

## CLIMATE CHANGE AND DISASTER RISK REDUCTION ASSESSMENT (SUMMARY)

### A. Issues, Progress, and Opportunities

1. **Risk profile.** The Philippines is one of the world's most natural hazard-prone countries. The WorldRiskReport 2011 ranked the Philippines number 3 on the WorldRiskIndex.<sup>1</sup> It is among the top 20 countries likely to be most adversely affected by climate change. Up to 60% of the total land area is exposed to multiple hazards, and 74% of the population is vulnerable to natural disasters. On average, about 1,000 lives are lost every year due to natural disasters. Tropical cyclones (tropical depressions, storms, typhoons, and associated flooding) account for about three-quarters of recorded deaths and two-thirds of damage, but the archipelago is also exposed to drought, earthquakes, floods, landslides, tsunamis, volcanic eruptions, wildfire, and technological hazards. Among natural hazards, typhoons (storms) caused the largest number of deaths (31,373) and affected the largest population (111.93 million).

2. **Economic losses.** The annual cost of disasters to the economy is estimated at between 0.7 and 1% of gross domestic product.<sup>2</sup> Storms are the dominant risk in the Philippines, with an economic average annual loss of \$151.3 million, followed by floods (\$68.8 million), earthquakes (\$33.2 million), volcanoes (\$14.9 million), droughts (\$14.7 million), and landslides (1.5 million).<sup>3</sup> The economic cost of tropical storm Ondoy and typhoon Pepeng, which hit the country in 2009 was estimated at 2.7% of GDP.<sup>4</sup>

3. **Climate change projections.** Climate change projections suggest an increase in temperature by 1.8°C in 2020 and by 2.4°C in 2050, and high variability in rainfall intensity.<sup>5</sup> Dry season (December–February) is projected to become drier (20% decrease in rainfall), and wet season (June–August) wetter (16% increase), but also showing regional variations, such as that southern areas (Mindanao) are likely to become drier overall. With about 60% of the country's 1,497 municipalities and 137 cities located along the coast, impacts of sea level rise due to both climate change and local land subsidence are expected to be severe.<sup>6</sup> Agriculture, fisheries, health, water resources, and infrastructure are likely to be severely impacted by climate change.<sup>7</sup>

4. **Need for effective government policies.** While the magnitude of natural hazards is outside of the control of the government, the scale and impact of disasters is dependent on the vulnerability of its economy and its people.<sup>8</sup> Vulnerability is influenced first by governance

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<sup>1</sup> United Nations University, Institute for Environment and Human Security. 2011. WorldRiskReport. Bonn. The index is based on calculations drawing on the formula: exposure times vulnerability. Vulnerability is defined as "susceptibility times lack of coping capacities times lack of adaptive capacities." The Philippines ranks 3 globally on annual exposure to natural hazards. An earlier study ranked the Philippines 8th worldwide in terms of disaster incidence and human impact. World Bank. 2005: *Natural Disaster Hotspots: A Global Risk Analysis*. Washington D.C..

<sup>2</sup> Government of the Philippines. National Disaster Coordination Council. ADB. UN. 2008. *National Assessment on the State of Disaster Risk Management in the Philippines. Final Report. October*. Manila

<sup>3</sup> United Nations International Strategy for Disaster Reduction. World Bank. 2010. ASEAN Disaster Risk Management Initiative. *Synthesis Report on Ten ASEAN Countries Disaster Risks Assessment*. Switzerland.

<sup>4</sup> Government of the Philippines. World Bank. Asian Development Bank. United Nations. Global Facility for Disaster Reduction and Recovery Partners. 2010. *Philippines Typhoons Ondoy and Pepeng: Post-Disaster Needs Assessment*. Main Report. Manila.

<sup>5</sup> Government of the Philippines. Second National Communication. 2009. *Draft 2<sup>nd</sup> National Communications of the Philippines to the United Nations Framework Convention on Climate Change*, Makati City, November.

<sup>6</sup> ADB. 2009. *Review of the Economics of Climate Change in South East Asia*. Manila.

