

# **PHILIPPINES**

## **Typhoons Ondoy and Pepeng: Post-Disaster Needs Assessment**

November 26, 2009

## Acknowledgments

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## Acronyms and Abbreviations

BPO	Business Process Outsourcing
CAR	Cordillera Administrative Region
CBDRM	Community-Based Disaster Risk Management
CCA	Climate Change Adaptation
CDS	City Development Strategies
CIS	Communal Irrigation System
COA	Commission on Audit
DPWH	Department of Public Works and Highways
DRM	Disaster Risk Management
DU	Distribution Utilities
EC	Electric Cooperatives
ECLAC	Economic Commission for Latin America and the Caribbean
EO	Executive Order
GFI	Government Financing Institutions
GOP	Government of the Philippines
GSIS	Government Service Information System
HFA	Hyogo Framework for Action
JMC	Joint Memorandum Circular
JTWC	Joint Typhoon Warning System
LGU	Local Government Unit
MDB	Multilateral Development Banks
MDFO	Municipal Development Fund Office
MERALCO	Manila Electric Company
MFI	Microfinance Institutions
MMDA	Metro Manila Development Authority
MSME	Micro, Small, and Medium Enterprises
NAMRIA	National Mapping and Resource Information Authority
NCR	National Capital Region
NDCC	National Disaster Coordinating Council
NEDA	National Economic and Development Authority
NGCP	National Grid Corporation of the Philippines
NGO	Non-Governmental Organization
NIS	National Irrigation System
ODA	Official Development Assistance
PAGASA	Philippine Atmospheric, Geophysical and Astronomical Services
PCG	Philippine Coast Guard
PDF	Philippines Development Forum
PDNA	Post Disaster Needs Assessment
PNRC	Philippine National Red Cross
RMF	Risk Mitigation Facility
SNAP	Strategic National Action Plan
TOR	Terms of Reference
TRANSCO	National Transmission Corporation
UN	United Nations

## Executive Summary

### A. The Disaster<sup>1</sup>

**Tropical storm Ondoy (international name Ketsana) hit the Philippines on September 26, 2009, causing widespread flooding.** Ondoy, the equivalent of a Category I storm, brought an unusually high volume of rain which inundated the central part of Luzon. During the 12-hour period starting at 8:00 am on September 26, the rainfall was recorded as approximately 450 mm at the Manila Observatory, an extremely rare occurrence. In turn, these intense rains generated high flooding in the Marikina River that exceeded the river's carrying capacity. Ondoy caused extensive flooding in the metropolitan Manila area and the neighboring Rizal province, including the cities of Antipolo, Makati, Malabon, Marikina, Muntinlupa, Pasig, Quezon, San Juan, Taguig, and Valenzuela.

**Tropical storm Ondoy was quickly followed by typhoon Pepeng (international name Parma).** Typhoon Pepeng, a Category III storm, affected the Philippines during October 3-9, 2009, following an irregular path which crossed over Central and Northern Luzon three times. It initially brought powerful winds with gusts of up to 230 km/hr then an extended period of heavy rains, with cumulative rainfall amounts exceeding 1,000 mm in some areas. The resulting river floods have been estimated to have a return period of around 50 years, meaning that statistically speaking, such a rainfall event occurs on average once in every 50 years.

**Ondoy and Pepeng resulted in large numbers of affected persons and casualties.** As of November 23, 2009, the official death toll from the two natural disasters combined was 956 persons, with 84 persons still missing and 736 injured. While the majority of deaths caused by tropical storm Ondoy were due to drowning, reported deaths during typhoon Pepeng were also due to landslides. Assessment data show that over 9.3 million people were affected severely, out of an estimated population of 43.2 million living in the affected regions.

**The Government declared a National State of Calamity on October 2<sup>nd</sup>.** In the aftermath of the disaster, the Government and private sector staged a commendable relief effort, supported by development partners. The Department of Finance requested development partners to undertake a Post-Disaster Needs Assessment (PDNA) jointly with the Government. In response, development partners organized a team of local and international experts to initiate the PDNA process for Ondoy and Pepeng with Government agencies.

### B. Economic and Social Impacts

**Tropical storm Ondoy and typhoon Pepeng caused substantial damages and losses, equivalent to about 2.7 percent of GDP.** The storms hit regions of the country that account for over 60 percent of GDP (including the National Capital Region, which accounts for about 38 percent of total 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 power and water shortages, damaged machinery, and absent employees, which contributed to an overall reduction in production capacity. As a result, the disaster is expected to have a negative impact on GDP growth in the short term. However, once

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<sup>1</sup> Due to the short time frame for preparation of the PDNA, this report focuses on Luzon and metropolitan Manila, which were the regions most affected by Ondoy and Pepeng.

projected public and private recovery and reconstruction spending are included, the net impact of the disasters on economic activity is expected to result in real GDP growth of 1.0 percent in 2009 and 3.5 percent in 2010 which implies a decline of about 0.4 percentage points in 2009, followed by an increase of about 0.4 percentage points in 2010, over the pre-disaster growth estimates.

**The Philippines is frequently affected by natural disasters, yet the recent disasters were significant in the overall magnitude of their effects.** The scale of the disasters was magnified by the impacts of the disasters in highly populated economic centers. While extreme events, however, the damage and losses incurred during the disasters,—estimated to be equivalent to about 2.7 percent of GDP—are comparable to other major recent disasters across the world. (Table 1)

**Table 1: Damages, Losses, and Magnitude of Similar Recent Disasters**

Disaster	Country	Year	Total Effects (US\$ million)	Magnitude (% of GDP)
Earthquake	Pakistan	2005	2,876	0.4
East Asia Tsunami (Aceh)	Indonesia	2005	4,452	1.6
Cyclone Sidr	Bangladesh	2007	1,640	2.8
Cyclone Season	Madagascar	2008	333	4.0
Cyclone Nargis	Myanmar	2008	4,060	19.7
Storm and Floods	Yemen	2008	1,638	6.0
TS Ketsana and Typhoon Parma	Philippines	2009	4,383	2.7

**As is usually the case, the disaster affects fiscal balances due to higher spending and lower revenues.** On the expenditure side, the direct impact includes infrastructure repair, emergency relief, and assistance to affected families. Total expenditures will depend on the policy decisions made to assist the most vulnerable citizens, for example through permanent relocation programs, slum upgrading, and water and flood management improvements. How the government chooses to prioritize spending for recovery and reconstruction will be critical, since this spending may need to be the centerpiece of the fiscal stimulus program for the next couple of years so as to remain within the fiscal envelope. Public revenues are also expected to be affected, both directly and indirectly resulting in revenue losses over the next year.

**The poor and vulnerable were inordinately affected by Ondoy and Pepeng, and efforts to help restore their housing and their livelihoods are needed urgently.** In urban areas, it is the poor who concentrate in informal settlements in at-risk areas such as floodplains. Similarly, in rural areas, it is the poorest who end up living in dangerous areas such as river embankments. For those living just above the poverty line, such disasters are likely to propel them back into poverty. Indeed, this PDNA estimates that in the most affected areas of Luzon, the incidence of poverty in 2009 could increase by as much as 3 percentage points as a result of Ondoy and Pepeng, and by 0.5 percentage points nationwide. The number of poor people in the Philippines is expected to increase by 480,000 in 2009. The storms severely disrupted livelihoods in the affected areas, with about 170 million workdays—equivalent to about 664,000 one-year jobs—lost due to their impacts. Total income lost due to the disaster amounted to Php 50.3 billion, which particularly affected informal workers with family-based livelihoods.

### C. Damage, Loss, and Needs Assessment

**This Post-Disaster Needs Assessment analysis covers damages, losses, and economic and social impacts.** *Damage* (direct impact) refers to the impact on assets, stock (including final goods, goods in process, raw materials, materials and spare parts), and property. *Losses* (indirect impact) refer to flows that will be affected, such as production declines, reduced incomes, and increased expenditures, over a time period until the economy and assets are recovered. *Economic and social impacts* include macroeconomic impacts, poverty impacts, employment and livelihoods impacts, and social impacts.

**The PDNA estimated that damage and losses from Ondoy and Pepeng amount to a total of US\$4.38 billion (Table 2).** The PDNA found that damage to physical assets in the affected areas amounts to an estimated Php 68.2 billion, equivalent to US\$1.45 billion. Associated losses in production and other flows of the economy were estimated at nearly Php 137.8 billion or US\$2.93 billion, equivalent to two-thirds of the total disaster effects. While the destruction or damage to assets occurred at the time of the storms, the associated changes in economic flows will last beyond the present calendar year. In some sectors and cases, the effects will be felt in 2010 and 2011 depending on the speed and efficiency of the post-disaster recovery and reconstruction activities.

**Table 2: Summary of Disaster Effects and Needs by Sector  
(in US\$ million)**

Sector	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstr.	Total
<b>Productive Sectors</b>	557.8	2,661.7	3,219.5	351.8	1,422.4	1,774.3
Agriculture *1	80.1	769.2	849.3	291.6	59.7	351.3
Industry	209.2	194.1	403.3	15.8	220.5	236.2
Commerce	256.2	1,644.4	1,900.6	33.7	1,126.8	1,160.4
Tourism	12.3	54.0	66.2	10.8	15.4	26.2
<b>Social Sectors</b>	706.5	212.5	919.0	197.0	1,606.3	1,803.3
Housing *2	541.6	188.8	730.3	166.4	1,444.9	1,611.4
Education	53.5	4.9	58.4	8.9	65.1	74.0
Cultural Heritage	6.0	0.5	6.5	0.6	6.8	7.5
Health	105.5	18.3	123.8	21.1	89.4	110.5
Infrastructure	181.1	56.2	237.3	42.3	397.2	439.5
Electricity	15.2	18.7	33.9	0.0	15.2	15.2
Water and Sanitation	7.9	16.4	24.3	0.7	2.8	3.4
Flood Control, Drainage and Dam Management	15.3	0.0	15.3	0.0	171.3	171.3
Transport	138.7	21.2	159.8	41.6	208.0	249.6
Telecommunication	4.1	0.0	4.1	0.0	0.0	0.0
Cross-Sectoral	6.3	0.9	7.1	351.8	54.1	405.9
Local Government	6.3	0.9	7.1	0.2	6.4	6.6
Social Protection	0.0	0.0	0.0	351.5	6.7	358.2
Financial Sector	0.0	0.0	0.0	0.1	2.9	3.0
Disaster Risk Management & Reduction	0.0	0.0	0.0	0.0	38.1	38.1
<b>Total</b>	<b>1,451.7</b>	<b>2,931.3</b>	<b>4,383.0</b>	<b>942.9</b>	<b>3,480.1</b>	<b>4,423.0</b>
*1 Based on Loss - Scenario 2, see agriculture sector report.						
*2 Long-term needs Php 17 billion (USD 362.6 million) not included, see housing sector report.						

**The private sector has borne most of the impact of the disasters.** The share of private sector damage and losses is equivalent to 90 per cent of the total, while that of the public sector constitutes the remaining 10 percent. It should be noted that in contrast to other disasters in which destruction of infrastructure is predominant, nearly 95 percent of total damage and losses were sustained by the productive and social sectors. Counting these

losses is also the main difference between the estimate of the PDNA and that of the National Disaster Coordinating Council (NDCC), which only selectively counts losses (e.g., in agriculture) and does not take into account private sector impacts, therefore yielding a lower estimate of total damage and losses.

**The assessment of damage and losses provides a basis for determining recovery and reconstruction needs.** The assessment of damage provides a basis for estimating reconstruction requirements, while the estimation of losses provides an indication of the recovery needs to address the reduction or decline in economic activity and in personal and household income. The two estimates are then combined to establish overall needs to achieve full recovery of economic activities at the macro-economic level and at the individual or household level.

**A total of US\$ 942.9 million is required to meet recovery needs, and a total of US\$ 3.48 billion is required for the reconstruction efforts (Table 2) over the short term (2009-10) to medium term (2011-12).** Larger investments, particularly in flood control and housing, may need to be considered in the longer term. It should be noted that the human and community-based early recovery needs identified by the IASC clusters and included in the Revised UN Flash Appeal are included in the amount of total needs. The share of the public sector in implementing the recovery and reconstruction program is estimated at 55 percent (US\$ 2.44 billion), whereas private sector execution amounts to 45 percent (US\$ 1.99 billion). The exact public sector need depends on the choices the government makes on the specific programs to implement, the timing and pacing of those programs, and the effectiveness with which these programs are implemented. Financing can come from a variety of sources, including the domestic budget, local government budgets, private sector contributions, and grants and concessional loans from development partners.

**The needs for financing are large, but the cost of doing nothing would be larger still.** This PDNA estimates the total cost of recovery and reconstruction at US\$ 4.42 billion. Given the very limited capacity of the flood management system in metropolitan Manila and the possibility of increased frequency and intensity of floods and typhoons, such costs can be expected to recur more frequently unless urgent efforts are made to mitigate the effects of future disasters. For example, metropolitan Manila's system of drainage was designed to withstand events of a 30-year return period. Given siltation, the presence of massive amounts of trash, and chronic lack of maintenance, the actual capacity of the system is now much lower than it was when designed. Coupled with the likely impacts of climate change, the drainage system can be expected to be overwhelmed again within the lifetime of most Ondoy victims if these deficiencies are not addressed. Because of the rapid increase in economic activity and concentration of people in metropolitan Manila, the costs of disasters such as Ondoy warrant investments in much higher protection against floods and other disasters than currently in place.

#### **D. Recovery and Reconstruction Strategy**

**Building back better is necessary, but it is not enough.** While Ondoy's flooding could not have been prevented, its extensive impact was preventable. Similarly, the damage wrought by Pepeng could have been mitigated. Preventing such impacts in the future requires attention to the governance of Filipino development in areas such as land use planning, housing, water management, environmental protection, and disaster risk mitigation. Indeed, the factors that resulted in the impacts from Ondoy and Pepeng are among the same factors that lie behind a number of major development challenges, including the congestion of

metropolitan Manila, the proliferation of slums, and the heavily polluted environment in urban areas; and the weak performance of agribusiness in rural areas.

**In implementing recovery and reconstruction, and looking beyond the recent disasters to the future, five areas stand out as meriting particular attention.**

- 1. *Rural Production:* Immediate restoration of rural livelihoods before the end of the year is necessary to avoid loss of production during the dry season.** First, rapid action is needed to repair irrigation systems and to clear fields of accumulated gravel, silt, and sand. Second, farmers need inputs such as seed and fertilizer. Third, farmers need finance to cover their needs for consumption and investment until the next harvest. To this end, a system of vouchers or direct cash transfers to the poor who have been directly affected (instead of the usual input subsidy programs that benefit the non-poor more) is warranted as an efficient, transparent, non-distorting, and flexible mechanism.
- 2. *Flood Management:* Given its vulnerability to flooding, protecting metropolitan Manila requires institutional changes, comprehensive planning, and investment in both restoration and new infrastructure.** The imperative policy choice is to determine the acceptable level of risk and protection, as this will determine subsequent engineering and financing decisions. In the medium term, the existing flood management and drainage system should be restored to fully operational condition, accompanied by funding for regular maintenance and the establishment of real-time monitoring and early warning systems. A new institutional structure, building on the existing framework—with responsibility for managing floods and drainage in the entire catchment area of metropolitan Manila including Laguna de Bay, and with the authority and means to enforce agreed policies and plans—would greatly facilitate future flood management. A risk assessment study for the entire basin is needed to update the existing master plan and to develop a comprehensive development program. Longer term, as part of the development program, additional investment will be needed to retain water upstream, facilitate the flow of water through the system, and maintain Laguna de Bay at a pre-determined level as informed by the risk assessment.
- 3. *Housing:* The vast majority of damage to the housing stock was concentrated in the informal sector which serves mainly low-income families, so building back better means providing better alternatives for informal settlers.** The issue of informal housing goes well beyond the impacts of Ondoy and Pepeng: about half the population of metropolitan Manila lives in informal settlements, and prior to the calamities, there was an estimated backlog of 3.7 million households in need of formal housing nationwide. Although addressing the needs of families living in the estimated 220,000 houses damaged and destroyed by the storms would still only meet a small part of the overall housing needs, it would provide an important way forward to addressing the much broader needs of informal settlers. The resettlement process will need to be based on consultation with affected communities and take into account the need to restore their livelihoods. It would not be feasible to resettle all of these victims in the short run. Those people who have lost their homes must be urgently provided with short-term or transitional housing options near their sources of livelihood. Resettlement of urban dwellers in peri-urban (or rural) areas that does not take proximity to livelihoods into account has been less than successful worldwide.

**Resettlement of flood victims in metropolitan Manila offers an opportunity to develop new, more appropriate ways of developing the area.** Cities such as Singapore and São Paulo that have successfully addressed the issue of slum upgrading have done so through more intensive use of urban land. Given the cost of land in metropolitan Manila and the need to keep people close to their sources of livelihoods, spreading upward (verticalization) in more compact settlements (densification) is a logical solution. The private sector could be tapped to promote such development, thereby providing “win-win” solutions where the poor pay less and eventually get title to their housing; developers make a profit; and, the quality of urban life is improved for all. Making this feasible requires the support of the National Housing Authority, national government agencies, and LGUs to facilitate greater access to land and services, as well as subsidization of start-up capital for the poor.

- 4. Disaster Risk Reduction (DRR): The existing DRR system needs to become more proactive, coherent, and effective.** The quality of and access to scientific data for predicting and forecasting disasters requires urgent improvement. Once adequate information is available, the mainstreaming of DRR into local planning needs to be significantly expanded, and critical service infrastructure (e.g., water, power, hospitals) should be upgraded to withstand an acceptable level of risk. These measures need to be coupled with better access to disaster risk financing.

**A strategy on disaster risk financing needs to shift from risk retention to risk transfer, hence limiting the public share of funding with higher involvement of private sources.** From the whole spectrum of financing options already analyzed under previous activities, contingency financing has been selected as the most appropriate to manage moderate risks. Two complementary mechanisms are warranted. The first is a standby credit to be drawn upon if the national government were to declare a calamity, providing close to immediate liquidity. The second is catastrophe pooling, as proposed by the League of Cities of the Philippines. Under this arrangement, LGUs would pool their calamity funds so that when disaster strikes, more resources would be available to the LGU to address urgent needs. At the same time, the role of private sector insurance provision should be increased.

- 5. Local Governance: LGUs should have a key role in implementing the recovery and reconstruction program and future measures to mitigate disaster risk.** A two-pronged post-disaster strategy could be followed. First, targeted financial assistance is needed to support the rapid restoration of LGU operations and services to pre-disaster levels. In the context of disaster, the normal national government/LGU cost sharing rules are likely to create problems for LGUs that are less well-endowed and should therefore be relaxed temporarily. Second, technical assistance should be provided to LGUs in disaster-prone areas to implement disaster mitigation measures to protect their assets and operations in the future.

**Correcting the failures that amplified the impacts of Ondoy and Pepeng will require a new level of commitment and collaboration but is achievable.** The LGUs of metropolitan Manila will need to cooperate. The national government will need to support LGUs by devolving resources as well as responsibility, putting into practice the principle of subsidiarity. At the same time, government, the private sector, and civil society will need to work together, adopting participatory approaches that bring stakeholders together.

## **E. Guiding Principles for Recovery and Reconstruction**

**A set of guiding principles will govern implementation of the recovery and reconstruction program.** The purpose of these principles is to enhance the effectiveness of recovery and reconstruction efforts, increase transparency and accountability, and ensure that resources are translated into results on the ground.

### ***A transparent, accountable, and results-based recovery and reconstruction program***

- Comprehensive and straightforward systems for monitoring activities, tracking funds, and evaluating projects and programs will be implemented by all stakeholders (including the provision of regular and transparent reporting against all funding sources).
- Results and progress will be tracked and reported to the public and development partners through regular meetings, the media, and a dedicated recovery and reconstruction website.
- All agencies involved in the recovery and reconstruction program will undertake appropriate audits of their activities and funds.
- Independent complaints handling mechanisms should be integrated into major projects to enable greater accountability.

### ***Community-based, people-centered, and equitable approaches***

- Community-based, participatory approaches that engage local communities in decision-making, implementation, and monitoring of activities will be adopted to increase the quality and speed of reconstruction, align projects with real needs, and lower the risk of misuse of funds.
- Projects should maximize the use of local initiative, resources, and capacities. Planning and execution will be based on local knowledge, skills, materials, and methods, taking into account the need for affordable solutions.
- Although disasters increase the vulnerability of all, groups who are already disadvantaged may need special assistance and protection. Particular priority will be given to the poor, marginalized female-headed households, children (including orphans), elderly, and people with disabilities.
- The capacity of local communities will be built at every stage of the recovery and reconstruction effort, with a focus on reducing vulnerability to future disasters.

### ***Reduction of future risks***

- With typhoons being a regular occurrence in the Philippines, integrated disaster risk management plans that take into consideration all likely significant hazards are needed to reduce the impact of future disasters.



## Introduction

**In the space of just two weeks, tropical storm Ondoy (international name Ketsana) and typhoon Pepeng (international name Parma)<sup>2</sup> caused extensive casualties and physical damage in the Philippines.** Ondoy and Pepeng brought large amounts of rain that resulted in widespread flooding in metropolitan Manila and in central and northern Luzon, although areas as far south as Mindanao were also affected. The disasters exacted a large human toll, with over 900 lives lost, and had severe impacts for over one-fifth of the population living in the affected areas. The storms had adverse effects across the economy, particularly in the enterprise, agriculture, and housing sectors. Notably, the private sector has borne most of the impact of the disasters, which damaged inventories, raw materials and machinery, and interrupted business operations.

**Section I of the PDNA presents an overview of the two disasters.** The Ondoy and Pepeng are described, together with information on the human toll and the immediate post-disaster response.

**Section II analyzes the damage, losses, and economic and social impacts of Ondoy and Pepeng.** *Damage* refers to the impacts of the storms on physical assets, stock (including final goods, goods in process, raw materials, materials and spare parts), and property. *Losses* refer to flows that will be affected, such as production declines, reduced incomes, and increased expenditures, over a time period until the economy and assets are recovered.

**Section III presents the economic and social impacts include macroeconomic impacts, poverty impacts, employment and livelihoods impacts, and social impacts.** To estimate these disaster effects, the PDNA uses a methodology developed originally by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) in the early 1970s, which has subsequently been used in post-disaster analysis around the world.

**Section IV presents the recovery and reconstruction needs based on the damage and losses assessment.** The assessment of damage provides a basis for estimating reconstruction requirements, while the estimation of losses provides an indication of the reduction or decline in economic activity and in personal and household income arising from the disasters. The two estimates are then combined to establish overall needs to achieve full recovery of economic activities at the macro-economic level and at the individual or household level. The section provides a strategic framework for recovery and reconstruction. Some principles for ensuring transparency and accountability in the implementation of the recovery and reconstruction program are presented. It also reviews the institutional, implementation, and coordination arrangements and the monitoring and oversight arrangements for the recovery and reconstruction efforts.

**Section V concludes with a discussion of how to strengthen disaster risk reduction and management to mitigate the effects of such disasters in the future.** Suggested improvements to the institutional framework for disaster risk management together with an assessment of the needs for DRM/DRR are presented.

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<sup>2</sup> For ease of reference, the PDNA refers to both events as “typhoons”, though strictly speaking, Ondoy was officially categorized as a “tropical storm”.

