



Review of Current and Planned Adaptation Action: East and Southeast Asia

Cambodia, China, Democratic People's Republic of Korea,
Indonesia, Lao People's Democratic Republic, Malaysia,
Mongolia, Myanmar, Philippines, Thailand, Timor-Leste
and Viet Nam

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Review of Current and Planned Adaptation Action: East and Southeast Asia

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About the Adaptation Partnership

The Adaptation Partnership was formed in May 2010 in response to a recognized need for development practitioners to share information and lessons on adaptation efforts. Chaired by Costa Rica, Spain and the United States, the goal of the partnership is to encourage effective adaptation by serving as an interim platform to catalyze action and foster communication among the various institutions and actors engaged in the effort to scale up adaptation and resilience around the world, particularly in the context of fast start finance. The Partnership synthesizes lessons learned and good practices, highlighting needs and priorities, and identifying opportunities for cooperation and alignment of support to build resilience to the adverse effects of climate change. It is also enhancing communities of practice engaged in the adaptation effort.

Adaptation Partnership

Website: <http://www.adaptationpartnership.org/>



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Foreword

In response to a growing awareness of the potential adverse effects of climate change and the particular vulnerability of developing countries to this process, a significant increase in adaptation action has been witnessed in recent years in Africa, Asia-Pacific, and Latin America and the Caribbean. These actions are providing opportunities to: increase understanding of the implications of climate change for the achievement of development objectives in the near and long terms; identify strategies and measures that can be taken to reduce climate vulnerability; communicate and build awareness of climate risks, opportunities and potential solutions; and begin implementing actions on the ground that build capacity to adapt to a changing climate.

Although the recent global upsurge in adaptation action is a welcome development, the emergence of a diverse array of efforts initiated by multiple actors within numerous jurisdictions has the potential to create confusion, lead to duplication of effort and limit the potential for sharing good practice guidance based on past efforts. Enhanced coordination among expanding networks of adaptation actors is needed to ensure resources are deployed quickly and effectively. To this end, the Adaptation Partnership was formed in 2010. Chaired by Costa Rica, Spain and the United States, the goal of the Adaptation Partnership is to encourage effective adaptation by serving as an interim platform to catalyze action and foster communication among the various institutions and actors engaged in the effort to scale up adaptation and resilience around the world.

Toward this goal, the Adaptation Partnership initiated a Review of Current and Planned Adaptation Action in the fall of 2010. Its purpose is to provide a baseline understanding of who is doing what on adaptation in three developing regions—Africa, Asia-Pacific, and Latin America and the Caribbean—and in priority adaptation sectors. Based on available resources, it seeks to provide a rapid assessment of: priority interests and adaptation needs; efforts by governments to support adaptation through policy and planning; the scope of international support for adaptation efforts in different countries and sectors; and potential gaps in adaptation efforts at the country and regional levels.

This document is one of 12 regional profiles completed as a contribution to the Review of Current and Planned Adaptation Action in Africa, Asia-Pacific, and Latin America and the Caribbean. It presents a review of current and planned adaptation action in East and Southeast Asia. For the purpose of this review, East Asia is defined as including China, the Democratic People's Republic of Korea (DPRK) and Mongolia. Southeast Asia is defined as including Cambodia, Indonesia, Lao People's Democratic Republic (Lao PDR), Malaysia, Myanmar, Philippines, Thailand, Timor-Leste and Viet Nam. Reflecting the relatively small number of countries within East Asia, adaptation action in these two regions is collectively presented; however, where pertinent, differences between the two regions are noted. The review first provides an overview of adaptation action at a regional level, highlighting commonalities and differences among East and Southeast Asian countries. The



appendices that follow discuss adaptation action taking place in each of the 12 countries in the region.



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Abbreviations and Acronyms

ACCI	ASEAN Climate Change Initiative
ACIAR	Australian Centre for International Agricultural Research
ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Center
AIT	Asian Institute of Technology
APN	Asia-Pacific Network for Global Change Research
AP-Net	Asia-Pacific Adaptation Network
APFIC	Asia-Pacific Fishery Commission
ARNAP	Adaptation Research Policy Network for Asia and the Pacific
ASEAN	Association of Southeast Asian Nations
AusAID	Australian Agency for International Development
CAN	Climate Action Network
CIA	Central Intelligence Agency
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CTI	Coral Triangle Initiative
DPRK	Democratic People's Republic of Korea
DANIDA	Danish International Development Agency
EAS	East Asia Summit
FAO	Food and Agriculture Organization of the United Nations
FPC	Foreign Press Center (Viet Nam)
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMSARN	Greater Mekong Subregion Academic and Research Network
ICARDA	International Center for Agricultural Research in the Dry Areas
ICEM	International Centre for Environmental Management
ICIMOD	International Centre for Integrated Mountain Development
IFAD	International Fund for Agriculture Development
IGES	Institute for Global Environmental Strategies
IPCC	Intergovernmental Panel for Climate Change
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute
JIID	Japanese Institute of Irrigation and Drainage
Lao PDR	Lao People's Democratic Republic
LDC	Least Developed Country
Lux-Development	Luxembourg Agency for Development Cooperation
MFf	Mangroves for the Future
MNRE	Ministry of Natural Resources and Environment
MRC	Mekong River Commission
MSTE	Ministry of Science, Technology and Environment
NACA	Network of Aquaculture Centres in Asia-Pacific



NAPA	National Adaptation Programme of Action
NOAA	National Oceanic and Atmospheric Administration (United States)
OECD	Organisation for Economic Co-operation and Development
SEI	Stockholm Environment Institute
SENSA	Swedish Environmental Secretariat for Asia
SIDA	Swedish International Development Cooperation Agency
SLU	Swedish University of Agricultural Sciences
START	Global Change System for Analysis, Research and Training
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNSD	United Nations Statistical Division
UNU	United Nations University
USDS	United States Department of State
WHO	World Health Organization
WRI	World Resources Institute
WWF	World Wildlife Fund / Worldwide Fund for Nature



Executive Summary

Growing understanding of the need to adapt to the impacts of climate change has led to a significant rise in ongoing and planned adaptation action in the developing regions of the world, including East and Southeast Asia. This upsurge in climate change adaptation action is a welcome occurrence, but enhanced coordination among expanding networks of adaptation actors is needed to ensure resources are deployed quickly and effectively. Responding to this concern, a review of current and planned adaptation action in East and Southeast Asia was undertaken by the Adaptation Partnership¹ between October 2010 and April 2011. This review covered the East Asian countries of China, Democratic People's Republic of Korea (DPRK) and Mongolia, and the Southeast Asian countries of Cambodia, Indonesia, Lao People's Democratic Republic (Lao PDR), Malaysia, Myanmar, Philippines, Thailand, Timor-Leste and Viet Nam.² The review identified priority adaptation needs, efforts by governments to support adaptation through policy and planning, the scope of international support for adaptation efforts in different countries and sectors, and potential gaps in adaptation efforts at the country and regional levels. This review of adaptation action in East and Southeast Asia is one of 12 profiles covering regions of Africa, Asia-Pacific, and Latin America and the Caribbean completed by the Adaptation Partnership.

To assess the level of adaptation action in East and Southeast Asia, a desk-based review of Internet sources and relevant documentation was undertaken. The content of these sources was assessed in relation to a set of parameters established to focus the review's scope and ensure consistency across regions. Notably, it examines *discrete* adaptation actions, or "policies, programs and projects designed and implemented specifically to address the current and projected impacts of climate change." The review therefore presents only a portion of the breadth of efforts underway to reduce the vulnerability of developing countries to the impacts of a changing climate. In particular, it does not capture the array of development activities that are increasing the adaptive capacity of communities and countries. As well, within the review, adaptation actions have been deemed to be "current" if they were ongoing or completed in 2009 or later. As such, the review does not include projects completed prior to 2009 that may have contributed to building local and national adaptive capacity. The review also does not offer judgment of the effectiveness of actions taking place, only which actions are underway. In addition, reflecting the desk-based nature of the review, it is acknowledged that the content is biased toward identification of large-scale projects funded by international development assistance organizations. As such, small-scale projects that meet the review's definition of adaptation action, particularly those occurring at the community level, are not fully represented within the review.

¹ Formed in 2010, the Adaptation Partnership is chaired by Costa Rica, Spain and the United States. Its goal is to encourage effective adaptation by serving as an interim platform to catalyze action and foster communication among the various institutions and actors engaged in the effort to scale up adaptation and resilience around the world.

² These two regions were considered simultaneously due to their geographic closeness and the small number of developing countries in the region of East Asia.

Climate Vulnerability

The region of East and Southeast Asia is characterized by considerable climatic diversity—from the tropical archipelagic countries of Indonesia and Philippines, to the tropical monsoon climates of Cambodia, Lao PDR, Malaysia, Myanmar, Thailand and Viet Nam, to the more continental and arid climates of Mongolia and western China (USDS, 2011). A rise in temperatures of 0.1° to 0.3°C per decade between 1951 and 2000 has been observed in the region (Cruz et al., 2007). This trend is projected to continue during this century. In East Asia, temperatures could rise by at least 3°C (based upon the low emissions B1 scenario) and potentially up to almost 7°C (based upon the high emission A1F1 scenario) by the 2070 to 2099 time period. In Southeast Asia, temperature increases are projected to be more moderate, rising by 1.87° to 3.92°C by the 2070 to 2099 time period.

Climate change is also projected to lead to more variable and intense rainfall patterns throughout the region. By the period of 2080 to 2099, mean annual rainfall is projected to increase by 9 per cent in East Asia and 7 per cent in Southeast Asia. However, large differences remain between the projections generated by different models (Christensen et al., 2007).³ Uncertainty remains regarding how the characteristics of extreme weather events may change in the future in East and Southeast Asia, due to the complexity associated with modeling their occurrences. Increasing variability of rainfall patterns is already being measured in China, Indonesia and the Philippines (Cruz et al., 2007). While there is a great degree of uncertainty to sea-level rise projections, models suggest that a global rise of between 0.18 to 0.38 meters on the low end to 0.25 to 0.6 meters on the high end could occur during this century (Meehl et al., 2007). Such a rise would be devastating to a region with many low-lying islands and coastal areas, including the densely populated Mekong Delta.

Identified Adaptation Needs and Priorities

Water resources, agriculture and coastal resource management (except for the landlocked countries of Lao PDR and Mongolia) are areas of adaptation need and priority identified by all countries in the region. Additional priorities identified by more than half of all countries in the region are: disaster risk reduction, particularly with respect to floods, droughts and—in Southeast Asia—typhoons; forestry; terrestrial ecosystems; health; policy integration; and research and the improved provision of meteorology information. Some of the specific needs and priorities include:

- *Water resources:* Much of East and Southeast Asia already faces water stress (IFAD, 2009) and this situation is projected to be exacerbated by greater glacial melt in Mongolia and China, intrusion of saltwater into freshwater resources in coastal areas, and potential modification of the Mekong River system. Actions suggested in response by countries in the region include strengthening water conservation and water efficiency practices, improving irrigation practices, improving flood monitoring, forecasting and management capacity, increasing water availability through better water allocation procedures and construction of reservoirs,

³ Precipitation projections based on averages generated by 21 global models in the multi-model data set for the A1B scenario (a medium-high emissions scenario) and assessed in comparison to a base time period of 1980 to 1999 (Christensen et al., 2007).



restoring vegetation cover and controlling soil erosion, and protecting water resources from pollution.

- *Agriculture*: Throughout East and Southeast Asia, agriculture is expected to be heavily affected by a combination of higher temperatures, greater variability in rainfall patterns, altered growing seasons, extreme weather events, sea-level rise and associated impacts on water availability and quality. Measures proposed in response include increased education and capacity building for farmers, identification of climate resilient crops, introduction of climate resilient cropping techniques, diversification of products, and better access to meteorological information that can assist in weather forecasting and planting schedules.
- *Coastal resource management*: Although uncertainty remains regarding the degree to which sea levels will rise, storm surges will be affected and tropical cyclones might be altered by climate change, it is expected that these changes will adversely impact the coastal regions of East and Southeast Asia. Adaptation measures identified to reduce this vulnerability include capacity building of local residents, introduction of Integrated Coastal Zone Management, improved coastal hazard management, ecosystem protection, improved aquaculture, and land use planning and infrastructure development that accounts for sea-level rise.

Policy Level Actions

Considerable variation in policy formation, strategy development and planning for adaptation exists within East and Southeast Asia. Some countries, namely Myanmar and Timor-Leste, have not yet completed their first National Communications to the United Nations Framework Convention on Climate Change (UNFCCC). These two least developed countries (LDCs) are also continuing to develop their National Adaptation Programmes of Action (NAPAs); the other two LDCs in the region, Cambodia and Lao PDR, have completed theirs. Other countries, such as China and Viet Nam, have relatively coherent plans for meeting their adaptation needs. As a country's needs are heavily related to water resources, coastal zones and agriculture, most plans focus on these sectors.

There are a number of regional forums in which adaptation is being addressed, including the Mekong River Commission (MRC)⁴ and the Association of Southeast Asian Nations (ASEAN).⁵ The MRC is charged with the shared management of the Mekong River, which traverses between its member countries and serves as a vital regional resource. The MRC's Climate Change and Adaptation Initiative addresses concerns related to rainfall patterns, extreme weather events, extreme temperatures, sea-level rise, displaced persons and changes in river and tributary flow. The ASEAN takes a broader view, looking to develop a collaborative regional approach on climate change. Activities planned and underway include the development of an ASEAN Climate Change Initiative, promotion of shared knowledge on adaptation, regional strategies on capacity building, and development of climate scenarios.

⁴ Membership: Cambodia, Lao PDR, Thailand and Viet Nam. Dialogue Partners: China and Myanmar.

⁵ Membership: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Thailand and Viet Nam.



Projects and Programs That Support Adaptation

The number and type of adaptation projects and programs underway in East and Southeast Asia also greatly varies. At the national level, some countries do not appear to have any projects underway solely designed to meet their adaptation needs (Malaysia, Myanmar and Timor-Leste), while others have 10 or more projects underway (Indonesia and Viet Nam). The majority of projects focus on capacity building (particularly in LDCs), policy formulation and vulnerability assessment; a smaller percentage is engaged in activities such as pilot implementation or infrastructure development. The vast majority of projects at the country level are in the areas of agriculture, water and coastal zone management.

Several regional level projects are underway that involve a few to nearly all East and Southeast Asian developing countries. Some countries are more engaged in regional projects than others, specifically, Cambodia, Indonesia, Lao PDR, the Philippines, Thailand and, in particular, Viet Nam. The cooperation between Mekong River countries, such as through the MRC, has led to a great deal of joint project-level action in this sub-region. Current regional adaptation projects have a large focus on priority sectors of agriculture and water/coastal management. Capacity building, as well as policy formation and integration, are a major focus of project activities.

Bilateral donors active in the region include Australia, Denmark, France, Germany, Japan, Norway, Sweden, the United Kingdom and the United States. Their funding is complemented by support from the Asian Development Bank, the Global Environment Facility, Least Developed Countries Fund, Red Cross/Red Crescent, Special Climate Change Fund, United Nations Development Programme, World Bank and the World Health Organization.

Adaptation Communities of Practice

There are a number of communities of practice active in the region, notably, the Asia-Pacific Adaptation Network; the Adaptation Knowledge Platform; the Adaptation Research Policy Network for Asia and the Pacific; Asian Cities Climate Change Resilience Network; and the Knowledge Center on Climate Change Adaptation in Agriculture and Natural Resource Management in Southeast Asia. These networks provide an opportunity for greater knowledge sharing, joint research and capacity building. Some are also involved in advocacy, policy and planning, and direct implementation of adaptation measures.

Gap Analysis

Many of the countries in East and Southeast Asia have been involved in preparing for climate change for more than a decade and continue to pursue a breadth of adaptation action. Through forums such as the MRC and the ASEAN, countries are beginning to address regional concerns at the political level, in addition to common participation in regional adaptation projects and programs. At the national level, the majority of countries have taken the preliminary steps of identifying adaptation needs and sectors of priority—thereby providing a starting point for adaptation action.



While positive, the adaptation needs within the region are still large. In particular, there are considerable disparities in the region regarding the level of adaptation action taking place. While some countries are among the most active in the world, others have barely begun to develop the policies and projects needed to help them adapt to the impacts of climate change. This disparity stems from a combination of circumstances, including capacity limitations, different political priorities and the unique political situations of DPRK and Myanmar. Further investment in regional initiatives and communities of practice, with the distinct goal of inclusion of countries where actions are fewer and capacity for action is lower, could be worthwhile to bring greater balance of action and enable a more collective climate change response.

In the future, greater attention may need to be given to:

- *Transition from capacity building to tangible implementation* – across the region, but particularly in the LDCs, capacity building, research, knowledge sharing and policy development remain the primary focus of current activities. While these efforts are necessary to laying the foundation for adaptation, greater focus on the implementation of tangible measures is needed going forward.
- *Coastal zone management and marine protection* – the focus of a number of current initiatives, greater attention to these issues could be directed to areas outside of the Mekong River Basin.
- *Forestry* – while identified as a priority area of adaptation by all Southeast Asian countries, the number of current initiatives directed toward this focus area appear to be limited.
- *Gender* – attention of the differential impacts of climate change on women and men is not a major consideration in the vast majority of adaptation policy and programming in the region and could be given greater emphasis in the future.
- *Human health* – while identified as a priority area by the majority of countries, the number of regional projects focused on this issue is limited and even fewer country-focused projects are underway.
- *Urban adaptation* – several regional initiatives focused on adaptation needs in urban areas have been initiated in recent years. However, given the rapid urbanization occurring in the region and the size of the populations involved, greater attention to this issue may be warranted.

Review of Current and Planned Adaptation Action: East and Southeast Asia

1.0 Introduction

East and Southeast Asia is a region of great diversity. It includes the East Asian countries China, the Democratic People’s Republic of Korea (DPRK) and Mongolia;⁶ and the Southeast Asian countries of Cambodia, Indonesia, Lao People’s Democratic Republic (Lao PDR), Malaysia, Myanmar, Philippines, Timor-Leste, Thailand and Viet Nam. As such, geographically, the region includes island states such as the Philippines and Indonesia; states with significant coastlines such as Malaysia, Thailand and Viet Nam; and landlocked states such as Lao PDR and Mongolia. Country sizes range from Timor-Leste, with an area of 14,874 square kilometers, to China—the third largest country in the world—covering an area of nearly 9.6 million square kilometers (CIA, 2011). The area is very heavily populated; the entire region contains four of the 14 most populated countries of the world and accounts for approximately 28 per cent of the world’s population. Still, the population of China, at over 1.336 billion people, more than doubles the population of all other countries in the region combined—a total of just over 637 million (CIA, 2011). By comparison, the smallest country by population is Timor-Leste, which is home to just over 1 million people (CIA, 2011).

Significant economic disparities also exist in the region. Four countries in

Figure 1: Map of East and Southeast Asia



Source: CIA, 2004.

⁶ In accordance with the United Nations Statistical Division’s classification of countries, East Asia is defined as including China, the Hong Kong Special Administrative Region (China), the Macao Special Administrative Region (China), the DPRK, Japan, Mongolia and the Republic of Korea (UNSD, 2010). Of these countries, only China, DPRK and Mongolia are recognized as Parties to the UNFCCC and are eligible to receive financial support from the OECD (OECD, 2009).



East and Southeast Asia are classified as among the least developed countries (LDCs) of the world: Cambodia, Lao PDR, Myanmar and Timor-Leste. Viet Nam and DPRK are classified as Low Income countries; China, Indonesia, Mongolia, Philippines and Thailand are classified as Lower Middle Income countries; and only one, Malaysia, is classified as an Upper Middle Income country.

These geographic, population and economic differences influence the vulnerability of East and Southeast countries to the impacts of climate change. To better understand these countries' efforts to prepare for and respond to climate change, this report provides a rapid review of current and planned adaptation action within the region. Based on available resources, it examines identified priority adaptation needs, efforts by governments to support adaptation through policy and planning, the scope of international support for adaptation efforts in different countries and sectors, and potential gaps in adaptation efforts at the country and regional levels. The main body of the report provides an overview of adaptation action at the regional level, highlighting commonalities and differences between Cambodia, China, DPRK, Indonesia, Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, Timor-Leste, Thailand and Viet Nam. In the appendices that follow, adaptation action taking place in each of these countries is discussed.

2.0 Methodology

A rapid review of current and planned adaptation action in East and Southeast Asia—one that gives attention to policies, programs and projects at the national and regional levels—presents a considerable task given the breadth of actions that can and are being taken to reduce vulnerability to the short-, medium- and long-term impacts of climate change. Prior to undertaking this review, it therefore was necessary to clarify the terms that would be used within it and to establish a set of parameters to limit its scope. This section provides an understanding of the research parameters established for this rapid review and the process by which the information it contains was gathered. These guidelines are presented to help clarify what the study does and does not aim to achieve.

Definition of “Adaptation Action”

Adaptation is generally defined as being an “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.”⁷ Given the breadth of actions that may be taken and that are in keeping with this definition, a critical first step in initiating the rapid review was determining the definition of “adaptation action” to be used within it.

This process was influenced by the outcomes of a review of 135 “adaptation” activities undertaken by McGray, Hammill and Bradley (2007) that led to identification of three different models of adaptation activity:

⁷ UNFCCC glossary of climate change acronyms, http://unfccc.int/essential_background/glossary/items/3666.php.



- *Serendipitous adaptation* – “activities undertaken to achieve development objectives [that] have outcomes that incidentally may also support adaptation” (McGray et al., 2007 p. 13). This type of adaptation reflects the widely acknowledged intimate linkage between sustainable development and building capacity to adapt to the impacts of climate change. Specifically, sustainable development can enhance adaptive capacity by strengthening institutions, promoting sound management of natural resources, improving health and education systems, promoting gender equity and fostering economic growth.
- *Climate-proofing of development efforts* – where activities are “added to an ongoing development initiative to ensure its success under a changing climate. In these cases, adaptation is seen as a means to a development end” (McGray et al., 2007, p. 13).
- *Discrete adaptation* – where “adaptation to climate change is the primary objective of a project or initiative. From the beginning, implementers and funders of these efforts have climate change in mind” (McGray et al., 2007, p. 13).

Recognizing the critical role of “serendipitous” adaptation and climate-proofing of development efforts in fostering adaptation to climate change in developing countries while simultaneously reviewing all three types of adaptation activities would be unmanageable. This study therefore focuses on an examination of discrete adaptation activities. Adaptation action within the review is therefore defined as “*policies, programs and projects designed and implemented specifically to address the current and projected impacts of climate change.*” As such, specific reference has been made to supporting adaptation to climate change, and/or climate risk reduction in the objectives and/or rationale of each policy, program or project included in the study.

Due to the selection of this definition, the review automatically presents a narrow snapshot of the wide breadth of activity (often funded through official development assistance⁸) that is helping developing countries build adaptive capacity and reduce their vulnerability to the impacts of climate change. The review therefore should not be viewed as fully representative of the entirety of adaptation action occurring in developing countries—nor of the degree to which vulnerability reduction is occurring in the countries and regions profiled. Rather, the review aims to contribute to understanding of the identified adaptation needs and priorities of different countries and regions and the degree to which discrete adaptation activities are contributing to meeting these needs.

Definition of “Current” Action

To further focus the study, adaptation actions have been deemed to be “current” if they were ongoing or completed in 2009 or later. As such, the review does not include a range of projects completed prior to 2009 that may have significantly contributed to building local and national adaptive capacity. This observation is particularly true of adaptation action in the Caribbean and the Pacific; reflecting the early interest and commitment of Small Island Developing States to

⁸ In 2010, official development assistance totaled US\$128.7 billion (OECD, 2011)—a level of funding that significantly outstrips that which is presently provided in support of adaptation to climate change. See, for example, SEI and UNEP (2010).



understanding and reducing their vulnerability to the impacts of climate change, countries in these regions began to explore adaptation concerns as early as the late 1990s.

While the review's definition of "current" adaptation action limits the scope of the study, the volume of discrete adaptation initiatives has accelerated in recent years, as reflected in the following trends:

- Financing for approved projects through the Least Developed Countries Fund has risen from nearly US\$24 million in 2008 to US\$177 million as of mid-2011.⁹
- Adaptation financing through the Special Climate Change Fund has increased from 22 projects worth nearly US\$90.73 million in 2009 (GEF, 2009) to 31 projects approved for financing in the amount of US\$128 million as of mid-2011.¹⁰
- Financing for adaptation by four Bilateral Financial Institutes increased by 31 per cent from US\$3,029 million in 2008 to US\$3,963 million in 2009 (SEI & UNEP, 2010).

The review therefore reflects the growing number of adaptation efforts initiated in recent years.

Identification of Projects and Programs

A wide range of climate adaptation related initiatives are underway throughout the world—covering the gamut from original scientific research that informs our understanding of current and future climate patterns, to capacity building and knowledge sharing, to the adoption of new planting practices by farmers, to the building of infrastructure that anticipates future climatic extremes. While acknowledging this diversity, to better achieve the specific objectives of the review, the review has focused on time-bounded projects that support preparation for and/or implementation of practical adaptation actions. As such, the review does not include projects and programs that focus on:

- Conducting original scientific research that enhances knowledge of climate change impacts and development of the tools and techniques for reducing vulnerability
- Ongoing, long-term monitoring efforts (whether climatic or socio-economic) that are needed to inform decision making
- Stand-alone capacity building and knowledge sharing workshops, conferences and training programs
- Activities solely related to participation in the ongoing international climate change negotiations

As well, the review only captures adaptation action financed through international development assistance; it does not capture adaptation efforts financed solely by national governments. This focus reflects the original impetus for conducting the review—the current scaling up of adaptation action and the potential for duplication of effort and limited sharing of good practice—and the challenge of rapidly identifying nationally funded adaptation projects. This parameter is particularly important

⁹ GEF, Least Developed Countries Fund website, <http://www.thegef.org/gef/ldcf>, retrieved September 2011.

¹⁰ GEF, Special Climate Change Fund website, <http://www.thegef.org/gef/sccf>, retrieved September 2011.



for countries such as Brazil and China, whose governments are engaged in self-driven and self-funded adaptation efforts that are not included within this review.

Data Collection

Projects and programs were primarily identified through a desk based review of the web sites of United Nations agencies, bilateral development agencies, multilateral financial institutions, international research organizations and non-governmental organizations. Reflecting the desire for a rapid review, a comprehensive examination of all of these organizations was not undertaken; rather an emphasis was placed on capturing initiatives involving organizations generally recognized as being actively engaged in fostering climate change adaptation. Additional information regarding current and planned adaptation action was gathered through an examination of relevant reports.

The process by which data were gathered for inclusion in the review has biased its content. Notably, it is highly likely that a number of small-scale projects meeting the review's definition of adaptation action, particularly those occurring at the community level, have not been captured. As well, the accuracy of the data captured in the review significantly depends upon the accuracy and completeness of the Internet resources used.

Classification of projects

To support analysis of the degree to which ongoing projects are addressing the priority adaptation needs of developing countries, identified initiatives have been classified in relation to two general characterizations—their sector or areas of focus and the types of activities being implemented. For the sectors or areas in which projects are supporting adaptation action, a classification system comprised of the following 14 macro project categories was developed: food, fiber and forests; ecosystems; freshwater resources; oceans and coastal areas; disaster risk management; migration and security; gender; business; infrastructure; human settlements; human health; climate information services; governance; and multi-sectoral. These macro project categories were then divided further to provide a more detailed picture of the types of projects identified through the review. For example, the macro project category of “food, fiber and forests” was sub-divided into agriculture, pastoralism, forestry and fire management. Current adaptation projects were then labeled in relation to one or more of these sub-categories.

For the types of projects being implemented, a shorter list of categories was developed. Current adaptation projects have been assessed in relation to the degree they support research, assessment, capacity building, knowledge communication, policy formation and integration, field implementation and community-based adaptation. A fuller discussion of the project classification system used during this review is provided at the beginning of the appendices.

Gender Analysis

Within the review, assessments of the degree to which gender-sensitive adaptation actions are underway in different countries and regions has focused solely upon the extent to which addressing

gender inequalities is a specified objective of projects and programs. The review did not assess the degree to which individual projects and programs may or may not have integrated gender issues into their detailed design.¹¹ The gender analysis provided in the review therefore should not be viewed as fully representative of the degree to which current adaptation actions are gender-sensitive.

Assessment of the Effectiveness of Adaptation Action

It should also be noted that this rapid review does not assess the quality or effectiveness of the project and programs it includes. The review therefore does not provide a basis upon which to judge the degree to which completed and ongoing projects have either achieved their stated objectives and/or made a positive contribution to increasing the ability of a country or region to adapt to the impacts of climate change. It only provides an indication of the intended outcomes of the identified initiatives, the type of action being taken (e.g., capacity building, policy integration, implementation of practical actions) and their areas of focus (e.g., agriculture, water, health).

Scientific Information

Synopsis of projected changes in climate in different countries and regions included in the review are based primarily upon the content of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) and national assessment reports (e.g., National Communications). New scientific analysis published since the completion of these reports may have both refined and presented revised understandings of the projected consequences of climate change in different regions of the world. The climate projections sections of the review therefore should be viewed as indicative of anticipated trends in climatic change at the time of publication of the cited reports.

Qualification of Degree of Adaptation Action

In order to evaluate and consistently describe the relative level of adaptation activity occurring by country in each region, a simple benchmarking process has been applied across the review. Using a scale from zero to X, where X is equivalent to the number of current adaptation projects underway in the country in a particular region with the largest number of current projects,¹² the scale was divided into five equivalent quintiles. Each quintile was then assigned a descriptor as follows:

- “Very Low” level of adaptation action = 0 to 20 per cent of X
- “Low” level of adaptation action = 21 to 40 per cent of X
- “Moderate” level of adaptation action = 41 to 60 per cent of X
- “High” level of adaptation action = 61 to 80 per cent of X
- “Very High” level of adaptation action = 81 to 100 per cent of X

¹¹ For example, a project may have as its objective building resilience in the agriculture sector, targeting farmers in general. As no reference to gender is made in the project’s objectives, it would not be considered a gender-focused adaptation action within the review. This finding would stand even if the detailed design of the project includes having set targets to ensure the involvement of women farmers.

¹² In other words, the country in the region with the highest total number of current adaptation projects was identified and used as a benchmark against which to assess performance in all other countries.



All countries in the region were allocated to one of these quintiles based on the total number of current adaptation projects and programs identified through the review.

This benchmark approach enabled a standard methodology to be applied across all 12 regions examined in the Review of Current and Planned Adaptation Action while also recognizing their individual differences. (For example, the smaller geographies and populations of Small Island Developing States suggest that hosting, for instance, 15 projects might reflect a higher level of activity than what might be possible in other regions of the world in which countries are larger and more populous). However, this methodology does not assess the financial size of individual projects; small projects are given equal weight in comparison to large projects. Within individual regions, this approach also does not account for a country's comparative geographic size, population, level of development and other factors that may affect its level of adaptation activity. These contextual influences are therefore discussed within individual country profiles and regional comparisons.

Countries and Regions Incorporated into the Review

To identify countries to be included in the Review of Current and Planned Adaptation Action in Africa, Asia-Pacific and Latin America and the Caribbean and to determine their regional allocations, the following criteria were considered:

- Inclusion only of non-Annex I Parties to the United Nations Framework Convention on Climate Change (UNFCCC)
- Allocation by region in accordance with the classification system used by the United Nations Statistics Division (UNSD, 2010)
- The Organisation for Economic Co-operation and Development's Development Assistance Committee's list of countries eligible to receive official development assistance in 2009 and 2010 (OECD, 2009)

Definition of "Communities of Practice"

Communities of practice traditionally have been defined as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger, 2006). These groups are usually defined by a shared domain of interest and relationships that enable mutual learning. Broadly speaking, two different types of communities of practice with an interest in adaptation to climate change may be identified:

- Established communities of practice, usually defined by a sector or issue, that have begun to integrate consideration of adaptation needs and priorities into their existing knowledge sharing efforts (e.g., a community of foresters discussing methods of integrating projected climate risk into their management planning)
- New communities of practice established specifically due to a shared interest in adaptation to climate change (e.g., community-based adaptation experts)

Of these two broad groupings, the review gives attention only to communities of practice that have originated due to their shared interest in adaptation to climate change. This includes networks of

non-governmental organizations actively engaged in sharing information regarding climate change. This focus reflects the greater challenge of identifying and assessing the degree to which the vast array of traditional associations and networks have begun to integrate adaptation concerns into their discussions.

Anticipated Reader

Finally, it should be noted that the review has been written in a manner that assumes that its readers will have a basic understanding of adaptation to climate change. As such it does not provide definitions of terms such as “National Communication” or “National Adaptation Programmes of Action.” Nor are explanations of key concepts included, such as “adaptive capacity,” “mainstreaming,” the relationship between climate change and development, or the challenges associated with the implementation of adaptation actions at the policy and program levels.

3.0 Climate Projections

Reflecting its vast area and diverse geography, a range of climates are found in East and Southeast Asia. Tropical monsoon climates are found in much of the continental countries of Southeast Asia—Cambodia, Lao PDR, Malaysia, Myanmar, Thailand and Viet Nam—with rainy seasons broadly between May and November and dry seasons from November to April. In the archipelagic countries of Southeast Asia, the climate is similarly tropical. Reflecting their more northerly locations and, for China and Mongolia, extension into the interior of Asia, East Asian countries have a climate that is generally more continental, with cold winters followed by hot summers. Much of the East Asia region is arid and semi-arid (USDS, 2011).

Rising temperatures have been measured across the region, with a general increase of 0.1° to 0.3°C per decade between 1951 and 2000. China has experienced a marked warming period over the past 50 years (Cruz et al., 2007). This trend of rising temperatures is projected to continue over the next century.

As outlined by the IPCC, Global Circulation Models project that temperatures in the East Asian region will rise by more than 2°C by mid-century and by at least 3°C by the 2070 to 2099 time period (based upon the B1 emissions scenario).¹³ At the high end, projections suggest that temperatures could rise more than 4°C by mid-century and almost 7°C by the 2070 to 2099 time period (based upon the A1F1 emissions scenario).¹⁴ In Southeast Asia, temperatures are also projected to continue

¹³ A low emissions scenario of the IPCC’s 2001 Special Report on Emissions Scenarios, the B1 emissions scenario, assumes a future in which there is “rapid change in economic structures toward a service and information economy, with reductions in material intensity and the introduction of clean and resource-efficient technologies. The emphasis is on global solutions to economic, social and environmental sustainability, including improved equity, but without additional climate initiatives” (IPCC, 2007, p. 18).

¹⁴ A high emissions scenario, the A1F1 scenario, describes a future in which there is “very rapid economic growth, global population that peaks in mid-century and declines thereafter, and the rapid introduction of new and more efficient

to rise in the future, but the degree of changes will not be as pronounced. As presented in Table 1, projections suggest that temperatures will rise by 1.30° to 2.32°C by mid-century and 1.87 ° to 3.92°C by the 2070 to 2099 time period.

Coupled with temperature increases are projections for increases in the amount and variability of rainfall occurring in East and Southeast Asia. East Asian countries are anticipated to experience a mean annual increase in precipitation of 9 per cent by the period of 2080 to 2099, with little seasonal difference; in Southeast Asia, the mean annual increase could be 7 per cent by 2080 to 2099. However, large differences remain among the projections generated by different models (Christensen et al., 2007).¹⁵ More variable rainfall patterns have already been noticed in China, Indonesia and Philippines, coupled with an increasing tendency across the region in the intensity and/or frequency of extreme weather events, particularly in Southeast Asia (Cruz et al., 2007).

Table 1: Projected changes in surface air temperature and precipitation in East Asia

Season	Projected Temperature Change (in °C) relative to 1961-1990					
	2010 to 2039		2040 to 2069		2070 to 2099	
	B1	A1F1	B1	A1F1	B1	A1F1
DJF	1.5	1.82	2.81	4.18	3.88	6.95
MAM	1.5	1.61	2.67	3.81	3.69	6.41
JJA	1.31	1.35	2.43	3.18	3.00	5.48
SON	1.24	1.31	2.24	3.16	3.04	5.51
Projected Precipitation Change (in %) relative to 1961-1990						
DJF	5	6	10	13	15	21
MAM	2	2	7	9	10	15
JJA	3	2	5	8	8	14
SON	1	0	2	4	4	11

Note: Projections based on a comparison of two IPCC standard scenarios—the lowest future emission scenario trajectory (B1) and the highest future emission scenario trajectory (A1F1)—and in comparison to a base period of 1961 to 1990. Projections represent an average over the area of 20°N to 50°N and 100°E and 150°E. Temperature projections based on use of Atmosphere-Ocean General Circulation Models.

Source: Derived from Cruz et al., 2007, p. 480.

Table 2: Projected changes in surface air temperature and precipitation in Southeast Asia

Season	Projected Temperature Change (in °C) relative to 1961-1990					
	2010 to 2039		2040 to 2069		2070 to 2099	
	B1	A1F1	B1	A1F1	B1	A1F1
DJF	0.72	0.86	1.32	2.25	2.02	3.92
MAM	0.80	0.92	1.34	2.32	2.04	3.83
JJA	0.74	0.83	1.30	2.13	1.87	3.61
SON	0.75	0.85	1.32	1.32	1.90	3.72
Projected Precipitation Change (in %) relative to 1961-1990						
DJF	1	-1	4	2	4	6
MAM	0	0	3	3	5	12
JJA	0	-1	1	0	1	7
SON	0	-2	1	-1	2	7

Note: Projections based on a comparison of two IPCC standard scenarios—the lowest future emission scenario trajectory (B1) and the highest future emission scenario trajectory (A1F1)—and in comparison to a base period of 1961 to 1990. Projections represent an average over the area of 10°S to 20°N and 100°E and 150°E. Temperature projections based on use of Atmosphere-Ocean General Circulation Models.

Source: Derived from Cruz et al., 2007, p. 480.

technologies. Major underlying themes are convergence among regions, capacity building and increased cultural and social interactions, with a substantial reduction in regional differences in per capita income.” It also assumes a fossil-intensive technological emphasis (IPCC, 2007, p. 18).

¹⁵ Precipitation projections based on averages generated by 21 global models in the multi-model data set for the A1B scenario (a medium-high emissions scenario) and assessed in comparison to a base time period of 1980 to 1999 (Christensen et al., 2007).

Given the many low-lying coastal areas and island states found in Southeast Asia, as well as the extensive coastlines of China and DPRK, the impact of climate change on sea levels is a clear concern in the region. IPCC emissions scenarios present a range of sea-level rise projections based on various emissions scenarios and resulting from thermal expansion of the oceans and land ice changes. On one end of the spectrum, under the B1 (low) emissions scenario, global sea levels are expected to rise from between 0.18 to 0.38 meters over the course of this century. On the opposite end of the spectrum, the (high) A1F1 emissions scenario projects a global sea-level rise of between 0.25 and 0.6 meters over the same time period. There is still a significant amount of uncertainty in these projections, as records of sea-level rise remain relatively short and there are uncertainties relating to the loss of land ice (Meehl et al., 2007).¹⁶ These changes will very likely cause significant loss of coastal ecosystems, greater coastal erosion, and intrusion of seawater into freshwater resources in some of the most heavily populated areas in the world—potentially leading to the displacement of millions of people (IFAD, 2009).

East and Southeast Asia are already subject to frequent cyclones and other extreme weather events whose patterns and intensity may be altered by climate change. Already, an increase in the frequency of strong cyclones in recent decades has been reported along the coast of China¹⁷ (Cruz et al., 2007). Uncertainty remains regarding how the characteristics of extreme weather events may change in the future in East and Southeast Asia, due to the complexity associated with modeling their occurrence. For example, while projections of the future characteristics of tropical cyclones show greater consistency when averaged globally, very low confidence remains regarding their projected changes within individual basins (Knutson et al., 2010).¹⁸ IPCC scenarios also point to a likelihood of increased runoff and flooding from rivers and oceans throughout the region by mid-century (Pachauri & Reisinger, 2007). These changes will likely put additional stress on coastal and delta populations and ecosystems already under pressure due to rapid urbanization and generally dense populations. As such, large numbers of people are likely to continue to be impacted by natural resource disturbances or extreme weather events in the future. The highly dense Mekong Delta in

¹⁶ The Vietnamese Ministry of Natural Resources and Environment projects that sea-level rises of 28 to 33 centimetres will occur by mid-century in Viet Nam and rises of 65 to 100 centimetres by the end of the century (FPC, 2009).

¹⁷ Fan and Li (2005, cited in Cruz et al., 2007 p. 476) found that of the 21 extreme storm surges that occurred between 1950 and 2004 along the coast of China, 14 occurred during the period of 1986 to 2004—suggesting that the number and intensity of strong cyclones has increased since the 1950s. In contrast, in a global study, Knutson et al. (2010) concluded that “considering available observational studies, and after accounting for potential errors arising from past changes in observing capabilities, it remains uncertain whether past changes in tropical cyclone frequency have exceeded the variability expected through natural causes.”

¹⁸ Projections of tropical cyclones are challenging due to limited historical data and because their significant fluctuations in frequency and intensity make it difficult to detect long-term trends (Knutson et al., 2010). “However, future projections based on theory and high-resolution dynamical models consistently indicate that greenhouse warming will cause the globally averaged intensity of tropical cyclones to shift towards stronger storms, with intensity increases of 2–11% by 2100. Existing modelling studies also consistently project decreases in the globally averaged frequency of tropical cyclones, by 6–34%. Balanced against this, higher resolution modelling studies typically project substantial increases in the frequency of the most intense cyclones, and increases of the order of 20% in the precipitation rate within 100 km of the storm centre” (Knutson et al., 2010, p. 157). For the Asia region, the IPCC has stated that should average sea-surface temperatures increase between 2° and 4°C relative to the current threshold temperature, projections suggest that the intensity of tropical cyclones could increase by 10 to 20 per cent (Cruz et al., 2007).

Viet Nam is singled out as one of the three mega-deltas in the world at significant risk due to climate change (Cruz et al., 2007).

Many of the countries in East and Southeast Asia have existing health, economic and natural resource concerns, and relatively minor shifts in temperature and precipitation patterns could have a very large effect on the well-being of their populations. A World Bank (2009) report listing the countries vulnerable to different projected climate change impacts found that the East or Southeast Asian region includes:

- Five countries at very high risk for floods (Cambodia, China, Lao PDR, Thailand, Viet Nam)
- Four countries at very high risk for storms (China, Mongolia, Philippines, Viet Nam)
- Four countries at very high risk for coastal sea-level rise (China, Indonesia, Myanmar, Viet Nam)

Countries without significant coastal areas are still vulnerable to the impact of changing weather patterns on agricultural production and other ecosystem-based livelihood activities, as well as greater likelihood of floods and other extreme weather events.

4.0 Needs and Priorities in East and Southeast Asia

Adaptation needs and priorities have been identified by most countries within East and Southeast Asia. The most prevalent sources for such information are National Communications to the United Nations Framework Convention on Climate Change (UNFCCC), National Adaptation Programmes of Action (NAPAs) and, where available, national level policy documents. Where national documentation is lacking, areas of concern have been identified through independent sources.

As summarized in Table 2, all East and Southeast Asian governments have identified agriculture and water resources as priority sectors in which adaptation action is needed; recognition of the connection between these two issues is also a common thread across all national and international analysis. Coastal resource management is also a common priority for all but the region's two landlocked countries (Mongolia and Lao PDR). More than half of all countries in the region also identified the following areas as additional shared priorities: disaster risk reduction, particularly with respect to floods, droughts and—in Southeast Asia—typhoons; forestry; terrestrial ecosystems; health; policy integration; and research and the improved provision of meteorology information.

Capacity building is a major need for all countries in the region, but particularly for its LDCs (Cambodia, Lao PDR, Myanmar and Timor-Leste). Many LDCs are already challenged by poor economic conditions, civil unrest, limited resources and limited technical knowledge that impedes their adaptive capacity and hinders implementation of adaptation action. Capacity is also a concern in the more advanced developing countries such as China, Indonesia and Malaysia. While basic capacity has been established, these countries are seeking to enhance their implementation capacities related to issues such as developing pilot projects, creating adaptation methodologies, changing

Table 2: Identified sectors of concern in East and Southeast Asian countries

	Coastal Zones	Water Resources	Agriculture	Health	Fisheries	Forestry	Terrestrial ecosystems	Disaster Risk Management	Public awareness	Policy integration	Research, Meteorology
China	✓	✓	✓	✓			✓				
DPRK	✓	✓	✓				✓	✓	✓	✓	✓
Mongolia		✓	✓				✓			✓	✓
Cambodia	✓	✓	✓	✓	✓	✓		✓			
Indonesia	✓	✓	✓	✓	✓	✓	✓	✓			
Lao PDR		✓	✓	✓		✓		✓	✓	✓	✓
Malaysia	✓	✓	✓			✓				✓	
Myanmar	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Philippines	✓	✓	✓		✓	✓	✓	✓		✓	✓
Thailand	✓	✓	✓			✓			✓		✓
Timor-Leste	✓	✓	✓	✓	✓	✓		✓		✓	✓
Viet Nam	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

technical specifications and addressing specific research needs. These differences demonstrate that while countries may identify similar priority sectors or desired adaptation actions, their technical and capacity needs vary greatly based on their individual levels of development. DPRK and Myanmar also face additional challenges due to their current government structures, which has led to sanctions and foreign relations barriers with several donor countries that typically support climate change efforts.

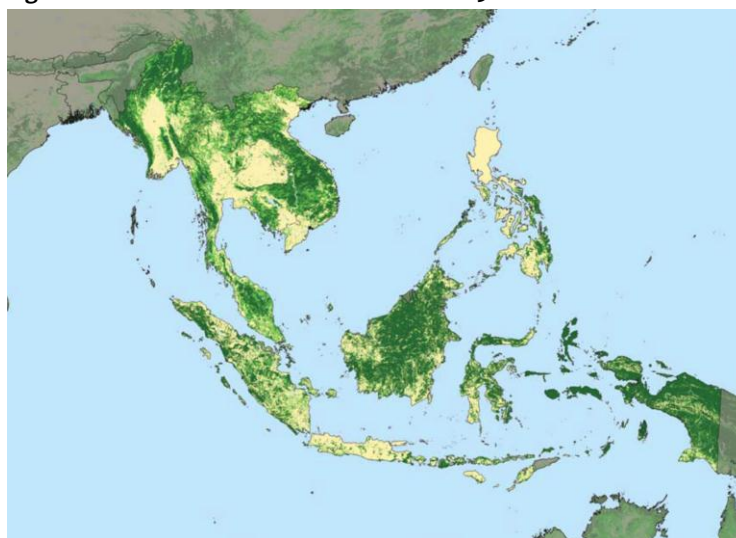
Resource-Dependent Economic Sectors: Agriculture, Fisheries, Forestry

Throughout East and Southeast Asia, agriculture is expected to be heavily affected by a combination of higher temperatures, greater variability in rainfall patterns, altered growing seasons, extreme weather events,¹⁹ sea-level rise leading to the inundation of productive agricultural lands, and associated impacts on water availability and quality. These changes—coupled with the region’s large and growing population, existing levels of land degradation and limited capacity to expand its agricultural land base—have the potential to be significant contributors to food insecurity, hunger and poverty (Cruz et al., 2007). The specific impact of climate change on agricultural productivity is uncertain and will vary by crop and local ecological and climatic factors; the results of climate change are also likely to be both damaging and beneficial. In the short term, some areas of East and

¹⁹ The East Asian countries of China, DPRK and (landlocked) Mongolia are vulnerable to extreme climate-related events such as flooding, storms and drought (World Bank, 2009) that can have significant negative impacts on food production.

Southeast Asia may experience improved agriculture production, in part because of increased rainfall. Over the long term, however, production is likely to decline due to greater stress caused by rising temperatures. Studies suggest that a rise in temperature of less than 2°C could result in agricultural losses in the Philippines, while rice yields would increase in Indonesia and Malaysia (IFAD, 2009). Overall, rice production in Asia could decline by 3.8 per cent, and in many countries production declines have already been measured (Cruz et al., 2007).

Figure 2: Forest cover in Southeast Asia in 2005



Source: FAO, 2011.

Such uncertainty particularly affects low-income rural populations that depend on traditional farming systems or use marginal land for crop and livestock production. These communities typically have limited resources to adapt to changing climate impacts.

