures will be provided accordingly. Activities under this component will comply with procedures and requirements stipulated in national legislation and in the World Bank's OP 4.01 (Environmental Assessment) and OP 4.12 (Involuntary Resettlement).

35. To allow flexibility and cater to varying needs of the PAPs, three standard resettlement options will initially be offered. Options include: (i) in-city resettlement in vertical housing, which should, where feasible, be the priority option; (ii) near-city resettlement defined as areas that will result in minimal socio-economic dislocation with access to basic services in adjacent LGUs, from where people can still commute to their livelihoods of origin in reasonable time and at low expense; or (iii) self-resettlement with cash payment. Screening of feasibility of these options will be undertaken before consulting with PAPs to make sure that only affordable and viable options are discussed with PAPs. Other options expressed as preference during consultations with PAPs (e.g. off-city resettlement) can be considered as well. Resettlement will build on the existing government housing programs and will be implemented by two KSAs, namely NHA and SHFC. The options will be presented and discussed with detailed information to allow the PAPs to make informed decisions. SHFC and NHA are especially interested to promote the following two options that are important development options under their resettlement programs:

(i) *SHFC - High Density Housing (HDH), In-city or Near-city.* Under this option, SHFC will provide housing finance to home-owners' associations (HOA) or housing cooperatives. The HOAs or housing cooperatives will choose and mobilize a CSO to help them in community organizing and social preparation. They will then undertake land identification and acquisition, manage the design and construction of housing and community infrastructure. The communities will also carry out procurement, implementation, and monitoring of civil works, all with expert support from the CSO and other hired specialists. SHFC will provide oversight; and

(ii) *NHA - Low-rise Buildings, In-city or Near-city.* NHA will carry out land acquisition and construction of housing units for the ISFs. Housing construction will be done through public procurement of contractors by NHA. NHA will elicit the participation of ISF communities particularly in housing design and monitoring of civil works.

36. Based on knowledge gained with the implementation of these programs, the two agencies have agreed to build in some innovative and good practices to improve their existing housing programs. These include: (i) provision of upfront income-based capital subsidy to bridge the affordability gap, specifically for those who opt for in-city vertical housing; (ii) provision of land on a usufruct arrangement to minimize the financial burden on the PAPs; (iii) standardization of the construction price ceiling and minimum specifications for both agencies' programs to avoid inequity; and (iv) as needed, provision of rental support, in the form of cash, as a transitory measure until the completion of their new housing units, which is expected to be around 24 months on average. The rental subsidy will allow early relocation so that the works in the technical footprint can start. A geographical division of labor between the two agencies has also been agreed upon, while also agreeing that there has to be some flexibility in this based on preference of affected communities (see Annex 3 for details). A communications plan will be developed under the Project to ensure that PAPs will be given full information on the resettlement options to allow them to make informed decisions.

37. Component 3 will support the activities discussed in the following paragraphs.

38. *Land acquisition, site development, and housing construction.* This sub-component will finance, through government counterpart funds, land acquisition, site development, and housing construction. There are several successful examples of these developments, including within Metro Manila, and the Project will build on these examples.

39. Based on available income data, an estimated 73 percent of the ISFs cannot afford the required amortization of a PhP 410,000 loan amount under the existing in-city vertical housing programs. In order to make in-city relocation affordable to all, a proposed mortgage subsidy design was developed through a year-long inter-agency working group comprising all KSAs, chaired by HUDCC, and supported by a Bank-executed TA. ISFs were first grouped into 10 income brackets based on the most comprehensive income data on ISFs available. The affordable loan amount was derived from the monthly mortgage payment each income group can afford, which was based on monthly household income allocated for housing related expenditure (according to past few national Family Income and Expenditure Surveys). The gap between what ISFs are required to repay (PhP 410,000, through a 30-year loan with interest of 4.5 percent per annum) and the affordable loan amount (based on income bracket) will be deducted from the mortgage amount and will be absorbed as a loss by the KSAs to be compensated by government. These amounts are not considered as part of the Project costs. The amount of subsidy will differ for each income group, with poorer households receiving a greater amount of deduction from the full mortgage. Monthly amortizations will be calculated accordingly and will be stipulated in the mortgage contract that will be signed between individual ISFs and SHFC/NHA. ISFs' original income levels will be determined through a census that will be carried out as part of RAP preparation, using the national household targeting system, a proxy means test used under the government's national conditional cash transfer program which was developed with Bank support. This program will be managed by NHA and SHFC. To further bridge the affordability gap, land will be provided under usufruct arrangements and thus not be added to the loan amount.

40. *Grant support for rental support and one-off cash compensation.* The component will provide rental support, as needed, as a transitory housing measure for those who opt for any of the housing options. The rental support will be provided until the new housing units are complete. This arrangement will be relevant especially during the first years of implementation. ISFs can move out of the Project technical footprint areas so that modernization of drainage areas can start, while planning and development of housing units is still ongoing. Rental assistance will be provided on a monthly basis in the form of cash directly from NHA/SHFC to the affected households. NHA/SHFC with the help of the CSO engaged for social preparation will ensure that the temporary accommodation meets minimum quality and safety standard. The levels of rental support, estimated at PhP 1,800/ISF per month, are the incremental costs for ISFs to afford a low-cost rental accommodation outside the informal settlement areas. The incremental costs include the difference between rent as well as utility cost such as water and electricity between the original waterway structures and nearby low-cost rental housing. The latter is derived from the Metro Manila low cost rental market study which was conducted by the Bank. Those who opt for one-off cash compensation rather than a housing option will be provided cash compensation in line with the Resettlement Policy Framework.

41. *Technical studies, capacity building, community organizing, and livelihood assistance.* The component will finance the non-structural requirements of housing and resettlement. It will support consultant services to: (i) help the LGUs and the community organizations in the conduct of consultations, social preparation, and community organizing activities to ensure substantive community participation in the resettlement process; (ii) carry out technical studies, including as needed soil suitability tests, geo-technical surveys, subdivision plans, and housing and community infrastructure designs, etc.; and (iii) provide livelihood assistance to HOAs or housing cooperatives.

42. The Project has an inherent feature of capacity-building for: (i) HOAs and housing cooperatives on aspects relating to organizational development and strengthening, community mapping and surveying, community savings, settlement planning, community procurement, financial management, and construction monitoring, among others; and for (ii) LGUs on participatory shelter/resettlement planning, procurement and financial management, and construction supervision, among others. Costs for the above activities will be channeled from the NHA/SHFC to the CSOs working with particular HOAs and housing cooperatives. Costs for the following activities will be channeled from the NHA/SHFC to the contractors selected by the communities: technical studies, including soil suitability tests, geo-technical surveys, subdivision plans, and housing and community infrastructure designs.

43. *Resettlement management and monitoring.* The Project will support the operation of a grievance redress mechanism in NHA and SHFC, specifically for resettlement activities. It will also carry out process evaluation, participatory monitoring, outcome assessment, including beneficiary satisfaction surveys, knowledge sharing, and peer-to-peer learning between and among communities and LGUs.

44. *Lessons taken into account for component design.* The component was developed based on a number of international and local good practices in housing and resettlement for informal settlers. Learning from innovative initiatives supported by Bank-financed TAs in the housing

sector in the Philippines, as well as lessons learned from failures in such programs, have been reflected in the Project design, specifically in the following aspects:

(i) The importance of an integrated and holistic approach to resettlement. The prevailing resettlement approach under the government's resettlement program has been off-city relocation, often resulting in disconnect from livelihood opportunities and social networks, and many resettled people return to informal settler areas in Metro Manila. Such approach to resettlement is neither in line with the Bank's safeguards policies and guidelines, nor sustainable for the communities or government. The design of component 3 strives for a holistic approach by empowering communities to work with LGUs and KSAs to build their resettlement community of choice, with enhanced organizational capacity, which is essential for the sustainability of the communities;

(ii) The need for extensive community participation in resettlement design and implementation. The component is anchored on empowering communities to make their own decisions among different resettlement options. This approach will help ensure community buy-in, and maintain ISFs' access to livelihood, basic services, and social networks. Based on a number of successful in-city developments in Metro Manila, this approach ensured much higher willingness to pay mortgage and services, and hence contributes to the sustainability of the shelter programs of the participating KSAs;

(iii) The need for subsidies for technical assistance and infrastructure to make in-city housing affordable for ISFs. Considering the issues with livelihood opportunities and adequate service provisions in off-city resettlement sites, making in-city housing affordable for the ISFs is essential for both the ISFs themselves and the sustainability of such resettlement program. Experiences in past ISF housing programs have shown that a critical funding gap lies in the technical assistance to enable the communities to make informed choices in land identification and housing options, as well as in the development of housing and community infrastructure; and

(iv) The need for LGU to be in the drivers' seat on shelter programs. Past national ISF housing programs often enjoyed limited LGU support, with receiving LGU of the off-city relocation finding it difficult to deal with a large influx of relocatees. Until recently, the *Oplan Likas* program has heavily relied on KSAs to directly work with communities, giving little incentives for LGUs to proactively support its implementation. The component will involve LGUs with implementation and work in close partnership with MMDA, DPWH, KSAs, CSOs, and communities to forge shelter solutions.

Component 4 - Project Management and Coordination (US$20 million; IBRD US$9.0 million)

45. The component will support the operation of the Project Management Offices in MMDA and DPWH. DPWH already has a well-established PMO under the Flood Control Management Cluster, headed by a director, and a Project Manager has already been appointed. MMDA has

established a PMO comprising management and staff from the Planning Office, the Flood Control and Sewerage Management Office, the Solid Waste Management Office, and the Financial Office. Both multi-disciplinary teams have worked on the project preparation as well. The PMOs will coordinate the overall planning, coordination, implementation, and supervision of Project activities, including central procurement and management of funds. Accounting and bookkeeping will be mainstreamed in MMDA and DPWH's Finance/Comptrollership Division.

46. The component will provide funding for: (i) incremental operating costs, including office rentals and utilities, per diem and other travel expenses for staff, operation and maintenance of vehicles, and allowances for short-term contractual staff; (ii) office equipment and materials, including computers, printers, and communication equipment; (iii) technical and management training and study tours of relevant DPWH, MMDA, and PMO staff; (iv) training of the PMO staff in strategic communications, the formulation of a communication and citizen engagement plan, and the execution of the same, headed by a dedicated communication specialist. Citizen engagement will also be monitored by PMO teams; (v) a consulting firm to support the PMOs, DPWH, MMDA, and LGUs, consulting firms to supplement the TA grants to prepare designs for future phases of the implementation of the Master Plan, and other specific consulting services, as needed; (vi) the development and implementation of a communication strategy; (vii) the operation of grievance redress mechanisms; and (viii) Project M&E, including carrying out baseline study, periodic monitoring during implementation, beneficiary satisfaction surveys, and an outcome completion assessment study. The component will also provide funding, as needed, on capacity building activities to assist MMDA and DPWH to address the audit findings and recommendations of COA in the audits of the agencies' financial statements.

47. To realize the Project, investigations and surveys, technical, social, and environmental studies, detailed designs of interventions in drainage areas, and construction supervision, will be conducted by the implementing agencies. In order to ensure there is enough capacity, consultants will be recruited to support the various implementing and participating agencies, including strengthening the technical capacity of engineers and operational staff.

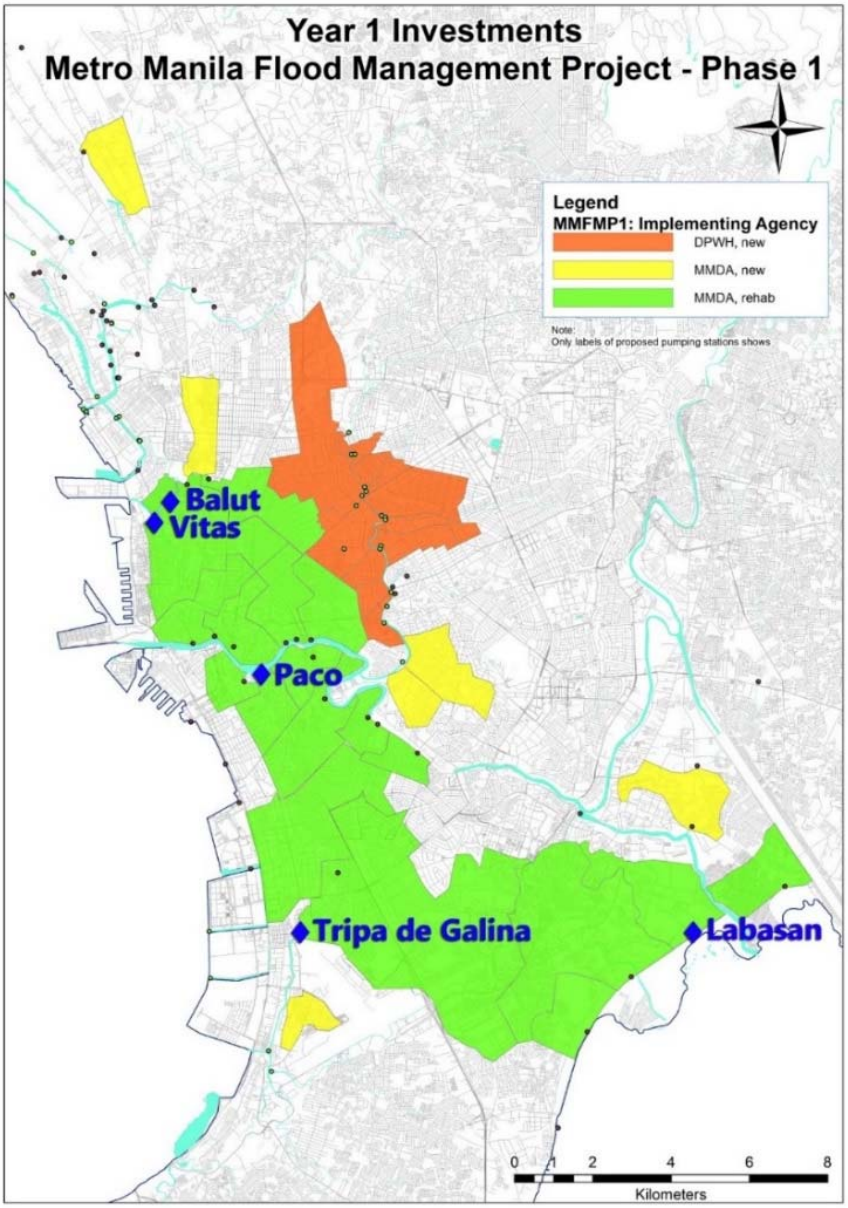
Project Year One Main Activities

48. *Pumping stations.* Five drainage areas have been selected for implementation to start during PY1. The five areas are Balut, Paco, and Vitas in Manila, Tripa de Galina in Pasay, and Labasan in Taguig. Except for Labasan, the pumping stations discharge water in rivers that are connected to Manila Bay. Labasan discharges into Laguna de Bay. Table 2.2 shows the size of the drainage areas and the current pump capacities and Figure 2.1 shows the locations of the PY1 drainage areas.

Table 2.2. Original characteristics of selected pumping stations

	Name	Current Capacity (m^3/s)	Catchment (ha)	Capacity per area ($m^3/s/ha$)
1	Vitas	32	641	0.065
2	Balut	2	45	0.030
3	Paco	7.6	196	0.020
4	Tripa de Galina	58	2,058	0.037
5	Labasan	9	440	0.015

Figure 2.1. Location of the five PY1 pumping stations



49. Between 2013 and 2015, MMDA modernized some pumps at 12 pumping stations. MMDA estimated the recommended increase in pumping capacity based on little hydrological assessments. A standard increase of 25 percent was used for most of the pumping stations. During the detailed preparation studies for the five PY1 areas, much more attention was paid to hydrological assessments to support the best decision-making on the upgrading of the existing pumps. The better the hydrological system can be assessed and understood, the better the feasible pumping capacity can be determined.