<sup>7</sup> While some climate change impacts will benefit certain sectors and areas, such as increased CO<sup>2</sup> fertilization benefiting agriculture, these are likely to be offset by other impacts, such as water insecurity. In the longer term negative impacts are likely to outweigh any benefits.

<sup>8</sup> World Bank. 2010. *Philippines Discussion Note No. 18: Disaster Risk Management*. Draft. 15 June. Manila.

aspects such as the quality of infrastructure, the implementation of building codes, and good urban and land use planning.<sup>9</sup> Second, vulnerability is influenced by the state of environmental degradation and thirdly by the resilience of rural livelihoods.<sup>10</sup> The vulnerability to disasters is also influenced by the effectiveness and efficiency of disaster risk management (DRM), disaster risk reduction (DRR), and climate change adaptation (CCA) measures.<sup>11</sup> Tropical storm Ondoy and typhoon Pepeng showed how illprepared the country is to deal with large scale disasters.

## B. Government Strategy

5. **The Philippine Development Plan (PDP), 2011–2016.** The PDP identifies enhanced resilience of natural systems and improved adaptive capacities of human communities to cope with environmental hazards including climate change-related risks as a priority goal in the chapter on Conservation, Protection and Rehabilitation of the Environment and Natural Resources. Under this goal, three outputs, each with detailed activities, are identified: (i) strengthen institutional capacities of national and local governments for CCA and disaster risk reduction and management (DRRM);, (ii) enhance the resilience of natural systems; and (iii) improve the adaptive capacities of communities. Other chapters, e.g., the ones on agriculture and energy, identify specific measures to adapt the sector to climate change.

6. **Legal basis for DRM.** The recent passage of the DRRM Act of 2010 (Republic Act [RA] No. 10121) and its implementing rules and regulations supported by the Climate Change Act of 2009 (RA 9729) have significantly strengthened the institutional foundation for DRM and CCA. The DRRM Act emphasizes the need for a coherent, comprehensive, integrated, and proactive approach to DRRM across levels and sectors of government, and among vulnerable communities. It shifts the focus from a purely reactive approach to include risk management and preparedness and establishes links to CCA. The DRRM Act calls for the development of a National DRR and Management Framework and National DRR and Management Plan, which will build on and reinforce the current Strategic National Action Plan for DRR per Executive Order 888.<sup>12</sup> The National Strategic Framework for Climate Change recognizes and adopts DRR as

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<sup>9</sup> Comprehensive land use planning is mandated to local government units under the 1991 Local Government Code. It is rarely based on systematic and participatory assessments including sustainable financing requirements, and lacks incentives for private investments in environment and natural resource management. Urban land use patterns have developed in response to demands and pressures of a rapidly growing population with limited land availability, rather than in a planned manner. This leads to urban infilling with high-density housing and increased numbers of informal settlers, generally located in city centers or areas typically unsuitable for residential development (e.g. extensive encroachment on flood-prone areas, or building alongside or over faultlines). Lack of local government unit coordination exacerbates hazard management (e.g., road construction has in places intensified local flooding problems due to practices of elevating streets above stormwater levels; and floods produce major public health risks because there is little or no coordination among public health bodies, flood control agencies, and sewage/sanitation providers).

<sup>10</sup> More detail on environmental degradation in the Philippines is provided in: Environment Assessment Summary (accessible from the list of linked documents in Appendix 2). United Nations International Strategy for Disaster Reduction 2009. *Global Assessment Report on Disaster Risk Reduction*. Switzerland.

<sup>11</sup> DRM is the use of administrative decisions, organizations, operational skills and capacities to implement policies, strategies, and coping capacities to lessen the impacts of disasters. DRR is a series of actions to minimize disaster vulnerability by avoiding or limiting the adverse effects of hazards within the broad context of sustainable development.