Given its importance to local economies and in meeting food needs and the potentially adverse consequences of climate change, all countries in the region have indicated that agriculture is a major focus area for adaptation action. Many NAPAs and National Communications cite a need to: increase education and capacity building for local farmers; provide farmers with new and more effective cropping techniques; identify more diverse and adaptable crop types for planting; and provide more regular and easy access to meteorological information that can help determine planting seasons and crop potential.

Forestry is another resource sector commonly identified by countries as a priority area for taking actions that reduce vulnerability. Climate change could lead to changes in tree physiology, forest growth, fire regimes, and the occurrence of pests, pathogens and invasive species (Cruz et al., 2007; SLU, 2008, cited in FAO, 2011). In a report titled *Southeast Asian Forests and Forestry to 2020*, the Food and Agriculture Organization (FAO) looked at adaptation needs related to forestry. Along with many countries in the region, the FAO recommended a combination of stakeholder engagement, reinventing and revitalization of forestry institutions and policies, and improved education for the next generation of consumers and decision makers (FAO, 2011). Improved forest management and monitoring is also needed if this major resource (as presented in Figure 2) is to achieve its potential with respect to serving as an emission sink (FAO, 2011).

The fisheries sector has been identified by Cambodia, Indonesia, Philippines, Timor-Leste and Viet Nam as an area in which adaptation action is needed. The Asia-Pacific region accounts for 51 per

cent of global fisheries production and 90 per cent of aquaculture, and the sector is an important source of food security and economic development. Needs identified include improved fisheries data collection and assessments to inform management and conservation decision making in the region (FAO, 2010). Members of the Asia-Pacific Fishery Commission (APFIC)²⁰ have also called for fisheries to be an integral part of NAPA development and to be integrated into national climate change strategies (FAO, 2010).

Water

Like agriculture, water is considered a priority area for adaptation by every country in East and Southeast Asia—in large measure due to its link to agriculture productivity, food security and human health. As well, much of the region already faces water stress (IFAD, 2009), and climate change will likely serve to intensify and broaden this concern. The precise nature and source of concern varies across the region, reflecting different geographic realities and the potential for some locations to experience greater rainfall in the future while others may experience less.

In East Asia, rapid glacial melt is of particular concern to Mongolia and China,²¹ as earlier thaw times lead to more water (and potentially floods) in the spring and shortages of water in the wintertime; the water supply of a quarter of a billion people in China alone could be affected (Cruz et al., 2007). Further declines in the amount of water flowing through China's six main rivers (the Haihe, Huaihe, Pearl, Songhua, Yangtze and Yellow Rivers) coupled with inefficient water management and rising demand due to rapid urbanization and industrialization creates a worrying situation. Sea-level rise and saltwater intrusion pose additional concerns in China (ADB, 2010). The responses advocated by East Asian countries include the strengthening of governance, capacity building and the promotion of climate-resilient development.

In Southeast Asia, climate change's impact on the Mekong River system is a major concern due to its central importance as a water source for many countries. The Mekong River traverses or serves as a national boundary for the countries of Cambodia, China, Lao PDR, Myanmar, Thailand and Viet Nam. Its basin covers an area of 795,000 square kilometers and is home to approximately 60 million people (MRC, 2009). The Mekong Delta is home to 17 million people and nearly 50 per cent of the region's rice production (Mydans, 2009). Naturally a delicate ecosystem, the Delta is traditionally subject to flooding in the rainy season and saline intrusion in the dry season (Nguyen et al., 2001).

For non-Mekong countries, climate variability and its impacts on agriculture also serve to make water management a high priority. While water shortages may decrease in the Philippines (IFAD,

²⁰ The APFIC promotes cooperation in fisheries issues in the Asia-Pacific region. Its current members are Australia, Bangladesh, Cambodia, China, France, India, Indonesia, Japan, South Korea, Malaysia, Myanmar, Nepal, New Zealand, Pakistan, Philippines, Sri Lanka, Thailand and Viet Nam, and the United Kingdom and United States.

²¹ For example, the glaciers on the Qinghai-Tibet plateau that are the headwaters of the Yangtze River have rapidly retreated over the past 40 years, declining from 1,247 square kilometres in 1971 to 1,051 square kilometres in 2008 (Guanqun, 2009).



2009), for many of these archipelagic states, the loss of freshwater resources due to sea-level rise is a concern.

Actions suggested in response by countries in the region include: establishing or strengthening water conservation and water efficiency practices and systems; improving irrigation practices and popularizing water-saving irrigation; improving flood monitoring, forecasting and management capacity; increasing water availability through the construction of reservoirs, improved management practices, water recycling/reuse, better water allocation procedures and water pricing systems; improving watershed management, protecting ecosystems, restoring vegetation cover and controlling soil erosion; and protecting water resources from pollution.

Coastal Resource Management

Although uncertainty remains regarding how sea-level rise, storm surges and tropical cyclones might be altered due to climate change, the potential impact of these hazards on coastal infrastructure is of importance to all except the landlocked countries of East and Southeast Asia. As previously mentioned, China, Indonesia, Myanmar and Viet Nam have been identified as being at high risk due to sea-level rise (World Bank, 2009); the low-lying island states of Timor-Leste and the Philippines are also at risk.²² As sea levels rise, not only are areas inundated, but more locations become subject to flooding in times of heavy rainfall. The effects of climate change on coral reefs (McGray et al., 2007) and aquaculture (NACA, 2011) are also common targets for adaptation needs in the region, having been identified as areas of concern by several countries studied.

Adaptation measures identified by countries to reduce the vulnerability of their coastal regions include: studies of impacts, improved management and capacity building of local residents; introduction of Integrated Coastal Zone Management; coastal hazard management, such as building storm shelter systems; protection of wetlands, swamps, marshes, coral reefs and atolls; improving aquaculture, such as by increasing the tolerance of species and sustainability of aquaculture plans; land use planning to limit development in areas subject to sea-level rise; improving drainage and flood control facilities; integrating consideration of rising temperatures and sea levels into the development of coastal infrastructure; and using organic matter to improve salty soil conditions.

Health

Health was identified as a priority area for action by many countries. The World Health Organization identifies seven main adverse health outcomes brought on by climate change in Southeast Asia (WHO, 2011):

- Heat stress, strokes and cardiovascular disorders due to declining air quality, particularly in newly industrialized areas (Cruz et al., 2007)

²² Should sea levels rise by 40 centimetres, it is estimated that the number of people flooded on an annual basis globally could increase from 13 million to 94 million—and that 20 per cent of the people affected would be in Southeast Asia. With a rise of just 30 centimetres, an estimated 81,348 square kilometres of China could be submerged (Cruz et al., 2007). A rise of 65 centimetres could lead to an inundation of 5,133 square kilometres in the Mekong Delta (FPC, 2009).

- Injuries, disability and drowning due to the increase in frequency and intensity of extreme weather events such as floods and storms
- Water- and food-borne diseases due to more variable precipitation patterns that will compromise the supply of freshwater, increasing the risk of water-borne diseases like cholera and outbreaks of diarrheal diseases
- Rising temperatures and variable precipitation are likely to decrease the production of staple foods in many of the poorest regions, increasing risks of malnutrition
- Warmer temperatures and other parameters are likely to lengthen the seasonal and geographical transmission of important vector-borne diseases such as dengue and malaria and to alter their geographic ranges, potentially reaching regions that lack either population immunity or a strong public health infrastructure
- Psychological stress caused by the displacements of population and loss of livelihood

Similar impacts may also be anticipated to occur in East Asia.

Increasing understanding and awareness of the health effects of climate change, building the local capacity of health systems and ensuring that health concerns are addressed in climate change policy decision making are all identified as adaptation priorities by many countries in the region.

Research and Meteorological Forecasting

Closely connected to the issues of disaster risk management (prediction and response) and agriculture (farming practices and cropping schedules) is an identified need by many countries for better capacity and dissemination of information regarding meteorological monitoring and forecasting. Better information can significantly help adaptation planning by enabling countries to better predict (and therefore prepare for) extreme weather events. It can also assist farmers in the identification of better cropping techniques, crop selection and better prediction of potentially changing growing seasons. Investment in strengthening national and local capacities in this area is an action that plays into several other sectors of need, and therefore is a common component of national plans and NAPAs.

5.0 Assessment of Adaptation Action, East and Southeast Asia

A significant amount of regional and country-specific adaptation action is presently underway in East and Southeast Asia, at both the policy and program/project levels. These initiatives are contributing to building the capacities of countries in the region to minimize the adverse consequences of climate change.



5.1 Regional Level Action

Reflecting the vulnerability of many countries in East and Southeast Asia to the impacts of climate change, as well as their shared needs and priorities, countries in the region are collaborating at the policy and project level on a number of regional adaptation initiatives.

Regional Policy Actions

East and Southeast Asian countries are engaged in a number of different political forums, through which efforts to support adaptation are being pursued. These include the Mekong River Commission (MRC) and the Association of Southeast Asian Nations (ASEAN).

In response to a need to carefully manage the waterway and basin of the Mekong River, Cambodia, Lao PDR, Thailand and Viet Nam formed the MRC in April 1995; China and Myanmar have served as dialogue partners since 1996 (MRC, 2011). The MRC has established a “Climate Change and Adaptation Initiative” in collaboration with a number of partners (see Table 3) that aims to support adaptation to the new challenges climate change poses for development in the Lower Mekong Basin. It addresses concerns related to impacts such as changing rainfall patterns, increased extreme weather events and temperature extremes, sea-level rise, displacement of persons, and changes in the flow of the river and its tributaries (MRC, 2010). The MRC seeks to increase understanding of the effect of climate change, identify joint and individual actions, and foster a climate change dialogue with stakeholders (including a dialogue specifically on gender-related impacts). Scenario planning has also been undertaken for the Mekong Delta by the Vietnamese Ministry of Natural Resources and Environment to assist the government and provinces to take specific actions to limit and adapt to climate impacts (FPC, 2009).

At a broader level, the ASEAN²³ is also facilitating regional collaboration on climate change. The “Roadmap for an ASEAN Community 2009–2015” includes a commitment to enhancing regional and international cooperation on climate change mitigation and its impacts on socio-economic development, health and the environment. Planned actions include: the development of an ASEAN Climate Change Initiative; promotion of shared knowledge on adaptation best practices; development of regional strategies to increase adaptation capacity; enhancing collaboration on the development of climate change scenarios and addressing climate related hazards (including a regional systematic observation system); promoting public awareness related to the links between human health and climate change; and, where possible, forming common positions on climate change (ASEAN, 2009a).

Building on these commitments, the ASEAN has:

²³ The mandate of the ASEAN includes promoting collaboration and mutual assistance in areas such as economic growth, social progress, cultural development, peace and stability, and technical and scientific knowledge. Its membership is composed of Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam.



- Launched the ASEAN Climate Change Initiative (ACCI) to promote further regional cooperation and collaboration on climate change. The initiative is to include policy and strategy formulation, information sharing, capacity building, and technology transfer (Letchumanan, 2010).
- Established a Working Group on Climate Change to “promote closer and deeper regional cooperation on climate change and to respond effectively to global efforts in addressing climate change issues” (ASEAN, 2009b, p. 1) and to support implementation of the ACCI and commitments made within the Roadmap (Letchumanan, 2010).
- Integrated climate change adaptation into the “ASEAN Agreement on Disaster Management and Emergency Response Work Programme, 2010-2015” (Letchumanan, 2010).
- Established the “ASEAN Multi-Sectoral Framework on Climate Change and Food Security” in 2009, the goal of which is to minimize climate change risk through coordinated development and implementation of sustainable management strategies related to agricultural, fisheries and forest resources (Letchumanan, 2010).

While signaling an interest in and commitment to regional cooperation in addressing climate change adaptation concerns, the degree to which progress has been made with respect to acting upon these declarations is uncertain.²⁴

China is a member of the ASEAN Plus Three (along with Japan and the Republic of Korea). In its Second Joint Statement (2007), this regional body reaffirmed the need for effective action on climate change, including adaptation (ASEAN, 2007). ASEAN Plus Three also forms part of the East Asia Summit (along with Australia, India, New Zealand, Russia and the United States), which meets following each annual ASEAN Ministerial meeting. The East Asia Summit also is undertaking action related to climate change, such as hosting seminars in China on this topic in 2008 and 2010 (EAS, 2009).

Shared Projects and Programs

Cooperative action is also taking place in the region through shared projects and programs, as listed in Table 3. Some of these regional initiatives involve only a few countries, while others are quite comprehensive. As highlighted in Table 4, some countries are more engaged in regional projects than others, specifically, Cambodia, Indonesia, Lao PDR, Philippines, Thailand and, in particular, Viet Nam. The level of involvement in regional initiatives seems to be determined by the interests of individual countries and their capacities to implement adaptation actions. Notably, there are very few projects exclusively involving countries from both East Asia and Southeast Asia.²⁵ Instead, China and Mongolia are more engaged in collaborative projects involving South Asian and Central Asian

²⁴ Following the May 2011 ASEAN summit, for example, Greenpeace expressed concern regarding the degree to which the ACCI and Climate Change Working Group have the mandate to enable strong collaboration on climate change (Anonymous, 2011).

²⁵ Only one project, “Water and Sanitation Sector Responses to Climate Change Impact in Yunnan Province of China and Vietnam,” has been identified that involves countries from both East and Southeast Asia.

countries (see Table 6). Due to their current political situations, neither DPRK nor Myanmar is engaged in any multi-country projects.

Many of the regional initiatives address the shared priority sectors of water/watershed management and agriculture. Other priorities being addressed through regional initiatives include marine management, health, policy integration, risk reduction and urban adaptation. One particular area where regional progress is being made is in the Mekong watershed (Vathana, 2010), largely due to cooperation between countries in the lower Mekong region; six of the 13 regional projects identified in Table 3 focus specifically on bringing together the Mekong River Basin countries. Water resource adaptation initiatives spearheaded by the MRC have led to significant action and progress. Nearly all of the regional projects identified focus on capacity building; research, vulnerability assessment and policy focused projects are also being implemented.

In Southeast Asia, greater participation in regional initiatives allows countries to take advantage of their more homogenous needs and priorities, enabling a greater base of activity and more coordinated adaptation action. It also allows the region's LDCs to partner with their more developed neighbors, lending a capacity building element to regional adaptation action. Areas in which countries might consider the development of additional partnerships, as appropriate, in sectors identified as priorities for adaptation action that are not well represented in current regional projects, include coastal management, disaster risk reduction, forestry, terrestrial ecosystems, health and improved provision of meteorology information. Given that water and agriculture are key priorities for adaptation throughout Southeast Asia, continued focus on these sectors also would likely be beneficial.

In addition, a number of countries are participating in projects that involve countries from across Asia and around the world. As presented in Table 6,²⁶ two or more countries from East and Southeast Asia are participating in:

- “Mangroves for the Future.”²⁷ Participating regional countries: Indonesia, Thailand and Viet Nam
- “Asian Cities Climate Change Resilience Network.”²⁸ Participating regional countries: Indonesia, Thailand and Viet Nam
- “Adaptation Knowledge Platform.”²⁹ Participating regional countries: Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand and Viet Nam
- “Strengthening Capacity for Policy Research on Mainstreaming Adaptation to Climate Change in Agriculture and Water Sectors.”³⁰ Participating regional countries: Malaysia and Viet Nam

²⁶ Table 7 may be found following the Conclusions section of this paper.

²⁷ MFF, <http://www.mangrovesforthefuture.org/> and <http://www.mangrovesforthefuture.org/Assets/documents/IUCN-MFF-Brochure-Web.pdf>.

²⁸ ACCCRN, <http://www.rockefellerfoundation.org/what-we-do/current-work/developing-climate-change-resilience/asian-cities-climate-change-resilience/>.

²⁹ AKP, <http://www.climateadapt.asia/about-us>.



- “Scientific capacity development of trainers and policy-makers for climate change adaptation planning in Asia and the Pacific.”³¹ Participating regional countries: China, Philippines and Thailand
- “Preparedness for Climate Change.”³² Participating regional countries: Indonesia, Philippines and Thailand
- “Advancing Capacity for Climate Change Adaptation.”³³ Participating regional countries: Mongolia and the Philippines
- “Health Vulnerability and Climate Change Adaptation Assessments.”³⁴ Participating regional countries: Cambodia and Mongolia
- “Climate Risk Management Technical Assistance Support Project: Phase II.” Participating regional countries: Mongolia and Timor-Leste
- “Cities in Climate Change Initiative.”³⁵ Participating regional countries: China, Indonesia, Mongolia, Philippines and Viet Nam

These projects address a wider diversity of priority sectors, the most common of which are policy formation and integration, along with water, disaster risk reduction and urban adaptation. Most projects emphasize capacity building, research and knowledge sharing; the number of projects with a clear focus on pilot project implementation is limited. Funders active in the region include: Australia, Germany, Norway, and the United States, as well as the Asian Development Bank and the Global Environment Facility.

In addition, it should be noted that a number of other initiatives currently underway in East and Southeast Asia have the potential to contribute to building the adaptive capacity of communities and countries. For example, a number of cooperative initiatives in the area of disaster risk reduction are taking place in East and Southeast Asia that, while not specifically seeking to reduce vulnerability to climate change, will increase capacity to address the adverse effects of climate change. Initiatives related to integrated water resource management, strengthening of public health systems, combating desertification, and coastal and marine protection systems, among many others, may also contribute to adaptation efforts.

³⁰ APN, <http://www.ukm.my/apn/> and Earth System Governance, <http://www.earthsystemgovernance.org/affiliated-projects/strengthening-capacity-policy-research-mainstreaming-adaptation-climate-change-a>.

³¹ APN, <http://www.apn-gcr.org/newAPN/resources/proceedingsAndMeetingReports/proceedings/igm-spg15.pdf>.

³² IFRC, <http://www.climatecentre.org/site/preparedness-for-climate-change-programme>.

³³ ACCCA, http://www.acccaproject.org/accca/files/ACCCA_Brochure_19pilotactions.pdf.

³⁴ WHO, http://www.who.int/globalchange/mediacentre/events/2010/costa_rica_consultation_200710/en/index.html.

³⁵ UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html.

Table 3: Current regional actions in East and Southeast Asia

Name		Objectives	Participating Countries	Project Details	
1.	Connecting Environmental Changes, Impacts and Responses in the Mekong Delta to Human Wellbeing and Ecosystem Integrity ³⁶	This United Nations University (UNU) multi-partner initiative will undertake a trans-disciplinary analysis of threats to human health and well-being and to ecosystem integrity caused by climate change. It will also respond to large-scale changes in the Mekong Delta region shared by Cambodia and Viet Nam. Assessment tools will be developed to evaluate the chain of events from environmental change to impacts on human well-being and ecosystem health.	Cambodia, Viet Nam	Funder(s)	UN University
				Total Budget	
				Implementing Agency(s)	UN University
				Duration	2007 – 2010
				Project Type	Research
				Focus Area(s)	Human health; Ecosystem conservation
2.	The MRC Climate Change and Adaptation Initiative ³⁷	The initiative seeks to understand the impacts of climate change in the lower Mekong basin, assess the types of adaptation actions that will have to be undertaken to respond to climate change, foster dialogue with the relevant stakeholders, and address the issue of gender and climate change. In addition to the creation of technical papers, and assessments outlining adaptation issues and recommended actions, the CCAI also develops educational documents for outreach with local residents on the issues of climate change and adaptation.	Cambodia, Lao PDR, Thailand, Viet Nam	Funder(s)	AusAID, DANIDA
				Total Budget	Approximately US\$15 million for first two phases ³⁸
				Implementing Agency(s)	Mekong River Commission with ADPC, ACIAR, CARE International, CSIRO, GIZ, FAO, GMSARN, ICEM, IUCN, IWMI, JIID, Lux-Development, Southeast Asia START Regional Center, SEI, SIDA, UNDP, UNEP, WWF, Wetlands Alliance
				Duration	2009 – 2025 In three five-year phases Phase 1: 2011 – 2015
				Project Type	Research; Capacity building; Assessment; Knowledge communication
				Focus Area(s)	Watershed management
3.	Capacity Building for	The project seeks to build the	Indonesia,	Funder(s)	APN

³⁶ UNU, <http://www.inweh.unu.edu/River/MekongDelta.htm>.

³⁷ MRC, <http://www.mrcmekong.org/ccai/Climate-change-n-adaptation-initiative.htm>.

³⁸ MRC, <http://www.mrcmekong.org/ccai/ccai-framework-document-extraction09.pdf>.

Name		Objectives	Participating Countries	Project Details	
	Research and Monitoring of Marine Protected Areas: An Adaptive Mechanism for Climate Change in the Asia-Pacific Region ³⁹	capacity of Marine Protected Area managers and technical staff of local government units in the Philippines and Indonesia. As members of the Coral Triangle Initiative in the Asia-Pacific region, these two countries have established a large number of Marine Protected Areas as adaptive mechanisms for natural and anthropogenic impacts. Training of Marine Protected Area monitoring teams will employ scientifically sound research and assessment methods of coral reef, sea grass, and mangrove communities.	Philippines	Total Budget	
				Implementing Agency(s)	Mindanao State University
				Duration	2010
				Project Type	Capacity building
				Focus Area(s)	Marine management
4.	Climate Sensitive Flood Water Management in the Lower Mekong Basin ⁴⁰	The project is strengthening the capacities of relevant professional bodies in the four riparian states of Cambodia, Lao PDR, Thailand and Viet Nam, as well as the Secretariat of the Mekong River Commission to project the impacts of climate change. The aim is for the countries to be better equipped to prevent or mitigate the growing risk of flooding and the damage arising from it.	Cambodia, Lao PDR, Thailand, Viet Nam	Funder(s)	Germany
				Total Budget	
				Implementing Agency(s)	Mekong River Commission, GIZ
				Duration	2010 – 2012
				Project Type	Capacity building; Assessment; Policy formation and integration
				Focus Area(s)	Disaster risk management; Climate information services
5.	Lower Mekong Initiative ⁴¹	The initiative aims to increase cooperation between the Lower Mekong countries and the United States in the areas of environment, health, education and infrastructure development. It seeks to further understanding of shared concerns, including vulnerability to climate change, transboundary water management and infectious diseases. Ongoing activities include: Forecast Mekong, which is a “data integration, modeling and scientific	Cambodia, Lao PDR, Thailand, Viet Nam Plus: United States	Funder(s)	United States
				Total Budget	
				Implementing Agency(s)	Various
				Duration	2010 – ?
				Project Type	Assessment; Capacity building; Knowledge communication
				Focus Area(s)	Climate information services; Watershed management; Human health

³⁹ APN, <http://www.carbon2markets.org/uploads/news/Volume16-No2-2010-Spring.pdf>.

⁴⁰ BMU, <http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=693>.

⁴¹ USDS, <http://www.state.gov/p/eap/mekong>.

Name		Objectives	Participating Countries	Project Details	
		visualization tool” that will be used to show the projected impacts of climate change; and the “sister-rivers partnership” that allows for sharing of best practices in areas such as climate change adaptation between the Mississippi River Commission and the MRC. ⁴²			
6.	Climate Adaptation through Sustainable Urban Development ⁴³	Through urban case studies, the project will focus on integrated urban water management systems. It will assess how sustainable urban development principles can be applied in response to climate change, population growth and greater demand for resources such as water and energy. The focus of the case studies will be Can Tho, Viet Nam and Makassar, Indonesia.	Indonesia, Viet Nam	Funder(s)	AusAID, CSIRO
				Total Budget	
				Implementing Agency(s)	
				Duration	2010 - ?
				Project Type	Research; Policy formation and integration
				Focus Area(s)	Urban area
7.	Climate Risk Management Assessment for Agriculture in Thailand and Viet Nam ⁴⁴	The outcome of this study will be better adaptation to climate change in the semi-arid tropics of Southeast Asia. As a result of this study and policy dialogues, the governments of Thailand and Viet Nam will be able to identify and prioritize areas most at risk and implement appropriate strategies to reduce risk and help farmers adapt. It also will develop gender-equitable agricultural adaptation strategies.	Thailand, Viet Nam	Funder(s)	ADB
				Total Budget	US\$200,000
				Implementing Agency(s)	ICRISAT
				Duration	ongoing
				Project Type	Research; Policy formation and integration
				Focus Area(s)	Agriculture; Gender
8.	Building Climate Resilience of Mekong Hydropower Dams ⁴⁵	Assist the Mekong River Commission and the four Lower Mekong countries to strengthen the climate resilience of both their existing and planned dams with a view to improve sediment management practices. The project supports the Lower Mekong Initiative (see Table 6).	Cambodia, Lao PDR, Thailand, Viet Nam	Funder(s)	USAID
				Total Budget	US\$1.9 million
				Implementing Agency(s)	National Heritage Institute
				Duration	2010 – 2013
				Project Type	Capacity building
				Focus Area(s)	Energy
9.	Knowledge Center on	The objectives of this project are:	Brunei,	Funder(s)	Southeast Asian

⁴² USDS, <http://www.state.gov/p/eap/mekong/faq/index.htm>.

⁴³ RFD Alliance, http://www.rfdalliance.com.au/site/current_projects.php.

⁴⁴ ADB, <http://www.adb.org/Climate-Change/agriculture-tha-vie.asp> and <http://www.adb.org/Documents/Books/Under-Weather-Rising-Tide/Under-Weather-Rising-Tide.pdf>.

⁴⁵ U.S. Department of State, <http://www.state.gov/documents/organization/151686.pdf>.

Name		Objectives	Participating Countries	Project Details	
	Climate Change: Adaptation and Best Practices in Agriculture and Natural Resources Sectors ⁴⁶	<ul style="list-style-type: none"> Increasing understanding, knowledge and skills of those in the agriculture and natural resources sectors Making clients quickly access and learn about what is going on about climate change Responding to every client with quickness, courtesy, competency and accuracy Providing products that give clients easy access to cutting-edge research and development results, learning events and policy advocacy 	Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam		Regional Center for Graduate Study and Research in Agriculture (SEARCA)
				Total Budget	US\$1.0 million for 5 years
				Implementing Agency(s)	SEARCA's University Consortium in Southeast Asia, University of the Philippine Los Banos, World Fish Centre and the ALM
				Duration	[2010 – 2014]
				Project Type	Capacity building; Knowledge communication
				Focus Area(s)	Agriculture; Climate information services
10.	Water and Sanitation Sector Responses to Climate Change Impact in Yunnan Province of China and Viet Nam ⁴⁷	Carried out by the Water and Sanitation Program, a multi-donor funded partnership, the objective of this project is to help government agencies and service providers better respond to risks posed by climate change in water supply and sanitation services. These will be initiated and tested by developing adaptation plans for the water and sanitation sector at the study sites of Ben Tre, Viet Nam, and Lijiang, Yunnan, China, where poor communities are a significant proportion of the population.	China, Viet Nam	Funder(s)	Multi-Donor
				Total Budget	
				Implementing Agency(s)	World Bank
				Duration	2010 – 2015
				Project Type	Policy formation and integration
Focus Area(s)	Freshwater supply; Waste management				
11.	Building Capacity to Adapt to Climate Change for Selected Southeast Asian Countries: Vulnerability assessment and	The overall objective of the project is to build capacities for research, planning and action with respect to climate change and the economics of adaptation. The specific objectives are: (a) to measure	Cambodia, Philippines, Viet Nam	Funder(s)	IDRC
				Total Budget	CAD\$228,700
				Implementing Agency(s)	SEARCA, IDRC, College of Economics - Hue University of Vietnam, and the Royal

⁴⁶ KC3, <http://beta.searca.org/kc3/> and ALM, <http://www.adaptationlearning.net/project/knowledge-center-climate-change-kc3-adaptation-and-best-practices-agriculture-and-natural-re>.

⁴⁷ World Bank, <http://www.devex.com/en/projects/climate-change-adaptation-for-the-water-sanitation-sector-in-vietnam-and-yunnan-province-of-china>.

Name		Objectives	Participating Countries	Project Details	
	economic analysis of adaptation ⁴⁸	communities' vulnerability to climate change through research in selected communities; (b) to produce maps of each community's relative vulnerability to climate change; (c) to analyze social vulnerability of local communities in terms of gender, geographic location, ethnicity, and socio-cultural, demographic and political-economic variables; (d) to identify locally appropriate adaptation options; (e) to conduct an economic analysis of adaptation options; and (f) to formulate policy recommendations to enhance local capacity to adapt to climate change.			University of Phnom Penh of Cambodia
				Duration	2011 – 2014
				Project Type	Assessment; Capacity building; Policy formation and integration
				Focus Area(s)	Government
12.	Coastal and Marine Resources Management in the Coral Triangle: Southeast Asia ⁴⁹	To promote the long-term conservation and sustainable management of coastal and marine resources in the Sulu-Sulawesi Marine Ecoregion Priority Seascape in the Coral Triangle, by strengthening integrated and ecosystem-based resources management. Project components include: (1) Strengthening national and local institutions for sustainable coastal and marine resources ecosystem management; (2) Strengthening of ecosystem-based approach to marine resources management, including vulnerability assessments conducted identifying adaptation measures; (3) Supporting mechanisms for sustainable livelihoods in coastal communities; and (4) Establishing effective project coordination and implementation.	Indonesia, Malaysia, Philippines	Funder(s)	GEF, Japan Fund for Poverty Reduction, ADB, United States
				Total Budget	US\$40,168,182
				Implementing Agency(s)	ADB
				Duration	2011 – 2015
				Project Type	Capacity building; Assessment
				Focus Area(s)	Marine management; Coastal zone management
13.	Mekong River Basin Project on Addressing	Helps communities assess climate change impacts on agriculture and	Cambodia, Lao PDR,	Funder(s)	USAID
				Total Budget	US\$2.8 million

⁴⁸ IDRC, http://www.idrc.ca/EN/Regions/South_East_Asia/Pages/ProjectDetails.aspx?ProjectNumber=106326 and SEARCA, <http://sis.searca.org/index.php/component/sobi2/?sobi2Task=sobi2Details&catid=28&sobi2Id=99>.

⁴⁹ GEF, <http://www.thegef.org/gef/node/3980> and ADB, <http://pid.adb.org/pid/TaView.htm?projNo=44113&seqNo=02&typeCd=2>.

Name		Objectives	Participating Countries	Project Details	
	Climate Change Impacts on Agriculture and Natural Resources ⁵⁰	ecosystems and strengthen adaptation capacity with respect to water resources, food security, livelihoods, and needs of vulnerable groups. The project supports the Lower Mekong Initiative.	Thailand, Viet Nam	Implementing Agency(s)	
				Duration	2011 – 2016
				Project Type	Assessment; Capacity building
				Focus Area(s)	Agriculture; Ecosystem conservation

5.2 National Level Action

The level of national or country-specific action on adaptation within the region ranges considerably—from some of the most active countries in the world to some in which only the most preliminary of actions have been undertaken. Table 4 provides a picture of current adaptation action at the national and regional levels in East and Southeast Asia. Viet Nam is clearly a regional leader, participating in a large number of national and regional projects. Cambodia, Indonesia and the Philippines are also engaged in implementing a number of country-specific projects. Note that the low number of projects indicated in Table 4 as underway in China is artificial; as noted in Section 2, the review only captures projects that are externally funded through international development assistance. A significant amount of self-driven and self-funded action in China is therefore not captured in this review.

In contrast, DPRK and Myanmar only have one and three active projects respectively, which is likely a reflection of their unique political situations and poor relations with several potential donor countries. Other countries in which the number of adaptation projects underway is either very low or low relative to others in the region are Lao PDR, Malaysia, Mongolia and Timor-Leste.

A few reasons may be identified for the considerable differences in levels of adaptation action between countries in the region. First, it is home to countries across the spectrum of economic development and income levels—from the LDCs of Cambodia, Lao PDR, Myanmar and Timor-Leste to the stronger economic performers of China, Malaysia, the Philippines and Thailand. Secondly, the region’s LDCs face distinct capacity barriers that limit their abilities to achieve progress on adaptation. Many projects in LDCs focus on basic capacity building and policy development, including a majority of projects put forward in the NAPAs of Cambodia and Lao PDR. Neither Myanmar nor Timor-Leste has completed the development of their NAPAs or their first National Communications to the UNFCCC. This situation reflects both the limited technical and human resources in these countries, as well as their government’s focus on other national priorities.

⁵⁰ USDS, <http://www.state.gov/documents/organization/151686.pdf>.

Table 4: Comparison of adaptation action at the policy and program level in East and Southeast Asia (as of May 2011)

		Policy Action			Participation in Projects/Programs		
		1 st National Communication	2 nd National Communication	NAPA	Country Specific/ National	Multi-country	Total
East Asia	China	2004		Non-LDC	5	12	17
	DPRK	2004		Non-LDC	1	0	1
	Mongolia	2001	2010	Non-LDC	3	4	7
Southeast Asia	Cambodia	2002		2007	7	13	20
	Indonesia	1999	2011	Non-LDC	10	12	22
	Lao PDR	2000		2009	4	8	12
	Malaysia	2000	2011	Non-LDC	0	6	6
	Myanmar			In Development	0	3	3
	Philippines	2000		Non-LDC	8	14	22
	Thailand	2000	2011	Non-LDC	2	14	16
	Timor-Leste			In Development	0	6	6
	Viet Nam	2003	2010	Non-LDC	18	21	39

Note: Information contained in this table is based upon research completed as of May 2011. Additional project and programs, for example, may be underway in each country. Full information regarding adaptation action in each country as of May 2011 is available in the Appendix of this report.

Between 2010 and mid-2011, five countries in the region submitted their second National Communications to the UNFCCC. These second National Communications are often far more developed than the first National Communications and, given that many initial National Communications are more than 10 years old, provide a much more recent and accurate picture of adaptation needs and priorities.

With a few exceptions, the degree to which East and Southeast Asian governments are integrating adaptation considerations into development planning remains low. Few governments have a solid policy framework for adaptation and most, where they do make these considerations, do so only with respect to the sectors of coastal zone management, water management, agriculture and, to a lesser extent, human health. Some countries have expressed a desire to integrate climate adaptation more fully into their policies and planning, but are only in the preliminary steps of doing so. More consideration for adaptation priorities and needs within national policy development is often an identified need for countries within the region.

Funding identified for adaptation actions is largely project-based, with the Asian Development Bank (ADB), Global Environment Facility (GEF), LDCF, Special Climate Change Fund (SCCF), United Nations Development Programme (UNDP), World Bank and World Health Organization (WHO) providing significant funding to nationally focused projects. Through bilateral assistance, funding for these projects is also being received by Australia, Denmark (particularly in Viet Nam), France, Germany, Japan, Norway, Sweden, the United Kingdom and the United States.

5.3 Communities of Practice

A number of civil society organizations are actively engaged in adaptation action in East and Southeast Asia, including in areas such as research, advocacy and the implementation of measures on the ground. These actors include numerous community-based and national non-governmental organizations (NGOs) as well as international organizations such as the Asian Disaster Preparedness Center, the Asia Institute of Technology, Institute for Global Environmental Strategies, the Stockholm Environment Institute and World Wildlife Fund.

While these civil society organizations support adaptation action on an individual basis, they also do so collectively through various networks, such as the Climate Action Network. They are engaged in sectors such as agriculture, water management, coastal protection and urban adaptation. Although the focus of these networks varies, knowledge sharing generally is a goal for all of them. Many of these networks also seek to address policy framework gaps, assist in the implementation of on-the-ground adaptation strategies and are engaged in capacity building, advocacy and research activities. Although these initiatives may or may not be undertaken in direct relationship with the national governments of the countries in which they operate, they do tend to deliver results that help meet adaptation priorities.

As outlined in Table 5, a number of initiatives have been launched in recent years that specifically are designed to facilitate knowledge exchange between countries in the region. These communities of practice include:

- Asia-Pacific Adaptation Network
- Adaptation Knowledge Platform
- Adaptation Research Policy Network for Asia and the Pacific
- Asian Cities Climate Change Resilience Network
- Knowledge Center on Climate Change Adaptation in Agriculture and Natural Resource Management in Southeast Asia
- Network of Vietnamese Non-Governmental Organisations and Climate Change
- SEA Change, which is focused on monitoring and evaluation of climate change interventions in Southeast Asia

The target audiences for these knowledge networks include policy makers at the national and municipal levels, as well as researchers and other practitioners. Through knowledge exchange and, in some cases, the funding of adaptation initiatives, these knowledge networks have the potential to facilitate improved understanding of adaptation needs and best practices. As some of these initiatives have funding for only a limited period of time, however, their long-term success remains to be seen.

Table 5: Select climate change communities of practice in East and Southeast Asia

Name	Scope	Category	Sector / area of work
Adaptation Knowledge Platform ⁵¹	Asia (Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, the Philippines, Sri Lanka, Thailand, Viet Nam)	Advocacy; Knowledge communication; Research; Field implementation	Dedicated to sharing information on climate change adaptation and developing capacity in Asian countries. Supports research and capacity building, policy making and information sharing to help countries adapt to climate change. Has a particular focus on mainstreaming adaptation into poverty reduction and sustainable development policies and strategies. Funding for this platform has been provided by SIDA for the period of 2009 to 2012.
Adaptation Research Policy Network for Asia and the Pacific (ARNAP) ⁵²	Asia and Pacific	Research; Knowledge communication	Looks to strengthen capacity for research and mainstreaming climate change adaptation for agriculture and water policies within the region.
Asia Pacific Adaptation Network (AP-Net) ⁵³	Australia, Cambodia, China, Fiji, Indonesia, Islamic Republic of Iran, Japan, Kazakhstan, Lao People's Democratic Republic, Malaysia, Mongolia, Nepal, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Russian Federation, Samoa, Sri Lanka, Singapore, Thailand, Tonga, Uzbekistan, Vanuatu, Viet Nam	Knowledge communication; Capacity building	AP-Net is a knowledge-based online clearing house for the Asia-Pacific region on climate change issues. They provide a platform for policy dialogues and consultation within the region; provide access to information and data on climate change issues and developments; and support capacity building for developing countries in the region.
Asian Cities Climate Change Resilience Network ⁵⁴	India, Indonesia, Thailand, Viet Nam	Capacity building; Knowledge communication; Policy formation and integration	With funding from the Rockefeller Foundation and USAID, this project (2008 to 2012) is establishing a network of cities in Asia that will develop robust plans to prepare for, withstand and recover from the predicted impacts of climate change. A core component of the project is the establishment of an online community of practice to exchange information and experiences between participating cities.
Climate Action Network (CAN): CAN China & CAN	China, Southeast Asia	Advocacy; Knowledge communication	CAN is a worldwide network of NGOs promoting action on climate change initiatives. They work to achieve their goals through information exchange

⁵¹ AKP, <http://www.climateadapt.asia/about-us>.

⁵² APN, [http://www.ukm.my/apn/pdf/salam32%20\(15Dec\).pdf](http://www.ukm.my/apn/pdf/salam32%20(15Dec).pdf).

⁵³ APN, <http://www.climateanddevelopment.org/ap-net/index.html>.

⁵⁴ ACCCRN, <http://www.rockefellerfoundation.org/what-we-do/current-work/developing-climate-change-resilience/asian-cities-climate-change-resilience>.

Name	Scope	Category	Sector / area of work
South East Asia ⁵⁵			and coordinated strategy on climate issues. CAN is organized into regional “nodes” of focus responsible for local governance and policy and advocacy work within their region.
Knowledge Center on Climate Change Adaptation in Agriculture and Natural Resource Management in Southeast Asia ⁵⁶	Southeast Asia	Knowledge communication; Research	This knowledge center is being built by the Southeast Asian Regional Center for Graduate Study and Research in Agriculture to organize, package and share information about climate change related disasters, with a focus on agriculture and natural resources.
Network of Vietnamese Non-Governmental Organisations and Climate Change ⁵⁷	Viet Nam	Knowledge communication; Advocacy	The network aims to mobilize and coordinate climate change activities in Viet Nam being taken by organizations and individuals; represent Vietnamese civil society to government; innovate and share successful climate change strategies; and be a leading sources of technical and project information.
SEA Change ⁵⁸	Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste and Viet Nam	Knowledge communication	Currently in development, this virtual community of practice focuses on monitoring and evaluation of climate change interventions in Southeast Asia. Funding for this network has been provided by the Rockefeller Foundation.

6.0 Conclusions

The East and Southeast Asia region brings together countries with a wide array of different development and capacity levels—ranging from countries with well developed economies and significant technical capacities (such as China, Indonesia, Malaysia and the Philippines), to LDCs with large capacity challenges, to countries like DPRK and Myanmar that have unique social and political circumstances. Yet these countries are united with respect to facing significant development challenges due to the anticipated consequences of climate change, including rising temperatures, more variable rainfall patterns, melting glaciers, coastal damage due to sea level rise, and greater risk of extreme weather events. In response, countries have identified the need for adaptation measures to be taken in relation to their water resources, agricultural sectors and coastal zones. Other sectors of concern include forestry, fisheries, human health, disaster risk management, and the strengthening of research and meteorological forecasting.

⁵⁵ CAN, <http://www.climatenetwork.org>.

⁵⁶ KC3, <http://beta.searca.org/kc3/index.php/about-kc3>.

⁵⁷ VNGO&CC, <http://srd.org.vn/en/content/network-vietnamese-non-governmental-organisations-and-climate-change>.

⁵⁸ Sea Change, <http://www.seachangecop.org>.



Most East and Southeast Asian countries are actively engaged in promoting and undertaking adaptation at the national and regional levels to address needs within these identified priority areas. Yet, although facing similar climatic challenges and having largely homogeneous priorities, technical and capacity needs are much more varied across jurisdictions. This variation between countries creates both challenges and opportunities.

The presence of common adaptation priorities in the region creates the potential for addressing adaptation needs through regional initiatives. As countries address their own challenges related to water, agriculture and coastal management, it is possible to create an environment in which these issues are tackled jointly, duplication of efforts is minimized, and lessons learned are shared widely. Within East and Southeast Asia, it is clear that the potential benefits associated with regional level action have been recognized. This is particularly evident in the Mekong River Basin, where countries are tackling the need to adapt to climate change at the political level through the Mekong River Commission and on the ground through a number targeted projects and programs. Similarly, the growing presence of adaptation focused communities of practice in the region is facilitating the exchange of information between and within countries.

Participation in regional initiatives may be particularly beneficial for countries with lower levels of economic and technical development. Lack of capacity is identified as a major challenge to addressing adaptation amongst these countries. They often know what their challenges are, and what they may be able to do to address them, but lack the capacity and technical expertise to proceed toward their adaptation goals. Through greater engagement in regional initiatives, it is possible for these countries to pool resources and build capacity in areas where their neighbors have similar adaptation priorities but greater technical and/or human capacity to act. This approach also allows for a more coordinated regional approach to climate change, recognizing that adaptation measures taken, or not taken, in one country may greatly affect its neighbors.

While more developed countries in the region have greater capacity to pursue measures that reduce their vulnerabilities to the impacts of climate change—as suggested by the level of adaptation action in countries like China, Indonesia, the Philippines and Thailand—they also face constraints. While these countries are making significant progress towards their goals, they note that a long-term commitment to address adaptation will be needed as climate change progresses over the next decades.

A review of adaptation action in East and Southeast Asia also points to the importance of additional factors in influencing the degree to which adaptation action is pursued. The significant amount of adaptation action taking place in Cambodia, an LDC, and Viet Nam, a low income country, for example, illustrates the importance of leadership by national governments in preparing for adaptation. It may also demonstrate the potential synergies resulting from an active national government supported by donor assistance organizations with a strong interest in addressing climate change.

In contrast, the level of adaptation action in countries such as Indonesia, Malaysia, the Philippines and Thailand is perhaps modest given their level of development. While it is quite likely that additional adaptation actions are taking place within these countries, potentially financed solely by national budgets, it is also possible that greater priority is being given to actions that reduce greenhouse gas emissions rather than meet adaptation needs.

Many of the countries in East and Southeast Asia has been involved in preparing for climate change for more than a decade and continue to pursue a breadth of adaptation action. Through forums such as the MRC and the ASEAN, countries are beginning to address regional concerns at the political level in addition to common participation in regional adaptation projects and programs. While positive, the adaptation needs within the region are still large. Greater attention may need to be given to areas such as:

- *Transition from capacity building to tangible implementation* – across the region, but particularly in the LDCs, capacity building, research, knowledge sharing and policy development remain the primary focus of current activities. While these efforts are necessary to laying the foundation for adaptation, greater focus on the implementation of tangible measures at the local, sectoral and national levels is needed going forward.
- *Coastal zone management and marine management* – the focus of a number of current initiatives, greater attention to these issues could be directed to areas outside of the Mekong River Basin.
- *Forestry* – while identified as a priority area of adaptation by all Southeast Asian countries, the number of current initiatives directed toward this focus area appears to be limited.
- *Gender* – attention of the differential impacts of climate change on women and men is not a major consideration in the vast majority of adaptation policy and programming⁵⁹ in the region and could be given greater emphasis in the future.
- *Human health* – while identified as a priority area by the majority of countries, the number of regional projects focused on this issue is limited and even fewer country-focused projects are underway.
- *Urban areas* – several regional initiatives focused on adaptation needs in urban areas have been initiated in recent years. However, given the rapid urbanization occurring in the region and the size of the populations involved, greater attention to this issue may be warranted.

⁵⁹ Exceptions include the “MRC Climate Change and Adaptation Initiative” and the project, “Building Capacity to Adapt to Climate Change for Selected Southeast Asian Countries: Vulnerability assessment and economic analysis of adaptation.”

Table 6: Participation by East and Southeast Asian countries (bolded) in Asia-wide and global adaptation programs and projects

Name	Objectives	Participating Countries	Project Details		
Participation in Projects in the Asia-Pacific Region					
1.	Floods from the Roof of the World: Protection thanks to applied research ⁶⁰	The project seeks to protect people and infrastructure from the hazards of glacial lake outburst floods (GLOFs). Based on previous fundamental research, the countries of Nepal, Bhutan, India, Pakistan and China/Tibet now have an inventory of glaciers and glacier lakes as well as a GLOF monitoring system. The data gathered are used as the basis for early warning systems. This enables priorities to be set and corresponding action to be taken. The database is also used to determine the amount of total available water resources the region will have in the future.	Bhutan, China , India, Nepal, Pakistan	Funder(s)	Swiss Development Corporation
				Total Budget	US\$500,000
				Implementing Agency(s)	ICIMOD
				Duration	Phase 1: 1999 – 2007 Phase 2: 2008 – 2012
				Project Type	Community based adaptation; Research
				Focus Area(s)	Disaster risk management
2.	Adaptation to Climate Change in the Hindu Kush Himalayas and Central Asia ⁶¹	This project is addressing how to adapt to too much and too little water in the Hindu Kush Himalayas and Central Asia, covering the following activities: <ul style="list-style-type: none"> Improved scenarios for climate change variation and impacts Scenarios for water demand and availability Improved knowledge on climate change effects on biodiversity and ecosystem services Improved understanding of impacts on agro-ecology and food production systems and food security Critical factors for achieving sustainable adaptation 	China , India, Nepal, Pakistan	Funder(s)	Norway (through UNEP)
				Total Budget	US\$62 million
				Implementing Agency(s)	ICIMOD, CICERO, UNEP, UNDP, participating countries
				Duration	2007 – 2011
				Project Type	Research; Policy formation and integration
				Focus Area(s)	Climate information services; Biodiversity; Agriculture
3.	Asian Cities Climate Change Resilience Network ⁶²	The project seeks to establish a network of cities in Asia that will have developed robust plans to	India, Indonesia , Thailand ,	Funder(s)	Rockefeller Foundation, USAID
				Total Budget	US\$40 million

⁶⁰ SDC, http://www.sdc.admin.ch/en/Home/Projects/Floods_from_the_Roof_of_the_World.

⁶¹ ALM, <http://www.adaptationlearning.net/research/too-much-too-little-water-adaptation-climate-change-hindu-kush-himalayas-and-central-asia>.

⁶² ACCCRN, <http://www.rockefellerfoundation.org/what-we-do/current-work/developing-climate-change-resilience/asian-cities-climate-change-resilience>.