## I. The Disaster

### A. Background

**The Philippines is highly prone to typhoon activity and other natural disasters.**<sup>3</sup> The country is considered one of the most disaster-prone. It ranks 12th among 200 countries most at-risk for tropical cyclones, floods, earthquakes, and landslides in the 2009 Mortality Risk Index of the UN International Strategy for Disaster Reduction. Around 20 typhoons cross the country each year, most frequently from July to November. Of the five main track patterns that typhoons typically follow in the Philippines, the ones that are usually most devastating are the track that traverses to the north of Manila and the track that traverses south of Manila.<sup>4</sup> Although typhoons can occur in all major regions, Central and Northern Luzon are especially affected.

**Typhoons account for up to 40 percent of the annual average rainfall.**<sup>5</sup> In the mountainous rural areas of Central and Northern Luzon, typhoons often result in flash floods of short duration in rivers and streams, bringing raging torrents. Typhoons that affect the Manila metropolitan area, a floodplain/tidal basin, result in relatively gentle flooding of low-lying areas, but the flooding can last for a long period of time.

**Rainfall events and flooding occur annually in the Philippines, oftentimes with devastating consequences.** NDCC records show that out of the many typhoons and tropical storms that hit the Philippines between 1990 and 2008, a total of 158 destructive typhoons resulted in 13,491 deaths. The impact of climate change is likely to increase the occurrence of extreme weather events further.

### B. *Ondoy* and *Pepeng* Events

**In a span of two weeks, tropical storm Ondoy and typhoon Pepeng caused extensive casualties and serious physical damage in the Philippines.** The impacts of the storms were particularly severe in metropolitan Manila and Central and Northern Luzon, although areas as far south as Mindanao were also affected. The situation was also exacerbated by the occurrence of typhoon Santi in late October 2009. Given the short timeframe for preparation of this assessment, it should be noted that the report focuses on the areas of metropolitan Manila and Luzon, which were most severely affected by Ondoy and Pepeng.

#### *Ondoy*

**Tropical storm Ondoy (international name Ketsana) hit the Philippines on September 26, 2009.** The storm first developed as a tropical depression on September 23, about 860 km to the northwest of Palau. It weakened into an area of low pressure, but then the following day, the Philippines Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) reported that the low pressure area had again become a tropical depression and assigned it the local name of Ondoy. On September 25, the Joint Typhoon Warning Center

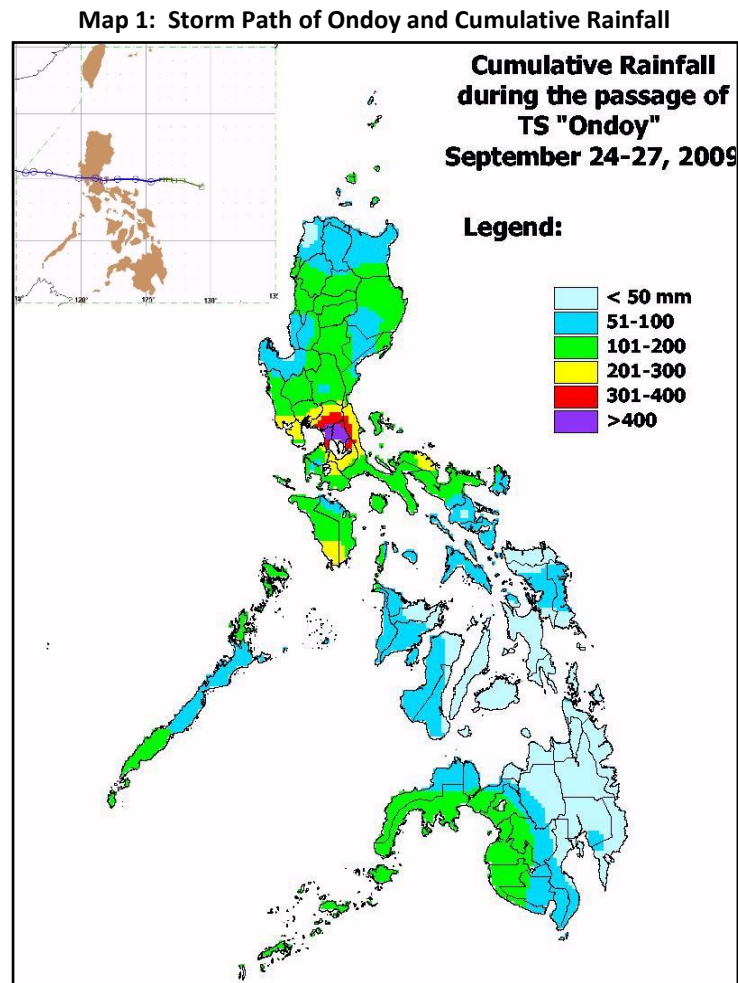
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<sup>3</sup> A typhoon is a tropical cyclone occurring in the Western Pacific or Indian Ocean, producing strong winds and heavy rains. Pepeng was classified as a typhoon. Ondoy was classified as a tropical storm, which produces heavy rains but less wind than typhoons.

<sup>4</sup> The other three main typhoon track patterns in the Philippines are: (i) one that passes east or northeast over the country, (ii) one that forms in the China Sea to the west of the country that can affect any part of the country, and (iii) one that re-curves in the China Sea without causing much harm to the country.

<sup>5</sup> The average annual rainfall in Manila is around 2,000 mm and in Laoag around 2,067 mm.

(JTWC) upgraded Ondoy to a tropical storm. Landfall occurred in the early morning of September 26, 2009, then the storm traversed the central part of the country. Map 1 shows the storm path of Ondoy as well as the cumulative amount of rain that fell as the storm passed over the country during September 24-27.



*Note:* The smaller map in the upper left corner shows the storm path of Ondoy. The larger map shows the cumulative amount of rain that fell as Ondoy passed over the Philippines.

Source: PAGASA, 2009.

**Ondoy brought an unusually high volume of rain, causing widespread flooding.** Ondoy was the equivalent of a Category I storm<sup>6</sup>—with maximum winds of up to 147 kilometers per hour—that drenched the central part of Luzon with heavy rainfall. During the 12-hour period starting at 8:00 am on September 26, the rainfall was recorded as approximately 450 mm<sup>7</sup> at the Manila Observatory, and the flood surge reached 5,300 cubic meters per second. In turn, these intensive rains generated a record-high flood in the Marikina River that was estimated to have a return period of 180 years, meaning that statistically speaking, such a rainfall event occurs on average once in every 180 years. Ondoy caused extensive flooding in the metropolitan Manila area and the neighboring Rizal province, including the cities of Cainta, Makati, Malabon, Marikina, Muntinlupa, Pasig, Quezon, San Juan, Taguig, and Valenzuela.

<sup>6</sup> This definition is assigned on the basis of the international Saffir-Sampson scale that classifies storm according to their wind velocity.

<sup>7</sup> Data used for the rainfall, flood surge and return period were generated mainly from PAGASA and the University of the Philippines National Hydraulic Research Center.

## ***Pepeng***

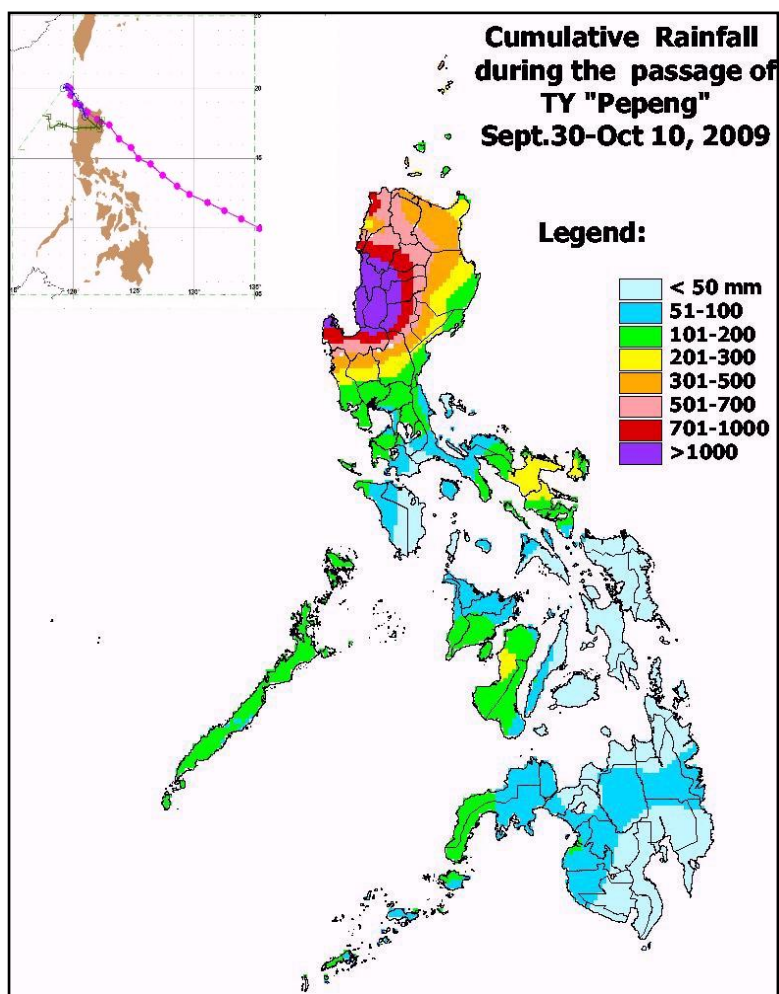
**Tropical storm Ondoy was immediately followed by typhoon Pepeng (international name Parma).** Typhoon Pepeng, a Category III storm, affected the Philippines during October 3-9, 2009, following a rather unusual path of impact over Central and Northern Luzon. It initially brought powerful winds, with maximum sustained velocities of about 195 km/hr and gusts of up to 230 km/hr. The typhoon also brought an extended period of heavy rains and, as it stalled in the northern part of Luzon then reversed its track, poured large amounts of rainfall on agricultural areas that already had their soils fully saturated.<sup>8</sup> The highest cumulative rainfall amounts (exceeding 1,000 mm) were experienced along the west coast of Northern Luzon. For example, Baguio City received 850 mm of rain during October 3-9, almost double the monthly rainfall of 461 mm in October 2008. Such floods are estimated to have a return period of around 50 years, albeit with some variation across the affected river basins. Map 2 shows the path of Pepeng over the Philippines and the aggregate rainfall.

**Questions have been raised about the role of spillway releases from the San Roque Dam.** A major dam such as San Roque changes the hydrological conditions in the downstream river, usually with less flooding, increased sedimentation brought about by downstream tributaries, and greater occupation of flood-prone areas within villages, municipalities, and cities. This typically increases the impact of incidental high spillway releases in a river with reduced carrying capacity. Stronger monitoring and flood warning forecasting systems and better management of the dam during the flood event perhaps could have reduced downstream flooding to some extent, because of the significant rainfall and rapid water level rise behind the dam, the dam operators had little choice but to release large volumes of water from the spillway to avoid damage to—or even destruction of—the dam. PAGASA rainfall records from the flooding events indicate that very high rainfall and damages were reported in those areas without spillway releases.

### **Map 2: Typhoon Path of Pepeng and Cumulative Rainfall**

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<sup>8</sup> Tropical storms may cause disasters in view of their three components: very high winds, heavy rainfall that may cause flooding, and the corresponding storm surge that may bring sea water in waves over the coastal areas. In the present case, the winds and storm surge did not produce much damage; it was the heavy rainfall from both storms that produced the disaster.



*Note:* The smaller map in the upper left corner shows the path of typhoon Pepeng. The larger map shows the cumulative amount of rain that fell as Pepeng passed over the Philippines.

Source: PAGASA, 2009.

### C. The Human Toll

**Ondoy and Pepeng resulted in large numbers of affected persons and casualties.** As of November 23, 2009<sup>9</sup>, the official death toll from the two natural disasters combined was 956 persons, with 84 persons still missing and 736 injured. While the majority of deaths caused by tropical storm Ondoy were due to drowning, reported deaths during typhoon Pepeng were also due to landslides, especially in the Cordillera Administrative Region (CAR). Assessment data shows that over 9.3 million people were affected severely, out of an estimated population of 43.2 million living in the affected regions.<sup>10</sup>

<sup>9</sup> NDCC, 2009, NDCC Update: Situation Report No. 51 on Tropical Storm Ondoy and Typhoon Pepeng

<sup>10</sup> 2007 National Census of Population, <http://www.census.gov.ph/data/census2007/index.html>

**Table 1: Affected people and casualties  
(as of November 23, 2009)<sup>11</sup>**

<i>Affected</i>	<b>Ondoy</b>	<b>Pepeng</b>
<b>Families/Persons</b>	993,227 families or 4,901,234 persons	954,087 families or 4,478,284 persons
<b>Provinces</b>	26	27
Cities	16	36
Municipalities	172	364
<b>Families/Persons in Evacuation Centers</b>	15,798 families or 70,124 persons in 244 centers	3,258 families or 14,892 persons in 54 centers
<b>Casualties</b>	1,030	746
Deaths	464	492
Injured	529	207
Missing	37	47

#### **D. Immediate Response**

**Following tropical storm Ondoy, the Government launched immediate search and rescue operations in the flooded areas on September 26.** The Armed Forces of the Philippines, the Philippine National Red Cross (PNRC), Philippine National Police, Bureau of Fire Protection, Department of Public Works and Highways, and the Philippine Coast Guard (PCG) were the first emergency responders. Counterparts from the private sectors and volunteer rescue groups, as well as the U.S. military forces, promptly joined in the emergency operations.

**Some preemptive measures were taken in anticipation of the arrival of typhoon Pepeng.** An early warning from PAGASA and the JTWC forecasting the incoming typhoon led to the preemptive evacuation of around 45,500 people from the path of Pepeng. Given the existing high levels of water saturation caused by Ondoy, relocation and temporary shelter were considered priorities.

**The Government requested international assistance on September 28.** The subsequent declaration of a National State of Calamity of October 2 required all agencies to coordinate rapid assessments through the NDCC. Immediate assessed needs after Ondoy resulted in a US\$ 74 million request in the initial UN Flash Appeal, which was increased to US\$ 144 million in the Revised UN Flash Appeal to include additional humanitarian and early recovery needs caused by typhoon Pepeng (see Section III).

**The Department of Finance requested development partners to undertake a Post-Disaster Needs Assessment (PDNA) jointly with the Government.** The request was made at the World Bank and International Monetary Fund Annual Meetings in Istanbul, Turkey during October 6-7. In response, development partners organized a team of local and international experts to initiate the PDNA process for Ondoy and Pepeng.

<sup>11</sup> NDCC, Situation Report 45, 23 November 2009. Records from the two events are reflected separately to avoid double counting.

## II. Damage, Loss, and Needs Assessment

### A. Methodology

**This PDNA uses a methodology developed originally by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC) in the early 1970s.** This methodology has been used in post-disaster analysis around the world and has been continuously strengthened and refined over the past three decades. It is used to determine the value of lost assets, define reconstruction requirements, and assess the impacts on each sector. For details on this methodology, see the Handbook for Estimating the Socio-Economic and Environmental Impact of Disasters by ECLAC (2003).

**The assessment analysis covers damages, losses, and economic and social impacts,** which are defined as follows:

- **Damage** (direct impact) refers to the impact—valued at agreed replacement (not reconstruction) unit prices—on assets, stock (including final goods, goods in process, raw materials, materials, and spare parts), and property. The assessment considers the level of damage in terms of whether an asset can be rehabilitated or repaired or if the asset has been destroyed completely.
- **Losses** (indirect impact) refer to flows that will be affected, such as production declines, reduced incomes, and increased expenditures, over a time period until the economy and assets are recovered. The estimates are quantified at present value.
- **Economic and social impacts** include macroeconomic impacts, poverty impacts, employment and livelihoods impacts, and social impacts. The analysis aims to measure these impacts at the national and sub-national levels.

**The PDNA covers 13 sectors, as well as 4 cross-sectoral areas.** The assessed sectors are: (i) productive sectors, which consist of agriculture and enterprises (industry, commerce, and tourism); (ii) social sectors, consisting of housing, education, cultural heritage, and health; and (iii) infrastructure, consisting of power, water and sanitation, flood control, drainage and dam management, transport, and telecommunications. The assessment also covers the cross-sectoral areas of local government, social protection, financial sector, and disaster risk management and reduction.

**The PDNA differs from past post-disaster assessments in the Philippines in its comprehensiveness, particularly in assessing the effects on the private sector.** Previous assessments did not cover the entire spectrum of sectors of the economy and society. They normally included only damage to public assets and flows.

**The assessment of damage and losses provides a basis for determining recovery and reconstruction needs.** The assessment of damage provides a basis for estimating reconstruction requirements, while the estimation of losses provides an indication of the reduction or decline in economic activity and in personal and household income arising from the disasters. The two estimates are combined to establish overall needs, including measures to reduce disaster risk, to achieve full recovery of economic activities at the macro-economic level and at the individual or household level.

**The conduct of the PDNA involved a number of stages,** beginning with the collection of baseline information and data on damages provided by the government through different

line ministries and offices, the use of other official statistical information, and information collected directly from affected local government units (LGUs) and communities. The assessment teams reviewed and verified data through special field visits to and surveys in affected areas, and included triangulation and independent verification of the data.

## B. Overall Damage, Losses, and Needs Estimates

### Damage and Losses

The PDNA estimated that damage and losses from Ondoy and Pepeng amount to a total of US\$ 4.423 billion (Php 207.9 billion). The PDNA found that damage to physical assets in the affected areas amounts to an estimated Php 68.2 billion, equivalent to US\$ 1.452 billion. Associated losses in production and other flows of the economy were estimated at nearly Php 137.8 billion or US\$ 2.931 billion. Table 2 summarizes the damage and losses as well as recovery and reconstruction needs across sectors, which will be discussed below.

**Table 2: Summary Table for Each Sector (in US\$ million)**

Sector	Damages and Losses		
	Damages	Losses	Total
Productive Sectors	557.8	2,661.7	3,219.5
Agriculture	80.1	769.2	849.3
Industry	209.2	194.1	403.3
Commerce	256.2	1,644.4	1,900.6
Tourism	12.3	54.0	66.2
Social Sectors	706.5	212.5	919.0
Housing	541.6	188.8	730.3
Education	53.5	4.9	58.4
Cultural Heritage	6.0	0.5	6.5
Health	105.5	18.3	123.8
Infrastructure	181.1	56.2	237.3
Electricity	15.2	18.7	33.9
Water and Sanitation	7.9	16.4	24.3
Flood Control, Drainage and Dam Management	15.3	0.0	15.3
Transport	138.7	21.2	159.8
Telecommunication	4.1	0.0	4.1
Cross-Sectoral	6.3	0.9	7.1
Local Government	6.3	0.9	7.1
Social Protection	0.0	0.0	0.0
Financial Sector	0.0	0.0	0.0
Disaster Risk Management & Reduction	0.0	0.0	0.0
Total	1,451.7	2,931.3	4,383.0
Total in Php million (1 USD = 47 Php)	68,228.4	137,770.3	205,998.7

It should be noted that about one-third of the total disaster effects represents the value of destroyed physical assets, while the remaining two-thirds represents reductions in production, sales, and income as well as increased operational costs after the disasters. As shown in Table 2 above, losses were more than twice as high as damages. While the

destruction or damage to assets occurred at the time of the storms, the associated changes in economic flows will last beyond the present calendar year. In some sectors and cases, the effects will be felt in 2010 and 2011 depending on the speed and efficiency of the post-disaster recovery and reconstruction activities.

**The private sector has borne most of the impact of the disasters** (Table 3). The figures presented above are indeed very high for a country such as the Philippines, which is often affected by similar disasters. These estimates include damage and losses sustained by the entire society—including both public and private sector entities—and cut across all sectors of economic activity. The share of private sector effects is equivalent to 90 per cent of the total figures, while that of public sector effects is the remaining 10 percent, which provides a first glimpse at the relative participation of each sector in post-disaster recovery and reconstruction efforts.

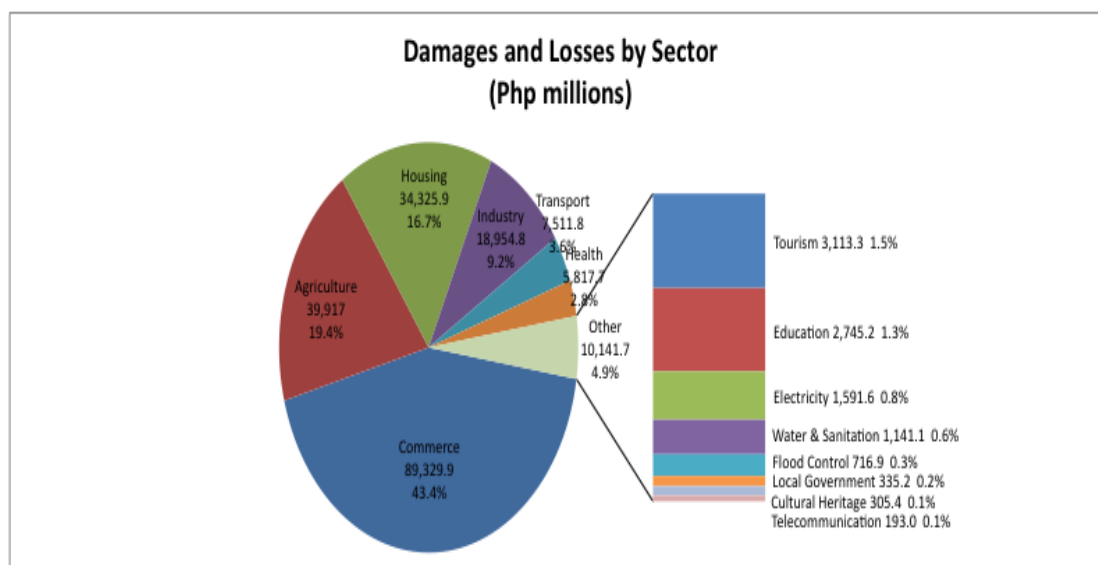
**Table 3: Damages and Losses by Sector and Type of Ownership (in Php millions)**

Sector	Damages and Losses					
	Damages	Losses	Total	Public	Private	Total
<b>Productive Sectors</b>	26,214.3	125,100.7	151,315.0	4,010.7	147,304.3	151,315.0
Agriculture *	3,765.0	36,152.0	39,917.0	4,010.7	35,906.3	39,917.0
Industry	9,832.0	9,122.8	18,954.8		18,954.8	18,954.8
Commerce	12,041.3	77,288.6	89,329.9		89,329.9	89,329.9
Tourism	576.0	2,537.3	3,113.3		3,113.3	3,113.3
<b>Social Sectors</b>	33,207.3	9,986.9	43,194.2	8,812.2	34,382.0	43,194.2
Housing	25,453.8	8,872.1	34,325.9	4,203.1	30,122.8	34,325.9
Education	2,515.7	229.5	2,745.2	2,149.3	595.9	2,745.2
Cultural Heritage	279.8	25.6	305.4	305.4		305.4
Health	4,958.0	859.7	5,817.7	2,154.4	3,663.3	5,817.7
Infrastructure	8,512.6	2,641.7	11,154.4	7,807.6	3,346.7	11,154.4
Electricity	713.1	878.5	1,591.6		1,591.6	1,591.6
Water and Sanitation	372.5	768.6	1,141.1	497.3	643.8	1,141.1
Flood Control, Drainage and Dam Management	716.9		716.9	716.9		716.9
Transport	6,517.1	994.7	7,511.8	6,593.4	918.3	7,511.8
Telecommunication	193.0		193.0		193.0	193.0
Cross-Sectoral	294.2	41.0	335.2	335.2	0.0	335.2
Local Government	294.2	41.0	335.2	335.2		335.2
Social Protection						
Financial Sector						
Disaster Risk Management & Reduction						
<b>Total</b>	<b>68,228.4</b>	<b>137,770.3</b>	<b>205,998.7</b>	<b>20,965.7</b>	<b>185,033.0</b>	<b>205,998.7</b>
Total in USD million (1 USD = 47 Php)	1,451.7	2,931.3	4,383.0	446.1	3,936.9	4,383.0

\* Based on Loss - Scenario 2, see agriculture sector report.