50. The standard required pumping capacity of the pumping stations in Metro Manila is based on the ability to handle a 48-hour design rain storm with a return period of 10 years. As part of the determination of the possible pumping capacity, numerous calculations have been

carried out for all five pumping stations to determine the water level upstream of the pumping station and the flooded area during and immediately after a two day long 10-year design rainstorm. The first calculation for each pumping station has been done for the current pumping capacity. From there the discharge capacity of the pumps has been step wise increased until the capacity that no more flooding occurred. For example, for Vitas pumping station calculations show that the current pumping capacity of 32 m^3/s is clearly not sufficient to prevent flooding during a two-day rainstorm with a return time of 10 years. To prevent all flooding in the catchment area of Vitas pumping station by pumping alone, the current pumping capacity of 32 m^3/s needs to be increased to 80 m^3/s.

51. The current pumping capacities of all five PY1 pumping stations are clearly insufficient to discharge the runoff from a two-day design rainfall with a return period of 10 years without causing severe flooding. The required pumping capacities to prevent flooding during and after a two-day design rainstorm with a return period of 10 years are 2.5 to 15 times higher than the current pumping capacities. For most existing pumping stations such large increase in capacity cannot be realized in the current buildings, while existing pump pits, pump bell mouth, etc. are also limiting factors to increase pumping capacity. Rebuilding all this for the above-mentioned increases in pumping capacities would be very expensive and is not considered, also because the waterways do not have the capacity to deliver very high volumes of water to the pumping stations. Based on hydraulic design calculations the feasible flow capacities for the pumping stations can be determined. The feasible increase in pump capacity within the current pumping stations is generally not sufficient to prevent flooding altogether. There will be some remaining flooding in the drainage areas, but this will affect smaller areas, have lower flood water depths, and flood waters will be drained quicker than currently the case. For example, for Vitas, the proposed pumping capacity is 50 m^3/s, which will result in a temporary flooded area of 12 percent, about half of the flooded area with the current pumping capacity. For each drainage area additional solutions can be introduced to reduce the flooded area and depth further, such as downstream river dredging to increase the utilization of flood gates and water retention facilities in the drainage areas.

52. Table 2.3 shows the cost estimates for the replacement of current pumps with proposed larger ones and the necessary auxiliaries such as new generator sets, new or refurbished trash racks, and flood gates.

Table 2.3. Summary of costs for the five pumping stations

No.	Pumping Station	Estimated Costs (PhP)	Estimated Costs (US$)
1	Vitas	738,771,000	15,719,000
2	Balut	83,192,000	1,770,000
3	Paco	181,687,000	3,866,000
4	Tripa de Galina	231,747,000	4,931,000
5	Labasan	198,561,000	4,225,000
	TOTAL PY1	**1,433,958,000**	**30,511,000**

53. *Desilting of Waterways.* Desilting of the waterways leading to the five pumping stations is another main activity expected to start in PY1. The volumes of dredged material and cost estimates are summarized in Table 2.4.

Table 2.4. Summary of desilting volumes and costs for PY1 drainage areas

No.	Pumping Station	Sediment Volumes (m^3)	Estimated Costs (PhP)	Estimated Costs (US$
1	Tripa de Galina	472,148	172,941,000	3,680,000
2	Vitas	383,166	101,863,000	2,167,000
3	Paco	92,989	22,827,000	486,000
4	Balut	53,031	14,423,000	307,000
5	Labasan	383,536	121,806,000	2,592,000
	Total PY1	**1,384,870**	**433,860,000**	**9,232,000**

54. *Desilting and Cleaning Equipment.* The Project intends to introduce modern dredging and drainage cleaning equipment during PY1 for both DPWH and MMDA. Modern equipment for removal of water hyacinth and cleaning of interceptor drains and drainage pipes will be introduced as well. Most of this equipment will initially be used by DPWH, MMDA, and contractors for demonstration purposes to show how efficient dredging and cleaning can be done with the right types of equipment.

55. A few examples of modern equipment are the floating bulldozer (FB) and the water hyacinth remover. The functionality of the FB lies in the ability to scrape sandy materials and push organic soft sediments from the bottom of waterways, canals and interceptors with an adjustable bulldozer blade towards a loading location where the sediment is removed by a hydraulic excavator or dragline. The forward and backward movements are done by two winches placed inside the main pontoon. The FB is insensitive for trash, solid waste, and debris that is present in the sediment and therefore suitable to perform most of the dredging tasks in urban waterways, channels, and interceptors to a depth of 2.2m below water level and 1.5m up to 40m wide. The removal of floating water hyacinths is efficiently done by a floating front loader with a collecting rake. This unit can clean approximately one hectare of water hyacinths or any other floating debris per working day. The floating front loader has two special propellers at the back which makes it very maneuverable and it is also designed to work in congested areas with water hyacinths or any floating debris. When the water hyacinths have accumulated to a very thick entangled layer it is necessary to cut this thick layer in manageable slices with a cutter on a hydraulic arm that is mounted on the side of the floating front loader.

56. Discussions with DPWH and MMDA led to an initial list of equipment to be procured. The estimated quantities are proposed for demonstration and testing program. The total estimated cost for the proposed equipment is US$6,761,000 as shown in Table 2.5.

Table 2.5. Equipment list with estimated prices

Suitable for Waterways, Canals, and Rivers				
Item No	Description	Est. Price per unit* (‘000 US$)	Quantity	Amount (‘000 US$)
1.1	Standard Floating Bulldozer	150	1	150
1.2	Small type Floating Bulldozer	140	1	140
1.3	Couple pontoons for crane pontoon	15	12	180
1.4	Couple pontoons with spud installation	18	4	72
1.5	Barge 22 m3	35	6	210
1.6	Push Boat for barges	120	2	240
1.7	Mobile hydraulic excavator on tires, 10–14 tons	160	6	960
1.8	Watertight truck capacity 7m3	80	5	400
1.9	Watertight truck capacity 25m3	150	5	750
1.1	Low Bed Truck, loading capacity 15 tons	130	1	130
1.11	Low Bed Trailer, loading capacity 30 tons	170	1	170
1.12	Mobile Cantina with toilet and washing facilities	8	3	24
1.13	Mobile Workshop in 20-foot container	40	1	40
1.14	Vandalism proof gasoline tank with pump	5	4	20
1.15	Closed-off fencing for loading locations, 50m	5	4	20
1.16	Wooden sheets for terrain protection; 8 pieces	12	4	48
1.18	Metal sheets for terrain protection: 20 pieces	20	4	80
1.19	Auxiliary equipment, anchors, cables and chains	28	4	112
	Total equipment waterways, canals and rivers			**3,746**
Suitable for Closed Drains and Interceptors				**0**
2.1	Remote Controlled Electric Floating Bulldozer	220	1	220
2.2	Gully Emptier truck	50	1	50
2.3	Gully Emptier pick-up	50	1	50
2.4	High-pressure Vacuum truck	110	1	110

2.5	High-pressure Vacuum pick-up 1500 liter	110	1	110
2.6	High-pressure Vacuum pick-up 3000 liter	120	1	120
2.7	Sewer Cleaning trailers for cars and pick-up	85	2	170
2.8	Sewer Cleaning build in installation units for van	30	2	60
2.9	Mobile Submersible Pump unit	20	1	20
2.1	Mobile Submersible Pump unit	20	1	20
2.11	Large pump unit standby for pumping stations	170	1	170
	Mobile hydraulic excavator 10–14 tons with winch	160	4	640
2.12	Mobile Workshop in 20-foot container	50	1	50
2.13	Safety equipment for traffic and manholes	12	5	60
2.14	Safety equipment for personnel in closed drains	6	10	60
2.15	Auxiliary equipment	25	5	125
	Total equipment closed drains and interceptors			**2,035**
Suitable for Removal of Water Hyacinths				
3.1	Floating Front Loader with rake	70	2	140
3.2	Floating front loader with rake and side cutter	110	3	330
3.3	Barge 22 m3	35	6	210
3.4	Push Boat for barges	120	2	240
3.5	Petrol and supply boat 1000 liter and outboard	35	1	35
3.6	Auxiliary and Safety equipment	25	1	25
	Total equipment Removal of Water Hyacinth			**980**
	GRAND TOTAL			**6,761**

* Estimated prices are FoB in US$ and exclude VAT.

Annex 3: Implementation Arrangements

PHILIPPINES: Metro Manila Flood Management Project

Project Institutional and Implementation Arrangements

1. A total of 139 drainage areas have been identified by MMDA, DPWH, and LGUs with either existing pumping stations or with a need to construct a pumping station (see table 3.1 on next page). The Project is following a programmatic approach and a number of drainage areas will be selected during each of the first three Project years, based on a set of technical, economic, and social criteria. Five drainage areas have already been selected so that modernization of few pumping stations and dredging can start during PY1. The main criteria for the selection from PY1 onwards, including the confirmation of the possible inclusion of the 56 initially selected drainage areas, will be: (i) the severity of drainage problems in a specific drainage area, with focus on the more serious ones; (ii) the severity of solid waste problems in a specific drainage area, with focus on the more serious ones; (iii) the number of ISFs already resettled from the Project's technical footprint (the fewer the better, with higher priority to the ones resettled in-city); (iv) capacity of the pump, with larger stations having priority; and (v) the number of ISFs to be resettled from the Project's technical footprint to allow optimum operation and maintenance (O&M) (the fewer the better). Before Project implementation starts, data will be collected from each potential drainage area related to these criteria to be able to make the selection from year 1 onwards.

2. Following the selection of a drainage area, surveys, investigations, and mapping will take place. Based on the identified needs, the required interventions will be determined in line with the scope of each of the components. Each of the identified interventions will be designed. This stage includes the implementation of the ESMF, including the RPF. An ESIA and ESMP or other applicable instrument, as suitable, will be prepared before the implementation of the interventions. Finally, the interventions will be implemented through one or more contract packages.

3. DPWH, with the close support of MMDA, will be the main implementing agency for the modernization of existing pumping stations and related drainage systems under component 1. DPWH will also be responsible for the design and construction of new pumping stations and related drainage areas. Both DPWH and MMDA have established PMOs that will be staffed with qualified government staff, supplemented with consultants as needed, so that the needed technical, safeguard, monitoring and evaluation, and fiduciary capacity is available. Engineers from DPWH's Flood Control Management Cluster will be responsible for the design of the component 1 interventions, with support of engineers from MMDA's Flood Control and Sewerage Management Office. MMDA operational staff located at pumping stations will support the design teams and also provide construction supervision. DPWH will also be responsible for the preparation and implementation of relevant safeguards instruments.

Table 3.1. Summary long list of drainage areas.

MMDA					
LGU	Major Pump Station	Minor Pump Station	New Pump Station	Relief Pump Station	Grand Total
Caloocan			1	1	2
Makati	1	2	2		5
Malabon			5	14	19
Mandaluyong			2		2
Manila	14	8	8		30
Muntinlupa			3		3
Pasay	2		2		4
Pasig		1	3		4
Pateros			1		1
Quezon City		2			2
San Juan	2	1	3		6
Taguig	3		1		4
Taytay	1				1
Valenzuela			5		5
Total	**23**	**14**	**36**	**15**	**88**

DPWH					
LGU	Major Pump Station	Minor Pump Station	New Pump Station	Relief Pump Station	Grand Total
Malabon			3	24	27
Manila			1		1
Paranaque			3		3
Quezon City			16		16
San Juan			4		4
Taguig	0				0
Total	**0**	**0**	**27**	**24**	**51**

4. Component 2 will be implemented by MMDA for solid waste interventions at pumping stations, as well as by staff of the Solid Waste Management Offices of LGUs and of the barangays at the barangay level. In the latter case, a Memorandum of Agreement would be signed between MMDA and a particular LGU during Project implementation that specifies the responsibilities for implementation by LGUs and barangays, and the support that is provided by MMDA. For example, MMDA will be responsible for the procurement of equipment for use by LGUs and barangays, based on approved requests from LGUs. In addition, MMDA will also be the lead agency for introducing non-structural interventions such as IEC, provision of

appropriate incentives, citizen feedback. and other necessary solid waste related interventions in areas where DPWH will construct new pumping stations.

5. DPWH will have overall responsibility for the implementation of component 3. It will prepare resettlement action plans and due diligence reports to be implemented under component 3, with the support of consultants, as needed, and in close cooperation with MMDA, DILG, HUDCC, and NHA or SHFC. A RAP or DDR for a particular drainage area will stipulate the arrangements for their implementation. NHA and SHFC will be the direct implementing agencies for all activities related to resettlement, with HUDCC providing overall oversight along with DPWH. Specifically, NHA and SHFC will be in charge of: (i) presenting all available resettlement options to PAPs; (ii) land acquisition; (iii) housing and site development; (iv) contracting service providers for social preparation and technical studies, as needed; (v) provision of rental assistance to PAPs; and (vi) engaging service providers to implement livelihood support activities for PAPs. A geographical division of labor was agreed between NHA and SHFC. NHA will be the lead agency for Manila, Pasay, San Juan, and Makati (Southern and Western area of the National Capital Region (NCR)), while SHFC will be the lead agency for Quezon City, Malabon, Muntinlupa, and Pasig. However, if certain communities in the designated LGUs already have ongoing/planned partnerships or have preferences for either one of the agencies, communities will be assigned to either one of the agencies on an individual basis, irrespective of the geographical location. All resettlement activities will be carried out in close coordination with relevant LGUs, including the host LGU.

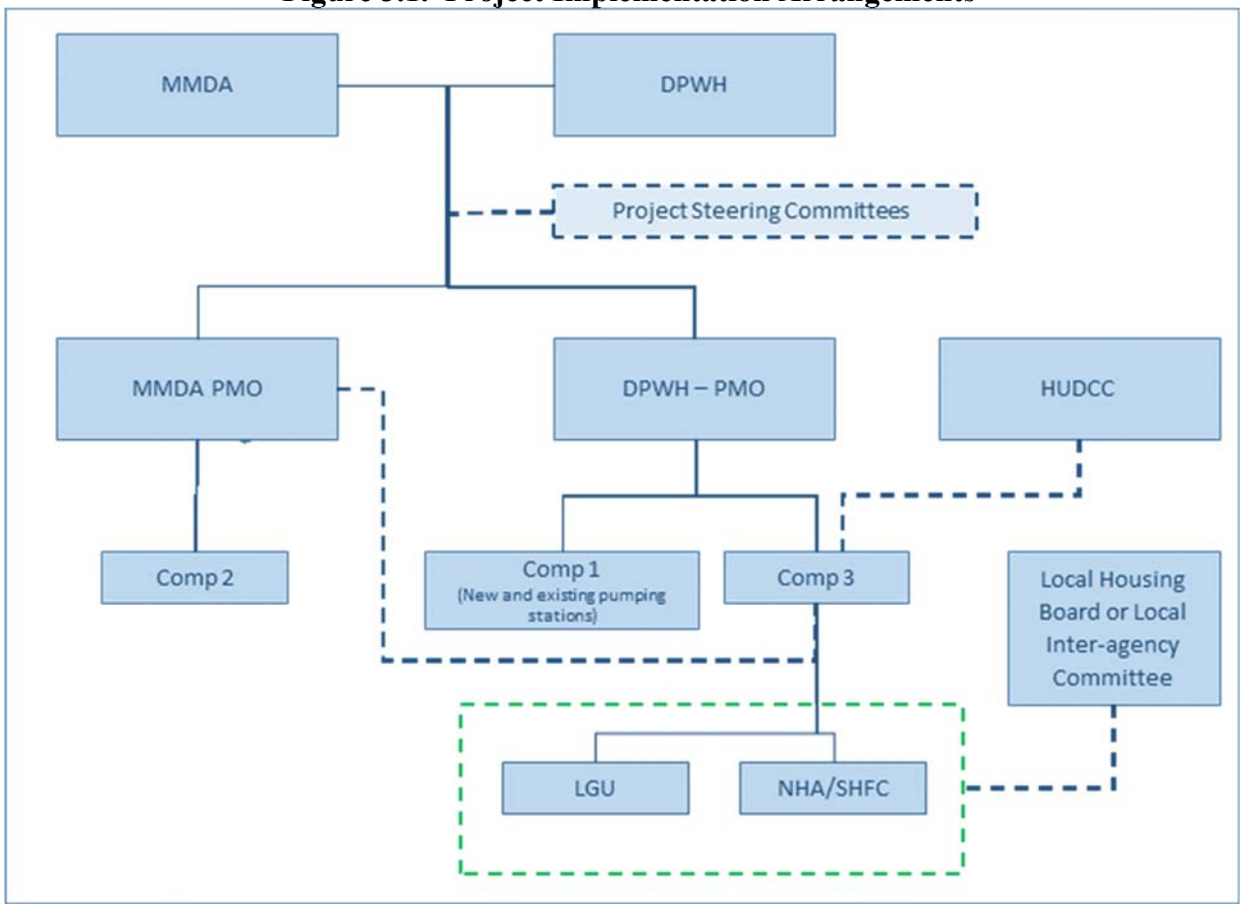
6. A Housing and Resettlement Team will be organized in the DPWH PMO, which will be staffed with qualified government personnel and assisted by consultants who will provide technical support as needed. The PMO-based Housing and Resettlement Team will be composed mainly of a housing and resettlement specialist and livelihoods specialist, who will be supported by supervising engineers and M&E specialist who will also act as grievance redress officer. The PMO's financial management specialist, procurement specialist, and environmental safeguards specialist will also provide fiduciary and environmental safeguards support to the Housing and Resettlement Team.