Name		Objectives	Participating Countries	Project Details	
		prepare for, withstand and recover from the predicted impacts of climate change by 2012. The network will catalyze attention, funding and action on building climate change resilience for poor and vulnerable people by creating robust models and methodologies for assessing and addressing risk through active engagement and analysis of various cities.	Viet Nam	Implementing Agency(s)	ISET, Arup International Development, ProVention, ICLEI, APCO Worldwide with local partners and municipal governments
				Duration	2008 – 2012
				Project Type	Capacity building; Knowledge communication; Policy formation and integration
				Focus Area(s)	Urban areas
4.	Protection of Sustainable Policy Initiatives in the Management of Natural Resources in the Hindu Kush Himalayas ⁶³	The program strengthens the role of International Centre for Integrated Mountain Development (ICIMOD) as an organization and service provider in the region and increases the accountability of the eight member countries. It helps develop and implement regionally agreed concepts and strategies to facilitate adaptation to climate change and sustainable resource management. This is realized by institutional strengthening of ICIMOD in areas such as data collection related to climatic changes and forests. GIZ further promotes the ICIMOD priority program Environmental Change and Ecosystem Services.	Afghanistan, Bangladesh, Bhutan, China , India, Myanmar , Nepal, Pakistan	Funder(s)	BMZ
				Total Budget	
				Implementing Agency(s)	ICIMOD, GIZ
				Duration	2008 – 2012
				Project Type	Capacity building
				Focus Area(s)	Government
5.	Coastal and Marine Resources Management in the Coral Triangle of the Pacific (under the Pacific Alliance for Sustainability Program and the Coral Triangle Initiative) ⁶⁴	To promote the conservation and sustainable use of globally significant coastal and marine resources in the Coral Triangle region through the introduction of integrated and ecosystem-based coastal and marine resources management in five Pacific countries. Includes the implementation of pilot adaptation measures to enhance resilience and increase capacity to respond to the	Federated States of Micronesia, Fiji, Palau, Papua New Guinea, Solomon Islands, Timor-Leste , Vanuatu	Funder(s)	GEF-SPA; Japan; Australia; United States
				Total Budget	US\$27,568,183
				Implementing Agency(s)	ADB (lead)
				Duration	2008 – 2013
				Project Type	Capacity building, Research; Field implementation
				Focus Area(s)	Coastal zone management; Marine

⁶³ GIZ, <http://www.gtz.de/en/weltweit/asien-pazifik/33473.htm>.

⁶⁴ GEF, <http://www.gefonline.org/projectDetailsSQL.cfm?projID=3591>.

Name		Objectives	Participating Countries	Project Details	
		adverse impacts of climate change on coastal and marine ecosystems.			management
6.	US Support Program to the Coral Triangle Initiative (CTI) ⁶⁵	To improve the management of biologically and economically important coastal and marine resources and associated ecosystems that support livelihoods and economies in the Coral Triangle and assist the six CTI countries in implementing the CTI Regional and National Plans of Action with activities that focus on instituting an ecosystem approach to fisheries management, creating marine protected areas, building climate change adaptive capacity and establishing regional platforms to promote cross-country learning and enhance sustainability.	Indonesia, Malaysia, Philippines, Papua New Guinea, Solomon Islands, Timor-Leste	<i>Funder(s)</i>	USAID
				<i>Total Budget</i>	US\$41 million
				<i>Implementing Agency(s)</i>	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA
				<i>Duration</i>	2008 – 2013
				<i>Project Type</i>	Capacity building; Assessment; Field implementation
				<i>Focus Area(s)</i>	Marine management
7.	Strengthening Adaptive Capacities to the Impacts of Climate Change in Small-scale Aquaculture ⁶⁶	The project (also known as "Aqua Climate") aims to strengthen the adaptive capacities of rural farming communities to the impacts of climate change. It is strengthening adaptive capacities to the impacts of climate change in resource-poor small-scale aquaculture and aquatic resources-dependent sectors in the south and southeast Asian region. The project will: (1) map farmers' perceptions and attitudes towards prospective climate change impacts and their adaptive capacities to address these impacts; (2) develop future scenarios based on the current trends; (3) assess the potential adaptive measures for different aquatic farming systems and prioritize better management practices; and (4) suggest Codes of Practices and improved methodologies for such systems.	India, Philippines, Sri Lanka, Viet Nam	<i>Funder(s)</i>	NORAD
				<i>Total Budget</i>	
				<i>Implementing Agency(s)</i>	NACA
				<i>Duration</i>	2009 – 2011
				<i>Project Type</i>	Capacity building; Assessment
				<i>Focus Area(s)</i>	Freshwater fisheries

⁶⁵ CTI, <http://www.uscti.org/uscti/default.aspx>.

⁶⁶ NACA, http://www.enaca.org/modules/inlandprojects/index.php?content_id=10.

Name		Objectives	Participating Countries	Project Details	
8.	Adaptation Knowledge Platform ⁶⁷	The goal of the Adaptation Knowledge Platform is to strengthen adaptive capacity and facilitate climate change adaptation in Asia at local, national and regional levels. Its specific purpose is to establish a regionally and nationally owned mechanism that facilitates the integration of climate change adaptation into national and regional economic and development policies, processes and plans, strengthen linkages between adaptation and the sustainable development agenda in the region and enhance institutional and research capacity, in collaboration with a wide range of national and regional partners.	Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Viet Nam	Funder(s)	SIDA
				Total Budget	
				Implementing Agency(s)	SEI, SENSEA, UNEP, AIT and UNEP Regional Resource Centre for Asia and the Pacific
				Duration	2009 – 2012
				Project Type	Capacity building; Policy formation and integration
				Focus Area(s)	Government
9.	Strengthening Capacity for Policy Research on Mainstreaming Adaptation to Climate Change in Agriculture and Water Sectors ⁶⁸	Project aims to strengthen research capacity on mainstreaming climate change adaptation concerns into agricultural and water policies and create a network for adaptation policy research in Asia (ARNAP: Adaptation Research Policy Network for Asia and the Pacific). The project enhances capacity to bridge gaps in adaptation research, policy and implementation through networking and communication among researchers and policy makers focusing on adaptation.	Malaysia India Viet Nam	Funder(s)	APN
				Total Budget	
				Implementing Agency(s)	IGES, IMHEM, Universiti Kebangsaan Malaysia, M.S. Swaminathan Research Foundation
				Duration	2009 – 2012
				Project Type	Capacity building; Research; Policy formation and integration
				Focus Area(s)	Agriculture; Freshwater supply
10.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1) ⁶⁹	Incorporation of climate risk management, adaptation practices, and greenhouse gas mitigation measures into infrastructure and key sector investment plans and project designs. Adaptation related actions include: • Pacific Climate Change Program – will assist participating countries	Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Palau, Papua New	Funder(s)	ADB; Canada
				Total Budget	US\$4.965 million
				Implementing Agency(s)	ADB
				Duration	2009 – ?
				Project Type	Capacity building; Policy formation and integration

⁶⁷ AKP, <http://www.climateadapt.asia/about-us>.

⁶⁸ APN, <http://www.ukm.my/apn/> and Earth System Governance, <http://www.earthsystemgovernance.org/affiliated-projects/strengthening-capacity-policy-research-mainstreaming-adaptation-climate-change-a>.

⁶⁹ ADB, <http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable>.

Name		Objectives	Participating Countries	Project Details	
		<p>to improve their resilience to climate change impacts through (i) mainstreaming of the adaptation in their policies, plans, programs, and projects; and (ii) strengthening their systems and capabilities to foster the adaptation process</p> <ul style="list-style-type: none"> Adaptation preparation – up to five countries will be supported in preparing the implementation of climate change adaptation plans, including further capacity building 	Guinea, Solomon Islands, Samoa, Timor-Leste , Tonga, Tuvalu, Vanuatu	Focus Area(s)	Government
11.	Climate Change and Drought in Central Asia and China ⁷⁰	This project aims to increase knowledge related to climate change and drought management, especially on how different ecosystems can adapt to climate variability and extreme climate events to achieve sustainable, equitable, and productive use and conservation of natural resources—including water, soils and biodiversity—within an ecosystem approach.	China , Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan	Funder(s)	ADB
				Total Budget	US\$775,000
				Implementing Agency(s)	ICARDA
				Duration	2009 – ?
				Project Type	Research
				Focus Area(s)	Agriculture
12.	Scientific Capacity Development of Trainers and Policy-makers for Climate Change Adaptation Planning in Asia and the Pacific ⁷¹	Building capacity of the trainers and policy makers in the Asia-Pacific in order to mainstream climate change adaptation principles and practices in some of the member countries in Asia-Pacific of the UNEP's Global Climate Change Adaptation Network.	Australia, China , India, Japan, Kazakhstan, Philippines , Republic of Korea, Thailand	Funder(s)	APN
				Total Budget	US\$30,000
				Implementing Agency(s)	IGES, Asia Institute of Technology (AIT) and the AIT/UNEP Regional Resource Center in Asia and the Pacific
				Duration	2010 – 2011
				Project Type	Capacity building; Policy formation and integration
				Focus Area(s)	Government
13.	Enhancing Adaptation to Climate Change by Integrating Climate Risk into Long-Term	This project aims to undertake a comparative analysis of the immediate to medium-term post-disaster recovery scenario in the	Bangladesh, India, Thailand	Funder(s)	APN
				Total Budget	
				Implementing Agency(s)	K J Somaiya Institute of Management Studies &

⁷⁰ ICARDA, http://www.icarda.org/cac/cac_news/en/cac39e.pdf and <http://www.icarda.org/RestrictedProject/Project8.pdf>.

⁷¹ APN, <http://www.apn-gcr.org/newAPN/resources/proceedingsAndMeetingReports/proceedings/igm-spg15.pdf>.

Name		Objectives	Participating Countries	Project Details	
	Development Plans and Disaster Management ⁷²	aftermath of extreme weather events of flooding faced by vulnerable cities in three Asian developing countries, namely, Mumbai (India), Bangkok (Thailand) and Dhaka (Bangladesh). It also aims to quantify the developmental impacts of flooding with the objective of integrating climate change risk considerations into long-term investment and development plans.			Research Vidyanagar
				Duration	2010 – 2011
				Project Type	Research
				Focus Area(s)	Disaster risk management; Urban areas
14.	Vulnerability to Climate Change: Adaptation strategies and layers of resilience ⁷³	Provide science-based solutions and pro-poor approaches for adaptation of agricultural systems to climate change for the rural poor and most vulnerable farmers in semi-arid regions of Asia, specifically Bangladesh, India, People's Republic of China, Pakistan and Sri Lanka.	Bangladesh, China, India, Pakistan, Sri Lanka	Funder(s)	ADB
				Total Budget	
				Implementing Agency(s)	ICRISAT
				Duration	2010 – 2012
				Project Type	Research; Field implementation
Focus Area(s)	Agriculture				
15.	Cities in Asia Develop Climate Change Adaptation Plans ⁷⁴	The project aims to raise awareness, enhance knowledge levels and boost the capacity to act among municipalities in India and the Philippines. To that end, researchers, an international network of municipalities and four cities in each of the two countries are working together to ascertain the local impacts of climate change and draw up future scenarios and decision-making aids.	India, Philippines	Funder(s)	German Federal Ministry for Environment, Nature Conservancy and Nuclear Safety
				Total Budget	€ 1,638,953
				Implementing Agency(s)	ICLEI
				Duration	2010 – 2013
				Project Type	Knowledge communication; Capacity building
Focus Area(s)	Urban areas				
16.	Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT) ⁷⁵	Increase access to financial resources for climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and	Bangladesh, Cambodia, Federated States of Micronesia, Fiji, Indonesia,	Funder(s)	USAID
				Total Budget	US\$18.0 million
				TBD	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA

⁷² APN, <http://www.apn-gcr.org/newAPN/activities/ARCP/2010/list2010projects.htm>.

⁷³ ICRISAT, <http://ongoing-research.cgiar.org/factsheets/vulnerability-to-climate-change-adaptation-strategies-and-layers-of-resilience>.

⁷⁴ BMU, <http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=552>.

⁷⁵ USDS, <http://www.state.gov/documents/organization/151686.pdf>.

Name		Objectives	Participating Countries	Project Details	
		strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up.	Lao PDR, Malaysia, Nepal, Palau, Philippines, Solomon Islands, Sri Lanka, Thailand, Viet Nam	<i>Duration</i>	2011 – 2016
				<i>Project Type</i>	Capacity building; Knowledge communication
				<i>Focus Area(s)</i>	Government
Participation in projects involving countries from Asia-Pacific, Africa and Latin America and the Caribbean					
17.	Preparedness for Climate Change ⁷⁶	The aim of this program was for the Red Cross and Red Crescent National Societies in countries particularly vulnerable to climate change to gain a better understanding of climate change and its impacts to identify country-specific adaptation measures in line with risks. Activities could include organizing a workshop on risks, assessment of risks through preparation of a background document, capacity building programs, and developing climate change resilient plans.	Global project: 39 countries <i>East and South East Asia participants in Phase 1:</i> Indonesia, Philippines, Thailand	<i>Funder(s)</i>	Red Cross/Red Crescent Climate Centre
				<i>Total Budget</i>	
				<i>Implementing Agency(s)</i>	National Red Cross/Red Crescent Societies
				<i>Duration</i>	Phase 1: 2006 – 2009 Phase 2: ongoing
				<i>Project Type</i>	Capacity building; Policy formation and integration
				<i>Focus Area(s)</i>	Disaster risk management
18.	Mangroves for the Future (MFF) ⁷⁷	The project has two main objectives: to strengthen the environmental sustainability of coastal development; and to promote the investment of funds and efforts in coastal ecosystem management. MFF re-orientes the current focus of coastal investment by moving from a reactive response to disasters, to progressive activities that address long-term sustainable management needs. These include building awareness and capacity for improved food and livelihood security, disaster preparedness, and climate change adaptation. Initially focused on countries that were highly affected by the 2004 tsunami—India, Indonesia, Maldives, Seychelles, Sri	India, Indonesia Maldives, Pakistan, Seychelles, Sri Lanka, Thailand, Viet Nam	<i>Funder(s)</i>	2007 – 2009: Australia, Germany, Norway, Sweden, UNDP, UNEP 2010 to now: Norway and Sweden
				<i>Total Budget</i>	
				<i>Implementing Agency(s)</i>	National governments with CARE International, FAO, IUCN, UNDP, UNEP and Wetlands International with NGOs and CBOs
				<i>Duration</i>	2006 – present
				<i>Project Type</i>	Research; Knowledge communication; Policy formation and implementation
				<i>Focus Area(s)</i>	Coastal zone

⁷⁶ IFRC, <http://www.climatecentre.org/site/preparedness-for-climate-change-programme>.

⁷⁷ MFF, <http://www.mangrovesforthefuture.org/> and <http://www.mangrovesforthefuture.org/Assets/documents/IUCN-MFF-Brochure-Web.pdf>.

Name		Objectives	Participating Countries	Project Details	
		Lanka and Thailand—the project has expanded to include Pakistan and Viet Nam.			management
19.	Pilot Program for Climate Resilience (PPCR) ⁷⁸	PPCR aims to pilot and demonstrate ways in which climate risk and resilience may be integrated into core development planning and implementation in a way that is consistent with poverty reduction and sustainable development goals. In this way, the PPCR provides incentives for scaled-up action and initiates transformational change. The pilot programs and projects implemented under the PPCR are country-led, build on NAPAs and other relevant country studies and strategies.	Bangladesh, Bolivia, Cambodia , Mozambique, Nepal, Niger, Tajikistan, Yemen, Zambia <i>Regional Programs:</i> Caribbean and Pacific (includes Papua New Guinea, Samoa, Tonga)	<i>Funder(s)</i>	World Bank's Strategic Climate Fund
				<i>Total Budget</i>	US\$971.75 million pledged as of February 2011
				<i>Implementing Agency(s)</i>	World Bank
				<i>Duration</i>	2008 – ongoing
				<i>Project Type</i>	Policy formation and integration
				<i>Focus Area(s)</i>	Multi-sectoral
20.	Advancing Capacity for Climate Change Adaptation (ACCCA) ⁷⁹	The rationale for this project is that countries lack scientific knowledge and understanding of climate risks, and that this is an impediment to addressing climate variability. Activities include the following: identify and prioritize climate risks; assess available knowledge about risks and adaptation opportunities; develop, test, and disseminate risk communication materials that are designed to assist adaptation decisions; and identify critical knowledge gaps that impede effective adaptation decisions.	Bangladesh, Burkina Faso, Cameroon, Ethiopia, Ghana, Kenya, India, Malawi, Mali, Mongolia , Nepal, Niger, Nigeria, Philippines , South Africa, Tanzania, Tunisia	<i>Funder(s)</i>	IDRC, DEFRA, Swiss Federal Office for the Environment, NCAP, European Commission
				<i>Total Budget</i>	
				<i>Implementing Agency(s)</i>	UNITAR
				<i>Duration</i>	2007 – 2010
				<i>Project Type</i>	Assessment; Capacity building; Policy formation and integration
				<i>Focus Area(s)</i>	Multi-sectoral
21.	Health Vulnerability and Climate Change Adaptation Assessments ⁸⁰	To provide national level evidence of the linkages between climate and health; improve understanding of local and specific health risks and vulnerabilities; provide the opportunity for capacity building; and serve as a baseline analysis to monitor how health risks may be influenced by a changing climate over time.	Bolivia, Brazil, Cambodia , Costa Rica, Ghana, India, Kyrgyz Republic, Macedonia, Mongolia , Russia,	<i>Funder(s)</i>	WHO
				<i>Total Budget</i>	
				<i>Implementing Agency(s)</i>	National Ministries
				<i>Duration</i>	2008 – 2010 (Closed)
				<i>Project Type</i>	Assessment
				<i>Focus Area(s)</i>	Human health

⁷⁸ CIF, <http://www.climatefundsupdate.org/listing/pilot-program-for-climate-resilience>.

⁷⁹ ACCCA, http://www.acccaproject.org/accca/files/ACCCA_Brochure_19pilotactions.pdf.

⁸⁰ WHO, http://www.who.int/globalchange/mediacentre/events/2010/costa_rica_consultation_200710/en/index.html.

Name		Objectives	Participating Countries	Project Details	
			Tunisia		
22.	Economics of Adaptation to Climate Change Study ⁸¹	The study had two specific objectives. The first was to develop a global estimate of adaptation costs to inform the international community's efforts to tailor support and provide new and additional resources to help vulnerable developing countries meet adaptation costs. The second objective was to support decision makers in developing countries to better evaluate and assess the risks posed by climate change and to better design strategies to adapt to climate change.	Bangladesh, Bolivia, Ethiopia, Ghana, Mozambique, Samoa, Viet Nam	Funder(s)	Governments of Netherlands, UK, Switzerland
				Total Budget	
				Implementing Agency(s)	World Bank
				Duration	2008 – 2010
				Project Type	Research; Policy formation and integration
				Focus Area(s)	Multi-sectoral
23.	Cities and Climate Change Initiative ⁸²	The first phase is designed to promote policy dialogue, develop tools and implement pilot activities in the cities of Sorsogon (Philippines); Esmeraldas (Ecuador); Maputo (Mozambique); and Kampala (Uganda). The project aims at advising and supporting cities and towns prone to the different impacts of climate change by offering innovative approaches and solutions for national and local development planning. In 2010, efforts were initiated to up-scale lessons from this initiative with UN-HABITAT partners in China, Fiji, Indonesia, Mongolia, Nepal, Papua New Guinea, Samoa, Sri Lanka, Vanuatu and Viet Nam. Through this initiative, 10 new cities carried out participatory assessments of their vulnerabilities to climate change.	China, Ecuador, Fiji, Indonesia, Mongolia, Mozambique, Nepal, Papua New Guinea, Philippines, Samoa, Sri Lanka, Uganda, Vanuatu, Viet Nam	Funder(s)	Government of Norway
				Total Budget	
				Implementing Agency(s)	UNEP, UN-Habitat
				Duration	2008 – present
				Project Type	Knowledge communication; Capacity building; Assessment
				Focus Area(s)	Urban areas
24.	Community-based Adaptation Programme ⁸³	The objective of the program is to enhance the capacity of communities in the pilot countries to adapt to climate change	Bangladesh, Bolivia, Guatemala, Jamaica,	Funder(s)	GEF (Strategic Priority on Adaptation), co-financing
				Total Budget	US\$6.7 million

⁸¹ World Bank, <http://climatechange.worldbank.org/content/economics-adaptation-climate-change-study-overview>.

⁸² UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html.

⁸³ GEF, <http://www.gefonline.org/projectDetailsSQL.cfm?projID=2774> and UNDP, http://www.undp-adaptation.org/projects/websites/index.php?option=com_content&task=view&id=203.

Name		Objectives	Participating Countries	Project Details	
		<p>including variability. Planned outcomes are:</p> <ul style="list-style-type: none"> Enhanced adaptive capacity allows communities to reduce their vulnerability to adverse impacts of future climate hazards National policies and programs include community-based adaptation priorities to promote replication, up-scaling and integration of best practices derived from community-based adaptation projects Cooperation among member countries promotes global innovation in adaptation to climate change including variability 	<p>Kazakhstan, Morocco, Namibia, Niger, Samoa, Viet Nam</p>	<p>Implementing Agency(s)</p>	<p>UNDP</p>
				<p>Duration</p>	<p>2009 – 2011</p>
				<p>Project Type</p>	<p>Knowledge communication; Capacity Building; Community-based adaptation</p>
				<p>Focus Area(s)</p>	<p>Multi-sectoral</p>
25.	<p>Piloting Climate Change Adaptation to Protect Human Health⁸⁴</p>	<p>To increase adaptive capacity of national health system institutions, including field practitioners, to respond to climate change-sensitive health risks. The expected outputs of the project are:</p> <ul style="list-style-type: none"> Early warning systems will be adjusted to include climate change induced health risks Capacity of health sector institutions to respond to climate-sensitive health risks will be improved Prevention measures piloted in emerging and epidemic risk area Cooperation among participating countries promotes innovation in adaptation to climate change including variability 	<p>Barbados, Bhutan, China, Fiji, Jordan, Kenya, Uzbekistan</p>	<p>Funder(s)</p>	<p>SCCF, co-financing</p>
				<p>Total Budget</p>	<p>US\$20,933,244</p>
				<p>Implementing Agency(s)</p>	<p>UNDP, WHO</p>
				<p>Duration</p>	<p>2009 – 2014</p>
				<p>Project Type</p>	<p>Capacity building; Field implementation</p>
				<p>Focus Area(s)</p>	<p>Human health; Disaster risk management</p>
26.	<p>Climate Risk Management Technical Assistance Support Project: Phase II⁸⁵</p>	<p>Building capacities for climate risk management among national stakeholders.</p>	<p>Bangladesh, Bhutan, Dominican Republic, Honduras, India,</p>	<p>Funder(s)</p>	<p>Sweden and SIDA through UNDP, UNDP core finance</p>
				<p>Total Budget</p>	
				<p>Implementing</p>	<p>ADPC, International</p>

⁸⁴ ALM, <http://www.adaptationlearning.net/project/piloting-climate-change-adaptation-protect-human-health>.

⁸⁵ UNFCCC, http://unfccc.int/files/adaptation/nairobi_workprogramme/partners_and_action_pledges/application/pdf/iisd_furtherinfo_water_190411.pdf.

Name		Objectives	Participating Countries	Project Details	
			Kenya, Maldives, Mongolia , Nepal, Nicaragua, Niger, Pakistan, Papua New Guinea, Peru, Timor-Leste and Uganda	Agency(s)	Institute for Sustainable Development
				Duration	2010 – 2011
				Project Type	Research; Policy formation and integration
				Focus Area(s)	Multi-sectoral
27.	Global Climate Change Alliance ⁸⁶	The Global Climate Change Alliance seeks to deepen the policy dialogue between the European Union and developing countries on climate change; and to increase support to target countries to implement priority adaptation and mitigation measures, and integration climate change into their development strategies. The program's five priority areas for funding are: improving the knowledge base of developing countries to the effects of climate change; promoting disaster risk reduction; mainstreaming climate change into poverty reduction development strategies; reducing emissions from deforestation and degradation; and enhancing participation in the Clean Development Mechanism.	Bangladesh, Belize, Cambodia , Ethiopia, Guyana, Jamaica, Maldives, Mali, Mozambique, Mauritius, Nepal, the Pacific Region, Rwanda, Senegal, Seychelles, Solomon Islands, Tanzania, Vanuatu	Funder(s)	European Commission, Czech Republic, Sweden, 10th European Development Fund
				Total Budget	€ 140 million
				Implementing Agency(s)	National Governments
				Duration	2008 – ongoing
				Project Type	Policy formation and implementation; Knowledge management
				Focus Area(s)	Disaster risk management; Government
28.	Partners for Resilience ⁸⁷	To increase the resilience of citizens against natural disasters, climate change and the deterioration of ecosystems, through various intervention strategies: stimulating sustainable economic developments; strengthening the capacity of local organizations and local authorities, among other things by making a risk assessment, natural disaster risk management plans and warning systems; advocacy and stimulation of knowledge sharing between governments, civil society,	Ethiopia, Guatemala, India, Indonesia , Kenya, Mali, Nicaragua, Philippines , Uganda	Funder(s)	Netherlands
				Total Budget	EUR 40 million
				Implementing Agency(s)	Dutch Red Cross, Red Cross Climate Centre, CARE, Cordaid, Wetlands International
				Duration	2011 – 2015
				Project Type	Capacity building; Knowledge communications
				Focus Area(s)	Disaster risk management

⁸⁶ GCCA, http://www.gcca.eu/pages/1_2-Home.html.

⁸⁷ Red Cross, <http://www.climatecentre.org/site/partners-for-resilience>.



Name	Objectives	Participating Countries	Project Details	
		knowledge institutes and the private sector in the field of natural disaster reduction and climate adaptation.		

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Appendices: Country Profiles

The appendices to this report provide an overview of adaptation action in each of: Cambodia, China, Democratic People's Republic of Korea, Indonesia, Lao People's Democratic Republic, Malaysia, Mongolia, Myanmar, Philippines, Thailand, Timor-Leste and Viet Nam.

To assess the level of adaptation action occurring in each of these countries, a desk-based review of internet sources and relevant documentation was undertaken. The content of these sources was assessed in relation to a set of parameters established to focus the review's scope and ensure consistency across regions. Notably, it examines *discrete* adaptation actions, or *policies, programs and projects designed and implemented specifically to address the current and projected impacts of climate change*. Therefore, the review presents only a portion of the breadth of the efforts underway to reduce the vulnerability of developing countries to the impacts of climate change. In particular, it does not capture the broad array of development activities that are increasing the adaptive capacity of communities and countries. As well, within the review, adaptation efforts have been deemed to be “current” if they were ongoing or completed in 2009 or later. Therefore, the review does not include projects completed prior to 2009 that may have contributed to building local and national capacity to adapt. The review also only identifies those actions currently underway; it does not offer judgment of the effectiveness of actions taking place. In addition, reflecting the desk-based nature of the review, it is acknowledged that the content is biased toward identification of large-scale projects funded by international development assistance organizations and those projects about which information is available online. Therefore, small-scale projects that meet the review's definition of adaptation action, particularly those occurring at the community level, are not fully represented within the review. A fuller explanation of the methodology used to develop the country profiles that follow is provided in the methodology section of this report.

To facilitate analysis of the degree to which current adaptation projects and programs identified through the review are helping to meet the adaptation needs and priorities of developing countries, a common classification system was developed. This system examined identified projects and programs from two perspectives—their sector or areas of focus and the types of activities they are supporting. A fuller description of these two types of classifications is provided below.

Sector or Area of Focus

To support development of a general classification system for adaptation projects on the basis of their sector or area of focus, a review of the categories used by the Adaptation Learning Mechanism, Intergovernmental Panel on Climate Change (IPCC), United Nations Environment Programme (UNEP) and the Nairobi Work Programme was completed and used to guide development of a series of

categories for characterizing activities included in this review. Based on this review and expert judgment, a set of 14 macro project categories were identified: food, fiber and forests; ecosystems; freshwater resources; oceans and coastal areas; disaster risk management; migration and security; gender; business; infrastructure and transportation; human settlements; human health; climate information services; governance; and multi-sectoral. Where appropriate, these macro project categories were further refined through the identification of various sub-categories. These sub-categories were then used to label the discrete adaptation projects included in the review.

Definitions of the macro project categories used in the review along with descriptions of the types of projects included within their individual sub-categories are presented below.

1. **Food, Fiber and Forests** – Defined as the management and use of terrestrial natural resources to directly improve human well-being. Its sub-categories are:
 - *Agriculture* – Encompassing subsistence agriculture, commercial agriculture and the rearing of confined domestic animals.
 - *Pastoralism* – Encompassing the use of domestic animals as a primary means for obtaining resources from habitats (UNEP, 2007), particularly in nomadic and semi-nomadic communities.
 - *Forestry* – Encompassing afforestation, reforestation, agroforestry, commercial forestry, community-based forest management and woodland management.
 - *Fire management* – encompassing monitoring, planning and management to address the impact of fires on settlements and ecosystems, including forested and grassland ecosystems.

2. **Ecosystems** – Defined as a system of living organisms interacting together and with their physical environment, the boundaries of which may range from very small spatial scales to, ultimately, the entire Earth (IPCC, 2007). Its sub-categories are:
 - *Biodiversity* – Encompassing activities related to the maintenance of living organisms at various spatial scales, including the establishment and protection of parks and bio-reserves.
 - *Ecosystem conservation* – Encompassing efforts to *maintain* the health of particular ecosystems, such as wetlands, grasslands, forests, mangroves and coral reefs.
 - *Ecosystem restoration* – Encompassing efforts to *restore* the health of particular ecosystems, such as wetlands, grasslands, forests, mangroves and coral reefs.

3. **Freshwater Resources** – Defined as the management and use of freshwater contained in terrestrial ponds, lakes, rivers, watersheds, among others. Its sub-categories are:
 - *Freshwater fisheries* – Encompasses the catching, packing and selling of fish and shellfish derived from lakes, rivers and ponds, as well as through freshwater aquaculture.
 - *Watershed management* – Encompassing management of the basins that supply water to different streams, rivers, lakes and reservoirs, including integrated watershed management.
 - *Freshwater supply* – Encompassing efforts to access and preserve freshwater for human consumption and use including drinking water sources, groundwater resources, rainwater harvesting and water infrastructure such as wells, dams and dikes.

4. **Oceans and Coastal Areas** – Defined as the management and use of coastal areas and oceans. Its sub-categories are:
 - *Coastal zone management* – Encompassing the management of land and water resources in coastal areas, including through integrated coastal zone management and the establishment and maintenance of coastal infrastructure.
 - *Marine management* – Encompassing the management and use of off-shore ocean and sea resources.
 - *Marine fisheries* – Encompassing the catching, packing and selling of fish, shellfish and other aquatic resources found in the oceans and seas, including through marine and coastal aquaculture.

5. **Disaster Risk Management** – Defined as the “systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster” (UNISDR, 2009, pp. 10). It includes emergency response measures, preparation for extreme events and early warning systems. No sub-categories were established in relation to this macro project category.

6. **Migration and Security** – Defined as efforts to support the movement of people and maintain their personal security in the face of incremental climate changes or climate shocks.
 - *Migration* – Encompassing preparations for and responses to the potential movement of people from one location to another due to climate change impacts.
 - *Security* – Relates to personal security and freedom from violence, crime and war due to natural and human-induced disasters (UNEP, 2007) and encompasses peace building, conflict reduction and conflict avoidance activities.

7. **Gender** – Defined as the social attributes and opportunities associated with being male and female and the relationships between women and men, and girls and boys, as well as the relations between women and those between men. These attributes, opportunities and relationships are socially constructed and are learned through socialization processes (UN Women, undated). It includes efforts to understand the vulnerability of women to the impacts of climate change, gender-sensitive adaptation strategies, and measures to improve the situation of women at the local and policy level, including through gender mainstreaming. No sub-categories were established in relation to this macro project category.

8. **Business** – Defined as the purchase and sale of goods and services with the objective of earning a profit. Its sub-categories are:
 - *Tourism* – Encompassing the adjustment and development of tourist facilities and operations to account for current and future vulnerabilities, including these actions in relation to ecotourism.
 - *Private sector* – Encompassing potential impact of climate change and potential adaptation strategies on the diverse activities underway in the portion of the economy in which goods and services are produced by individuals and companies including industry, mining and other economic sectors.
 - *Trade* – Encompassing the exchange of goods and services within and between countries.
 - *Insurance* – Encompassing the development, testing and adjusting of insurance and risk-management schemes, including weather-based index systems.

9. **Infrastructure** – Defined as the basic equipment, utilities, productive enterprises, installations, institutions and services essential for the development, operation and growth of an organization, city or nation (IPCC, 2001). Its sub-categories are:
 - *Energy* – Encompassing energy-related systems and infrastructure, including small-scale and large-scale energy generation through hydroelectric power generation, wind, solar and other forms of traditional and new energy sources, as well as transmission networks.
 - *Transportation* – Encompassing the components of the system required to move people and goods, including roads, bridges, railway lines, shipping corridors and ports.
 - *Waste management* – Encompassing sanitation, sewage systems, drainage systems and landfills.
 - *Buildings* – Encompassing actions related to built structures such as houses, schools and offices, including changes to building codes, building practices and green ways of construction.

10. **Human Settlements** – Defined as a place or area occupied by settlers (IPCC, 2001). Its sub-categories are:
 - *Peri-urban areas* – Encompassing the outskirts of urban centers, and the transition zone between rural and urban areas.
 - *Urban areas* – Encompassing municipalities, towns and cities, as well as areas in these centers (such as slums).
 - *Rural areas* – Encompassing villages and other small settlements, as well as rural landscapes and integrated rural development.

11. **Human Health** – Defined as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, undated). It includes efforts to assess vulnerabilities to and the impacts of climate change on human health directly and indirectly, and the development and implementation of appropriate adaptation strategies at the local, regional and national levels. No sub-categories were established in relation to this macro project category.

12. **Climate Information Services** – Defined as the production and delivery of authoritative, timely and usable information about climate change, climate variability, climate trends and impacts to different users at the local, sub-national, national, regional and global levels.⁸⁸ It includes efforts to develop, adjust and provide short- and long-term climate forecasts, including climate change projections, to different audiences. No sub-categories were established in relation to this macro project category.

13. **Governance** – Defined as the institutions (laws, property rights systems and forms of social organization) through which societies define and exercise control over resources.⁸⁹ Its sub-categories are:
 - *Government* – Encompassing efforts to build the capacity of government officials, either at the national or sub-national level, to prepare for and facilitate adaptation to climate change, including through the development of policies, plans, frameworks and strategies, as well as the establishment and operation of climate change trust funds.
 - *Civil society* – Encompassing efforts to build the capacity of the public including non-governmental organizations, to understand, prepare for and respond to climate change.

14. **Multi-sectoral** – Defined as actions that simultaneously address more than one sector in one and/or multiple locations. It includes efforts that address more than one sector, which are challenging to tease apart, and in the context of this review includes large, multi-country projects in which the specific sector of focus is nationally determined and, therefore, varies from country to country. No sub-categories were established in relation to this macro project category.

⁸⁸ Derived from: <http://www.ioss.ucar.edu/cscc/climate-service-definition-condensed.pdf>

⁸⁹ Derived from UNEP, 2007.

Types of Activities

The following categories were used to organize the types of activities being completed as part of current adaptation projects and programs identified through the review:

- *Research* – Encompassing efforts to develop new knowledge and/or organize existing information so as to increase understanding of the links between climate change, human society and ecosystems and inform adaptation decision-making.
- *Assessment* – Encompassing risk, impact and vulnerability assessments, as well as monitoring of ecological and societal trends.
- *Capacity building* – Encompassing the provision of technical training, technical assistance, institutional strengthening and education.
- *Knowledge communication* – Encompassing efforts to share information, knowledge and practices related to climate change adaptation, including awareness raising and engagement of media.
- *Policy formation and integration* – Encompassing efforts to inform, develop and implement climate change adaptation plans, strategies, frameworks and policies at the local, sub-national, national and international levels.
- *Field implementation* – Encompassing physical measures to reduce vulnerability to the impacts of climate change, including the implementation of pilot projects, construction of infrastructure, development and modification of technologies and the management of physical resources.
- Community-based adaptation – Encompassing actions that directly engage community members in efforts to understand, plan for and respond to the impacts of climate change.

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1.0 Cambodia

ACIAR	Australian Centre for International Agricultural Research
ADPC	Asian Disaster Preparedness Center
AIT	Asian Institute of Technology
AusAID	Australian Agency for International Development
CIA	Central Intelligence Agency
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DANIDA	Danish International Development Agency
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GMSARN	Greater Mekong Subregion Academic and Research Network
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ICEM	International Centre for Environmental Management
IDRC	International Development Research Centre
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute
JIID	Japanese Institute of Irrigation and Drainage
LDC	least developed country
LDCF	Least Developed Countries Fund
Lux-Development	Luxembourg Agency for Development Cooperation
MOE	Ministry of Environment
MRC	Mekong River Commission
NAPA	National Adaptation Programme of Action
NOAA	National Oceanic and Atmospheric Administration (United States)
NSDP	National Strategic Development Plan
SEI	Stockholm Environment Institute
SENSA	Swedish Environmental Secretariat for Asia
SNC	Second National Communication
START	Global Change SysTem for Analysis, Research and Training

SIDA	Swedish International Development Cooperation Agency
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNU	United Nations University
USAID	United States Agency for International Development
USDS	United States Department of State
WHO	World Health Organisation
WWF	World Wildlife Fund / Worldwide Fund for Nature

Cambodia occupies 181,035 square kilometers and has a population of 14.7 million people (CIA, 2011). The country is classified as being among the least developed in the world, with a human development ranking of 124 out of 169—the second lowest in the region (UNDP, 2010). Despite these challenges, the country’s economy has grown considerably over the past several years, with manufacturing, tourism and agriculture representing major economic sectors (USDS, 2010). As one of the least developed countries (LDCs) in the region, Cambodia faces particularly acute challenges related to climate change including a need to build domestic capacity to address challenges related to health, agriculture and water resources.

A. Adaptation Needs and Priorities

Cambodia Submitted a National Adaptation Programme of Action (NAPA) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2007 (MOE, 2006). Its NAPA outlines Cambodia’s main areas of concerns related to water management and agriculture, as well as the development challenges that compound the country’s vulnerability to climate change. Cambodia reports an increasing severity of floods and droughts, which has led to crop failures and contributes substantially to poverty levels (MOE, 2006). In its NAPA, Cambodia specifically identified some of the primary needs and threats that it faces with respect to adaptation, as well as priority sectors targeted for action, including agriculture, water resources, coastal zones and human health. It also notes the need for flood protection enhancement through initiatives like riverbank improvements, particularly in areas of the Mekong watershed; and for food security protection to address floods and adverse weather events.

Through its Initial National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) Cambodia identified adaptation needs in the priority sectors of agriculture, and forestry. With respect to agriculture, adaptation suggestions in the



National Communication include: development of new high-yield crop varieties, improved crop management, warning systems for extreme weather events, and improvement of irrigation. Within the forestry sector, Cambodia suggests the creation of forest plantations on otherwise unproductive lands, conservation of protected areas, and improved forest resource management. The National Communication also discusses adaptation priorities within the area of human health, including education and disease control measures, as well as in coastal zones, including the development of a strategic response to sea level rise including studies of impacts, improved management and capacity building of local residents (MOE, 2002).

In addition there has been considerable research on the relationship between climate change and fisheries in Cambodia. Fisheries are a critical component of rural livelihoods and makes up as much as 80 per cent of the animal protein in a traditional diet. Hydrological variation in the Mekong Basin induced by climate change is predicted to amplify the emerging boom and bust cycle of fish catches, resulting in less stability for rural people. It is argued that fisheries and aquaculture can provide compensation for other adaptation problems such as low lying agricultural land and should be considered a key component of adaptation strategies in the country.

B. National Level Policies and Strategic Documents

Cambodia's Initial National Communication to the UNFCCC was published in October 2002 (MOE, 2002). It speaks about adaptation needs generally and does not list potential adaptation options. These priorities were more clearly articulated in its NAPA, in which poverty reduction and increased agricultural production are repeatedly mentioned as the central goals of Cambodia's adaptation efforts. For Cambodia, adaptation policy and development policy are closely linked, and are at the forefront of the *Rectangular Strategy for Growth, Employment, Equity and Efficiency*. The Climate Change Department of the Ministry of Environment of Cambodia is in the process of finalizing Cambodia's Second National Communication (SNC) to the UNFCCC. These efforts include preparation of National Adaptation and Mitigation Plans and identification of technology, institutional and policy gaps. The SNC work will culminate in the preparation of the Climate Change Strategy and Action Plan, which is expected to commence in 2011.

Cambodia has a number of national policies on poverty, the environment and development; however adaptation is not a prominent component of these policies. The country's NAPA currently is the cornerstone of Cambodian adaptation planning and priority action identification. Major policy frameworks are much more generally focused and have goals more related to sustainable resource management and poverty reduction; as such, they have adaptation co-benefits. The country's most recent adaptation related policies and reports are listed in Table 1 below.

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Rectangular Strategy for Growth, Employment, Equity and Efficiency: Phase I and II ⁹⁰	Royal Government of Cambodia	Published in 2004	Multi-sectoral	National level policy encompassing initiatives in all sectors targeted to improve poverty reduction and develop economic growth. Recognizes that climate change is one of the key challenges facing Cambodia and is one of the main threats to its development. Commits to ensuring environmental sustainability, through sustainable management and use of natural resources. Agriculture improvements include crop diversification, irrigation, research and development, infrastructure improvement, microfinance, and improved land management. Water resource improvements include irrigation, expanded reservoirs, improved access, improved management of Mekong basin and encouragement of private sector support in development and management of irrigation.
2.	National Adaptation Programme of Action ⁹¹	Ministry of Environment	Completed in 2007	Multi-sectoral	Provides a profile of national circumstances and vulnerability to climate change. Identifies key adaptation needs and criteria for priority activities. Concludes with a list of proposals for actions.
3.	Strategic Framework for Food Security and Nutrition in Cambodia ⁹²	Royal Government of Cambodia	2008 – 2012	Agriculture	The Framework was developed by the Council for Agricultural and Rural Development in a broad process of consultation involving various ministries and government agencies, development partners and Non-Governmental Organizations (NGOs), and especially the Technical Working Group on Food Security and Nutrition. Improving food security and nutrition is a development priority of the Royal Government of Cambodia, as is apparent from its current national strategic frameworks, including the Cambodia Millennium Development Goals, the Rectangular Strategy and the National Strategic Development Plan. The five main program goals and objectives to be undertaken in this strategy are focused on: (i) increased food security, (ii) increased food access, (iii) improved use and utilization of food, (iv) increased stability of food supply, and (v) enhanced institutional and policy environment for food

⁹⁰ Cambodia, <http://www.phnompenh.um.dk/NR/rdonlyres/FB448000-1A59-4AB9-A352-477F16525778/0/RGCRectangularStrategypassw.pdf>

⁹¹ Cambodia, <http://unfccc.int/resource/docs/napa/khm01.pdf>

⁹² Cambodia, http://www.foodsecurity.gov.kh/News_Events_Ann.aspx?IdNews=442&chk=News

Name of Policy Action	Government Division Responsible	Status	Sector(s) of Focus	Summary description
				security and nutrition.
4. National Strategic Development Plan 2006-2010 (NSDP) ⁹³	Royal Government of Cambodia	Updated in 2009	Multi-sectoral	Formulated using the Rectangular Strategy, the NSDP synthesizes various policy documents, including the Millennium Development Goals and the National Poverty Reduction Strategy, and provides a framework and strategies for implementation to reach these goals.
5. Strategy for Agriculture and Water ⁹⁴	Royal Government of Cambodia	2010 – 2013	Agriculture; Freshwater supply	The Strategy is identified to be instrumental for contributing to achieving the overall development goal of the NSDP, with its particular focus on improving the institutional and management capacity. The Strategy broadly identifies priority areas along with approximate targeting and sequencing of activities and cost estimates. The six main program components to be undertaken in this strategy are focused on: (i) policy and regulation, (ii) institutional capacity building and human resource, (iii) research and education (iv) food security, (v) water resource management and agricultural land management, and (vi) agricultural business and marketing.

C. Current Adaptation Action

There are a number of nationally and regional adaptation projects and programs occurring in Cambodia at present. National projects are focused on capacity building, as well as some policy formulation, awareness raising, knowledge sharing, and community based adaptation activities. The main sectors of focus are agriculture, water, risk reduction and meteorology. Cambodia is participating in a slightly higher proportion of regional projects. These projects are primarily focused on capacity building, vulnerability assessment, research, and policy formulation within the areas of health, nature, water, risk reduction, and policy. Funders active in supporting adaptation action in Cambodia include: the Least Developed Countries Fund (LDCF), the World Bank’s Climate Investment Facility, and the governments of Denmark, the European Commission, Sweden and the United States.