<sup>12</sup> The Strategic National Action Plan (SNAP) for DRR was adopted by the government in March 2010, The SNAP operationalizes the country's commitments to the Hyogo Framework for Action (HFA) and provides a basis for expanding and mobilizing resources for the implementation of a strategic DRM program. The HFA was adopted by 168 member states of the United Nations in 2005 and highlights five priority areas of action: (i) ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; (ii) identify, assess, and monitor disaster risks and enhance early warning; (iii) use knowledge, innovation, and education to build a culture of safety and resilience at all levels; (iv) reduce the underlying risk factors; and (v) strengthen disaster preparedness for effective response at all levels.

one of its strong pillars, while integration of CCA and DRR is likewise being pursued by mandated agencies. Existing policies, plans, and projects of the different sectors are currently being reviewed to ensure alignment with the National DRR and Management Framework, which is currently under preparation. While the DRRM Act provides an improved enabling environment for DRM in the Philippines, successful implementation, including at the local level, will take time and will depend on whether the necessary support for implementation will address the issues outlined below.

7. **Functional assignments and coordination mechanisms for DRM.** Under the DRRM Act, the former National Disaster Coordinating Council is now called the National Disaster Risk Reduction and Management Council (NDRRMC). Regional and local councils are similarly relabeled. NDRRMC is the government focal point for DRM, assisted by the Office of Civil Defense (OCD). Chaired by the Secretary of the Department of National Defense, NDRRMC is to provide leadership, determine broad DRM policies, oversee DRR implementation, provide DRR-CCA linkages (with the Climate Change Commission) and advocate for DRR concerns on broader development issues. Individual line agencies and local government units (LGUs) are legally responsible for implementing DRR within their respective areas of responsibility. The law provides for scope to address the coordination issues that hampered the National Disaster Coordinating Council provided mandates will be adequately funded.

8. **Line agency and LGU capacities for DRM.** Line agencies and LGUs often lack the capacity to assume the DRM functions assigned to them. Key issues include duplication of efforts in providing hazard and risk information to LGUs, lack of disaggregated data on historical disaster damage and losses, and lack of capacity to conduct vulnerability and risk assessments. For example, while the Department of Interior and Local Government spearheads the mainstreaming in cities of DRRM/CCA into local comprehensive land use plans, comprehensive development plans, and investment programs, it is the National Development Planning Agency, that does the same for provinces. These issues are exacerbated by challenges in line departments such as the lack of resources for DRR activities, absence of a continuous risk assessment and monitoring and evaluation processes, and lack of a multihazard early warning system (footnote 4). In practice, some LGUs have yet to establish local disaster coordinating systems, while systems in others vary significantly in quality. Requirements aimed to build up knowledge and capacity within key sectors and LGUs, mostly for nonstructural interventions, for the short- and medium-term are estimated at P955 and P835 million respectively (footnote 3). The secretariat of NDRRMC, OCD, also lacks capacity to provide the coordination and facilitation functions for NDRRMC agencies. For example, it has a very weak knowledge management capability for delivering hazard and risk information to all of its stakeholders, encouraging other line agencies to take on this task piecemeal. Neither RA10121 nor the Strategic National Action Plan foresee funding for building up line agency and LGU capacities for DRM; however the DRRM Act increases the funding of OCD tenfold to P1 billion.

9. **Limited use of disaster risk financing (DRF) options.** The DRRM Act allocates a specific budget for DRM by providing a clear and continuing appropriation of P5 billion (around \$111 million) for a National Disaster Risk Reduction and Management (NDRRM) Fund, 30% of which is reserved for a Quick Response Fund. P1 billion (around \$22 million) has been allocated to OCD as a revolving fund to enable it to perform its strengthened mandate under the DRRM Act. Aside from the NDRRM Fund, the law also encourages and authorizes the government to use a portion of its budget appropriations to implement projects designed to address DRRM activities in accordance with the guidelines to be issued by the NDRRM Council in coordination