7. The LGUs will be the anchor of resettlement activities. Assisted by the DPWH-PMO, each participating LGU will have a tripartite Housing and Resettlement Team to handle the day-to-day implementation of resettlement activities. The Team will be composed of officials and staff drawn from relevant LGU offices (Urban Poor Affairs Office/Urban Settlements Office, City Social Welfare and Development, and City Engineering Office), designated personnel from NHA/SHFC, and representative from the CSOs who will be engaged to carry out social preparation activities. Officials and staff from other city departments including Budget Office, City Planning and Development Office, and City Environment and Natural Resources Office may be engaged as Project activities require.

8. A high-level steering committee and a technical-level steering committee were established by DPWH Order for the overall management and coordination of the Master Plan preparation. The membership includes DPWH, MMDA, DENR, PAGASA, DoF, NEDA, DILG, and LLDA. These steering committees will continue to operate during Project implementation, with an expanded membership including the KSAs, the Presidential Commission for the Urban

Poor, DBM, and HUDCC. The high-level committee is expected to meet at least once per year to provide overall direction and strategic guidance to the PMOs of the implementing agencies. It will ensure efficient Project implementation and make sure that major implementation and supervision issues are adequately addressed by each of the implementation agencies. The technical-level committee is expected to meet at least twice per year to provide overall technical direction and guidance to the PMOs, in particular to resolve implementation issues outside the control of the PMOs.

Figure 3.1. Project Implementation Arrangements



9. Following the selection of a drainage area into the Project, surveys, investigations, and mapping will take place, under the leadership of DPWH, but with full involvement of MMDA, NHA or SHFC, HUDCC, LGU, and others, as needed. Based on the identified needs, the required interventions will be determined in line with the overall scope of each of the components. Interventions will vary from drainage area to drainage area. The various components are integrated and work towards a long-term solution to improve flood management in the Project's drainage areas, but this does not mean that all components will be implemented in all drainage areas. For example, if in a particular drainage area there is no need to relocate people from the technical footprint, component 3 will not be part of the detailed interventions for such drainage area.

10. A feasibility report for each drainage area will be prepared that describes the surveys, investigations, and mapping, the proposed interventions, safeguards requirements, and initial estimates of costs and benefits. An inter-agency committee, chaired by the Undersecretary Operations of DPWH and the Assistant General Manager for Operations of MMDA as co-chair, and attended by technical, safeguards, and fiduciary staff of the two agencies and staff of NHA and SHFC, will meet on a monthly basis, or as required, to review and approve feasibility reports. Minutes of meetings will be prepared and shared with the Bank. The Bank will also review the feasibility study to determine that it is consistent with the objective and general scope of the Project. If acceptable, the Bank will provide a written confirmation to DPWH that the Bank is in agreement for DPWH to proceed with the detailed design of the activities in the drainage area. A copy of the feasibility study and the minutes of the inter-agency committee will be sent to NEDA's Project Monitoring Office for information and use during regular monitoring activities.

11. After the Bank's formal agreement to proceed with a drainage area has been given, the identified interventions will be designed by the relevant agencies, as needed with support of consultants. At this time the required safeguards documents and tender documents will be prepared as well, in consultation with relevant stakeholders and PAPs. When draft documents are available, to be submitted to the Bank by the chair of the inter-agency committee, the Bank will carry out appraisal of the proposed activities in the drainage area, including technical and safeguards appraisal. This may require several interactions between the implementing agencies and the Bank task team to get acceptable documents. After a positive appraisal in compliance with the Loan Agreement, safeguards instruments, etc., the Bank will issue a no objection in writing to the chair of the inter-agency committee stating that the proposals in the drainage area have been appraised and are eligible for inclusion in the Project (see also Annex 4). The committee will then make a final decision to proceed with implementation, which will be through a number of contract packages that will be procured in accordance with the applicable Procurement Guidelines. Relevant safeguards documents will have to be disclosed in-country and in the Bank's Infoshop before the implementation of activities for which the documents apply.

12. A multi-disciplinary consulting firm will assist the PMOs with the overall implementation of the Project. Support to PMOs will include support to procurement, safeguards, and financial management, including periodic reviews of the internal control systems, and assistance with the monitoring of the physical and financial progress. It will provide engineering and hydrology support as well as construction supervision and quality control under component 1. For component 2, the firm's support may include a solid waste management specialist, a behavioral specialist, and possibly a waste to energy specialist. The firm's expertise needed for component 3 may include a housing and resettlement specialist and a livelihoods specialist. The MMDA-PMO in coordination with the consultants will also be responsible for the preparation and conduct of training programs for LGU and CSO staff under component 2.

13. A Project Operations Manual will be used during Project implementation. The POM will include details of roles and responsibilities of all implementing agencies and the management structure, processes, and procedures for the implementation of the Project.

Financial Management, Disbursements, Procurement, and Integrity Management

Financial Management

14. Under the Bank's OP/BP 10.0 with respect to projects financed by the Bank, the Borrower and the Project implementing entities are required to maintain financial management systems - including budgeting, accounting, internal controls, financial reporting, and auditing systems - adequate to ensure that Project funds will be used in an efficient and economical way to enable the PDO to be met. The World Bank completed an assessment of the borrower's financial management systems.[12] The conclusion of the assessment is that the financial management systems at DPWH and MMDA meet the Bank's requirements.

15. The financial management risk of the Project before the mitigating measures is assessed as Substantial. A number of mitigating measures are proposed to reduce the risks. The mitigating measures to be implemented to reduce risks associated with the current Financial Management system are: (i) adopt and use a FM Manual to formalize control processes specific to the Project; and (ii) maximize use of direct payments for large contracts. During review missions, the Bank team will, as needed, review status/progress of actions taken by DPWH and MMDA to address the findings and recommendations of the Commission on Audit on the audits of MMDA and DPWH financial statements, starting with the comments on the CY2015 audits.

16. *FM Implementation Arrangements.* DPWH and MMDA's current financial management systems will be used for the implementation of the Project. It includes acceptable budgeting, accounting, internal controls, financial reporting, and auditing systems. The agencies will have a robust information system that will regularly report the progress of Project implementation. The directors of the Finance Services at DPWH and MMDA shall be designated as the FM focal persons who will: (i) facilitate the financial management processes within DPWH and MMDA; and (ii) coordinate the financial management requirements of the Project with the PMOs.

17. *Budgeting Arrangement.* Budget proposals are prepared annually by DPWH and MMDA and submitted to DBM. They are incorporated into the General Appropriations Act each year. The Project will prepare an Annual Work Plan and Budget to be submitted to the Bank before 15th November of each year for the subsequent year for its agreement. The budget for the government counterpart funds under Component 3 (for land acquisition, site development, and housing construction) will be directly released by DBM to NIA or SHFC as applicable. The implementing agencies shall ensure that the Project is carried out in accordance with the Annual Work Plan and Budget. Only those activities included in the relevant Plan and Budget approved by the Bank shall be eligible for Bank financing. Plans and budgets can be revised during the year as needed for proper Project implementation with the agreement of the Bank.

[12] The financial management assessment of the project was conducted in accordance with the "Financial Management Practices in World Bank Financed Investment Operations" issued by the Financial Management Sector Board on November 3, 2005 and as further rationalized in the "Principles-Based Financial Management Practice Manual" issued by the Board on March 1, 2010 and retrofitted on February 4, 2015.

18. *Accounting Arrangement.* The accounting records of the Project shall be maintained by DPWH and MMDA using the electronic New Government Accounting System (eNGAS) or other acceptable system prescribed by the COA. The chart of accounts complies with the eNGAS chart of accounts prescribed by the COA. The DPWH and MMDA Accounting Division under the Finance Services shall maintain the accounting records in accordance with the country accounting procedures and policies. Processing and accounting of Project transactions shall be mainstreamed. Hence, adequate staff resources of the respective Accounting Divisions shall be made available to ensure timely completion of the financial reports, monitoring of the Designated Accounts, and preparation of withdrawal applications. Separate books of account will be maintained for the Project. Each Implementing Agency maintaining a Designated Account will submit withdrawal applications to the World Bank and AIIB and will request funds to be disbursed to the Project's Designated Account as per agreed financing agreement. Applications for withdrawal will cover the financing of both WB and AIIB. The World Bank will review the Withdrawal Applications and the eligibility of the amount requested under both loan agreements and, as the case may be, recommend that AIIB, if it agrees, proceed to make the requested disbursement to the relevant Project designated account.

19. *Internal Control and Internal Auditing.* DPWH and MMDA finance offices have sufficient staff and there is segregation of incompatible duties. For DPWH, the Comptrollership and Financial Management Service is under the Assistant Secretary for Finance and Legal Affairs. For MMDA, the Finance Service is under the Office of the Assistant General Management for Finance and Administration. Under the Finance Service are the Accounting Division, Budget Division, and Treasury Division. The Project shall follow the internal controls and policies found in eNGAS, Government Audit and Accounting Manual, COA and DBM memoranda and circulars, and other laws and regulations. Specifically, the following requirements shall be implemented for the Project as part of the regular FM arrangements:

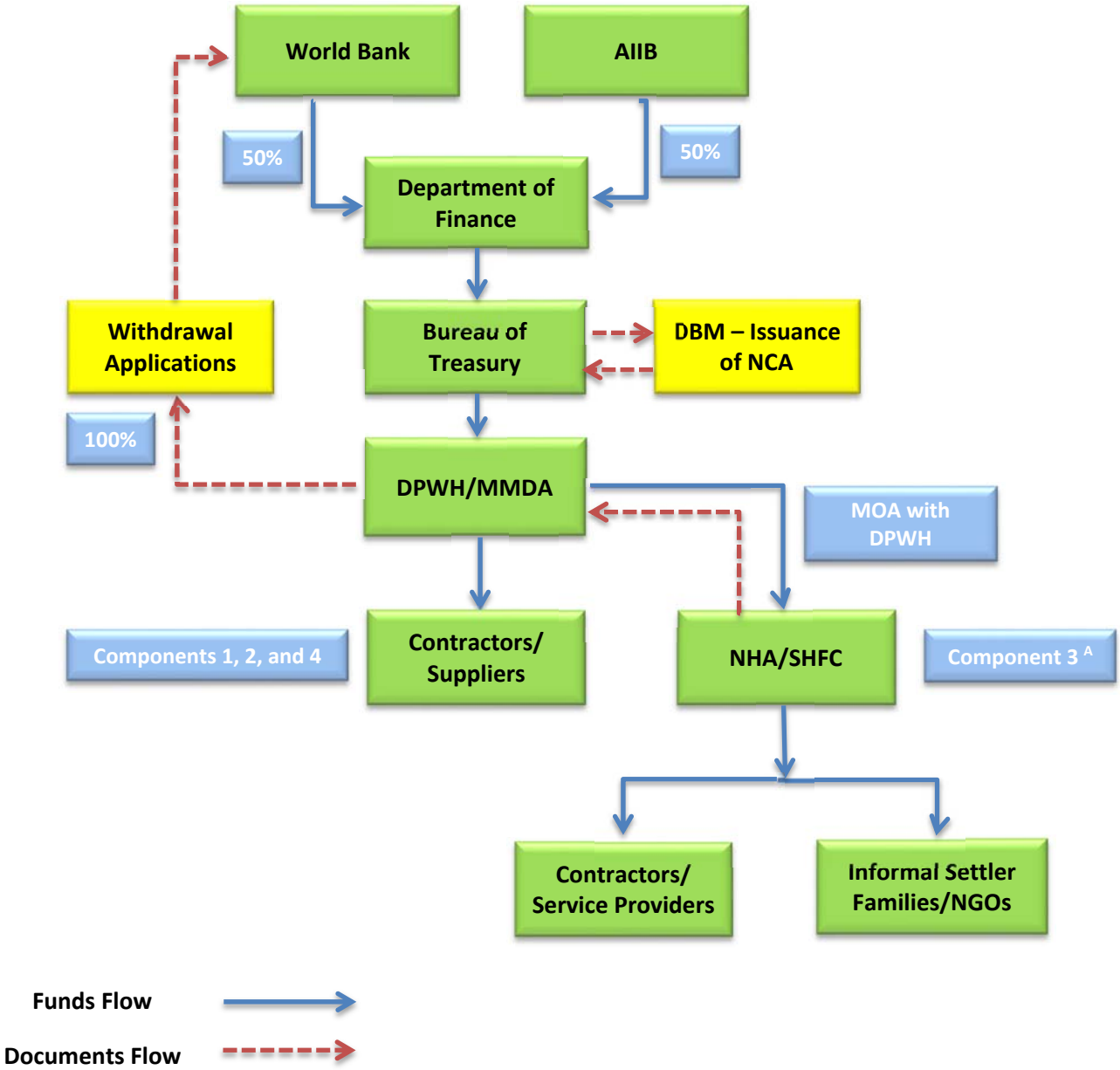
a. Subsidiary records shall be maintained for the Designated Accounts and the related Project Peso accounts;
b. Quarterly bank reconciliation statements shall be prepared and submitted to DPWH and MMDA Finance latest by every 20th day after end of each quarter together with the trial balance; and
c. Annual physical inventory count of fixed assets shall be conducted and results reconciled with the accounting and property records.

20. *Funds Flow Arrangements.* The funds from the loan proceeds will flow from the Bank to the account of the Bureau of Treasury account at the Central Bank of the Philippines. After the issuance of the Notice of Cash Allocation (NCA) by the Department of Budget and Management, the funds will be credited to the Designated Accounts of the Project maintained by DPWH and MMDA. Funds flow for IBRD loan is depicted in Figure 3.2 and further discussed below in the section on Disbursements.

21. *Financial Reporting Arrangement.* DPWH and MMDA will prepare and submit Unaudited Interim Financial Reports (IFR) within 45 days after the end of each calendar quarter consisting of the: (a) financial reports on the Project's: (i) statement of financial position; (ii) statement of sources and uses of funds which should include the current and cumulative data

compared with plan & by fund source; and (iii) bank reconciliation statements, both Dollar and Peso Project bank accounts; (b) physical progress report; and (c) procurement status report. The physical accomplishment report must be linked to the financial report. The IFR should also be accompanied by a narrative explanation of the progress of the Project and the significant variances between actual against planned and financial against physical accomplishments. The format of the IFR will be included in the POM.

Figure 3.2. Funds Flow



Note A: Component 3 expenditures, except land acquisition, site development, and housing construction, which will be funded by GoP.