**Ondoy and Pepeng most heavily affected the productive and social sectors.** Nearly 95 percent of the damage and losses were sustained by the productive and social sectors, in contrast to other disasters in which destruction of infrastructure is predominant. Figure 1 shows a breakdown of damage and losses by sector. These sectoral effects have implications for the type and amount of post-disaster activities required for recovery and reconstruction.

Figure 1

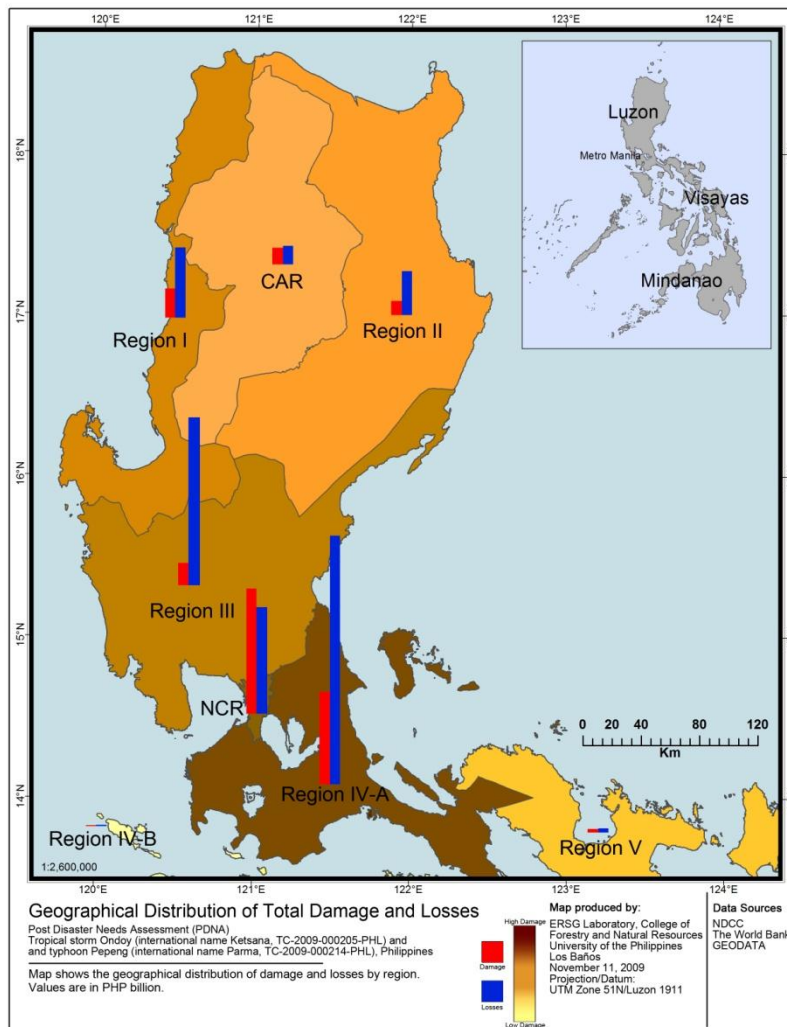


**The enterprise sector (industry, commerce, and tourism) sustained the highest value of disaster effects**, with US\$ 447.6 million (Php 22.4 billion) in damage and US\$ 1.89 billion (Php 88.9 billion) in losses of sales. The very high production losses in the enterprise sector are explained by the fact that prior to the disaster, traders had been stocking up on goods to meet the anticipated high demand for those products during the end-of-year sales. These as-yet-unsold inventories were destroyed or damaged by the floods. The impacts were felt most strongly by the micro- to medium-sized enterprises, which normally have limited or no access to formal credit.

**The next highest disaster effects were experienced in the agriculture sector and the housing sector.** The agriculture sector sustained damage of US\$ 80.1 million (Php 3.8 billion) and losses of US\$ 769.2 million (Php 36.2 billion). The storms came at a time when the current crops were about to be harvested, so most of the production was lost. Furthermore, irrigation systems were partially destroyed, which will have a negative impact on the next summer crop. This therefore calls for prompt reconstruction to avoid similar losses in the next year. Housing sustained an unprecedented degree of damage (US\$ 541.6 million/Php 25.5 billion) and incurred significant expenditures in temporary shelter (US\$ 188.8 million/Php 8.9 billion). The disasters affected many informal housing units that had been erected in flood areas, which will result in very high reconstruction costs that involve partial re-settlement.

**The spatial distribution of disaster effects was uneven.** Some regions were affected more intensely than others by Ondoy or Pepeng, and others were affected by both storms. In terms of destruction of physical assets, the NCR was most affected, followed by Region IV-A. Production losses were highest in Region IV-A, Central Luzon, and the NCR, as shown in Map 3.

**Map 3: Spatial Distribution of Damage and Losses by Region**



The Philippines is frequently affected by disasters, and these recent disasters were significant in the overall magnitude of their effects. The scale of the disasters was magnified by the impacts of the disasters in highly populated economic centers. While extreme events, however, the damages and losses incurred during these disasters are comparable to other major recent disasters across the world (Table 4).

**Table 4: Damages, Losses, and Magnitude of Similar Recent Disasters**

Disaster	Country	Year	Total Effects (US\$ million)	Magnitude (% of GDP)
Earthquake	Pakistan	2005	2,876	0.4
East Asia Tsunami (Aceh)	Indonesia	2005	4,452	1.6
Cyclone Sidr	Bangladesh	2007	1,640	2.8
Cyclone Season	Madagascar	2008	333	4.0
Cyclone Nargis	Myanmar	2008	4,060	19.7
Storm and Floods	Yemen	2008	1,638	6.0
TS Ketsana and Typhoon Parma	Philippines	2009	4,383	2.7

## Needs

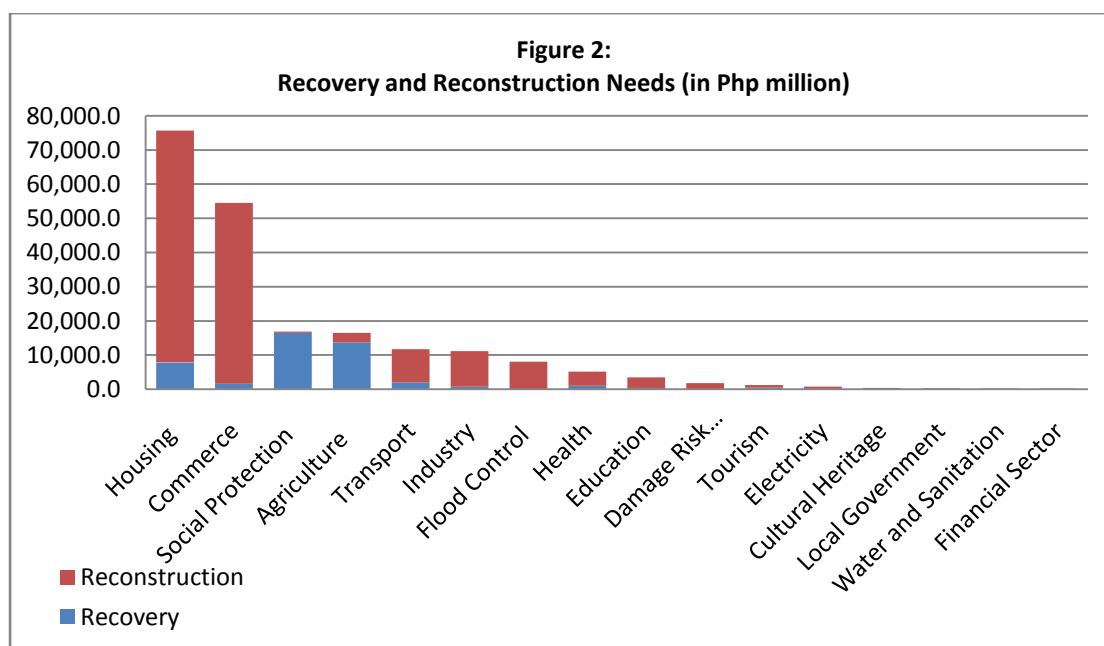
**Needs for post-disaster recovery and reconstruction have been derived from a detailed, quantitative analysis of the estimated damage and losses.** Needs for recovery are identified as the amount of resources required to bring the economy back to normal levels of performance, and they usually require amounts that are equivalent to a fraction of the estimated losses in production in each sector of economic activity. Needs for reconstruction, on the other hand, represent the amount of resources required to build, retrofit, or repair the physical assets that were destroyed by the disaster. Depending on an agreed strategy of reconstruction that implies “building back better,” the value of estimated damage is adjusted upwards to take into consideration quality improvements, adoption of disaster-resilient standards of design and construction, and, in selected cases, relocation of activities to safe areas. Whenever reconstruction is to take more than one year to be completed, inflation rates are introduced into the needs.

**Recovery and reconstruction needs that are to be implemented in the short term, both by the public and private sector, amount to around US\$ 2.6 billion** (Table 5). The estimated needs cover the entire Philippine society and economy, as affected by the storms, and include both the public and private sector requirements. In the case of the public sector, both central and local government needs are identified. Public sector support and guidance are also needed to ensure that private sector needs are met and addressed comprehensively and efficiently.

**Table 5: Recovery and Reconstruction Needs by Implementation Period  
(in Php million)**

Sector	Short-term	Medium-term	Total
Productive Sectors	80,581.9	2,808.0	83,389.9
Agriculture	13,704.0	2,808.0	16,512.0
Industry	11,103.6	0	11,103.6
Commerce	54,540.6	0	54,540.6
Tourism	1,233.7	0	1,233.7
Social Sectors	30,719.1	54,036.4	84,755.5
Housing *	25,391.3	50,344.1	75,735.4
Education	1,633.2	1,844.1	3,477.3
Cultural Heritage	183.2	168.0	351.2
Health	3,511.4	1,680.2	5,191.6
Infrastructure	2,692.7	17,963.1	20,655.8
Electricity	713.1	0	713.1
Water and Sanitation	24.4	137.1	161.5
Flood Control, Drainage and Dam Management	0	8,050.0	8,050.0
Transport	1,955.2	9,776.0	11,731.2
Telecommunication	0	0	0
Cross-Sectoral	10,388.6	8,690.5	19,079.1
Local Government	273.1	37.8	310.9
Social Protection	9,018.9	7,817.7	16,836.6
Financial Sector	141.6	0	141.6
Disaster Risk Management & Reduction	955.0	835.0	1,790.0
Total	124,382.3	83,498.0	207,880.3
Total in USD million (1 USD = 47 Php)	2,646.4	1,776.6	4,423.0

**A total of US\$ 942.9 million (Php 44.3 billion) is required to meet recovery needs, and a total of US\$ 3.48 billion (Php 163.6 billion) is required for reconstruction efforts.** Figure 2 summarizes the estimated recovery and reconstruction needs by sector of economic activity. As expected based on the assessment of damage and losses, the recovery and reconstruction needs are highest in the productive and social sectors.



**Recovery and reconstruction needs can be implemented through public agencies (such as central or local governments) or private organizations (such as private sector support through credit lines and grants, and local and international civil society organizations).** As shown in Table 6, the share of the public sector in implementing the recovery and reconstruction program is estimated at 55 percent (US\$ 2.43 billion or Php 114.5 billion), whereas private sector execution amounts to 45 percent (US\$ 1.98 billion or Php 93.4 billion). While the central government does not have a direct role in the execution of privately owned schemes for recovery and reconstruction, it does have a pivotal role in promoting the issuance of special credit lines through the Central Bank and the private banking system. It can also promote the acquisition of grant funding from development partners to channel to the private sector for assisting micro-entrepreneurs that are normally not creditworthy.

**Table 6: Recovery and Reconstruction Needs (in Php million)**

Sector	Public	Private	Total
<b>Productive Sectors</b>	15,525.0	67,864.9	83,389.9
Agriculture	14,968.0	1,544.0	16,512.0
Industry	138.1	10,965.5	11,103.6
Commerce	330.7	54,209.9	54,540.6
Tourism	88.2	1,145.5	1,233.7
<b>Social Sectors</b>	61,946.9	22,808.6	84,755.5
Housing *	56,801.6	18,933.9	75,735.4
Education	2,781.8	695.5	3,477.3
Cultural Heritage	351.2		351.2
Health	2,012.3	3,179.3	5,191.6

<b>Infrastructure</b>	19,797.3	858.5	20,655.8
Electricity		713.1	713.1
Water and Sanitation	16.1	145.4	161.5
Flood Control, Drainage and Dam Management	8,050.0		8,050.0
Transport	11,731.2		11,731.2
Telecommunication			
<b>Cross-Sectoral</b>	17,217.9	1,861.2	19,079.1
Local government	310.9		310.9
Social Protection	14,975.4	1,861.2	16,836.6
Financial Sector	141.6		141.6
Disaster Risk Management & Reduction	1,790.0		1,790.0
<b>Total</b>	<b>114,487.1</b>	<b>93,393.2</b>	<b>207,880.3</b>
<b>Total in USD million (1 USD = 47 Php)</b>	<b>2,435.9</b>	<b>1,987.1</b>	<b>4,423.0</b>

### C. The PDNA and the United Nations Flash Appeal

**Following the two disasters, the IASC clusters were mobilized, leading to the preparation of the UN Flash Appeal covering the humanitarian needs.** The UN Flash Appeal prioritizes emergency life-saving actions and also includes a range of early recovery interventions. Early recovery efforts in the Flash Appeal are meant to build on the emergency response and to help provide a strong foundation for the broader recovery process, which will extend beyond the short timeframe of the Flash Appeal which was originally launched on October 6, 2009, with plans to last six months. Thus, the Revised Flash Appeal, launched on November 18, maintains this original short-duration timeframe.

**The PDNA is meant to take advantage of and enhance existing early recovery efforts and to help move forward with a longer-term vision of recovery and reconstruction.** The PDNA is quite different from the Flash Appeal in that it is meant to take stock of damages and losses to production and infrastructure—including macroeconomic impacts—and to assess the needs and capacities of those directly and indirectly affected by the disaster, including further clarification of existing social recovery needs. This assessment helps to identify and prioritize the broad range of interventions and resource requirements to support the overall recovery and reconstruction effort.

**Since both the Flash Appeal and the PDNA include essential activities for early recovery, it is important that the linkages be clarified.** Both the Flash Appeal and PDNA cover the critical areas of livelihood and shelter, restoration of essential services, social protection of vulnerable groups, and in reducing future disaster vulnerabilities. The inter-linkages between the Flash Appeal and the PDNA are shown in Table 7. This includes those activities in the Flash Appeal that primarily aim to achieve the outcomes of the PDNA in the respective

sectors. Overall, activities worth US\$ 68.7 million relate to the PDNA, while the remaining Flash Appeal activities are primarily relief-focused and are not covered by the PDNA.

**Table 7: Link Between the PDNA and the Revised UN Flash Appeal**

Sector	Estimated needs as identified by the PDNA		Flash Appeal requested funds	Flash Appeal Requested Funds against PDNA outcomes
	in Php million	in USD million	in USD Million	in USD Million
Agriculture	16,512.0	351.3	10.0	10.0
Housing	75,735.4	1,611.4	16.3	15.3
Education	3,477.3	74.0	8.3	8.3
Health *	5,191.6	110.5	12.3	2.0
Water and Sanitation	161.5	3.4	10.4	0.8
Local Government	310.9	6.6	5.5	5.5**
Social Protection ***	16,836.6	358.2	64.6	26.8***
Other emergency relief			16.4	0.0
<b>Total</b>	<b>118,225.3</b>	<b>2,515.4</b>	<b>143.8</b>	<b>68.7</b>

\* PDNA Health Links to Flash Appeal Health and Nutrition

\*\* Refers to 'early recovery' needs, most of which would be implemented by LGUs

\*\*\* Includes USD 0.58 million from Health Sector in UN Flash Appeal which is linked to Social Protection in the PDNA.

Source: UN Philippines Country Team.

#### D. Damage, Losses and Needs by Sector

**A sector-by-sector analysis of damage and losses points to several key priority areas for recovery and reconstruction efforts.** As mentioned above, although all of the sectors were affected by the two disasters to some extent, the enterprise sector sustained the highest damage and losses, followed by the agriculture and housing sectors. Meeting the needs of these sectors is therefore critical to economic recovery and to minimizing the longer-term impacts on household well-being. Other sectors, such as telecommunications, have already repaired much of the damage caused by the storms and therefore have relatively minimal recovery and reconstruction needs.

##### Productive Sectors

###### *Agriculture*

**Ondoy and Pepeng caused a total of Php 3.8 billion in damages and Php 36.2 billion in immediate losses in the agriculture, fisheries, and forestry sector.**<sup>12</sup> The storms adversely affected a total of about 480,000 farmers in seven regions of Luzon: Cordillera Administrative Region (CAR) and Regions, I, II, III, IV-A, IV-B, and V. Damages were mainly concentrated on the irrigation assets of the crop subsector (Php 3.4 billion) and in the forestry (Php 369.1 million) subsector. The crops subsector also bore the major brunt of the immediate losses (Php 23.5 billion), followed by the fisheries sub-sector (Php 1.2 billion). By commodity, rice accounted for 87 percent of the immediate losses.

<sup>12</sup> "Immediate losses" refers to losses from standing crops and from products of livestock/poultry, fisheries, and forestry.

**Given the relative magnitude of the damage and losses, the recovery and reconstruction for the sector should prioritize the rice farming areas, especially in Regions I, II, and III.** To prevent further losses in coming dry season harvests, rice farmers should be able to plant by December 2009 at the latest. “Level 1”<sup>13</sup> damages in both the NIS and CIS must also be addressed by end 2009 at the latest. The loss in rice production rises dramatically—to between Php 30 billion and Php 47.5 billion—when probable losses in 2010 due to “level 2”<sup>14</sup> damages in irrigation infrastructure are included, underscoring the need for immediate action on irrigation reconstruction.

**The overall recovery and reconstruction needs for the agriculture sector are estimated at Php 16.5 billion** (Table 8). For rice, the financing requirement for enabling farmers to operate fully during the dry season is Php 8.7 billion, the bulk of which would be used to purchase hired labor and fertilizers. Some funds could also be used for food expenses during farming operations and for seeds. In addition, around Php 143 million of the funds could help pay for the interest on their current loans, which will enable farmers to keep their credit lines open for the coming wet season. To reconstruct irrigation systems, the National Irrigation Authority (NIA) plans to complete the rehabilitation works in two phases. Phase One will cover Level 1 or short-term rehabilitation needs (costing around Php 1.4 billion), which entails immediate remedial measures to save standing crops. Phase Two, which covers Level 2 or mid-term rehabilitation (costing around Php 2.4 billion), will entail restoration works.

**Table 8: Damages, Losses, and Needs in the Agriculture Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	3,765.0	36,152.0	39,917.0	13,704.0	2,808.0	16,512.0
in million USD	80.1	769.2	849.3	291.6	59.7	351.3
* Based on Loss - Scenario 2, see agriculture sector report.						
* 1 USD = 47 Php						

**These cost estimates do not yet include the attendant administrative and logistical costs, and the final total financing requirement will depend on the modalities that will be used to deliver assistance.** For example, the Government's direct provision of inputs to affected farmers would have higher costs compared to a voucher scheme, in which affected farmers would access their preferred inputs from accredited suppliers. Due to capacity constraints, not all needs may be simultaneously attended, so prioritization may be necessary. Prioritization criteria could include: a) the total number of farmers or hectares affected in a given area and b) the intensity of the losses suffered as a result of the calamities.

**In addition, the number of farmers whose farm lands are still inundated needs to be determined.** For these farmers, alternative livelihood support rather than farming assistance would be more relevant. Possible forms of support could include cash transfers over a limited period of time in order to start a new livelihood activity, food-for-work programs (e.g., repairs of damaged farm-to-market roads, de-silting/clearing of irrigation passages, etc.), and/or training and capital for alternative livelihoods. Such options are discussed in the social protection section below.

<sup>13</sup> “Level 1 damages” are non-structural damages that are easily repaired, such as silting of irrigation canals.

<sup>14</sup> “Level 2 damages” are structural damages that will require major repair effort.

## Enterprise

**Ondoy and Pepeng caused a total of Php 111.4 billion in damage and production losses in the enterprise sector across the NCR, CAR, Region I, Region II, Region III, and Region IV-A.**

The bulk of the losses comprised foregone revenues valued at Php 88.9 billion (80 percent of total damage and losses) as a result of production interruptions and inventory losses. Inventory losses, estimated at Php 78.7 billion, accounted for a substantial portion of the foregone revenues, as establishments had prepared for the anticipated increase in demand for the coming holidays. The remaining Php 22.4 billion (20 percent) represented damage to business premises, including buildings, warehouses, machinery, and equipment.

**In terms of subsectors, the commerce subsector was the most affected, accounting for 80 percent of total damage and losses in the enterprise sector.**

These damages and losses, which amounted to Php 89.3 billion, were largely due to damaged inventory buffer stocks for the Christmas season. The damage and losses in commerce were significant since they affected economically dense geographic areas, namely the NCR and Region IV-A. Although small and micro establishments accounted for only 4.2 percent of the damage and losses, they were hit particularly hard, and the resumption of normal operations will take longer for most of them compared to medium and large companies.

**The manufacturing subsector sustained 17 percent of total damage and losses in the enterprise sector,**

mostly in medium and large companies and economically dense regions. The Php 9.8 billion worth of damage to factory sites and machinery seriously affected the sector's ability to deliver orders that were particularly high ahead of the important Christmas season. Damage to raw materials and inventory stocks, which resulted in slowdowns in production, reduced future revenues by an additional Php 9.1 billion.

**The tourism subsector was affected less severely, with total damages and losses estimated at Php 3.1 billion.**

The decline in the number of tourists and commuters due to transport disruptions could have generated large revenue losses in tourism. However, this was offset by a surge in demand for hotel and restaurant services by families affected by the flooding who could afford to stay in hotels or resorts for temporary shelter.

**Overall, the enterprise sector needs Php 66.8 billion for reconstruction and recovery activities**

(Table 9). This amount includes Php 64.0 billion for reconstruction and improvement activities, including the possibility of resettling businesses to safer areas, and Php 2.8 billion for working capital. Large and medium enterprises account for 96 percent of these total reconstruction and recovery needs. For micro and small businesses, a financing scheme of grants and concessionary loans is needed. As discussed in the financial sector section below, the financing scheme should be composed of carefully priced and structured Business Disaster Loans, which is a Risk Mitigating Facility (RMF)-backed loan, and grants for micro and small businesses to accelerate short- and medium-term reconstruction and recovery. For medium-sized companies, a credit line for reconstruction and recovery is needed. The credit line should be packaged in the form of Business Disaster Loans that are for a longer term and with a quick processing time, to be accessible to medium-sized companies (as well as small and micro businesses) that sustained only partial damages and losses. No concessionary loans should be provided to large companies, since they have other sources of funds to finance reconstruction and recovery activities.