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with the Department of Budget and Management. The Strategic Framework on Climate Change also provides avenues for financing DRR activities. Despite these available financial resources, disaster risks are not systematically taken into account as an integral part of financial planning, in particular at the LGU level. Other possible sources of financing for DRM could include a Disaster Management Fund; sector investment loans for mitigation, preparedness, and response; and risk transfer mechanisms such as a contingent credit arrangement for rehabilitation and reconstruction.<sup>13</sup> The Government Service Insurance System (GSIS), a government-owned insurer, provides insurance for government-owned assets; however, these assets are typically under-insured at depreciated book value rather than replacement cost. Coverage rates for privately owned assets are also quite low. At the local level, calamity funds are also budgeted for in annual cycles, but are insufficient to meet the need and in a typical year the national and local calamity funds can honor only about 10% of actual needs.<sup>14</sup> The DRRM Act provides for additional flexibility for the government to use its resources for *ex ante* risk finance. Given the reality that the fiscal implications of disasters are likely to rise in the future, increasing the burden on the government, and the need for resources for DRM work at various levels of government, a risk finance strategy is needed to guide both public and private stakeholders to anticipate, plan for, reduce, and transfer disaster risks due to natural hazards prior to occurrence.

10. **Risk identification and assessment.** To inform the design of DRR programs, hazards, vulnerabilities, exposure, and risks should be identified and analyzed early on. However, in the Philippines, especially at the local level, hazard maps of only the most susceptible areas have been considered for various planning processes, including land use and development planning. The Hazards Mapping and Assessment for Effective Community-Based Disaster Risk Management Project has done a lot of work in multihazard mapping at the subnational level. Under it, risk assessments have been conducted including completion of 1:50,000 scale hazard maps for earthquake hazards for 12 provinces. Volcanic hazard maps for five provinces were also completed, and earthquake and volcanic hazard mapping is ongoing for 15 additional provinces. This interagency project covers 28 of 80 provinces in the country. Despite this effort, municipalities and cities, through their planning and development offices, are still in need for capacity development to conduct their own hazard and vulnerability assessments, as risk mapping is more appropriately done at the city or municipal level, preferably at the 1:5,000 or 1:10,000 scale, in order to be appropriate for land use planning. Using such assessments for land use planning, devising appropriate zoning ordinances, and enforcing these remain a challenge.

11. **Legal basis for CCA.** The Climate Change Act of 2009 (RA 9729) envisions the Philippines to be a climate risk-resilient country that proactively implements cost-effective and nationally approved mitigation actions. The Act provides overarching policy direction to national and local actions on climate change and includes provisions for attracting foreign funds for CCA and DRR projects. Executive Order No. 881 (signed on 26 April 2010) authorized the Climate Change Commission (CCC) to coordinate climate change activities including efforts to reduce emissions from deforestation and forest degradation (REDD++). As a complementary initiative, the National Framework Strategy and Program on Climate Change was signed in April 2010, providing a basis for the national program on climate change that defines key result areas to be pursued (see Table 1). The Department of Environment and Natural Resources spearheads the program, including the management of funds from the United Nations and other international

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<sup>13</sup> The World Bank is currently finalizing negotiations with the government to secure a contingent arrangement, which is referred to as Catastrophe Deferred Drawdown facility.

<sup>14</sup> Key elements of the existing risk financing system include (i) a national calamity fund, (ii) local calamity funds, (iii) GSIS, (iv) a crop insurance scheme, (v) private donations from charities, and (vi) indemnity payments from private insurance companies.

organizations. The National Climate Change Adaptation Plan is expected to give direction on the implementation of climate change adaptation measures in a cross-sectoral manner to be reflected in and implemented through local plans.

**Table 1: Key Result Areas in the National Framework Strategy and Program on Climate Change**

Mitigation	Adaptation
<ul style="list-style-type: none"> <li>• Energy efficiency and conservation</li> <li>• Renewable energy</li> <li>• Environmentally sustainable transport</li> <li>• Waste Management</li> <li>• National REDD++</li> </ul>	<ul style="list-style-type: none"> <li>• Vulnerability and adaptation assessment</li> <li>• Ecosystem-based adaptation</li> <li>• River basin management</li> <li>• Coastal and marine systems</li> <li>• Biodiversity and REDD ++</li> <li>• Water governance and management</li> <li>• Climate responsive agriculture</li> <li>• Climate resilient health</li> <li>• Climate proofed infrastructure</li> <li>• Disaster risk reduction</li> </ul>
<p><b>Cross cutting issues:</b> Capacity development, knowledge management, research and development and technology transfer</p>	

REDD++ = reduce emissions from deforestation and forest degradation.