⁹³ Cambodia, http://www.cdc-crdb.gov.kh/cdc/aid_management/nsdp.pdf

⁹⁴ Cambodia, http://www.foodsecurity.gov.kh/News_Events_Ann.aspx?IdNews=629&chk=News

Table 2: Current Adaptation Projects and Programs in Cambodia

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
National Action								
1.	Building Adaptive Capacity and Ecosystem Resilience to Floods and Droughts in Indigenous and Minority Communities ⁹⁵	Assess and document local and indigenous perceptions and voices on climate change impacts, implications and responses, with a focus on floods and droughts.	GEF Small Grants Programme Budget: US\$45,994	Non-Timber Forest Products	Capacity building	2010	Disaster risk management	Two villages, one in Rattanakiri province and one in Stung Treng province
2.	Promoting Climate-Resilient Water Management and Agricultural Practices ⁹⁶	The project objective is to “enhance adaptive capacity, at the national, institutional and local levels, to climate change induced changes in water resources availability for the agricultural sector in Cambodia.” Anticipated outcomes include: (1) improved capacity for development planning under conditions of climate change; (2) locally appropriate adaptation options adopted to reduce exposure to climate -induced risks; and (3) lessons learned in the pilot sites replicated in other vulnerable areas of Cambodia.	LDCF; co-financing Budget: US\$4,190,350	UNDP	Capacity building; Field implementation	2009 - ?	Freshwater supply; Agriculture	
3.	Helping Address Rural Vulnerabilities and Ecosystem Stability (HARVEST) ⁹⁷	Building Cambodian resilience to climate change through adaptive measures in crop selection, water conservation and improved land management.	USAID Budget: Adaptation Component estimate: US \$5 to 9	Fintrac, Inc.	Capacity building; Policy formation and implementation; Field implementation	2010 – 2015	Agriculture	

⁹⁵ UNDP Small Grants Programme,

http://sgp.undp.org/web/projects/16439/building_adaptive_capacity_and_ecosystem_resilience_to_floods_and_droughts_in_indigenous_and_minority.html

⁹⁶ ALM, <http://www.adaptationlearning.net/project/promoting-climate-resilient-water-management-and-agricultural-practices>

⁹⁷ <http://www.state.gov/g/oes/rls/rpts/faststart/asia/151476.htm>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		million (life of project)		on			
4. Preparation of a Strategic Pilot Program for Climate Resilience Project Phase I ⁹⁸	The objective of the project is to mainstream climate resilience into national and sub-national development policies, plans and projects supported by scaled up financing of adaptation activities in the key development sectors and underpinned by (i) strengthened participation and coordination among stakeholders, (ii) science-based adaptation planning, and (iii) enhanced links between adaptation and disaster risk reduction measures.	Climate Investment Fund Budget: US\$ 1,500,000	ADB, World Bank, Royal Government of Cambodia	Policy formation and integration	2010 – 2011	Government; Disaster risk management	
5. Cambodia Community Based Adaptation Programme (CCBAP) ⁹⁹	The project aims to: (1) improve necessary capacity within NGOs, CBOs and local communities to implement community adaptation measures; (2) mainstream adaptation to climate change at the commune level; and (3) document and share lessons learned and good practices to influence changes of policy and program development.	SIDA Budget: US\$ 1,638,612	UNDP	Assessment; Community based adaptation; Policy formation and integration	2010 – 2012	Multi-sectoral	
6. The Cambodia Climate Change Alliance ¹⁰⁰	The objectives of this project are to: <ul style="list-style-type: none"> • Support capacity development and institutional strengthening to prepare for and mitigate climate change risks. • Directly help vulnerable communities by enhancing their resilience to climate 	SIDA, DANIDA, UNDP, EU Budget: US\$8,901,00	UNDP	Capacity building; Knowledge communication; Field implementation	2010 – 2012	Multi-sectoral	Cambodia

⁹⁸ CIF, <http://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/cambodia%20Phase%201%20Proposal%20jdk.pdf> and Cambodia ODA Database, <http://cdc.khmer.biz/>

⁹⁹ Cambodia ODA Database, <http://cdc.khmer.biz/>

¹⁰⁰ UNDP, <http://www.un.org.kh/undp/what-we-do/projects/cambodia-climate-change-alliance-and>
http://www.un.org.kh/undp/media/files/projects/factsheets/factsheet-Cambodia_Climate_Change_Alliance.pdf

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	change and other natural hazards.	o		on			
7.	Vulnerability Assessment and Adaptation Programme for Climate Change within Coastal Zone of Cambodia considering Livelihood Improvement and Ecosystems ¹⁰¹	LDCF; Cambodia Budget: US\$5.88 million	UNEP, Ministry of Environment of Cambodia	Capacity building; Policy formation and integration; Assessment	2011 – 2014	Coastal zone management	Provinces of Sihanoukville, Kampot, Koh Kong, and Kep
Participation in Regional and Global Projects							
8.	Connecting Environmental Changes, Impacts and Responses in the Mekong Delta to Human Wellbeing and Ecosystem Integrity ¹⁰²	UNU	UNU	Research	2007 – 2010	Human health; Ecosystem conservation	Regional: Cambodia, Viet Nam
		<i>In Cambodia: to be determined</i>					

¹⁰¹ GEF, <http://gefonline.org/projectDetailsSQL.cfm?projID=3890>

¹⁰² UNU, <http://www.inweh.unu.edu/River/MekongDelta.htm>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	and Viet Nam. Assessment tools will be developed to evaluate the chain of events from environmental change to impacts on human well-being and ecosystem health.						
9.	Health Vulnerability and Climate Change Adaptation Assessments ¹⁰³	World Health Organization	National Ministries	Assessment	2008 – 2010 (Closed)	Human health	Global: 15 countries including Bolivia, Brazil, Cambodia, Costa Rica, Ghana, India, Kyrgyz Republic, Mongolia and Tunisia
<i>In Cambodia: Vulnerability assessment completed.¹⁰⁴</i>							
10.	Pilot Program for Climate Resilience (PPCR) ¹⁰⁵	World Bank's Strategic Climate Fund Budget: US\$971.75 million pledged as of February 2011	World Bank	Policy formation and integration	2008 – present	Multi-sectoral	Regional Programs: Caribbean and Pacific Country programs: Bangladesh, Bolivia, Cambodia, Mozambique, Nepal, Niger, Tajikistan, Yemen,

¹⁰³ WHO, http://www.who.int/globalchange/mediacentre/events/2010/costa_rica_consultation_200710/en/index.html

¹⁰⁴ Further information available here: http://www.who.int/globalchange/mediacentre/events/2010/costa_rica_consultation_200710/CAMBODIA_va.pdf

¹⁰⁵ Climate Funds Update, <http://www.climatefundsupdate.org/listing/pilot-program-for-climate-resilience>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
							Zambia
		<i>In Cambodia: to be determined</i>					
11.	Adaptation Knowledge Platform ¹⁰⁶	SIDA	SEI, SENA, UNEP, AIT and UNEP Regional Resource Centre for Asia and the Pacific	Capacity building; Policy formation and integration	2009 – 2012	Government	Asia: Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, the Philippines, Sri Lanka, Thailand, Viet Nam
		<p><i>In Cambodia:</i></p> <ul style="list-style-type: none"> • Research into existing adaptation responses, coping strategies and factors affecting resilience at the community level. • Piloting of adaptation planning, mainstreaming into overall development planning at the sub-national level, linked to awareness raising and capacity building amongst planners at this level. <p><i>Implementing organization: UNEP</i></p>					
12.	The MRC Climate Change and Adaptation Initiative ¹⁰⁷	AusAID, DANIDA	Mekong River Commission with ADPC, ACIAR, CARE International, CSIRO, GIZ, FAO, GMSARN,	Research; Capacity building; Assessment; Knowledge communication	2009 – 2025 In three five-year phases Phase 1:	Watershed management	Regional: Cambodia, Lao PDR, Thailand, Viet Nam

¹⁰⁶ AKP, <http://www.climateadapt.asia/>

¹⁰⁷ MRC, <http://www.mrcmekong.org/ccai/Climate-change-n-adaptation-initiative.htm>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	gender and climate change. In addition to the creation of technical papers, and assessments outlining adaptation issues and recommended actions, the Climate Change and Adaptation Initiative also develops educational documents for outreach with local residents on the issues of climate change and adaptation.	first two phases ¹⁰⁸	ICEM, IUCN, IWMI, JIID, Lux-Development, Southeast Asia START Regional Center, SEI, SIDA, UNDP, UNEP, WWF, Wetlands Alliance		2011 – 2015		
<i>In Cambodia: to be determined</i>							
13.	Lower Mekong Initiative ¹⁰⁹	United States	Various	Assessment; Capacity building; Knowledge communication	2010 – ?	Climate information services; Watershed management; Human health	<i>Regional:</i> Cambodia, Lao PDR, Thailand, Viet Nam <i>Plus:</i> United States
<i>In Cambodia: to be determined</i>							

¹⁰⁸ MRC, <http://www.mrcmekong.org/ccai/ccai-framework-document-extraction09.pdf>

¹⁰⁹ USDS, <http://www.state.gov/p/eap/mekong/>

¹¹⁰ USDS, <http://www.state.gov/p/eap/mekong/faq/index.htm>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
14. Climate Sensitive Flood Water Management in the Lower Mekong Basin ¹¹¹	The project is strengthening the capacities of relevant professional bodies in the four riparian states of Cambodia, Lao PDR, Thailand and Viet Nam, as well as the Secretariat of the Mekong River Commission to project the impacts of climate change. The aim is for the countries to be better equipped to prevent or mitigate the growing risk of flooding and the damage arising from it.	Germany	Mekong River Commission, GIZ	Capacity building; Assessment; Policy formation and integration	2010 – 2012	Disaster risk management; Climate information services	<i>Regional:</i> Cambodia, Lao PDR, Thailand, and Viet Nam
<i>In Cambodia: to be determined</i>							
15. Building Climate Resilience of Mekong Hydropower Dams ¹¹²	Assist the Mekong River Commission and the four Lower Mekong countries to strengthen the climate resilience of both their existing and planned dams with a view to improve sediment management practices. The project supports the Lower Mekong Initiative.	USAID Budget: US\$1.9 million	National Heritage Institute	Capacity building	2010 – 2013	Energy	<i>Regional:</i> Cambodia, Lao PDR, Thailand, Viet Nam
<i>In Cambodia: to be determined</i>							
16. Knowledge Center on Climate Change: Adaptation and Best Practices in Agriculture and Natural Resources Sectors ¹¹³	The objectives of this project are: <ul style="list-style-type: none"> • Increasing understanding, knowledge and skills of those in the agriculture and natural resources sectors; • Making clients quickly access and learn about what is going on about climate change; • Responding to every client with quickness, courtesy, competency and accuracy; • Providing products that give clients easy access to cutting-edge research and 	Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) Budget: US\$1.0	SEARCA's University Consortium in Southeast Asia, University of the Philippines Los Banos, World Fish Centre and the Adaptation Learning Mechanism	Capacity building; Knowledge communication	[2010 – 2014]	Agriculture; Climate information services	<i>Regional:</i> Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam

¹¹¹ BMU, <http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=693> and MRC, http://www.mrcmekong.org/MRC_news/press11/Germany-renews-its-support-to-Mekong-Cooperation23Feb11.html

¹¹² U.S. Dept. of State, <http://www.state.gov/documents/organization/151686.pdf>

¹¹³ KC3, <http://beta.searca.org/kc3/> and ALM, <http://www.adaptationlearning.net/project/knowledge-center-climate-change-kc3-adaptation-and-best-practices-agriculture-and-natural-re>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	development results, learning events and policy advocacy.	million for 5 years					
<i>In Cambodia: to be determined</i>							
17.	Building Capacity to Adapt to Climate Change for Selected Southeast Asian Countries: Vulnerability assessment and economic analysis of adaptation ¹¹⁴	IDRC Budget: CND \$228,700	SEARCA, IDRC, College of Economics - Hue University of Viet Nam, and the Royal University of Phnom Penh of Cambodia	Assessment; Capacity building; Policy formation and integration	2011 – 2014	Government	<i>Regional:</i> Cambodia, Philippines, Viet Nam
<i>In Cambodia: to be determined</i>							
18.	Global Climate Change Alliance ¹¹⁵	European Commission, Czech Republic, Sweden, 10th European Development	National Governments	Policy formation and implementation; Knowledge communication	2008 – ongoing	Disaster risk management; Government	<i>Global:</i> 17 countries ¹¹⁶ and the Pacific region, including Cambodia

¹¹⁴ IDRC, http://www.idrc.ca/EN/Regions/South_East_Asia/Pages/ProjectDetails.aspx?ProjectNumber=106326 and SEARCA, <http://sis.searca.org/index.php/component/sobi2/?sobi2Task=sobi2Details&catid=28&sobi2Id=99>

¹¹⁵ GCCA, http://www.gcca.eu/pages/1_2-Home.html

¹¹⁶ These countries are; Bangladesh, Belize, Cambodia, Ethiopia, Guyana, Jamaica, Maldives, Mali, Mozambique, Mauritius, Nepal, Rwanda, Senegal, Seychelles, Solomon Islands, Tanzania and Vanuatu.

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
	development strategies. The program's five priority areas for funding are: improving the knowledge base of developing countries to the effects of climate change; promoting disaster risk reduction; mainstreaming climate change into poverty reduction development strategies; reducing emissions from deforestation and degradation; and enhancing participation in the Clean Development Mechanism.	t Fund Budget: € 140 million						
		<i>In Cambodia:</i> The Cambodia Climate Change Alliance (CCCA). ¹¹⁷ The initiative aims to enable Cambodia to own and align climate change interventions with national development priorities. <ul style="list-style-type: none"> • <i>Funder(s):</i> EU, UNDP, SIDA and DANIDA • <i>Budget:</i> Euros 2.2 million • <i>Implementing agency(s):</i> Ministry of Environment on behalf of the National Climate Change Committee <i>Duration:</i> 2009 – 2012						
19.	Mekong River Basin Project on Addressing Climate Change Impacts on Agriculture and Natural Resources ¹¹⁸	Helps communities assess climate change impacts on agriculture and ecosystems and strengthen adaptation capacity with respect to water resources, food security, livelihoods, and needs of vulnerable groups. The project supports the Lower Mekong Initiative.	USAID Budget: US\$9.0 million		Assessment; Capacity building	2011 – 2016	Agriculture; Ecosystem conservation	<i>Regional:</i> Cambodia, Lao PDR, Thailand, Viet Nam
		<i>In Cambodia:</i> to be determined						
20.	Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT) ¹¹⁹	Increase access to financial resources for climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up.	USAID Budget: US\$18.0 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Knowledge communication	2011 – 2016	Government	<i>Asia Region:</i> Bangladesh Cambodia Federated States of Micronesia, Fiji, Indonesia, Lao PDR, Malaysia,

¹¹⁷ GCCA, http://www.gcca.eu/cgi-bin/datadirs.pl?&lg=2&id_datadir_family=1&extlink=8&sw=detail&id_datadir_sheet=6

¹¹⁸ USDS, <http://www.state.gov/documents/organization/151686.pdf>

¹¹⁹ USDS, <http://www.state.gov/documents/organization/151686.pdf>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
							Nepal, Palau, Philippines, Solomon Islands, Sri Lanka, Thailand, Viet Nam
<i>In Cambodia: to be determined</i>							

D. Proposed Adaptation Action

Through the completion of its NAPA, Cambodia identified a number of priority adaptation projects for funding. The level of detail for these proposed actions is quite general and may be elaborated upon in the future. As well, Cambodia has proposed projects for funding to the Special Climate Change Fund (SCCF). These planned adaptation projects are presented in Table 3.

Table 3: Proposed Adaptation Projects and Programs in Cambodia

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
Projects proposed in NAPA				
1. Rehabilitation of a Multiple-Use Reservoir in Takeo Province	To improve water storage capacity for multiple uses including irrigation, water supply for urban areas, recreational uses and enhanced aquatic biodiversity.		Agriculture; Freshwater supply	Takeo
Notes: Budget proposed in NAPA: \$4,000,000				
2. Rehabilitation of Multiple-Use Dams in Takeo and Kampong Speu Provinces	To improve water management for multiple uses including irrigation, water supply rural communities, recreational uses and aquatic biodiversity enhancement.		Agriculture; Freshwater supply	Takeo, Kampong Speu
Notes: Budget proposed in NAPA: \$2,500,000				
3. Community and Household Water Supply in Coastal Provinces	To provide safer water for rural communities in coastal areas; and to reduce the incidence of water-related diseases.		Coastal zone management	Kampot, Kep and Koh, Kong
Notes: Budget proposed in NAPA: \$1,00,000				
4. Development and Rehabilitation of Flood Protection Dikes	To protect settlements and agricultural fields from flood.		Agriculture; Freshwater supply	Battambang, Kampong Cham, Kandal, Kratie, Pursat, Sihanoukville and Svay Rieng

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
				Notes: Budget proposed in NAPA: \$5,000,000
5. Rehabilitation of Upper Mekong and Provincial Waterways	<ul style="list-style-type: none"> - To reduce risks caused by Mekong floods - To improve fishery resources - To improve rural livelihoods by supplying sufficient water for irrigation and domestic uses; and - To improve provincial water transportation 		Agriculture; Freshwater supply	Provinces along upper Mekong, Koh Kong, Prey Veng, Pursat and Svay Rieng
				Notes: Budget proposed in NAPA: \$30,000,000
6. Rehabilitation of Multiple-Use Canals in Banteay Meas District, Kampot Province	To enhance water storage capacity for general use in the village during the dry season.		Coastal zone management	Kampong Thom
				Notes: Budget proposed in NAPA: \$1,500,000
7. Vegetation Planting for Flood and Windstorm Protection	To reduce flood and windstorm damage to property and crops.		Multi-sectoral	Kampong Thom, Kampong Speu, Kratie, Sihanoukville, Takeo, Prey Veng, Battambang and Banteay Meanchey
				Notes: Budget proposed in NAPA: \$4,000,000
8. Strengthening of Community Disaster Preparedness and Response Capacity	<ul style="list-style-type: none"> - To ensure preparedness for and effective response to climate hazards at the community level; and - To reduce climate hazard risks for local communities. 		Multi-sectoral	Banteay Meanchey, Kampong Cham, Kampong Speu, Kampong Thom, Kandal, Prey Veng, Svay Rieng and Takeo
				Notes: Budget proposed in NAPA: \$5,000,000
9. Water Gates and Water Culverts Construction	<ul style="list-style-type: none"> - To regulate flood water around the newly rehabilitated road network; and - To minimize road and crop damage caused by flood. 		Agriculture; Transportation	Banteay Meanchey, Kampong Cham, Kandal, Kratie, Prey Veng, Siem Reap, Svay Rieng and Takeo
				Notes: Budget proposed in NAPA: \$10,000,000
10. Safer Water Supply for Rural Communities	<ul style="list-style-type: none"> - To provide safe water in sufficient quantities for rural communities; and - To reduce the risk of contracting water-related diseases. 		Agriculture; Freshwater supply	Battambang, Kampong Cham, Kampong Speu, Kampong Thom, Kandal, Kratie, Prey Veng, Ratanak Kiri and Takeo
				Notes: Budget proposed in NAPA: \$5,000,000
11. Development and Improvement of Small-Scale Aquaculture Ponds	<ul style="list-style-type: none"> - To ensure food security in the areas where wild fish stocks are insufficient to meet demand; and - To increase the income of people living in these areas. 		Freshwater fisheries	Kampong Cham Kampong Speu Kandal, Kratie, Sihanoukville and Svay Rieng
				Notes: Budget proposed in NAPA: \$4,000,000

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
12.	Promotion of Household Integrated Farming	- To increase agricultural productivity; and - To improve farmers' incomes, food security and livelihoods in the areas affected by flood and drought.		Agriculture; Freshwater supply	Banteay Meanchey, Battambang, Kampong Speu, Prey Veng, Svay Rieng and Takeo
Notes: Budget proposed in NAPA: \$2,500,000					
13.	Rehabilitation of Coastal Protection Infrastructure	- To increase agricultural production in coastal areas.		Agriculture; Freshwater supply	Kampot, Kep, Koh Kong and Sihanoukville
Notes: Budget proposed in NAPA: \$2,000,000					
14.	Development and Improvement of Community Irrigation Systems	- To provide sufficient water for rice farming; - To reduce the risk of crop failures from water shortage; and - To enhance food security and assist in eliminating poverty among rural people.		Agriculture; Freshwater supply	Banteay Meanchey, Battambang, Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Thom, Kampot, Kandal, Kratie, Prey Veng, Pursat, Ratanak Kiri, Siem Reap, Svay Rieng and Takeo
Notes: Budget proposed in NAPA: \$45,000,000					
15.	Community Mangrove Restoration and Sustainable Use of Natural Resources	- To stabilize shoreline; - To reduce sea water intrusion; - To reduce coastal erosion; and - To protect coastal areas from storm.		Coastal zone management	Kampot, Kep and Koh Kong
Notes: Budget proposed in NAPA: \$1,000,000					
16.	Community Based Agricultural Soil Conservation in Srae Ambel District, Koh Kong Province	- To reduce soil erosion from agricultural land in the coastal watershed; and - To increase food security.		Coastal zone management; Agriculture	Koh Kong
Notes: Budget proposed in NAPA: \$2,000,000					
Additional Projects in Development					
17.	Improve Water Resource Access and Management for Better Farming in Drought Prone Communities	This projects aims to reduce vulnerability and increase adaptive capacity to climate change, including drought, in seven villages of Chantrea district Svay Rieng, by building the capacity of communities to manage available water resources and irrigation systems for agricultural production, conservation of natural ecosystems and strengthen communities.		Agriculture	Chantrea district Svay Rieng
Notes: GEF Proposal: \$50,000,000					

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
18. Supporting Sub-National Level Decision Makers to Prioritize Adaptation Initiatives within Development Planning Frameworks ¹²⁰		Capacity building	Policy formation and integration	Cambodia, Sri Lanka, Ghana, Tunisia, Tanzania, Uruguay, Peru, Senegal, Albania, Philippines
Notes: Proposed SCCF Funding = \$10 million; co-financing to be determined.				

E. Assessment

Climate change is a high priority for Cambodia, as acknowledged through its national level strategic cross-sectoral planning, as well as through completion of its NAPA. The country has made progress in identifying key adaptation goals and priorities, and the government has established high level of knowledge on where its current adaptation gaps lie. Of the key adaptation priorities identified by the country, it appears that the areas of agriculture and water are receiving the bulk of attention through ongoing adaptation projects, although there appears to be a need for concrete initiatives such as building dikes to minimize the impacts of floods and testing climate resilient crops. A number of ongoing projects are also working to improve domestic capacity to address climate change at the policy level. Gaps in adaptation action appear to exist within the following areas:

- Human health: Identified as a priority through the country’s NAPA and National Communication, there are presently very few adaptation activities addressing health underway in the country.
- Coastal zones: There presently do not appear to be any projects occurring within this area; however certain ongoing projects addressing adaptation within the water sector may touch upon these coastal zones although this is not explicitly mentioned.
- Fisheries: Fisheries are a critical part of the Cambodian’s diet and future project work may seek to expand adaptation initiatives within this sector.
- Gender: although a component of a couple of regional projects, none of the initiatives identified in Cambodia specifically aim to understand and respond to the gender dimensions of climate change.

¹²⁰ GEF, http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf



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2.0 China

ADB	Asian Development Bank
AIT	Asian Institute of Technology
APN	Asia-Pacific Network for Global Change Research
CIA	Central Intelligence Agency
CICERO	Center for International Climate and Environmental Research – Oslo
GEF	Global Environment Facility
ICARDA	International Center for Agricultural Research in the Dry Areas
ICIMOD	International Centre for Integrated Mountain Development
ICIRISAT	International Crops Research Institute for the Semi-Arid Tropics
IGES	Institute for Global Environmental Strategies
LDC	least developed country
PRC	People’s Republic of China
SCCF	Special Climate Change Fund
SEI	Stockholm Environment Institute
SENSA	Swedish Environmental Secretariat for Asia
SIDA	Swedish International Development Agency
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USDS	United States Department of State
WHO	World Health Organisation



As a country covering 9,596,961 square kilometers containing over 1.3 billion people, China is by far the largest country in the region in terms of both geography and population (CIA, 2011). With a human development index ranking of 89 out of 169, China's ranking is average for the region, although inequality within the country gives rise to varying levels of development along regional and rural-urban lines (UNDP, 2010). Given its substantial size, China's topography and climate are highly diverse, ranging from plains and deltas in the east and high plateaus and deserts in the west (USDS, 2010). The climate varies from tropical in the south to subarctic in China's northern regions (USDS, 2010). As a result of its rapidly growing economy, China is in a unique position of being one of the major international contributors to global greenhouse gas emissions, but is also highly vulnerable to the impacts of climate change due to its economy, society and natural environment. China has several high-profile adaptation related needs, which it is addressing international assistance and its own financial resources.

A. Adaptation Needs and Priorities

The process of climate change has begun in China, with average temperatures in winter time having already shown an increase of about 0.5°C between the 1970s and the early 2000s (PRC, 2004). Chinese scenarios predict this trend will continue, with a mid-century rise of 2 to 3°C. Although China's internal modeling and forecasting capacity is likely one of the most advanced in the region, uncertainties remain within studies conducted to date, (PRC, 2004).

Given China's great expanses of inland areas as well as shorelines and islands with vulnerable ecosystems, China faces a large variety of potential climate change impacts and requires an adaptation response that address an extremely wide variety of potential impacts. Some of these needs were identified in China's Initial National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) submitted in December 2004 (PRC, 2004). Within it, the sectors identified as having priority adaptation needs are water resources, agriculture, terrestrial ecosystems and coastal zones. Climate change effects are projected to have a significant impact on water resources, with the intensity of both drought and floods expected to increase. In the agricultural sector, warmer temperatures are expected to extend growing seasons, but this potential benefit could more than be offset by decreases in crop output and fertility, leading to an overall decline in agriculture production (PRC, 2004). In addition, the increased likelihood of extreme weather events could have a very negative impact on the agricultural sector. Threats to biodiversity are also expected. Sea level rise is expected to be significant, particularly in the southern areas, rising as much as 23 centimeters by 2050. This change could lead to significant erosion and intrusion on deltas.

China has identified a number of priorities for adaptation in its National Communication in the sectors of water and agriculture, including:

Freshwater Resources:

- Establishing a modern water conservancy management system and strengthening the unified management and protection of water resources;
- Building up water-saving agriculture and industry, vigorously popularizing water-saving irrigation, developing sprinkle irrigation and dripping irrigation, extending the use of water-saving facilities so as to increase water use efficiency;
- Increasing the capacity of reservoirs and river dams to prevent floods, tapping water sources to increase water-supply capacity, planning and building the trans-valley water converting project and achieving optimized allocation and utilization of water resource cross valleys;
- Enhancing the protection and building of ecosystems, restoring vegetation cover, preventing and controlling soil erosion and loss; and
- Protecting the water environment, preventing and controlling the water pollution, increasing the rate of treating sewage, improving the renewal and utilization of sewage, achieving the benign cycle of the ecology and environment.

Agriculture:

- Adjusting the agricultural structure and the cropping system, such as through expansion of the area of paddy-rice fields in the areas of northeast China, and a shift from the dual structure in the traditional farm production in some areas in China to a ternary structure of coordinated development of food crop, fodder crop and cash crop, etc.;
- Raising multiple cropping indexes;
- Selecting, cultivating and popularizing stress-resistant varieties;
- Improving management measures, such as through active popularization of water-saving agricultural measures, technologies of optimized fertilization and deep fertilization, and technologies of comprehensive prevention and control of soil erosion; and
- Constructing and improving agricultural infrastructures, such as through fundamental construction of farmland, fundamental construction of water conservancy, building the agricultural ecosystem, construction of farmland with high and stable yields, conversion of unduly reclaimed land to pasture.

China stresses that it faces a “dual pressure” on climate change by having both economic development and environmental protection barriers to overcome, particularly in relation to technology development. Despite its recent economic prowess, China remains a

developing country and faces barriers to adaptation implementation. China stresses a need for funding, technology and capacity building to meet its climate change goals.

B. National Level Policies and Strategic Documents

China has a long list of environmental and sustainable development policy plans that it has implemented over the years, the most prominent of which are listed in Table 1. Its National Communication to the UNFCCC also highlights a long list of sectoral policies it has put in place to support adaptation action. As part of its 12th Five-Year Development Plan, China is expected to develop a national Climate Change Plan to address climate change issues¹²¹ along with economic development. How much focus this plan will have on adaptation will be seen when the plan is published in March 2011.

China has taken on a number of policies and actions that have adaptation benefits nationally. Since 2008, China has been issuing an annual report, *China's Policies and Actions for addressing Climate Change*, which summarizes progress on internal policies.¹²² This document outlines policies and action on adaptation as well as mitigation.

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Ten-Point Strategy for China's Environment and Development	Central Government	Developed in 1992	Multi-sectoral	The Strategy is a ten-point series of recommendations for environment and development for China in order to fulfill the obligations under the Conventions to which China is a Party.
2.	China Agenda 21 –China's Population, Environment and Development in the 21st Century	Chinese State Council	Issued in 1994	Multi-sectoral	Agenda 21 is the “master strategy” for environmental policy and an action plan for promoting the coordination of economy, society, resources and environment and sustainable development.
3.	Program of Action for Sustainable Development in China in the Early 21st Century ¹²³	Central Committee	Developed in 2003	Multi-sectoral	The scientific outlook on overall, coordinated and sustainable development and the promotion of all-round economic, social and human development as the most important guidelines and principles for furthering the reform of economic structure

¹²¹ NRDC, http://switchboard.nrdc.org/blogs/bfinamore/china_renews_efforts_on_climat.html

¹²² China, <http://www.ccchina.gov.cn/WebSite/CCChina/UpFile/File571.pdf>

¹²³ NRDC, http://en.ndrc.gov.cn/newsrelease/t20070205_115702.htm

4.	National Communication to the UNFCCC ¹²⁴	State Development Planning Commission	Submitted December 2004	Multi-sectoral	Provides details on national circumstances with respect to climate change and an inventory of greenhouse gas emissions, as well as identification of impacts of climate change and ideas for potential adaptation actions.
5.	National Climate Change Programme ¹²⁵	National Development and Reform Commission	Printed June 2007	Multi-sectoral	Guidelines, principles and objectives of China to address climate change, including a particular focus on key areas for adaptation, as well as needs to implement climate change policies.
6.	White Paper on China's Policies and Actions for Addressing Climate Change ¹²⁶	Chinese Government	Published 2008	Multi-sectoral	A list of policies and actions that stated what the country was adopting to address climate change and progress achieved. Followed up with a progress report in 2009.
7.	China's 12 th Five-Year Plan (2011-2015) ¹²⁷	Chinese Government	To be Published March 2011	Multi-sectoral	Expected to include a national Climate Change Plan.

C. Current Adaptation Action

Over the past several years, China has attracted a considerable amount of climate change funding; however, a large majority of this funding has been directed to mitigation and the energy sector. For example, China has secured nearly half of a billion dollars for climate change projects through the GEF but only a small percentage is funding is for adaptation initiatives.¹²⁸ Nonetheless there are a number of ongoing adaptation activities within the country supported through international partners—the majority of which are regionally-focused projects—that address China's adaptation priorities.

Current nationally focused adaptation projects within China are focused most prominently on adaptation within the agriculture and water sectors, as well as land use management and meteorology. Project activities include capacity building, policy formulation, pilot project implementation, vulnerability assessment and community based adaptation. China is participating in a considerably larger number of regionally-focused projects. These regional projects are primarily focused on water, agriculture, and policy formulation and implementation, with one or two active projects addressing adaptation in the areas of health, nature, urban areas, risk reduction and meteorology. Gender is not a prominent component of either national or multi-country projects in China at present. Leading funders of

¹²⁴ State Development Planning Commission, http://unfccc.int/essential_background/library/items/3599.php?such=j&symbol=CHN/COM/1%20B#beg

¹²⁵ China, <http://www.ccchina.gov.cn/WebSite/CCChina/UpFile/File188.pdf>

¹²⁶ China.org.cn, http://www.china.org.cn/government/news/2008-10/29/content_16681689.htm

¹²⁷ National Peoples Congress, <http://www.uncsd2012.org/rio20/content/documents/Report%20on%20the%20Work%20of%20the%20Government.pdf>

¹²⁸ There are also a number of projects on flood and drought management in China that do not necessarily meet the definition of an adaptation project as per the definition in this review, but will also have a positive environmental benefit.

adaptation action in China include: the Asian Development Bank (ADB), Asia-Pacific Network for Global Change Research (APN), the Special Climate Change Fund (SCCF) and the governments of Norway and Switzerland.

Table 2: Current Adaptation Projects and Programs in China

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action							
1.	Hydrology and Meteorology of the Tibetan Plateau ¹²⁹	FutureWater	Institute for Tibetan Plateau Research, Institute of Geographical Sciences and Natural Resources	Research	2008 – 2012	Freshwater supply	Tibetan Plateau, China
2.	Mainstreaming Climate Change Adaptation in Irrigated Agriculture Project ¹³⁰	SCCF, co-financing Budget: \$55.0 million	World Bank, China's State Office for Comprehensive Agricultural Development, China's Ministry of Finance	Knowledge communication; Capacity building; Policy formation and implementation; Field implementation	2008 – 2012	Agriculture; Freshwater supply	Huang-Huai-Hai River Basin

¹²⁹ FutureWater, <http://www.futurewater.nl/uk/projects/ceopaegis/>

¹³⁰ GEF, <http://www.thegef.org/gef/node/2155> and World Bank, <http://web.worldbank.org/external/projects/main?pagePK=64312881&piPK=64302848&theSitePK=40941&Projectid=P105229>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	consuming) crops; and 3) Mainstreaming adaptation into the Comprehensive Agricultural Development Program and institutional strengthening.						
3.	Policy Study on Government Public Expenditure in Agricultural Production Project ¹³¹	ADB, Climate Change Fund <i>Budget: US\$1-million</i>	Ministry of Agriculture	Capacity building; Assessment	2009 - ?	Agriculture	
4.	Adapting to Climate Change in China ¹³²	DFID, SDC and Department for Energy and Climate Change <i>Budget: US\$6.75 million</i>	National Development and Reform Commission	Research; Capacity building	2009 – 2012	Multi-sectoral	Guangdong and the Autonomous regions of Ningxia and Inner Mongolia
5.	Sustainable Development in	The project aims to support China by	GEF Trust	World Bank	Community	2010 – 2015	Rural areas Chongqing

¹³¹ ADB, <http://www.adb.org/projects/project.asp?id=43068>

¹³² ACCC, <http://www.ccadaptation.org.cn/WebSite/accc/Upload/File/201008/20100829192651170750.pdf>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
Poor Rural Areas Project: Sustainable land management and adaptation ¹³³	exploring and piloting more effective and innovative ways to deliver assistance to the poorest communities and households through community driven development and participatory approaches. A component of the project will provide additional assistance to rural communities to identify and analyze climate change adaptation risks and address such risks through improved and more sustainable management of the surrounding natural and land resources.	Fund; World Bank Budget: US \$159,165,000 (GEF: \$4,265,000)		based adaptation			Municipality, Henan Province and Shaanxi Province	
Participation in Regional and Global Actions								
6.	Floods from the Roof of the World: Protection thanks to applied research ¹³⁴	The project seeks to protect people and infrastructure from the hazards of glacial lake outburst floods (GLOFs). Based on previous fundamental research, the countries of Nepal, Bhutan, India, Pakistan and China/Tibet now have an inventory of glaciers and glacier lakes as well as a GLOF monitoring system. The data gathered are used as the basis for early warning systems. This enables priorities to be set and corresponding action to be taken. The database is also used to determine the amount of total available water resources the region will have in the future.	Swiss Development Corporation	ICIMOD	Community based adaptation; Research	Phase One: 1999 – 2007 Phase Two: 2008 – 2012	Disaster risk management	Asia region: Bhutan, China, India, Nepal, Pakistan
			In China: To be determined					
7.	Management of Flash Floods: Capacity building	Flash floods have caused huge loss of lives and properties of people in the Hindu-Kush	USAID	ICMOD	Capacity building	Phase I: 2006 – 2007	Disaster risk management	Asia Region: China, Nepal,

¹³³ GEF, http://www.thegef.org/gef/sites/thegef.org/files/documents/document/4-13-10%20-%20Webposting-%203608_0.pdf and World Bank, <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CHINAEXTN/0,,contentMDK:22611995~menuPK:50003484~pagePK:2865066~piPK:2865079~theSitePK:318950,00.html?cid=EXTEAPMonth1>

¹³⁴ SDC, http://www.sdc.admin.ch/en/Home/Projects/Floods_from_the_Roof_of_the_World

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	and awareness raising in the Hindu Kush Himalayas ¹³⁵				Phase II: 2008 – 2010		Pakistan
<i>In China: To be determined</i>							
8.	Adaptation to Climate Change in the Hindu Kush Himalayas and Central Asia ¹³⁶	Norway (through UNEP) Budget: US\$62 million	ICIMOD, CICERO, UNEP, UNDP, participating countries	Research; Policy formation and integration	2007 – 2011	Climate information services; Biodiversity; Agriculture	Asia Region: China, India, Nepal, Pakistan
<i>In China: To be determined</i>							
9.	Protection of Sustainable Policy Initiatives in the Management of Natural Resources in the Hindu Kush Himalayas ¹³⁷	BMZ	ICIMOD, GIZ	Capacity building	2008 – 2012	Government	Asia Region: Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, Pakistan
<i>In China: To be determined</i>							

¹³⁵ ICIMOD, <http://www.icimod.org/?q=258>

¹³⁶ ALM, <http://www.adaptationlearning.net/research/too-much-too-little-water-adaptation-climate-change-hindu-kush-himalayas-and-central-asia>

¹³⁷ GIZ, <http://www.gtz.de/en/weltweit/asien-pazifik/33473.htm>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	data collection related to climatic changes and forests. GIZ further promotes the ICIMOD priority program Environmental Change and Ecosystem Services.						
10.	Cities and Climate Change Initiative ¹³⁸	Government of Norway	UNEP, UN-HABITAT	Knowledge communication; Capacity building; Assessment	2008 – ?	Urban areas	<i>Global:</i> China, Ecuador, Fiji, Indonesia, Mongolia, Mozambique, Nepal, Papua New Guinea, Philippines, Samoa, Sri Lanka, Uganda Vanuatu and Viet Nam
							<i>In China:</i> Vulnerability assessment tools are being translated and will be rolled out in interested cities. ¹³⁹
11.	Adaptation Knowledge Platform ¹⁴⁰	SIDA	SEI, SENA, UNEP, AIT and UNEP Regional Resource Centre for Asia and the Pacific	Capacity building; Policy formation and integration	2009 – 2012	Government	<i>Asia:</i> Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar,

¹³⁸ UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html

¹³⁹ UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/pdf/CCCI_Asia-Pacific_Flyer.pdf

¹⁴⁰ AKP, <http://www.climateadapt.asia/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	processes and plans, strengthen linkages between adaptation and the sustainable development agenda in the region and enhance institutional and research capacity, in collaboration with a wide range of national and regional partners.						Nepal, the Philippines, Sri Lanka, Thailand, Viet Nam
<i>In China: to be determined</i>							
12.	Climate Change and Drought in Central Asia and China ¹⁴¹	ADB Budget: US\$775,000	ICARDA	Research	2009 – ?	Agriculture	Asia region: China, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan
<i>In China: To be determined</i>							
13.	Piloting Climate Change Adaptation to Protect Human Health ¹⁴²	SCCF, co-financing Budget: US\$20,933,244	UNDP, WHO	Capacity building; Field implementation	2009 – 2014	Human health; Disaster risk management	Global: Barbados, Bhutan, China, Fiji, Jordan, Kenya, Uzbekistan
<i>In China: The objective of the project's activities in China is "to strengthen the national capacity to respond to the increased health risks due to heat waves in China." The expected outcomes of the project are: "(1) an early warning system is established for impending heat waves to protect people at risk of cerebro- and cardio-vascular diseases; (2) systemic and institutional capacity of health sector will be improved to respond to climate-sensitive health risks; and (2) improve the adaptation capacities and emergency medical plans implemented for cases of cerebro- and cardio-vascular disease during heat waves."</i>							

¹⁴¹ ICARDA, http://www.icarda.org/cac/cac_news/en/cac39e.pdf and <http://www.icarda.org/RestrictedProject/Project8.pdf>

¹⁴² ALM, <http://www.adaptationlearning.net/project/piloting-climate-change-adaptation-protect-human-health>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	climate change including variability.						
		<ul style="list-style-type: none"> • <i>Implementing agency(s)</i>: Institute for Environmental Health and Related Product Safety, China Centre for Disease Control and Prevention, WHO and UNDP. • <i>Budget</i>: US\$550,000 • <i>Geographical focus</i>: Cities of Harbin, Nanjing and Guangzhou¹⁴³ 					
14.	Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific ¹⁴⁴	APN <i>Budget</i> : US\$30,000	IGES, Asia Institute of Technology (AIT) and the AIT/UNEP Regional Resource Center in Asia and the Pacific	Capacity building; Policy formation and integration	2010 – 2011	Government	<i>Asia Region</i> : Australia, China, India, Japan, Kazakhstan, Republic of Korea, Philippines, Thailand
		<i>In China</i> : to be determined					
15.	Food Security and Climate Change in the Asia-Pacific Region: Evaluating mismatch between crop development and water availability ¹⁴⁵	APN <i>Budget</i> : US\$119, 700	University of Western Sydney	Research; Capacity building	2010 – 2011	Agriculture; Freshwater supply	<i>Asia region</i> : India China Australia
		<i>In China</i> : to be determined					

¹⁴³ ALM, http://www.adaptationlearning.net/sites/default/files/China%20Country%20Profile_10.2.11.pdf

¹⁴⁴ APN, <http://www.apn-gcr.org/newAPN/resources/proceedingsAndMeetingReports/proceedings/igm-spg15.pdf>

¹⁴⁵ APN, <http://www.apn-gcr.org/newAPN/activities/ARCP/2010/list2010projects.htm> and University of Western Sydney, http://www.uws.edu.au/health_science/chs/news/news_archive/food_security_and_climate_change_in_the_asia-pacific_region

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
16. Vulnerability to Climate Change: Adaptation strategies and layers of resilience ¹⁴⁶	Provide science-based solutions and pro-poor approaches for adaptation of agricultural systems to climate change for the rural poor and most vulnerable farmers in semi-arid regions of Asia, specifically Bangladesh, India, People's Republic of China, Pakistan and Sri Lanka.	ADB	ICIRISAT	Research; Field implementation	2010 – 2012	Agriculture	Asia Region: Bangladesh, China, India, Pakistan, Sri Lanka
In China: To be determined							
17. Water and Sanitation Sector Responses to Climate Change Impact in Yunnan Province of China and Viet Nam ¹⁴⁷	Carried out by the Water and Sanitation Program, a multi-donor funded partnership, the objective of this project is to help government agencies and service providers better respond to risks posed by climate change in water supply and sanitation services. These will be initiated and tested by developing adaptation plans for the water and sanitation sector at the study sites of Ben Tre, Viet Nam, and Lijiang, Yunnan, China, where poor communities are a significant proportion of the population.	Multi-Donor	World Bank	Policy formation and integration	2010 – 2015	Freshwater supply; Waste management	Regional: China, Viet Nam
In Viet Nam:							

D. Proposed Adaptation Action

The SCCF has received several proposals involving China, as noted in Table 3. These proposals focus on water, transportation and community-based adaptation efforts.

¹⁴⁶ ICIRISAT, <http://ongoing-research.cgiar.org/factsheets/vulnerability-to-climate-change-adaptation-strategies-and-layers-of-resilience/>

¹⁴⁷ World Bank, <http://www.devex.com/en/projects/climate-change-adaptation-for-the-water-sanitation-sector-in-vietnam-and-yunnan-province-of-china>

Table 3: Proposed Adaptation Projects and Programs in China

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Rural Water Resource Utilization in Eastern Qinghai ¹⁴⁸			Freshwater supply	Qinghai
Notes: SCCF Proposal. Proposed funding from the SCCF: \$7.0-million. Proposed co-financing: \$40.0-million.					
Regional and Global Projects					
2.	Increasing Climate Resiliency of the Transport Sector in the Asia Pacific ¹⁴⁹			Transportation	Asia region: China, Timor-Leste, Solomon Islands, Viet Nam
Notes: SCCF Proposal. Proposed funding from SCCF: \$30-million. Proposed co-financing: 1,089.5-million.					
3.	Up-scaling and Replicating Successful Approaches to Adaptation at the Local Level ¹⁵⁰		Community-based adaptation		Barbados, China, Indonesia, Mali, Nicaragua, Peru, Sri Lanka, Tajikistan, Tanzania, Tunisia
Notes: SCCF Proposal. Proposed funding from SCCF: \$5.0-million. Proposed co-financing to be determined.					

E. Assessment

China is making considerable strides in addressing climate change through its various policies as well as participation in a number of projects that address its priority adaptation needs. Given the importance placed on climate change mitigation within the country, it is possible that adaptation is receiving less focus than is warranted. Nonetheless, China has the scientific and technical capacity needed to address its adaptation goals, and has demonstrated that it is cognizant of its adaptation priorities. At the same time it has shown the ability to enact large-scale policy reforms to achieve climate change goals.

China does have significant adaptation issues that need to be addressed and is making progress to meeting these goals. For example, it appears that the country has made considerable advancements in addressing climate change in the agriculture and water sector, two of

¹⁴⁸ GEF, http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf

¹⁴⁹ GEF, http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf

¹⁵⁰ GEF, http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf



its key adaptation priorities. However gaps persist in other areas, including in the priority areas of coastal zones and terrestrial ecosystems.

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3.0 Democratic People's Republic of Korea

CIA	Central Intelligence Agency
DPRK	Democratic People's Republic of Korea
MLEP	Ministry of Land and Environment Protection
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

The Democratic People's Republic of Korea (DPRK), with a geographical area of 120,538 square kilometers and a population of over 24.4 million, is one of the more isolated countries in the region of East and Southeast Asia. Situated between the Republic of Korea and China, it is geographically isolated in the north-east edge of the region, and its government system also creates an isolation of its own as outside travel and trade to and from the country is limited, particularly with developed countries. This isolation limits development of a clear understanding of the socio-economic¹⁵¹ and climate situation within DPRK.

A. Adaptation Needs and Priorities

The DPRK submitted its First National Communication under the United Nations Framework Convention on Climate Change (UNFCCC) in May 2004. The primary adaptation concerns listed in the document are related to sea level rise, intensified extreme weather events, and flooding (MLEP, 2004). Much of the data on climate change impacts in DPRK rely on outside sources such as the Intergovernmental Panel on Climate Change to identify potential impacts and threats. Climate change is likely to not only increase temperatures, but increase precipitation as well, which could have a negative impact on forestry and agriculture, as well as exacerbate pre-existing threats from flooding.

An United Nations Environment Programme (UNEP) *State of the Environment* document published in 2003, one of the few available assessments of DPRK, also points to significant problems related to resource degradation, deforestation and other vulnerabilities that likely will only be exacerbated by climate-related impacts. Coupled with agricultural pressures (UNEP, 2003), greater precipitation could

¹⁵¹ For example, DPRK did not have a 2010 human development ranking (UNDP, 2010). The last available data is from 1995 and ranks DPRK as a mid-range developing country (UNDP, 1998).

result in soil degradation and create a greater risk for events such as landslides and sedimentation of waterways (which also negatively impacts water quality).

Like many neighboring countries, priority adaptation sectors for DPRK identified include agriculture and food security as well as coastal zones and marine ecosystems. With respect to water resources, there is a need to: increase access through reservoirs and improved management practices; increase efficiency and irrigation practices; and improved flood management capacity.

B. National Level Policies and Strategic Documents

Since completing its First National Communication, DPRK has placed increasing importance on climate change adaptation and mitigation. The country has conducted internal research and the Ministry of Land and Environment Protection (MLEP) has gained increasing government influence. A second National Communication is nearing completion, but at the time of writing had not been published. As well, an effort is underway by DPRK and UNEP to update the 2003 assessment. However, there is a lack of strongly defined adaptation policy in the country other than those inferred through its National Communication. Insufficient financial and technical resources and/or competing priorities may be hindering adaptation efforts. Gender has not been considered prominently in DPRK policy and strategy to date.

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	National Communication to the UNFCCC ¹⁵²	Ministry of Land and Environment Protection	Submitted May 2004	Multi-sectoral	Provides details on national circumstances with respect to climate change, an inventory of greenhouse gas emissions, as well as identification of impacts of climate change and potential options for adaptation actions.

C. Current Adaptation Action

Based on available information, it appears that only one nationally focused adaptation project is taking place in the DPRK. Due to its relatively isolated economy and society, the country is not benefitting from the regional actions and initiatives that many other East and Southeast Asian countries are taking part in. Of late, DPRK has started opening up trade lines, particularly with China, and hopes to be able to attract Clean Development Mechanism-type investment in the future which may have adaptation co-benefits. The one identified

¹⁵² Ministry of Land and Environment protection, http://unfccc.int/essential_background/library/items/3599.php?rec=j&preref=4296#beg

project focuses on food security and adaptation in the agriculture sector, and is funded by the United Nations Development Programme (UNDP).

Table 2: Current Adaptation Projects and Programs active in Democratic People's Republic of Korea

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)
National Action						
1.	Reduction of Post-Harvest Losses for Food Security ¹⁵³	The project will focus on post-harvest management practices of farmers and extension workers, and enhance formal training, assessment skills, supplemented by specialized study tours, and the development of pilot demonstration farms.	UNDP Budget: US\$1,761,498	UNDP	Capacity building; Field implementation	2006 – 2010 Agriculture
		Geographic focus (if any)	Jangsuwn Cooperative Farm, Daesong District, Pyongyang Up Cooperative Farm, South Hwanghae Province Soho Cooperative Farm, Mundok County, South Pyongan Province Pyongam Cooperative Farm, North Hwanghae Province Daepyong Cooperative Farm, Singye County, North Hwanghae Province Osin Cooperative Farm, Daeam District, Nampo City			

D. Proposed Adaptation Action

In its National Communication, the DPRK has identified three priority projects for implementation. The needs highlighted in these projects do not appear to be addressed within the current adaptation-related project underway in the country.

Table 3: Proposed Adaptation Projects and Programs in Democratic People's Republic of Korea

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)	
1.	Enhancing capacity in the Environment and Development Center to develop the policies and measures to respond to climate change	Modernization and establishment of the data, statistics and analysis needed to develop adaptation policies.	Capacity building	Multi-sectoral	
		Notes: From National Communication.			
2.	Establishment of forecasting service and alarm systems in vulnerable areas along west and east coastal zones over sea level rise	Prevention of damages associated with flooding, typhoons and tidal waves.	Field implementation	Disaster risk management	Coastal zones
		Notes: From National Communication.			

¹⁵³ UNDP, <http://www.undp.org/dprk/docs/projects/RPHLES.pdf>



Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
3.	Research capacity building for development of new crop variety	Crop diversification	Capacity building	Agriculture	
			Notes: From National Communication		

E. Assessment

DPRK presents a very unique situation in terms of assessing current adaptation action. Its closed political and governmental system makes it difficult to ascertain the country's projected climate impacts and risks, having to rely on national statistics that are difficult to verify, and limited direct observations. What is known is that poverty and famine are significant problems driven by climate variability, degradation of forests and agricultural land, insufficient factors of production including energy and fertilizers, and other factors. Current needs and priorities are difficult to assess, and while it is quite possible that work is ongoing in-country, it is not well publicized. Future adaptation actions may be focused on the country's identified adaptation priorities—including agriculture and food security as well as coastal and marine ecosystems—and address capacity building and climate forecasting in order to establish an up-to-date assessment of climate risks.