**Table 9: Damages, Losses, and Needs in the Enterprise Sector**

Sub-sector	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
Industry	9,832.0	9,122.8	18,954.8	741.3	10,362.3	11,103.6
Commerce	12,041.3	77,288.6	89,329.9	1,582.3	52,958.3	54,540.6
Tourism	576.0	2,537.3	3,113.3	507.6	726.1	1,233.7
<b>Total</b>	<b>22,449.3</b>	<b>88,948.7</b>	<b>111,398.0</b>	<b>2,831.2</b>	<b>64,046.7</b>	<b>66,877.9</b>
<b>Total in USD million</b>	<b>477.6</b>	<b>1,892.5</b>	<b>2,370.2</b>	<b>60.2</b>	<b>1,362.7</b>	<b>1,422.9</b>
* 1 USD = 47 Php						

**Helping the enterprise sector in the affected areas recover will require a mix of financing mechanisms.** The sector’s recovery would also be facilitated by rapid recovery of other sectors producing complementary goods and services (for example, transport or agriculture). A private sector recovery and management framework is essential to foster preparedness for, timely response to, and effective management of any future disasters and should be integrated with the country’s overall disaster management framework.

## **Social Sectors**

### *Housing*

**The housing sector was heavily affected by Ondoy and Pepeng, with damage and losses estimated at Php 25.5 billion and Php 8.9 billion, respectively.** The storms left about 220,000 homes completely destroyed or partially damaged by floodwaters in metropolitan Manila and across Luzon. Hundreds of thousands of people were left homeless. The value of damages and losses to the housing sector are calculated as the amount it would cost to restore the structure to its pre-disaster state as well as to replace the items lost in the household. Damages included: (i) damage to the home itself; (ii) household items, estimated as a fraction of the total construction cost; and (iii) damage to home-based informal micro-enterprises. Losses included: (i) the cost of demolition and rubble removal for destroyed homes; (ii) temporary loss of rental income incurred by owners whose structures were damaged; and (iii) the cost of temporary shelter schemes for those made homeless by the floods.

**The biggest share of damages was in the informal sector, consisting of makeshift dwellings located in flood-prone areas.** Notably, site visits to the most affected LGUs found that the main cause of destruction was the location of the dwellings rather than the building material. The vast majority of houses destroyed were in unsafe locations, and approximately 20 percent of all partially destroyed houses are also in unsafe areas and will need to be relocated. Of the remaining affected houses, 60 percent will be repaired and have vulnerability reduction measures. The remaining 20 percent will only be repaired. For the houses that will remain on their original sites (80 percent of partially damaged houses), a better warning system and evacuation plan will need to be implemented.

**Total financing needs—based on in-city relocation which is consistent with the Government’s preferred housing policy option—are Php 75.7 billion over the PDNA period, plus Php 17.0 billion for two additional years** (Table 10). Financing is needed for: (i) technical assistance, (ii) capacity development, (iii) housing repair/risk reduction, (iv) shelter and transitional housing, (v) housing reconstruction, and (vi) housing for families living around water hazard areas. The needs in housing include about 94,000 new housing units related to damage caused by the disasters. In addition, about 83,000 households are currently living on land considered as “water hazards” which are in danger of flooding.<sup>15</sup> Relocation of these households to higher ground is necessary to ensure their safety. Construction under the “build back better” premise will require improved housing design and construction solutions that will reduce costs as well as ensure participation from the new dwellers.

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<sup>15</sup> This figure is based on data collected by the PDNA Team. It is limited to households living in “water danger zones” in metropolitan Manila, so it is still an underestimation of the overall cost of rehousing households living in all types of hazard-prone areas across the country.

**Table 10: Damages, Losses, and Needs in the Housing Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	25,453.8	8,872.1	34,325.9	7,823.0	67,912.4	75,735.4
in million USD	541.6	188.8	730.3	166.4	1,444.9	1,611.4
* Long-term needs Php 17 billion (USD 362.6 million) not included, see housing sector report.						
* 1 USD = 47 Php						

**To reduce the impact of future storms, policies and development practices in urban development and housing need to be addressed.** The most important initiative is to ensure that LGUs prepare comprehensive land use plans based on updated thematic maps that take into account risk-sensitive land use planning. From these maps, zoning ordinances should be phased in and enforced to ensure that housing is not located in areas of imminent danger. National and LGU housing policies need to be developed further to ensure that a coherent program of slum upgrading and urban renewal can be developed in the context of City Development Strategies (CDS). For households requiring relocation due to disasters, programs should always ensure participatory mechanisms leading to consensus-based solutions. It is also necessary to ensure the long-term livelihoods of displaced households through measures such as: in-city resettlement close to existing employment; the provision of new, ample income opportunities in housing sites outside metropolitan Manila; and affordable transport and/or housing facilities for wage earners of resettled households who work in the city. In addition, new and improved financial intermediation practices are needed to ensure that the current willingness to pay among most low-income households is transformed into reliable mortgage repayments. In many cases, targeted subsidies will be required to ensure affordability for the poor. In some cases, public-private partnership solutions could be crafted to enable the financing of low-income housing by the private sector, in which case NGO and private sector intermediation (microfinance) would be the preferred modality.

### *Education*

**Ondoy and Pepeng have affected or displaced over one million schoolchildren and 21,000 day care workers and teachers.** A total of 3,417 schools, 36 colleges and universities, and about 2,800 day care centers were affected or damaged. Children suffered from disruptions in their schooling: some, especially those who were moved to evacuation centers or whose schools were transformed into evacuation centers were relocated and, along with children in their host schools, had to go through multiple shifts, cutting down their time for learning; some experienced trauma; and many schoolchildren, as well as teachers, lost their school supplies and textbooks. The displaced pre-schoolers in day care centers were also affected, but their key duty bearers, the LGUs, and local social workers were absorbed in responding to affected families and to urgent relief operations.

**Total damage and losses in the education sector are estimated at Php 2.7 billion.** Total damage is valued at Php 2.5 billion and includes damage to school buildings and furniture, computers and equipment, and educational materials. The public sector share of the overall damage is approximately ten times higher than the private share. Estimated losses total Php 230 million and include the costs of demolition and rubble removal and the costs of repairing schools that were used as temporary shelters after Ondoy and Pepeng. Public sector losses are estimated to be four times higher than private sector losses.

**The total recovery and reconstruction needs for education are estimated at Php 3.5 billion** (Table 11). Efforts must be made to restore education for affected and displaced children because it is both life-saving and life-sustaining and provides children with a sense of normalcy, stability, and structure, and helps them deal with disaster-related trauma.

Approximately Php 417 million is required for recovery and Php 3.1 billion for reconstruction. Of the total Php 3.4 billion in financing needs, Php 2.8 billion will be sourced from the public sector and Php 695 million from the private sector. The bulk of total needs (Php 2.7 billion) is for recovery and reconstruction of elementary education.

**Table 11: Damages, Losses, and Needs in the Education Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	2,515.7	229.5	2,745.2	417.2	3,060.1	3,477.3
in million USD	53.5	4.9	58.4	8.9	65.1	74.0
* 1 USD = 47 Php						

**Top priority must be given to the immediate repair and rehabilitation of damaged learning facilities.** The main activities should focus on: (i) immediate cleaning, repair, and rehabilitation of damaged schools, ECCD centers, and college and university facilities; (ii) replacement of damaged instructional materials and equipment and lost school supplies; (iii) repair and rehabilitation of damaged water and sanitation facilities; (iv) review of construction standards and development of relocation guidelines; (v) assessments of pre-schools, elementary, and high schools in high-risk areas; and (vi) planning for long-term solutions, including relocation. These activities may continue into the medium term. In addition, resilience should be built into repair and reconstruction activities in order to ensure continuity of education in disaster situations. In the long run, the capacity of government partners to advocate for the integration of disaster-risk reduction as well as its integration into regular education programs needs to be strengthened.

#### *Cultural Heritage*

**Ondoy and Pepeng affected a number of cultural heritage assets**, such as theatres, museums, historic churches, shrines, archaeological sites, cultural landscapes, and historic landmarks. Assessing damage and losses to cultural heritage assets is a site-specific exercise: their variety requires site-by-site assessments, and a unit cost approach cannot be easily applied. Over 100 sites were considered, and damage was reported from 45 of them.

**Total damage and losses for cultural heritage sites was estimated to be Php 305.4 million.** The estimation of losses took into account the income loss from tickets and donations. The impact on the external sector was assessed through projected increases in imports for restoration works needed, whereas the projected impact on the fiscal budget featured reductions in fiscal flows due to the unavailability of these assets until their complete restoration.

**The needs for recovery and reconstruction are estimated to be Php 351.2 million** (Table 12), which includes immediate needs (such as emergency rescue, temporary storage of artifacts in alternative locations, and temporary site roofing) as well as needs to ensure a complete restoration of the assets affected by Ondoy and Pepeng, reduce their vulnerability through retrofitting measures, and improve preparedness (for example, plans to move the artifacts to safer locations in case of flood warning). Given the current capacity of local government, it is reasonable to estimate that complete reconstruction will require at least three years, if the economic resources are available.

**Table 12: Damages, Losses, and Needs in the Cultural Heritage Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	279.8	25.6	305.4	29.4	321.8	351.2
in million USD	6.0	0.5	6.5	0.6	6.8	7.5
* 1 USD = 47 Php						

## Health

**Ondoy and Pepeng had significant effects on the health of the population living in the most affected areas**, namely Regions I, II, III, IV-A, CAR, and NCR. Around 20 percent of total health facilities in the affected areas suffered from partial disruption or damage, and the hardest-hit facilities are still having difficulties in resuming normal service delivery. The immediate health-related concerns include: (i) the treatment of injuries caused by the storm, (ii) the provision of continuous basic health services, (iii) the prevention of malnutrition and treatment of disease outbreaks, and (iv) management of short- and longer-term psychological effects among the affected populations. An equally critical priority is restoring the health system that was damaged to be able to continue the provision of health services.

**The estimated total damage and losses wrought by the storms amounts to at least Php 5.8 billion**, of which the public and private sector shares total Php 2.15 billion and Php 3.66 billion, respectively. Within the public sector, damage to national government-owned facilities amounted to Php 1.16 billion, while Php 0.54 billion was related to local government-owned health facilities. The NCR, followed by Region I, accounted for most of the damage to both types of public facilities. Losses are estimated to be Php 859.7 million for both the private and public sectors and include costs incurred for: the direct provision of basic health services to affected populations, treatment of injuries, disease surveillance in the affected areas, public health information campaigns, transport of patients, revenue losses, and other costs.

**Total recovery and reconstruction needs in the health sector amount to Php 5.2 billion, most of which (Php 4.2 billion) is for reconstruction-related activities** (Table 13). The recovery and reconstruction strategy entails the resumption of normal service delivery, recovery from the negative health impacts, making the health sector better prepared for disasters, and reconstruction of health facilities that were damaged or destroyed by the storms. The estimated financing needs for recovery and reconstruction of priority public sector facilities are estimated at Php 2.0 billion. Although private sector needs cannot be determined precisely, they have been estimated at Php 3.2 billion based on public sector data.

**Table 13: Damages, Losses, and Needs in the Health Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	4,958.0	859.7	5,817.7	991.6	4,200.0	5,191.6
in million USD	105.5	18.3	123.8	21.1	89.4	110.5

**Restoration of the health system would start with the reconstruction of facilities that sustained the most damage and losses in terms of infrastructure and equipment.** The Government has already developed criteria for prioritizing the facilities for immediate reconstruction: (i) capacity to resume normal operations after the disaster, (ii) level and extent of service provided, and (iii) scale of services provided to the general population and catchment areas they serve. Non-prioritized hospitals and rural health facilities must also be repaired to make them operational at a minimum level and ensure the delivery of basic health services. On the policy side, the Government is encouraged to develop a policy to implement standard building codes, highlighting minimum criteria for both public and private health facilities located in hazard-prone geographical areas, as well as address crucial health requirements in existing disaster plans.

## Infrastructure Sectors

### Electricity

**Total damage and losses in the electricity sector amounted to Php 1.6 billion**, of which Php 713 million and Php 879 million were for damages and losses, respectively. By subsector, only the transmission and distribution networks experienced damages. The main causes of damage to the transmission lines were strong winds and soil erosion from floods. In the distribution utilities (DUs), damages were mainly caused by high winds, debris, and fallen vegetation and flooding. Economic losses were due mainly to lost revenues from unserved electricity demands caused by the power outages. In terms of regions, the damage and losses caused by Ondoy were mainly in the distribution networks of the Manila Electric Company (MERALCO) covering the NCR and in Region IV-A. Damages caused by Pepeng were most severe in Region I, followed by CAR and Region II.

**Total financing needs for reconstruction amount to Php 713 million in the short term (Table 14), although the sector has essentially recovered.** During and immediately after the typhoons, the main priority of the transmission company and the DUs was the timely restoration of power supply within the capabilities and safety requirements of their networks. The work ranged from full replacement of damaged infrastructure to the use of temporary or makeshift structures. Line-bypasses and re-routings were made to connect inaccessible customer locations. To date, power supply has been restored fully. Reconstruction works are ongoing, with completion targets set for before the end of 2010. The risk of work slippages beyond 2010 and into the medium term is minimal.

**Table 14: Damages, Losses, and Needs in the Electricity Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	713.1	878.5	1,591.6	0.0	713.1	713.1
in million USD	15.2	18.7	33.9	0.0	15.2	15.2
* 1 USD = 47 Php						

**Since there are no foreseen major obstacles to full reconstruction, the transmission company and DUs have adopted a “forward-looking” approach for future typhoon preparedness.** In 2008, the National Transmission Corporation (TRANSCO) recommended an overall tower-strengthening program, particularly in the country’s critical high-wind zone. A Terms of Reference (TOR) was developed for consulting services to provide TRANSCO with a comprehensive investment plan to ensure that the company was better prepared to deal with typhoons in the future. It is recommended that the TOR be discussed by TRANSCO with the new private concessionaire of the transmission system, the National Grid Corporation of the Philippines (NGCP), which is now responsible for upgrading the grid. A similar TOR should also be developed and implemented for the distribution networks, particularly the electric cooperatives (ECs).

### Water and Sanitation

**The total value of damage and losses in the water and sanitation sector is estimated at Php 1.14 billion**, with damage amounting to Php 372.5 million and losses amounting to Php 768.6 million. The two storms caused damage to more than 50 water supply systems managed by the various water supply service providers, three wastewater systems, and collection and disposal facilities for solid waste management. Approximately 65 percent of the total damage was sustained by the public sector in 11 provinces, and the remaining 35

percent was sustained by the private sector. Almost all private sector damage (99 percent) occurred in metropolitan Manila. In terms of losses, 67 percent was sustained by the private sector, all in the metropolitan Manila area. As a whole, the region that suffered the most damage in water supply facilities was the NCR at 48 percent, followed by the CAR at 30 percent. Urban areas experienced significantly more damage and losses in both the water supply and sanitation subsectors at Php 1.1 billion, compared to Php 50.0 million in rural areas.

**The recovery and reconstruction needs of the sector are estimated at Php 161.5 million**, with Php 24.4 million needed in the short term and Php 137.1 million needed in the medium term (Table 15). Although most of the recovery and reconstruction started immediately after the storms, service providers still have remaining activities to implement, including the enactment of policies as well as the immediate purchase of goods needed to respond to disasters. Priority needs are categorized as follows: (a) facility-related restoration and reconstruction works on damaged components of the system; (b) policy measures to facilitate immediate reconstruction, such as flexible emergency financing support and streamlined project approval and procurement processes; (c) project preparatory activities and studies; and (d) capacity development on disaster management. In the short term, services to affected areas must be restored by reconnecting and providing affected people with potable water supply. In the medium term, various components of the water supply and sewerage system should be revisited, and based on the experience of water providers, options to mitigate and protect against recurrence should be planned and implemented.

**Table 15: Damages, Losses, and Needs in the Water and Sanitation Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	372.5	768.6	1,141.1	31.3	130.2	161.5
in million USD	7.9	16.4	24.3	0.7	2.8	3.4
* 1 USD = 47 Php						

**On the policy side, a policy on emergency financing is needed**, including an inventory of existing funds available for water supply, project approvals and procurement. There is also a need to establish an integrated sector framework by implementing Executive Orders (EO) 123<sup>16</sup> and 279<sup>17</sup>, including the establishment of a common financing architecture that may be tapped by water service providers.

#### *Flood Control and Drainage, and Dam Management*

**Ondoy and Pepeng were extraordinary events that overwhelmed the flood management and drainage infrastructure in metropolitan Manila and in Central and Northern Luzon, respectively.** The probability of occurrence of the two storms exceeded the design capacities of the infrastructure. Although the damage to flood management infrastructure within metropolitan Manila was limited compared to the massive investments made, Ondoy exposed serious weaknesses in the overall flood management and drainage arrangements. Meanwhile, Pepeng caused destruction and damage to flood embankments, especially along the Agno, Laoag, Cagayan, and Bucao Rivers. Although the floods generated by the typhoons exceeded the design level of the embankments which was bound to lead to flooding, the typhoon also exposed the vulnerability of infrastructure resulting, in particular, from lack of

<sup>16</sup> Executive Order 123 of 2002 Reconstituting the National Water Resources Board.

<sup>17</sup> Executive Order 279 of 2004 Instituting Reforms in the Financing Policies for the Water Supply and Sewerage Sector and Water Service Providers and Providing for the Rationalization of LWUA's Organizational Structure and Operations in Support Thereof.

maintenance. Many sections of embankments were breached, and others were damaged to such an extent that future protection cannot be guaranteed.

**The overall estimated damage caused by Ondoy and Pepeng is Php 716.9 million.** Most of the damage occurred in Region I and metropolitan Manila, while the damage in Region IV-A was negligible. The total damage to the flood management and drainage infrastructure in metropolitan Manila is estimated at Php 238.0 million, while the total damage to flood embankments along the Agno, Laoag, Cagayan, and Bucao Rivers has been estimated at Php 479.0 million. Direct losses were not estimated, as these have been taken into account by other sectors.

**Several medium-term activities are proposed during the three-year timeframe from 2010 to 2012, with estimated funding requirements of Php 8.05 billion** (Table 16). Priority activities to be undertaken in metropolitan Manila include: (i) the implementation of an urgent program of rehabilitation and improvement of key flood management and drainage systems to return the infrastructure at least to full design conditions; (ii) the further development and implementation of a comprehensive monitoring and warning system, as well as a flood forecasting system; (iii) the development and implementation of appropriate institutional arrangements for the management of water within the overall catchment area, including the Marikina and Pasig Rivers and Laguna Lake; and (iv) preparation of a comprehensive update of the 1990 master plan that will prioritize the future developments to increase the safety against flood events up to a level appropriate for metropolitan Manila, including Laguna de Bay. The total estimated funding requirements for this program are Php 5.5 billion. For Central and Northern Luzon, a program of river bank strengthening is proposed, initially focusing on severely damaged sections that must be reconstructed before the 2010 flood season. The total estimated cost of this intervention is Php 2.5 billion.

**Table 16: Damages, Losses, and Needs in the Flood Control, Drainage, and Dam Management Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	716.9	0.0	716.9	0.0	8,050.0	8,050.0
in million USD	15.3	0.0	15.3	0.0	171.3	171.3
* 1 USD = 47 Php						

**The medium-term priorities need to be complemented by broader institutional and policy developments.** Before proceeding with large capital investments, the update of a master plan should be completed with a clear development objective, an overall infrastructural and institutional development plan that is prioritized, feasibility-level cost estimates, and stronger coordination among relevant existing agencies until institutional arrangements for overall water management are strengthened, for example through a single water management agency. The timeframe for a priority program of staged infrastructural improvements is estimated to be around 20 years, with an estimated cost of at least Php 50 billion-Php 75 billion.

### *Transport*

**The transport sector impacts of Ondoy and Pepeng were greatest on road infrastructure, with estimated damage and losses of Php 7.5 billion.** This amount is comprised of Php 2.6 billion damage to national roads, Php 3.9 billion damage to local roads, and Php 1 billion in transport losses. In low-lying areas in metropolitan Manila and Northern Luzon and communities around Laguna Lake, many roads were flooded. In some places, roads were impassable for extended periods. Along mountainous and difficult terrain, most prominently in Benguet, severe damage was caused by landslides, rockfalls, and destructive water flow,

which led to the closure of certain corridors and costly damage to structures. Several bridges along major rivers and waterways were washed away. Economic losses resulted from increased vehicle operation costs and travel delays as roads were closed and/or alternate routes had to be taken.

**The disasters exposed major risks to transport infrastructure that require more permanent interventions, particularly in sections with serious damage to structures.** Sections with damaged structures that have been opened to traffic need to be monitored closely through regular inspection for safety risks. Regular advisories to the public on road conditions in critical areas would help inform travel plans. In difficult terrain, as in the Cordillera region, new permanent structures need to be designed for greater reliability, such as those for slope protection, embankments, bridges, drainage, and so on. This could increase the cost of road projects, thus the need to consider alternative options, including perhaps the study of new alignments or routes. Existing alignments would also need to be reinvestigated in terms of vulnerability to the surrounding geology or hydrology so remedial measures can be identified.

**Recovery requirements are estimated to be about Php 2 billion and reconstruction needs are estimated at Php 9.8 billion** (Table 17). The issue of sustainable financing for disaster response needs to be studied. Moreover, to enable the immediate response of the Department of Public Works and Highways (DPWH) and LGUs in times of disaster, a dependable source of emergency financing for immediate restoration works should be put in place. Concessional loans from a government institution are available for LGUs for emergency activities, but there is preference for grants for major capital investments.

**Table 17: Damages, Losses, and Needs in the Transport Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	6,517.1	994.7	7,511.8	1,955.2	9,776.0	11,731.2
in million USD	138.7	21.2	159.8	41.6	208.0	249.6
* 1 USD = 47 Php						

### *Telecommunications*

**The storms and related flooding caused extensive damage to the telecommunications infrastructure**, including fixed lines, mobile networks, and broadband (Internet) networks, resulting in temporary network outages in some areas. Flood damage disproportionately affected the fixed-line network—primarily in the NCR, Region II, and Region IV-A—which disturbed fixed broadband internet (DSL) connections and some private data networks. Damage to cell sites reduced the availability of mobile coverage, particularly in the NCR and Region IV-A. Telecommunications service interruptions affected residential consumers, businesses, government offices, banks, internet service providers, and the business process outsourcing (BPO) industry.

**Eighty percent of the telecommunications infrastructure was repaired almost immediately thanks to robust disaster recovery and business continuity facilities.** About 97.5 percent of the damaged infrastructure is expected to be repaired by end-November 2009. The remaining infrastructure is unlikely to be restored due to changes in demand. Restoration of mobile networks was relatively fast, although repairs to fixed lines were slower for logistical reasons.

The total estimated cost of repairs and restoration is Php 193 million based on the available information,<sup>18</sup> but these costs are viewed as manageable without external assistance. The main costs to the industry have been replacement of plants and equipment, plus rebates and discounts to clients. However, some of these costs will be covered by insurance. Overall revenues in the industry have reportedly increased relative to usual levels for the third quarter due to increased demand for services, including for emergency communications and special services such as e-payments (i.e. for donations and funds transfers). As a result, the costs of repairing and restoring services were noted to be manageable, and the need for external funding or subsidies has not been raised as an issue by service providers. In fact, the industry has contributed to reconstruction and community support efforts in other sectors.