22. *External Audit Arrangement.* The audit of the Project Financial Statements (consisting of the statement of financial position, statement of financial performance, a statement of changes in net assets/equity, and a cash flow statement) will be conducted by the COA, the Philippines' Supreme Audit Institution. COA has extensive experience in auditing government agencies and Bank-funded projects and is acceptable to the Bank. The audit will be conducted in accordance with International Standards on Auditing and the reports will be submitted to the Bank within six months after the end of each calendar year. The audited project financial statements shall be made available to the public by DPWH and MMDA in a timely fashion acceptable to the Bank.

23. *Financial Management Action Plan.* The actions to be taken to strengthen DPWH and MMDA financial management systems and reduce the fiduciary risks are described in Table 3.2.

Table 3.2: Action plan to strengthen DPWH and MMDA Financial Management

	Action	***Date due by***	***Responsible***
1	Maintain adequate FM staffing to support day to day operations.	Throughout project implementation	*DPWH/MMDA*
2	Capacity building on financial management conducted for finance staff who will be involved in the Project. Brief FM orientation to key finance officers and staff shall be conducted to ensure that they understand the FM requirements under the Project.	Within six months after effectiveness	DPWH/MMDA/ Bank
3	Finalize and adopt an FM Manual, incorporated in the POM, to formalize control processes specific to the Project.	Within three months after effectiveness	DPWH/MMDA
4	Submit status/progress of actions taken to address the findings and recommendations of the Commission on Audit on the audits of DPWH and MMDA financial statements.	Reviewed during Bank implementation review missions.	DPWH/MMDA

Disbursements

24. The proceeds of both the Bank and AIIB loans will be disbursed against eligible expenditures in accordance with the financial plan of the Project for the categories shown in Table 3.3.

25. The disbursement methods allowed under the Project are: (i) advance; (ii) direct payments; and (iii) reimbursements. The Project will maximize the use of direct payments for large contracts. The proposed minimum value of application for direct payments and reimbursements is US$4.0 million for DPWH and US$500,000 for MMDA.

26. Withdrawals with respect to eligible expenditures up to an aggregate amount not to exceed US$1 million may be made as retroactive financing for payments made between August 1, 2017 and the date of signing the loan agreement, provided that the relevant Bank procurement guidelines have been followed.

Table 3.3 Allocation of IBRD Loan Proceeds

Category	Amount of the Loan Allocated (expressed in USD)	Percentage of Expenditures to be financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, and consultants' services, including Incremental Operating Costs and Training, for DPWH's Respective Part of the Project (*including resettlement compensation, but expressly excluding land acquisition, site development and housing construction*).	182,334,197	100 percent of the share of the Bank's financing reflected in the relevant Annual Work Plan and Budget approved by the Bank
(2) Goods, works, non-consulting services, and consultants' services, including Incremental Operating Costs and Training, for MMDA's Respective Part of the Project.	24,750,000	100 percent of the share of the Bank's financing reflected in the relevant Annual Work Plan and Budget approved by the Bank
(3) Front-end Fee	519,008	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 3.01 (a) of the General Conditions
TOTAL AMOUNT	**207,603,205**	

27. Under the advance method, DPWH and MMDA will each open and maintain a pooled DA for funds from the Bank and AIIB denominated in US Dollars at Land Bank of the Philippines, an authorized government depository bank acceptable to the Bank. The maximum ceiling for the DA shall be initially set at US$20.0 million for DPWH and US$2.5 million for MMDA (US$10.0 million and US$1.25 million each coming from the Bank and AIIB under the pooled accounts of DPWH and MMDA, respectively). The DA ceiling shall be reviewed by DPWH and MMDA in consultation with the Bank's Task Team from time to time to assess its reasonableness and adequacy. DPWH and MMDA shall withdraw funds from the Bank through the submission of duly signed Withdrawal Applications and Statement of Expenditures (SOE). Disbursements under the Project shall comply with the Bank policies and procedures on disbursements and financial management as reflected in the Bank's Disbursements Handbook. All replenishments to the DA shall only be for eligible expenditures based on the agreed eligibility/financing percentage in the Loan Agreements. The frequency for reporting eligible expenditures paid from the DA will be quarterly or as need arises.

28. To allow the submission of Withdrawal Applications and supporting documentation for expenditures *incurred* on or before the Closing Date, the Project will be granted a four-month grace period to report these eligible expenditures.

29. Under Component 3, funds shall be transferred to the National Housing Authority or Social Housing Finance Corporation. A Work and Financial Plan and a Memorandum of Agreement entered between DPWH and NHA/SHFC, enumerating the roles and responsibilities and the accountabilities of NHA/SHFC with respect to the funds downloaded to them. Detailed procedures on the grant support for rental support and on-off resettlement cash compensation will be captured in the POM. The cost of land acquisition, site development, and housing construction will come from the GoP counterpart funds. The counterpart funding has to be carefully planned to ensure timely availability of government funds for especially land acquisition as delays with acquiring land can severely affect Project implementation.

Procurement

30. *General.* Procurement for the Project will be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works, and Non-consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers" dated January 2011, revised July 2014; and "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrower" dated January 2011, revised July 2014, and the provisions stipulated in the Legal Agreement. The World Bank's "Guidelines On Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 15, 2006, revised in January 2011, and as of July 1, 2016" will apply to all contracts and to the Project as a whole. While the Philippine Procurement Law (RA 9184) is in reasonable harmony with the Guidelines at the National Competitive Bidding (NCB) level, Section III of the Appendix to the Loan Agreement includes detailing procedures that are not acceptable to the Bank and provisions that apply when NCB is used. The general descriptions of various items under different expenditure categories are described below.

31. Works to be procured under this Project will include modernizing pumping stations and constructing new pumping stations, and appurtenant infrastructure such as but not limited to replacing or repairing flood gates, cleaning and improving waterways, fixing manholes, access roads, greenways, electrical connections, and material recovery and water retention facilities. The applicable method of procurement (ICB, NCB, Shopping) for each specific contract and the Bank's review requirements (prior or post review) will depend on the nature, value, and risk of each contract and will be specified in the procurement plan approved by the Bank.

32. Goods to be procured under this Project will include pumps, specialized waterways maintenance and cleaning equipment, garbage bins, recycling containers, trucks, vehicles, office equipment, etc. The applicable method of procurement (ICB, NCB, Shopping, Direct Contracting) for each specific contract and the Bank's review requirements (prior or post review) will depend on the nature, value, and risk of each contract and will be specified in the procurement plan approved by the Bank.

33. Consulting firms and individual consultants may be required for technical assistance and operational support, capacity building, various studies for Project implementation and monitoring, feasibility study and detailed engineering design, information, education, communication and advocacy, and community organizing activities. The applicable method of selection (QCBS, QBS, LCS, CQS, SSS for firms, and competitive or SSS for individuals) for

each specific contract and the Bank's review requirements (prior or post review) will depend on the nature, value, and risk of each contract and will be specified in the procurement plan approved by the Bank.

34. *Assessment of the agency's capacity to implement procurement.* Procurement activities will be carried out mainly by DPWH and MMDA, with some procurement by NHA and SHFC through Community Organizations. The Bids and Awards Committees (BAC) of the government agencies will carry out the procurement, specifically from the pre-procurement conference to handling the actual bidding process up to the award of contracts. The BACs will be supported by regular (administrative) secretariat unit and an ad hoc technical working group whose memberships (that may include representatives from end-users) depend on the nature of contract to be procured. These offices are staffed with people familiar with the local procurement rules in varying degrees. The government procuring entities have been doing procurement regularly including large ones for works, goods, and to a certain extent, consultancy services, using mostly local funds, except for DPWH which is well-versed with the Bank's Procurement Guidelines. However, this will be the first time in many years that MMDA will be implementing again a Bank-financed Project while NHA and SHFC have not implemented a Bank-funded project of this magnitude. Procurement assessment of COs will be done on random sampling once the participants have been identified.

35. An assessment of the capacity of the implementing agencies to implement procurement actions for the Project has been carried out by the Designated Bank Procurement Specialist for the Project in April 2015, updated in August 2016, and finalized in February 2017. The assessment reviewed the organizational structure for implementing the Project and the interaction between the various offices responsible for delivering procurement results.

36. Procurement risk for the Project is assessed as Substantial. Some of the identified weaknesses in the procurement systems relate to: (i) the uneven experiences of the agencies with the Bank's Procurement Guidelines and processes; and (ii) lack of internal manuals and clarity of the procurement process for MMDA, NHA, and SHFC. The following measures were agreed to mitigate the gaps/risks:

(a) Engagement of Procurement Specialist with relevant experience in the Bank procurement procedures to provide guidance on all the procurement aspects of the Project;

(b) A POM with a specific procurement section detailing, among others, the procurement arrangement based on the Loan Agreement and processing timelines within DPWH, MMDA, NHA, SHFC, and COs. Standard procurement documents, including standard bidding documents and Philippine bidding documents acceptable to the Bank, will be finalized well before the first contracts are awarded;

(c) The Project will aim at using OpenContracting, which has been used in the Philippines already, to enhance transparency. All contracts for the Project are uploaded in the OpenContracting website, including information on all bidders and winners, along with the estimated contract price as well as the awarded price;

(d) Line agency specialists who will be conducting on-site supervision of civil works during contract implementation will file supervision reports that will document progress of the works in their area. These reports will be important tracking, contract management, and audit tools, and will be accessible to the auditors who will be conducting audits and to the Bank team when it conducts implementation review and support missions;

(e) On the basis of the Loan Agreement, the implementing agencies will ensure an annual procurement audit (within six months after each fiscal year) as part of the regular financial audit is performed by COA following the Guide in the Audit of Procurement. The Bank will ensure that findings are discussed and appropriate measures are put in place to align and enhance the procurement process involving the Project on a continuing basis;

(f) A Procurement Plan detailing the identified contract packages for works, goods, and consulting services was prepared by the implementing agencies by negotiations. It will be updated on an annual basis or as the need arises to reflect current circumstances, including improvements in institutional procurement capacity. Updated Procurement Plans will be cleared by the Bank; and

(g) Procurement training based on the loan agreement and POM, including the Bank's Systematic Tracking of Exchanges in Procurement, will be conducted for the implementing agencies.

37. *Procurement Plan.* A Procurement Plan for Project implementation will provide the basis for the procurement methods and prior review thresholds, with standard prior review thresholds proposed. The plan for the first 18 months of Project implementation was agreed between the Borrower and the Bank during negotiations and made available on the website of the implementing agencies. It will also be available in the Project's database and in the Bank's external website.

38. *Frequency of Procurement Supervision.* In addition to the prior review supervision to be carried out by the Bank, the capacity assessment of the Implementing Agency has recommended two supervision missions per year by the Bank to visit the field to carry out post review of procurement actions. The post review sample size will not be less than 20 percent of the contracts subject to post review.

39. *Contracts eligible for retroactive financing.* Procurement of goods and works and selection of consultants after August 1, 2017 and in advance of Project effectiveness shall follow the Bank's Procurement and Consultants Selection Guidelines to be eligible for retroactive financing under the proposed loan.

Integrity Management Program

40. *Mandate and Objective.* The Project will support implementation of the Integrity Management Program in DPWH and will support rollout of the IMP in MMDA. The IMP is a department-wide integrity improvement system mandated by Executive Order No. 176, issued in December 2014, institutionalizing the IMP as the national corruption prevention program in all departments, bureaus, offices, agencies, including government-owned and controlled corporations, government financial institutions, state universities and colleges, and LGUs. It calls for the establishment of integrity management systems by the government entity. Its main objective is to reduce the level of corruption vulnerabilities at the agency level, and to ensure that integrity measures are practiced in the public sector with the primary aim of improving public's trust and confidence in government. It covers six dimensions, namely: (i) Service Delivery; (ii) Institutional Leadership; (iii) Human Resource Management and Development; (iv) Financial; (v) Procurement; and (vi) Asset Management, Internal Reporting and Investigation, and Corruption Risk Management.

41. *Implementing Guide and Oversight.* An IMP Handbook guides the agencies in the implementation of the IMP. It describes the methods for producing ten templates toward attaining a sustainable IMP, including: (1) Critical Systems for Assessment; (2) Process Matrix; (3) Corruption Risk Register; (4) Assessment Report; (5) Integrity Management Plan Logical Framework; (6) Implementation Plan; (7) Monitoring and Evaluation Plan; (8) Monitoring and Evaluation Progress Report; (9) Performance Monitoring Report; and (10) Performance Rating Sheet. The process is overseen by a Program Management Committee (PMC) jointly chaired by the Office of the President and the Office of the Ombudsman (OMB). The PMC is cited by the governing EO 176 as the overseer of the implementation of the IMP in all government agencies, including the local government units.

42. *IMP Organization.* Being a department-wide system, and not merely for the Project, the Project will continue to support DPWH's efforts to roll-out the IMP. DPWH has created its Implementation Management Committee (IMC) chaired by the Secretary, with an Assistant Secretary serving as Vice Chair. The members are the Heads of different offices, bureaus, service offices, including attached agencies. The IMC secretariat is the Internal Audit Service, headed by a Director. The DPWH's IMC is responsible for the implementation of the IMP as mandated by the EO 176 and guided by the IMP handbook. The Secretariat ensures that the process is followed, i.e.: (i) that the required template outputs are consolidated agency-wide; (ii) that the templates are submitted to the IMC and, eventually to the PMC; and (iii) that monitoring and evaluation are carried out according to the agreed indicators.

43. *Implementation Status.* The DPWH IMC and its Secretariat, together with representatives from various offices, bureaus and attached agencies, have conducted several meetings and workshops to discuss, and agree, on the required templates that are supervised and duly recorded by the PMC representatives from the Office of the President and OMB. MMDA will need to initiate a similar process, which can be supported by the Project.

44. The Project will support workshops for relevant officials and core staff in participating Departments and agencies on the "E-SALN", which is the e-system that helps mandated users

comply with annual requirements to file a Statement of Assets and Liabilities (SALN). OMB oversees the SALN. OMB collects the statements and files and archives these for reference, and can mine related data to spot anomalies. In addition, the Project will finance training of a cohort of young engineers from DPWH who have previously undergone training on Integrity Risk Management under an initiative supported under the recently-closed WB-financed National Roads Improvement Project II. This activity aims to train young engineers who have been hired by DPWH over the past 2-3 years to acquire skills to recognize and deal with fraud and corruption risks. The acquisition of such skills will equip them with the tools and wisdom they will need in carrying out their tasks as project managers in the future, and contribute to the goals of the Agency to minimize the impact of fraud and corruption on projects undertaken by DPWH. It is expected that by the end of the training, young engineers will be able to: (i) describe the main features of common misconduct; (ii) practice tools they will learn over the course of the training in order to better manage the risks posed by the common forms of misconduct; and (iii) adapt tools and techniques they will learn to the methods and strategies to identified by DPWH under the broader IMP. If MMDA identifies young engineers who may benefit from such training, they will be similarly considered.

Environmental and Social (including safeguards)

45. The significant positive and negative environmental and social impacts of the Project are as follows: (i) reduction in the incidences of floods and the consequent benefit to health and safety of the community: (ii) a general improvement in the quality of life in the areas with reduced flooding incidences; (iii) during construction there will be negative impacts from the dredging activities to be done in the waterways, disposal of solid waste collected from the drainage systems; elevated noise levels, etc.; and (iv) during operations, the impacts would be related to the generation of solid waste collected at the pumping stations, noise, and occupation safety and health issues related to exposure to contaminated water. The impacts of dredging would stem from the resuspension of contaminants during the dredging operation, the generation of large amounts of dredge material which may potentially contain toxic compounds, and the odor which may emanate from the dredged material. Key positive social impacts of the Project include enhanced wellbeing of beneficiaries, health benefits, ease of transport during rainy days, continuation of economic activities, increase in land values and property prices, and poverty reduction. Negative social impacts mainly involve past, not Project-related, relocation of informal settlers and its consequent impacts on their access to services and livelihood opportunities. The following Safeguards Policies are triggered: OP 4.01, OP 4.04, OP 4.11, and OP 4.12.

