Highlights

Climate Change in Asia and the Pacific

How can countries adapt?

Edited by
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ADBInstitute

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Introduction

The Asia and Pacific region is more vulnerable to climate change risks than other regions of the world, because of its dependence on the natural resources and agriculture sectors, densely populated coastal areas, weak institutions, and poverty among a considerable proportion of the population. Therefore, adaptation—making adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects that moderate negative or exploit beneficial opportunities—becomes a key strategy for sustaining economic growth. Failure to adapt could stall development, particularly in the countries that depend on natural resources. Adaptive capacity entails the ability to adapt, conduct a sum of actions to change behaviors, shift priorities, produce necessary goods and services, and to plan and respond in ways that reduce harmful climate change impacts or transform them into no-regret economic opportunities.

This book examines the framework conditions for integrating climate change adaptation measures into agriculture, water, and natural resources management activities. Based on the review of country experiences, it describes key dimensions and suggests interventions for further explorations, and thus serves as a basis for planning and mainstreaming climate change adaptation into sectoral planning.

The content of this volume draws mainly on two regional workshops organized by the Asian Development Bank Institute (ADBI). These workshops focused on mainstreaming climate change adaptation considerations in development planning and gathered experts from academia, think tanks, public service sector, private sector, and international organizations. The basis of our analysis also includes results from post-workshop surveys, updated literature from the field, as well as interviews and consultations with experts.

Mainstreaming adaptation capacity of the most vulnerable sectors into development planning entails the full engagement of relevant stakeholders, including policymaking agencies, research institutions, the private sector, and civil society. The specific role in catalyzing adaptation strategies, in a cost-effective way, depends on the context of the issue being addressed. The book addresses these issues in a detailed way. It is organized as follows: Part I: climate change challenges, scenarios, risks, and planning tools; Part II: adaptation measures in the Asia and Pacific region; Part III: successful programs of adaptation in vulnerable areas; Part IV: strategies to reduce risk impacts; Part V: capacity building strategies for mainstreaming climate change adaptation; and lastly, conclusions and policy implications.

Climate Change Challenges, Scenarios, Risks, and Planning Tools

Production and activities in the agriculture, forestry, and fisheries sectors are inherently affected by variability in climate. While climate change may generate economic opportunities in some parts of the world, adapting to and accepting it are urgent issues for developing economies of Asia. The Asia and Pacific region is more vulnerable to climate change due to its geography that exposes the region to forces of nature, its weak institutional infrastructure, and a considerable portion of the population being poor.

Climate change predictions are often expressed in terms of anticipated patterns of temperature and rainfall, frequency of extreme events and sea level rise, the impact on agricultural production, and gross domestic product (GDP). Assessing the exposure is the first step in developing strategies for climate change adaptation. These

draw heavily on the outputs of global and downscaled regional models for predicted climate change impacts across a country.

Assessing the sensitivity is a two-step process. The first step is to assess the likely exposure to natural resources by using climate model outputs. The second step is to examine the follow-on impacts of change on human economic and social systems, and ecosystems. Changes in agricultural production directly impact human welfare in many countries. Ecological system impacts are equally important since they influence the availability of food, fiber, and medicine. Once a sensitivity assessment is made, it will be possible to highlight the other areas of harmful impacts.

Options for adaptation to climate change in natural resource management include developing new crop varieties, maximizing water use efficiency, formulating new standards for infrastructure design, exploiting co-benefit approaches, building institutional capacity, and changing the policymaking environment under which all other adaptation activities typically occur. However, there is formidable information as well as attitudinal, technological, and economic barriers to implementing adaptation measures.

Evolving Adaptation Measures in the Region

Diversified adaptation measures are being undertaken by the countries in Asia and the Pacific region. The effectiveness of a measure depends on the location, sectoral capacity, and socioeconomic situation. Structural and nonstructural measures are used to deal with floods and inundation. Those measures could also be classified into structural or nonstructural measures, and building the resilience capacity involves finding a better combination of both. These measures could also be grouped into sectoral, cross sectoral, or multisectoral. Adaptation measures in one sector often involves a strengthening of the policy that already exists, emphasizing the importance of including long-term climate change considerations, such as extreme weather events, existing local coping mechanisms, and integrating these into sectoral development plans.