**Table 18: Damages, Losses, and Needs in the Telecommunications Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	193.0	0.0	193.0	0.0	0.0	0.0
in million USD	4.1	0.0	4.1	0.0	0.0	0.0
* 1 USD = 47 Php						

## Cross-Sectoral Issues

### *Local Government*<sup>19</sup>

**Ondoy and Pepeng caused an estimated Php 294.2 million in damage to the assets of LGUs and Php 41.0 million in losses.** Flooding was the main cause of damage to LGU assets, which include assets such as municipal halls, community-level facilities, vehicles, heavy equipment, office furniture, and IT systems. The damage estimate was calculated based on LGU estimates of the costs of repairing partially damaged assets and the costs of reconstructing/replacing totally damaged assets. The estimated losses, which include reductions in tax revenues and other local income as well as additional operating costs and restoration costs, were calculated based on estimates reported by LGUs of (i) reduced own-source revenue collections resulting from the disasters; (ii) costs of restoring the functions of offices whose operations were disrupted due to the disasters; and (iii) higher operational costs for operating offices in the period following the storms.<sup>20</sup>

**Of the total Php 310.9 million in total needs, Php 300.9 million is estimated to be needed for reconstruction** (Table 19). Although the overall impact of the disasters on LGU assets analyzed here seems relatively small, the damage to physical assets was still substantial, and LGUs have to incur significant costs to repair and reconstruct these assets. The main objectives of the reconstruction efforts for LGUs are to: (i) fully restore operations to pre-disaster levels and (ii) strengthen the capacity of LGUs to mitigate risks to assets and operations from future disasters. The short-term costs estimated for rebuilding partially

<sup>18</sup> From PLDT, Smart, Globe, Eastern Telecoms, and Bayantel and from data provided by the National Telecommunications Commission.

<sup>19</sup> LGUs in the Philippines consist of three levels: (i) the provinces and independent cities, (ii) component cities and municipalities, and (iii) the barangays.

<sup>20</sup> Although information was collected from the majority of the affected LGUs, it should be noted that: (i) several large LGUs did not submit data or were unable to estimate costs, leading to a considerable underestimation of LGU damages and losses; (ii) there is a significant variability in the estimates since the costs for damage and losses were self-reported by the LGUs; and (iii) in numerous cases, LGUs reported damaged assets and affected operations but did not estimate the resulting costs.

damaged facilities is Php 89.7 million, while the estimated medium-term cost for reconstructing totally damaged facilities is Php 37.8 million. Given the peculiarities of LGU facilities which are different in size, location, and design, it is not possible to estimate the costs for “building back better.” The estimation of needs, thus, only covers reconstruction expenditures to return to the pre-disaster situation.

**The primary recovery needs for LGUs are linked to recovery in other sectors.** The costs reported by LGUs to restore the operations of various offices are estimated at Php 7.9 million, which is a relatively small amount. The LGUs have already used their Calamity Funds to cover these immediate restoration costs, as well as various emergency needs related to relief operations and the restoration of basic services. As a result, these costs do not need to be included in the estimate of recovery needs. The greater concern over 2010 and onwards is the impact of Ondoy and Pepeng on local property markets and local economies, which may have adverse effects on LGU local revenue mobilization. Hence, the primary recovery needs of LGUs are closely linked to the recovery efforts for key sectors of the economy, particularly housing, transport, agriculture, commerce, and livelihoods. The specific recovery strategies and policy measures for these sectors will serve as the critical interventions to accelerate the recovery of the local government sector.

**Table 19: Damages, Losses, and Needs in the Local Government Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	294.2	41.0	335.2	10.0	300.9	310.9
in million USD	6.3	0.9	7.1	0.2	6.4	6.6
* 1 USD = 47 Php						

**A two-pronged post-disaster strategy for the local government sector is suggested.** First, targeted financial assistance should be extended to the most heavily affected LGUs. These LGUs would benefit from a concessional loan facility, which would allow them to repair damaged equipment and facilities rapidly and replace destroyed assets to their pre-disaster state. Access to these soft loans should be carefully targeted and strictly restricted to LGUs that suffered significant damage to assets stemming from the storms. The loan facility should provide flexibility to allow LGUs to borrow not just for capital assets but also for non-capital assets that were damaged, including furniture, computer systems, and office equipment. Second, technical assistance should be provided to LGUs in disaster-prone areas to help them implement disaster management and disaster risk reduction measures. LGUs located in identified high-risk areas would benefit from a capacity development facility that could help strengthen their ability to mitigate the risks of damage to LGU assets and operations due to natural disasters.

#### *Social Protection*

**The socio-economic impacts of Ondoy and Pepeng can be addressed through a variety of social protection measures.** As discussed in the previous section, the damage caused by Ondoy and Pepeng affected the well-being of households, particularly through the disruption of employment and livelihoods. Well-designed social protection programs, including cash transfers and active labor market programs, can help the poor and vulnerable cope with the impact of the disasters, as well as reduce the risk of future income losses due to similar disasters.

**To help the most vulnerable households and communities recover more quickly, a package of short term safety net interventions will be necessary.** These measures include cash or food transfers (possibly in the form of cash or food-for-work programs) to help the most vulnerable households and those otherwise unable to earn a living (Php 1.1 billion). Community block grants can support communities rebuild and also create meaningful work and leverage sweat equity (Php 315 million). Trauma counseling would need to be prioritized to ensure that the most severely affected individuals can begin to recover (Php 160 million). Furthermore, the specific protection needs of women, children, the elderly, and people with disabilities will require special consideration.

**Social protection interventions of this sort are also complimentary to the particular circumstance of the many households who are homeless as a result of these disasters.** While core shelter programs need to be expanded, reconstruction and relocation will need to be further supported through attention to livelihood restoration. Community block grants can also play an important role in re-establishing basic services and other public goods in eventual relocation areas. Any relocation of households/communities and livelihood restoration interventions should include a systematic process of consultation and take into account groups with particular needs. This applies in particular to indigenous communities whose collective attachment to ancestral land means a strong preference for remaining in their current areas of residence.

**In addition, there is a need to help households recover their livelihoods through support to affected workers and micro-entrepreneurs.** It is estimated that some Php 38.1 billion of livelihood incomes have been lost due to the disasters. Of the total estimated livelihood losses, small and home-based enterprises can refinance about 24 percent, or Php 12.3 billion, of their own losses. A survey conducted among different types and sizes of enterprises found that 13 percent of micro-entrepreneurs can recover lost incomes from remittances and loans/gifts from relatives, while another 11 percent will seek to refinance their losses from moneylenders.<sup>21</sup>

**To generate immediate incomes for priority target groups and increase employment opportunities for the displaced, a program amounting to Php 15.0 billion is proposed.**<sup>22</sup> The first program component focuses on generating emergency employment and income support for priority target groups. It would require an estimated Php 4.3 billion for a public works program which would cover 210,000 workers (one worker per household) in the affected regions whose incomes have been severely reduced because they lost their livelihoods or jobs. Cash transfers for priority groups (e.g., micro-entrepreneurs) could also be provided to help restore lost productive livelihood assets. The second component applies local economic recovery measures to increase employment opportunities and facilitates the reintegration of displaced people. Main activities include: (i) labor-based investment in socio-economic and productive infrastructure, using participatory approaches; (ii) support to job-seekers through employment services and provision of skill training; (iii) support to micro entrepreneurs and scaling up of local micro enterprises; (iv) support to micro entrepreneurs and capacity development of local partners including associations of producers, workers and micro-entrepreneurs, and business service providers; (v) support to local microfinance institutions to improve quality of service and performance; and (vi)

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<sup>21</sup> Rapid assessment on the impact of the disaster on enterprises, commissioned for the PDNA. See also the PDNA report on the enterprise sector.

<sup>22</sup> Though not possible to calculate in detail, recovery and reconstruction activities in the other sectors covered by the PDNA are expected to generate sufficient livelihood incomes to close the remaining needs gap.

support for enhancing the preparedness of local authorities for livelihood recovery for future disasters. The third component supports active employment policies, social protection schemes for the poor, and the application of decent working conditions. Activities include: (i) support to interrelated national policies and financial mechanisms; (ii) support to the establishment of regulatory frameworks for the development of the financial sector and business development services; and (iii) support to labor-related institutions that enhance employability, social protection, and other aspects of labor administration in post-disaster situations. Such a program should also be complemented by policy measures that facilitate the livelihood recovery response to future disasters.

**Table 20: Damages, Losses and Needs in the Social Protection Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	0.0	0.0	0.0	16,521.6	315.0	16,836.6
in million USD	0.0	0.0	0.0	351.5	6.7	358.2

### *Financial Sector*

**Overall, the direct damages sustained by the financial sector have been limited.** In the capital markets, the Philippines Stock Exchange suffered no physical losses, nor did its Manila brokers, although the extent of damage to its regional brokers remains unknown. While trade volumes did fall first by 50 percent then by 25 percent during the two days before Ondoy struck, this was the only perceptible impact. Leasing appears to have been similarly unaffected, with the largest leasing company in the country reporting only six small leases being affected, all of them requiring only short-term restructuring. It also appears that damage and losses in the banking sector have not been significant enough to impair its operations or robustness, as the total volume of loans that reportedly may need to be restructured represents only 0.8 percent of the total loans outstanding in the country.<sup>23</sup>

**The banking sector could play a leading role in providing financing for the recovery and reconstruction of private firms affected by the storms.** By using Multilateral Development Banks (MDB) funds to partly guarantee the new portfolio of loans to micro, small, and medium enterprises (MSME) damaged by the storms, the government could entice a small number of carefully chosen private banks to use their own funds to cover these financial needs. Loans should be carefully priced and structured to be affordable for the vast majority of MSMEs. By adding a second loss cover<sup>24</sup> from an international private sector bank or an IFC/DEG/FMO-type development institution, it should be possible to at least double the volume of funding flowing to affected businesses, compared to an approach in which only government funds are disbursed. The estimated financing required from the government/MDBs to design, fund, and manage such a Risk Mitigation Facility (RMF) amounts to Php 5.65 billion. Grants can also play a role in assisting MSMEs that have no productive assets left and negligible creditworthiness. These payments should be distributed by microfinance institutions (MFIs), thus increasing their exposure to new micro-entrepreneurs.<sup>25</sup>

<sup>23</sup> This is partly because banks' lending levels are low, with only 51 percent of banking assets invested in loans. This means that Php 2.8 billion of assets in the banking system currently remains un-lent.

<sup>24</sup> See appendix for description and graph of how such a Risk Mitigation Facility could work.

<sup>25</sup> Total funding for this grant program could be around Php 614 million. Additional details are also provided in the Enterprise Sector.

**Financial needs are highly dependent upon the assessments carried out in other sectors, particularly enterprises, housing, and disaster risk management.** While the housing sector assessment makes the case for LGU finance for low-income housing, this section focuses on how to facilitate private sector lending to LGUs for this purpose. Since the degree of guarantee required is expected to be far lower than for disaster-struck MSMEs, it is assumed that 15 percent is required on a Php 10.6 billion portfolio, coming to a total government/MDB contribution of Php 1.6 billion.<sup>26</sup> One proposal currently being studied is to establish an LGU Catastrophe Insurance Pool.<sup>27</sup> As the private sector is likely to play a key role in establishing and managing the proposed pool, the cost linked to this role is reflected in this section. The cost of hiring a highly reputable and proven team and covering their costs for 18 months until the Pool is self-financing is estimated to be around Php 60 million. It is also recommended that a study be conducted to explore what measures might be taken to help increase finance of the consumer retail sector, particularly to encourage more micro-housing loans in the affected areas.

**The total funding required for recovery and reconstruction for the financial sector is estimated at Php 141.6 million (Table 21).** These interventions are relatively short-term in nature in terms of spending, as they all aim to serve as catalysts for systems that become self-financing relatively rapidly.

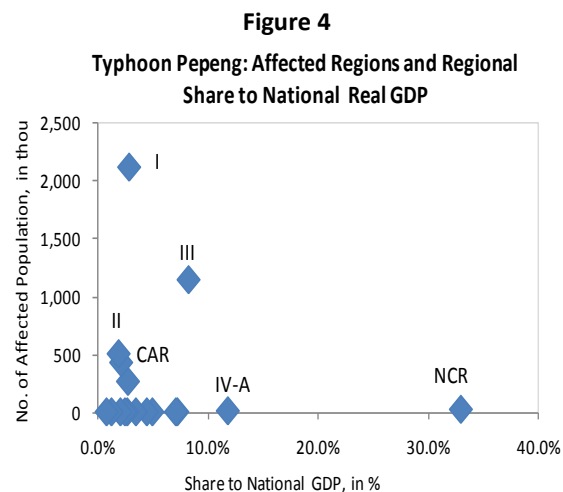
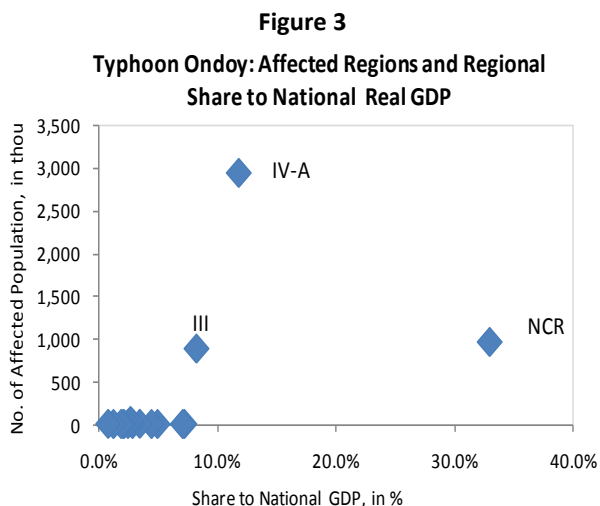
**Table 21: Damages, Losses, and Needs in the Financial Sector**

Currency	Damages and Losses			Needs		
	Damages	Losses	Total	Recovery	Reconstruction	Total
in million Php	0.0	0.0	0.0	3.4	138.2	141.6
in million USD	0.0	0.0	0.0	0.1	2.9	3.0
* 1 USD = 47 Php						

<sup>26</sup> LGUs are generally not considered high risk, and real estate portfolios are far more palatable to banks.

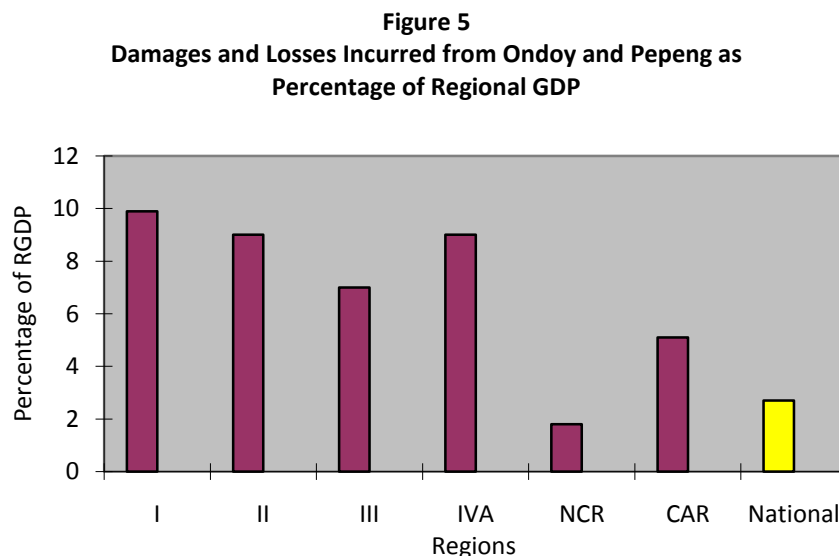
<sup>27</sup> Catastrophe Insurance Pools are among the measures used to reduce the fiscal burden arising from the costs of disasters (e.g. Caribbean Catastrophe Risk Insurance Facility and the Turkish Catastrophe Insurance Pool).





Source: National Statistical Coordination Board, National Disaster Coordination Council

**While damages and losses from Ondoy and Pepeng constituted 2.7 percent of national GDP, these disasters have had a substantial impact on the economies of the affected regions.** For example, the regional damages and losses accounted for as much as 10 percent of Region I's GDP, 9 percent of Region II and IV-A's GDP, and 7 percent of Region III's GDP. The NCR, which accounts for close to 38 percent of national GDP, suffered damages and losses of 1.8 percent of its regional GDP (Figure 5).



**In terms of sub-sector impacts, commerce and trade incurred heavy losses, particularly due to damaged stocks.** The sub-sector suffered losses totaling Php 89.3 billion, of which the largest share was incurred by large and medium enterprises due to lost inventories. The timing of the calamities heightened the impacts, as the floods hit at a time of year when production and inventory buildup are at their highest. Wholesalers and retailers had stocked up in preparation for the Christmas season, making the subsequent losses inordinately high, which in turn translated into forgone sales for the trade sector. Almost all of these losses occurred in Regions IV-A, III, and the NCR, where warehouses are co-located with industrial sites and small retailers are also numerous (Figure 6). Overall, the losses in the trade sector account for half of the reduction in GDP growth (Figure 7).

Figure 6

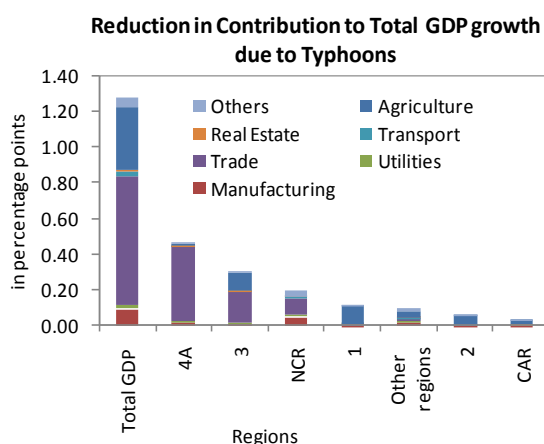
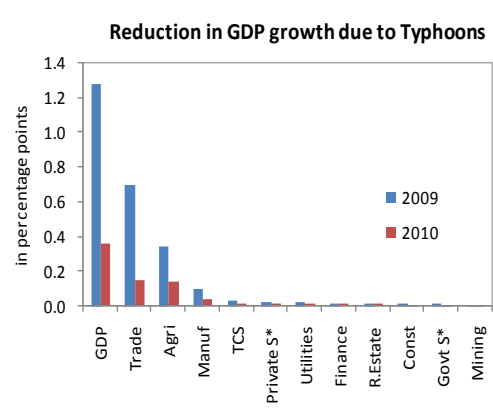


Figure 7



Note: \* Services  
Source: National Statistical Coordination Board, WB Staff Estimates

**The disasters had a major impact on agriculture, as they hit the Philippines during the harvest period of the wet season crop (May to October).** As a result, almost the entire wet season crop was destroyed in the affected areas. Although the dry season crop starts in November and finishes in April, it could also be significantly and negatively affected. Unless rehabilitation work of irrigation systems in the affected areas begins immediately, agricultural production may be lower in 2010.

**Manufacturing was also adversely affected, as some plants in Manila and nearby regions were flooded.** Although most flooded factories were small and medium enterprises (SMEs), some large enterprises also experienced the impacts—for example, steel and glass processors located along the Pasig River and the factories of Unilever Philippines and Alaska Milk Corporation. As mentioned above, damaged machinery and premises, difficulty of employers and suppliers in accessing the factories, and electricity shortages contributed to reduced productivity. The halt in production resulted in lost orders, further weakening the financial balances of export-oriented SMEs which were still reeling from the collapse in exports from the global recession. Losses of stocks and inventories of raw materials during the flooding have stopped or delayed the resumption of production.

**Aside from trade sub-sectors, other services sectors have only been moderately and temporarily affected.** Airport and port disruptions were temporary, while road transportation was affected in localized areas. Certain property markets—Marikina, Pasig, Bulacan, Cavite—were seriously affected by floods and have experienced price collapses, reducing income streams and creating large negative wealth effects to their owners. Companies in the business process outsourcing (BPO) sector were affected by the unavailability of staff for several days immediately after Ondoy, but normal operations resumed quickly. The most affected BPO companies coped by redirecting workloads to non-affected sites, either in the Philippines or abroad.

**Balance of Payments**

**Several exporters were hit by Ondoy and Pepeng, although the magnitude of the impact on exports is unclear.** While some exporters (e.g., exporters of decors and gifts) suffered losses, the Philippine Economic Zone Authority reported no significant impact on export processing zones in Luzon. Most of the affected ones were located in hard-hit areas in metropolitan Manila and neighboring areas. Since Ondoy and Pepeng did not hit prime

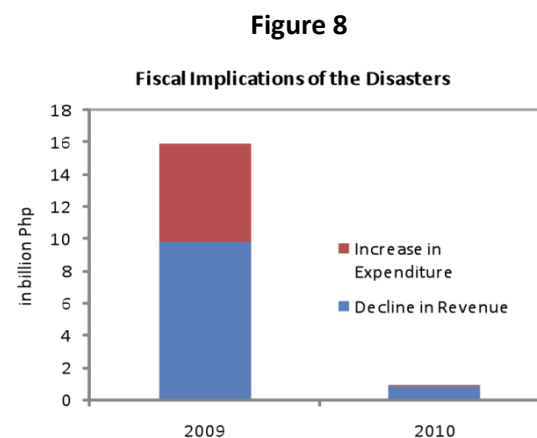
tourist destinations, the impact on services exports was minimal, although the disasters may have dampened the country's attraction as a tourist destination. While some firms were hit hard, the BPO sector, with a turnover of US\$6 billion in 2008, was able to weather the disaster relatively unaffected thanks to flexible workload and workforce arrangements. The continued rise in gross international reserves from US\$42.5 billion in September to US\$43.2 billion in end-October also indicates that the external sector remained in good shape despite the disasters. An expected large inflow in remittances to partially offset lost income and damages helps explain the continued strength in gross international reserves.

### **Financial and Corporate Sector**

**Financial markets took a benign view of Ondoy and Pepeng.** Immediately after both disasters, the Peso depreciated slightly against the US dollar, although this followed several weeks of strong appreciation. After Ondoy, bond prices fell slightly at the short end but actually rose for longer-dated bonds. Sovereign spreads on Philippines global bonds remained toward their 2009 lows. Equity prices fell by 1.3 (0.4) percent on the opening day immediately following Ondoy (Pepeng), but Asian markets were mostly down, some significantly more than the Philippines. The mild reaction, particularly for listed companies, likely hinged on the perception that the disasters would have a moderate impact on profits of top corporations, partly since large companies have a higher incidence of insurance coverage and more flexibility in terms of staff and financial and operational resources to react to such shocks.

### **Fiscal Policy**

**The impact on the fiscal balance is likely to be significant, due to higher spending needs and reduced revenues** (Figure 8). On the expenditure side, the direct impact includes infrastructure damages, emergency relief, and assistance to affected families. Indirect costs could be significantly higher but are yet unknown, as they depend on the policy decisions made to assist the most vulnerable citizens, for example through permanent relocation programs, slums upgrading, and water management improvements. Public revenues are also expected to be affected, both directly and indirectly. Most of the direct tax revenue reduction would arise from a sharp surge in tax credit refund on inventory losses. Moreover, firms are also allowed to deduct non-insured damages they have suffered against their taxable corporate income over the next five years, hence corporate income tax collection is expected to be affected adversely this year and in the next coming years. The indirect impact mostly stems from lower consumption and profits.



Source: National Statistics Office

### **Monetary Policy**

**In response to the impacts of Ondoy and Pepeng, the central bank temporarily exercised regulatory forbearance in directly hit areas.** For affected areas, the Bangko Sentral ng Pilipinas (BSP) allowed banks to exclude loans of borrowers from the computations of past

due loan ratio and granted a 4 percentage point reduction in general loan loss provision until December 2009. The BSP also established a Php 5 billion special rediscounting line for micro, small, and medium enterprises (MSMEs) affected by Ondoy and Pepeng.

**The government issued a temporary price freeze on basic commodities and oil.** Immediately after the two storms, the government decreed a ceiling on all prices of basic commodities in supermarkets and wet markets to protect affected households, especially the poor. The government also extended the price cap on oil prices a week after Pepeng hit the country. These price caps were lifted in mid-November, contributing to an increase in the inflation rate which reached 1.6 percent in October, from 0.7 percent in the previous month. Regions in Luzon (except Region IV-B) have all experienced month-on-month increases in their inflation rates, signaling an upward pressure on prices due to Ondoy and Pepeng. Prices of some commodities such as vegetables were affected as major producers (e.g., Benguet in Region CAR) were directly hit and isolated after Pepeng.