46. To address the impacts of the Project, the MMDA and DPWH: (i) conducted an environmental and social impact assessment study of the first five selected pumping stations (PY1 drainage areas); (ii) drafted an environmental and social management framework and resettlement policy framework to guide the PMOs in the implementation of safeguards for activities to be done during Project implementation covering all components of the Project; (iii) conducted due diligence reports for four of the five PY1 drainage areas; and (v) prepared a Resettlement Action Plan for Vitas Drainage Area.

47. The institutional capacity assessment of MMDA for safeguards that was conducted indicated the need for institutional capacity-building on the effective implementation and monitoring of compliance to the ESMF. MMDA has already established a team that will be responsible for preparation of safeguards documents and plans and a GRM has been set up in coordination with the MMDA Help Desk. The staff and other specialists in MMDA have been oriented with the Bank's safeguards policies and have participated in a Bank-managed safeguards workshop. A series of safeguards orientation seminars will be conducted during the early stage of Project implementation with the other agencies involved such as SHFC, NHA, and participating LGUs. Those in government's housing sector, SHFC and NHA, are familiar with the OP 4.12 on Involuntary Resettlement, but not necessarily with environmental safeguards policies. Public consultations on the safeguards instruments have been conducted as required. Additional consultations are required for all succeeding activities during Project implementation as stated in the ESMF.

48. The DPWH has integrated in its development operations various environmental and social laws, through issuances of Department Orders. The institutionalization of the safeguards policies in DPWH started with the creation of EIA Project Office, which was renamed Environment and Social Safeguards Office, and now the Environmental and Social Safeguards Division (ESSD). Through a MOA between DPWH and DENR, the ESSD's roles were extended beyond EIA compliance to include the design and implementation of Resettlement Action Plans, public consultation and information dissemination, and providing guidance and training to all DPWH offices. In 1999, the DPWH adopted the Land Acquisition, Resettlement and Rehabilitation Policy to avoid, mitigate, or compensate for adverse social impacts of infrastructure projects.

49. In 2003, the DPWH Social and Environmental Management System (SEMS) Policy Framework and Operational Manual was launched through DPWH Department Order 245 s. 2003 in line with the policy direction of DPWH to fast-track its development of infrastructure projects considering the need for integrating social and environmental requirements for sustainable development. The DO states that the SEMS Policy Framework and Operations Manual shall be applied in all infrastructure projects, particularly those covered by the Philippine EIS System (PD 1586). Whenever possible, other projects not covered by the EIS System shall still be implemented in a manner compliant with the environmental management plan recommended in the SEMS Operations Manual. The SEMS Policy Framework Manual was revised in 2007, with the inclusion of an updated Land Acquisition, Resettlement, Rehabilitation and Indigenous Peoples Policy. The Policy Framework aims to meet the changing national regulations and organizational set-ups, and enhance global environmental and social safeguards policies and practices, including the adoption of the World Bank Environmental and Social Safeguards Policies which provide international best practice safeguards guidelines and standards for development projects.

50. The PMOs will provide the oversight of the Project's safeguards compliance, including the overall coordination and compliance monitoring of KSAs, LGUs, and other Project beneficiaries.

Monitoring & Evaluation

51. Monitoring and evaluation activities related to the Project will be the direct responsibility of the PMOs, with the support of consultants, as needed. Monitoring Project progress and achievements will entail a process for reviewing continuously and systematically the various Project implementation activities. The objectives of the M&E are to: (i) measure input, output, and outcome indicators (see Annex 1); (ii) provide information regularly on progress towards achieving desired results and to facilitate reporting to the management of oversight and participating technical agencies in government, as well as the Bank; (iii) alert managers, both in government and the Bank, to actual or potential problems in implementation so that timely adjustments can be made; and (iv) provide a process whereby the PMOs can reflect and improve on performance. Furthermore, a good baseline, comprising a description of the current conditions, will have to be prepared for each drainage area, which will be done during the investigation and design stage.

52. The results of relevant M&E activities will be reported in semi-annual progress reports. The information for the reports will be prepared by both PMOs, but compiled in one report by DPWH's PMO. The reports will cover the progress of the works in drainage areas, the institutional activities, training, special studies, as well as updates of the performance indicators, the procurement plans, etc. A section of the progress reports will be devoted to issues identified during Project implementation and strategies and actions to be taken to resolve such issues to avoid that they negatively affect progress.

53. A mid-term review will be conducted during the third year of Project implementation to review the soundness of the Project scope and design and to make adjustments, as needed, to be able to complete the Project in time and with achievement of the PDO. An outcome assessment, including beneficiary feedback surveys, will be conducted before Project completion.

Role of Partners

54. The Master Plan was prepared with financial assistance from the World Bank-administered Global Facility for Disaster Risk Reduction. In addition, already during the preparation of the Master Plan, several partners (notably Australia's Department of Foreign Affairs and Trade and JICA) were closely involved through participation in workshops and meetings and sharing information and discussing findings and outputs. A similar cooperation is envisaged under the proposed Project to produce a synergistic effect.

55. Since there are several financiers involved in flood management, and the initiative could attract new ones, it is proposed to establish a donor committee to build a shared vision of the Project, to align efforts, and to unify requests. This will also help to reduce the burden on the implementing agencies to respond to multiple requests, reports, and formats of different donors.

56. The Bank will serve as the focal point for AIIB vis-à-vis the Borrower and other parties in all matters relating to technical aspects of the Project. In addition, the Bank will provide the following services: environmental and social services, procurement services under joint co-financing, investigative services, financial management services, and disbursement services.

Annex 4: Implementation Support Plan

PHILIPPINES: Metro Manila Flood Management Project

Strategy and Approach for Implementation Support

1. The implementation support strategy for the Project is based on the nature of activities supported by the Project and the capacities of the implementation agencies. The main risks relate to the resettlement issues and to a lesser extent technical and procurement issues. Implementation support will mainly be provided through continuous interaction with DPWH, MMDA, and other involved agencies to provide support and guidance on issues and challenges that may arise during implementation of the Project.

2. A multi-disciplinary task team will be established, mostly working out of the Manila country office. The core team will comprise an engineer, procurement and contract management specialist, social and environmental specialists, an urban specialist with resettlement experience, solid waste management specialist, and a communication specialist. The core team will have to ensure rapid and effective response to the Client's needs for implementation support. Considering the complexities of the Project, the core team will receive regular support from the regional safeguard's advisor's office, the senior regional and country operational advisors, and other technical staff in Washington and elsewhere.

3. The supervision strategy for the Project includes formal reviews by the Bank on average every six months. Although the Bank will administer the Project on behalf of the AIIB, including, technical, safeguards, and fiduciary aspects, most of the formal review missions are expected to be joint by AIIB staff. The entire Project will be reviewed at the same time. These reviews will include field visits and intensive discussions on Project performance, and will be used as a forum for providing constructive and corrective technical guidance. The findings of these reviews will also be used to identify gaps constraining implementation and support will be provided to the implementing agencies for the same. Besides the formal review missions, technical support will be provided by the Bank team to the implementing agencies as needed to enable them to implement all Project activities.

4. Under the leadership of DPWH, a feasibility study will be prepared for each drainage area that describes the surveys, investigations, and mapping, the proposed interventions, safeguards requirements, and feasibility-level costs and benefits. The Bank's task team will review the feasibility study to determine that it is consistent with the objective and general scope of the Project. If acceptable, the Bank will provide a written confirmation to DPWH that the Bank is in agreement to proceed with the detailed design of activities in the drainage area. When draft design, safeguards, and tender documents are available, the Bank will carry out appraisal of the proposed activities in the drainage area, including technical and safeguards appraisal. All resettlement action plans and the first five due diligence reports will be reviewed and cleared by the Bank's Regional Safeguards Advisor. There may be several communications between the Bank's task team and the implementing agencies to achieve acceptable documents. After a positive appraisal, the Bank will issue a no objection in writing to the chair of the inter-agency committee stating that the proposals in the drainage area have been appraised and eligible for inclusion in the Project. This no objection will be issued by the task team leader, except for

drainage areas where there will be resettlement, in which case the no objection will be issued by the Country Director for the Philippines.

5. Capacity building of the implementing agencies in monitoring and evaluation is a key aspect of supervision and support to the implementation agencies. The PMOs will be supported with developing monitoring and reporting formats for all components and activities to be undertaken by the Project, and analysis of data collected and presentation and use of findings. The PMOs will be assisted by consultants, as needed.

6. Financial management implementation support missions will be conducted twice a year focusing on the adequacy of the FM system to ensure that funds are used for the intended purposes with due regard to economy and efficiency. Based on the level of FM risks at the time of FM supervision, the reviews may include any or all of the following: (i) review and verification of specific transactions; (ii) review of bank reconciliations; (iii) analysis of the financial statements in relation to the funds disbursed by the Bank; and (iv) physical verification of structures as to existence. Desk reviews will also be conducted on a regular basis and upon submission of the annual external audit of the Project and the quarterly IFRs. Issues arising from these reports will be used to revise and adjust the scope of the planned FM implementation support. Training of PMO staff on financial management procedures will take place in the first 12 months of Project implementation, as needed. Project level service standards will be developed for disbursement against financial and results reporting.

7. Procurement review and support will focus on prior review supervision and participation in two formal review missions per year to assess procurement procedures being followed in the Project and recommend needed remedial actions, as well as carry out post review of procurement actions. In addition, continuous training of IA staff on procurement procedures will take place prior and during the first 12 months of Project implementation. Other improvements in the public procurement system will be adopted under the Project, including: (i) performance monitoring using the APCPI; (ii) professionalization of procurement practitioners; (iii) for major procurement packages, the involvement of CSO/NGO and private sector as procurement observers; (iv) the use of geo-tagging in identifying specific location of pumping stations and other critical interventions; and (v) result of annual procurement audit (as part of the regular audit) using GAP to be discussed with the IAs for further improvement of the procurement processes. During the Project Launch Workshop, the Bank will go over provisions of the Anti-Corruption Guidelines, and will discuss with core officials and key staff of participating agencies the main integrity risks that could affect the Project, as seen in similar projects in the World Bank's global portfolio.

8. A senior social safeguard specialist will be an integral member of the core task team during the first few years of Project implementation. The specialist will have main responsibility ensuring that the Project is implemented according to the approved safeguards instruments. He/she will also participate in formal review missions to provide technical support and assess the adequacy of the implementation of the social management activities. The specialist will also be available in between formal missions to provide support, especially considering that social issues may feature highly in the Project.

9. An environmental safeguard specialist will participate in formal review missions to provide technical support and to assess the adequacy of the implementation of the environmental management activities.

Implementation Support Plan

10. Regular need-based visits will be carried out by the core task team, supported by other specialists as required. Estimated inputs from different specialists will be more or less the same during each year of implementation of the Project and are outlined below for the core team.

Table 4.1. Implementation Support Plan

Time	Focus	Skills Needed	Resource Estimate (staff weeks/year)
During entire Project implementation	Engineering	Lead Engineer (also TTL)	10
	Social Safeguards	Social Development Specialist	6
	Resettlement	Resettlement Specialist	4
	Low-income housing finance	Housing Finance Specialist	3
	Land	Land management Specialist	2
	Legal	Lawyer specialized in working with real estate, low income communities	2
	Urban Renewal	Urban Planner	5
	Environment	Environmental specialist	4
	Financial Management	Financial Management Specialist	4
	Procurement and Contract management	Procurement Specialist	4

Annex 5: Economic Analysis

PHILIPPINES: Metro Manila Flood Management Project

Development context

1. As presented earlier, the Philippines' geographical location makes it vulnerable to typhoons and other natural hazards. An average of 20 typhoons a year enter the Philippine area of responsibility and about half make landfall. With climate change, these typhoons are expected to increase in number and intensity. Metro Manila is frequented by typhoons and monsoon rains and this often results in physical destruction, loss of lives, and significant losses to the economy. The most devastating typhoon that hit Metro Manila in recent history was typhoon Ondoy in 2009 (internationally known as Ketsana) which submerged much of the city, incurring damages and losses amounting to 2.7 percent of the country's GDP. Metro Manila contributes about a third of the country's GDP. Further, the city's low-lying location lends itself to flooding, which is exacerbated by the combined effects of population growth and rapid urbanization as well as inadequate flood management infrastructure. After typhoon Ondoy, a Metro Manila Flood Management Master Plan was prepared with World Bank assistance and approved by government in 2012. The Master Plan aims to reduce vulnerability to and to strengthen resilience against floods. It includes priority structural and non-structural measures over a 25-year period with total estimated cost of Php350 billion. This Project is the first major phase of the implementation of the Master Plan and is intended to reduce risks from flooding caused by regular rainfall events, particularly in the most vulnerable areas of Metro Manila where many poor, marginalized families reside.

The Project

2. The PDO will be achieved through: (i) modernization of existing pumping stations, increasing the number of these stations, and improving drainage systems; (ii) addressing solid waste management to improve efficiency of pumps and the drainage systems; and (iii) addressing resettlement of ISFs living in the vicinity of the pumping stations. The Project will be implemented following a programmatic approach. While target drainage areas have been identified, these will be subject to a set of technical, economic, social, and environmental criteria, and subsequently prioritized based on importance and readiness for implementation. Existing pumping stations for rehabilitation were selected by MMDA based on the age of the equipment, some of which were installed some 30 years ago, many of which are not operating efficiently anymore. The MMDA list was further vetted by concerned LGUs and revised accordingly to reflect issues on the ground, including enhancing synergy with other flood-related investments funded by both local and national government agencies with the objective of maximizing impact. New pumping stations identified by MMDA and DPWH are based on the frequency of flooding brought about by urbanization. The Project area is about 12,000 hectares with a population of almost 3.5 million, of which about 50 percent is estimated to be directly affected.

Methodology

3. Cost-benefit analysis was applied with costs and benefits defined based on 'with' and 'without Project' scenarios. Detailed design of Project interventions will be site specific and will consider best practices globally, where appropriate, as well as build on existing good practices of local governments. The ERR was estimated for the entire Project. Economic viability is measured by a positive NPV, a BCR of more than one, and an ERR higher than the discount rate of 15 percent, which is the rate used by NEDA for its economic analyses. The assumptions used are summarized at the end of this Annex.

Benefits

4. Benefits from this Project include avoided or reduced flood damages, avoided losses in business income and from disruption of commercial activities, avoided productivity loss due to traffic interruption and inaccessibility of roads during floods, avoided opportunity loss for school age children from disruption in schools and for the public from interrupted access to public services, and avoided health costs. At the household level, avoided costs are those due to increases in food prices and transportation costs during and in the immediate aftermath of floods. Due to data constraints, not all benefits could be monetized. The main benefits monetized include avoided flood damages and avoided productivity loss.

5. *Reduced flood damages.* Flood damages were estimated using data from the study *Enhancing Risk Analysis Capacities for Flood, Tropical Cyclone Severe Wind and Earthquake for Greater Metro Manila Area*, a project of government led by the agencies comprising the Collective Strengthening on Community Awareness on National Disasters (CSCAND)[13], assisted by AusAid and completed in 2014. In particular, flood damage estimates were based on the *Flood Risk Analysis of the Pasig-Marikina River Basin* prepared by PAGASA and completed in mid-2015. Data of LGUs with at least 80 percent coverage in the study's hydrological model were used as proxy for damages arising from urban flooding.[14] Flood damages estimated under the above-mentioned study considered replacement cost of damaged structural components and finishes, fixtures and fixed equipment, but excluded contents. For this analysis, damage from urban flooding covers the costs of repairs on house structures, household appliances and vehicles, plus the cost of cleaning up after each flood event. This damage was assumed to be five percent of the estimated average cost per square meter of floor area under the abovementioned CSCAND project.[15] The affected area was estimated using maps made available by the government's National Mapping and Resource Information Authority. It was estimated that about 80 percent of the city area is built up. The estimate on directly affected population was based on the same maps and adjusted to 2015 data based on two percent annual growth rate. Estimated annual damages used under the CSCAND project are for a 10-year return period of rainfall. The value of damages was assumed to grow by two percent a year in real

[13] The government agencies comprising CSCAND include Office of Civil Defense (OCD) as chair, NAMRIA and MGB under DENR, and PHILVOLCS and PAGASA under DOST, as members. The Technical Working Group on Flood Risk Modelling is composed of PAGASA as chair, and members including MGB, DPWH, MMDA, and LLDA.