Source: ADB staff.

12. **Other important legislation for climate change.** Besides the Climate Change Act of 2009 and the National Framework Strategy and Program on Climate Change in 2010, various laws such as the Agriculture and Fisheries Modernization Act (1997), Philippine Clean Air Act (1999), Ecological Solid Waste Management Act (2000), Philippine Clean Water Act (2004), Biofuels Act (2006), and Renewable Energy Act (2008) direct appropriate agencies to consider climate change. The environmental impact assessment (EIA) system is one of the entry points identified by National Development Planning Agency to mainstream climate risk reduction into national and local development plans and regulatory processes. The Environment Management Bureau of the Department of Environment and Natural Resources, responsible for EIA system enforcement, will initiate a policy review to institute appropriate changes in the EIA system.

13. **DRR-CCA integration.** RA 10121 and RA 9729 have a common goal, which is to increase the resilience of the Philippines to disasters and thus decrease the damaging effects of disaster to its society and economy in the future. Implementation should be complementary to ensure synergetic outcomes at the local level, where action is needed most. The urgent need, therefore, is to promote coordination mechanisms between the institutions responsible for climate change and DRR, which are the CCC and NDRRMC. For example, both laws require the development of local action plans, and questions remain how these will differ from each other or how these are to be integrated into the comprehensive land use plans of LGUs so that budgets can be matched in the annual investment plans. The improved use of risk information is also a common objective; so is their common goal to mainstream into development and land use planning. The key challenge is thus to minimize the burden on local governments while maximizing actions at the local level. Therefore, making use of "no-regret" measures and climate proofing all development activities, e.g., in land use plans, will help avoid maladaptation and sustainably reduce vulnerabilities.

14. **Climate change mitigation.** The Philippines is not a major emitter of greenhouse gases (GHGs), as it accounts for only 0.4% of global emissions. However, the country took an active role in mitigation, especially in the energy sector, by promoting clean development mechanism (CDM) projects. The *Philippine Development Plan, 2011-2016* identifies climate change

mitigation as a priority. The Department of Energy has developed plans to reduce GHGs, through improved energy efficiency and the promotion of renewable energy sources. The *Philippine Energy Plan 2004–2013* envisions sourcing 53% of the total energy supply from renewable energy by 2013. Since unsustainable land use and land use change carry huge opportunity costs for the economy and environmental resilience alike, financing mechanisms can be deployed to provide offsetting or compensating revenue; therefore the country also hopes to enhance carbon sequestration through active participation in REDD++. Carbon capture and storage (CCS) has emerged as a promising new approach to realize deep cuts in emissions from fossil-fueled power plants, industrial facilities, and gas processing operations. While CCS is not explicitly highlighted in the country's climate change mitigation plans, increasing industrialization and, in particular, increased use of coal for power generation in the future would necessitate the deployment of CCS to limit GHG emissions from the power and industrial sectors.

15. **Clean Technology Fund (CTF) Investment Plan.** Recently, the government prepared a CTF Investment Plan to mobilize financing of about \$2.5 billion from the government, multilateral development banks, carbon finance, and the private sector.<sup>15</sup> The Investment Plan proposes CTF cofinancing of \$250 million for (i) catalyzing private sector investment in distributed power generation through renewable resources and increasing the number of viable off-takers (electric cooperatives) for such renewable energy, (ii) investment support and risk mitigation for the private sector's entry into energy efficiency and cleaner production sectors, (iii) solar generation with net metering, and (iv) introduction of bus rapid transport systems in Cebu and Metro Manila. The Investment Plan will help implement the government's National Environmentally Sustainable Transport Strategy, which aims to reduce energy consumption in the transport sector.