### ***Recovery and Reconstruction***

**Retained earnings, insurance claims, and other interest-free sources of financing can finance about 70 percent of the total recoverable production from the disasters.**<sup>28</sup> For large and medium corporations, a large proportion of the financing needs can be met by insurance claims and by retained earnings. This recovery spending is expected to boost economic activity by 0.3 and 0.02 percentage points of GDP in 2009 and 2010, respectively (Table 22).

**Consumption is expected to increase temporarily, but this is expected to slow down eventually due to negative wealth and income effects.** While the poor have been hit disproportionately by the floods, upper- and middle-class households have also been affected, having lost cars and expensive household goods. Most of these households do not carry flood insurance or are not covered against “acts of god.”<sup>29</sup> In the short term, spending on basic necessities lost during the typhoons should have an immediate positive impact on growth. However, middle-class families who suffered severe damage to properties and other assets will probably curtail spending, given the negative wealth shock and the need to replenish savings used to replace damaged household assets. Income losses of farmers due to damaged crops, for example, are expected to affect revenues in the trade sector. For those who did not lose their belongings in the floods but whose real properties are located in the most affected cities, the reduction in the value of their houses (20 to 30 percent in some cases) will also contribute to the negative wealth effect on consumption.

**Pepeng and especially Ondoy may have encouraged higher remittance inflows in October 2009.** Recent research shows that remittances in the Philippines act as insurance for households affected by natural disasters.<sup>30</sup> Ondoy affected many middle- and upper-middle class households, who are the main beneficiaries of overseas remittances (Figure 9). It also affected metropolitan Manila, where most overseas remittances are remitted (Figure 10). The findings of Yang and Choi (2007) indicate that on average, 60 percent of household income lost through natural disasters is replaced by remittances, which means remittances

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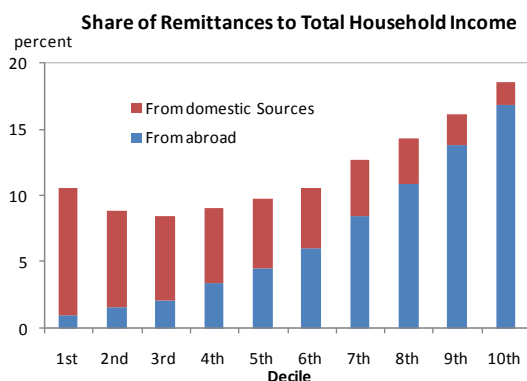
<sup>28</sup> It is also assumed that 50 percent of inventory losses can be recovered in 2009 and are financed by readily available funds.

<sup>29</sup> The Insurance Association estimated that only about 12 percent of the losses and damages were insured.

<sup>30</sup> Yang, Dean, and HwaJung Choi (2007), “Are Remittances Insurance? Evidence from Rainfall Shocks in the Philippines,” *World Bank Economic Review*, Vol. 21(2), pp. 219-48.

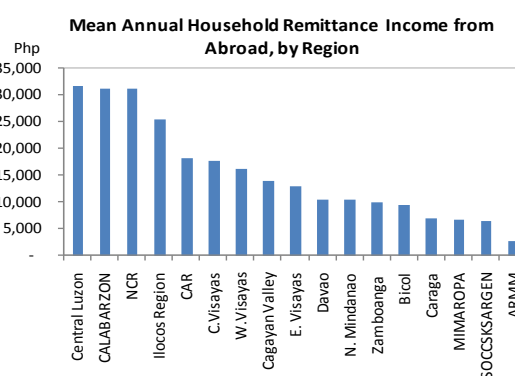
might increase by another US\$ 327 million (60 percent of total income losses in 2009), pushing the projected dollar remittance growth from 4.0 to 6.0 percent this year. Despite the strong upside potential for remittances in the remaining months of 2009, the real peso value of remittances is expected to slow down moderately, as inflation has moderated and the exchange rate has appreciated. However, the impact of remittances on private consumption is not expected to decrease, since (i) the economy is recovering, so precautionary savings motives are reduced, and (ii) the expected temporary surge in remittances is likely to be directed toward immediate reconstruction and rehabilitation needs.

**Figure 9**



Source: FIES 2006, National Statistics Office

**Figure 10**

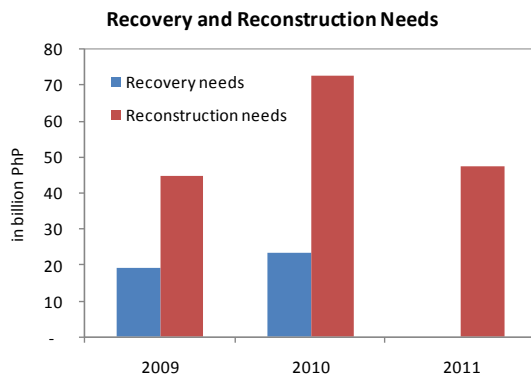


Source: FIES 2006, National Statistics Office

**Affected companies need additional financing of Php 43 billion so as to obtain adequate working capital to operate.** Since insurance coverage is relatively modest, recovering the losses will prove difficult for most companies. Most of the needs are concentrated in agriculture and trade industries. For SMEs, this financing need is more urgent, particularly for exporting SMEs since they risk losing market share. Quick access to additional financing is critical for companies to salvage the few opportunities that might still exist ahead of the Christmas season.

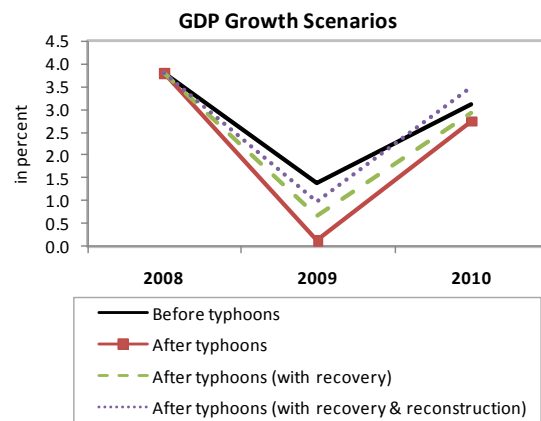
**The economy needs about Php 160 billion to restore damaged assets and reduced capacity, which would boost real GDP growth to 1.0 and 3.5 percent in 2009 and 2010, respectively** (Figures 11 and 12). This amount is needed to restore damaged buildings and damaged machinery and equipment, which are crucial for avoiding production bottlenecks in the medium term, notwithstanding the current slack in capacity utilization due to the global recession. For some capital-intensive sectors, restoring capacity may be even more urgent because production cannot start until these are addressed. In agriculture, one implication of not rebuilding is less food production, which would have important consequences for inflation, food security, and rural poverty. A strong reconstruction effort may temporarily boost imports of construction materials and machineries by Php 10 billion in 2009 and Php 16 billion in 2010, widening the trade deficit in the short run. Given the projected increase in remittances of Php 16 billion in 2009, however, the current account is expected to remain in surplus.

**Figure 11**



Source: National Statistics Office

**Figure 12**



Source: National Statistics Office

**Policy decisions will be critical to the net impact of the recovery and reconstruction program on public finances.** On the revenue side, as the projected recovery and reconstruction efforts will boost economic activity significantly (Table 22), tax collection should also improve. However, to the extent that tax relief measures are adopted, the buoyancy of tax collection will be less than otherwise.<sup>31</sup> In addition, tax deductibility of damages will be spread over several fiscal years, and a large stock of VAT input refunds are expected to be owed to businesses that have lost inventories. This will require reinforced tax policy measures and tax administration efforts to shore up revenues. On the expenditure side, the reconstruction and recovery plan will call for increased public spending on implementation both from the national and local governments. It will be critical to prioritize and sequence spending plans carefully given the limited fiscal space.

## B. Poverty Impacts

### *Pre-Disaster Situation*

**An estimated one-third of the country's population was considered poor as of 2006.**<sup>32</sup> The World Bank also estimates that about 19.7 million Filipinos or 22.6 percent of the population live below the international poverty benchmark of US\$1.25 per day. Moreover, while poverty rates are highest in the Mindanao regions, Luzon has the highest concentration of the poor (about 12 million) due to much higher population density. About 8 million poor people are located in the six regions that were most affected by tropical storm Ondoy and typhoon Pepeng.

### *Post-Disaster Impacts*

**As a result of the losses in incomes due to lower economic activity, the number of poor people in the Philippines is estimated to increase by 480,000 in 2009** (Table 23). It is estimated that the disasters resulted in about 172 million work-days lost and about Php 50.3

<sup>31</sup> These measures include tariff exemptions for goods imported for recovery and reconstruction purposes or financial incentives for accelerated tax payments.

<sup>32</sup> NSCB, Poverty Estimates 2008. The latest official poverty estimates from the government are based on the 2006 Family Income and Expenditures Survey (FIES).

billion worth of lost livelihoods in the affected areas.<sup>33</sup> This translates into a reduction in income of about Php 24,000 per affected household,<sup>34</sup> which is equivalent to 12 percent of the average household income in these regions. The impact on poverty at the national level is not large, increasing national poverty incidence by only 0.5 percentage points. Similarly, the effect on the poverty gap and severity of poverty are small, and the impact on income inequality is negligible. The estimated impact does not account for any increase in social protection or benefits from job creation during reconstruction activities.

**Table 23: Philippines: Impact of the Disasters on National Poverty (2009-2010)**<sup>35</sup>

	2009			2010		
	Benchmark (1)	Typhoon (2)	Impact (2)-(1)	Benchmark (1)	Typhoon (2)	Impact (2)-(1)
<b>Poverty</b>						
Headcount rate	32.4	32.9	0.5	32.4	33.0	0.66
Poverty gap	10.3	10.6	0.3	10.4	10.8	0.42
Severity of poverty	4.5	4.7	0.2	4.6	4.9	0.29
<b>Inequality</b>						
Gini	0.476	0.478	0.001	0.478	0.480	0.002

Note: Benchmark = assumes economy growth on trend; Typhoon = assumes disaster scenario.

Source: World Bank staff calculations.

**Although the national-level poverty impact of the disasters is not large, the most affected regions in Luzon could experience an increase of as much as 3 percentage points in the poverty rate in 2009.** The six regions in Luzon that were heavily affected by the disasters were Region I, Region II, Region III, Region IV-A, CAR, and NCR. The poverty impact of the disasters in these regions is presented in Figure 13. The increase in poverty is highest in Region I, where the poverty rate is estimated to increase by 2.8 percentage points in 2009. Although income losses were found to be highest in the NCR and Central Luzon in Peso terms,<sup>36</sup> the estimated impact of the disaster as a share of what would have been the region's GDP in 2009 is highest in Region I.<sup>37</sup> With less production, the ability of the region to generate enough employment and income is constrained, ultimately affecting household welfare. Since the impact of the disasters will continue to weigh on family incomes in 2010, poverty incidence in Region I is likely to increase by 3.5 percentage points in 2010.

<sup>33</sup> Refer to Impacts on Employment and Livelihoods section for details of estimate.

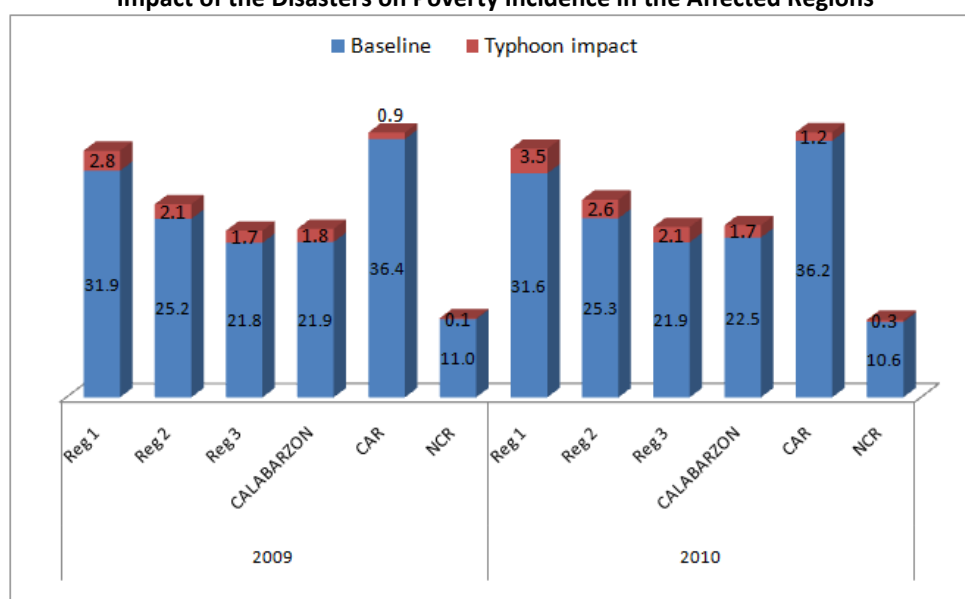
<sup>34</sup> Total number of families affected by both typhoons was 1.94 million. Refer to Section 1 on The Disaster.

<sup>35</sup> The methodology for estimating the poverty impacts of Ondoy and Pepeng involves linking macroeconomic indicators to household data on employment and incomes. In the absence of survey data that measures income or consumption levels during a disaster, a model linking macro-economic projections with pre-crisis household data can provide rough projections of the welfare impacts of Ondoy and Pepeng. The approach requires data on the following macro indicators from the base year up to the projection years: sector output, population, employment, prices, and remittances. The following micro-level data for the same years are also required: labor and non-labor income, labor force status, and basic job characteristics. Models to predict employment status and earnings are developed using individual and job characteristics based on the 2006 FIES and the 2006 Labor Force Survey (LFS). These models are then used to generate the projected changes in household incomes in the outer years (2009 and 2010) based on projected changes in output. Regional poverty estimates were computed applying the same methodology on regional data.

<sup>36</sup> Refer to Impacts on Employment and Livelihoods section.

<sup>37</sup> Refer to Macroeconomic Impacts section.

**Figure 13**  
**Impact of the Disasters on Poverty Incidence in the Affected Regions**



Source: World Bank staff calculations based on macro projections and LFS and FIES 2006.

**Recent surveys indicate the worsening of welfare for people living in Luzon, especially in the NCR.** The massive flooding and landslides caused by Ondoy and Pepeng shattered many families in terms of lost lives and affected livelihoods. The survey on self-rated poverty in September 2009 was up by 3 percentage points from 50 percent in June 2009, with the highest increase noted in Luzon at 7 percentage points, compared to an increase of 4 percentage points in Visayas and a decline of 5 percentage points in Mindanao (Social Weather Stations, November 2009). Food-poverty among Filipino families also increased from 39 percent in June to 41 percent in September. In addition, a special Social Weather Stations survey conducted at the end of October found that hunger rose from 17.5 percent just before Ondoy and Pepeng to 18.9 percent following the disasters.<sup>38</sup>

### C. Impacts on Employment and Livelihoods

#### *Pre-Disaster Situation*

**Unemployment and underemployment in the Philippine labor market are high, averaging 7.4 percent,**<sup>39</sup> which is higher than most countries in East Asia (3.8 percent) and Southeast Asia (5.7 percent). The working-age population grew at an annual rate of 2.7 percent between 2001 and 2007, but employment generation barely kept pace, increasing by only 2.0 percent annually.<sup>40</sup> Youth account for more than half of the unemployed, with a high degree of unemployment even among the college-educated. Internal migration from rural to

<sup>38</sup> For more details on the survey, see Social Weather Stations, SWS Media Release, 23 November 2009.

<sup>39</sup> Estimates from independent research groups show that unemployment is higher and estimated at above 20 percent in 2008 (Pulse Asia, 2009; Social Weather Stations, 2009a). Their definition of unemployment differs from the government's official definition in two respects: (i) unemployment is measured based on the adult labor force population, i.e., those who are at least 18 years old, versus the 15 years old and above used in government estimates; and (ii) it does not use the "availability for work" criterion used in the government's definition. For more details, see National Statistics Office ([www.census.gov.ph](http://www.census.gov.ph)), Pulse Asia (2009), and Social Weather Stations ([www.sws.org.ph](http://www.sws.org.ph)).

<sup>40</sup> Data from various rounds of the Labor Force Survey.

urban areas compounds the problem of finding jobs in densely populated areas such as metropolitan Manila, resulting in a high concentration of informal jobs in these areas.

**The services sector accounts for a large share of employment, including informal employment.** Of the 35 million Filipinos who are employed, nearly half are in the services sector and one-third are in agriculture.<sup>41</sup> Industry and services are concentrated mainly in the NCR and Region IV-A (region around NCR), which together account for about half of GDP from the industry and services sectors. Informal workers account for a third of total employment and are split almost evenly between agriculture (48 percent) and the service sector (45 percent).

**Filipino households are highly dependent on wage income, which comprises 45 percent of an average household's resources.** This dependency on wages reflects the extent of household vulnerability to falling incomes in the face of crisis. Real wages have not been able to keep up with general price increases since 2001. Between 2003 and 2006, average real family income declined by 3.7 percent. Remittances are a source of financial support received by three out of five households (a quarter of them under the poverty line) and account for 11.5 percent (abroad) and 3.3 percent (in-country) of total household income.

**The recent food price crisis and the global economic crisis further depressed the incomes of households by reducing earnings and employment.** Remittances from family members (abroad or in-country) reportedly declined as employment opportunities diminished. Urban areas reported higher increases in unemployment and job losses. The NCR, Region IV-A, and Region III suffered more than the other regions since they account for about half (46 percent) of employment in the industry and services sectors.

### ***Post-Disaster Impacts***

**The assessment of losses estimates the impact of the disasters on employment and income of the affected persons and households involved in productive activities.** It is calculated on the basis of damage and losses estimated in each of the productive sectors (agriculture and enterprises) using a standard methodology.

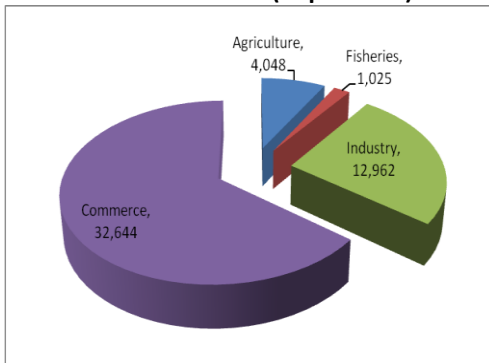
**About 170 million workdays, equivalent to about 664,000 one-year jobs, were lost due to the impacts of the disasters on livelihoods.** This represents about 4 percent of total employment prior to the disasters in the six affected regions in Luzon. Total income lost due to the disasters amounted to Php 50.3 billion, which particularly affected informal workers with family-based livelihoods. Results of interviews with microfinance institutions around Luzon confirm huge livelihood income losses in their localities: the Microfinance Council of the Philippines reported that 164,588 clients across 20 microfinance institutions (MFIs) were affected by the disasters.

**Across the sectors, commerce sustained the biggest losses in employment and incomes in 2009** (Figures 14 and 15). Commerce represents about 65 percent of total lost income, amounting to Php 32.6 billion. The temporary closedown of some firms and home-based enterprises due to flooding and damage to property and equipment reduced production in the wholesale and retail trade subsector by about 4 percent of its gross value added in 2009. The manufacturing industry incurred the second biggest losses in incomes and employment, losing about 150,000 work-years due to the disaster and about Php 13.0 billion in incomes.

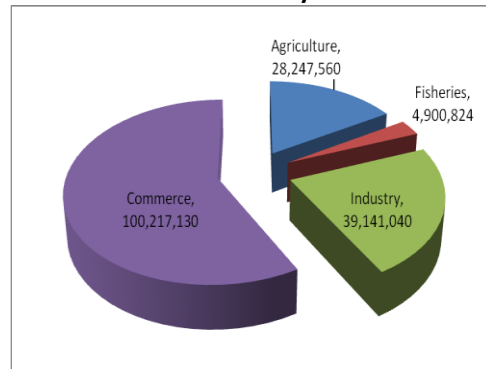
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<sup>41</sup> NSO, 2009 Labor Force Survey Results.

**Figure 14**  
Sector share to total losses in Income (Php million)



**Figure 15**  
Sector share to total losses in workdays

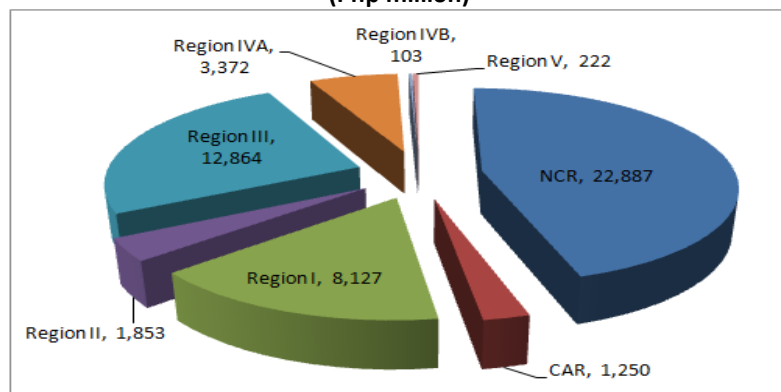


Source: World Bank staff estimates.

**Income losses in the agriculture sector amounted to about Php 3.7 million**, equivalent to about 7 percent of total income losses and 11 percent of workers' lost incomes in the commercial sector. Average wages in agriculture in the affected regions are lower than the legislated minimum wage in these areas by 20-40 percent. Income losses in the agriculture sector in 2009 resulted from flooded and silted farms (part of which will recover in the next season and part of which are now likely to be permanently unproductive), fish ponds that overflowed, and livestock that drowned in the flood. If left unaddressed, the impact of damages to agricultural lands is expected to cause additional employment and income losses in the sector in 2010.

**In terms of regional impacts, the biggest loss in incomes has been concentrated in the NCR and Region III.** Total income losses were estimated at Php 22.9 billion for the NCR and Php 12.8 billion for Region III (Figure 16). These two regions command 33 percent of national output and about 28 percent of total employment in wholesale and retail trade. Together, they also account for about half of affected wholesale and retail trade establishments, most of which are workers in home-based and small or micro enterprises. This suggests that workers in the trade-related sectors in these two regions suffered the biggest livelihoods losses.

**Figure 16: Regional Share to Total Income Losses (Php million)**



Source: World Bank staff estimates.

**Informal sector workers have been affected the most.** Workers and micro-employers in the informal sector are the most vulnerable to shocks from natural disasters, especially small

traders and vendors, food-related producers, service providers, self-employed agricultural workers, and those relying on survival livelihood activities. The post-disaster socio-economic situation further increased their vulnerability in terms of limited opportunities. In commerce, which incurred the biggest income losses, about 60 percent are self-employed.

#### **D. Social Impacts and Vulnerable Groups**

##### ***Socio-Economic Impacts***

**A social impacts assessment was carried out using qualitative research methods** (i.e. participant observation, focus group discussions, and in-depth interviews). Research in metropolitan Manila was conducted by the Institute of Philippine Culture, with the support of civil society organizations active in the barangays visited. Research in other affected areas of Luzon<sup>42</sup> was carried out by a joint Department of Social Welfare and Development (DSWD), World Bank, and UN team.<sup>43</sup>

**The social impact assessment found that tropical storm Ondoy and typhoon Pepeng severely disrupted livelihoods, particularly for farmers and agricultural laborers.** A near total loss of crops and livestock was reported across all sites visited, and land has become temporarily—and in some cases, permanently—unusable. In the coastal areas visited, yields from fishing dropped significantly. More diversified livelihood strategies in urban areas indicate a greater potential for households to recover, particularly in cases where families have varied sources of income. The most severely affected households in urban areas were those that relied on a single home-based business, since both equipment and inventory were often lost. Government assistance to re-establish these households and micro-businesses is currently very limited.