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4.0 Indonesia

ACIAR	Australian Centre for International Agricultural Research
AfD	Agence Francaise de Développement
AIT	Asian Institute of Technology
APN	Asia-Pacific Network for Global Change Research
AusAID	Australian Agency for International Development
CIA	Central Intelligence Agency
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DFID	Department for International Development
GEF	Global Environment Facility
ICCTF	Indonesia Climate Change Trust Fund
JICA	Japan International Cooperation Agency
MOE	Ministry of Environment
NOAA	National Oceanic and Atmospheric Administration (United States)
SEI	Stockholm Environment Institute
SENSA	Swedish Environmental Secretariat for Asia
SIDA	Swedish International Development Agency
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USDS	United States Department of State
WWF	World Wildlife Fund / Worldwide Fund for Nature

As an archipelago nation located between the Indian and Pacific Oceans, Indonesia covers a wide area of 1,904,569 square kilometers. With a population of over 245 million people, it has the second highest population in the region and fourth in the world (CIA, 2011). Its human development ranking of 108 of 169 (UNDP, 2010) places it in the middle of the group for the region. The country's 54,000

kilometers of coastline and over 17,500 islands makes the country particularly vulnerable to climate change effects such as sea level rise. As well, concern over water resources and extreme weather events has grown in frequency in recent years (USDS, 2010).

A. Adaptation Needs and Priorities

The Indonesian archipelago is particularly susceptible to extreme weather events and sea level rise, making these two threats central to adaptation planning, priorities and policymaking. Extreme weather events have grown in frequency from the 1950s to the 1980s,¹⁵⁴ and have led to frequent flooding, landslides and increases in water-borne diseases (MOE, 2010). This greater frequency in extreme weather is attributed to an increase in maximum and minimum temperatures, as well as changes in rainfall patterns and the length of the wet seasons. In recent years, drought has become a significant driver of crop failure leading to food shortages in Indonesia. Trends show the instances of these extreme events continually increasing, driving the need for immediate and effective implementation of adaptation actions and policies. In addition to the threat of extreme weather events, poverty and unemployment are also significant challenges—both of which are exacerbated by climate related impacts.

A 2007 report, *The Other Half of Climate Change: Why Indonesia must adapt to protect its poorest people*, highlights some of the major threats that climate change poses to livelihoods, health, food security and water in the country (UNDP, 2007):

- *Livelihoods* – The effects of climate change are being felt more acutely by the poorest communities. Many work in agriculture or fisheries so their livelihoods are acutely climate sensitive. Whether in urban or rural areas, the poor are also likely to be living on the most marginal land that is vulnerable to droughts, floods or landslides. And when disaster strikes, poor communities have very few resources to fall back on.
- *Health* – Heavy rainfall and flooding can overwhelm rudimentary systems of sanitation in the slum areas of towns and cities, exposing people to water-borne diseases such as diarrhea and cholera. Prolonged intense heat waves coupled with high humidity will also lead to heat exhaustion particularly among the urban poor and the elderly. And higher temperatures will also allow mosquitoes to spread to new areas, with the ensuing hazards of malaria and dengue fever.
- *Food security* – The poorest regions have the potential to suffer food shortages; some are acutely vulnerable to climatic variations.
- *Water* – Changing rainfall patterns are also reducing the availability of water for irrigation and drinking. In coastal areas, the loss of groundwater combined with rising sea levels will also allow more sea water to intrude into freshwater sources.

¹⁵⁴ The Second National communication also states that the top 20 natural hazards causing economic lose and human impacts have all occurred after the 1980s (Ministry of Environment, 2020)



In its Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), Indonesia has highlighted as its highest priorities agriculture and coastal zones/sea level rise. Agriculture is identified as a priority in part because rice production is expected to fall by 1.8 to 3.6 million tons between 2025 and 2050 (MOE, 2010). Similar crop failures in the past have led to government aid becoming the largest source of income for farmers (MOE, 2010). In its National Communication, the Government of Indonesia has placed a major focus on improving the capacity of local farmers through actions such as: diversifying cropping techniques and varieties; researching technological advances; better information collection and dissemination; and improved water management practices that recognize upcoming strains on irrigation water sources.

Indonesia's coastal areas are threatened by a potential rise in sea levels of 25 to 50 centimeters in 2050 and 2100 respectively, and a potential rise in sea temperatures, which is a significant threat to coral ecosystems (MOE, 2010). Areas of focus for coastal resources include capacity building through increased community participation in planning processes, adaptation strategies to deal with sea level rise, and improved protection and rehabilitation of coastal areas (especially coral reefs and mangroves) suffering from climate change impacts. As with the agriculture sector, there is also a major focus on sustainable resource management as it pertains to coastal resources, including fisheries.

The Second National Communication also speaks to some of the obstacles and challenges that the country faces related to funding, technology and capacity. The increasing instance of extreme weather events has most affected the poor in Indonesian society, who also are the most exposed and least resilient, meaning significant capacity building is required. The government recognizes that international support is necessary to meet funding requirements and sees the creation of the Indonesian Climate Change Trust Fund as one of the central efforts to address this gap. Technology gaps that prevent effective communication of climate information are also a major problem, as well as a need for effective adaptation planning tools (MOE, 2010).

B. National Level Policies and Strategic Documents

Indonesia submitted its First National Communication to the UNFCCC in October 1999 (Sugandhy, 1999), released the Executive Summary of its Second National Communication in late 2009 (UNDP, 2009), and submitted its full Second National Communication to the UNFCCC in January 2011. Progression from Indonesia's first to second National Communication is marked by a distinct increase in understanding of projected climatic changes and their potential negative consequences. The first National Communication was much more directed to mitigation rather than adaptation, but does recognize the need for some specific adaptation actions, particularly in the area of agriculture. The second National Communication stresses the need for a more balanced approach, and states that adaptation to



climate change is one of Indonesia's highest priorities. It highlights measures to facilitate adaptation in the areas of agriculture, water resources, forestry, coastal and marine areas, and health (MOE, 2010).

Indonesia has one of the more developed national policy frameworks on climate change. The President of the country is directly involved as the Chair of the National Council on Climate Change, the body responsible for formulating national policies and coordinating the actions of government with respect to implementation of climate change policy.

To further its climate change efforts, Indonesia launched the Indonesia Climate Change Trust Fund (ICCTF) in 2009 under the interim trusteeship of the United Nations Development Programme (UNDP). The fund's purpose is to serve as a focal point for the attraction, management and mobilization of funding to support the government's efforts to move forward on low carbon development and adapt to the impacts of climate change. Australia, the Netherlands, Norway, Sweden and the United Kingdom have all allocated grants to the fund, totaling US\$8,514,883 to date. Adaptation is one of three priority areas of the ICCTF, with a particular focus on agriculture, health, coastal zone management and water resources. Work of the ICCTF is overseen by a ministerial steering committee led by the Ministries of Finance and the National Development planning agency. While just becoming fully operational, the ICCTF is funding a pilot project on public awareness, training and education on climate change issues through its adaptation window. As the fund matures, more projects may be accepted through a proposal submission and assessment process ultimately to be managed by the fund manager once UNDP's interim fund manager status ends.

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	First National Communication under the United Nations Framework Convention on Climate Change ¹⁵⁵	State Ministry of Environment	Submitted October 1999	Multi-Sectoral	Provides details on national circumstances with respect to climate change, an inventory of greenhouse gas emissions, as well as identification of impacts of climate change and potential options for adaptation actions.
2.	National Council on Climate Change	Chaired by the President	Established in 2008	Multi-Sectoral	As Stated In Presidential Decree No.46/2008, The Tasks Of The National Council On Climate Change Are To: <ul style="list-style-type: none"> • “Formulate National Policies, Strategies, Programs And Activities On Climate Change Control;

¹⁵⁵ State Ministry of Environment, http://unfccc.int/essential_background/library/items/3599.php?rec=j&preref=2436#beg

Name of Policy Action	Government Division Responsible	Status	Sector(s) of Focus	Summary description
				<ul style="list-style-type: none"> • Coordinate Activities In The Implementation Of Control Tasks That Include Climate Change Adaptation, Mitigation, Technology Transfer And Financing; • Formulating Mechanism And Procedure For Carbon Trading; • Implement Monitoring And Evaluation Of The Implementation Of Policies On Climate Change Control; • Strengthen Indonesia's Position To Encourage Developed Countries To Take More Responsibility In Controlling Climate Change.”¹⁵⁶
3.	National Committee on Climate Change and Environment	Ministry of Environment	Agriculture; Climate information services	The National Committee oversees Indonesia’s responses to climate change and the work of three working groups on agriculture, environment and meteorology and geophysics. It is through the work of the committee that climate change policies are developed.
4.	Indonesia Second National Communication under the United Nations Framework Convention on Climate Change ¹⁵⁷	State Ministry of Environment	Submitted January 2011	Multi-Sectoral Provides further details and update of climate change impacts and progress in Indonesia since the publishing of the First National Communication.

C. Current Adaptation Action

Indonesia has been able to secure significant funding for climate change focused projects and programs, but to date the vast majority has been towards mitigation activities, not adaptation. The government recognizes this and is making efforts to balance the two. Despite this disparity, Indonesia is currently benefitting from a number of national and regional adaptation projects. Nationally focused projects are primarily focused on the areas of agriculture, fisheries and coastal zones. The focus of these activities includes awareness raising, capacity building, policy formulation, research and technical assistance. Key areas of focus for regional and global projects include urban areas, water, fisheries, and policy formulation. Significant supports of national, regional and global adaptation projects underway in Indonesia include Australia, Germany, Japan, Norway, Sweden and the United States.

¹⁵⁶ DNPI, <http://adaptasi.dnpi.go.id/index.php/main/contents/54>

¹⁵⁷ State Ministry of Environment, http://unfccc.int/files/national_reports/non-annex_i_natcom/submitted_natcom/application/pdf/indonesia_snc.pdf

Table 2: Current Adaptation Projects and Programs in Indonesia

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action							
1. Climate Change Program Loan ¹⁵⁸	The Climate Change Program Loan aims at developing public policies to support: climate change mitigation and greenhouse gas reduction (forestry, energy, industry); climate change adaptation (water and agriculture); cross-sectoral issues; and might also have financed state-owned or private energy sector companies. Adaptation actions supported through this program included: development of an Integrated Water Resource Management Plan and establishment of a National Water Council; development of a spatial land use planning methodology for the forest sector that takes in account climate change risks; and implementation of climate field school for agricultural development.	Agence Française de Développement; Japan International Cooperation Agency (JICA); World Bank	Government of Indonesia	Policy formation and implementation	2007 – 2010	Adaptation component: Freshwater supply; Forestry; Agriculture	
2. Indonesia Climate Change Trust Fund (ICCTF) ¹⁶⁰	The ICCTF serves as one of the funding mechanisms in the climate change arena. It has two main general objectives: 1. To achieve Indonesia's goals of a low carbon economy ¹ with greater resilience in the face of the impact of climate change dynamics.	DFID, AusAID	UNDP	Field implementation	Phase 1: 2009 Phase 2: 2010 – 2011 Phase 3:	Government	

¹⁵⁸ AFD, http://www.afd.fr/jahia/webdav/site/afd/shared/PORTAILS/PAYS/EUDN_INDONESIE/Fiche_AFD_CCPL_eng.pdf; JICA, http://www.mofa.go.jp/ICSFiles/afidfile/2008/09/02/h2008_indon.pdf and [http://www.iaia.org/iaia-climate-symposium-dc/proceedings/iaia/day%201/12_IAIA\(JICA\)%20-%20Copy.pdf](http://www.iaia.org/iaia-climate-symposium-dc/proceedings/iaia/day%201/12_IAIA(JICA)%20-%20Copy.pdf)

¹⁵⁹ This budget was provided in a series of tranches. The Agence Française de Développement (AfD) and Japan International Cooperation Agency (JICA) provided \$200 million in 2008 and \$300 million in 2009. In the third tranche of funding for 2010, \$300 million was provided by AfD as a soft and long-term loan; \$300 million by the JICA; and \$200 million from the World Bank (AfD, 201x).

¹⁶⁰ ICCTF, <http://www.icctf.org/site/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	2. To establish innovative ways to link international financial sources with national investment strategies, and simultaneously, to become a showcase of alternative financing for climate change mitigation and adaptation programs managed by government, in a transparent and accountable manner.				2012		
3.	Public Awareness, Training and Education Program on Climate Change Issue For All Levels of Societies in Mitigation and Adaptation ¹⁶¹	ICCTF	Meteorological Climatological, and Geophysical Agency	Knowledge communication; Capacity building	[2010] - ?	Agriculture; Marine fisheries	Provinces of North Sumatra, Jakarta, West Java, East Java, and Southeast Sulawesi
4.	Climate Adaptation Strategies for Rural Livelihoods in Indonesia ¹⁶²	AusAID, CSIRO	Government of Indonesia; Indonesia scientists	Research	2010 - ?	Agriculture; Coastal zone management; Marine fisheries	Province of Nusa Tenggara Barat
5.	Indonesia Climate Change Center ¹⁶³	United States,		Capacity building	2010 - ?	Government	

¹⁶¹ ICCTF, <http://www.icctf.org/site/node/20>

¹⁶² RDF Alliance, http://www.rfdalliance.com.au/site/c_proj_three.php

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	representatives to link climate change policy to science. The initial focus of the center will be on mitigation from peat lands.	Norway Budget: \$34-million					
6.	Climate Adaptation and Disaster Resilience ¹⁶⁴	USAID	Farmers' Initiatives for Ecological Livelihoods and Democracy (FIELD), Lutheran World Relief, Mercy Corps, World Neighbors	Capacity building	2010 – 2013	Disaster risk management	West Sumatra, Aceh, Jakarta, Lampung, Maluku, East Nusa Tenggara, West Nusa Tenggara
7.	Indonesia Marine and Climate Support Project ¹⁶⁵	USAID	Chemonics International	Capacity building Knowledge communication; Policy formation and integration	2010 – 2014	Marine management	Southeast Sulawesi and West Nusa Tenggara Barat
8.	Indonesian Forest and Climate Support Project ¹⁶⁶	USAID	Tetra Tech ARD	Capacity building; Community based adaptation	2010 – 2014	Ecosystem conservation	

¹⁶³ USDS, http://jakarta.usembassy.gov/pr_06282010.html

¹⁶⁴ USAID, <http://www.grants.gov/search/search.do?mode=VIEW&oppId=50515>

¹⁶⁵ USAID, [http://indonesia.usaid.gov/en/USAID/Activity/271/Indonesia Marine and Climate Support IMACS Project](http://indonesia.usaid.gov/en/USAID/Activity/271/Indonesia_Marine_and_Climate_Support_IMACS_Project)

¹⁶⁶ USAID, [http://indonesia.usaid.gov/en/USAID/Activity/274/USAID Indonesian Forest and Climate Support USAID IFACS Project](http://indonesia.usaid.gov/en/USAID/Activity/274/USAID_Indonesian_Forest_and_Climate_Support_USAID_IFACS_Project)

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
9. Strategic Planning and Action to Strengthen Climate Resilience of Rural Communities in Nusa Tenggara Timor province ¹⁶⁷	To enable the province of Nusa Tenggara Timor to strengthen the climate resilience of its rural communities. Expected outcomes are: (1) increased understanding and capacity to plan for climate induced threats and risk reduction responses affecting vulnerable areas and communities in the province; (2) local government and rural communities have integrated climate resilience actions in their development policies, plans and program; and (3) livelihoods and sources of income diversified and strengthened for vulnerable rural communities in three districts. ¹⁶⁸	SCCF, UNDP, West Nusa Tenggara Province <i>Budget:</i> US\$59.8 million	Nusa Tenggara Timor Development Planning Agency	Capacity building; Community based adaptation	2011 – 2015	Rural areas	Nusa Tenggara Timor Province
10. Policy Advice for Environment and Climate Change ¹⁶⁹	The program is advising and supporting the national government, local governments and industries with climate change mitigation and adaptation initiatives. Measures include the joint development of holistic climate change action plans for cities, the establishment of fiscal incentives for low carbon production and fostering the generation and use of renewable energy.	German Federal Ministry for Economic Cooperation and Development	GIZ	Policy formation and integration; Capacity building		Government Urban areas	
Participation in Regional and Global Actions							
11. Preparedness for Climate Change ¹⁷⁰	The aim of this program was for the Red Cross and Red Crescent National Societies in countries particularly vulnerable to climate change to gain a better understanding of	Red Cross/Red Crescent Climate	National Red Cross/Red Crescent Societies	Capacity building; Policy formation and	Phase 1: 2006 – 2009 Phase 2: ongoing	Disaster risk management	<i>Global:</i> 39 countries <i>East and</i>

¹⁶⁷ GEF, <http://gefonline.org/projectDetailsSQL.cfm?projID=4340>

¹⁶⁸ GEF, [http://www.gefonline.org/ProjectDocs/Climate%20Change/Indonesia%20-%20\(4340\)%20-%20Strategic%20Planning%20and%20Action%20to%20Strengthen%20Climate/10-20-2010%20ID4340%20-%20-%20PIF.pdf](http://www.gefonline.org/ProjectDocs/Climate%20Change/Indonesia%20-%20(4340)%20-%20Strategic%20Planning%20and%20Action%20to%20Strengthen%20Climate/10-20-2010%20ID4340%20-%20-%20PIF.pdf)

¹⁶⁹ PAKLIM, <http://www.paklim.org/about/national-policy-advice/>

¹⁷⁰ IFRC, <http://www.climatecentre.org/site/preparedness-for-climate-change-programme>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	climate change and its impacts to identify country-specific adaptation measures in line with risks. Activities could include organizing a workshop on risks, assessment of risks through preparation of a background document, capacity building programs, and developing climate change resilient plans.	Centre		integration			South East Asia participants in Phase 1: Indonesia, Philippines, Thailand
<i>In Indonesia:</i> Based on completion of activities within this project, the Indonesia Red Cross is developing climate change resilient plans and programs.							
12.	Mangroves for the Future (MFF) ¹⁷¹	<p>2007 – 2009: Australia, Germany, Norway, Sweden, UNDP, UNEP</p> <p>2010 to now: Norway and Sweden</p>	<p>National governments with CARE International, FAO, IUCN, UNDP, UNEP and Wetlands</p> <p>International with NGOs and CBOs</p>	<p>Research; Knowledge communication; Policy formation and implementation</p>	2006 – present	Coastal zone management	<p>Global; Asia region: India, Indonesia, Maldives, Pakistan, Seychelles, Sri Lanka, Thailand, Viet Nam</p>
<i>In Indonesia:</i> To be determined.							
13.	Cities and Climate Change Initiative ¹⁷²	Government of Norway	UNEP, UN-HABITAT	Knowledge communication; Capacity building;	2008 – ?	Urban areas	<p>Global: China, Ecuador, Fiji, Indonesia,</p>

¹⁷¹ MFF, <http://www.mangrovesforthefuture.org/> and <http://www.mangrovesforthefuture.org/Assets/documents/IUCN-MFF-Brochure-Web.pdf>

¹⁷² UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	(Mozambique); and Kampala (Uganda). The project aims at advising and supporting cities and towns prone to the different impacts of climate change by offering innovative approaches and solutions for national and local development planning. In 2010, efforts were initiated to up-scale lessons from this initiative with UN-HABITAT partners in China, Fiji, Indonesia, Mongolia, Nepal, Papua New Guinea, Samoa, Sri Lanka, Vanuatu and Viet Nam. Through this initiative, 10 new cities carried out participatory assessments of their vulnerabilities to climate change.			Assessment			Mongolia, Mozambique, Nepal, Papua New Guinea, Philippines, Samoa, Sri Lanka, Uganda Vanuatu and Viet Nam
		In Indonesia: In Pekalongan City, a vulnerability assessment has been completed and the development of an action plan has begun. ¹⁷³					
14.	Asian Cities Climate Change Resilience Network ¹⁷⁴	Rockefeller Foundation, USAID Budget: US\$40-million	ISET, Arup International Development, ProVenton, ICLEI, APCO Worldwide	Capacity building; Knowledge communication; Policy formation and integration	2008 – 2012	Urban areas	Asia Region: India, Indonesia, Thailand, Viet Nam
		In Indonesia: <ul style="list-style-type: none"> • Implementing agencies: Mercy Corps and Urban and Regional Development Institute • Locations: Bandar Lampung and Semarang Have developed city selection criteria and process to be used in the Network project. Will test programs to improve the ability of urban areas to withstand, prepare for and recover from the projected impact of climate change. ¹⁷⁵					
15.	US Support Program to the Coral Triangle Initiative (CTI) ¹⁷⁶	USAID Budget:	WWF, Conservation International,	Capacity building; Assessment;	2008 – 2013	Marine management	Asia-Pacific: Indonesia, Malaysia,

¹⁷³ UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/pdf/CCCI_Asia-Pacific_Flyer.pdf

¹⁷⁴ ACCCRN, <http://www.rockefellerfoundation.org/what-we-do/current-work/developing-climate-change-resilience/asian-cities-climate-change-resilience/>

¹⁷⁵ Mercy Corps, <http://indonesia.mercycorps.org/?show=work&type=work&id=8>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	that support livelihoods and economies in the Coral Triangle and assist the six CTI countries in implementing the CTI Regional and National Plans of Action with activities that focus on instituting an ecosystem approach to fisheries management, creating marine protected areas, building climate change adaptive capacity and establishing regional platforms to promote cross-country learning and enhance sustainability.	US\$41 million	the Nature Conservancy, ARD Inc., NOAA	Field implementation			Philippines, Papua New Guinea, Solomon Islands, Timor-Leste
		<i>In Indonesia:</i> Further information required.					
16.	Adaptation Knowledge Platform ¹⁷⁷	SIDA	SEI, SENA, UNEP, AIT and UNEP Regional Resource Centre for Asia and the Pacific	Capacity building; Policy formation and integration	2009 – 2012	Government	Asia: Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, the Philippines, Sri Lanka, Thailand, Viet Nam
		<i>In Indonesia:</i> to be determined					
17.	Capacity Building for Research and Monitoring of Marine Protected Areas: An Adaptive Mechanism for	APN	Mindanao State University	Capacity Building	2010	Marine management	Regional: Indonesia, Philippines
		<i>In Indonesia:</i> To be determined.					

¹⁷⁶ CTI, <http://www.uscti.org/uscti/default.aspx>

¹⁷⁷ AKP, <http://www.climateadapt.asia/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Climate Change in the Asia-Pacific Region ¹⁷⁸	of the Coral Triangle Initiative in the Asia-Pacific region, these two countries have established a large number of Marine Protected Areas as adaptive mechanisms for natural and anthropogenic impacts. Training of Marine Protected Area monitoring teams will employ scientifically sound research and assessment methods of coral reef, sea grass, and mangrove communities.						
18. Climate Adaptation through Sustainable Urban Development ¹⁷⁹	Through urban case studies, the project will focus on integrated urban water management systems. It will assess how sustainable urban development principles can be applied in response to climate change, population growth and greater demand for resources such as water and energy. The focus of the case studies will be Can Tho, Viet Nam and Makassar, Indonesia.	AusAID, CSIRO		Research; Policy formation and integration	2010 - ?	Urban areas	Regional: Indonesia, Viet Nam
<i>In Indonesia: Further information required.</i>							
19. Knowledge Center on Climate Change: Adaptation and Best Practices in Agriculture and Natural Resources Sectors ¹⁸⁰	<p>The objectives of this project are:</p> <ul style="list-style-type: none"> • Increasing understanding, knowledge and skills of those in the agriculture and natural resources sectors; • Making clients quickly access and learn about what is going on about climate change; • Responding to every client with quickness, courtesy, competency and accuracy; • Providing products that give clients easy 	Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) Budget:	SEARCA's University Consortium in Southeast Asia, University of the Philippines Los Banos, World Fish Centre and the Adaptation Learning	Capacity building; Knowledge communication	[2010 – 2014]	Agriculture; Climate information services	Regional: Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam

¹⁷⁸ APN, <http://www.carbon2markets.org/uploads/news/Volume16-No2-2010-Spring.pdf>

¹⁷⁹ RDF Alliance, http://www.rfdalliance.com.au/site/current_projects.php

¹⁸⁰ KC3, <http://beta.searca.org/kc3/> and ALM, <http://www.adaptationlearning.net/project/knowledge-center-climate-change-kc3-adaptation-and-best-practices-agriculture-and-natural-re>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	access to cutting-edge research and development results, learning events and policy advocacy.	US\$1.0 million for 5 years	Mechanism				
<i>In Indonesia:</i> To be determined.							
20.	Coastal and Marine Resources Management in the Coral Triangle: Southeast Asia ¹⁸¹	To promote the long-term conservation and sustainable management of coastal and marine resources in the Sulu-Sulawesi Marine Ecoregion Priority Seascape in the Coral Triangle, by strengthening integrated and ecosystem-based resources management. Project components include: (1) strengthening national and local institutions for sustainable coastal and marine resources ecosystem management; (2) strengthening of ecosystem-based approach to marine resources management, including vulnerability assessments conducted identifying adaptation measures; (3) supporting mechanisms for sustainable livelihoods in coastal communities; and (4) establishing effective project coordination and implementation.	GEF, Japan Fund for Poverty Reduction, ADB, United States Budget: US\$40,168,182	ADB	Capacity building; Assessment	2011 – 2015	Marine management; Coastal zone management <i>Regional:</i> Indonesia, Malaysia, Philippines
<i>In Indonesia:</i> To be determined.							
21.	Partners for Resilience ¹⁸²	To increase the resilience of citizens against natural disasters, climate change and the deterioration of ecosystems, through various intervention strategies: stimulating sustainable economic developments; strengthening the capacity of local organizations and local authorities, among other things by making a risk assessment,	Netherlands Budget: EUR 40m total	Dutch Red Cross, Red Cross Climate Centre, CARE, Cordaid, Wetlands International	Capacity building; Knowledge communication	2011 – 2015	Disaster risk management <i>Global:</i> Ethiopia, Guatemala, India, Indonesia, Kenya, Mali, Nicaragua, the

¹⁸¹ GEF, <http://www.thegef.org/gef/node/3980> and ADB, <http://pid.adb.org/pid/TaView.htm?projNo=44113&seqNo=02&typeCd=2>

¹⁸² Red Cross, <http://www.climatecentre.org/site/partners-for-resilience>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	natural disaster risk management plans and warning systems; advocacy and stimulation of knowledge sharing between governments, civil society, knowledge institutes and the private sector in the field of natural disaster reduction and climate adaptation.						Philippines, Uganda
<i>In Indonesia:</i> Further information required.							
22.	Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT) ¹⁸³	USAID <i>Budget:</i> US\$18.0 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Knowledge communication	2011 – 2016	Government	<i>Asia Region:</i> Bangladesh Cambodia Federated States of Micronesia, Fiji, Indonesia, Lao PDR, Malaysia, Nepal, Palau, Philippines, Solomon Islands, Sri Lanka, Thailand, Viet Nam
<i>In Indonesia:</i> Further information required.							

D. Proposed Adaptation Action

Research to date has yielded identification of a limited number of proposed adaptation projects in Indonesia, as presented in Table 3.

¹⁸³ USDS, <http://www.state.gov/documents/organization/151686.pdf>

Table 3: Proposed Adaptation Projects and Programs in Indonesia

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Up-scaling and Replicating Successful Approaches to Adaptation at the Local Level (additional 10 countries) ¹⁸⁴				Global: Indicative 10 countries: Tanzania, Peru, Barbados, Nicaragua, Mali, China, Sri Lanka, Indonesia, Tajikistan, Tunisia
<p>Notes: Identified by the GEF as a project ready to be financed. Proposed to SCCF = \$5.0 million; Proposed co-financing = to be confirmed</p>					

E. Assessment

Like many countries in the region, Indonesia had a stronger commitment to mitigation in its earlier climate change documents, but has showed an increasing awareness and commitment to adaptation of late (MOE, 2010). The review shows a lot of progress in awareness of the need for adaptation, and a commitment to balancing mitigation and adaptation in climate change policies. This recent push for balance between adaptation and mitigation policy and actions may be viewed as a positive development.

There are a great many adaptation needs in the country and a number of challenges ahead as climate impacts intensify. Through its National Communications and other documents, Indonesia has identified adaptation needs in a variety of sectors, particularly agriculture, water resources, forestry, coastal and marine areas, and health. Of particular priority are its coastal and food production sectors. Indonesia is making strides in addressing its adaptation needs in a range of sectors as highlighted by the projects identified in Table 2. The greatest number of projects focuses on the sectors of agriculture, fisheries, coastal resources, water, policy development and urban areas. Although there is room to expand and deepen efforts in these aforementioned areas, some gaps also may be identified. For instance, although identified as a priority concern, human health is not a main focus of current initiatives. As well, none of the projects identified specifically seek to better understand the gender dimensions of climate change. More effort to address adaptation needs in the forestry sector also may be appropriate. However, as Indonesia is very active in the area of climate change mitigation, particularly around reducing emissions from deforestation and forest degradation, it is possible that some of these projects are providing adaptation co-benefits.

¹⁸⁴ GEF, http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf

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5.0 Lao People's Democratic Republic

ACIAR	Australian Centre for International Agricultural Research
ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Center
AIT	Asian Institute of Technology
AusAID	Australian Agency for International Development
CIA	Central Intelligence Agency
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DANIDA	Danish International Development Agency
FAO	Food and Agriculture Organization of the United Nations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMSARN	Greater Mekong Subregion Academic and Research Network
ICEM	International Centre for Environmental Management
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute
JIID	Japanese Institute of Irrigation and Drainage
LDC	Least Developed Country
LDCF	Least Developed Countries Fund
Lux-Development	Luxembourg Agency for Development Cooperation
MRC	Mekong River Commission
NAPA	National Adaptation Programme of Action
NOAA	National Oceanic and Atmospheric Administration (United States)
NSEDP	National Socio-Economic Development Plan
NSCC	National Strategy on Climate Change
PDR	People's Democratic Republic
SEI	Stockholm Environment Institute
SENSA	Swedish Environmental Secretariat for Asia
SIDA	Swedish International Development Cooperation Agency
START	Global Change SysTem for Analysis, Research and Training

UNDP	United Nations Development Programme
UNEP	United Nation Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
WWF	World Wildlife Fund / Worldwide Fund for Nature

With a geographical area of 236,800 square kilometers and population of just over 6.4 million (CIA, 2011), Lao People's Democratic Republic (PDR) is one of just two landlocked countries in the region. Lao PDR had a ranking of 122 of 169 on the human development index in 2010 (UNDP, 2010), putting it near the bottom of the list of countries that have achieved a medium level of human development. The country's per capital annual income in 2010 was approximately US\$986 (USDS, 2010). The country's economy is highly dependent on agriculture, representing 30 per cent of GDP and employing approximately 75 per cent of the country's population. The country's climate is tropical and monsoonal, characterized by a rainy season from May to November and a dry season from November to April (USDS, 2010).

A. Adaptation Needs and Priorities

Lao PDR faces significant threats from climate change, in part because 75 per cent of its population depends on natural resources for their livelihood. The government has expressed concern regarding the impacts of climate change on flooding and rainfall patterns, which are said to be increasing and becoming erratic. Floods and droughts historically have significantly impacted Lao PDR's agriculture, forestry, water resources, health and economic growth. As such, these sectors have also been identified as priority areas for adaptation (Sengchandala, 2010). Additional concerns are: a lack of capacity and knowledge with respect to climate modeling; a lack of scientific data on climate effects and potential impacts; low levels of public awareness; and a weak institutional setup that acts as a barrier to adaptation.¹⁸⁵ Financial and capacity constraints are highlighted as major barriers to climate change action (DoE, 2000).

Knowledge of climate change issues has progressed over the past decade, but the barriers to implementation still largely remain. Capacity building at all levels of government would greatly support improved awareness and help generate accurate information and data on climate change and appropriate adaptation strategies in the country.¹⁸⁶

¹⁸⁵ Personal communication, Pauline Gerrard, IISD, April 2011.

¹⁸⁶ Personal communication, Pauline Gerrard, IISD, April 2011.

B. National Level Policies and Strategic Documents

Lao PDR submitted its First National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) in November 2000. This document identifies raising awareness as one of the initial areas of focus for the country; the actual term “adaptation” only appears twice in the entire document, and is primarily referenced in relation to the need for a vulnerability and impact assessment of climate change risk. Subsequently, in 2008, Lao PDR established a National Steering Committee on Climate Change and a National Climate Change Office (Sengchandala, 2010). It also prepared a National Adaptation Programme of Action (NAPA) that was submitted to the UNFCCC in May 2009. It is currently developing its Second National Communication with the support of the United Nations Development Programme (UNDP).

In March 2010, Lao PDR approved a National Strategy on Climate Change (NSCC). This framework document identifies seven priority areas for adaptation and mitigation: agriculture and food security; forestry and land use change; water resources; energy and transport; industry; urban development; and public health (Sengchandala, 2010). The NAPA forms a central component of the NSCC. An overarching goal of the NSCC was to ensure that climate change was streamlined into Lao’s Seventh National Socio-Economic Development Plan (2011-2015). The NAPA, NSCC and current Development Plan have greatly strengthened the policy framework for climate change work in Lao PDR and have served to build awareness of the issue at least among senior government officials in the country. Despite this progress, a weak institutional setup is still seen as significant barriers to adaptation. In particular, a lack of coordination between the UNFCCC National Focal Point, the Water Resource and Environment Administration and other line Ministries limits integration of climate change adaptation policies into sector strategies.¹⁸⁷

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	National Communication to the UNFCCC ¹⁸⁸	Department of Environment	Submitted November 2000	Multi-sectoral	Provides details on national circumstances with respect to climate change, an inventory of greenhouse gas emissions, as well as identification of impacts of climate change and potential options for adaptation actions.
2.	National Adaptation	National Environment	Submitted May	Multi-sectoral	Provides an update and background on national circumstances and

¹⁸⁷ Personal communication, Pauline Gerrard, IISD, April 2011.

¹⁸⁸ Department of Environment, http://unfccc.int/essential_background/library/items/3599.php?rec=j&preref=2741#beg

Name of Policy Action	Government Division Responsible	Status	Sector(s) of Focus	Summary description
Programme of Action ¹⁸⁹	Committee	2009		vulnerability to climate change. Identifies key adaptation needs and criteria for priority activities. Concludes with a list of proposals for actions.
3. The National Strategy on Climate Change (NSCC)	Water Resource and Environment Agency	Approved March 2010	Multi-sectoral	A framework document which lists priority areas for adaptation and mitigation.
4. Seventh National Socio-Economic Development Plan (2011-2015)	Ministry of Planning and Investment	Completed 2010	Multi-sectoral	One of the overarching planning documents for the country. It lists achievements during the past five years and lays the framework for the country's goal of, "national development, to achieve economic growth of at least 8% annually, reduce poverty, achieve the Millennium Development Goals by 2015 and construct basic infrastructure for industrialization and modernization in the times to come." Mitigating the effects of climate change is mentioned as a macro level goal under environmental protection and natural resource management.

C. Current Adaptation Action

Lao PDR is benefitting from a number of adaptation projects, with a smaller number of national projects compared to multi-country projects underway in the country (see Table 2). Its level of activity, though, is low compared to other East and Southeast Asian developing countries. National projects are primarily focused on water, agriculture and disaster risk management, and are funded by the Asian Development Bank (ADB), the Global Environment Facility (GEF), Least Developed Countries Fund (LDCF), Nordic Development Fund and UNDP. Regional projects active in Lao PDR also are primarily focused on addressing adaptation concerns in the water and agriculture sectors, but also address disaster risk management and the provision of climate information services. These regionally focused projects are funded by the governments of Australia, Denmark, Germany, Sweden and the United States.

¹⁸⁹ Lao PDR, <http://unfccc.int/resource/docs/napa/laos01.pdf>

Table 2: Current Adaptation Projects and Programs in Lao People’s Democratic Republic¹⁹⁰

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action							
1.	Addressing the Challenges of Climate Change ¹⁹¹	The objective of the project is to “strengthen the technical and institutional capacity of the Lao PDR to mainstream climate change concerns into sectoral and national development priorities, including the National Socio-Economic Development Plan. The initiative includes support to the: 1. Realization of an updated greenhouse gas inventory; 2. Assessment and development of programs that facilitate both adaptation to and mitigation of the impacts of climate change; 3. Elaboration of the Second National Communication to the UNFCCC; and 4. Provision of strategic guidance and advice to the Government to develop a comprehensive and consolidated response to climate change challenges.”	GEF, UNDP, Lao PDR Budget: US\$898,130	Water Resources and Environment Administration	Policy formation and integration	2008 – 2011	Government
2.	Capacity Enhancement for Coping with Climate Change ¹⁹²	The project will address capacity barriers by providing support to National Climate Change Office and government institutions responsible for addressing the following areas: agriculture, land use and forestry; water resources; energy; urban infrastructure; public health; economy;	ADB Technical Assistance Special Fund, Nordic Development Fund	Water Resources and Environmental Administration	Assessment; Capacity building; Knowledge communication; Field implementation	2009 – 2011	Government; Freshwater supply; Forestry; Agriculture

¹⁹⁰ There are also a series of disaster risk management projects being done by Save the Children Australia and Oxfam which don’t directly address climate change adaptation to climate change. More information on these initiatives is available here: <http://www.savethechildren.org.au/where-we-work/lao-pdr/emergency-programs> and here: <http://www.laos.embassy.gov.au/vtan/AusAID18-July-2008.html>

¹⁹¹ UNDP, <http://www.undplao.org/whatwedo/factsheets/Env/SNCCC.pdf>

¹⁹² ADB, <http://pid.adb.org/pid/TaView.htm?projNo=43443&seqNo=01&typeCd=2>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	financial instruments; and clean production. It will also raise the awareness of policymakers and the public. A main activity of the project include: (i) Assessment of investment and financial flows to address climate change in water, agriculture and energy sectors; (ii) Detailed work plans by eight climate change technical working groups; (iii) Education, training and public awareness campaign; (iv) Information dissemination and identification of additional pilot activities to allow scaling up and replication; (v) Adaptation pilots in the water sector; and (vi) Adaptation pilots in agriculture and forestry sectors.	Budget: US\$3.1 million		on			
3.	Improving the Resilience of the Agricultural Sector in Lao PDR to Climate Change Impacts ¹⁹³	To minimize food insecurity resulting from climate change in Lao PDR and reduce vulnerability of farmers to extreme flooding and drought events.	LDCF; co-financing Budget: US\$9,544,000	UNDP	Community based adaptation	2010 – 2014	Agriculture; Disaster risk management
4.	Climate Impact and Adaptation Sectoral Strategy for Rural Infrastructure in Lao PDR ¹⁹⁴	The study assesses the impacts and risks associated with climate change-induced flooding on priority rural infrastructure and agricultural outputs in Southern Laos through the development of an impact and adaptation risk-based approach designed to support priority rural infrastructure and agricultural outputs in Southern Laos.	ADB Small Grant Budget: US\$100,000		Research; Assessment	ongoing	Agriculture; Disaster risk management Southern Lao PDR

¹⁹³ ALM, <http://www.adaptationlearning.net/project/improving-resilience-agriculture-sector-lao-pdr-climate-change-impacts>

¹⁹⁴ ADB, <http://www.adb.org/climate-change/rural-infrastructure-lao.asp>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
Participation in Regional and Global Actions								
5.	Adaptation Knowledge Platform ¹⁹⁵	The goal of the Adaptation Knowledge Platform is to strengthen adaptive capacity and facilitate climate change adaptation in Asia at local, national and regional levels. Its specific purpose is to establish a regionally and nationally owned mechanism that facilitates the integration of climate change adaptation into national and regional economic and development policies, processes and plans, strengthen linkages between adaptation and the sustainable development agenda in the region and enhance institutional and research capacity, in collaboration with a wide range of national and regional partners.	SIDA	SEI, SENA, UNEP, AIT and UNEP Regional Resource Centre for Asia and the Pacific	Capacity building; Policy formation and integration	2009 – 2012	Government	Asia: Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, the Philippines, Sri Lanka, Thailand, Viet Nam
<i>In Lao PDR: to be determined</i>								
6.	The MRC Climate Change and Adaptation Initiative ¹⁹⁶	The initiative seeks to understand the impacts of climate change in the lower Mekong basin, assess the types of adaptation actions that will have to be undertaken to respond to climate change, foster dialogue with the relevant stakeholders, and address the issue of gender and climate change. In addition to the creation of technical papers, and assessments outlining adaptation issues and recommended actions, the Climate Change and Adaptation Initiative also develops educational documents for outreach with	AusAID, DANIDA <i>Budget: Approximately US\$15-million for first two phases¹⁹⁷</i>	Mekong River Commission with ADPC, ACIAR, CARE International, CSIRO, GIZ, FAO, GMSARN, ICEM, IUCN, IWMI, JIID, Lux-Development, Southeast Asia START Regional	Research; Capacity building; Assessment; Knowledge communication	2009 – 2025 In three five-year phases Phase 1: 2011 – 2015	Watershed management	<i>Regional:</i> Cambodia, Lao PDR, Thailand, Viet Nam

¹⁹⁵ AKP, <http://www.climateadapt.asia/>

¹⁹⁶ MRC, <http://www.mrcmekong.org/ccai/Climate-change-n-adaptation-initiative.htm>

¹⁹⁷ MRC, <http://www.mrcmekong.org/ccai/ccai-framework-document-extraction09.pdf>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	local residents on the issues of climate change and adaptation.		Center, SEI, SIDA, UNDP, UNEP, WWF, Wetlands Alliance				
7.	Lower Mekong Initiative ¹⁹⁸	United States	Various	Assessment; Capacity building; Knowledge communication	2010 – ?	Climate information services; Watershed management; Human health	Regional: Cambodia, Lao PDR, Thailand, Viet Nam Plus: United States
<i>In Lao PDR: to be determined</i>							
8.	Climate Sensitive Flood Water Management in the Lower Mekong Basin ²⁰⁰	Germany	Mekong River Commission, GIZ	Capacity building; Assessment; Policy formation and integration	2010 – 2012	Disaster risk management; Climate information services	Regional: Cambodia, Lao PDR, Thailand, and Viet Nam
<i>In Lao PDR: to be determined</i>							

¹⁹⁸ USDS, <http://www.state.gov/p/eap/mekong/>

¹⁹⁹ USDS, <http://www.state.gov/p/eap/mekong/faq/index.htm>

²⁰⁰ BMU, <http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=693> and MRC, http://www.mrcmekong.org/MRC_news/press11/Germany-renews-its-support-to-Mekong-Cooperation23Feb11.html

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	equipped to prevent or mitigate the growing risk of flooding and the damage arising from it.						
9.	Building Climate Resilience of Mekong Hydropower Dams ²⁰¹	USAID Budget: US\$1.9 million	National Heritage Institute	Capacity building	2010 – 2013	Energy	Regional: Cambodia, Lao PDR, Thailand, Viet Nam
<i>In Lao PDR: to be determined</i>							
10.	Knowledge Center on Climate Change: Adaptation and Best Practices in Agriculture and Natural Resources Sectors ²⁰²	Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) Budget: US\$1.0 million for 5 years	SEARCA's University Consortium in Southeast Asia, University of the Philippine Los Banos, World Fish Centre and the Adaptation Learning Mechanism	Capacity building; Knowledge communication	[2010 – 2014]	Agriculture; Climate information services	Regional: Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam
<i>In Lao PDR: to be determined</i>							
11.	Mekong River Basin Project on Addressing Climate Change Impacts on	USAID Budget:		Assessment; Capacity building	2011 – 2016	Agriculture; Ecosystem conservation	Regional: Cambodia, Lao PDR,

²⁰¹ U.S. Dept. of State, <http://www.state.gov/documents/organization/151686.pdf>

²⁰² KC3, <http://beta.searca.org/kc3/> and ALM, <http://www.adaptationlearning.net/project/knowledge-center-climate-change-kc3-adaptation-and-best-practices-agriculture-and-natural-re>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Agriculture and Natural Resources ²⁰³	to water resources, food security, livelihoods, and needs of vulnerable groups. The project supports the Lower Mekong Initiative.	US\$9.0 million					Thailand, Viet Nam
<i>In Lao PDR: to be determined</i>							
12. Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT) ²⁰⁴	Increase access to financial resources for climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up.	USAID Budget: US\$18.0 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Knowledge communication	2011 – 2016	Government	Asia Region: Bangladesh Cambodia Federated States of Micronesia, Fiji, Indonesia, Lao PDR, Malaysia, Nepal, Palau, Philippines, Solomon Islands, Sri Lanka, Thailand, Viet Nam
<i>In Lao PDR: to be determined</i>							

D. Proposed Adaptation Action

Through its NAPA and NSCC, Lao PDR has developed a number of proposals for adaptation action as listed in Table 3.

²⁰³ USDS, <http://www.state.gov/documents/organization/151686.pdf>

²⁰⁴ USDS, <http://www.state.gov/documents/organization/151686.pdf>

Table 3: Proposed Adaptation Projects and Programs in Lao People’s Democratic Republic

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Strengthen the Capacity of the National Disaster Management Committee	Improve and strengthen the capacity and knowledge of the Committee in the prevention and mitigation of the impacts of climate change (with a particular emphasis an extreme climatic events floods and droughts).	Capacity building	Multi-sectoral	
Notes: Budget presented in NAPA: US\$1,000,000					
2.	Promote secondary professions in order to improve the livelihoods of farmers affected by natural disasters induced by climate change	To decrease the vulnerability of farmers living in drought and flood prone areas through livelihood diversification and the development of secondary occupations.	Capacity building	Agriculture	Drought-prone Areas
Notes: Budget presented in NAPA: US\$820,000					
3.	Continue the slash and burn eradication program and permanent job creation program	Replace the slash and burn agriculture with permanent livelihoods.	Capacity building	Forestry	Watersheds in Bokeo, Luang Namtha, Oudomxay, Luang Prabang and Huaphanh Provinces
Notes:					
4.	Strengthen capacity of village forestry volunteers in forest planting, caring and management techniques as well as the use of village forests	To increase technical the capacity of forest volunteers in community forest management.	Capacity building	Forestry	Luang Prabang, Vientiane, Khammouane, Saravane and Attapeu Provinces
Notes: Budget presented in NAPA: US\$900,000					
5.	Awareness raising on water and water resource management	Conduct public awareness raising campaign in management of water and water resources.	Knowledge communication	Freshwater supply	
Notes: Budget presented in NAPA: US\$100,000					
6.	Mapping of Flood Prone Areas	Conduct mapping of flood prone areas in Lao PDR.	Research	Disaster risk management	Vientiane Capital, Vientiane, Borikhamxay, Khammouane, Savannakhet, Saravane, Attapeu and Champasack Provinces
Notes: Budget presented in NAPA: US\$650,000					
7.	Establish an early warning system for flood	Establish an effective early warning	Field implementation	Disaster risk	Three flood prone areas

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
	prone areas and improve and expand meteorology and hydrological networks and weather monitoring systems		management	located in Luang Namtha, Khammouane, Savannakhet and Attapeu Provinces
Notes: Budget presented in NAPA: US\$2,200,000				
8.	Strengthen institutional and human resource capacities related to water and water resource management	Capacity building	Government; Freshwater supply	Vientiane Capital
Notes: Budget presented in NAPA: US\$200,000				
9.	Survey underground water sources in drought prone areas	Research	Freshwater supply; Disaster risk management	Drought prone areas located in the provinces of Luang Prabang, Savannakhet and Champasack
Notes: Budget presented in NAPA: US\$2,100,000				
10.	Study, design and build multi-use reservoirs in drought prone areas	Field implementation	Freshwater supply; Disaster risk management	Three selected critical drought areas located along the road No. 9 corridor of Savannakhet Province
Notes: Budget presented in NAPA: US\$2,350,000				
11.	Improve systems for the sustainable use of drinking water and sanitation with community participation in flood and drought prone areas	Field implementation	Freshwater supply; Disaster risk management	In pilot sites throughout the country, especially in the flood and drought prone areas
Notes: Budget presented in NAPA: US\$440,000				
12.	Improve knowledge and skills of engineers who design and build water and sanitation systems	Capacity building	Freshwater supply; Waste management	Central and Provincial levels
Notes: Budget presented in NAPA: US\$300,000				



E. Assessment

While climate change is characterized as a high priority in Lao PDR, it appears that capacity is lacking for effective implementation. This observation is reflected in the fact that the country's highest adaptation priority is simply education and capacity building. Strides have been made in improving this capacity through the development of a NAPA and NSCC, supported by the LDCF.