16. **Difficulties in attracting climate change financing.** Climate change financing has been integrated into development planning and has been limited to GHG mitigation activities: As of June 2010, 41 CDM projects were registered at the United Nations Framework Convention on Climate Change (UNFCCC) Executive Board, but only about 95,000 certified emission reductions had been issued so far.<sup>16</sup> Even though more than 90 CDM projects were registered, many projects may not materialize due to limited underlying financing. Climate change adaptation, a key priority for the government, has until very recently, received limited financing. The World Bank is currently preparing a \$480 million Catastrophe Deferred Drawdown Option loan as well as a catastrophe bond.

### C. ADB Experience and Assistance Program

17. Asian Development Bank (ADB) assistance for DRM has to date reflected government priorities. Therefore, the greatest proportion has been for postimpact assistance, such as the Southern Leyte Landslide Disaster Assistance Project I.<sup>17</sup> Similarly, following flooding in Metro Manila by tropical storm Ondoy (October 2009), ADB contributed significantly to a joint postdisaster needs assessment. The government's main goal is to strengthen the nation's capacity, reduce its exposure, and enhance disaster preparedness. ADB's Disaster and Emergency Assistance Policy supports this goal. Mainstreaming DRM and DRR is also a priority of Strategy 2020. The Country Partnership Strategy, 2011–2016 (CPS) highlights mainstreaming of DRR into ADB-funded operations through the following:

<sup>15</sup> <http://www.dotc.gov.ph/Philippines%20CTF%20CIP%20Nov%2009.pdf>

<sup>16</sup> Institute for Global Environmental Strategies. 2010. GES CDM Country Fact Sheet. Virginia, USA.

<sup>17</sup> Funded by a \$3 million grant from the Japan Fund for Poverty Reduction, it supported rehabilitation and reconstruction of key infrastructure facilities damaged by the February 2006 landslide, and provided long-term risk reduction measures.

- (i) **Disaster risk management.** ADB plans to facilitate integrated DRM by working with the government to develop risk-sensitive land use planning in order to reduce the physical, social, and economic vulnerability of communities to earthquakes and floods. A review of urban land assets in Metro Manila may be conducted to identify safer locations for resettlement of the urban poor.
- (ii) **Capacity development and risk screening.** ADB will support the government's DRM-DRR capacity by mainstreaming it into relevant projects. ADB will work with the government to screen development projects for hazard-induced risk and to ensure that risks are addressed in the design of ADB-financed investment projects. ADB's Risk Screening Tool<sup>18</sup> will be used to determine whether more systematic hazard assessment is necessary.
- (iii) **Disaster risk financing.** ADB will work with the government and the private sector to develop sustainable long-term solutions to assist with the development and implementation of DRF modalities that are demand-based and will consider lessons learned from other DRF mechanisms implemented in the Asia and Pacific region as well as developing economies in Latin America.

18. The Philippines is included in a new three-year regional policy and advisory technical assistance (TA) program on Developing a Disaster Risk Financing Capability<sup>19</sup> that ADB initiated in 2011. The TA will support the development of DRF schemes in Indonesia and the Philippines to provide participating urban areas with effective DRF solutions in the context of CCA and DRR planning. It will focus on the urban areas in these two countries because of the unique DRM and CCA challenges they face; their high share of the total populations; and the relative lack of attention they have received from development organizations, which have typically been more oriented toward rural and national level disaster management. The TA will complete risk profiles in each country and assess potential DRF mechanisms for two selected cities in each country to determine which DRF solutions show promise in terms of feasibility, demand, and effectiveness. Upon completion of these steps, DRF schemes will be designed and implemented in the selected cities in each country.

19. Further DRF projects are also being discussed by ADB with the Department of Finance and the Philippine Insurance Commission. These discussions have highlighted a range of potential DRF options, including national and local government liquidity coverage, residential insurance, and public infrastructure insurance.