**The main coping strategy adopted after the disasters was to take on temporary work.** However, this is particularly challenging in rural areas which have few opportunities to earn off-farm income. Migration to another barangay, to Manila, or abroad was very rarely considered. Sources of credit regularly used prior to the storms often became unavailable. Where households are able to borrow, they frequently use loans to cover basic expenditures and to pay back other loans. Households have had to reduce expenses further by cutting down on food, and there are reports of children being taken out of school and of older children working. With few assets and no land to sell, many of the most vulnerable households fear they may not be able to recover.

##### ***Impacts on Social Relations and Cohesion***

**The family has been the main source of support.** In the majority of cases, the immediate family remained together, with no instances reported of dependents being sent to stay with relatives. Families played a key role in providing cash, accommodation, and food. The

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<sup>42</sup> In addition, the findings include some preliminary information collected by various IASC Clusters during their assessments.

<sup>43</sup> The municipalities and Barangays visited for metropolitan Manila were: Kasiglahan Village 1 (San Jose, Montalban), Doña Imelda (Quezon City), Camacho (Nangka) and Marikina Heights (Marikina City), Maybunga (Pasig City), Southville, Caingin (Sta Rosa City) and Malaban, Santa Cruz (Laguna). In Northern and Southern Luzon they were: Botolan, (Zambales), Rosales and San Fabian (Pangasinan), Santa (Ilocos Sur), Naguillan (La Union), Baliwag, Bustos, San Ildefonso (Bulacan), Cabanatuan City and Palayan City (Nueva Ecija), Puguis, La Trinidad (Benguet).

financial support provided was used for basic household expenditures but was insufficient to re-establish livelihoods. Remittances from overseas are not a viable coping strategy for the poor and vulnerable households in the community.

**Ondoy and Pepeng have not had a significant impact on intra-household relations or social cohesion.** Both gender and intergenerational roles remain unchanged. While women are taking on additional work outside the home, there is no evidence that gender roles within the household are changing. This is equally true of rural areas, where women often seem to have more temporary work opportunities than men. For example, where women are now working away from home (as domestic workers) child-care responsibilities are handed over to older siblings or to female neighbors, even though the fathers might not currently have a job. Women continue to be the ones taking out and managing loans from informal lenders and micro-finance institutions. Where support networks (female family members, neighbors for example) are not available this could result in an increased work-load for women. During the rescue and immediate aftermath of the floods, men tended to take more risks, staying behind to secure the house and returning sooner to determine damage and start repairs. Women and children were evacuated first. They were also the last to return home from temporary accommodation centers, which could place them at increased risk.<sup>44</sup>

**There were relatively few instances of collaborative behavior in rural areas, in contrast to the situation in urban areas.** The exception was indigenous communities where resources were pooled to carry out rituals to re-establish a sense of normalcy after the disaster. Formal homeowners and neighborhood associations in metropolitan Manila played an important role in the distribution of relief goods. There were no significant reports of increased insecurity in the areas visited.

### ***Governance Impacts***

**Previous experience of moderate flooding resulted in households being reluctant to leave despite warnings in some areas, and the readiness of local governments to respond to the flooding varied significantly.** In some areas, the respective roles of the municipality and the barangay were clearly defined, and emergency response plans were followed effectively. Overall, however, emergency preparedness plans were not implemented systematically. Relief was provided in all areas visited but with variable quality and promptness, which was linked to the fact that relief was provided through a number of sources with no minimum standards adhered to across sites. While there were no reports of groups excluded from assistance, a number of needs (including non-food items, hygiene products, shelter as well as basic health services, education, water and sanitation, and psycho-social support) were unmet. In most sites visited, people expressed general satisfaction with how relief goods were distributed. However, in three sites, there were concerns expressed about the undue involvement of elected local officials in the distribution of relief.

**Communities in the LGUs visited reported that they had not yet been consulted on their needs for relocation and restoration of livelihoods.** This may be the result of LGUs still having to deal with the immediate relief efforts. Consequently, there was a sense of

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<sup>44</sup> There were no reports of gender-based violence or violence/abuse of children in the sites visited during the PDNA exercise. The IASC Protection Cluster assessment has collected some reports of incidents of gender-based violence in evacuation centers, relocation sites and areas at risk.

confusion among communities as they had little information about specific plans for relocation and other recovery measures. Responses to the idea of relocation were mixed, with communities in urban areas, those highly dependent on their place of residence for income, and indigenous groups being the most reluctant to move. Rural communities were more open to relocation. All stressed the importance of being able to pursue viable livelihood strategies in any new area of residence. Capital was consistently considered to be the key input needed to resume income-generating activities.

## IV. Recovery and Reconstruction Strategy and Program

### A. Recovery and Reconstruction Strategy

**The calamities wrought by tropical storm Ondoy and typhoon Pepeng offer an important window of opportunity to address difficult, long-standing development issues.** The challenge now is to make full use of this opportunity. If the Philippines rises to the challenge, it will facilitate modernization of the country overall and metropolitan Manila in particular, with improved living conditions for its population. If it does not rise to the challenge, the country will be increasingly at risk from the impacts of not just typhoons but also earthquakes, volcanoes, and other natural disasters, as well as the negative impacts of possible future climate change.

**Disaster-related calamities will likely recur if adequate measures are not taken to reduce risk.** Pepeng was not an especially unusual event; such typhoons hit the Philippines every year. Ondoy was unusual in that the resulting flood volumes were statistically associated with a historical occurrence of once in 180 years, but changes in the watershed in modern times have modified rainfall-runoff relationships, so the country must prepare itself for floods of this magnitude to happen more frequently in the future. Metropolitan Manila's system of drainage was originally designed to withstand events of a 30-year return period. This may have been economically optimal a few decades ago, but given the economic development and concentration of activity in metropolitan Manila today, this level of protection is no longer sufficient. Furthermore, given encroachment, siltation, large volumes of solid waste, and insufficient maintenance of the flood management infrastructure, the actual capacity of the system is now much lower than it was when originally designed.

**Building back better is essential, but it is not enough.** While the flooding caused by the two typhoons could not have been prevented, the extent of its impact could have been mitigated. Reducing flood impacts in the future requires attention to important aspects of governance, such as land use planning, housing, water management, environmental protection, and disaster risk reduction. Indeed, the factors that resulted in the impacts from Ondoy and Pepeng are among the same factors that lie behind a number of major development challenges, including the congestion of metropolitan Manila, the proliferation of slums, and the heavily polluted environment in urban areas; and the weak performance of agribusiness in rural areas.

**The poor and vulnerable were inordinately affected by Ondoy and Pepeng, and efforts to help restore their housing and their livelihoods are urgently needed.** It is the poor who have fewest land and housing alternatives who settle in at-risk areas, such as floodplains, unstable slopes, near the "crush zones" of the faultlines, and river embankments. Furthermore, the effects of the two disasters are likely to propel those living just above the poverty line back into poverty. The PDNA estimates that the incidence of poverty in the most affected areas of Luzon will have increased by as much as 3 percentage points as a result of Ondoy and Pepeng. The livelihoods of the poor and vulnerable have been severely disrupted, and their ability to recover is hampered by limited access to credit and often by pre-existing debt, insufficient short-term support through public assistance programs, and few medium- to long-term opportunities for recovery. They need an injection of capital and access to livelihoods and employment opportunities to be able to recover. Better and safer housing that allow people to resume their livelihoods will provide the best opportunity for rapid and sustainable recovery for the poor.

## **Strategic Priorities**

**An effective, results-oriented recovery and reconstruction program is required to address the needs of those most affected by the Ondoy and Pepeng typhoons.** The preparation of a recovery and reconstruction program will be guided by a strategy that focuses on five priority issues: (i) restoration of agricultural, fisheries, and livestock production; (ii) flood management; (iii) housing for low-income families; (iv) LGU governance; and, (v) disaster risk management.

**Rural Production: Immediate restoration of rural livelihoods before the end of 2009 is necessary to avoid production losses during the dry season.** First, rapid repairs to and cleaning of irrigation systems and fields are needed urgently. Without water, major crops cannot be produced during the dry season. While some damage to irrigation systems will require more work than is feasible in this timeframe, many systems can be restored quickly. In addition, many fields have been covered with gravel, silt, and/or sand, and production will not be possible if they are not cleared. Second, farmers need inputs such as seed and fertilizer. Third, farmers need finance to cover their consumption and investment needs until the next harvest. A system of vouchers to poor farmers whom have been directly affected may be considered as an efficient, transparent, non-distorting, and flexible alternative to the usual input subsidy programs that tend to benefit the non-poor more.

**Flood Management: Given the vulnerability of metropolitan Manila to flooding, additional protection is critical and will require institutional reform, comprehensive planning, and investment in both restoration and new infrastructure.** The imperative policy choice is to determine an acceptable level of risk and protection, as this will determine the economic feasibility of subsequent engineering and financing choices. In the medium term, the existing flood management and drainage system should be restored to a fully operational condition, accompanied by funding for regular maintenance and the establishment of real-time monitoring and early warning systems. A new institutional structure, building on the existing framework—with responsibility for managing floods and drainage in the entire catchment area of metropolitan Manila including Laguna de Bay, and with the authority and means to enforce agreed policies and plans—would greatly facilitate future flood management.<sup>45</sup> A risk assessment study for the entire basin is needed to update the existing master plan and to prepare a comprehensive development program. Longer term, as part of the development program, additional investment will be needed to retain water upstream, facilitate the flow of water through the system, and maintain Laguna de Bay at a pre-determined level as informed by the risk assessment. This would be expected to include a new floodway to link Laguna de Bay to Manila Bay.

**Housing: The vast majority of damage to the housing stock was concentrated in the informal sector which serves mainly low-income families, so building back better means providing better alternatives for informal settlers.** The issue of informal housing goes well beyond the impact of Ondoy and Pepeng: about half the population of metropolitan Manila lives in informal settlements, and prior to the calamities, there was an estimated backlog of 3.7 million households in need of formal housing nationwide. Although addressing the needs of families living in the estimated 220,000 houses damaged and destroyed by the storms would still only meet a small part of the overall housing needs, it would provide an important way forward to addressing the much broader needs of informal settlers. The resettlement process will need to be based on consultation with affected communities and

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<sup>45</sup> The regional water authorities (*waterschappen*) of the Netherlands that have overall responsibility for the control and management of water catchment areas could serve as an effective model.

take into account the need to restore their livelihoods. It would not be feasible to resettle all affected households in the short run. Those people who have lost their homes must be urgently provided with short-term or transitional housing options near their sources of livelihood.

**Resettlement of flood victims in metropolitan Manila offers an opportunity to develop new, more appropriate ways of developing the area.** Cities such as Singapore and São Paulo that have successfully addressed the issue of slum upgrading have done so through more intensive use of urban land. Given the cost of land in metropolitan Manila and the need to keep people close to their sources of livelihoods, spreading upward (verticalization) in more compact settlements (densification) is a logical solution. The private sector could be tapped to promote such development, thereby providing “win-win” solutions where the poor pay less and eventually get title to their housing; developers make a profit, and the quality of urban life is improved for all. Making this feasible requires the support of the National Housing Authority, national government agencies, and LGUs to facilitate greater access to land and services, as well as subsidization of start-up capital for the poor.

**Both flood management and resettlement/slum upgrading require effective land management.** To improve the effectiveness of land management the proposed new institutional structure for managing water resources in metropolitan Manila would need to have the authority to impose restrictions on land management for LGUs covered by its authority, and to ensure that LGU land use plans reflects these restrictions. Beyond flood management, LGU urban planning should also include a monitoring and sanction system, and a public strategy for facilitating access to land for the poorer segment of the population.

**Disaster Risk Management (DRM): The existing DRM system needs to become proactive, coherent, and effective.** The quality of and access to scientific data for predicting and forecasting disasters requires urgent improvement. Once adequate information is available, the mainstreaming of DRM into local planning needs to be significantly expanded, and critical service infrastructure (e.g., water, power, hospitals) should be upgraded to withstand an acceptable level of risk. These measures need to be coupled with better access to disaster risk financing.

**A strategy on disaster risk financing needs to shift from risk retention to risk transfer, hence limiting the public share of funding with higher involvement of private sources.** From the whole spectrum of financing options already analyzed under previous activities, contingency financing has been selected as the most appropriate to manage moderate risks. Two complementary mechanisms are warranted. The first is a standby credit to be drawn upon if the national government were to declare a calamity, providing close to immediate liquidity. The second is catastrophe pooling, as proposed by the League of Cities. Under this arrangement, LGUs would pool their calamity funds so that when disaster strikes, more resources would be available to the LGU to address urgent needs. At the same time, the role of private sector insurance provision should be increased.

**Local Governance: LGUs should have a key role in implementing the recovery and reconstruction program and future measures to reduce disaster risk, through a comprehensive DRM framework that coordinates and integrates all levels of government.** A two-pronged post-disaster strategy could be followed. First, targeted financial assistance is needed to support the rapid restoration of LGU operations and services to pre-disaster levels. In situations where ODA would be provided to support post-disaster recovery and reconstruction in affected LGUs, the normal national government/LGU cost-sharing rules that require a minimum of 50 percent contribution from LGUs are likely to place an

unreasonable burden on affected LGUs. A temporary relaxation of the cost-sharing rule for a defined period of time would help LGUs jump-start the recovery and reconstruction process. Second, technical assistance should be provided to LGUs in disaster-prone areas to implement disaster mitigation measures to protect their assets and operations in the future.

**Correcting the failures that amplified the impacts of Ondoy and Pepeng will require a new level of commitment and collaboration but is achievable.** The LGUs of metropolitan Manila will need to work together better. The national government will need to support LGUs by devolving resources as well as responsibility, putting into practice the principle of subsidiarity more consistently. At the same time, government, the private sector, and civil society will need to work together, adopting more participatory approaches that bring stakeholders together to define shared vision for development.

### ***Financing***

**Financing needs are enormous, but the cost of doing nothing would be even larger.** The PDNA estimates the cost of recovery and reconstruction at US\$ 4.423 billion. Given the very limited capacity of the flood management system in metropolitan Manila, and the possibility of increased frequency and intensity of floods and typhoons, such costs can be expected to recur more frequently unless urgent efforts are made to mitigate the effects of future disasters.

**Financing will come from a number of sources.** The Government will invest its own resources. It is also soliciting financial support from international development partners. Funding can be mobilized through a number of modalities: borrowing from multilateral and bilateral sources, including on accelerated emergency terms; reallocation of funds under ongoing donor-supported projects and programs; and, through additional financing arrangements. In many cases (particularly in metropolitan Manila), LGUs themselves also have accumulated resources that should be drawn upon to support recovery and reconstruction in their communities. The private sector will also contribute through savings and borrowing. Finally, “sweat equity” through community contributions will also play a significant role at the local level, particularly in the provision of better housing.

### **B. Recovery and Reconstruction Program**

The PDNA presents a set of post-disaster activities—the recovery and reconstruction program—to be undertaken to achieve two main goals:

- *Recovery* of all economic activities at the macroeconomic, sectoral and personal/household levels
- *Reconstruction* of destroyed or damaged physical assets, using pre-defined post-disaster standards

Financial needs for the recovery and reconstruction program have been estimated based on the of damage and loss assessment caused by the typhoons. These needs are expressed in a disaggregated manner taking into consideration breakdowns by sector of economic activity, regional needs, and groupings of the affected population (e.g., farmers, urban poor).

To ensure full recovery from the negative impact of the disaster, program interventions and their corresponding financial needs are presented. Financial needs for reconstruction are defined on the basis of the estimated value of damage while adopting a strategy that seeks to introduce disaster-resilient standards, depending on availability of funding. A “building-

back-better” strategy requires quality and technological improvement, relocation of selected activities to safer areas, improved design and construction standards, structural retrofitting and adequate flood-control measures and schemes.

**Table 24: Summary Short- and-Medium-Term Activities for the Recovery and Reconstruction Program**

Sector	Activity	Public/ Private Sector	Needs to Dec. 2010 (Php million)	Needs to Dec. 2012 (Php million)
<b>Productive Sectors</b>				
Agriculture	Recovery and reconstruction (crops, livestock, forestry and fisheries)	Public & Private	13,704	2,808
Enterprises	Support to manufacturing	Private	11,104	
	Support to wholesale and retail trade	Private	54,541	
	Support to the tourism sector	Private	1,234	
<b>Social Sectors</b>				
Housing	Establish a transitional housing program	Public & Private	4,200	1,800
	Undertake a housing repair and reconstruction initiative	Public & Private	19,800	43,600
	Implement a sustainable housing programme for hazard areas	Public & Private	1,100	4,500
	Build capacity to implement large scale urban reconstruction programs	Public & Private	200	200
	Establish the information and policy framework for urban upgrading	Public & Private	131	196
Education	Repair and rehabilitate learning facilities, materials and equipment	Public & Private	1,200	1,800
	Replace damaged learning and educational materials	Public & Private	53	
	Support continuing education in disaster affected areas (including psycho-social support)	Public	314	
	Support disaster preparedness in the education sector	Public	50	0
Health	Repair and rehabilitate public health facilities	Public & Private	1,865	840
	Access to soft loans by private health facilities	Private	1,650	840
Cultural Heritage	Restoration of assets and vulnerability reduction	Public	183	168
<b>Infrastructure</b>				

Electricity	Restoration of power supply and reconstruction of damaged infrastructure	Public	713	
Water Supply and Sanitation	Restore potable, safe and reliable water supply to disaster affected and resettlement areas	Public	6	43
	Restore and enhance waste-water treatment and solid waste collection	Public	19	94
Flood Control, Drainage and Dam Management	Return flood management and drainage systems to at least original design conditions	Public		8,000
Transport	Restore damaged roads and bridges	Public	1,955	9,776
Telecommunication	No reconstruction needs	Private		
<b>Cross-Sectoral</b>				
Local Government	Restore local government operations to pre-disaster levels	Public	263	38
	Improve local government capacity for disaster risk mitigation	Public	10	
Social Protection	Provide most affected households with re-establishment grants (cash transfers)	Public	1,100.0	
	Support for restoration of livelihoods and relocation of most affected communities (participatory process)	Public	485.8	
	Build capacity building of GOP Relief and Rehabilitation Committee in emergency response	Public	60.8	100.0
	Monitoring disaster response and take corrective action as needed	Public	2.7	19.1
	Restoration of livelihoods through labor intense schemes and support for micro-entrepreneurs and job seekers	Public & Private	6,147.6	1,800.1
	Investment in socioeconomic and productive infrastructure	Public	940.0	5,640.0
	Policy & institutional initiatives to facilitate livelihood recovery	Public	230.3	225.6
	Build capacity of local authorities for livelihood recovery	Public	52.0	32.9
Finance	Distribute grants to small borrowers	Public	57	
	Disburse loans to small and medium enterprises in affected areas	Private	25	
	Establish Local government Catastrophe Insurance Pool scheme	Public	60	
Disaster Risk Management and Reduction	Support the establishment of an improved institutional framework for DRMR	Public	100	245
	Build capacity of relevant authorities for DRMR interventions	Public	855	590

**The recovery and reconstruction program operationalizes the strategy.** More than one-third (36.4 percent) of the total recovery and reconstruction program is for the housing

sector, reflecting the overriding need to tackle this complex issue, especially in metropolitan Manila. This is followed by investments in trade and manufacturing (primarily a private sector undertaking), transport infrastructure, flood management and control (public sector), and agriculture (a mix of public and private sector). Funding for close to two-thirds (60 percent) of the overall recovery and reconstruction program would need to be mobilized for the activities to be carried out during the period up to December 2010.

**The PDNA has also highlighted the need to develop longer-term solutions to address priority policy issues.** Development solutions for the major policy issues highlighted in the PDNA—housing, flood control, rural production, local governance, and disaster risk reduction—require concerted efforts over many years, well beyond the period covered by the PDNA. Addressing the housing backlog, identifying economically viable and socially acceptable solutions to the flood control challenge, reducing the reliance of the rural poor on volatile agricultural incomes, measures to prevent landslides, and establishing systems to reduce disaster risk all require longer-term reform agendas linked to sustainable investment programs. Nevertheless, action in these key sectors can and should be initiated now to keep the challenges from becoming insurmountable in the future. Table 24 provides an overview of the short- and medium-term interventions proposed in key sectors.

### **C. Guiding Principles for Implementation**

**A set of guiding principles will govern implementation of the recovery and reconstruction program.** The purpose of these principles is to enhance the effectiveness of recovery and reconstruction efforts, increase transparency and accountability, and ensure that resources are translated into results on the ground. The principles seek to guide a reconstruction program that will build back stronger and more resilient communities. The principles presented below draw on lessons learned from recovery and reconstruction programs in other countries.

#### ***A transparent, accountable, and results-based recovery and reconstruction program***

- Comprehensive and straightforward systems for monitoring activities, tracking funds, and evaluating projects and programs will be implemented by all stakeholders, including the provision of regular and transparent reporting against all funding sources.
- Results and progress will be tracked and reported to the public and development partners through regular meetings, the media, and a dedicated recovery and reconstruction website.
- All agencies involved in the recovery, reconstruction, and rehabilitation program will undertake appropriate audits of their activities and funds. The results will be made publicly available at regular intervals in both the print media and electronically.
- Independent complaints handling mechanisms should be integrated into major projects to enable greater accountability.

#### ***Community-based, people-centered, and equitable approaches***

- Community-based, participatory approaches that engage local communities in decision-making, implementation, and monitoring of activities will be adopted to

increase the quality and speed of reconstruction, align projects with real needs, and lower the risk of misuse of funds.

- Projects should maximize the use of local initiative, resources, and capacities. Planning and execution will be based on local knowledge, skills, materials, and methods, taking into account the need for affordable solutions.
- Although disasters increase the vulnerability of all, groups who are already disadvantaged may need special assistance and protection. Particular priority will be given to the poor, marginalized female-headed households, children, orphans, elderly, and people with disabilities.

The capacity of local communities will be built at every stage of the relief and recovery effort, with a focus on reducing vulnerability to future disasters.

### ***Reduction of future risks***

- With typhoons being a regular occurrence in the Philippines, integrated disaster risk management plans that take into consideration all likely significant hazards are needed to reduce the impact of future disasters. Improved construction and building standards and reconsideration of spatial planning and urban development strategies will be necessary to reduce the risk of further human loss and physical damage in the future.

### **D. Institutional, Implementation, and Coordination Arrangements**

**The Special National Public Reconstruction Commission (“the Reconstruction Commission”) will lead coordination of recovery and reconstruction, in collaboration with the Philippines Disaster Recovery Foundation.** Pursuant to Executive Order 838, the public commission is mandated to undertake studies on the causes of the recent disasters and measures to avoid any recurrence; set policies and plans; mobilize funds; oversee and monitor implementation; and, ensure high fiduciary standards. The Commission shall also act as a clearinghouse for assistance from all sources—government and non-government, national and international. A Cooperation Agreement between the two Commissions mandates collaboration and information sharing.

**The Commission’s main functions are coordination, monitoring, and ensuring accountability.** *Coordination* is necessary to avoid overlaps and address gaps, as the reconstruction work will be large and complex and will involve multiple players. *Monitoring* will ensure that funds match needs and that work is being undertaken in accordance with quality standards. As significant amounts of funding are likely to come from off-budget sources, the regular government monitoring system will not be sufficient and will be expanded and strengthened. Ensuring *accountability* to safeguard funds will be undertaken jointly with relevant government agencies such as the Commission on Audit and the Office of the Ombudsman.

