



# PROJECT HIGHLIGHTS

Region: East Asia and Pacific  
Country: Philippines



Focus Area:  
**Risk Reduction**  
*Structural and non-structural measures; land use planning, policies and regulation, infrastructure retrofitting, etc.*

## Towards Integrated Flood Risk Management

*Reducing Greater Manila Area's vulnerability to flooding and protecting its 21 million inhabitants*

### Overview

The Philippines is located in the Pacific typhoon belt with most of the population vulnerable to the impacts of natural hazards. The Greater Manila Area, encompassing Metro Manila and surrounding areas, is exposed to frequent flooding. In 2009, Tropical Storm Ondoy (Ketsana) and Typhoon Pepeng (Parma) brought extensive rainfall over the area, putting most of the city under water, severely affecting the population and assets of the entire Greater Manila region. In total, the losses caused by Tropical Storm Ondoy and Typhoon Pepeng amounted to approximately US\$4.4 billion or 2.7 percent of the gross domestic product (GDP). Based on the recommendations from the 2009 Government-led Post-Disaster Needs Assessment (PDNA), the World Bank, in partnership with GFDRR, is supporting the Philippine Government in its efforts to mainstream disaster risk management (DRM) and climate change adaptation into development, which includes the preparation and implementation of an Integrated Flood Management Master Plan to reduce vulnerability to flooding in Metro Manila and the surrounding areas.

### Challenges

With a population of more than 21 million, which accounts for almost a fifth of the total country population, the greater Manila area is an important economic center generating close to 40 percent of the country's GDP. Existing flood management facilities are inadequate to protect the population and economic assets that are perennially affected by flooding. Flood events are exacerbated by factors such as institutional fragmentation and lack of maintenance (e.g., dredging of silts, cleaning of solid waste), which reduces the capacity of rivers, waterways, and drains to carry extensive rainfall away from the affected areas.

### Approach

The Philippines is taking a proactive approach to DRM, focusing on three core areas: (i) strengthening the institutional capacity for DRM; (ii) mainstreaming disaster risk reduction into development planning; and (iii) managing its fiscal exposure to natural hazard impacts, as identified in the Philippines' National Disaster Risk Reduction and Management Law (Republic Act No. 10121).

Based on the recommendations of the PDNA following the devastating 2009 typhoons, the World Bank and GFDRR extended technical support to formulate a Flood Management Master Plan (Master Plan) to reduce and manage flood risks in the greater Manila area and the surrounding areas. The Master Plan focuses on: (i) the prioritization of legislative action and investments to strengthen institutional coordination; (ii) improved flood management through structural (engineered) measures for the main rivers, the Laguna Lakeshore and urban areas; (iii) non-structural measures, including strengthening the flood forecasting and warning system, capacity building for strengthening community-based flood risk management; and (iv) improving the information management for effective DRM.

The Master Plan recommends structural solutions (e.g., for dams, river improvements, floodways); non-structural mitigation measures (e.g., in land use regulations, watershed conservation, reforestation); and preparedness measures including improving the flood warning systems, rainfall and water level gauging stations and information systems. During the development of the Master Plan, policymakers representing all major agencies and organizations involved in flood management were consulted, as were civil society organizations (CSO) and the private sector.



## Highlights

Reducing flood vulnerability in Metro Manila can have tremendous economic benefits for the area as well as the entire country.

To reduce vulnerability of the Greater Manila Area to future flooding, GFDRR supported the Government of the Philippines in developing the Metro Manila Flood Management Master Plan which proposes a 25-year program with structural (engineered) and non-structural investments.

The Master Plan provides a comprehensive guide to future investments undertaken by the Philippine government and development partners.

The work has led to an initial allocation of government funding for immediate mitigation measures, with substantial investment plans underway.



## Results

The Master Plan:

- Proposes a 25-year program road map with structural and non-structural investments to decrease flood vulnerability and strengthen flood risk management in the Greater Manila area.
- Provides a comprehensive guide to future investments to be undertaken by the Philippine Government and development partners.
- Makes concrete recommendations for institutional reforms for flood management, capacity building interventions, amendments to legislations and rules introducing integrated flood management approaches for the Greater Manila area.
- Proposes protection and infrastructure measures, and cost prioritization for construction and rehabilitation. It includes proposals that would make the city and its 17 million residents safe against floods with a 1:100 year return period.

With approximately Philippine Peso 352 billion (about US\$9 billion), the Master Plan has been approved by the Government through the Philippine's National Economic and Development Authority (NEDA) Board, chaired by the President of the Philippines. An initial amount of Philippine Peso 5 billion (US\$120 million) has been allocated by the Government for immediate investments proposed by the Plan, and substantial investments plans are under preparation. The development of the Master Plan strengthened the ongoing dialogue on DRM in the country.

## Partnership

The development of the Master Plan was supported by GFDRR with US\$1.65 million. The World Bank supported the Government in coordinating discussions among agencies and development partners. The main counterpart agency was the Department of Public Works and Highways. Other partners in this ongoing initiative include: NEDA, the Philippines' Office of Civil Defense, the National Disaster Risk Reduction and Management Council, the Metropolitan Manila Development Authority, Metro Manila Local Government Units (LGUs), the Department of Budget, Department of Finance, the Pasig River Rehabilitation Commission, Laguna Lake Development Authority, Department of Environment and Natural Resources, as well as development partners, (most notably the Japan International Cooperation Agency (JICA) and the Australian Aid Agency (AusAID)), civil society organizations, the private sector and academia.

## Next Steps

Reducing flood vulnerability and improving institutional coordination as well as structural and non-structural mitigation measures can have tremendous economic benefits for the Greater Manila Area and the country as a whole. Given the positive response of relevant decision makers, the World Bank continues to provide advisory and technical services on specific investment proposals. The immediate steps forward include the implementation of simpler measures. A set of priority measures (including a flood management dam, river improvements and land reclamation) have been agreed to and the preparation of detailed feasibility studies and designs is expected to begin in 2013. Future work will also draw on analysis undertaken in the Greater Metro Manila Area Risk Assessment Project funded by AusAID and implemented by the Philippine Government and other DRM projects funded by JICA.

## REFERENCES

Philippines. Typhoons Ondoy and Pepeng: Post-Disaster Needs Assessment. Main Report. 2009. ([http://gfdrr.org/docs/PDNA\\_Philippines\\_MainReport.pdf](http://gfdrr.org/docs/PDNA_Philippines_MainReport.pdf))



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*A flood management plan is needed to reduce risk in Manila especially since the area is struck by constant flooding.*

“The recently approved allotment will support the implementation of a flood management master plan in these areas, where floodwaters rise even with moderate rains.”

Florencio Abad  
Budget Secretary  
Philippine Government

## Lessons Learned

Even modest technical assistance can lead to substantial investments in risk reduction, if it is well-targeted and is provided in close coordination with relevant policy-makers and stakeholders.

To move policy recommendations and investment proposals forward, it is vital to have strong partnerships and be able to provide consistent support to those partnerships.