20. The ADB Strategy 2020 identifies climate change as a key priority. The Southeast Asia Department (SERD) has developed a medium-term (2009–2015) strategic framework and a Climate Change Implementation Plan to mainstream climate change into its operations with the goal of reducing the carbon footprint and enhancing the resilience of its investments. SERD's interventions on climate change are based on five guiding principles: (i) recognition that climate change can annul development achieved so far; (ii) focus on integrated solutions of GHG mitigation and adaptation, mitigation and land use, and adaptation and disaster risk reduction; (iii) need for bringing transitional and transformational changes in socioeconomic systems; (iv) holistic view of climate resilience, including the need to avoid mal-adaptations; and (v) gradual shift from project-specific interventions to programmatic/policy-based approaches.

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<sup>18</sup> <http://www.adb.org/documents/events/2010/Building-Capacity-Climate-Change/CC-Disaster-Risk-Screening-Tool.pdf>

<sup>19</sup> ADB. 2011. *Technical Assistance for Developing a Disaster Risk Financing Capability*. Manila.

21. Mainstreaming climate change into the CPS 2011–2016 will follow five operational priorities: (i) scaling up clean energy, (ii) facilitating climatefriendly urban development and transport sector, (iii) enhancing carbon sequestration through sustainable natural resource management, (iv) promoting climate resilient development, and (v) strengthening climate change institutional and policy support. These priorities will be pursued through three modalities: mobilizing additional financing, developing knowledge products, and building partnerships.

22. Under the first priority of scaling up clean energy, a multitranche financing facility on climate change to enhance energy efficiency and promote renewable energy will be implemented with cofinancing from CTF and other partners. The Philippines is included in a regional capacity development TA on CCS initiated in October 2010. The TA, entitled Determining the Potential for CCS in Southeast Asia, will undertake scoping analyses, identify key sources of emissions and options for storing the carbon emissions, undertake preliminary due diligence, and develop roadmaps for early pilots in each of the focus countries. Specific support will be given to the Land Bank of the Philippines to promote renewable energy in Mindanao. By implementing the Philippines Solid Waste Management Sector Project, and through initiatives such as Cities Development Initiative for Asia and Sustainable Transport Initiative, climate-friendly urban development and transport will be promoted. The third priority of enhancing carbon sequestration and reduced emissions from forest degradation will be pursued through projects such as the Integrated Natural Resources and Environmental Management Project. Climate resilience will be promoted in selected river basins through ecosystem-based adaptation approaches by implementing projects such as the Integrated Natural Resources and Environmental Management, the coral triangle initiative, and Agusan river basin management. The fifth priority of institutional support on climate change will be pursued through technical assistance such as a scoping study on carbon capture and storage, climate policy development tool, and focused support to the CCC. ADB, in cooperation with partners in print and multimedia, is supporting a capacity development TA activity, the goal of which is to increase public awareness of climate change issues through a targeted communications campaign, thereby creating an enabling policy environment for climate change-related activities. This campaign will mobilize universities, media, and the private sector in creating a campaign plan based on selected key climate change issues that aims to inform citizens, reform current policies, and mobilize further financial resources to address climate change.<sup>20</sup>

23. The above assessment reveals that the Philippines has created many legislative and institutional structures to address DRM and CCA, but strengthening of institutions in mainstreaming climate change and disaster risk concerns into sectoral and local development planning is critical and is still lacking. However, as institutional capacity in various sectors varies, approaches to mainstream DRM and climate change should also be different. Since most climate-related stresses are mediated through water, ADB will initially focus its adaptation efforts in the water resources sector (using ecosystem-based resilience approaches), and its mitigation efforts in the energy and land use sectors. Later, efforts to reduce its carbon footprint and enhance the resilience of the transport and urban sectors will be intensified. Simultaneously, opportunities for mainstreaming climate change concerns in social sectors, especially health, will be explored.<sup>21</sup> Innovative financing modalities will be used to mainstream DRM and CCA into development planning at the local, regional, and national levels.

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<sup>20</sup> ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Enabling Climate Change Responses in Asia and the Pacific*. Manila.

<sup>21</sup> Building upon the recommendations from TA 7407: Managing Climate Impacts of Health in Water and Agriculture sectors and Disaster Risk Reduction.