[14] The LGUs are Manila with 90.5 percent of area covered by the hydrological modelling, Pasig with 93.7 percent, and San Juan with 86.1 percent.

[15] Estimated damages under the CSCAND project is based on full replacement cost of damaged structures.

terms as flood damages in a without Project scenario are expected to increase in the future. For conservatism, it was assumed that the Project overall would reduce flood damages by 30 percent of total estimated damages.

6. *Avoided productivity loss.* Benefits from avoided productivity loss were estimated using as proxy gross national income per capita multiplied by five days during which economic activities are expected to be disrupted due to traffic interruption and inaccessibility of roads. This was then multiplied by the population affected by the Project and broken down by age group using the age profile of the population of Metro Manila. The impact by age group was assumed to be 0, 100, and 40 percent for ages 0 – 14 years, 15 – 64 years, and 65 years and older, respectively. Population growth in Metro Manila is assumed at two percent annually.

7. *Other benefits.* Other benefits of the Project include the following:

(i) improved well-being from better housing and environmental amenities, and positive health impacts particularly for the affected ISFs that will be relocated under the Project;
(ii) greater knowledge on designs applying 'green technology' such as adopting green infrastructure in retention facilities (e.g. green roofs), rooftop wastewater collection, permeable pavements, retention of drainage water in public areas like basketball courts, parking garages, etc., waste conversion technologies, among others, to be piloted and demonstrated under the Project;
(iii) greater knowledge on: (i) good practices in community-based solid waste management focusing on minimizing dumping of solid waste in waterways particularly in communities with narrow road access that cannot be reached by garbage trucks, estimated at 20 percent of uncollected solid wastes; (ii) incentive-based approaches to solid waste management; (iii) targeted information, education, and communication campaigns; and (iv) mechanisms and institutional arrangements in recycling of residual solid wastes;
(iv) lessons learned from institutional arrangements supporting in-city relocation of ISFs; and
(v) capacity building of DPWH, MMDA, LGUs, NHA, and SHFC as implementers of projects funded by international financial institutions.

Costs

8. Project costs include capital and operation and maintenance costs for each component. Taxes and duties were assumed to be 12 percent of the financial costs and were deducted to reflect the economic cost.

Results

9. Based on the assumptions used, the base case scenario with avoided flood damages as a benefit shows positive results, with an ERR of 34.3 percent, a positive NPV of PhP 12.6 billion, and a BCR of 1.9. Considering the additional benefit of avoided productivity loss increases the ERR to 44 percent (see Table 5.1).

Table 5.1. Economic viability results

	Net present value (PhP million)	Benefit cost ratio	Economic internal rate of return (percent)
Base case – only includes Avoided Flood Damages as benefit	12,598	1.9	34.3
Includes Avoided Flood Damages and Avoided Productivity Loss as benefits	19,996	2.5	44.0

Sensitivity analysis

10. Sensitivity analysis was applied on the base case to determine impact of changes of certain variables on the economic viability of the Project. The scenarios included: (i) reducing benefits by 20 percent; (ii) increasing costs by 20 percent; and (iii) combination of the two scenarios. The Project remains viable under all scenarios (Table 5.2).

Table 5.2. Sensitivity analysis

	Net present value (PhP million)	Benefit cost ratio	Economic internal rate of return (percent)
Scenario 1: reduction of benefits by 20 percent	7,398	1.6	26.3
Scenario 2: increase in costs by 20 percent	9.917	1.6	27.6
Scenario 3: combination of scenarios 1 and 2 above	4,716	1.3	21.0

11. Beyond the avoidance of economic losses due to flooding, the ultimate economic impact of the Project is the unquantified effect of improving living and business environments in the areas under the Project. For the local economy, improvement in local businesses will bring in higher revenues due to a decrease in income losses from damages caused by flooding and the closure of business operations during flood events. Also, more businesses will mean more tax revenues for local governments and more employment opportunities for their constituents.

Impact on the poor

12. The impact on the poor, especially the ISFs, relates to the opportunity to have safer and cleaner environment. There will be positive health impacts from reductions in flooding and there will be benefits of reduced expenses from flood damages and productivity losses.

13. On employment creation and income generation, during Project implementation, it is expected that much of the skilled and unskilled labor required by the Project, e.g., civil works, dredging, cleaning of waterways, collection of solid wastes, will be sourced from the local communities surrounding the Project areas. This will generate employment opportunities as well as downstream economic activities e.g., provision of transportation to and from Project sites, lodging of transient workers, and food and other domestic services. During operation, skilled

labor will be needed to operate and manage the pumping stations, and implement solid waste programs. Similarly, this will create economic opportunities that will generate income for communities close to the Project areas. The Project will also support those currently employed living in the vicinity of the Project areas, otherwise affected by the lack of accessibility during floods. These flood prone areas are densely populated, mostly low to medium income communities where majority of households are involved in the informal economy with low-paying jobs. The Project will help sustain their employment and therefore their income, even during the rainy season, as well as minimize interruptions in economic activities with a strong possibility of increasing productivity from improved physical conditions.

Notes and assumptions used:

(i) Discount rate used was 15 percent.[16]
(ii) Taxes and duties are 12 percent of financial costs.
(iii) Shadow rate for foreign exchange is 1.2.[17]
(iv) Shadow rate for unskilled labor is 0.60.[18]
(v) Per square meter cost of flood damage was assumed to be PhP 10,947 (2011 prices) based on average cost of Manila, Pasig, and San Juan cities under the Flood Risk Analysis prepared by PAGASA in 2015. For conservatism, the same cost was used for 2016 and adjusted by 2 percent annually to reflect increasing future real costs. Only five percent of this cost was used to account for costs of cleaning up and minor repairs in house structures, household appliances and vehicles.
(vi) Gross national income in 2014 is PhP 86,510 per capita, 2000 prices (source National Statistics Authority) using an annual growth rate of 3.5 percent based on the average growth rate for the period 2008 to 2014.
(vii) Real increase in prices was assumed at 2 percent annually.
(viii) Population by age group for the National Capital Region (2010 data) is 29, 68, and 3 percent for ages 0-14 years, 15-64 years, and 65 years and older, respectively. Source: National Statistics Office.
(ix) Average annual population growth of National Capital Region for the period 1990 to 2010 is 2.02 percent. Source: National Statistics Office.
(x) Impact of flooded days by age group was assumed to be 0, 100, and 40 percent for ages 0-14 years, 15-64 years, and 65 years and older, respectively.
(xi) Annual O&M costs of components 1 and 2 were assumed to be one percent and seven percent of investment costs, respectively.

[16] Government project evaluation guidelines.
[17] Ibid.
[18] Ibid.

Annex 6: Relevant Technical Assistance of the World Bank

PHILIPPINES: Metro Manila Flood Management Project

1. The design of the Project has been informed by a number of studies and technical assistance projects undertaken by the Bank and by the Government with the assistance of the World Bank in both the water and urban sectors in the Philippines.

Water Sector

2. In September 2009, Tropical Storm Ondoy hit Metro Manila and surrounding areas causing tremendous flood damage. The government, with the technical and financial support of the World Bank, has prepared a Flood Management Master Plan for Metro Manila and Surrounding Areas.[19] The Master Plan established the overall vision and road map for a sustainable and effective flood risk management (FRM) in Metro Manila and surrounding areas. The study area covers the entire Metro Manila and surrounding area of 4,373 km^2, composed of the Pasig-Marikina, Malabon-Tullahan, Meycauayan, and South Parañaque-Las Piñas River Basins, and Laguna de Bay Basin.

3. Considering the regular flood events that affect Metro Manila and surrounding areas, the results of the analysis on the mechanism of floods and flood damage, and the need to attain certain flood safety levels in Metro Manila and surrounding areas, structural measures and non-structural measures for integrated flood risk management are required. The Master Plan identified a long-list of possible measures and prioritized a short-list of essential interventions to improve flood management in the study area. The Master Plan was approved by the NEDA Board on September 4, 2012. The total estimated cost for the implementation of the Master Plan is around PhP 352 billion (about US$7.5 billion) over a 20-25 year period.

4. The main elements of the Master Plan are: (a) structural measures to reduce flooding from river systems that run through the city; (b) structural measures to eliminate long-term flooding in the flood plain of Laguna de Bay; (c) structural measures to improve urban drainage; (d) non-structural measures such as flood forecasting and early warning systems and community-based flood risk management; and (e) recommendations for an improved institutional structure to deal with flood management in an integrated manner.

5. In order to improve the overall flood management conditions in Metro Manila all interventions under elements (a) to (e) have to be implemented. However, each element has unique solutions that are not directly linked to other elements and can be implemented independently from each other. For example, improvements in drainage areas proposed under this Project would not protect areas from flash floods in major rivers or prevent annual flooding along the shores of Laguna de Bay.

6. Implementation of the Master Plan has started with some interventions, such as dredging, river bank protection, and improvements to a small number of pumping stations. It is important

[19] The World Bank sourced US$1.5 million grant funds from GFDRR for the preparation of the Master Plan. These funds were provided to government. Government in turn requested the Bank to implement the grant. The Bank recruited consultants and had overall responsibility for the preparation of the Master Plan and its quality.

to scale up such activities, which will be done under this proposed Project. In parallel feasibility studies and designs of major priority interventions under element (a) of the Master Plan, such as a high flood management dam and river embankments, have to be prepared as soon as possible as they are essential for a sustainable flood risk reduction and city-wide improvement. Government was provided with about US$6 million TA grant assistance from the Australia – World Bank Philippines Development Trust Fund (PH-PTF) and PHRD Trust Fund, both administered by the World Bank, and currently the necessary studies and designs for the dam that could form the next major phase of the implementation of the Master Plan are underway.

Housing and Urban Sector

7. The World Bank has a long history of engaging in the housing and urban sector in the Philippines, dating back to the 1970s when the successful Tondo Foreshore Project implemented the largest slum upgrading program in Asia. The support has ranged from direct production and upgrading of housing stock in the 1970s and 1980s, to institutional reforms that aimed to enhance the efficiency and efficacy of the housing market in the 1990s. There were limited activities as to the World Bank's support in the housing sector during the first 10 years of the 21th century. Between December 2010 and mid-2016, the World Bank revived its support to the low-income housing sector, and provided a package of Technical Assistance to the Government of the Philippines, with a particular focus on the ISFs living along the waterways in Metro Manila.

8. The Bank has taken a two-pronged approach to supporting the housing and urban sector in the Philippines between 2010 and 2016, namely policy dialogue and operational support to government's own programs. On the policy front, the Bank supported HUDCC in formulating a National Informal Settlement Upgrading Strategy (NISUS). The NISUS, adopted by the HUDCC Council in 2014, places people at the cornerstone of solutions, highlights the central role that LGUs should play, and commits to a mission of providing a more dignified life for at least one million ISFs by 2025 through secure and better quality housing, improved physical infrastructure and social services, and greater access to jobs, transport, capital, and livelihood. Moreover, the Bank provided technical inputs to the National Summit on Housing and Urban Development, which was sponsored by the Philippine Congress and Senate's Joint Committee on Housing and Urban Development in 2015 and 2016. The Summit held over 40 plenary sessions among over 110 organizations from national/local governments, private sector, academics, CSOs, and development partners to discuss key policy reforms related to land, housing finance, governance, and inclusive urbanization. Key policy recommendations were endorsed by all in the form of a Joint Statement, and collated as a Policy Paper which has been published.

9. At the operational level, the Bank has provided targeted TA to relevant government agencies, NGOs, and communities to enhance their knowledge and capacity to address challenges faced both in supply and demand side of the housing market. As the Government focused its efforts on *Oplan Likas*, the gravity of the Bank TA also shifted to support the Government's *Oplan Likas,* implemented between 2011 and 2016, to fulfil its original intent of in-city relocations for ISFs in danger zones.

10. On the supply side, the Bank has provided just-in-time Advisory Services to the National Technical Working Group (NTWG) to inform the formulation of the Operational Guidelines for the *Oplan Likas* program. The Bank provided customized TA to both SHFC and NHA, the two main implementation agencies for the *Oplan Likas* program, to enhance their capacity to establish new programs, such as SHFC's High Density Housing program that focuses on in-city and near-city resettlement and its new wholesale lending window to respond to the demand coming out of the participatory shelter plans (see below). In parallel, the Bank assisted relevant national government agencies and LGUs to explore ways in which more land can be made available for affordable housing. The Bank also supported the design and provision of the LGU seed grant to incentivize LGUs to participate in in-city relocation and upgrading. Lastly, as per request of the Department of Interior and Local Government, the Bank conducted a rapid assessment to review the *Oplan Likas* Program with focus on what has worked and what should be improved, as well as to assess whether the program is consistent with the objective of the World Bank safeguards policy on resettlement (OP 4.12).

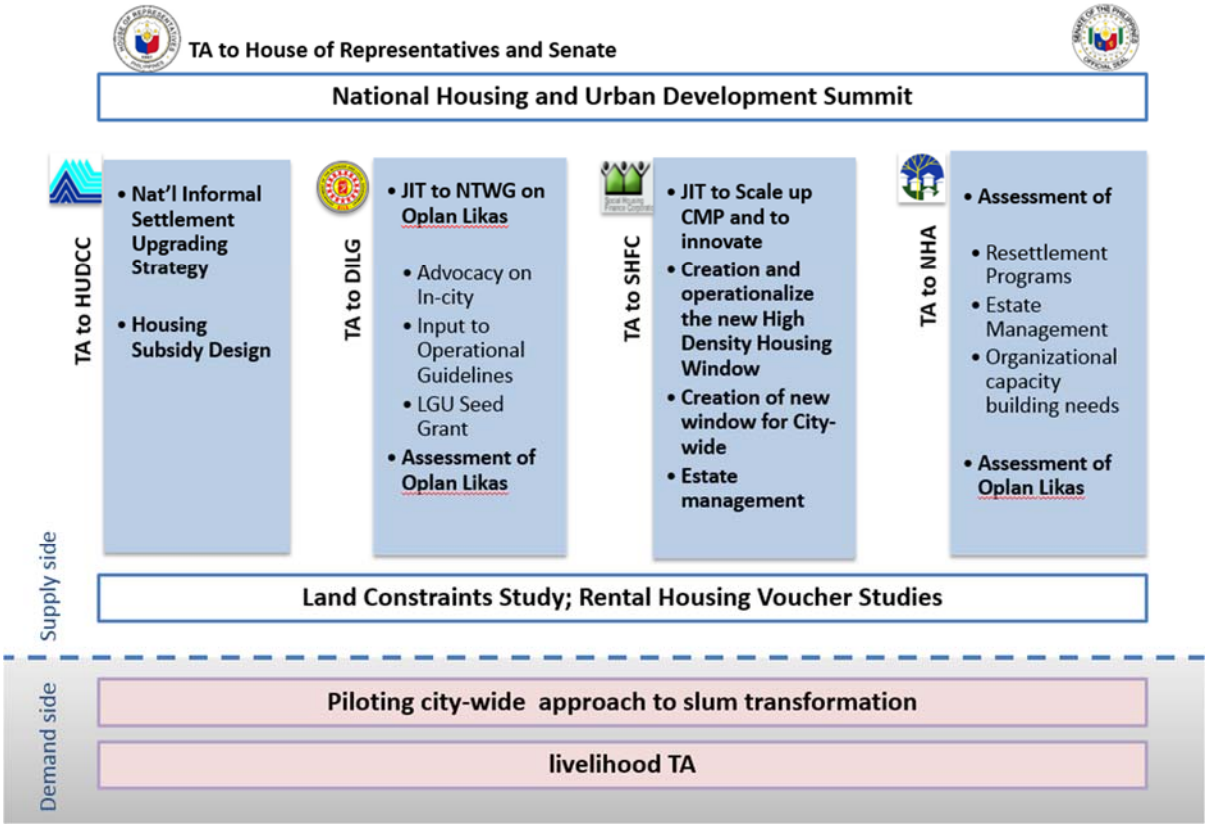
11. On the demand side, the Bank has supported the design of subsidy schemes for the *Oplan Likas* Program, including rental assistance as a transitory measure for the ISFs. To address the challenges of lack of regular income streams to ensure mortgage payment to the government subsidized housing loans, a livelihood study has been carried out to take stock of what has worked and what has not in improving the livelihood of ISFs both in the Philippines and around the world, as well as to suggest appropriate modalities and institutional arrangements for ISFs to be resettled in both in-city and off-city sites. To ensure sustainability of interventions, the Bank also supported TA on estate management to support Key Shelter Agencies and communities to maintain and manage their communities in a viable manner.