Ongoing adaptation initiatives within the country are addressing many of the adaptation priorities identified by the country. There is a considerable amount of work occurring with the water and agriculture sectors, at both the regional and national level, as well as within the area of policy formulation and risk reduction. Gaps in Lao PDR's climate change activities include a dearth of initiatives within the forestry sector, which has been identified as a top adaptation priority for the country. Forestry initiative may exist within the country under the banner of mitigation projects, and it is possible that these projects would entail adaptation co-benefits. Additional gaps in current programming include energy and transport, urban areas, public health and gender. In addition, it appears that the country has a lack of climate change expertise or accurate data. Going forward, Lao PDR could greatly benefit from the sharing and internal development of scientific and technical capacity for climate change generally and adaptation specifically.

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6.0 Malaysia

AIT	Asian Institute of Technology
APN	Asia-Pacific Network for Global Change Research
CIA	Central Intelligence Agency
GEF	Global Environment Facility
LDC	least developed country
MSTE	Ministry of Science, Technology and Environment
NOAA	National Oceanic and Atmospheric Administration (United States)
PNG	Papua New Guinea
PRECIS	Providing Regional Climates for Impact Studies
SCCF	Special Climate Change Fund
SEI	Stockholm Environment Institute
SENSA	Swedish Environmental Secretariat for Asia
SIDA	Swedish International Development Agency
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USDS	United States Department of State

Malaysia is a country encompassing two main territories within Southeast Asia; peninsular Malaysia and East Malaysia, located on the island of Borneo (USDS, 2010). The country spans a total area of 329,847 square kilometers, with a relatively mid-range population for the region of over 28.7 million (CIA, 2011). The country's terrain is characterized by coastal plains and jungle-covered mountains in the interior, and its climate is tropical. Malaysia has one of the strongest economies in the region, with a solid industrial base centered on oil and gas, plantations, ship building, steel and other industries (USDS, 2010). It has by far the highest human development ranking in the region at 57 of 169 (UNDP, 2010), making it the only country in the region in the top half of the world rankings. The country's advanced development status affords it an advantage in being better able to address the issues of climate change, but it still faces many of the same threats as its Southeast Asian neighbors.

A. Adaptation Needs and Priorities

While at a higher development level than some of its neighbors, Malaysia faces many of the same adaptation challenges and vulnerabilities. As a country that is subject to monsoon seasons, it is particularly vulnerable to changes in weather patterns and rainfall variability and intensity (MSTE, 2000). Malaysia has been able to do a significant amount of climate modeling and development of projections. In its First National Communication to the United Nations Framework Convention on Climate Change (UNFCCC), it observed that resulting scenarios varied greatly. While temperatures are projected to rise, no significant changes in the patterns of rainfall or weather can be identified. More predictable was the potential for sea level rise, which could have a significant negative impact on the country (MSTE, 2000).

After completion of its first National Communication, Malaysia undertook a series of actions to address its adaptation needs. These included (MRRE, 2011):

- The development of a dynamic downscaled climate projection model called the “Regional Hydro-Climate Model for Peninsular Malaysia;”
- Incorporating integrated approaches to water management through the introduction of Integrated Water Resources Management to assist in dealing with floods and droughts;
- Improving infrastructure to address urban flooding;
- Initiation of the development of drought tolerant varieties of rice, rubber, oil palm and cocoa;
- Implementation of the Integrated Shoreline Management Plans to assist in coastal management; and
- A Vector-borne Diseases Control Program that has helped make improvements in the health sector.

In its second National Communications, released in April 2011, Malaysia identifies seven sectors where vulnerability assessments were undertaken, including water resources, agriculture, biodiversity, forestry, coastal and marine resources, energy, and public health. Concerns related to these sectors expressed through both of Malaysia’s National Communications include:

- *Freshwater resources* – Concerns expressed relate to supply, floods and erosion (MRRE, 2011). Water resources are already under particular strain in Malaysia because of increasing demand and, in particular, because of irrigation—which accounts for 83 per cent of total water usage in the country. Increased periods of drought could further threaten water resources (MSTE, 2000).
- *Agriculture* – The potential impact of climate change on key crops, namely oil palm, rice, rubber and cocoa, are a concern (MRRE, 2011). Flooding due to sea level rise threatens as much as six per cent of oil palm production and four per cent of

rubber production. Temperature increases are also a major concern because of their ability to hinder crop production (MSTE, 2000).

- *Forest resources* - Mangrove and montane forests are projected to be adversely affected by increasing rainfall and temperatures (MRRE, 2011).
- *Coastal and marine management* – Sea level rise, higher sea surface temperatures and increasing intensity, duration and frequency of storms are predicted to occur with negative consequences (MRRE, 2011). Shoreline erosion and loss of mangroves is also presented as a significant threat (MSTE, 2000).
- *Energy* – Changes in weather patterns and extreme weather events are projected to have negative impacts on the energy production and development sector, while increases in ambient temperature reduce generation power and put additional stress on transportation infrastructure (MRRE, 2011).
- *Human health* – A central concern is that climate change will lead to an increase in vector-borne diseases, such as malaria and dengue, and water-borne diseases such as diarrhea (MRRE, 2011).

Some adaptation priorities related to agriculture, forestry and coastal zones were identified in Malaysia’s first National Communication. Adaptation actions in the agriculture sector focused on improving agricultural practices such as increased crop variety, water management, food storage, and livestock practices. Forestry efforts included plantation establishment, sustainable forest management, and reduction of forest waste. Water management policies included options for adaptation response based on the principles of defend, accommodate, retreat, counter attack, buyback, and improved coastal management zones. Further adaptation measures and recommendations for these sectors as well as for water resources, biodiversity, energy and human health have been suggested with some detail in the second National Communication, with the goal of implementing these measures much the same way as many were under the initial National Communication.

B. National Level Policies and Strategic Documents

Malaysia launched its National Policy on Climate Change in 2010. Although previous environmental strategies were in place, this policy was the first document that contains a major focus on adaptation. Within it, the government advocates for a balanced approach between mitigation and adaptation (MNRE, 2009). The document contains a number of “Strategic Thrusts” which operate as policy goals and “Key Actions” that are proposals to address climate change and meet these goals. While some of the actions proposed are quite specific, there is not any detailed description of how these actions will be undertaken, or a detailed timeline for their achievement.

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	First National Communication to the UNFCCC ²⁰⁵	Ministry of Science, Technology & Environment	Submitted August 2000	Multi-sectoral	Provides details on national circumstances with respect to climate change, an inventory of greenhouse gas emissions, as well as identification of impacts of climate change and potential options for adaptation actions.
2.	National Policy on Climate Change	Natural Resources and Environment	Launched in 2010	Multi-sectoral	Presents a framework to meet national objectives of mainstreaming climate change through the management of resources and environmental conservation, developing plans and programs to strengthen resilience to impacts of climate change and strengthening institutional and implementation capacity to reduce negative impacts of climate change. It is very focused on integration and mainstreaming of climate actions into all government policy development.
3.	National Steering Committee on Climate Change ²⁰⁶	Natural Resources and Environment		Multi-sectoral	To formulate and implement climate change policies including mitigation of greenhouse gas emissions and adaptation to climate change. Members including the Ministries of Natural Resources and Environment, Energy, Water and Communications, Plantation Industries and Commodities, Finance, Education, International Trade and Industry, Agriculture, Foreign Affairs and the Malaysian Meteorological Service,
4.	Second National Communication to the UNFCCC ²⁰⁷	Ministry of Natural Resources and Environment	Submitted in April 2011	Multi-sectoral	Provides updates on national circumstances and greenhouse gas inventory. Also provides an analysis of mitigation, vulnerability and adaptation activities and an observation of capacity in research and technology. Offers analysis of needs and future plans to address climate change.

²⁰⁵ Ministry of Science, Technology and the Environment, http://unfccc.int/essential_background/library/items/3599.php?rec=j&preref=2745#beg

²⁰⁶ CDM in Malaysia, <http://cdm.eib.org.my/subindex.php?menu=7&submenu=58>

²⁰⁷ Ministry of Natural Resources and Environment, http://unfccc.int/files/national_reports/non-annex_i_natcom/submitted_natcom/application/pdf/malaysia_snc.pdf

C. Current Adaptation Action

Many of the climate change projects active in Malaysia's are focused on mitigation and energy, with a lesser focus on adaptation. The enactment of the national policy on climate change, which indicated a more balanced approach to mitigation and adaptation, may begin to signal a shift towards more action on adaptation, but this remains to be seen. It is also possible that the country's relative level of development allows it to fund its own adaptation projects, and as such the projects presented below may not be a complete reflection of current adaptation action.

At present, Malaysia appears to be participating in a very low number of adaptation projects relative to other developing countries in East and Southeast Asia. All projects identified involve partnerships with other countries within the Asia-Pacific region. These include a focus on adaptation in the areas of agriculture, nature, coastal zones, marine resources, natural resources management, water, and policy formulation. Funding for these projects has been provided by the Asian Development Bank, Asia-Pacific Network for Global Change Research (APN), Global Environment Facility (GEF), Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) and the governments of Japan, Sweden and the United States.

Table 2: Current Adaptation Projects and Programs in Malaysia

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
Participation in Regional and Global Actions								
1.	US Support Program to the Coral Triangle Initiative (CTI) ²⁰⁸	To improve the management of biologically and economically important coastal and marine resources and associated ecosystems that support livelihoods and economies in the Coral Triangle and assist the six CTI countries in implementing the CTI Regional and National Plans of Action with activities that focus on instituting an ecosystem approach to fisheries management, creating marine protected areas, building climate change adaptive capacity and establishing regional platforms to promote cross-country learning and enhance sustainability.	USAID Budget: US\$41 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Assessment; Field implementation	2008 – 2013	Marine management	Asia-Pacific: Indonesia, Malaysia, Philippines, Papua New Guinea, Solomon Islands, Timor-Leste
<i>In Malaysia: Further information required.</i>								

²⁰⁸ CTI, <http://www.uscti.org/uscti/default.aspx>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
2. Strengthening Capacity for Policy Research on Mainstreaming Adaptation to Climate Change in Agriculture and Water Sectors ²⁰⁹	Project aims to strengthen research capacity on mainstreaming climate change adaptation concerns into agricultural and water policies and create a network for adaptation policy research in Asia (ARNAP: Adaptation Research Policy Network for Asia and the Pacific). The project enhances capacity to bridge gaps in adaptation research, policy and implementation through networking and communication among researchers and policy makers focusing on adaptation.	APN	IGES, IMHEM, Universiti Kebangsaan Malaysia, M.S. Swaminathan Research Foundation	Capacity building; Research; Policy formation and integration	2009 – 2012	Agriculture; Freshwater supply	Asia Region: India, Malaysia, Viet Nam
<i>In Malaysia: to be determined</i>							
3. Adaptation Knowledge Platform ²¹⁰	The goal of the Adaptation Knowledge Platform is to strengthen adaptive capacity and facilitate climate change adaptation in Asia at local, national and regional levels. Its specific purpose is to establish a regionally and nationally owned mechanism that facilitates the integration of climate change adaptation into national and regional economic and development policies, processes and plans, strengthen linkages between adaptation and the sustainable development agenda in the region and enhance institutional and research capacity, in collaboration with a wide range of national and regional partners.	SIDA	SEI, SENA, UNEP, AIT and UNEP Regional Resource Centre for Asia and the Pacific	Capacity building; Policy formation and integration	2009 – 2012	Government	Asia Region: Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, the Philippines, Sri Lanka, Thailand, Viet Nam
<i>In Malaysia: to be determined</i>							
4. Knowledge Center on Climate Change: Adaptation and Best Practices in	The objectives of this project are: <ul style="list-style-type: none"> Increasing understanding, knowledge and 	SEARCA <i>Budget:</i>	SEARCA's University Consortium in	Capacity building; Knowledge	[2010 – 2014]	Agriculture; Climate information	Regional: Brunei, Cambodia,

²⁰⁹ APN, <http://www.ukm.my/apn/> and Earth System Governance, <http://www.earthsystemgovernance.org/affiliated-projects/strengthening-capacity-policy-research-mainstreaming-adaptation-climate-change-a>

²¹⁰ AKP, <http://www.climateadapt.asia/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Agriculture and Natural Resources Sectors ²¹¹	<p>skills of those in the agriculture and natural resources sectors;</p> <ul style="list-style-type: none"> • Making clients quickly access and learn about what is going on about climate change; • Responding to every client with quickness, courtesy, competency and accuracy; • Providing products that give clients easy access to cutting-edge research and development results, learning events and policy advocacy. 	US\$1.0 million for 5 years	Southeast Asia, University of the Philippine Los Banos, World Fish Centre and the Adaptation Learning Mechanism	communication		services	Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam
<i>In Malaysia: to be determined</i>							
5. Coastal and Marine Resources Management in the Coral Triangle: Southeast Asia ²¹²	<p>To promote the long-term conservation and sustainable management of coastal and marine resources in the Sulu-Sulawesi Marine Ecoregion Priority Seascape in the Coral Triangle, by strengthening integrated and ecosystem-based resources management. Project components include: (1) strengthening national and local institutions for sustainable coastal and marine resources ecosystem management; (2) strengthening of ecosystem-based approach to marine resources management, including vulnerability assessments conducted identifying adaptation measures; (3) supporting mechanisms for sustainable livelihoods in coastal communities; and (4) establishing effective project coordination and implementation.</p>	<p>GEF, Japan Fund for Poverty Reduction, ADB, United States</p> <p>Budget: US\$40,168,182</p>	ADB	Capacity building; Assessment	2011 – 2015	Marine management; Coastal zone management	Regional: Indonesia, Malaysia, Philippines
<i>In Malaysia: to be determined</i>							
6. Asia Pacific Climate Change	Increase access to financial resources for	USAID	WWF,	Capacity	2011 – 2016	Government	Asia Region:

²¹¹ KC3, <http://beta.searca.org/kc3/> and ALM, <http://www.adaptationlearning.net/project/knowledge-center-climate-change-kc3-adaptation-and-best-practices-agriculture-and-natural-re>

²¹² GEF, <http://www.thegef.org/gef/node/3980> and ADB, <http://pid.adb.org/pid/TaView.htm?projNo=44113&seqNo=02&typeCd=2>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Adaptation Project Preparation Facility (ADAPT) ²¹³	climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up.	Budget: US\$18.0 million	Conservation International, the Nature Conservancy, ARD Inc., NOAA	building; Knowledge communication			Bangladesh Cambodia Federated States of Micronesia, Fiji, Indonesia, Lao PDR, Malaysia, Nepal, Palau, Philippines, Solomon Islands, Sri Lanka, Thailand, Viet Nam
<i>In Malaysia: Further information required.</i>							

D. Proposed Adaptation Action

A single project, “Adaptation in the Coral Triangle” proposed to the Special Climate Change Fund, has been identified to date. Malaysia has shown ability to access funding where possible, although to date it has had a heavy focus on mitigation and energy projects as opposed to adaptation.

Table 3: Proposed Adaptation Projects and Programs in Malaysia

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1. Adaptation in the Coral Triangle ²¹⁴				Asia region: Malaysia, Papua New Guinea, Philippines, Solomon Islands, Timor-Leste
Notes: Proposed to the SCCF. Funding request: \$20 million. Proposed co-financing: \$290 million				

²¹³ USDS, <http://www.state.gov/documents/organization/151686.pdf>

²¹⁴ GEF, http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf



E. Assessment

Malaysia is the most developed country in the region and, as such, has considerable internal capacity to assess and respond to climate change impacts. The country's priority areas for adaptation are similar to its geographical neighbors, with a heavy focus on agriculture, water, and coastal protection, as well as forestry. Any climate impacts on agriculture, either directly or indirectly (i.e. water shortages affecting irrigation), have the potential to be devastating for the local economy.

Malaysia a very low level of engagement in adaptation projects funded by international partners than other countries in the region, which may in part be due to the fact that it does not qualify for least developed country assistance programs. Through these actions, the country has made some progress in addressing adaptation needs in key priority areas—including agriculture, coastal zones, water and biodiversity. However, there is room to expand initiatives within these areas and to address gaps within the areas of forestry, energy, and public health. As well, gender has not been a prominent consideration in adaptation policy and projects thus far. As in other countries in the region, it is possible that certain mitigation projects active in the country (particularly those focused on land use and forestry) may also provide adaptation co-benefits which have not been captured through this review. Given that Malaysia's recently released National Policy on Climate Change notes that future efforts will need to reflect a greater balance between mitigation and adaptation, it is possible that adaptation action in the country could expand in the future.

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7.0 Mongolia

APN	Asia-Pacific Network for Global Change Research
CIA	Central Intelligence Agency
CSAG	Climate System Analysis Group
DEFRA	Department for Environment, Food and Rural Affairs (United Kingdom)
ENDA	Environment and Development Action in the Third World
GEF	Global Environment Facility
IDRC	International Development Research Centre
IFAD	International Fund for Agricultural Development
MNET	Ministry of Nature, Environment and Tourism
NAMHEM	National Agency for Meteorology, Hydrology and Environmental Monitoring
NCAP	Netherlands Climate Assistance Programme
SEI	Stockholm Environment Institute
START	Global Change SysTem for Analysis, Research and Training
UNDP	United Nations Development Program
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNITAR	United Nations Institute for Training and Research

Mongolia is one of only two land-locked countries in the East and Southeast Asia region.²¹⁵ It covers an area of over 1.5 million square kilometers (making it the 19th largest country in the world and the third largest in the region) but has a population of just over 3.1 million (CIA, 2011). The country's Human Development Index ranking of 100 out of 169 (UNDP, 2010) places it at the midpoint for the region. The country's economy is traditionally based on herding and agriculture, although presently also includes industrial production of copper, coal, tin, tungsten and gold (USDS, 2010).

²¹⁵ The second country is the Lao People's Democratic Republic.

A. Adaptation Needs and Priorities

Due to its landlocked status and great distance from oceans, Mongolia has a distinctly different climate from its more tropical, geographically smaller and more populous Southeast Asian neighbors. The country's climate has been described as "severe" as it is susceptible to high fluctuations in temperature, low precipitation and distinct climate differences across the country. While most East and Southeast Asian states are concerned about flooding and ocean based extreme weather events, Mongolia's concerns are more about effects on growing seasons, water resource risk, and risks to soil productivity (especially desertification) (NAMHEM, 2001). Its fragile environment is slow to recover from current climatic events, making impact avoidance and preparedness extremely important (MNET, 2010).

Mongolia has submitted two National Communications to the United Nations Framework Convention on Climate Change (UNFCCC); the first in November 2001 (NAMHEM, 2001), and the second in December 2010 (MNET, 2010). In the First National Communication, Mongolia recognizes that its climate is already quite harsh and relatively cold, making the margins for agriculture production narrow and the sector susceptible to the smallest changes in climate patterns. While temperature increases²¹⁶ are expected to lead to greater water resources and agriculture production in the short-term, this benefit is expected to fall off in the medium term and lead to increased desertification and significantly hindered agriculture production in the future. As agriculture is a primary driver of the Mongolian economy, the vulnerability of this sector creates a situation in which climate change could have a very large negative impact on the country's overall economic development. For this reason much of the adaptation priorities and measures described in Mongolia's First National Communication are related to the agriculture sector, including food security, water resources, terrestrial ecosystems and soil (NAMHEM, 2001).

The Second National Communication provides a more thorough assessment of technical issues and includes a greater emphasis on the policies and measures that Mongolia has in place and plans to implement in response to climate change (MNET, 2010). Primary areas for adaptation action are identified as being agriculture, livestock production and freshwater resources. Institutional capacity and financial resources are noted as being two of the central barriers to policy implementation. To overcome these concerns and implement an effective adaptation plan, Mongolia has identified a number of immediate needs, including capacity building, research, vulnerability assessments, and policies and projects that address its primary adaptation needs (MNET, 2010).

²¹⁶ A rise in temperatures of 2.1°C between 1940 and 2007 is reported in Mongolia's Second National Communication (MNET, 2010).

B. National Level Policies and Strategic Documents

Whereas some East and Southeast Asian countries at a similar level of development have placed a greater emphasis on mitigation, Mongolia has a focus on adaptation and is actively trying to address its priority concerns. This effort includes development of a National Action Program on Climate Change and establishment of a National Climate Committee, as identified in Table 1.

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action	Government Responsible	Division	Status	Sector(s) of Focus	Summary description
1. National Action Programme on Climate Change	Air Quality Office, assisted by the Government of the Netherlands		Three phases: Short (2000-2005), Medium (2006-2015), Long (2015-?)	Multi-sectoral (heavy agriculture focus)	Sets priorities for actions and defining policy on mitigation and adaptation. A number of pilot projects and studies have been carried out under this action program, which is now in the midst of its second phase. Much of the adaptation work is done in the area of agriculture, improving resilience and production methods to increase the ability of farmers to adapt to changing climates.
2. Mongolia's Initial National Communication ²¹⁷	Ministry of Environment		Submitted November 2001	Multi-sectoral	Provides details on national circumstances with respect to Climate Change, an inventory of greenhouse gas emissions, as well as identification of impacts of climate change and potential options for adaptation actions.
3. Mongolia Second National Communication under the United Nations Framework Convention on Climate Change ²¹⁸	Ministry of Nature, Environment and Tourism		Submitted December 2010	Multi-Sectoral	Focus is much the same as the initial National Communication, but includes more in-depth focus on the issues in contains as well as updates in policy and national circumstances.
4. National Climate Committee	Ministry of Nature, Environment and Tourism		Currently in operation	Multi-sectoral	Coordinates and guides national adaptation measures and mitigation activities. Approves policies, evaluates projects and guides activities.

²¹⁷ National Agency for Meteorology, Hydrology and Environment Monitoring, http://unfccc.int/essential_background/library/items/3599.php?rec=j&preref=3195#beg

²¹⁸ Ministry of Nature, Environment and Tourism, http://unfccc.int/essential_background/library/items/3599.php?such=j&symbol=MNG/COM/2%20E#beg

C. Current Adaptation Action

Mongolia is participating in several adaptation projects, but their total number is very low relative to some other East and Southeast Asian developing countries. While Mongolia is implementing a few national projects, the majority of initiatives underway in the country involve other developing countries from around the world. The nationally-focused projects address adaptation within the areas of water, land management, agriculture (livestock), and risk reduction. Project activities include research and capacity building. Funders of these projects include the Adaptation Fund, Asia-Pacific Network for Global Change Research (APN) and the Special Climate Change Fund (SCCF). The multi-country projects in which Mongolia is a participant address needs in a variety of sectors, including agriculture, water, health, urban issues and policy formation. Like its national projects, these initiatives focus on capacity building, vulnerability assessment, community based adaptation, and policy formulation. These global projects are supported by the European Commission, International Development Research Centre (IDRC), World Health Organisation and the governments of the Netherlands, Norway, Switzerland, Sweden and the United Kingdom.

Table 2: Current Adaptation Projects and Programs in Mongolia

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action							
1.	Dryland Development Paradigm Application for the Most Vulnerable to Climate and Land Use Change of Pastoral Systems ²¹⁹	APN	Dr. Chuluun Togtohyn	Research; Policy formation and integration	2010 – 2011	Pastoralism; Ecosystem conservation	Southern Khangai Mountains
2.	Mongolia Livestock Sector Adaptation Project ²²⁰	Special Climate Change Fund; co-	IFAD, with Ministry of Nature and Environment of	Capacity building	2010 – 2014	Pastoralism; Disaster risk management	

²¹⁹ APN, <http://www.apn.gr.jp/newAPN/resources/list2010capableprojects.htm>

²²⁰ ALM, <http://www.adaptationlearning.net/sites/default/files/mong%20pif.pdf>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
	livestock system as well as the capacity of herders' groups to cope with climate change impacts. Its planned outputs are: (1) increasing the climate change adaptive capacity of the Mongolian pastoral system; (2) strengthening of the capacity of Rangeland Monitoring and Management Committees and raising awareness on climate change impacts in rural communities; and (3) improved rural risk management system.	financing Budget: US\$5,125,000	Mongolia, and Ministry of Food and Agriculture					
3.	Ecosystem-based Adaptation Approach to Maintaining Water Security in Critical Water Catchments in Mongolia ²²¹	To "maintain the water provisioning services supplied by mountain and steppe ecosystems by internalizing climate change risks within land and water resource management regimes."	Adaptation Fund Budget: US\$5.5 million	UNDP	Capacity building; Community based adaptation	2011 – 2017	Watershed management	Altai Mountain/Great Lakes Basin and the Eastern Steppe
Participation in Regional and Global Actions								
4.	Advancing Capacity for Climate Change Adaptation (ACCCA) ²²²	The rationale for this project is that countries lack scientific knowledge and understanding of climate risks, and that this is an impediment to addressing climate variability. Activities include the following: identify and prioritize climate risks; assess available knowledge about risks and adaptation opportunities; develop, test, and disseminate risk communication materials that are designed to assist adaptation decisions; and identify critical knowledge gaps that impede	IDRC, DEFRA, Swiss Federal Office for the Environment, NCAP, European Commission	UNITAR, ENDA, SEI, CSAG and START	Assessment; Capacity building; Policy formation and integration	2007 – 2010	Multi-sectoral	Global: Bangladesh, Burkina Faso, Cameroon, Ethiopia, Ghana, Kenya, India, Malawi, Mali, Mongolia, Nepal, Niger, Nigeria,

²²¹ Adaptation Fund, http://adaptation-fund.org/sites/default/files/AFB14_Report_English.pdf and http://adaptation-fund.org/sites/default/files/AFB.PPRC_5.11%20Proposal%20for%20Mongolia_0.pdf

²²² ACCCA, <http://www.acccaproject.org/accca/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
	effective adaptation decisions.						Philippines, South Africa, Tanzania, Tunisia	
		<p><i>In Mongolia:</i> “Policy Framework for Adaptation Strategies for the Mongolian Rangelands to Climate Change at Multiple Scales.”²²³ The purpose of this project is to develop local adaptation strategies of the coupled social-environmental system to climate change in the Mongolian rangelands. Spatially large landscape is critical in arid lands to offset climate variability. A fragmentation of the cultural landscapes in the arid and semi-arid lands of Mongolia has increased vulnerability. Therefore, this project will try to reinstate traditional land use practices, while supplementing these with knowledge of adaptive land management.</p> <ul style="list-style-type: none"> • <i>Implementing agency:</i> National University of Mongolia, Ministry of Construction and Urban Development, National Development Institute. • <i>Type of project:</i> Capacity building • <i>Priority Sectors:</i> Agriculture; Pastoralism 						
5.	Health Vulnerability and Climate Change Adaptation Assessments ²²⁴	To provide national level evidence of the linkages between climate and health; improve understanding of local and specific health risks and vulnerabilities; provide the opportunity for capacity building; and serve as a baseline analysis to monitor how health risks may be influenced by a changing climate over time.	World Health Organization	National Ministries	Assessment	2008-2010 (Closed)	Human health	<i>Global:</i> 15 countries including Bolivia, Brazil, Cambodia, Costa Rica, Ghana, India, Kyrgyz Republic, Mongolia and Tunisia
		<p><i>In Mongolia:</i> Summary of the process undertaken is available here: http://www.who.int/globalchange/mediacentre/events/2010/costa_rica_consultation_200710/SUMMARY_MONGOLIA_VA.pdf</p>						

²²³ ACCCA, <http://www.acccaproject.org/evolution/modules/knowledgebox/external2/view.php?id=301&kbid=5>

²²⁴ WHO, http://www.who.int/globalchange/mediacentre/events/2010/costa_rica_consultation_200710/en/index.html

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
6. Cities and Climate Change Initiative ²²⁵	The first phase is designed to promote policy dialogue, develop tools and implement pilot activities in the cities of Sorsogon (Philippines); Esmeraldas (Ecuador); Maputo (Mozambique); and Kampala (Uganda). The project aims at advising and supporting cities and towns prone to the different impacts of climate change by offering innovative approaches and solutions for national and local development planning. In 2010, efforts were initiated to up-scale lessons from this initiative with UN-HABITAT partners in China, Fiji, Indonesia, Mongolia, Nepal, Papua New Guinea, Samoa, Sri Lanka, Vanuatu and Viet Nam. Through this initiative, 10 new cities carried out participatory assessments of their vulnerabilities to climate change.	Government of Norway	UNEP, UN-HABITAT	Knowledge communication; Capacity building; Assessment	2008 – ?	Urban areas	<i>Global:</i> China, Ecuador, Fiji, Indonesia, Mongolia, Mozambique, Nepal, Papua New Guinea, Philippines, Samoa, Sri Lanka, Uganda Vanuatu and Viet Nam
							<i>In Mongolia:</i> In Ulaanbaatar, a vulnerability assessment and National Study on Cities and Climate Change is underway. ²²⁶
7. Climate Risk Management Technical Assistance Support Project: Phase II ²²⁷	Building capacities for climate risk management among national stakeholders.	Sweden and SIDA through UNDP, UNDP core finance	ADPC, International Institute for Sustainable Development	Research; Policy formation and integration	2010 – 2011	Multi-sectoral	<i>Global:</i> Bangladesh, Bhutan, Dominican Republic, Honduras, India, Kenya, Maldives, Mongolia, Nepal, Nicaragua, Niger, Pakistan,

²²⁵ UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html

²²⁶ UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/pdf/CCCI_Asia-Pacific_Flyer.pdf

²²⁷ UNFCCC, http://unfccc.int/files/adaptation/nairobi_workprogramme/partners_and_action_pledges/application/pdf/iisd_furtherinfo_water_190411.pdf

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
							Papua New Guinea, Peru, Timor-Leste and Uganda
<i>In Mongolia: To be identified.</i>							

D. Proposed Adaptation Action

In its First National Communication, Mongolia proposed a number of adaptation projects, some of which are presented in Table 3. Its Second National Communication provides a general list of 50 adaptation strategies, recommended measures, and policies by sector (MNET, 2010) grouped under the headings/priority areas of arable farming, water resources, human health, forestry, and animal husbandry. These actions are not discussed in detail, and their level of implementation is not mentioned, but the list provides an idea of priority areas for Mongolia and some policy initiatives the government has proposed to help address its adaptation needs.

Table 3: Adaptation projects and programs identified by Mongolia in its First National Communication (NAMHEM, 2001)

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1. Education of herdsmen and farmers on issues sensitive to climate change	To understand the reality of the climate change concerns, education and public awareness campaigns for agriculture people should be implemented.	Capacity building	Agriculture	
Notes:				
2. Conserve and restore native rangeland vegetation	At present, natural grasslands are degraded and overgrazed. This tendency will be intensified due to climate change. Therefore, conservation and restoration is needed to provide animal husbandry with food and forage.		Agriculture	
Notes:				
3. Development of new agro-technologies for crop planting	To develop new arable farming technologies suited to climate change.	Research	Agriculture	
Notes:				
4. Advanced Assessment of Changes in Permafrost Area and Snow Cover in Mongolia: Effects and future recommendations	More than half of the country's territory is covered by permafrost and snow cover is a water source for animals in winter. Changes in these systems will seriously affect the country's economy. The project there would undertake comprehensive studies and recommendations for future agriculture management policy.	Research	Agriculture	
Notes:				

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
5.	Establishment and introduction of new crop sowing and planting date	It is necessary to establish new sowing data for spring wheat and potato and introduce in main arable farming areas.	Research	Agriculture	
Notes:					

E. Assessment

Mongolia is particularly susceptible to the impacts of climate change due to its harsh existing climate, limited water resources, fragile ecosystems and heavy economic dependence on agriculture—a sector that has narrow margins for production of crops and livestock. Recognizing the threat posed by a potential increase in the number and intensity of extreme weather events, Mongolia took the initiative relatively early to develop its own national strategy on climate change and start implementing adaptation policies. The fact that they are navigating these challenges at the same time as making the long and difficult transition to a market based economy further influences their ability to be resilient in the face of climate change.

Mongolia has proven that it is aware and concerned about the potential impacts of climate change; the focus now has to be on taking the next step towards implementation of adaptation actions. Comparisons between Mongolia’s First and Second National Communications demonstrate enhanced internal technical capacity and a growing focus on adaptation, as well as an increased readiness to address climate change. Although the number of discrete adaptation projects underway in the country is limited, they are focused on priorities articulated by the government through its various policy documents, including agriculture, livestock and water. There is a need for adaptation activities to be enhanced within these areas, however, as well as expanded to give greater attention to health, forestry, gender concerns, meteorology, capacity building and policy formulation.

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Ministry of Nature, Environment and Tourism [MNET] (2010). *Mongolia Second National Communication*. Retrieved from <http://unfccc.int/resource/docs/natc/mongnc2.pdf>



National Agency for Meteorology, Hydrology and Environmental Monitoring [NAMHEM] (2001). *Mongolia's Initial National Communication*. Retrieved from <http://unfccc.int/resource/docs/natc/mongnc1.pdf>

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8.0 Myanmar

AIT	Asian Institute of Technology
ALM	Adaptation Learning Mechanism
CIA	Central Intelligence Agency
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ICIMOD	International Centre for Integrated Mountain Development
IRC	International Rescue Committee
NAPA	National Adaptation Programme of Action
SEI	Stockholm Environment Institute
SENSA	Swedish Environmental Secretariat for Asia
SIDA	Swedish International Development Agency
UNDP	United Nations Development Program
UNEP	United Nations Environment Programme
UNFCCC	United Framework Convention on Climate Change

Myanmar covers an area of 676,578 square kilometers and has a population of nearly 54 million people (CIA, 2011). Ranked 135 of 169 on the Human Development Index (UNDP, 2010), Myanmar is the lowest ranked country in East and Southeast Asia and the only one classified as having a “low” level of human development. Much of its struggling economy is based on fossil fuel industries (CIA, 2011) that contribute to environmental degradation.

Adaptation Needs and Priorities

Myanmar’s climate is primarily tropical, with heavy rainfall during the months of May to October. Temperatures during the summer months of March to May are typically as high as 43°C on the coast and 36°C further north. Rainfall patterns also vary by geographical area—being as much as five times higher on the coast compared to the country’s northern regions. Due to the extremely high rainfall amounts during certain periods of the year, landslides are a common occurrence. The area is also subject to extreme weather events such as cyclones floods and droughts (ALM, 2009). In addition there are significant pollution problems with soil, water and sanitation concerns (ALM, 2009).



Finding information on Myanmar with regards to adaptation to climate change is a challenging task due to both a lack of any National Communications to the United Nations Framework Convention on Climate Change (UNFCCC) and the delayed submission of a National Adaptation Programme of Action (NAPA). The lack of any communication on climate change is a hindrance to both developing a response to climate change and being able to translate that response into actions and project proposals.

The vulnerability of the country to extreme climatic events, however, may be derived from the impact of the Nargis Cyclone that killed 78,000 people in 2008 (IRC, 2008). This event, and other climate impacts, exemplifies a significant need for disaster risk management and a focused approach and policy to increase capacity to respond to climate change. A cursory review of the limited available data points to adaptation needs likely being greatest in the areas of agriculture, forestry and coastal management. As well, the United Nations Development Programme (UNDP) has identified several needs including a basic lack of awareness of environmental issues, exacerbation of pre-existing conditions by climate change, and severely diminished local resilience capacities.

Barriers to adaptation in Myanmar include not only the capacity and issues that many least developed countries face but also government controls and international isolation. Myanmar currently is subject to economic sanctions imposed by several western countries because of political and governmental concerns. Currently, the governments of the Australia, Canada, the European Union and the United States have all enacted sanctions against the Myanmar government (CIA, 2011).

B. National Level Policies and Strategic Documents

No national-level policy initiatives with respect to adaptation could be identified. The Government of Myanmar initiated development of its NAPA in 2008 with the assistance of the United Nations Environment Programme (UNEP) and funding provided through the Least Developed Countries Fund.²²⁸ When completed should provide a preliminary policy direction for adaptation actions in Myanmar.

C. Current Adaptation Action

Myanmar has obtained limited funds for development and climate change initiatives, meaning that its level of activity in the area of climate change adaptation is very low compared to other developing countries in East and Southeast Asia. It is engaged in handful of ongoing regional projects that are focused primarily on knowledge sharing, capacity building, institutional strengthening and policy formation. These projects are oriented towards addressing needs in the sectors of agriculture and natural resources management.

²²⁸ Further information available here : <http://gefonline.org/projectDetailsSQL.cfm?projID=3702>

Adaptation projects in Myanmar are being supported by the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) and the governments of Germany and Sweden.

Table 1: Current Adaptation Projects and Programs in Myanmar

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Participation in Regional and Global Actions							
1.	Knowledge Center on Climate Change: Adaptation and Best Practices in Agriculture and Natural Resources Sectors ²²⁹	SEARCA Budget: US\$1.0 million for 5 years	SEARCA's University Consortium in Southeast Asia, University of the Philippine Los Banos, World Fish Centre and the Adaptation Learning Mechanism	Capacity building; Knowledge communication	[2010 – 2014]	Agriculture; Climate information services	<i>Regional:</i> Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam
		<i>In Myanmar:</i> To be determined.					
2.	Adaptation Knowledge Platform ²³⁰	SIDA	SEI, SENA, UNEP, AIT and UNEP Regional Resource Centre for Asia and the Pacific	Capacity building; Policy formation and integration	2009 – 2012	Government	<i>Asia:</i> Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, the Philippines,

²²⁹ KC3, <http://beta.searca.org/kc3/> and ALM, <http://www.adaptationlearning.net/project/knowledge-center-climate-change-kc3-adaptation-and-best-practices-agriculture-and-natural-re>

²³⁰ AKP, <http://www.climateadapt.asia/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	development agenda in the region and enhance institutional and research capacity, in collaboration with a wide range of national and regional partners.						Sri Lanka, Thailand, Viet Nam
<i>In Myanmar: To be determined.</i>							
3.	Protection of Sustainable Policy Initiatives in the Management of Natural Resources in the Hindu Kush Himalayas ²³¹	BMZ	ICIMOD, GIZ	Capacity building	2008 – 2012	Government	Asia Region: Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, Pakistan
<i>In Myanmar: To be determined.</i>							

D. Proposed Adaptation Action

It is expected that the NAPA, upon completion, will provide a significant list of adaptation actions that Myanmar proposes to undertake.

E. Assessment

Given the lack of information available, it is difficult to assess Myanmar’s progress in addressing climate change. It is clear, however, that an adaptation plan and supporting policies are needed given the vulnerability of its population to climate change impacts—as suggested by the devastating effects of the Nargis cyclone. The current political and socio-economic barriers in the country, including sanctions placed on the regime by some countries seen as primary funders of climate change initiatives, are major barriers to

²³¹ GIZ, <http://www.gtz.de/en/weltweit/asien-pazifik/33473.htm>



implementing adaptation actions. Completion of its NAPA should go a long way to putting in place the first steps needed towards an adaptation plan.

References:

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International Rescue Committee [IRC] (2008, May 20). *Burma in the Aftermath of Cyclone Nargis*. Retrieved from <http://www.theirc.org/burma-aftermath-cyclone-nargis>

United Nations Development Program [UNDP] (2010). Human Development Index 2010. Retrieved from <http://hdr.undp.org/en/statistics/>

9.0 Philippines

ADB	Asian Development Bank
AIT	Asia Institute of Technology
APN	Asia-Pacific Network for Global Change Research
CIA	Central Intelligence Agency
CSAG	Climate System Analysis Group
ENDA	Environment and Development Action in the Third World
FAO	Food and Agriculture Organisation of the United Nations
GEF	Global Environment Facility
IACCC	Inter-agency Committee on Climate Change
ICLEI	Local Governments for Sustainability
IDRC	International Development Research Centre
IGES	Institute for Global Environmental Strategies
ILO	International Labour Organisation
NDCC	National Disaster Coordinating Council
NOAA	National Oceanic and Atmospheric Administration (United States)
OPP	Office of the President of the Philippines
SEARCA	Southeast Asian Regional Center for Graduate Study and Research in Agriculture
SEI	Stockholm Environment Institute
START	Global Change SysTem for Analysis, Research and Training
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN-HABITAT	United Nations Agency for Human Settlements
UNITAR	United Nations Institute for Training and Research
USDS	United States Department of State
WHO	World Health Organisation
WWF	World Wildlife Fund / Worldwide Fund for Nature

The Philippines is an archipelagic country comprised of more than 7,100 islands that spans an area of roughly 300,000 square kilometers (CIA, 2011). The country's terrain is primarily mountainous, with narrow coastal lowlands and arable farmland comprises 40 per cent of its land area (USDS, 2010). With a population of over 101 million people (CIA, 2011), the Philippines ranks 97 of 169 in the 2010 Human Development Index (UNDP, 2010), placing it in the top half of countries that have achieved a medium level of human development. The country's economy is dominated by the services sector, which contributes over half of economic output, followed by industry (30 per cent) and agriculture (less than 20 per cent) (USDS, 2010).

A. Adaptation Needs and Priorities

As an archipelagic country with a tropical climate and a total coastline of over 36,000 kilometers (CIA, 2011), the Philippines is particularly susceptible to ocean based extreme weather events. It experiences an average of 20 typhoons per year (World Bank and NDCC, n.d). It also ranks second behind Japan in terms of the absolute number of people exposed to tropical cyclones each year and second behind Bangladesh in terms of its Mortality Risk Index (Peduzzi and Deichmann, 2009). Flooding and landslides are also significant risks in the country. In the 2009 Global Assessment Report on Disaster Risk Reduction, the Philippines was ranked eighth in the world with respect to the absolute number of people exposed to floods per year (Peduzzi and Deichmann, 2009). The same report ranked the Philippines tenth on the Mortality Risk Index for landslides. The Philippines is also vulnerable to earthquakes—experiencing an average of 887 each year—and volcanic eruptions—with 20 of 220 volcanos within the archipelago being active (World Bank and NDCCRP, n.d). Due to these factors, the Philippines is considered to be one of the most disaster prone countries in the world (Vos et al., 2010).²³²

Looking to the future, the Philippines is expected to experience an average temperature increase of between 1.7 and 3.0°C by 2050, with the highest increases projected to occur in the primary agriculture growing regions (OPP, 2010: 9). Rainfall patterns are projected to vary, with some regions seeing up to 16 per cent increases, while others experiencing a drying effect. Sea level rise is projected to result in a land loss of over 129,000 hectares (OPP, 2010: 10). Given the Philippines current exposure to natural disasters and the continuing importance of agriculture to its national economy, these changes could have significant negative impacts on its population and economic development.

²³² For example, according to the Annual Disaster Statistical Review, the Philippines was ranked as the country hit by the highest number of natural disasters in 2009, and experience the third highest number of disaster related deaths in 2009, just behind India and Indonesia (Vos et al, 2010).

Through its first National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) released in May 2000, the Philippines expressed the importance of adaptation to its future development, highlighting in particular the risks posed by extreme climatic events, sea level rise and degradation of marine ecosystems (GEF and UNDP, 2000). The country has taken steps to undertake vulnerability assessments in many areas, particularly agriculture, to determine the potential impacts of changes in climate and weather patterns. It has identified the following sectors as priority areas for adaptation, as well as some proposed adaptation measures (GEF and UNDP, 2000; OPP, 2010):

- *Agriculture* – priorities include: changes to agricultural management practices; better water management; cropping pattern adjustment to take advantage of growing seasons in relation to rain patterns; advanced weather prediction information that is passed down to local farmers; improved access to agricultural data on diversified farming irrigation strategies; and improved post-harvest handling practices.
- *Freshwater resources* – priorities include: comprehensive watershed management; water allocation procedures; establishment of irrigation efficiency; recycling/reuse of water; introduction of low water use crops and efficient farming practices; improvement of monitoring and forecasting systems for floods and droughts; water pricing policies and structures; and raising awareness of climate change.
- *Coastal and marine management (including fisheries)* – priorities include: formulation of guidelines and legislation for the implementation of Integrated Coastal Zone Management;²³³ inclusion of wetlands, swamps and marshes as protected ecosystems; limitations on development of land subject to sea-level rise; and long term planning on coastal zone management.
- *Disaster risk management*
- *Forestry*

B. National Level Policies and Strategic Documents

The Philippines is establishing a governance framework for mitigating and adapting to the impacts of climate change. While the mandate of the government historically has been more focused on mitigation and energy issues, greater attention is beginning to be given to adaptation as it and public increasingly recognize the vulnerability of the country. In 2009, the government passed the national Climate Change Act that enabled creation of a Climate Change Commission responsible for coordinating climate actions and policy through the Office of the President. As well, in 2010, it established the Philippine National Climate Change Framework Strategy to help map out

²³³ In an effort to address this need, the Philippines has enacted Executive Order 533 (Adopting Integrated Coastal Management as a National Strategy to Ensure the Sustainable Development of the Country's Coastal and Marine Environment and Resources Establishing Supporting Mechanisms for its Implementation). This Order provides the basis for developing and implementing integrated coastal management.

climate policies and prepare international negotiating communications and positions. The Framework Strategy stresses a balance between adaptation and mitigation. Amongst other issues, it emphasizes the need for coastal and marine ecosystem protection for resilience against extreme weather events. As well, it has a focus on equity in adaptation action with respect to protection of the poor, women, children and other vulnerable sectors.

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Inter-agency Committee on Climate Change	15 Government Agencies and non-governmental organizations. Chaired by Minister of Environment and Natural Resources	Dissolved in 2009; Replaced by Climate Change Commission	Multi-sectoral	The Inter-agency Committee on Climate Change was established to coordinate various climate change related activities, propose climate change policies and prepare the Philippine positions to the UNFCCC negotiations.
2.	Initial National Communication to the UNFCCC ²³⁴	Ministry of Environment	Submitted May 2000	Multi-sectoral	Provides details on national circumstances with respect to climate change, an inventory of greenhouse gas emissions, as well as identification of impacts of climate change and potential options for adaptation actions.
3.	Presidential Task Force on Climate Change ²³⁵	Energy, Environment and Natural Resources		Education, Agriculture, Governance, Science and technology, Natural Resources, Energy	All the line agencies named to the Task Force, along with the designated private sector and civil society representatives, will be involved in program planning and implementation. Rather than being grouped vertically along functional areas, Presidential Task Force on Climate Change flagship programs will be cross sectoral in nature and will be classified into four areas—mitigation, adaptation, financing and technology, research and development—consistent with the proposed climate change response framework. These flagship programs and the projects under them would not preclude the initiation or continuance of mitigation and adaptation measures that fall under the exclusive ambit of any of the line agencies.
4.	Climate Change Act (Republic Act 9729) ²³⁶	Passed by Congress,	Passed 2009	Multi-sectoral	Designed to mainstream climate change into all government policy formation. Dissolved the Inter-agency Committee on

²³⁴ GEF, UNDP, http://unfccc.int/essential_background/library/items/3599.php?rec=j&prirref=2739#beg

²³⁵ Philippines, <http://www.doe.gov.ph/cc/ptfcc.htm>

Name of Policy Action	Government Division Responsible	Status	Sector(s) of Focus	Summary description	
				Climate Change and replaced it with the Climate Change Commission.	
5.	Climate Change Commission ²³⁷	Office of the President	Enacted 2009	Multi-sectoral	Attached to Office of the Presidency, same status as a national agency. Formulation of and implementation of plans for disaster risk reduction and addressing worsening climate conditions. Replaces the IACCC.
6.	National Plan of Action for the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security	Department of Environment and Natural Resources, Protected Areas and Wildlife Bureau	Published 2009	Coastal zone management, Marine fisheries	A goal of the plan is to support adaptation to climate change and presents specific adaptation actions to address climate change impacts on biodiversity, fishery productivity, ecology of coastal and marine habitats and ecosystem services.
7.	National Framework Strategy and Program on Climate Change for 2010-2022 ²³⁸	Developed by the Climate Change Commission	Enacted 2010	Multi-sectoral	Serves as basis for planning research and development, extension and monitoring of climate change activities with a particular focus on adaptation. Committed towards ensuring and strengthening adaptation to climate change.

C. Current Adaptation Action

The Philippines is currently participating in a moderate number of adaptation projects relative to other East and Southeast Asia developing countries. Current nationally focused projects are addressing a number of adaptation priorities, including research and pilot project implementation in the areas of agriculture and natural resources management; engaging in awareness raising and the development of early warning systems in order to reduce risk to the effects of natural disasters, particularly in flood-affected areas; policy formulation and integration to better address adaptation across a range of sectors; and enhancing resilience within the areas of coastal zones, agriculture, water and natural ecosystems. These projects are being funded by a range of donors including the Asian Development Bank (ADB), the Food and Agriculture Organization (FAO), Special Climate Change Fund (SCCF), United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), World Bank, World Health Organization (WHO) and the governments of Germany and the United States.