Evolving multisectoral adaptation measures are related to the management of natural resources which span sectors; for example,

integrated water resource management. Linking management measures for adaptation to climate change with those management measures identified as necessary from other sectoral plans is deemed effective in developing no-regret strategies. The United Nations Framework Convention for Climate Change (UNFCCC) compendium on methods to evaluate the impacts of vulnerability, and the Food and Agriculture Organization (FAO) applications used for performance evaluation, benchmarking, and modernizing irrigation systems address a range of adaptation choices.

Cross-sectoral measures also span several sectors, usually including systematic improvements in risk assessment and developing effective communication mechanisms. For example, countries in the Mekong region provide an example of a cross-sectoral initiative. This initiative involves facilities for forecasting or early warning systems to provide timely information on seasonal risks to agricultural production, which also include early warning and disaster management strategies for food security and emergency relief to vulnerable communities during extreme weather events.

Adapting to climate change also demands the prevention and removal of maladaptive practices. Maladaptation refers to measures that do not succeed in reducing vulnerability but, instead, increase it. Examples of measures that prevent or avoid maladaptation include better management of local irrigation systems and removal of laws that inadvertently increase vulnerability such as destruction of mangroves in coastal zones. There is a large body of knowledge and experience within local communities in coping with climatic variability, extreme weather events and health risks, which should become important elements in urban planning and bringing co-benefits.

Successful Programs and Measures of Adaptation in Vulnerable Areas

The Asia and Pacific region is giving serious consideration to early warning systems to counter fatalities and flood damage. The regional flood forecasting ability is gradually improving, but local flood

forecasting remains a big challenge. The maintenance of ground-based measurement stations is a particular challenge. Recently, advanced methods to introduce early warning systems by remotely sensed precipitation data in combination with a digital elevation model were introduced. Appropriate warnings could be given well ahead in time without the establishment of local climate and flood measurement stations. The social aspect of flood warning systems needs further improvement. For example, formulating emergency action plans involving all concerned groups remains to be established for most flood prone areas.

Sector specific insurance models based on the principles of public–private sector partnerships are evolving in the region. Financial relief to climate change damage could be provided by insurance companies in Asia and the Pacific. So far this possibility is underexploited, in particular, in the economically disadvantaged parts of the region where many poor people cannot pay the premiums for catastrophic damage. In these cases, conditional cash transfer schemes such as subsidies to the premiums, should be paid by governments until appropriate insurance schemes are established. Weather derivates are agreements where farmers get paid. For example, people are compensated if a previously defined period is too dry, or if an extreme precipitation level or a disastrous wind velocity is exceeded. A current problem in introducing insurance-based options is the lack of a dense climate station network in wide areas of the region, which eludes the valuable measurement of climate-induced damage.

Community-based approaches considerably reduce the degree of local vulnerability to climate change by bringing appropriate awareness to local people. Examples of such approaches are the successful lowering of river erosion in Bangladesh, avoiding expected desertification in Mongolia, and introducing renewable energy systems in Indonesia. These projects used a number of innovative pro-poor technologies in agriculture, natural resource use, and disaster management that have since been replicated outside the project implementation areas. The people involved received economic incentives that led to improved household-level consumption, sales of farm products, higher food security, as well as better management of basic health, water, sanitation, and livestock diseases.

Including gender dimensions in adaptation planning improves the equity and efficiency of adaptation measures. Gender issues are of great importance to climate change adaptation at the local level, in disaster prevention, and in disaster relief. Neighborhood associations in Japan provided an example where the role of women in the community saved many lives during earthquakes. Empowering women to key positions in emergency action planning is one efficient measure to improve local readiness and avoid fatalities and property loss. The UN Manila Declaration for Global Action on Gender, Climate Change, and Disaster Risk Reduction of 2008 is a useful document to mobilize action in the Asia and Pacific region.