12. One key constraint cuts across both demand and supply sides: lack of city-wide participatory shelter planning to tackle shelter challenges in a systematic manner. Interventions in informal settlement upgrading in the Philippines tend to be project-based, and relying primarily on community initiatives. LGUs, with few exceptions, do not integrate shelter planning in its comprehensive land use plans, and when they do, the shelter plans are undertaken with limited community participation. As a result, shelter plans often face resistance by the communities and are not implemented. To tackle this challenge, the Bank carried out a TA to pilot city-wide shelter planning in three flood-affected LGUs in Metro Manila. The TA has helped LGUs build a platform to collaborate with communities and their NGO partners to proactively plan and implement informal settlement upgrading and resettlement in a systematic manner. This effort has also strengthened the community's ability to articulate their shelter and service needs.

13. With one exception- the NISUS – all TAs in the housing sector were Bank-executed, included in the Programmatic Advisory Services and Analytics (ASA) on Metro Manila Development (see Figure 6.1 for a summary of key activities). All advice has been given in line with the Bank's relevant safeguards policies, including OP 4.12 on involuntary resettlements. As an integral part of the TA, the Bank has brought in relevant international good practices such as those in Latin America (Chile and Brazil), South East Asia (Thailand, Indonesia, and Vietnam), and South Asia (India). This was done through international consultants as well as knowledge

exchanges, including study visits in the areas of low income housing and informal settlement upgrading.

Figure 6.1. Relevant Advisory Services and Analytics that have contributed to the design of Component 3



15. The package of ASA has generated substantial impacts in the low-income housing sector:

- First, it has changed the quality of policy discussion with evidence derived from research and global knowledge and elevated the issue of ISF housing at the national level. For instance, while the urban poor groups have been demanding in-city relocation and criticizing the government for resorting to off-city resettlement, they lacked sound analysis to make the case for in-city and the need for greater government support to make in-city possible. A Bank supported study comparing welfare outcomes of in-city and off-city relocatees displaced by Ondoy and Pepeng in 2009 has shown strong evidence that everything else being equal, in-city relocatees fare much better than off-city relocates. Equally important, the overall welfare to the economy is also greater if taking the approach of in-city relocation. This study has helped make evidence-based debate to inform the formulation of the Operational Guidelines for the *Oplan Likas* Program, which makes in-city a priority. In 2015, as requested by the Congressional Committee on Housing and Urban Development and the Senate Committee on Urban Planning, Housing and Resettlement, the Bank has provided TA to support the National Housing and Urban Development Summit, an eight-month long consultative process. The main objective of the Summit was to

bring together all stakeholders in the housing sector - government, the private sector, and the civil society - to collaborate towards identifying key policy reforms needed to close the affordable housing gaps and effecting immediate interventions to address the ISF shelter needs in the Philippines. The value addition of the Bank is the sound policy and technical analyses, drawing from local and international experiences on land, financing, institutions, as well as livelihood, which have grounded the discussion among stakeholders on facts and possible solutions.

- Second, the TA has helped the government demonstrate that in-city relocation based on "People's Plan" is possible. This was primarily realized through TA to SHFC, which has supported the creation of the High Density Housing Program to allow a comprehensive package of land and housing loan for multiple story dwellings. Under the *Oplan Likas* Program approximately 10,000 in-city and near-city HDH housing units have been developed. This represents a significant breakthrough in government's housing programs, as well as a substantial increase in the supply in low-income housing within Metro Manila.

- Third, the TA Advisory Services introduced policy instruments such as upfront income based subsidies and rental support to make housing more affordable for the ISFs. The current subsidy schemes for the socialized housing program of the Philippine government are largely in the form of interest rate subsidies. The large non-collection of repayments constitutes de facto subsidies in the form of forgone revenues. Such subsidies are not equitable nor efficient and also not transparent. The Bank's TA has supported a process whereby a multi-agency working group designed a better subsidy scheme, which was informed by global good practices in subsidy design for low-income housing. Through this process, SHFC has started offering 10 percent of total cost as subsidies for communities for soft and indirect costs (professional fees, taxes and permit fees, etc.) in their HDH program. NHA also instituted price differential across floors to enable a "self-selection" process according to affordability levels of ISFs. These changes in SHFC and NHA's existing subsidy schemes are one step forward towards good practices in subsidy design. Additional income-based subsidies will be introduced under the Project.

- Fourth, the TA built capacity of key shelter agencies, in a demand-responsive manner, to begin changing the way of doing business to be more in line with international good practices. International and local consultants provided advise in product innovation and business process enhancement. Capacity building took place through exchanges with Community Organizations Development Institute of Thailand and mentoring and training of SHFC staff and its stakeholders. The TA has supported SHFC to start transforming itself in a developmentally oriented institution, not merely a financing-oriented institution. NHA also started examining its practices in large-scale resettlement in its entire project cycle and endeavored to fill the gaps as compared to international good practices.

16. Table 6.1 below summarizes the objectives, key activities, and main outputs of above ASAs.

Table 6.1: World Bank Relevant Advisory Services and Analytics on Philippine Urban Development and Housing Sector FY 2011-2016

Project/TA Name	Brief Description and Key Outputs	Implementing Agency
National Informal Settlements Upgrading Strategy (NISUS) for the Philippines	• Supported the development of a national strategy to guide the National Government and LGUs in the preparation and implementation of effective policies and programs on informal settlements upgrading. • Key Outputs: (a) Comprehensive Assessment Report on informal settlement communities in the Philippines; (b) Conference proceedings on international and local good practices on upgrading; and (c) National Informal Settlements Upgrading Strategy Report.	HUDCC (Recipient-executed)
Design of Housing Subsidy Schemes for the ISF Program	• Supported a consultative process to develop subsidy designs to bridge the affordability gap of the low to middle-income groups, leverage funding from the Home Development Mutual Fund (Pag-ibig), and incentivize private sector participation in housing production. • Key Outputs: (a) proceedings of series consultative technical workshop on the design of upfront income- based subsidy for socialized housing; and (b) upfront income-based capital subsidy design proposed for the Metro Manila Flood Management Project.	World Bank/HUDCC/ SHFC/NHA
Support to National TWG on ISF	• Provided just-in-time advisory services in the formulation of a comprehensive framework for the PhP 50 billion ISF program, premised on prioritizing on-site improvements and in-city or near-city relocation. This program later was dubbed as "*Oplan Likas*". The TA provided support to DILG, the leading agency for the National Technical Working Group (TWG) on ISF in Metro Manila as follows: (a) technical support to the Convergence Workshop to develop a road map for ISF shelter development; (b) provided evidence of the welfare benefits of in-city relocation to individual families and to the economy as a whole; (c) provided technical input to the formulation of the Memorandum of Agreement among Philippine Government Agencies for the *Oplan Likas* program; and (d) conceptualized the LGU Housing Seed Fund, which was envisioned to provide funding to LGUs for technical assistance and capacity-building, land acquisition and site development, and/or bridge financing/matching grant for community savings to allow communities to make down-payments for land acquisition. • Key Outputs: (a) Proceedings of the Convergence Workshop; (b) Presentation "Comparing Apples with Apples: An Integrated Cost-Benefit Analysis – in-city vs. off-city relocation"; (c) Comments on the MoA among Philippine Government Agencies involved in the Execution of the ISF Fund; and (d) Concept note, and Funding Flow for the LGU Housing Seed Fund.	World Bank/DILG

SHFC-TA	• Phase 1 provided just-in-time technical advice to SHFC regarding its portfolio, procedures, and processes with the aim of addressing bottlenecks in implementation and scaling up the delivery of the Community Mortgage Program (CMP). It also reviewed the CMP Portfolio particularly on how different factors have affected the performance of the community repayments. Key recommendations included the development of High Density Housing Program for in-city/near-city housing and demonstrating the efficacy of the city-wide development approach to shelter provision in LGUs in Metro Manila. • Phase 2 supported SHFC in the establishment of the HDH program and building the capacity of the agency and its stakeholders to operationalize this new program. It also supported SHFC in championing and piloting the city-wide development approach to shelter provision through learning exchange events with SHFC program partners that included LGUs, civil society organizations, and relevant national government agencies. • Key Output: SHFC Review and Recommendation Report and briefs and presentation materials on key policy and operational issues on an on-demand basis.	World Bank/SHFC
Citywide Community Upgrading Strategy	• Piloted a citywide planning process to help reduce informality in Metro Manila in three flood-prone cities in Metro Manila: Caloocan (Barangay 177), Muntinlupa, and Quezon City (Sixth Congressional District). Key Activities included: (a) spatial mapping and socio-economic profiling of all informal communities in the city (or district/barangay) overlaid with hazard maps; (b) citywide shelter development plan for each LGU based on supply (land, subsidy, other financing) and demand-side (shelter needs, affordability, etc.) analyses and prioritization of communities based on a clear set of criteria; (c) prioritization of community-driven slum upgrading projects in each pilot city; (d) establishment or revitalization of a platform for government-civil society-private sector collaboration; and (e) capacity-building activities for key stakeholders. • Key Output: Citywide Community Upgrading Strategy Stocktaking Report.	World Bank, SHFC, and the LGUs of Caloocan, Quezon City, and Muntinlupa
NHA-TA	• Phase 1 provided advisory assistance to NHA in reviewing its resettlement program with an end view of introducing good practices and enhancements to make the program aligned with international standards. The TA outputs paved the way for NHA to review and improve its standards and manuals for site-selection, site suitability analysis, and site planning, and developed an Estate Management Manual. Phase 1 took a learning-by-doing approach to assist NHA in enhancing its organizational capability to sustain the innovations and changes introduced as a result of the analytical work. • Phase 2 sought to inform the design of the proposed Metro Manila Flood Management Project by providing input to the preparation of its social safeguards instruments; help NHA strengthen its capacity to plan and implement resettlement programs; and determine its appropriate role in livelihood interventions vis a vis other players. The TA reviewed the *Oplan Likas* program to determine the level of compliance and consistency with the World Bank's Operational Policy on Involuntary	World Bank/NHA

	Resettlement and recommend improvements for government's future resettlement programs as well as possible corrective actions for past resettlement activities. The TA also conducted an ISF livelihood study to look into optimal livelihood interventions for ISFs who were resettled off-city and in-city, considering their differing constraints. Finally, it carried out capacity building activities for NHA managers and personnel in the areas of resettlement planning, implementation, and monitoring and evaluation, and estate management to help improve the performance and outcome of its large-scale resettlement programs. • Key Outputs: Final NHA-TA Phase I Report, including Estate Management Manual, Revised Manuals for Site-Selection, Site Suitability Analysis and Site Planning; Synthesis Report on NHA TA Phase II which summarizes key findings and recommendations from the following: Briefing Paper 1: stocktaking of the achievements and gaps of *Oplan Likas* program; Briefing Paper 2: livelihood situation in resettlement sites; and Briefing Paper 3: recommendations on possible livelihood interventions for and options for implementation arrangements for livelihood interventions.	
Land Constraints Study	• The study generated a better understanding of land-related constraints that hamper the implementation of viable and sustainable housing solutions. It looked into three key areas: (i) land administration; (ii) land mobilization, land tenure, and housing rights; and (iii) land use and planning regulations. • The study identified and provided recommendations on the following constraints: (i) limited access to up-to-date and reliable information on land and ISFs; (ii) planning rules and regulations; (iii) overly lengthy process of proclamations; (iv) absence of clear guidelines on administration and disposition of lands proclaimed for ISFs; (v) lengthy process for issuance of special patents; (vi) limited access by ISFs to compliance housing projects and mechanisms per Section 18 of the Urban Development and Housing Act; and (vii) high capital gains tax imposed on foreclosed properties that prevents LGUs from using these lands for ISFs. These issues and resulting recommendations were unraveled and confirmed during the conduct of the National Housing and Urban Development Summit. • Key Output: Land Constraints Study.	World Bank
Rental Housing Voucher Scheme	• A rapid assessment was undertaken of the supply of and demand for low cost rental housing in Metro Manila to better understand the rental arrangements, pricing, potential supply in the market, as well as the rental behavior and needs of households in informal settlements. A parallel TA that developed the Operational Manual on the implementation of a rental housing voucher scheme for Yolanda-affected areas was instrumental in the design of a transitional rental support program under the Metro Manila Flood Management Project. • Key Output: Metro Manila Rental Housing Assessment Study.	World Bank

National Housing and Urban Development Summit	• A year-long process that brought together main stakeholders in the housing sector – government, the private sector, and the civil society – to collaborate towards identifying key policy reforms needed to close the affordable housing gaps and effecting immediate interventions to address the ISF shelter needs in the Philippines. It focused on the main theme of "Making In-City Housing a Reality." It gave attention to four major themes: (i) land and housing; (ii) housing finance; (iii) participatory governance; and (iv) urban development. All these themes took off from the various outputs of the World Bank TA program and recent efforts by various stakeholder groups. • Key Output: Policy Paper "Closing the Gap in Affordable Housing in the Philippines" that summarizes key policy recommendations, with Policy Briefs by technical experts on the identified issues above.	World Bank/ House of Representatives and Senate of the Philippines
Urbanization Review	• Analytical work to better understand the urbanization process in the Philippines, how Metro Manila could better perform, and how urbanization can be leveraged for employment growth, poverty reduction, and improved quality of life. The work was envisioned to better inform policy makers and the general public of the Philippine urbanization process, assist Government to identify policy and investment constraints, and develop a knowledge base and framework to design and implement effective urbanization policies and programs. • Key Output: Philippines Urbanization Review – Fostering Competitive and Sustainable Cities.	World Bank

Annex 7: *Oplan Likas* Program

PHILIPPINES: Metro Manila Flood Management Project

1. *Oplan Likas* is a multi-agency and multi-sectoral program implemented under the lead of the Department of Interior and Local Government. Although dubbed as *Oplan Likas* only since 2013, the program was initiated in 2010 with the aim to resettle over 100,000 informal settler families out of danger areas[20] in the National Capital Region, starting with ISFs who live above and within the three-meter legal easement along eight priority waterways.[21] *Oplan Likas* envisaged that the relocation would primarily be on-site, near-city, and in-city, in accordance with the People's Plans which were to be developed in a fully participatory manner.[22] To implement *Oplan Likas*, the Government committed to providing PhP 50 billion (PhP 10 billion annually) between 2011 and 2016. The National Housing Authority was tasked to provide 101,210 housing units, including 16,748 in-city housing and 84,462 units for off-city resettlement. In addition, the Social Housing Finance Corporation was tasked to provide housing units to 19,491 ISFs. DILG was to provide interim shelter fund in the amount of PhP18,000 each for 52,734 ISFs and seed fund for land acquisition and community infrastructure to nine LGUs in the total amount of PhP 1.4 billion. As of March 2017, NHA reported that a total of 81,826 units have been completed or are under construction. Around half (51 percent) have been occupied, 18 percent are ready for occupancy, 12 percent are being readied for occupancy, and 19 percent are currently being constructed and expected to be completed by 2018.