²³⁶ Philippines, http://www.lawphil.net/statutes/repacts/ra2009/ra_9729_2009.html

²³⁷ Philippines, <http://www.climate.gov.ph/index.php/en/>

²³⁸ Philippines, <http://www.climate.gov.ph/index.php/en/downloads/category/5-national-framework-strategy-on-climate-change-nfscce?download=12%3Anational-framework-strategy-on-climate-change-nfscce>

The Philippines is also involved a range of adaptation projects that bring together other Asian countries, as well as a number of projects with a global reach. These multi-country projects are primarily focused on capacity building, vulnerability assessment, and community based adaptation within the following areas: policy formulation, fisheries, coastal zones, agriculture, water, and urban areas. These projects are receiving funding from a wide array of donors, including: the ADB, Asia-Pacific Network for Global Change Research (APN), the European Commission, Global Environment Facility (GEF), the International Development Research Centre (IDRC), the Red Cross/Red Crescent, Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), and the governments of Germany, Japan, the Netherlands, Norway, Switzerland, Sweden, the United Kingdom and, in particular, the United States.

Table 2: Current Adaptation Projects and Programs in Philippines

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action							
1.	Strengthening the Philippines' Institutional Capacity to Adapt to Climate Change ²³⁹	This program seeks to address the Philippines limited capacity to undertake climate risk based planning and project implementation by: (1) mainstreaming climate risk reduction into key national and local development planning and regulatory processes; (2) enhancing capacities of key national agencies, local governments, academe and communities to undertake climate resilient development and (3) testing six integrated adaptation approaches with up-scaling potential.	FAO, ILO, UNDP, UNEP, UN-HABITAT, WHO <i>Total Budget:</i> US\$8-million	UNDP and National Economic and Development Authority	Capacity building; Policy formation and integration; Field implementation	2008 – 2011	Government
2.	Low-Cost Warning System for Flood/Slide-Prone Communities ²⁴⁰	To minimize casualties and property destruction caused by heavier rains anticipated to occur due to climate change, this project will establish a low-cost, fast, effective and community-based early	World Bank <i>Budget:</i> US\$121,000	University of the Philippines at Los Baños, and the Center for Initiative	Capacity-building; Field implementation	2009 – 2011	Disaster risk management

²³⁹ MDG Fund, <http://www.mdgfund.org/sites/default/files/Philippines%20-%20Environment%20-%202010%201st%20Semester%20-%20JP%20Fact%20sheet.pdf>, and <http://www.mdgfund.org/sites/default/files/Philippines%20signed%20JP%20complete%20version.pdf>

²⁴⁰ World Bank, <http://wbi.worldbank.org/developmentmarketplace/idea/bell-and-bottle-low-cost-warning-system-floodslide-prone-communities>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	warning system for floods or landslides that is appropriate and practical in remote mountain communities. The project aims to organize, educate and train local communities to improve their capacity to access and use hazard-risk information and therefore enhance their early-warning system. The project also aims to enhance other community-based responses to landslides and floods by providing them with information and supporting community-based activities that will reduce their vulnerabilities.		and Research for Climate Adaptation				
3.	Philippines Climate Change Adaptation Project, Phase I ²⁴¹	SCCF, co-financing <i>Budget:</i> US\$30.687 million	World Bank	Research; Policy formation and integration; Field implementation	2009 – 2014	Agriculture	
4.	Coral Triangle Support Partnership Project ²⁴²	USAID <i>Budget:</i> US\$300,000		Assessment; Field implementation	2010	Marine management; Marine fisheries	Batangas Province

²⁴¹ ALM, <http://www.adaptationlearning.net/project/philippines-climate-change-adaptation-project-phase-i> and <http://climate.gov.ph/index.php/en/news/ccc-in-the-news/90-world-bank-grants-climate-change-fund>

²⁴² U.S. Depart. of State, <http://www.state.gov/g/oes/rls/rpts/faststart/asia/151902.htm>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	plans that will be developed for these areas.						
5. Strengthening Disaster Preparedness of Southern Leyte ²⁴³	To increase the capacity of households to prepare and respond to disasters by promoting awareness on the links between climate change and disasters, and to strengthen the institutional capacity of the Southern Leyte Disaster Risk Management structures through training and improved communication systems.	World Bank Budget: US\$199,000	Philippines Business for Social Progress	Capacity building; Knowledge sharing	2010	Disaster risk management	Southern Leyte
6. Strengthening Climate Change Resilience in the Integrated Natural Resources and Environmental Management Sector Development Program ²⁴⁴	The program is expected to increase the resilience of upland communities and fragile mountain ecosystems and river basins amid localized climate impacts; and reduce overall vulnerability of the Northern Luzon and Mindanao watershed-dependent loan areas by institutionalizing adaptive social, economic, technological, physical and political measures.	ADB Small Grants program Budget: US\$100,000		Research; Community-based adaptation	On-going	Watershed management	Northern Luzon and Mindanao watersheds
7. Enhanced Climate Change Adaptation Capacity of Communities in Contiguous Fragile Ecosystems in the Cordillera ²⁴⁵	Improve climate change coping mechanisms and adaptation strategies in the Cordillera through tested pilot schemes with national up-scaling potential. The focus of climate change adaptation measures is on agriculture and water/watershed management including biodiversity conservation.	FAO Budget: US\$900,000	Department of Agriculture	Field implementation	2010 – 2012	Agriculture; Watershed management; Ecosystem conservation	Cordillera Administrative Region

²⁴³ World Bank, <http://wbi.worldbank.org/developmentmarketplace/idea/strengthening-disaster-preparedness-southern-leyte-thru-sms-technology>

²⁴⁴ ADB, <http://www.adb.org/climate-change/phi-environmental-management.asp> and <http://www.adb.org/documents/reports/climate-change-sea/climate-change-sea.pdf>

²⁴⁵ Philippines Department of Agriculture, http://car.da.gov.ph/index.php?option=com_content&view=article&id=243:da-fao-project-on-climate-change-opens-office-in-baguio-&catid=45:1st-quarter-press-release2010&Itemid=197

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
8. Adaptation to Climate Change and Conservation of Biodiversity ²⁴⁶	The overall goals of the project are to enhance resilience in the face of climate change and an approach of sustainable economic, social and environmental development is pursued. It aims to increase the climate change adaptive capacity of national and local government structures as well as local communities. Moreover, it aims to protect biodiversity.	German Federal Ministry for Economic Cooperation and Development	GIZ	Capacity development; Policy formation and implementation		Biodiversity; Government	National
Participation in Regional and Global Actions							
9. Preparedness for Climate Change ²⁴⁷	The aim of this program was for the Red Cross and Red Crescent National Societies in countries particularly vulnerable to climate change to gain a better understanding of climate change and its impacts to identify country-specific adaptation measures in line with risks. Activities could include organizing a workshop on risks, assessment of risks through preparation of a background document, capacity building programs, and developing climate change resilient plans.	Red Cross/Red Crescent Climate Centre	National Red Cross/Red Crescent Societies	Capacity building; Policy formation and integration	Phase 1: 2006 – 2009 Phase 2: ongoing	Disaster risk management	<i>Global:</i> 39 countries <i>East and South East Asia participants in Phase 1:</i> Indonesia, Philippines, Thailand
<i>In the Philippines: By the conclusion of the first phase of activity, the Philippines Red Cross Society was developing climate change resilient plans and programs.²⁴⁸</i>							
10. Cities and Climate Change Initiative ²⁴⁹	The first phase is designed to promote policy dialogue, develop tools and implement pilot activities in the cities of Sorsogon (Philippines); Esmeraldas (Ecuador); Maputo (Mozambique); and Kampala (Uganda). The	Government of Norway	UNEP, UN-HABITAT	Knowledge communication; Capacity building; Assessment	2008 – ?	Urban areas	<i>Global:</i> China, Ecuador, Fiji, Indonesia, Mongolia,

²⁴⁶ GIZ, <https://www.gtz.de/en/unternehmen/33976.htm>

²⁴⁷ IFRC, <http://www.climatecentre.org/site/preparedness-for-climate-change-programme>

²⁴⁸ IFRC, <http://www.climatecentre.org/downloads/File/programs/Final%20PFCC%20General%20Assembly%20Document%20with%20renewed%20table.pdf>

²⁴⁹ UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	project aims at advising and supporting cities and towns prone to the different impacts of climate change by offering innovative approaches and solutions for national and local development planning. In 2010, efforts were initiated to up-scale lessons from this initiative with UN-HABITAT partners in China, Fiji, Indonesia, Mongolia, Nepal, Papua New Guinea, Samoa, Sri Lanka, Vanuatu and Viet Nam. Through this initiative, 10 new cities carried out participatory assessments of their vulnerabilities to climate change.						Mozambique, Nepal, Papua New Guinea, Philippines, Samoa, Sri Lanka, Uganda Vanuatu and Viet Nam
		<i>In the Philippines:</i> In Sorsogon City, key adaptation actions have been identified and are starting to be implemented. A revision of the Land-Use Plan and Development plan is take place and national stakeholders engaged. ²⁵⁰					
11.	US Support Program to the Coral Triangle Initiative (CTI) ²⁵¹	USAID <i>Budget:</i> US\$41 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Assessment; Field implementation	2008 – 2013	Marine management	<i>Asia-Pacific:</i> Indonesia, Malaysia, Philippines, Papua New Guinea, Solomon Islands, Timor-Leste
		<i>In the Philippines:</i> Further information required.					
12.	Advancing Capacity for Climate Change Adaptation (ACCCA) ²⁵²	IDRC, DEFRA, Swiss Federal	UNITAR, ENDA, SEI, CSAG and START	Assessment; Capacity building; Policy	2007 – 2010	Multi-sectoral	<i>Global:</i> Bangladesh, Burkina Faso, Cameroon,

²⁵⁰ UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/pdf/CCCI_Asia-Pacific_Flyer.pdf

²⁵¹ CTI, <http://www.uscti.org/uscti/default.aspx>

²⁵² ACCCA, <http://www.acccaproject.org/accca/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
	Activities include the following: identify and prioritize climate risks; assess available knowledge about risks and adaptation opportunities; develop, test, and disseminate risk communication materials that are designed to assist adaptation decisions; and identify critical knowledge gaps that impede effective adaptation decisions.	Office for the Environment , NCAP, European Commission		formation and integration			Ethiopia, Ghana, Kenya, India, Malawi, Mali, Mongolia, Nepal, Niger, Nigeria, Philippines, South Africa, Tanzania, Tunisia	
		<p><i>In the Philippines: “Mainstreaming Climate Change Adaptation in Watershed Management and Upland Farming.”²⁵³ Based on the assessment of vulnerability and adaptation policies/strategies, climate risks adaptation communication materials will be developed for policy makers, local farmers, and other local stakeholders. It is also expected that the project will contribute to the preparation of the Philippines Second National Communication to the UNFCCC.</i></p> <ul style="list-style-type: none"> • Budget: US\$70,000 • Implementing Agency: University of the Philippines Los Banos • Type of Project: Policy formation and integration • Duration: 2007 – 2009 • Priority sector(s): Watershed management; Agriculture 						
13.	Strengthening Adaptive Capacities to the Impacts of Climate Change in Small-scale Aquaculture ²⁵⁴	The project (also known as "Aqua Climate") aims to strengthen the adaptive capacities of rural farming communities to the impacts of climate change. It is strengthening adaptive capacities to the impacts of climate change in resource-poor small-scale aquaculture and aquatic resources-dependent sectors in the south and south east Asian region. The	NORAD	NACA	Capacity building; Assessment	2009 – 2011	Freshwater fisheries	Asia Region: India, Philippines, Sri Lanka, Viet Nam
		<i>In the Philippines: To be determined</i>						

²⁵³ ICRAF, <http://www.worldagroforestrycentre.org/sea/ph/node/35>

²⁵⁴ NACA, http://www.enaca.org/modules/inlandprojects/index.php?content_id=10

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	project will: (1) map farmers' perceptions and attitudes towards prospective climate change impacts and their adaptive capacities to address these impacts; (2) develop future scenarios based on the current trends; (3) assess the potential adaptive measures for different aquatic farming systems and prioritise better management practices; and (4) suggest Codes of Practices and improved methodologies for such systems.						
14.	Adaptation Knowledge Platform ²⁵⁵	SIDA	SEI, SENA, UNEP, AIT and UNEP Regional Resource Centre for Asia and the Pacific	Capacity building; Policy formation and integration	2009 – 2012	Government	Asia: Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, the Philippines, Sri Lanka, Thailand, Viet Nam
<i>In the Philippines: Further information required.</i>							
15.	Capacity Building for Research and Monitoring of Marine Protected Areas: An Adaptive Mechanism for	APN	Mindanao State University	Capacity Building	2010	Marine management	Regional: Indonesia, Philippines
<i>In the Philippines: To be determined</i>							

²⁵⁵ AKP, <http://www.climateadapt.asia/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Climate Change in the Asia-Pacific Region ²⁵⁶	of the Coral Triangle Initiative in the Asia-Pacific region, these two countries have established a large number of Marine Protected Areas as adaptive mechanisms for natural and anthropogenic impacts. Training of Marine Protected Area monitoring teams will employ scientifically sound research and assessment methods of coral reef, sea grass, and mangrove communities.						
16. Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific ²⁵⁷	Building capacity of trainers and policy-makers in the Asia-Pacific in order to mainstream climate change adaptation principles and practices in some member countries of UNEP's Global Climate Change Adaptation Network.	APN Budget: US\$30,000	IGES, Asia Institute of Technology (AIT) and the AIT/UNEP Regional Resource Center in Asia and the Pacific	Capacity building; Policy formation and integration	2010 – 2011	Government	Asia region: Australia, China, India, Japan, Kazakhstan, Republic of Korea, Philippines, Thailand
<i>In the Philippines: To be determined</i>							
17. Cities in Asia Develop Climate Change Adaptation Plans ²⁵⁸	The project aims to raise awareness, enhance knowledge levels and boost the capacity to act among municipalities in India and the Philippines. To that end, researchers, an international network of municipalities and four cities in each of the two countries are working together to ascertain the local impacts of climate change and draw up future scenarios and decision-making aids.	German Federal Ministry for Environment , Nature Conservancy and Nuclear Safety	ICLEI	Knowledge communication; Capacity building	2010 – 2013	Urban areas	Asia Region: India, Philippines
<i>In the Philippines: In Sorsogon City, key adaptation actions have been identified and are</i>							

²⁵⁶ APN, <http://www.carbon2markets.org/uploads/news/Volume16-No2-2010-Spring.pdf>

²⁵⁷ APN, <http://www.apn-gcr.org/newAPN/resources/proceedingsAndMeetingReports/proceedings/igm-spg15.pdf>

²⁵⁸ BMU, <http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=552>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
		starting to be implemented. A revision of the Land-Use Plan and Development plan is take place and national stakeholders engaged. ²⁵⁹						
18.	Knowledge Center on Climate Change: Adaptation and Best Practices in Agriculture and Natural Resources Sectors ²⁶⁰	<p>The objectives of this project are:</p> <ul style="list-style-type: none"> • Increasing understanding, knowledge and skills of those in the agriculture and natural resources sectors; • Making clients quickly access and learn about what is going on about climate change; • Responding to every client with quickness, courtesy, competency and accuracy; • Providing products that give clients easy access to cutting-edge research and development results, learning events and policy advocacy. 	<p>Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA)</p> <p>Budget: US\$1.0 million for 5 years</p>	<p>SEARCA's University Consortium in Southeast Asia, University of the Philippine Los Banos, World Fish Centre and the Adaptation Learning Mechanism</p>	<p>Capacity building; Knowledge communication</p>	<p>[2010 – 2014]</p>	<p>Agriculture; Climate information services</p>	<p>Regional: Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam</p>
<i>In the Philippines: To be determined</i>								
19.	Building Capacity to Adapt to Climate Change for Selected Southeast Asian Countries: Vulnerability assessment and economic analysis of adaptation ²⁶¹	<p>The overall objective of the project is to build capacities for research, planning and action with respect to climate change and the economics of adaptation. The specific objectives are: a) to measure communities' vulnerability to climate change through research in selected communities; b) to produce maps of each community's relative vulnerability to climate change; c) to analyze</p>	<p>IDRC</p> <p>Budget: CND 228,700</p>	<p>SEARCA, IDRC, College of Economics - Hue University of Viet Nam, and the Royal University of Phnom Penh of Cambodia</p>	<p>Assessment; Capacity building; Policy formation and integration</p>	<p>2011 – 2014</p>	<p>Government</p>	<p>Regional: Cambodia, Philippines, Viet Nam</p>

²⁵⁹ UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/pdf/CCCI_Asia-Pacific_Flyer.pdf

²⁶⁰ KC3, <http://beta.searca.org/kc3/> and ALM, <http://www.adaptationlearning.net/project/knowledge-center-climate-change-kc3-adaptation-and-best-practices-agriculture-and-natural-re>

²⁶¹ IDRC, http://www.idrc.ca/EN/Regions/South_East_Asia/Pages/ProjectDetails.aspx?ProjectNumber=106326 and SEARCA, <http://sis.searca.org/index.php/component/sobi2/?sobi2Task=sobi2Details&catid=28&sobi2Id=99>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	social vulnerability of local communities in terms of gender, geographic location, ethnicity, and socio-cultural, demographic and political-economic variables; d) to identify locally appropriate adaptation options; e) to conduct an economic analysis of adaptation options; and, f) to formulate policy recommendations to enhance local capacity to adapt to climate change.	<i>In the Philippines:</i> The project site is the province of Laguna and the climate hazard focus is flooding. ²⁶²					
20.	Coastal and Marine Resources Management in the Coral Triangle: Southeast Asia ²⁶³	GEF, Japan Fund for Poverty Reduction, ADB, United States	ADB	Capacity building; Assessment	2011 – 2015	Marine management; Coastal zone management	<i>Regional:</i> Indonesia, Malaysia, Philippines
	To promote the long-term conservation and sustainable management of coastal and marine resources in the Sulu-Sulawesi Marine Ecoregion Priority Seascape in the Coral Triangle, by strengthening integrated and ecosystem-based resources management. Project components include: (1) strengthening national and local institutions for sustainable coastal and marine resources ecosystem management; (2) strengthening of ecosystem-based approach to marine resources management, including vulnerability assessments conducted identifying adaptation measures; (3) supporting mechanisms for sustainable livelihoods in coastal communities; and (4) establishing effective project coordination and implementation.	Budget: US\$40,168,182	<i>In the Philippines:</i> To be determined				
21.	Partners for Resilience ²⁶⁴	Netherlands	Dutch Red Cross, Red	Capacity building;	2011 – 2015	Disaster risk management	<i>Global:</i> Ethiopia,

²⁶² SEARCA, <http://beta.searca.org/kc3/index.php/news/southeast-asia/648-searca-to-conduct-training-in-climate-change-vulnerability-assessment-for-local-government-officers>

²⁶³ GEF, <http://www.thegef.org/gef/node/3980> and ADB, <http://pid.adb.org/pid/TaView.htm?projNo=44113&seqNo=02&typeCd=2>

²⁶⁴ Red Cross, <http://www.climatecentre.org/site/partners-for-resilience>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	deterioration of ecosystems, through various intervention strategies: stimulating sustainable economic developments; strengthening the capacity of local organizations and local authorities, among other things by making a risk assessment, natural disaster risk management plans and warning systems; advocacy and stimulation of knowledge sharing between governments, civil society, knowledge institutes and the private sector in the field of natural disaster reduction and climate adaptation.	Budget: EUR 40m total	Cross Climate Centre, CARE, Cordaid, Wetlands International	Knowledge communication			Guatemala, India, Indonesia, Kenya, Mali, Nicaragua, the Philippines, Uganda
<i>In the Philippines: Further information required.</i>							
22.	Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT) ²⁶⁵	USAID Budget: US\$18.0 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Knowledge communication	2011 – 2016	Government	Asia Region: Bangladesh, Cambodia, Federated States of Micronesia, Fiji, Indonesia, Lao PDR, Malaysia, Nepal, Palau, Philippines, Solomon Islands, Sri Lanka, Thailand, Viet Nam
<i>In the Philippines: Further information required.</i>							

²⁶⁵ USDS, <http://www.state.gov/documents/organization/151686.pdf>

D. Proposed Adaptation Action

The Philippines plans to be part of two multi-country projects submitted for consideration to the SCCF: “Supporting Sub-National Level Decision Makers to Prioritize Adaptation Initiatives within Development Planning Frameworks,” which will involve countries from around the world; and “Adaptation in the Coral Triangle” involving five Southeast Asian and Pacific island countries.

Table 3: Proposed Adaptation Projects and Programs in the Philippines

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1. Supporting Sub-National Level Decision Makers to Prioritize Adaptation Initiatives within Development Planning Frameworks ²⁶⁶		Capacity building	Government	Global: Albania, Cambodia, Ghana, Peru, Philippines, Senegal, Sri Lanka, Tanzania, Tunisia, Uruguay
				Notes: Proposed to the SCCF. Funding request: \$10 million
2. Adaptation in the Coral Triangle ²⁶⁷				Asia region: Malaysia, Papua New Guinea, Philippines, Solomon Islands, Timor-Leste
				Notes: Proposed to the SCCF. Funding request: \$20 million. Proposed co-financing: \$290 million

E. Assessment

The Philippines has made significant advancements in addressing climate change both at the policy and project level. It has shown the ability to identify areas of need and develop ways to help meet these needs. Although the country’s policy frameworks are well developed, one of the key challenges faced by the Philippine Climate Change Commission is ensuring the full integration and mainstreaming of adaptation policies and actions from the National Communication to the UNFCCC and the National Framework Strategy. It is the responsibility of the Commission to address inconsistencies and gaps in policy across government. More clarity is also needed on the interaction and interplay of disaster risk reduction and climate change adaptation.

Progress has been made in recent years in balancing mitigation and adaptation actions. The early commitment the country showed to climate change, and the development of a national committee comprising 15 agencies, later replaced by a Commission headed by the President’s Office, no doubt contributed to this progress. Capacity on data and knowledge seems to be improving, however there is a

²⁶⁶ GEF, http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf

²⁶⁷ GEF, http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf



need to improve scientific infrastructure to support research and analysis of climate change exposure, impacts and vulnerabilities to enable targeted policy and planning outcomes.

At the project level, progress is being made in a number of the areas identified as priorities by the government, including risk reduction, coastal zones, fisheries and marine resources, as well as agriculture, water, natural resources management and policy formulation. Gaps appear to persist within the forestry sector, which was also identified as a key area of vulnerability in the country. Moreover, none of the projects identified specifically focuses on addressing the differential gender impacts of climate change, although the Philippine National Climate Change Framework Strategy specifically aims to promote equity in adaptation action, including the protection of women. Future adaptation efforts may transition from the current focus on capacity building and pilot project implementation to more concrete adaptation measures.

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10.0 Thailand

ACIAR	Australian Centre for International Agricultural Research
ADPC	Asian Disaster Preparedness Center
AIT	Asian Institute of Technology
APN	Asia-Pacific Network for Global Change Research
AusAID	Australian Agency for International Development
CIA	Central Intelligence Agency
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DANIDA	Danish International Development Agency
FAO	Food and Agriculture Organization of the United Nations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMSARN	Greater Mekong Subregion Academic and Research Network
ICEM	International Centre for Environmental Management
ICIRISAT	International Crops Research Institute for the Semi-Arid Tropics
IGES	Institute for Global Environmental Strategies
ISET	Institute for Social Environmental Transition
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute
JIID	Japanese Institute of Irrigation and Drainage
Lux-Development	Luxembourg Agency for Development Cooperation
MFf	Mangroves for the Future
MNRE	Ministry of Natural Resources and Environment
MRC	Mekong River Commission
MSTE	Ministry of Science, Technology and Environment
NOAA	National Oceanic and Atmospheric Administration (United States)
ODA	Overseas Development Assistance
SEI	Stockholm Environment Institute
SENSA	Swedish Environmental Secretariat for Asia
SIDA	Swedish International Development Cooperation Agency



START	Global Change SysTem for Analysis, Research and Training
UNDP	United Nations Development Program
UNEP	United Nation Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
WWF	World Wildlife Fund / Worldwide Fund for Nature

Sharing a northern border with Myanmar, Lao PDR and Cambodia, and a southern border with Malaysia, Thailand covers an area of 513,120 square kilometers and has a population of 66.7 million people (CIA, 2011). With a Human Development Index ranking of 92 out of 169, it has the second highest ranked level of developing countries in East and Southeast Asia (UNDP, 2010). Thailand has seen a marked increase in temperatures and changes in rainfall patterns over the past thirty years. Both of these changes have a significant effect on food production, particularly rice—the yields of which are essential to national food security (MSTE, 2000). Thailand’s long coastlines, fragile agriculture system and susceptibility to extreme weather events make it vulnerable to the effects of climate change.

A. Adaptation Needs and Priorities

Thailand submitted its First National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) in November 2000, and its second in March 2011. Within its First National Communication, Thailand highlighted its barriers to adaptation at that time. These barriers included a lack of sufficient research and technological development to be able to accurately identify which adaptation measures were most necessary and would have the most impact. Given these limitations, Thailand’s highest identified adaptation priority was to enhance its research and development capacity to better develop adaptation strategies and projects. Increased public awareness about the threats of climate change is also viewed as a necessity (MSTE, 2000).

As well, in its First National Communication, Thailand identified the following sectors as being priorities for adaptation: agriculture (particularly because of its potential negative impacts on rice yields), water management and coastal regions. Specific adaptation measures for each of these sectors were also identified (MSTE, 2000):

- *Agriculture:* proposed actions included: conservation and improvement of local drought resistant varieties of crops; improvement of cropping practices to minimize water use; application of risk averse cropping systems; analysis of potential crop substitution in different regions; and promotion of crop diversification programs.

- *Freshwater Management*: proposed actions included: addressing water pricing and rights; integrated watershed management; community-based resources management; and water conservation and crop diversification initiatives in agriculture.
- *Coastal Regions*: proposed actions included: establishing a coastal hazard management subcommittee to develop policies, strategies and guidelines for coastal hazard management; providing guidelines on management and development of coastal areas; improving drainage and flood control facilities; and using organic matter to improve salty soil conditions.

Within its Second National Communication to the UNFCCC, Thailand outlines some changes and progress made since submission of its first report. The document reiterates that adaptation to increasing climate variability and extreme weather events remains Thailand's greatest climate change challenge. It highlights that Thailand has made significant strides to increase its technological capacity on impact analysis, vulnerability assessments and actions as a result of placing adaptation as the highest priority in Thailand's National Strategy on Climate Change. It also stresses a need for further bilateral and multilateral cooperative projects through the UNFCCC. The Second National Communication also assesses potential impacts and climate trends in sectors of importance, including agriculture, water resources, health, forestry and wildlife, and marine and coastal resources (MNRE, 2011).

Thailand also identified four main constraints to adaptation within its Second National Communication (MNRE, 2011):

- The level of uncertainty in climate scenarios, and an inability to downscale information that is available;
- Research techniques to prioritize key sectors and analyze best alternatives for adaptation;
- Integration of adaptation options into the socio-economic development of risk-prone communities; and
- Technology options for villages in disaster-prone areas.

To address these limitations, the priorities for adaptation identified by Thailand focus on monitoring and measures, including (MNRE, 2011):

- Uncertainties in downscaling the global climate change scenarios to national and regional scenarios;
- Meaningful behavioral linkages between climate factors and key sectors of the economy, such as climate change and cash crops, paddy and fruit trees;
- Socio-economic scenarios for vulnerability analysis in all sectors; and
- Integration of vulnerability and adaptation strategies into different sectors and stakeholders.

B. National Level Policies and Strategic Documents

Within Thailand, the National Committee on Climate Change has primary responsibility for developing its national strategy on climate change issues, including adaptation. Established in 1993, adaptation, mitigation and other climate change issues are all considered under the work plan of the Committee (MSTE, 2000). In 2008, the Thai Cabinet approved its National Strategy on Climate Change for 2008 to 2012 (Thaweema, n.d.). This strategy contains six components (Tummakird, n.d.: 3):

- “build capacity to adapt and reduce vulnerability to climate change impacts;
- support greenhouse gas emissions reduction and address more carbon dioxide sinks on integrity development;
- support research and development to better understand climate change, its impacts and adaptation and mitigation options;
- raise awareness and promote public participation;
- Build capacity of relevant personnel and institutions and establish a framework of coordination and integration; and
- Support international cooperation to achieve the common goal of climate change mitigation and sustainable development.”

In the area of adaptation, the strategy aims to improve capacity to assess climate change impacts (such as through the development of impact assessment models); reduce the damage caused by climate change impacts (such as by installing early warning systems); increase adaptive capacity in all sectors (such as through reforestation efforts); improve climate change related knowledge (such as by developing weather resistant crops); and development appropriate mechanisms to support policy-making (such as through establishment of a research network) (Thaweema, n.d.).

Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	National Committee on Climate Change ²⁶⁸	Chaired by the Permanent Secretary of the Ministry of Science, Technology and Environment (MSTE)	Established 1993	Multi-sectoral	Responsible for developing national Thai policy on all issues related to climate change
2.	First National Communication to the UNFCCC ²⁶⁹	Ministry of Science, Technology and Environment	Submitted November 2000	Multi-sectoral	Provides details on national circumstances with respect to climate change, an inventory of greenhouse gas emissions, as well as identification of impacts of climate change and potential options for adaptation actions.

²⁶⁸ UNESCAP, http://www.unescap.org/DRPAD/VC/conference/ex_th_235_ncc.htm

²⁶⁹ Ministry of Science, Technology and Environment, http://unfccc.int/essential_background/library/items/3599.php?rec=j&preref=2740#beg

Name of Policy Action	Government Division Responsible	Status	Sector(s) of Focus	Summary description
3. Thailand National Strategy on Climate Change 2008-2012	Ministry of Natural Resources and Environment	On-going	Multi-sectoral	Six strategies on building adaptive capacity, greenhouse gas mitigation, research and development for mitigation and adaptation, raising awareness, building institutional capacity, and supporting international cooperation.
4. Second National Communication to the UNFCCC ²⁷⁰	Ministry of Natural Resources and Environment	Submitted 2011	Multi-sectoral	Assessment of impacts and threats from climate change in the areas of agriculture, water resources, health, forestry and wildlife, and marine and coastal resources. Identification of central constraints to action and plans for going forward.

C. Current Adaptation Action

A moderate number of adaptation projects, relative to other East and Southeast Asia developing countries, are currently underway in Thailand. The majority of these projects are being implemented in partnership with other countries in Asia and around the world. Nationally focused projects are engaged in policy integration and capacity building activities within the areas of coastal zones and tourism. Multi-country projects are addressing needs in a range of sectors, including water, agriculture, risk reduction and policy formation, as well as (to a lesser extent) coastal zones, forestry, urban issues, natural resources and ecosystems. Their activities generally involve capacity building, vulnerability assessment, research, and policy integration and formulation. Funders of more than one adaptation project in Thailand include the Asia-Pacific Network for Global Change Research (APN), Red Cross/Red Crescent Climate Centre, United Nations Development Programme (UNDP) and the governments of Australia, Germany, Sweden and the United States.

Table 2: Current Adaptation Projects and Programs in Thailand

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action							
1. Climate Protection in Tourism ²⁷¹	The project's main objectives are to "improve the framework conditions for the reduction of greenhouse gas emissions and implement measures for nature-oriented	Germany's Federal Ministry for the	GIZ, Designated Areas for Sustainable	Capacity building; Policy formation and	2009 – 2011	Tourism	Trat Province

²⁷⁰ Ministry of Natural Resources and Environment, http://unfccc.int/files/national_reports/non-annex_i_natcom/submitted_natcom/application/pdf/snc_thailand.pdf

²⁷¹ GIZ, <http://archive.thai-german-cooperation.info/news-events/news/german-environment-ministry-launches-climate-protection-initiative-in-thailand.html>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
	tourism to adapt to climate change.” This includes the integration of climate relevant measures into planning and making nature-oriented tourism more climate friendly. This project is being implemented as part of the Thai-German Climate Protection Programme, under Germany’s International Climate Protection Initiative.	Environment , Nature Conservation and Nuclear Safety	Tourism Authority	integration				
2.	Strengthening the Capacity of Vulnerable Coastal Communities to Address the Risk of Climate Change and Extreme Weather Events ²⁷²	The objective of this project is to incorporate climate change concerns into disaster management strategies, plans and measures within the government of Thailand. The achievement of this goal will contribute to strengthened resilience of vulnerable communities in Thailand to climate change impacts. The project aims to provide benefits to vulnerable communities, as well as contribute to local and national capacity to manage climate-related disasters.	SCCF, UNDP, Thai Red Cross Society, and the Sustainable Development Foundation <i>Budget: US\$3,573,863</i>	UNDP, Thai Red Cross Society, Department of Disaster Mitigation & Prevention, Ministry of Interior, and the Sustainable Development Foundation	Policy formation and integration	2010 – 2013	Disaster risk management; Coastal zone management	Coastal areas
Participation in Regional and Global Actions								
3.	Preparedness for Climate Change ²⁷³	The aim of this program was for the Red Cross and Red Crescent National Societies in countries particularly vulnerable to climate change to gain a better understanding of climate change and its impacts to identify country-specific adaptation measures in line with risks. Activities could include organizing a workshop on risks, assessment of risks	Red Cross/Red Crescent Climate Centre	National Red Cross/Red Crescent Societies	Capacity building; Policy formation and integration	Phase 1: 2006 – 2009 Phase 2: ongoing	Disaster risk management	Global project: 39 countries East and South East Asia participants in

²⁷² GEF, <http://www.thegef.org/gef/sites/thegef.org/files/documents/document/06-08-2010%20ID3299%20-%20Council%20Letter.pdf> and [GIZ, http://www.thai-german-cooperation.info/download/bmu_tourism_factsheets.pdf](http://www.thai-german-cooperation.info/download/bmu_tourism_factsheets.pdf)

²⁷³ IFRC, <http://www.climatecentre.org/site/preparedness-for-climate-change-programme>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
	through preparation of a background document, capacity building programs, and developing climate change resilient plans.						Phase 1: Indonesia, Philippines, Thailand	
		<i>In Thailand:</i> By the conclusion of the first phase of activity, the Thai Red Cross Society was engaged in capacity building for the climate resilient programs.						
4.	Mangroves for the Future (MFF) ²⁷⁴	The project has two main objectives: to strengthen the environmental sustainability of coastal development; and to promote the investment of funds and efforts in coastal ecosystem management. MFF re-orientes the current focus of coastal investment by moving from a reactive response to disasters, to progressive activities that address long-term sustainable management needs. These include building awareness and capacity for improved food and livelihood security, disaster preparedness, and climate change adaptation. Initially focused on countries that were highly affected by the 2004 tsunami—India, Indonesia, Maldives, Seychelles, Sri Lanka and Thailand—the project has expanded to include Pakistan and Viet Nam.	2007 – 2009: Australia, Germany, Norway, Sweden, UNDP, UNEP 2010 to now: Norway and Sweden	National governments with CARE International, FAO, IUCN, UNDP, UNEP and Wetlands International with NGOs and CBOs	Research; Knowledge communication; Policy formation and implementation	2006 – present	Coastal zone management	Global: India, Indonesia Maldives, Pakistan, Seychelles, Sri Lanka, Thailand, Viet Nam
		<i>In Thailand:</i> to be determined						
5.	Asian Cities Climate Change Resilience Network ²⁷⁵	The project seeks to establish a network of cities in Asia that will have developed robust plans to prepare for, withstand and recover from the predicted impacts of climate change by 2012. The network will catalyze attention, funding and action on building	Rockefeller Foundation, USAID <i>Budget:</i> US\$40	ISET, Arup International Development, ProVention, ICLEI, APCO Worldwide	Capacity building; Knowledge communication; Policy formation and	2008 – 2012	Urban areas	Asia Region: India, Indonesia, Thailand, Viet Nam

²⁷⁴ MFF, <http://www.mangrovesforthefuture.org/> and <http://www.mangrovesforthefuture.org/Assets/documents/IUCN-MFF-Brochure-Web.pdf>

²⁷⁵ ACCCRN, <http://www.rockefellerfoundation.org/what-we-do/current-work/developing-climate-change-resilience/asian-cities-climate-change-resilience/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	climate change resilience for poor and vulnerable people by creating robust models and methodologies for assessing and addressing risk through active engagement and analysis of various cities.	million		integration			
		<i>In Thailand:</i> <ul style="list-style-type: none"> • <i>Implementing agency:</i> Thailand Environment Institute and ADPC • <i>Location:</i> Chiang Rai and Hat Yai 					
6.	Adaptation Knowledge Platform ²⁷⁶	SIDA	SEI, SENA, UNEP, AIT and UNEP Regional Resource Centre for Asia and the Pacific	Capacity building; Policy formation and integration	2009 – 2012	Government	Asia: Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, the Philippines, Sri Lanka, Thailand, Viet Nam
		<i>In Thailand:</i> Scoping study undertaken and released in 2010 funded by SIDA. <ul style="list-style-type: none"> • <i>Implementing agency:</i> SEI 					
7.	The MRC Climate Change and Adaptation Initiative ²⁷⁷	AusAID, DANIDA	Mekong River Commission with ADPC, ACIAR, CARE International, CSIRO, GIZ, FAO, GMSARN,	Research; Capacity building; Assessment; Knowledge communication	2009 – 2025 In three five-year phases Phase 1:	Watershed management	Regional: Cambodia, Lao PDR, Thailand, Viet Nam

²⁷⁶ AKP, <http://www.climateadapt.asia/>

²⁷⁷ MRC, <http://www.mrcmekong.org/ccai/Climate-change-n-adaptation-initiative.htm>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	gender and climate change. In addition to the creation of technical papers, and assessments outlining adaptation issues and recommended actions, the Climate Change and Adaptation Initiative also develops educational documents for outreach with local residents on the issues of climate change and adaptation.	first two phases ²⁷⁸	ICEM, IUCN, IWMI, JIID, Lux-Development, Southeast Asia START Regional Center, SEI, SIDA, UNDP, UNEP, WWF, Wetlands Alliance		2011 – 2015		
<i>In Thailand: to be determined</i>							
8.	Scientific Capacity Development of Trainers and Policy-Makers for Climate Change Adaptation Planning in Asia and the Pacific ²⁷⁹	APN <i>Budget:</i> US\$30,000	IGES, Asia Institute of Technology (AIT) and the AIT/UNEP Regional Resource Center in Asia and the Pacific	Capacity building; Policy formation and integration	2010 – 2011	Government	<i>Asia region:</i> Australia, China, India, Japan, Kazakhstan, Republic of Korea, Philippines, Thailand
<i>In Thailand: to be determined</i>							
9.	Lower Mekong Initiative ²⁸⁰	United States	Various	Assessment; Capacity building; Knowledge communication	2010 – ?	Climate information services; Watershed management; Human health	<i>Regional:</i> Cambodia, Lao PDR, Thailand, Viet Nam

²⁷⁸ MRC, <http://www.mrcmekong.org/ccai/ccai-framework-document-extraction09.pdf>

²⁷⁹ APN, <http://www.apn-gcr.org/newAPN/resources/proceedingsAndMeetingReports/proceedings/igm-spg15.pdf>

²⁸⁰ USDS, <http://www.state.gov/p/eap/mekong/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	including vulnerability to climate change, transboundary water management and infectious diseases. Ongoing activities include: Forecast Mekong, which is a “data integration, modeling and scientific visualization tool” that will be used to show the projected impacts of climate change; and the “sister-rivers partnership” that allows for sharing of best practices in areas such as climate change adaptation between the Mississippi River Commission and the MRC. ²⁸¹						Plus: United States
		In Thailand: to be determined					
10.	Enhancing Adaptation to Climate Change by Integrating Climate Risk into Long-Term Development Plans and Disaster Management ²⁸²	APN	K J Somaiya Institute of Management Studies & Research Vidyanagar	Research	2010 – 2011	Disaster risk management; Urban areas	Asia Region: Bangladesh, India, Thailand
	This project aims to undertake a comparative analysis of the immediate to medium-term post-disaster recovery scenario in the aftermath of extreme weather events of flooding faced by vulnerable cities in three Asian developing countries, namely, Mumbai (India), Bangkok (Thailand) and Dhaka (Bangladesh). It also aims to quantify the developmental impacts of flooding with the objective of integrating climate change risk considerations into long-term investment and development plans.						
		In Thailand: to be determined					
11.	Climate Risk Management Assessment for Agriculture in Thailand and Viet Nam ²⁸³	ADB	ICRISAT	Research; Policy formation and integration	Ongoing	Agriculture; Gender	Regional: Thailand, Viet Nam
	The outcome of this study will be better adaptation to climate change in the semi-arid tropics of Southeast Asia. As a result of this study and policy dialogues, the governments of Thailand and Viet Nam will be able to identify and prioritize areas most at risk and	Budget: US\$200,000					
		In Thailand: to be determined					

²⁸¹ USDS, <http://www.state.gov/p/eap/mekong/faq/index.htm>

²⁸² APN, <http://www.apn-gcr.org/newAPN/activities/ARCP/2010/list2010projects.htm>

²⁸³ ADB, <http://www.adb.org/Climate-Change/agriculture-tha-vie.asp> and <http://www.adb.org/Documents/Books/Under-Weather-Rising-Tide/Under-Weather-Rising-Tide.pdf>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
	implement appropriate strategies to reduce risk and help farmers adapt. It also will develop gender-equitable agricultural adaptation strategies.							
12.	Climate Sensitive Flood Water Management in the Lower Mekong Basin ²⁸⁴	Germany	Mekong River Commission, GIZ	Capacity building; Assessment; Policy formation and integration	2010 – 2012	Disaster risk management; Climate information services	Regional: Cambodia, Lao PDR, Thailand, and Viet Nam	
			<i>In Thailand: to be determined</i>					
13.	Building Climate Resilience of Mekong Hydropower Dams ²⁸⁵	USAID Budget: US\$1.9 million	National Heritage Institute	Capacity building	2010 – 2013	Energy	Regional: Cambodia, Lao PDR, Thailand, Viet Nam	
			<i>In Thailand: to be determined</i>					
14.	Knowledge Center on Climate Change: Adaptation and Best Practices in Agriculture and Natural Resources Sectors ²⁸⁶	The objectives of this project are: <ul style="list-style-type: none"> Increasing understanding, knowledge and skills of those in the agriculture and natural resources sectors; Making clients quickly access and learn about what is going on about climate 	Southeast Asian Regional Center for Graduate Study and Research in	SEARCA's University Consortium in Southeast Asia, University of the Philippine Los Banos,	Capacity building; Knowledge communication	[2010 – 2014]	Agriculture; Climate information services	Regional: Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar,

²⁸⁴ BMU, <http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=693> and MRC, http://www.mrcmekong.org/MRC_news/press11/Germany-renews-its-support-to-Mekong-Cooperation23Feb11.html

²⁸⁵ U.S. Dept. of State, <http://www.state.gov/documents/organization/151686.pdf>

²⁸⁶ KC3, <http://beta.searca.org/kc3/> and ALM, <http://www.adaptationlearning.net/project/knowledge-center-climate-change-kc3-adaptation-and-best-practices-agriculture-and-natural-re>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
	<p>change;</p> <ul style="list-style-type: none"> • Responding to every client with quickness, courtesy, competency and accuracy; • Providing products that give clients easy access to cutting-edge research and development results, learning events and policy advocacy. 	<p>Agriculture (SEARCA)</p> <p>Budget: US\$1.0 million for 5 years</p>	<p>World Fish Centre and the Adaptation Learning Mechanism</p>				<p>Philippines, Thailand, Timor-Leste, Viet Nam</p>	
<i>In Thailand: to be determined</i>								
15.	<p>Mekong River Basin Project on Addressing Climate Change Impacts on Agriculture and Natural Resources²⁸⁷</p>	<p>Helps communities assess climate change impacts on agriculture and ecosystems and strengthen adaptation capacity with respect to water resources, food security, livelihoods, and needs of vulnerable groups. The project supports the Lower Mekong Initiative.</p>	<p>USAID</p> <p>Budget: US\$9.0 million</p>		<p>Assessment; Capacity building</p>	<p>2011 – 2016</p>	<p>Agriculture; Ecosystem conservation</p>	<p>Regional: Cambodia, Lao PDR, Thailand, Viet Nam</p>
<i>In Thailand: to be determined</i>								
16.	<p>Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT)²⁸⁸</p>	<p>Increase access to financial resources for climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up.</p>	<p>USAID</p> <p>Budget: US\$18.0 million</p>	<p>WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA</p>	<p>Capacity building; Knowledge communication</p>	<p>2011 – 2016</p>	<p>Government</p>	<p>Asia Region: Bangladesh, Cambodia, Federated States of Micronesia, Fiji, Indonesia, Lao PDR, Malaysia, Nepal, Palau, Philippines, Solomon Islands, Sri Lanka,</p>

²⁸⁷ USDS, <http://www.state.gov/documents/organization/151686.pdf>

²⁸⁸ USDS, <http://www.state.gov/documents/organization/151686.pdf>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
							Thailand, Viet Nam
In Thailand: to be determined							

D. Proposed Adaptation Action

No projects in development were identified through this review.

E. Assessment

Thailand is transitioning from a country heavily dependent on official development assistance to a more market based economy. Through modeling, it has built capacity on which it can make projections and determine the most appropriate ways to address its adaptation needs. A firm national policy commitment is in place in relation to climate change, and a growing focus on adaptation within the government’s approach. While further developed than some of its neighbors, it still faces financing and technical gaps that prevent it from fully addressing its adaptation requirements. A well-defined adaptation strategy may assist Thailand with developing adaptation projects and accessing funding sources.

Thailand’s identified adaptation priorities are being addressed through one or more active projects, including activities in the areas of water, agriculture, and coastal zones, as well as through existing efforts to improve scientific and technological capacity in anticipating future climate impacts as well as through policy formulation and integration activities. There is, however, seemingly a need to expand adaptation efforts within the areas of forestry, wildlife and coastal zones and marine resources. Additional sectors that currently appear to be underrepresented in the country’s active projects are gender issues and the health impacts associated with adaptation to climate change; neither of these issues appears to be addressed within Thailand’s current adaptation projects.

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11.0 Timor-Leste

ALM	Adaptation Learning Mechanism
CIA	Central Intelligence Agency
FSM	Federated States of Micronesia
GEF	Global Environment Facility
NAPA	National Adaptation Programme of Action
NOAA	National Oceanic and Atmospheric Administration (United States)
PNG	Papua New Guinea
SEARCA	Southeast Asian Regional Center for Graduate Study and Research in Agriculture
SCCF	Special Climate Change Fund
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
WWF	World Wildlife Fund / Worldwide Fund for Nature

Timor-Leste is the smallest country in the region of East and Southeast Asia both geographically—with a total area of less than 15,000 kilometers—as well as in regards to population—with less than 1.2 million people (CIA, 2011). Since achieving independence in May 2002 following civil unrest in the late 1990s, the country has focused on rebuilding its infrastructure and economy. Its Human Development Index ranking of 120 out of 169 (UNDP, 2010) is near the lower end of the region, but Timor-Leste has made strides in recent years.²⁸⁹ Still, it remains classified as one of the least developed countries in the world.

A. Adaptation Needs and Priorities

Very little data is available about Timor-Leste’s adaptation needs and priorities. The country has not completed a National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) and is in the process of preparing a National Adaptation Programme of Action (NAPA) with the support of the United Nations Development Programme (UNDP). Despite these limitations, it is generally accepted that Timor-Leste is susceptible to extreme weather events, flooding, sea level rise, deforestation and soil erosion due to sub-prime agricultural practices (ALM, 2009). Understanding of potential climate-related impacts

²⁸⁹ Timor-Leste’s ranking within the UNDP Human Development Index rose by 11 spots from 2005 to 2010.

and issues beyond these general assessments, however, does not appear to be available at present. Statements from its government recognize the importance of climate change issues and the need to react to climate change (e.g., Government of Timor-Leste, 2010a & 2010b).

B. National Level Policies and Strategic Documents

To date, the Government of Timor-Leste has made little progress with respect to the development of a policy architecture related to climate change adaptation, having completed neither its first National Communication nor NAPA.²⁹⁰ As such, Timor-Leste does not have a formal adaptation strategy or plan. However, there are reports of some progress in the areas of agricultural education (ALM, 2009).