Action Plan for Policymakers and Planners to Reduce Risk Impacts

Analysing the resilience and vulnerability, understanding the links between disaster risk reduction and climate change adaptation, and downscaling climate change and impact assessment data are essential capacities required to deal with the effects of climate change. Policymakers must have access to adequate operational national systematic observation networks and the data available from other global and regional networks.

Global warming will continue to increase due to existing greenhouse gas (GHG) content in the atmosphere, even if emissions are reduced to acceptable levels. Climate change affects countries and social groups differently. Therefore, local capacity should be developed at the local scale to forecast climate change, to assess the impacts in various sectors, to design appropriate adaptation measures, and to build alternate strategies. Higher education institutions should be mandated to play a major role in this respect.

Consequences of natural disasters are severe and visible, but unpredictable. However, resources available for natural disaster prevention and mitigation are limited. Many financial schemes exist but their effectiveness is low, which make it difficult for households or local government authorities to take ex-ante activities against natural disasters. Ex-post support in the form of government assistance and emergency

donor relief is inefficient. Therefore, there is a need for financial schemes to insure households that are highly self-reliant, comprehensive, sustainable, and appropriate. Measures, in the long term, have to be closer to the "market rules," meaning that capital spent can be refunded or is profitable. A community-managed insurance scheme based on a self reliance fund (SRF) has been proposed. Accessing the funds that are available at present is a complex and lengthy process. Even if this process is streamlined, a lot more funding will still be required for adaptation. New international financing mechanisms and sufficient responses to adaptation will also be needed.

Since agriculture will continue to be the main sector of the economy in many countries, it is important to study the economic impact of climate change on agriculture. Three approaches have been widely used in the literature to measure the sensitivity of agricultural production to climate change: agronomic-economic models, cross-sectional models, and agro-ecological zone models. Even though several models are used to capture the impacts at the macroeconomic level, the Ricardian-type model with cross-section data could be applied to assess the impacts of climate change at the farm level.

Capacity Building Strategies for Mainstreaming Climate Change Adaptation

Incorporating or integrating adaption to climate change into planning process is a necessary strategy for sustainable development of the Asia and Pacific region. Climate change impact does not happen in isolation; impacts on one sector can adversely or positively affect another. In many countries there are difficulties in mainstreaming adaptation concerns into development planning due to low staff capacity for monitoring, poor data on adaptation options and lack of mechanisms for information sharing and management, and limited funding for adaptation. Effective training and capacity building need support and funding to provide effective technical and financial support and capacity building opportunities.

Given that many countries experience similar effects from climate change, sharing experiences can broaden knowledge on how to

address adaptation challenges. International collaboration mechanisms fostered by the UNFCCC process include assessment of vulnerability and risk associated with climate change such as funding for national communications and national adaptation programs of action (NAPAs), public education and outreach, data and observations, decision support, adaption planning, and implementation. Operational guidelines could be prepared to help integrate adaptation into various sectors from national to local level and from local to national level, and to encourage countries in the region to implement more pilot projects and provide funding for such projects.

Effective implementation of climate change adaptation is complicated because of different scales involved; the level at which action leading to change occurs is often different from the level at which decisions regulating such actions are taken. Lack of cooperation among ministries is highlighted as a major barrier to progress on adaptation. In order that real progress is made, key government agencies such as the ministries of finance need to be informed of the relevant outputs of impact and vulnerability assessments. Sectoral institutions need to be strengthened to address the complexities of coordinating the implementation of adaptation action.