2. The genesis of *Oplan Likas* Program dates back to the 2010 presidential elections when Urban Poor Groups demanded, among others, a shift of the country's housing program from off-city relocation to area upgrading and in-city resettlement. In-city versus off-city resettlement was and is an obvious concern of the urban poor because off-city resettlement typically disconnects people from their work places, and basic services are provided with varying degrees of delays.

3. With consent of the HUDCC chairman, in December 2010, the President requested the program on ISF concerns in Metro Manila to be led by the Department of Interior and Local Government. An Informal Settler Families – National Technical Working Group (ISF-NTWG) was established, consisted of 18 national government agencies and NGO representatives, to operationalize the program. A Joint Memorandum Circular (JMC) was drafted to govern the utilization of the PhP 50 billion Housing Fund for the affected ISFs. The JMC premised upon Supreme Court's Mandamus to undertake clean-up of the Manila Bay and its interconnected waterways. It puts a premium on on-site, near-site, and in city relocation and supports the "People's Plan" by the affected ISFs themselves. Off-city resettlement is the last resort if directly requested by the affected families themselves or by the NHA with the prior consent of the ISF Fund Executive Committee. Three sub-committees (social preparation, site selection and

[20] Danger areas refer to waterways, railroad tracks, garbage dumps, riverbanks, shorelines, transmission lines, and other public places.

[21] The eight priority waterways comprise San Juan River, Tullahan River, Estero Tripa de Galina, Estero de Maypajo, Estero de Sunog Apog, Maricaban Creek, Pasig River, and the Mangahan Floodway.

[22] Government of the Republic of the Philippines. (2013). "Draft Joint Memorandum Circular on the Policy Guidelines on the Operationalization and Utilization of the PhP 50 Billion Housing Fund for ISFs in Danger Areas of the NCR".

evaluation, and finance and affordability) led by different agencies were set up to ensure a broad-based platform and that the "People's Plan" process is respected and the rights of the ISFs are protected. The JMC, however, was never signed. Instead, on June 25, 2014, more than three years since the program's inception, Operational Guidelines were issued by the ISF-NTWG.

4. The implementation of the PhP 50 billion housing fund has encountered difficulties, in particular, in realizing its goal of achieving in-city relocation. Weak and fragmented institutional set up, lack of subsidies, and land constraints, are main factors behind the slow implementation for in-city relocation.

5. Evolution of the *Oplan Likas* and Bank's involvement is as follows:

- Stage 1 (December 2010-September 2011): advocacy and exploration, led by NTWG supported by the Informal Settlers Assistance Program Action Team.

    - The initial stage of *Oplan Likas* was one of advocacy and exploration. The Secretary of DILG requested in writing the Bank's advice on how to build medium rise buildings for the urban poor for in-city relocation of the ISFs in Metro Manila. The Bank supported the advocacy for in-city relocation through an integrated cost-benefit analysis comparing in-city and off-city relocation. The Bank also supported a series of multi-stakeholder Convergence Workshops (chaired by DILG, with 14 National Government Agencies and urban poor NGOs participating) to craft a road map for addressing ISF shelter challenges in Metro Manila. As part of the road map, prioritization of ISFs (danger zones vs. non-danger zones, public vs. private lands), and institutional modalities were discussed and participatory approaches advocated. The Urban Poor Groups pushed for multi-agency implementation arrangement to involve SHFC, LGUs, and NGOs to help deliver in-city shelter solutions.

- Stage 2 (October 2011-September 2012): operationalization of the PhP 50 billion.

    - While the implementation was still being worked out through the NTWG, in October 2011, as part of the Disbursement Acceleration Program to speed-up public spending and to boost economic growth for the country, PhP 10 billion was disbursed to NHA for on-site development for ISFs living in danger zones.

    - The NTWG began formulating a JMC delineating the roles of different agencies, principles for ISF housing programs, and operational guidelines. Observing that DILG was still staffing up its team supporting the NTWG, the Bank team provided secretariat support and informal advisory on the JMC and operational guidelines.

    - On January 10, 2012, the Secretary of DILG requested for TA from the Bank to provide expert advice to the NTWG on the development of the overarching framework and technical guidelines for the program by the NTWG, as well as

just-in-time advice at the site-specific level. The Bank responded to the TA request positively in April 2012.

- In May 2012, the Bank team responded to SHFC's request for TA to support its goal of increasing its beneficiaries by assisting with the creation of the High Density Housing window to tap into the PhP 50 billion *Oplan Likas* Program, enhancing its business processes and building capacity of SHFC staff and its stakeholders. The team of individual consultants that was mobilized supported both SHFC and DILG for the implementation of the *Oplan Likas*.

- Late 2012 after the appointment in DILG of an Undersecretary for special concerns on ISFs, AusAID (now DFAT) started providing TA to the NTWG. As the Bank TA on ISF issues was also supported by the AusAID, the agreement was that AusAID bilateral effort would focus on addressing the demand side of the ISF Housing through DILG. The Bank would focus on the supply side with the KSAs. The Bank also shared global experience on rental assistance to ISFs which contributed to the provision to ISFs of PhP 18,000 financial assistance.

- Stage 3 (October 2012-mid 2016): delivering targets and addressing challenges. While facing pressure to meet the target of over 100,000 ISFs by 2016, the ISF-NTWG relied on the NHA and SHFC to deliver the units.

  - In 2013, after the SHFC Board approved its High Density Housing product line, SHFC received a small allocation out of DILG's budget allocation for *Oplan Likas*. In 2014 and 2015 respectively, PhP 3.6 billion and PhP 3.7 billion direct allocation was made for SHFC under *Oplan Likas*.

  - In June 2013, NHA requested Bank TA to enhance its resettlement programs. Under the NHA TA, past large-scale resettlement experiences (including those under *Oplan Likas*) were to be reviewed and compared against international good practices and specifically the Bank's OP 4.12 on involuntary resettlement. In January 2014, the Bank signed a memorandum of understanding with the NHA, which specified that the engagement will be guided, among others, by Bank's Fiduciary Policies, including safeguards policies and guidelines.

  - In January 2014, the Bank sent a letter to the Secretary of DILG, highlighting three critical constraints (land constraints, affordability, and institutional arrangement, in particular LGU's role in *Oplan Likas*) which have contributed to the slow pace of implementation of *Oplan Likas*, and offered to further support the ISF program in the above three areas.

  - Since 2013, the Bank has provided a package of TA to address the above three constraints (see also Annex 6). On affordability, the Bank supported a working group led by HUDCC to design subsidy schemes for in-city relocation. NTWG endorsed the subsidy scheme in March 2015, and SHFC intends to pilot it in its HDH program, including under the Project. On land constraints, the Bank has

supported a study to explore ways in which more land can be made available for affordable housing purposes in Metro Manila. On institutions, the Bank team has provided TA to set up a LGU seed fund to incentive the participation of LGUs in the *Oplan Likas* and to provide more sustainable and locally driven solutions.

6. In order for the Government to further improve its large-scale resettlement policies and practices, a rapid stock taking study was conducted to review the progress made to date under the *Oplan Likas* Program with focus on what have worked and what could be improved. An associated objective was to assess, in a broad brushed way, the compliance and consistency of *Oplan Likas* with the Bank safeguards policy on resettlement (OP 4.12). The study covered four off- city resettlement sites (Golden Horizons, Sunshine Ville, San Jose Del Monte Heights, and Pandi Residences) and one in-city (Bistekville 2) resettlement site. The following are the key results and recommendations:

- *Major Achievements.* The relocation of thousands of informal settler families was accomplished without any major incident contrary to many relocation activities prior to Oplan *Likas*. The effective manner by which people transferred and resettled was due to a confluence of factors: (i) adoption of certain protocols[23], e.g. the affected families demolishing the houses themselves; standard of consultation of the beneficiaries; institutionalizing collaboration between the sending and receiving LGUs through memorandum of understandings; (ii) incentives such as the transitional assistance of PhP 18,000; (iii) consultations with ISF communities; (iv) a certain degree of choice on which site to resettle; and (v) clear eligibility criteria and conduct of a census. Moreover, *Oplan Likas* provided stronger and more durable shelter which are safer and more secure than their places of origin. The housing units are also located in less crowded communities. People observed a lesser incidence of crime in their new homes, and lower risks to effects to typhoons and fire occurrences. Finally, ISFs have secure tenure. Unlike in the places of origin of ISFs where eviction was an omnipresent threat and evacuation almost a yearly ritual because of typhoons, people enjoyed security of tenure in both in-city and off-city resettlement sites.

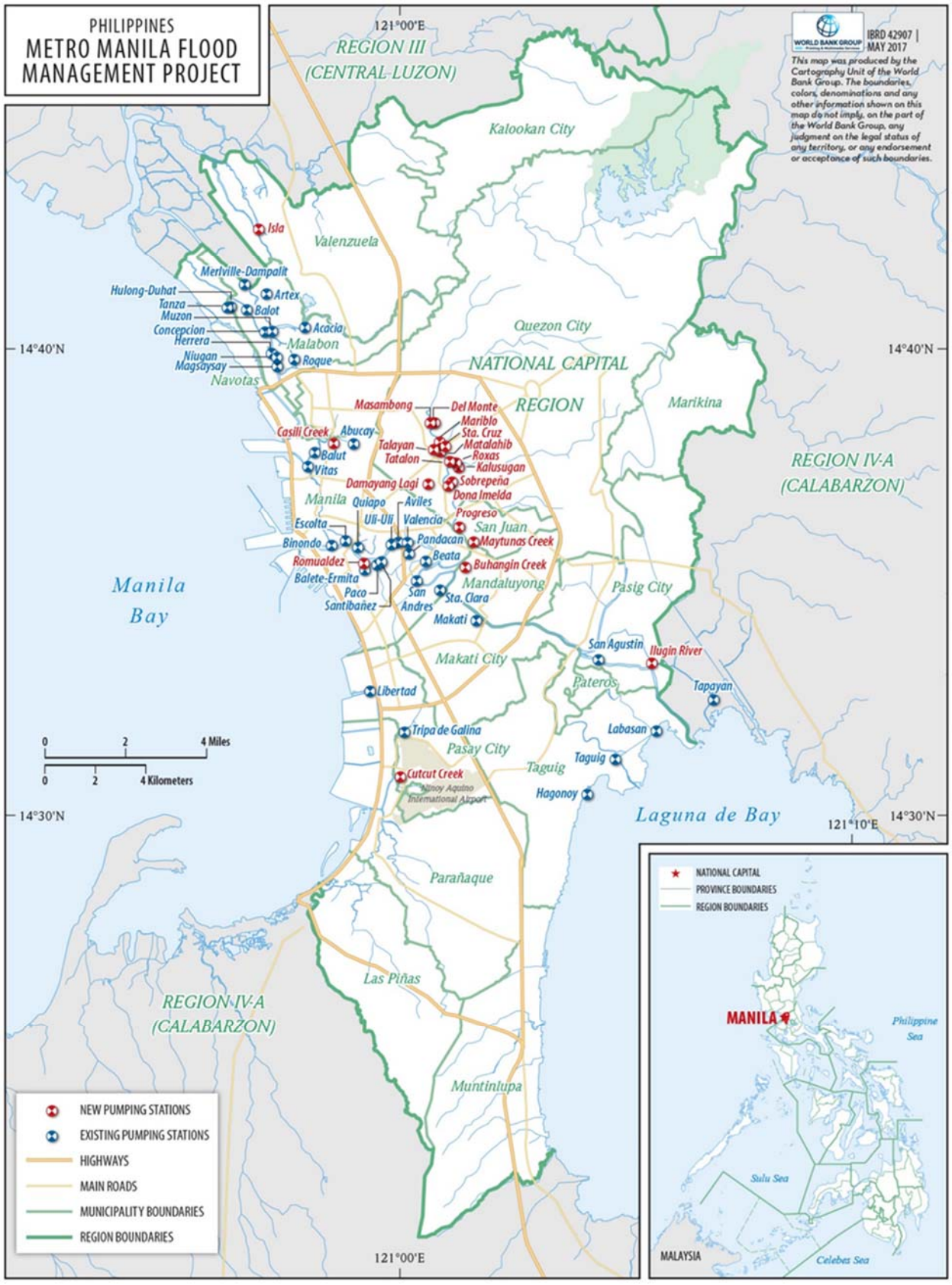
- *Gaps.* Among the gaps of the program include: (i) lack of adequate consultations with the hosting communities (implementers only discussed and made agreements with high ranking LGU officials, but no consultations were made with the communities); (ii) there was no evidence that a Peoples' Plan or a Resettlement and Rehabilitation Action Plan was prepared for each ISF affected community; (iii) not all affected ISFs did know the types and extent of the assistance they were entitled to receive from both national and local governments; (iv) lack of readiness of some off-city sites to receive occupants because of the absence of electricity and water connections and in many sites the communities were left on their own to apply for utility connections; (v) limited livelihood restoration measures were implemented prior to relocation. Livelihood interventions, specifically training and product development, were introduced without full regard for the demand or market for the skills and product and the people's preferences, and were not followed up with seed capital and with the provision of tools; (vi) failure to systematically provide assistance to the hosting local governments and community to

[23] Some of which were introduced mid-way through and issued towards the tail end of the program.

upgrade health, education, and other public facilities and services including to cope with the new arrivals. By and large, the hosting LGUs were expected to cope with the influx through their own resources, specifically through the Internal Revenue Allotment; and (vii) *Oplan Likas* has an appeals process or GRM, but it could be improved with better involvement of receiving LGUs and barangays in the planning, construction, and transfer of people to the resettlement site.

- *Recommendations.* The study recommended: (i) pursuing in-city resettlement as much as possible. Among the five study sites, only Bistekville II achieved the objective of OP 4.12 of restoring standards of living of displaced people to pre-displacement or pre-project level; (ii) implementing appropriate livelihood restoration measures even before displacement to allow resettled people reduce the learning curve and allow people to recover faster from the ill-effects of physical displacement; and (iii) help communities in reducing cost of living. Interventions may include constructing commercial areas, public markets, where people could buy and sell food and other daily necessities, thereby reducing the need to travel and identifying and organizing resettled people to obtain franchises with the hosting LGU or the local Land Transport and Franchising Board to operate tricycles and jeepneys from the resettlement sites to key areas of the cities; (iv) facilitating the increase of the Internal Revenue Allotment to receiving or hosting communities commensurate to their intake of resettled people; (v) facilitating collaboration among regional and provincial offices of the relevant national government agencies; (vi) facilitating connection of off-city resettlement sites to utility grids. It would be helpful to involve the water utilities early, specifically in resettlement site assessment and design stages; and (vii) enable people to get the necessary documentation indispensable in accessing employment, applying for utility connections, enrollment in school, and borrowing money.

7. In sum, the Bank has provided just-in-time advisory to the DILG-led NTWG and TA to the KSAs to support the Government of the Philippines to realize *Oplan Likas*' intended purposes, providing on-site, near site, or in-city relocation for the ISFs in danger zones. Although the TA did not have much leverage in determining how *Oplan Likas* was eventually implemented, it provided advice to the Government for their consideration and informed the scope of the Project.


PHILIPPINES
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121°00'E
14°40'N
14°30'N
121°10'E
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Kalookan City
Valenzuela
Quezon City
NATIONAL CAPITAL REGION
Marikina
REGION IV-A (CALABARZON)
Malabon
Navotas
Manila
San Juan
Mandaluyong
Pasig City
Makati City
Pateros
Taguig
Pasay City
Parañaque
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Ilugin River
Tapayan
Labasan
Taguig
Hagonoy
0 2 4 Miles
0 2 4 Kilometers
NEW PUMPING STATIONS
EXISTING PUMPING STATIONS
HIGHWAYS
MAIN ROADS
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