**Implementation of the recovery and reconstruction program will be conducted primarily through existing channels.** Government line agencies and LGUs will have the main responsibility for implementation of the program for “on-budget” funds. “Off-budget” funds will be executed mostly by non-governmental organizations (NGOs), private sector groups, and community or people’s organizations.

**The government acknowledges international experience that demonstrates how decentralizing implementation can enhance recovery and reconstruction speed and alignment with local needs.** However, policy decisions will be required on the role of LGUs in implementation. Special procedures for channeling funds to LGUs would need to be considered if this option is pursued, including altering or eliminating national government/LGU cost-sharing arrangements, lowering interest rates on LGU borrowing facilities through GFIs, and faster disbursement procedures through the Municipal Development Fund Office (MDFO). The Commission will address this issue as a matter of priority.

**The Philippines Development Forum (PDF) will be the main mechanism for coordination between the government and development partners.** The PDF is the government's main mechanism for facilitating substantive policy dialogue among stakeholders on the country's development agenda. The government has proposed that a PDF working group be established for disaster risk management, so the existing government working group on disaster risk management, led by the National Disaster Coordinating Council (NDCC), will be brought under the PDF umbrella to ensure linkage of priorities in DRR to the broader policy agenda. The government will decide on the choice and appointment of a development partner as co-chair of the working group. In the first year, regular meetings will be held by the working group to present progress against program objectives, discuss implementation challenges, identify funding gaps, and mobilize additional resources as necessary. Depending on the theme and agenda of the main PDF event which is held usually every 12 months or so, the working group on DRR could be called upon to discuss its policy reform agenda and recommendations.

#### **E. Monitoring and Oversight Arrangements**

**Success of the recovery and reconstruction program will depend to a large extent on the strength of governance arrangements.** Robust systems to monitor progress and safeguard funds transparently will be established. Monitoring and oversight will operate on three main levels: (i) monitoring results, (ii) financial tracking, and (iii) audit and grievance handling.

##### ***Monitoring and reporting results***

- All agencies delivering recovery or reconstruction projects must establish simple and comprehensive systems to monitor activities. The Commission will produce comprehensive six-monthly reports on reconstruction progress. The progress reports will capture outputs and outcomes from government, non-government, private sector, and donor programs. The reports will be presented and discussed at meetings of the PDF working group on DRR as well as in special meetings of the PDF. The reports would be posted on a website which the government plans to create, which in turn would be linked to the main PDF website.
- Monitoring and evaluation efforts will be enhanced by utilizing existing mechanisms that draw on the renowned strength of the Philippines' civil society organizations. Civil society networks such as Procurement Watch and Road Watch could be engaged to monitor construction progress. Public-private monitoring arrangements, such as the Infrastructure Monitoring and Advisory Group (IMAG) that operates across Mindanao, could be expanded to cover flood-affected areas. Involving central line agencies, LGUs, project contractors, representatives from the business sector, NGOs, the media, and religious organizations, IMAGs monitor progress, address problems, and provide advice on major infrastructure projects.

### ***Financial tracking***

- Timely and consistent tracking of budgets/commitments and execution is critical for monitoring and assessing recovery and reconstruction progress. The government will establish a financial tracking system to monitor financial information. Covering *all* flows (government, NGOs, private sector, and donors), the system will transparently monitor progress and identify gaps through regular reports on budget commitments and execution by sector and by geographic location.
- Financial tracking should equip the government with the necessary information to manage the recovery and reconstruction program effectively. Data collection and analysis efforts will focus on tracking movement of funds against actual needs on the ground. Commitments, allocations, and disbursements will be tracked and reported quarterly so government and partners in the private sector and development community can manage funds and respond to gaps in the recovery and reconstruction program or other needs as they develop. This type of tracking will necessitate active data collection by the government from all agencies involved in reconstruction rather than passive receipt of data.
- Funds tracking will also be important for demonstrating transparency throughout the recovery and reconstruction process and will contribute to analysis of the Philippines' national disaster response management.

### ***Audit and grievance handling***

- Appropriate audits will be required of all agency activities related to the recovery and reconstruction program. The Commission of Audit (COA) will audit all government-implemented activities. All audits, whether conducted by COA or independent firms, will be made publicly available through the print media and electronically, including through a dedicated recovery and reconstruction website.
- An independent grievance redress mechanism will be established by the Reconstruction Commission to promote greater accountability. Local universities could be hired or an independent Supervisory Board established to monitor performance and handle public complaints. Autonomy of the grievance mechanism could be enhanced by assigning selection of members and funding to the Private Sector Reconstruction Commission. Major recovery and reconstruction activities should incorporate grievance handling mechanisms as a standard element of project design.

## V. Disaster Risk Reduction and Management<sup>46</sup>

### A. Introduction

**The geographical location of the Philippines in the tropics and in the so-called “ring of fire” makes it one of the most disaster-prone countries in the world.** It ranks in the top 10 countries worldwide with respect to incidence and human impacts of disasters,<sup>47</sup> and it is ranked among the top 20 countries likely to be most affected by climate change.<sup>48</sup> Up to 60 percent<sup>49</sup> of the total land area of the country is exposed to a range of hydro-meteorological and geo-physical hazards, and 23 provinces face significant risk to four or more hazards.<sup>50</sup> Settlement patterns make 74 percent of the population vulnerable to disasters<sup>51</sup>, with many areas subject to shocks from repeated severe weather events. On average, more than 1,000 people die in natural disasters each year, and the adverse effects of natural disasters also have significant implications for the country’s economic development. Over the period 1990 to 2008, the Philippines incurred an estimated annual average of Php 28 billion in direct damages which is equivalent to 0.7 percent of GDP per annum. This is on top of the losses in human lives and to the social and environmental assets of communities (NDCC, 2009). The full extent of the impact is greater as losses (particularly private sector losses) have not been fully accounted for in the past.

### B. Institutional Framework for Disaster Risk Management

**The legal and institutional framework for DRM is mostly oriented toward emergency response.** Over the past 20 years, there have been numerous efforts to update the DRM (Presidential Decree Nos. 1 of 1972 and 1566 of 1978), with a view to shifting the emphasis from a reactive to a proactive mode that focuses on disaster prevention, preparedness, and mitigation activities required to reduce risk. Although several efforts have been made to introduce administrative measures (DBM and DILG Joint Memorandum Circular No.2003-1) that enable the use of local calamity funds for disaster preparedness and mitigation activities, these have not yet led to significant change at the local level. In the absence of legal reforms, it will be difficult to encourage more widespread action. Therefore, priority should be placed on finalizing and passing the long-awaited DRM Law and aligning it with other relevant policy and legislative reforms (e.g., the proposed National Land Use Law).

**Recently impetus for enacting a DRM bill and other legislation has gained momentum, with recognition of the country’s increased exposure to climate change risk and heightened awareness created by the Ondoy and Pepeng disasters.** In October 2009, the

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<sup>46</sup> The UN-ISDR defines **DRM** as the systematic process of using administrative decisions, organizations, operational skills, and capacities to implement policies, strategies, and coping capacities of a society to lessen the impacts of disasters. Similarly, **DRR** is defined as a series of interconnected actions to minimize disaster vulnerability by avoiding (prevention) or limiting (mitigation and preparedness) the adverse effects of hazards within the broad context of sustainable development. These definitions are similar to that proposed by the Senate and House draft DRM bills.

<sup>47</sup> Center for Research on the Epidemiology of Disasters, 2009

<sup>48</sup> Dasgupta, Susmita, et. al., 2009. “Climate Change and the Future Impacts of Storm Surge Disasters in Developing Countries”, Center for Global Development.

<sup>49</sup> Philippine Country Risk Profile, GFDRR

<sup>50</sup> This is the result of the vulnerability screening undertaken under the technical assistance “Supporting Local Government Capacities to Manage Impacts of Natural Disasters in the Philippines” supported by GFDRR. The provinces were identified using historical data gathered from different government agencies such as PHIVOLCS, MGB, DA and DPWH among others.

<sup>51</sup> Op cit.

Philippine Climate Change Law (Republic Act 9729) was passed, and efforts to formalize the Philippine Strategic National Action Plan (SNAP) on DRR are underway. The SNAP is the Government-led multi-stakeholder response to implement the Hyogo Framework for Action (HFA).<sup>52</sup> It identifies the priority actions, ranging from establishing sound policies to concrete DRR programs and projects, aimed at building the country's resilience to natural disasters. The SNAP has strong local and national government support as it was developed through a consultative process with various interest groups. However, both the SNAP and the proposed law could benefit from the better integration of the climate change adaptation (CCA) and disaster preparedness agenda.

### **C. Needs Assessment for DRM/DRR**

**The Ondoy and Pepeng disasters highlighted weaknesses in the current DRM framework<sup>53</sup> that emphasize the need to accelerate mainstreaming of DRM into policies and programs at the local and national levels, and in different development sectors.** To this end, the following sections present actions for a sound policy and institutional framework to ensure the sustainability of the recovery and reconstruction program and to avoid repeated damages and losses by adopting “build back better” strategies that emphasize the importance of prevention and mitigation. These measures have been classified to align with the five priority objectives presented in the proposed SNAP.

**Estimate of the short-and-medium-term needs.** The requirements for the short-and medium-term are estimated at Php 955 and Php 835 million, respectively, and are mostly non-structural interventions that aim to build the knowledge and capacities among crucial sectors and local governments. They focus mainly on the range of activities of ex-ante preparation and mitigation that are envisaged to reduce, not just the economic damages and losses, but also mortality from natural disasters. Many of these interventions have already been planned and/or initiated by the members of the NDCC, with support from many development partners. However, there is a need for immediate action and effective implementation of these efforts, to reduce the vulnerability of the local governments and their communities to increasing impacts of natural hazards.

#### ***Establish a sound legal and institutional foundation for DRM at national and local levels***

**Enact the DRM Bill to enable a shift in focus toward risk reduction.** Efforts are underway to enact a DRM law. The Senate passed its version of the DRM Bill (SB No. 3086) in September 2009, while the House of Representatives has completed its second reading of its own version of the DRM Bill (HB No. 6985), with a bicameral conference targeted to take place in December. The DRM Bill has the potential to transform the policy and institutional environment toward a risk reduction approach. However, further refinements are needed to ensure that the bill embodies the fundamental DRR principles of:

- Establishing a strong foundation for introducing sound institutions, practices, and processes;
- Identifying essential tasks and assigning responsibilities and accountabilities;

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<sup>52</sup> *Building the Resilience of Nations and Communities to Disasters* accessed on November 20, 2009, at <http://www.unisdr.org/eng/hfa/docs/Hyogo-framework-for-action-english.pdf>

<sup>53</sup> Many of which had already been identified in “The National Assessment on the State of DRM in the Philippines” (ADB and UNDP, 2008).

- Identifying minimum acceptable actions commensurate to the type and level of risk; and
- Encouraging actors/agencies to take actions based on evaluation of risks to meet stated intentions.

In line with these principles, the Bill should: (a) strengthen the links between DRM and development planning; (b) clearly delineate functions among agencies performing advisory, oversight, and service delivery tasks, notably national and local governments, quasi government bodies/public corporations, and the citizenry; and (c) institutionally link DRR with CCA in the coordination of strategies, priorities, and resources.

**Formalize the SNAP.** The NDCC has proposed an Executive Order to adopt the SNAP into a formal government document that can provide the official guiding framework for DRR. Formalizing the SNAP would indicate the Government’s strong commitment to implement a 10-year “roadmap” on DRR, in line with global good practices, by creating an enabling environment for many of the other steps outlined below. The SNAP would also establish a basis for mobilizing further funding support from development partners for accelerating and scaling up the implementation of a long-term DRR program.

**Mainstream DRR into local governance, planning, and budgeting systems.** Ondoy and Pepeng affected a total of 37 provinces. Many of the local governments affected by these storms are among those that are historically at high risk to various forms of hazards. Scaled-up efforts to develop the capacity of local governments (which are by law, convention, moral obligation, and proximity the “first responders”) to prevent, prepare, mitigate, and respond to disasters are needed, in line with the reform efforts outlined in the SNAP and draft DRM bill. In particular, DRR needs to be linked to local development planning by making local physical and development plans risk-sensitive. Doing so will require that DRR principles and processes be factored into existing efforts to harmonize planning and budgeting processes (DILG, NEDA, DBM, and OCD Joint Memorandum Circular no. 1 2007). Priority should be given to ensuring that guidelines for mainstreaming DRR into existing planning and budgeting are consistent with, and integrated into, the ongoing rationalization and harmonization process based on the JMC rather than introducing stand-alone DRR plans as currently proposed in the draft DRM bill. Most local governments will require not only technical assistance to identify and address their specific risks, but also funding to implement corresponding measures such as retrofitting of physical assets, relocation, or upgrading of DRR-activities and facilities to effectively reduce their risks. The necessary DRR measures (commensurate with local hazards) will need to be reflected across the full spectrum of the local planning system—land use plans, development plans and programs, ordinances, and budgets.

**Strengthen Community-Based DRM (CBDRM) to deal with disasters on the ground.** Community-based DRM systems are the most efficient approach to reducing disaster risk at the local level. Local knowledge about vulnerabilities, hazards, and traditional coping capacities is needed to assess the actual disaster risk and identify feasible interventions for prevention, mitigation, preparedness, and recovery. However, the capacity of communities will need strengthening to empower them to act on their own in case of emergency, especially if external assistance cannot be provided during extreme events. Broad participation is important for a successful and efficient CBDRM system. In addition to local governments as key players, other stakeholders, such as the regional or local staff of national line agencies, the private sector, civil society representatives, and vulnerable groups themselves have to be actively involved. CBDRM is also most effective if linked to the

national DRM system. This level sets the laws and standards according to which local actors should act. As natural hazards do not recognize community boundaries, close cooperation with other communities is important, especially in cases where common resources such as watershed or river systems are involved.

**Establish a system for gathering data on damages, losses, and needs and tracking expenditures.** The PDNA process revealed the presence of data gaps and inconsistencies in the current approach for reporting damages and losses and recording receipts and expenditures. Accurate monitoring and reporting is an essential input to risk reduction efforts. Estimation of damages and losses by local governments provides a valuable planning tool to quantify the impact and identify the nature of disasters so communities can design appropriate responses, identify sources of financing, and monitor the use of funds. Likewise, expanded coverage of data gathering efforts to both public and private sectors, national agencies, government-owned and -controlled corporations, and local governments is needed at the national level. This information is required not only to assess and respond to needs (e.g., the allocation of calamity funds) but also to match funds to identified needs more accurately and to establish the fiscal and macroeconomic impact.

The NDCC has prepared a country-specific disaster assessment methodology adapted from the Economic Commission on Latin America and the Caribbean (ECLAC) methodology. However, the methodology needs to be fully tested and rolled out and may need to be updated to take into account recent lessons of experience. A review of the current system of data collection and compilation is needed to ensure that accurate information can be provided to decision makers which can be used to plan relief, recovery, and reconstruction programs as well to identify prevention and mitigation measures. A key priority is to allow tracking of expenditures across levels of government and from various sources (private, agencies, local). This information is essential for determining the resources required to build back better.

***Identify, assess, and monitor disaster risks and enhance end-to-end, multi-hazard early warning systems***

**Fast track the preparation of multi-hazard and/or risk maps in high-risk LGUs.** Despite the fact that many of the affected LGUs had contingency plans in place, many were not sufficiently prepared for Ondoy and/or Pepeng. This was also due to inadequate integration of DRR parameters into land use and development plans and programs. As a result, many local governments did not have adequate zoning ordinances, building codes, and standards to mitigate against these risks. Successful risk reduction programs require accurate and timely information on the nature and location of hazards, as well as the ability to translate this information into comprehensive risk reduction and contingency plans, taking into account the level of exposure and vulnerability.

NDCC is preparing multi-hazard maps for at least 27 provinces (jointly being implemented by OCD, PHIVOLCS, PAGASA, MGB, and NAMRIA) through the ongoing Hazards Mapping and Assessment for Effective Community-Based Disaster Risk Management Project.<sup>54</sup> To be more effective for use of local governments, these hazard maps are proposed to be prepared at a scale 1:10,000 which may increase the cost and technical requirements. To

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<sup>54</sup> The Government has identified 27 provinces on the basis of their exposure to typhoon events. These are Surigao del Sur, Surigao del Norte, Benguet, Cavite, Pampanga, Aurora, Bohol, Leyte, Southern Leyte, Ilocos Sur, Abra, Laguna, Quirino, Zambales, Catanduanes, Northern Samar, Eastern Samar, Antique, Zamboanga del Sur, Ilocos Norte, Isabela, Rizal, Nueva Vizcaya, Cagayan, Agusan del Sur, Iloilo, and Zamboanga Sibugay.

speed up implementation in the short term, additional capacity for the preparation and utilization of these maps is essential, and in the longer term, a national spatial data infrastructure that can be accessed and used by stakeholders at the local and national levels is needed to capture and maintain the relevant information across all scientific agencies. It should be integrated with other fundamental data such as administrative maps and census data. The National Economic and Development Authority and the National Mapping and Resource Information Authority (NAMRIA) are jointly supporting this initiative to establish the risk exposure of local governments. External support especially in the form of satellite and aerial mapping and photography can help facilitate the preparation of these maps.

In addition, due to its unique nature and high level of exposure, a similar effort is required for Metro Manila local governments to update previous plans and studies (e.g., MMEIRS, MMetroplan), incorporating more recent information (e.g., Metro Manila Climate Change Study).<sup>55</sup> The Metro Manila Development Authority and individual cities are supporting this initiative.

**Strengthen the risk modeling and forecasting capacities of scientific/technical agencies.**

Currently, the primary basis for risk identification is from various historical data. While these data are both useful and necessary for planning purposes, given that weather-related disasters affecting the Philippines account for 70 percent of recent damages and given the uncertainty brought about by climate change, better use of scientific information for modeling risk and forecasting hazardous events is needed. Given that on average 20 typhoons and tropical storms are recorded annually, investing in additional capacity (e.g., Doppler radars) is a priority<sup>56</sup>. Through PAG-ASA, the procurement of Doppler radars to improve its forecasting capacities has been initiated. Efforts to complete the expeditious acquisition of this and other necessary equipment required for climate change modeling should go a long way toward improving the use of scientific information in planning risk reduction measures. The expansion of forecasting capacity will have to be matched on the ground with preparedness and local-level early warning activities, or the increased forecasting will be a purely academic exercise. Truly “end-to-end” forecasting and early warning are necessary to save lives and reduce losses.

***Use knowledge, innovation, and education to build a culture of safety and resilience at all levels***

**Provide DRR information in a form that is useful for communities and local governments.**

Within municipalities, the primary role in identifying risk reduction measures lies at the community level. It is at this level that early warning systems, evacuation plans, and search and rescue efforts become operational. Ensuring that vulnerable communities have the necessary information to plan their efforts is an essential challenge. More than 7,000 barangays were affected by Ondoy and Pepeng, and there are many others that required similar preparation for managing and dealing with disaster impacts. Numerous resources on DRR have been prepared (studies, tools, and resources) at the national level, but these are not always provided in a form that is useful at the local or community level. These materials can be compiled, harmonized and disseminated to guide decision making and prioritization at the local level. NDCC, DILG, and Leagues of LGUs and the CHED can work collectively to harness existing DRR expertise and local and global knowledge that can serve as the foundation for the systematic management and transfer of knowledge to LGUs and other

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<sup>55</sup> These studies have led to the identification of the hazards, namely earthquake, climate change, and flooding and their potential social and economic impacts on Metro Manila.

<sup>56</sup> To this end the Philippines is receiving assistance from Australia and Japan.

stakeholders. The nature of interventions required by each community varies—some will require more technical expertise than others, so a hierarchy of support systems at each level of government is needed. Provinces and cities that already have access to in-house technical capacity and use GIS-based hazard and vulnerability mapping may offer support services to nearby municipalities that cannot afford a full service. This support may supplement the services currently available from scientific and technical agencies of the national government or academia. The DRM bill seeks to establish a DRR Institute that will provide the necessary capacities across sectors and local governments. DRM curricula can likewise be institutionalized in the education system as a way to build a culture of safety and resilience at an early level.

### ***Reduce underlying disaster risks***

**Fast track risk finance options to pool and transfer risk.** Over the years, a system of national and local disaster risk financing institutions has been developed to provide post-disaster funding. The key elements of the existing risk financing system include: (i) a National Calamity Fund, (ii) local Calamity Funds, (iii) GSIS (a government-owned insurer providing catastrophe insurance coverage for government-owned assets), (iv) a crop insurance scheme, (v) private donations from charities, and (vi) indemnity payments from private insurance companies. Despite this, there is a shortage of post-disaster funding experienced by many segments of the economy, including homeowners, LGUs, government agencies in charge of disaster relief and reconstruction, as well as centrally and locally owned utilities. In addition, there is concern that the fiscal implications of disasters are likely to rise in the future, which will further increase the burden on government over time. To address these shortcomings, a risk finance strategy is necessary to rationalize the distribution of the financial burden between the public and private sectors through a range of options to expand risk reduction and risk transfer mechanisms. Two important options should be considered: a catastrophe pool that would allow local governments to build up reserves to manage medium risks by providing immediate liquidity to its members when a significant disaster occurs, thus reducing the burden on national government, and a contingent financing option that would provide immediate liquidity when a national calamity is declared, as well as backing up the catastrophe pool in its early years. The League of Cities of the Philippines has expressed strong support for the establishment of a catastrophe pool for its members. Risk finance and transfer schemes that would benefit the private sector, including housing and SMEs, are also being explored, together with the option of establishing regional catastrophe financing pools with other countries in the Southeast Asia region. Many countries have already established their own risk-financing instruments that have proven effective in reducing the fiscal burden arising from the cost of disasters, e.g., the Caribbean Catastrophe Risk Insurance and the Turkey Catastrophe Risk Insurance Pool.

**Provide affordable financing to LGUs for priority risk reduction investments.** Investments related to DRR are considered public goods. As such, there is a need to encourage LGUs to improve preparedness and invest in priority mitigation and prevention measures by providing access to additional and affordable financing. For low-income LGUs, matching grants or other incentive programs can be designed to encourage and assist with major DRR investments. Existing facilities, such as the Disaster Management Assistance Fund (DMAF) established by the Municipal Development Fund Office (MDFO), which currently offers limited funding on concessional terms, could be further expanded by tapping additional resources from the Municipal Development Fund (MDF) or through injections of additional government or international financing. Funding windows set up by GFIs can also be complemented by matching funds from the national government to accelerate the uptake of loans for DRR-related investments. Technical assistance to determine and design these

investments and to build implementation capacity will also be needed to ensure the timely provision of DRR services and infrastructure investments.

***Strengthen disaster preparedness for effective response at all levels***

**Prepare for a wide range of hazard scenarios.** Several local governments that were severely affected by the recent disasters had previously been positively evaluated as “prepared”— i.e., having the necessary capacities and systems to deal with disasters, including contingency plans, trained staff, and equipment. It is clear, however, that although contingency plans did exist, in many cases, they were inadequate or inappropriate for the scale of the events that occurred. It is essential to strengthen local contingency planning through a more comprehensive policy that ensures that search and rescue capability, evacuation procedures, and relief services that take into account a wide range of hazard scenarios including future risks based on available local climate scenarios. Such plans should be broad-based and include local government, civil society, the business sector, volunteer groups, and other humanitarian organizations. Furthermore, joint plans or support systems should be established between neighboring or clustered (metropolitan) LGUs. In addition, basic emergency facilities, training, and regular testing of emergency response systems should be required in high-risk LGUs. Fail-safe backup plans are also needed to avoid repetition of the Ondoy/Pepeng situation where damaged communications and other infrastructure vital to the response and rescue efforts were rendered inoperable.