Capacity building at local level (for example, strengthening coping strategies and feedback to national policies), national level (for example, inter-agency policy coordination in the water sector and legal provisions for mainstreaming), and regional level (for example, incorporating climate risks in projects of development agencies) is vital to enable developing countries adapt to climate change. It is important for stakeholders and development partners to recognize the role of universities and knowledge institutes. Enhanced support is needed for institutional capacity building, including establishing and/or strengthening centers of excellence, so that they can resolve the complexities of addressing and coordinating the planning and implementation of adaptation actions. Effective regional cooperation among the countries will also help the structured dissemination (internationally and nationally) of the best practices, sharing of climate information, supporting institutional coordination, and generating additional resources for enhancing the adaptive capacity at local level.

Conclusion, Policy Implications, and the Way Forward

While the impetus for reacting to climate change and more effective adaptive action is building up and becoming recognized, albeit to varying degrees at all levels and by all players, there is a serious gap in public awareness for constructive actions with respect to addressing very complex climate change adaptation issues. Increasing speculation makes the much needed mainstreaming difficult to agree upon and implement, further exacerbating climate risks. There is an urgent need to start working toward developing a commonly shared vision on the way forward, involving all principal stakeholders and reconciling diverse perspectives.

Managing expectations from the public and decision makers regarding the adaptation process is important. Successful adaptation does not just happen. One key recommendation is to carefully plan and execute long-term national programs for supporting public participation in climate change adaptation aimed at educating and building capacity of all stakeholders. The first step could be to develop detailed guidelines, as well as provide training, on public participation for both environmental authorities and sectoral agencies, adjusted to specific needs of the sector. Attention should be given to building capacity at local level to help communities understand the climate risks and links to sector activities, and thus effectively gain participation in public forums. Overall, the programs should be designed and targeted according to the diversity of stakeholders.

Effective mainstreaming requires informed consensus on climate change risks, objectives, and policies that are based on a good understanding of the shared roles and responsibilities of all players, including sectoral agencies, ministries of environment, ministries of planning, and the affected community. This fundamental notion of shared responsibility has currently been challenged in the Asia and Pacific region by the general perception— that climate change is the sole responsibility of environmental agencies to effectively implement

necessary adaptation measures—among the public, project proponents, and development authorities alike. As economies in Asia and the Pacific continue to accelerate growth rates, the responses to climate change will come under increased scrutiny and pressure. The cases discussed in this book, however, observed that unless an increasing demand for mainstreaming is matched by adequate capacity building, it would be naive to expect substantial progress and unfair to solely blame the sectoral agencies.

There are significant capacity constraints of sectoral agencies to meet their existing mandates, as well as the need to introduce new adaption programs and tools and improve the effectiveness of existing ones. This book recommends that ministries of environment, education, and sectoral agencies, using recent examples of good practices, develop medium-term capacity strengthening action plans to meet the current and projected needs, including financing requirements. These plans should first explore the possible capacity gains through (*a*) rationalizing decision-making processes; (*b*) upgrading climate information; (*c*) decentralizing responsibilities to regional offices, along with staff, resources and equipment, and outsourcing certain non-core functions; and (*d*) training to upgrade skills. It would conclude with a staffing plan, including the need for additional positions to meet the core requirements, upon exhausting all options for improvements in processes and efficiency. The plans could be used for negotiations with planning and financing agencies, subject to making a strong and verifiable case.

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Climate change is now widely regarded as one of the most serious challenges the world faces, and adapting to it is an urgent requirement for countries across the globe. The less developed countries in the Asia and Pacific region, despite contributing the least to the emission of greenhouse gases, are the most vulnerable to the effects of climate change.

Climate Change in Asia and the Pacific: How Can Countries Adapt compiles policies and best practices on climate change adaptation, emphasizing the fact that the Asia and Pacific region needs immediate measures—both structural and nonstructural—in order to adapt to climate change. The discussions elaborate on issues related to water resources, agriculture, and natural resources management—some of the most vital sectors for the region from environmental, social, and economic perspectives.

Although the policies and measures discussed in the book are specific to the Asia and Pacific region, the key findings will be relevant to other regions as well; for example, Africa and Latin America.

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