C. Current Adaptation Action

Timor-Leste is currently involved in a very low number of adaptation projects in comparison to other developing countries in East and Southeast Asia. To date it appears to only be involved in projects that also include other countries. Several of these projects are being undertaken in collaboration with Pacific region countries, reflecting in part its status as a small island nation. Each of these projects has a strong focus on capacity building. The vulnerable sectors addressed through these projects include agriculture, water, natural resource management, coastal zone management, marine management and policy and planning. These projects are being funded by the Asian Development Bank (ADB), the Global Environment Facility (GEF), Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), and the countries of Canada, Sweden and the United States.

Table 1: Current Adaptation Projects and Programs in Timor-Leste

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Participation in Regional and Global Actions							
1. International Climate Change Adaptation Initiative ²⁹¹	To help the most vulnerable countries adapt to the impacts of climate change. It includes four components: (a) improved scientific information and understanding; (b) strategic planning and vulnerability assessments; (c) implementing, financing and coordinating	AusAID Budget: US\$328.2 million		Research; Field implementation; Capacity building	2008 – 2011	Multi-sectoral	Pacific and Timor-Leste (focus on islands neighboring Australia)

²⁹⁰ Timor-Leste received a grant of USD \$200,000 in 2008 from the Least Developed Countries Fund to undertake the development of its NAPA (ALM, 2009).

²⁹¹ AusAID, http://www.ausaid.gov.au/keyaid/adaptation_initiative.cfm

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	adaptation measures; (d) multilateral support for climate change adaptation.	<i>In Timor-Leste: Further information required.</i>					
2.	US Support Program to the Coral Triangle Initiative (CTI) ²⁹²	USAID Budget: US\$41 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Assessment; Field implementation	2008 – 2013	Marine management	<i>Asia-Pacific:</i> Indonesia, Malaysia, Philippines, Papua New Guinea, Solomon Islands, Timor-Leste
		<i>In Timor-Leste: Further information required.</i>					
3.	Strengthening the Capacity of Pacific Developing Member Countries to Respond to Climate Change (Phase 1) ²⁹³	ADB, Canada Budget: US\$4.965 million	ADB	Capacity building; Policy formation and integration	2009 – ?	Government	<i>Asia-Pacific:</i> Cook Islands, Fiji, FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Solomon Islands, Samoa, Tonga, Timor-Leste, Tuvalu, Vanuatu

²⁹² CTI, <http://www.uscti.org/uscti/default.aspx>

²⁹³ ADB, <http://pid.adb.org/pid/TaView.htm?projNo=43071&seqNo=01&typeCd=2#timetable>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	adaptation plans, including further capacity building	In Timor-Leste: to be determined					
4.	Coastal and Marine Resources Management in the Coral Triangle of the Pacific (under the Pacific Alliance for Sustainability Program and the Coral Triangle Initiative) ²⁹⁴	GEF-SPA; Japan; Australia; United States Budget: US\$27,568,183	ABD; national governments	Capacity building, Research; Field implementation	2009 – 2013	Coastal zone management; Marine management	Asia-Pacific: FSM, Fiji, Palau, PNG, Solomon Islands, Timor-Leste, Vanuatu
		In Timor-Leste: to be determined					
5.	Climate Risk Management Technical Assistance Support Project: Phase II ²⁹⁵	Sweden and SIDA through UNDP, UNDP core finance	Asian Disaster Preparedness Center, International Institute for Sustainable Development	Research; Policy formation and integration	2010 – 2011	Multi-sectoral	Global: Bangladesh, Bhutan, Dominican Republic, Honduras, India, Kenya, Maldives, Mongolia, Nepal, Nicaragua, Niger, Pakistan, Papua New Guinea, Peru,

²⁹⁴ GEF, <http://www.gefonline.org/projectDetailsSQL.cfm?projID=3591>

²⁹⁵ UNFCCC, http://unfccc.int/files/adaptation/nairobi_workprogramme/partners_and_action_pledges/application/pdf/iisd_furtherinfo_water_190411.pdf

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
							Timor-Leste and Uganda	
<i>In Timor-Leste: to be determined</i>								
6.	Knowledge Center on Climate Change: Adaptation and Best Practices in Agriculture and Natural Resources Sectors ²⁹⁶	The objectives of this project are: <ul style="list-style-type: none"> • Increasing understanding, knowledge and skills of those in the agriculture and natural resources sectors; • Making clients quickly access and learn about what is going on about climate change; • Responding to every client with quickness, courtesy, competency and accuracy; • Providing products that give clients easy access to cutting-edge research and development results, learning events and policy advocacy. 	SEARCA Budget: US\$1.0 million for 5 years	SEARCA's University Consortium in Southeast Asia, University of the Philippine Los Banos, World Fish Centre and the Adaptation Learning Mechanism	Capacity building; Knowledge communication	[2010 – 2014]	Agriculture; Climate information services	<i>Regional:</i> Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam
<i>In Timor-Leste: to be determined</i>								

D. Proposed Adaptation Action

Timor-Leste is proposed to be part of two regional projects submitted to the Special Climate Change Fund (SCCF), as presented in Table 2.

Table 2: Proposed Adaptation Projects and Programs in Timor-Leste

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Increasing Climate Resiliency of the Transport Sector in the Asia Pacific ²⁹⁷		Transport	<i>Asia region:</i> China, Solomon Islands, Timor-Leste, Viet Nam
Notes: SCCF Proposal. Proposed funding from SCCF: \$30-million. Proposed co-financing: 1,089,500,000 million.				

²⁹⁶ KC3, <http://beta.searca.org/kc3/> and ALM, <http://www.adaptationlearning.net/project/knowledge-center-climate-change-kc3-adaptation-and-best-practices-agriculture-and-natural-re>

²⁹⁷ GEF, http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf



Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
2.	Adaptation in the Coral Triangle ²⁹⁸			Marine management	Asia region: Malaysia, Papua New Guinea, Philippines, Solomon Islands, Timor-Leste
		Notes: Proposed to the SCCF. Funding request: \$20 million. Proposed co-financing: \$290 million			

E. Assessment

Timor-Leste is taking steps towards improving its level of development under the leadership of its relatively new government. While these efforts may be expected to contribute to improving the adaptive capacity of the country, a clear priority going forward is the need for basic understanding of climate change and building capacity to act upon this knowledge. As such, the completion of its NAPA and an initial National Communication to the UNFCCC will be a significant step forward in the country's efforts to begin developing a national climate change action plan. In the interim, as progress is being made in Timor-Leste with respect to meeting its basic development needs, it will be important for the country to integrate considerations for climate change implications into its planning process. The degree to which this is already taking place within the country is unclear.

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²⁹⁸ GEF: http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf



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12.0 Viet Nam

2Wcom	Competence in Wireless Communication
ACIAR	Australian Centre for International Agricultural Research
ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Center
AIT	Asian Institute of Technology
APN	Asia-Pacific Network for Global Change Research
AusAID	Australian Agency for International Development
CIA	Central Intelligence Agency
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CTU	Can Tho University, College of Technology, Mekong Delta Development Research Institute
DANIDA	Danish International Development Agency
DFD-DLR	German Remote Sensing Data Centre of the German Aerospace Centre
EOMAP	Earth Observation and Mapping in Hydrology
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GEF	Global Environment Facility
GFZ	Deutsches GeoForschungsZentrum / German Research Center for Geoscience
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMSARN	Greater Mekong Subregion Academic and Research Network
ICEM	International Centre for Environmental Management
IDR	Institute of Development Economics Research, University of Economics
IGES	Institute for Global Environmental Strategies
IMHEM	Vietnam Institute of Meteorology, Hydrology and Environment
IUCN	International Union for Conservation of Nature
IWMI	International Water Management Institute
JIID	Japanese Institute of Irrigation and Drainage
Lux-Development	Luxembourg Agency for Development Cooperation
MARD	Ministry of Agriculture and Rural Development

MFF	Mangroves for the Future
MNRE	Ministry of Natural Resources and Environment
NTP	National Target Programme
SCCF	Special Climate Change Fund
SEI	Stockholm Environment Institute
SENSA	Swedish Environmental Secretariat for Asia
SIDA	Swedish International Development Cooperation Agency
SISD	Southern Institute for Sustainable Development
SIWRR	Southern Institute of Water Resources Research
SRHMC	Southern Region Hydro-Meteorological Centre
SRIDP	Sustainable Rural Infrastructure Development Project in the Northern Mountains
START	Global Change SysTEm for Analysis, Research and Training
Sub-NIAPP	Sub-National Institute for Agricultural Planning and Projection
UIT	University of Information Technology
UNDP	United Nation Development Programme
UNEP	United Nation Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNU	United Nations University
USAID	United States Agency for International Development
VAST-GIRS	Vietnamese Academy of Science and Technology, Division of Remote Sensing and Geographic Information Systems
WWF	World Wildlife Fund / Worldwide Fund for Nature

Viet Nam covers an area of over 331,000 square kilometers and has an estimated population of 90.5 million people—making it the 14th most populated country in the world (CIA, 2011). While Viet Nam is working to modernize its economy, agricultural production continues to generate about one-fifth of the country’s Gross Domestic Product (GDP; in 2010) and this sector continues to employ 53.9 per cent of the labor force (in 2009). By comparison, industry generated about 41.1 per cent of GDP, and services generated 38.3 per cent (in 2010). Deep poverty has declined significantly in recent years, and was estimated to be 10.6 per cent in 2010 (CIA, 2011). Viet Nam’s 2010 Human Development Index ranking was 113 of 169 countries (UNDP, 2010).

A. Adaptation Needs and Priorities

Viet Nam's present climate is tropical in the south and monsoonal in the north, with a hot, rainy season from May to September and a warm dry season from October to March (CIA, 2011). Since 1950, the country has experienced a rise in average surface temperatures of 0.7°C. As well, the country's typhoon and flood seasons are observed to be longer than in the past; there is increased incidences of heavy rainfall and flooding; storms are tracking into new coastal areas; and drought in areas previously not vulnerable to aridity have been noted (Carew-Reid, 2008). These trends may be indicators of climate change, which is projected to lead to: rising temperatures; increased rainfall across nearly all regions; more erratic rainfall patterns; and rising sea levels along Viet Nam's extensive coastlines (MONRE, 2003).

Given Viet Nam's geographical location, current level of development and projected climatic changes—particularly with respect to sea-level rise, extreme weather events and rainfall patterns (Oxfam, 2008)—it has often been identified as a country that is particularly vulnerable to the effects of climate change (World Bank, 2009). These vulnerabilities vary throughout the different regions of Viet Nam in light of their physical and social characteristics. As summarized in Table 1, the Mekong Delta Region and Central Coast are highly exposed to climate impacts, but have moderate sensitivity to these changes; the northern mountains, in contrast, are not very exposed to climate risks but the region's poverty means that it has a high level of sensitivity to the changes projected to occur (McElwee, 2010). Overall, climate change has the potential to significantly exacerbate poverty related issues in a country that has made significant strides on this issue over the past decades.

Understanding of this vulnerability has been documented in Viet Nam's First National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) submitted in December 2003 (MONRE, 2003), and its Second National Communication submitted in December 2010 (MONRE, 2010). Through these reports, Viet Nam has also communicated its adaptation needs and priorities and recommended responses to climate threats. Sectors identified as being priorities for adaptation action are agriculture, water, forestry, coastal zones and fisheries (MONRE, 2003; MONRE, 2010):

- *Agriculture*: Projected increases in temperature, measured through fewer days below 20°C and more days above 25°C, are could negatively impact agricultural productivity in Viet Nam by increasing water needs, changing growing seasons, decreasing output, forcing changes to agriculture practices and crop varieties and the loss of 5,469 square kilometers of arable land by 2100 due to sea level rise (MONRE, 2010). In response, priority adaptation measures have been identified as: development of crop patterns suitable to climate changes; effective use of irrigation water; upgrading of irrigation systems for agriculture; development of new

crop varieties that can withstand severe environmental conditions; improved storage of harvested varieties as well as establishing crop seed banks; and development of farming techniques appropriate to climate change (MONRE, 2010).

- *Freshwater resources:* These resources are also expected to come under increasing stress, with the potential for the groundwater level to drop drastically after 2020. Sustainable development of water resources is a high priority in general, with a need to take into account potential climate impacts in the management and storage of water resources. Recommended responses in the National Communications include: creating plans for water development in all river basins; reinforcing and upgrading infrastructure, including dykes, canals and drainage systems; improving observation and forecasting; increasing public awareness of climate change coupled with promotion of efficiency and conservation of water use; increasing water reservoirs; and increasing research and study into long term water resource protection.
- *Forestry:* Predictions to 2100 show climate change causing the shrinkage of natural forest ecosystems, increases in pest impact and greater risk of forest fires. Adaptation measures identified to address these concerns include: enhancing reforestation, particularly protecting and developing mangrove forest; strengthening sustainable forest management; improving forest fire prevention; enhancing timber processing efficiency and limiting use of wood; and selecting and developing plant varieties suitable to natural conditions (and resilient to pest and fire risk) while taking into account projected climate changes.
- *Coastal zones and fisheries:* With one of the largest and most heavily populated deltas in the world, sea-level rise and increasing temperatures are of particular concern to Viet Nam. To reduce its vulnerability to these projected changes, the countries has identified measures such as: taking into account sea level rise and increase of temperatures while building infrastructure such as quays, ports and store houses; creating transitional belts between land and sea by building back-up dikes behind sea dikes, with the areas between mainly being used for aquaculture; building storm shelter port systems along the coast as well as on islands; establishing natural ecological reserves, especially coral reefs and atolls; improving aquaculture, including increasing tolerance of species and sustainable aquaculture plans; and disaster protection and risk reduction measures, including insurance improvements.

Viet Nam's awareness of the importance of education and capacity building across all topics is also well documented, particularly with respect to water.

Table 1: Vulnerabilities to climate change in Viet Nam by region

Region	Characterization	Main Physical Vulnerabilities	Main Social Vulnerabilities
Mekong Delta Region	High Exposure, Moderate Sensitivity	<ul style="list-style-type: none"> • Sea level rise, flooding, saline intrusions, rising rates of storms: inland flood zone including An Giang and Dong Thap provinces; • Saline intrusion areas: Kien Giang, Ca Mau, Bac Lieu; • Lack of freshwater supply in the dry season; • Long flood duration areas (the Trans-Bassac depression zone) such as Can Tho city. 	<ul style="list-style-type: none"> • Several provinces with poor Khmer ethnic minority; • Rising rates of landless; • Large numbers of migrants (10 per cent poverty rate).
Central Highlands	Moderate Exposure, High Sensitivity	<ul style="list-style-type: none"> • Floods and flash floods; • Droughts. 	<ul style="list-style-type: none"> • High number of ethnic minorities; • High rates of poverty (29 per cent incidence by region); • Many migrants; • High numbers dependent on rain-fed and subsistence agriculture.
Northern Mountains (Northeast and Northwest)	Low Exposure, High Sensitivity	<ul style="list-style-type: none"> • Landslides, flash floods, droughts, storms from East China Sea. 	<ul style="list-style-type: none"> • 49 per cent poverty in the northwest region; • Many provinces dominated by diverse ethnic minorities; • High illiteracy rates and large families; • Low rates of female education; • Many remote areas with poor road access; • High rates of subsistence and rain-fed agriculture
Central Coast (North and South)	High Exposure, Moderate Sensitivity	<ul style="list-style-type: none"> • Increased storms from East China Sea, coastal surges, flooding; • Some drought-prone areas, especially in southern coast. 	<ul style="list-style-type: none"> • 29 per cent poverty in North, 13 per cent in south coast; • Pockets of ethnic minorities; • Many fishing communities; • Dependence on rain-fed agriculture in many areas.
Red River Delta	Moderate Exposure, Low Sensitivity	<ul style="list-style-type: none"> • Storms from East China Sea, floods and flash floods, inundation. 	<ul style="list-style-type: none"> • Relatively low (nine per cent) poverty rate but large number of poor people overall; • High rates of outmigration and female-headed households.
Southeast Region	Low Exposure, Low Sensitivity	<ul style="list-style-type: none"> • Coastal storms • Drought in inland areas 	<ul style="list-style-type: none"> • Low rates of poverty overall (six per cent) but some pockets, particularly for ethnic minorities; • Many migrant workers.

Source: McElwee (2010).

B. National Level Policies and Strategic Documents

Viet Nam launched its National Target Programme to Respond to Climate Change (NTP) in late 2008 with the goal of developing national policy on adaptation and mitigation by the end of 2010 and full implementation in 2015. The adaptation related goals of the NTP are to (Government of Viet Nam, 2008):

- Identify the extent of climate change in Viet Nam and its expected impacts;
- Identify adaptation measures and policies;
- Promote scientific and technological activities related to climate change;
- Strengthen capacity building to respond to climate change;
- Raise public awareness;
- Promote international cooperation;
- Mainstream climate change into socioeconomic development strategies and all levels of planning; and
- Develop specific action plans and pilot projects to respond to climate change.

In most areas of climate change policy in Viet Nam, adaptation has been given equal footing with mitigation.

Table 2: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	Initial National Communication to the UNFCCC ²⁹⁹	Ministry of Natural Resources and Environment	Submitted December 2003	Multi-sectoral	Provides details on national circumstances with respect to climate change, an inventory of greenhouse gas emissions, as well as identification of impacts of climate change and potential options for adaptation actions.
2.	Vietnamese National Target Programme to Respond to Climate Change ³⁰⁰	Ministry of Natural Resources and Environment	Approved in December 2008, implementation of plans by 2015	Multi-sectoral	Tasked with developing and implementing an overall climate change strategy including goals for both adaptation and mitigation.
3.	Second National Communication to the UNFCCC ³⁰¹	Ministry of Natural Resources and Environment	Submitted December 2010	Multi-Sectoral	Follows up on the Initial National Communication and further articulates options for adaptation action as well as an updated assessment of adaptation needs.

C. Current Adaptation Action

Viet Nam has been one of the most active countries in the world with respect to undertaking discrete adaptation projects. As demonstrated in Table 3, Viet Nam has a very high level of ongoing adaptation projects and programs relative to other East and

²⁹⁹ MONRE, http://unfccc.int/essential_background/library/items/3599.php?rec=j&preref=3995#beg

³⁰⁰ NTP, http://www.thereddesk.org/sites/default/files/decision_on_national_target_program_on_reduction_of_climate_change_0.pdf

³⁰¹ MONRE, http://unfccc.int/essential_background/library/items/3599.php?such=j&symbol=VNM/COM/2%20E#beg

Southeast Asian developing countries. These include projects designed specifically to meet the needs of Viet Nam, and those that also are being undertaken in other developing countries in Asia, Africa and Latin America and the Caribbean. The nationally focused projects are addressing a wide range of sectors, including coastal zones, policy formulation, water, disaster risk reduction, rural development, education and the needs of urban areas. The majority of these projects include capacity building, research, knowledge sharing, awareness raising and vulnerability assessments; a smaller number of projects include components involving community based adaptation and implementation. Funders of more than one nationally-focused adaptation project in Viet Nam include the Asian Development Bank (ADB), the United Nations Development Programme (UNDP) and the governments of Australia, Germany, Japan and, in particular, Denmark.

Regional as well as globally focused projects are addressing a similarly wide range of adaptation priorities, with a slightly higher concentration of projects addressing adaptation in the areas of water, agriculture and urban centers; fewer address adaptation needs related to coastal zones, policy formulation, health, forestry, natural resources and fisheries and marine resources. Funders of more than one multi-country adaptation project that includes Viet Nam are: the Asia-Pacific Network for Global Change Research (APN) and the governments of Australia, Germany, Norway, Sweden and, especially, the United States.

Table 3: Current Adaptation Projects and Programs in Viet Nam

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action³⁰²							
1.	Benefits on Climate Change Adaptation from Small and Medium Scale Hydropower Plants: Synergies and trade-offs with rural development ³⁰³	The project's objectives are: 1. To understand the benefits of small and medium scale hydropower plants in climate change adaptation as well as rural development; and 2. To recommend mitigation measures to minimize impacts from small and medium scale hydropower plants on environment and human well-being, especially to poor communities.	DANIDA Budget: US\$466400	MNRE, Vietnam Institute of Meteorology, Hydrology and Environment	Research	2006 – 2009	Energy Lao Cai Province

³⁰² Actions identified through internet research.

³⁰³ PIK, <http://cigrasp.pik-potsdam.de/adaptations/assessment-of-small-and-medium-scale-hydropower-plants-synergies-and-trade-offs-with-rural-development> and IOPscience, http://iopscience.iop.org/1755-1315/6/29/292041/pdf/1755-1315_6_29_292041.pdf

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
2. Mangrove Management Information System (MMIS) ³⁰⁴	Recognizing the role that mangroves play in protecting coastal areas from sea level rise and tropical storms, the project provides training in the use of a geographic information system, the MMIS, which is used to help manage to manage dykes in Northern Viet Nam, specifically mangroves.	Government of Denmark	Department of Dyke Management and Flood Control under the Ministry of Agriculture and Rural Development	Capacity building	2007 – ?	Coastal zone management	Provinces of Ha Tinh, Nghe An, Thanh Hoa, Ninh Binh, Nam Dinh, Thai Binh, Hai Phong and Quang Ninh
3. Climate Change and the Impacts on Water Resources in Viet Nam ³⁰⁵	Strengthen capacity in Viet Nam for water management to adapt to potential water crisis brought on by changes in climate.	Government of Denmark <i>Budget:</i> US\$800,000	Vietnam Institute of Meteorology, Hydrology and Environment and MONRE	Capacity building	2007 – 2009	Freshwater supply	
4. Water-related Information System for the Sustainable Development of the Mekong Delta in Vietnam (WISDOM) ³⁰⁶	The main objective of this multidisciplinary German-Vietnamese Initiative is to develop and implement a platform for the collection, exchange and processing of water related information for the Mekong River Delta in Viet Nam. This platform will also provide operational services in the fields of disaster prevention and mitigation, and integrated water resources management in the project region. Part of the project includes examination of local adaptation strategies and related changes of the specific	Germany: Federal Ministry of Education and Research	<i>In Viet Nam:</i> SIWRR, VAST-GIRS, UIT, Sub-NIAPP, SISD, CTU, SRHMC & IDR <i>In Germany:</i> DFD-DLR, UNU, University of Bonn, GFZ, University of Würzburg,	Capacity building; Knowledge communication; Research	Phase 1: 2007 - 2010 Phase 2: 2010 – 2013	Watershed management; Disaster risk management	Mekong River Delta

³⁰⁴ Embassy of Denmark in Hanoi,

<http://www.ambhanoi.um.dk/en/menu/Developmentpolicy/ClimateandEnergy/ClimateChangeInitiatives/MangroveManagementInformationSystem/>

³⁰⁵ Embassy of Denmark in Hanoi,

<http://www.ambhanoi.um.dk/en/menu/Developmentpolicy/ClimateandEnergy/ClimateChangeInitiatives/ClimateChangeAndTheImpactsOnWaterResourcesInVietnam/>

³⁰⁶ WISDOM, <http://131.220.109.9/index.php?id=1197>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	waterborne livelihoods of the Mekong Delta.		2Wcom and EOMAP				
5. Ho Chi Minh City Adaptation to Climate Change ³⁰⁷	Enhance the capacity of Ho Chi Minh City to respond to climate change. In its second phase, the project: developed modeling scenarios to quantitatively integrate rainfall, land-use, and sea level into water regime scenarios; assessed the current knowledge and coping strategies for floods, storm surge, cyclones, and tides; identified potential scenarios that could affect coastal watersheds; identified vulnerable infrastructure and communities; quantified the magnitude of climate impacts on social, environmental, and economic resources; prioritized adaptive scenarios within current institutional frameworks; and looked at government capacity to manage natural disasters and climate shocks.	United Kingdom and Japan through the ADB Small Grant for Adaptation Project Phase II <i>Budget:</i> US\$167,000	International Centre for Environmental Management, Ho Chi Minh City Department of Natural Resources and Environment	Capacity building; Research	2008 – 2009 (Closed)	Urban areas	Ho Chi Minh City
6. Impacts of Climate Change on Water Resources and Adaptation Measures ³⁰⁸	Build capacity to respond to climate impacts on water resources	DANIDA	Vietnam Institute of Meteorology, Hydrology and Environment	Assessment; Capacity building	2008 – 2009	Freshwater supply	
7. Developing and Implementing Climate Change Adaptation Measures to Increase Resilience of National	The project seeks to: <ul style="list-style-type: none"> • Protect the environment and natural resources; and • Develop institutional capacity and human resources, encourage technology transfer, 	UNDP	MONRE	Capacity building; Field implementation	2008 – 2012	Government	

³⁰⁷ ADB, <http://www.adb.org/documents/reports/hcmc-climate-change/hcmc-climate-change-summary.pdf> and <http://www.adb.org/Climate-Change/vic-adaptation-mitigation.asp>

³⁰⁸ VIMHE, http://www.imh.ac.vn/a_gioi_thieu?set_language=en&cl=en

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	Development	and promote research and development						
8.	Sea Water Level Rise and Disaster Risk in Viet Nam ³⁰⁹	Project aims to mitigate impacts of sea level rise by proposing adaptation measures.	Government of Denmark Budget: US\$880,000	Vietnam Institute of Meteorology, Hydrology and Environment and MONRE	Assessment; Policy formation and integration	2008 – 2013	Coastal zone management	Coastal areas
9.	Climate Change Impact and Adaptation Study in the Mekong Delta ³¹⁰	The goal of the project is to develop the physical and economic resilience of rural and poor people in the Mekong Delta region to future climate change and variability. This will be accomplished through developing the capacity of sector and provincial authorities in the Mekong Delta region to increase the climate-resilience of programs, plans, policies, and/or projects to guide future development planning.	ADB, Government of Australia, Government of Viet Nam Budget: 1.3 million	Ministry of Natural Resources and Environment	Capacity building; Research; Policy formation and integration	2009 – 2011	Rural areas; Government	Mekong Delta Region
10.	Capacity Building Project on Climate Change for Civil Society Organizations ³¹¹	To raise awareness and build capacity of civil society, focusing on non-governmental organizations and their partners, to effectively respond to and integrate climate change adaptation and mitigation into relevant existing and future programs to contribute to long term sustainable development of the country and Vietnamese people. In addition the program will indirectly reach and build the capacity and resilience of the vulnerable and remote communities and marginalized groups that	Finland	Centre for Sustainable Rural Development, Climate Change Working Group and the Viet Nam Non-Governmental Organizations & Climate Change	Capacity building	2009 – 2012	Civil society	

³⁰⁹ Embassy of Denmark in Hanoi,

<http://www.ambhanoi.um.dk/en/menu/Developmentpolicy/ClimateandEnergy/ClimateChangeInitiatives/SeaWaterLevelRiseAndDisasterRiskInVietnam/>

³¹⁰ ADB, <http://www.adb.org/projects/project.asp?id=43295>

³¹¹ <http://www.ngocentre.org.vn/content/capacity-building-project-climate-change-civil-society-organizations>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	are the main beneficiaries of the targeted non-governmental organizations.		Network				
11. Strengthening National Capacities to Respond to Climate Change in Viet Nam, Reducing Vulnerability and Controlling Greenhouse Gas Emissions ³¹²	Develop capacity for partners of National Target Programs in policymaking, planning, information and research. The project will put in place the frameworks, mechanisms and capacities needed to inform, guide and coordinate: (i) analysis of climate change related risks and formulation of climate change adaptation policy responses and investment plans; and (ii) analysis of greenhouse gas emissions.	UNDP <i>Budget:</i> US\$4,660,000	MNRE with Ministry of Agriculture and Rural Development and People Committees of Can Tho, Binh Thuan and Binh Dinh provinces	Capacity building; Policy formation and integration	2009 – 2012	Government	Ha Noi, Binh Dinh, Binh Thuan, and Can Tho
12. Climate Change Adaptation and Mitigation Program: Viet Nam ³¹³	The program includes two components: <ul style="list-style-type: none"> • The climate change adaptation component will support implementation of the Vietnamese National Target Programme to Respond to Climate Change under the direction of the MNRE. Its objective is to enhance Viet Nam's capacity and efficiency in respond to climate change in order to ensure sustainable development, protect people from its harmful consequences, prevent and reduce risks posed by climate change while joining the efforts of the international community to mitigate its impacts, and protect the global climatic system; and • Support the National Target Program on Energy Efficiency and Conservation. 	Denmark <i>Budget:</i> DKK 200 million	MNRE, Ministry of Industry and Trade, Quang Nam and Ben Tre Peoples Committees	Capacity building; Policy formation and integration	2009 – 2013	Government	Adaptation component: provinces of Ben Tre and Quang Nam
13. Climate-resilient	The objectives of this project are to:	SCCF, ADB,	ADB, UNDP,	Capacity	2010 – 2014	Coastal zone	Coastal areas

³¹² UNDP, <http://www.undp.org.vn/detail/what-we-do/project-details/?contentId=3798&languageId=1&categoryName=All&CategoryConditionUse=all>

³¹³ <http://www.ambhanoi.um.dk/en/menu/Developmentpolicy/ClimateandEnergy/ClimateChangeInitiatives/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Infrastructure Planning and Coastal Zone Development ³¹⁴	1). Integrate climate change adaptation into coastal zone management policies, plans and regulations. 2). Enhance capacity to understand emerging climate hazards and address them through strategic risk reduction measures at the sectoral and local planning levels. 3). Demonstrate and develop lessons learned from climate proofing of selected coastal area infrastructure.	UNDP <i>Budget:</i> US\$180.36 million	Ministry of Agriculture and Rural Development, Provincial People's Committees, Ministry of Construction	building; Policy formation and integration; Field implementation		management; Disaster risk management	
14. Development of a Prototype System for Dam and Disaster Management in Viet Nam ³¹⁵	To help prevent the loss of life and economic damage resulting from dam discharge or failure due to extreme weather events.	New Zealand <i>Budget:</i> NZD 2.5 million		Research	[2011 – ?]	Disaster risk management	
15. Nordic Development Fund Support for National Target Program on Climate Change ³¹⁶	To help Viet Nam implement its National Target Program by helping Ho Chi Minh and Da Nang cities, the Ministry of Transport, the Ministry of Industry and Trade, and Thanh Hoa province plan and implement effective climate change response measures. ³¹⁷	Nordic Development Fund, Government of Viet Nam <i>Budget:</i> EUR 2.21 million	ADB, Ministry of Industry and Trade	Assessments; Policy formation and integration; Capacity building	2011 – 2013	Urban areas; Transportation; Government	Ho Chi Minh and Da Nang cities, Thanh Hoa province
16. Climate Change and Coastal Ecosystems Program ³¹⁸	Support Viet Nam to manage and protect its coastal ecosystems, which includes responding to the impacts of climate change. It will also include a national level component to support central policy development and resourcing decisions based	Germany and Australia <i>Budget:</i> US\$63.9 million	GIZ	Capacity building; Policy formation and integration	2011 – 2016	Coastal zone management	Provinces of An Giang, Bac Lieu, Ca Mau, Kien Giang and Soc Trang

³¹⁴ ALM, <http://www.adaptationlearning.net/project/climate-resilient-infrastructure-planning-and-coastal-zone-development>

³¹⁵ New Zealand, http://unfccc.int/files/adaptation/application/pdf/nz_fsf_progress_report_2011_formatted.pdf

³¹⁶ NDF, <http://www.ndf.fi/index.php?id=52>

³¹⁷ Climate-L.org, <http://climate-liisd.org/news/adb-nordic-development-fund-support-climate-change-action-in-viet-nam/>

³¹⁸ Australian Embassy in Vietnam, <http://www.vietnam.embassy.gov.au/hnoi/MR110603AusGerMekongProject.html>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	on experiences in the target provinces.						
17. Mekong Delta Water Management for Rural Development ³¹⁹	The development objective of the project is to protect and enhance the utilization of water resources in the project provinces of the Mekong Delta Region in order to sustain gains in agricultural productivity, provide access to water supply for rural households, and contribute to climate change adaptation. It also aims to protect and enhance utilization of water resources through capacity building at the sub-regional and provincial level, on-farm pilot projects, infrastructure improvements, and extension of sanitation services.	World Bank <i>Budget:</i> US\$206.6 million	Ministry of Agriculture and Rural Development	Capacity building; Field implementation	2011 – 2017	Watershed management	Mekong River Delta
18. Supporting Program to Respond to Climate Change ³²⁰	Support climate change-related actions and policies in accordance with the National Target Program to respond to climate change.	Japan, France <i>Budget:</i> US\$134.0 million	Ministry of Natural Resources and Environment	Policy formation and integration	2012 – ?	Government	
Participation in Regional and Global Actions							
19. Mangroves for the Future (MFF) ³²¹	The project has two main objectives: to strengthen the environmental sustainability of coastal development; and to promote the investment of funds and efforts in coastal ecosystem management. MFF re-orientes the current focus of coastal investment by moving from a reactive response to disasters, to progressive activities that address long-term sustainable management	2007 – 2009: Australia, Germany, Norway, Sweden, UNDP, UNEP 2010 to now: Norway and	National governments with CARE International, FAO, IUCN, UNDP, UNEP and Wetlands International with NGOs and	Research; Knowledge communication; Policy formation and implementation	2006 – present	Coastal zone management	<i>Global:</i> India, Indonesia, Maldives, Pakistan, Seychelles, Sri Lanka, Thailand, Viet Nam

³¹⁹ World Bank, <http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P113949>

³²⁰ <http://www.newsvietnam.com.vn/Vietnam-News/Japan-France-Help-Vietnam-Respond-To-Climate-Change/31-785/cbo.vn>

³²¹ MFF, <http://www.mangrovesforthefuture.org/> and <http://www.mangrovesforthefuture.org/Assets/documents/IUCN-MFF-Brochure-Web.pdf>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	needs. These include building awareness and capacity for improved food and livelihood security, disaster preparedness, and climate change adaptation. Initially focused on countries that were highly affected by the 2004 tsunami—India, Indonesia, Maldives, Seychelles, Sri Lanka and Thailand—the project has expanded to include Pakistan and Viet Nam.	Sweden	CBOs				
<i>In Viet Nam: to be determined</i>							
20.	Connecting Environmental Changes, Impacts and Responses in the Mekong Delta to Human Wellbeing and Ecosystem Integrity ³²²	UNU	UNU	Research	2007 – 2010	Human health; Ecosystem conservation	<i>Regional:</i> Cambodia, Viet Nam
<i>In Viet Nam: to be determined</i>							
21.	Cities and Climate Change Initiative ³²³	Government of Norway	UNEP, UN-HABITAT	Knowledge communication; Capacity building; Assessment	2008 – ?	Urban areas	<i>Global:</i> China, Ecuador, Fiji, Indonesia, Mongolia, Mozambique, Nepal, Papua New Guinea, Philippines, Samoa, Sri Lanka,

³²² UNU, <http://www.inweh.unu.edu/River/MekongDelta.htm>

³²³ UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/index_en.html

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
	initiative with UN-HABITAT partners in China, Fiji, Indonesia, Mongolia, Nepal, Papua New Guinea, Samoa, Sri Lanka, Vanuatu and Viet Nam. Through this initiative, 10 new cities carried out participatory assessments of their vulnerabilities to climate change.						Uganda Vanuatu and Viet Nam	
		<i>In Viet Nam:</i> National Study on Cities and Climate Change is underway, supported by a comparative analysis of city-level vulnerability assessments to strengthen a tool developed for use in Sorsogon, the Philippines. ³²⁴						
22.	Economics of Adaptation to Climate Change Study ³²⁵	The two specific objectives of the study were: (1) to develop a global estimate of adaptation costs to inform the international community's efforts to tailor support and provide new and additional resources to help vulnerable developing countries meet adaptation costs; and (2) to support decision makers in developing countries to better evaluate and assess the risks posed by climate change and to better design strategies to adapt to climate change.	Governments of the Netherlands, the UK, and Switzerland	World Bank	Research; Policy formation and integration	2008 – 2010	Multi-sectoral	<i>Global and in the following countries:</i> Bangladesh, Bolivia, Ethiopia, Ghana, Mozambique, Samoa and Viet Nam
		<i>In Viet Nam:</i> Results of the Economics of Adaptation Study's country case study in Viet Nam are accessible here: http://climatechange.worldbank.org/sites/default/files/documents/EACC_Vietnam.pdf						
23.	Asian Cities Climate Change Resilience Network ³²⁶	The project seeks to establish a network of cities in Asia that will have developed robust plans to prepare for, withstand and recover from the predicted impacts of climate change by 2012. The network will catalyze attention, funding and action on building climate change resilience for poor and vulnerable people by creating robust models and methodologies for assessing and addressing risk through active engagement	Rockefeller Foundation, USAID <i>Budget:</i> US\$40-million	ISET, Arup International Development, ProVention, ICLEI, APCO Worldwide	Capacity building; Knowledge communication; Policy formation and integration	2008 – 2012	Urban areas	<i>Asia Region:</i> India, Indonesia, Thailand, Viet Nam
		<i>In Viet Nam:</i> <ul style="list-style-type: none"> • <i>Implementing agencies:</i> Challenge to Change and National Institute for Science and Technology Policy and Strategy Studies 						

³²⁴ UN-HABITAT, http://www.fukuoka.unhabitat.org/programmes/ccci/pdf/CCCI_Asia-Pacific_Flyer.pdf

³²⁵ World Bank, <http://climatechange.worldbank.org/content/economics-adaptation-climate-change-study-homepage>

³²⁶ ACCCRN, <http://www.rockefellerfoundation.org/what-we-do/current-work/developing-climate-change-resilience/asian-cities-climate-change-resilience/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	and analysis of various cities.	<ul style="list-style-type: none"> Participating cities: Da Nang, Quy Nhon and Can Tho 					
24. Community-based Adaptation Programme ³²⁷	<p>The objective of the program is to enhance the capacity of communities in the pilot countries to adapt to climate change, including variability. Planned outcomes are:</p> <ul style="list-style-type: none"> Enhanced adaptive capacity allows communities to reduce their vulnerability to adverse impacts of future climate hazards; National policies and programs include community-based adaptation priorities to promote replication, up-scaling and integration of best practices derived from community-based adaptation projects; and Cooperation among member countries promotes global innovation in adaptation to climate change including variability. 	GEF (Strategic Priority on Adaptation), co-financing Budget: US\$6.7 million	UNDP	Knowledge communication; Capacity Building; Community-based adaptation	2009 – 2011	Multi-sectoral	Global: Bangladesh, Bolivia, Guatemala, Jamaica, Kazakhstan, Morocco, Namibia, Niger, Samoa, and Viet Nam
		<p><i>In Viet Nam:</i> Activities in Viet Nam will focus on adaptation through natural resource management among resource-dependent communities, and will be guided by the Viet Nam Country Programme Strategy. Supported initiatives are:</p> <ul style="list-style-type: none"> Community participation in minimizing negative impact of climate change for sustainable aquaculture in Con Truong, Hoang Chau Commune (with Fisheries Associations of Thanh Hoa Province) Reducing vulnerabilities and increasing adaptive capacity in addressing drought and saltwater intrusion issues in agro development in the Ky Nam Community (with Ha Tinh Union of Science and Technology Associations) Adapting to climate change and contributing to sustainable agricultural production and food security at Phuoc Hoa Commune (with Union of Science and Technology Associations of Binh Dinh Province) Adapting to climate change through conservation and sustainable use of natural resources in Thua Thien Hue province (with Consultative and Research Center on Natural Resource Management) Adapting to climate change impact through conservation and sustainable use of drought and salinity tolerant rice varieties in the Phuoc Long community (with Bac Lieu Farmers' Associations)³²⁸ 					

³²⁷ GEF, <http://www.gefonline.org/projectDetailsSQL.cfm?projID=2774> and UNDP, http://www.undp-adaptation.org/projects/websites/index.php?option=com_content&task=view&id=203

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
25. Strengthening Adaptive Capacities to the Impacts of Climate Change in Small-scale Aquaculture ³²⁹	The project (also known as "Aqua Climate") aims to strengthen the adaptive capacities of rural farming communities to the impacts of climate change. It is strengthening adaptive capacities to the impacts of climate change in resource-poor small-scale aquaculture and aquatic resources-dependent sectors in the south and south east Asian region. The project will: (1) map farmers' perceptions and attitudes towards prospective climate change impacts and their adaptive capacities to address these impacts; (2) develop future scenarios based on the current trends; (3) assess the potential adaptive measures for different aquatic farming systems and prioritise better management practices; and (4) suggest Codes of Practices and improved methodologies for such systems.	NORAD	NACA	Capacity building; Assessment	2009 – 2011	Freshwater fisheries	Asia Region: India, Philippines, Sri Lanka, Viet Nam
		<i>In Viet Nam:</i> Case study being implemented called "Vulnerability and Adaptation to Climate Change Impacts on Catfish Farming." The case study is being implemented in Can Tho. ³³⁰					
26. Adaptation Knowledge Platform ³³¹	The goal of the Adaptation Knowledge Platform is to strengthen adaptive capacity and facilitate climate change adaptation in Asia at local, national and regional levels. Its specific purpose is to establish a regionally and nationally owned mechanism that facilitates the integration of climate change adaptation into national and regional economic and development policies, processes and plans, strengthen linkages between adaptation and the sustainable	SIDA	SEI, SENA, UNEP, AIT and UNEP Regional Resource Centre for Asia and the Pacific	Capacity building; Policy formation and integration	2009 – 2012	Government	Asia: Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, the Philippines,

³²⁸ UNDP, http://www.undp-adaptation.org/projects/websites/index.php?option=com_content&task=view&id=254&sub=1

³²⁹ NACA, http://www.enaca.org/modules/inlandprojects/index.php?content_id=10

³³⁰ NACA, <http://www.enaca.org/modules/wfdownloads/singlefile.php?cid=210&lid=986>

³³¹ AKP, <http://www.climateadapt.asia/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	development agenda in the region and enhance institutional and research capacity, in collaboration with a wide range of national and regional partners.						Sri Lanka, Thailand, Viet Nam
<i>In Viet Nam: to be determined</i>							
27.	Strengthening Capacity for Policy Research on Mainstreaming Adaptation to Climate Change in Agriculture and Water Sectors ³³²	APN	IGES, IMHEM, Universiti Kebangsaan Malaysia, M.S. Swaminathan Research Foundation	Capacity building; Research; Policy formation and integration	2009 – 2012	Agriculture; Freshwater supply	Asia Region: India, Malaysia, Viet Nam
<i>In Viet Nam: to be determined</i>							
28.	The MRC Climate Change and Adaptation Initiative ³³³	AusAID, DANIDA <i>Budget: Approximately US\$15-million for first two phases³³⁴</i>	Mekong River Commission with ADPC, ACIAR, CARE International, CSIRO, GIZ, FAO, GMSARN, ICM, IUCN, IWMI, JIID, Lux-Development, Southeast Asia START Regional Center, SEI,	Research; Capacity building; Assessment; Knowledge communication	2009 – 2025 In three five-year phases Phase 1: 2011 – 2015	Watershed management	Regional: Cambodia, Lao PDR, Thailand, Viet Nam

³³² APN, <http://www.ukm.my/apn/> and Earth System Governance, <http://www.earthsystemgovernance.org/affiliated-projects/strengthening-capacity-policy-research-mainstreaming-adaptation-climate-change-a>

³³³ MRC, <http://www.mrcmekong.org/ccai/Climate-change-n-adaptation-initiative.htm>

³³⁴ MRC, <http://www.mrcmekong.org/ccai/ccai-framework-document-extraction09.pdf>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	change and adaptation.		SIDA, UNDP, UNEP, WWF, Wetlands Alliance				
<i>In Viet Nam: to be determined</i>							
29.	Climate Adaptation through Sustainable Urban Development ³³⁵	AusAID, CSIRO		Research; Policy formation and integration	2010 - ?	Urban areas	<i>Regional:</i> Indonesia, Viet Nam
<i>In Viet Nam: to be determined</i>							
30.	Coastal Marine Biodiversity of Viet Nam: Regional and local challenges and coastal zone management for sustainable development ³³⁶	APN	APN, Vietnam Academy of Science and Technology, A.V. Zhirmunsky Institute of Marine Biology	Research	2010 - ?	Coastal zone management	<i>Asia-Pacific:</i> Korea, Russia and Viet Nam
<i>In Viet Nam: to be determined</i>							
31.	Lower Mekong Initiative ³³⁷	United States	Various	Assessment; Capacity building; Knowledge communicatio	2010 - ?	Climate information services; Watershed management;	<i>Regional:</i> Cambodia, Lao PDR, Thailand, Viet Nam

³³⁵ RDF Alliance, http://www.rfdalliance.com.au/site/current_projects.php

³³⁶ APN, http://www.apn.gr.jp/newAPN/links/supportedProjectSites_ARCP.htm

³³⁷ USDS, <http://www.state.gov/p/eap/mekong/>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	further understanding of shared concerns, including vulnerability to climate change, transboundary water management and infectious diseases. Ongoing activities include: Forecast Mekong, which is a “data integration, modeling and scientific visualization tool” that will be used to show the projected impacts of climate change; and the “sister-rivers partnership” that allows for sharing of best practices in areas such as climate change adaptation between the Mississippi River Commission and the MRC. ³³⁸			n		Human health	Plus: United States
		In Viet Nam: to be determined					
32.	Climate Risk Management Assessment for Agriculture in Thailand and Viet Nam ³³⁹	ADB Budget: US\$200,000	ICRISAT	Research; Policy formation and integration	Ongoing	Agriculture; Gender	Regional: Thailand, Viet Nam
	The outcome of this study will be better adaptation to climate change in the semi-arid tropics of Southeast Asia. As a result of this study and policy dialogues, the governments of Thailand and Viet Nam will be able to identify and prioritize areas most at risk and implement appropriate strategies to reduce risk and help farmers adapt. It also will develop gender-equitable agricultural adaptation strategies.	In Viet Nam: to be determined					
33.	Climate Sensitive Flood Water Management in the Lower Mekong Basin ³⁴⁰	Germany	Mekong River Commission, GIZ	Capacity building; Assessment; Policy formation and	2010 – 2012	Disaster risk management; Climate information services	Regional: Cambodia, Lao PDR, Thailand, and Viet Nam
	The project is strengthening the capacities of relevant professional bodies in the four riparian states of Cambodia, Lao PDR, Thailand and Viet Nam, as well as the Secretariat of the Mekong River Commission						

³³⁸ USDS, <http://www.state.gov/p/cap/mekong/faq/index.htm>

³³⁹ ADB, <http://www.adb.org/Climate-Change/agriculture-tha-vie.asp> and <http://www.adb.org/Documents/Books/Under-Weather-Rising-Tide/Under-Weather-Rising-Tide.pdf>

³⁴⁰ BMU, <http://www.bmu-klimaschutzinitiative.de/en/projects?p=1&d=693> and MRC, http://www.mrcmekong.org/MRC_news/press11/Germany-renews-its-support-to-Mekong-Cooperation23Feb11.html

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	to project the impacts of climate change. The aim is for the countries to be better equipped to prevent or mitigate the growing risk of flooding and the damage arising from it.			integration			
		<i>In Viet Nam: to be determined</i>					
34.	Building Climate Resilience of Mekong Hydropower Dams ³⁴¹	USAID Budget: US\$1.9 million	National Heritage Institute	Capacity building	2010 – 2013	Energy	<i>Regional:</i> Cambodia, Lao PDR, Thailand, Viet Nam
		<i>In Viet Nam: to be determined</i>					
35.	Knowledge Center on Climate Change: Adaptation and Best Practices in Agriculture and Natural Resources Sectors ³⁴²	The objectives of this project are: <ul style="list-style-type: none"> Increasing understanding, knowledge and skills of those in the agriculture and natural resources sectors; Making clients quickly access and learn about what is going on about climate change; Responding to every client with quickness, courtesy, competency and accuracy; Providing products that give clients easy access to cutting-edge research and development results, learning events and policy advocacy. 	Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) Budget: US\$1.0 million for 5 years	SEARCA's University Consortium in Southeast Asia, University of the Philippine Los Banos, World Fish Centre and the Adaptation Learning Mechanism	Capacity building; Knowledge communication	[2010 – 2014]	Agriculture; Climate information services <i>Regional:</i> Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Timor-Leste, Viet Nam
		<i>In Viet Nam: to be determined</i>					
36.	Water and Sanitation Sector Responses to Climate Change Impact in Yunnan	Carried out by the Water and Sanitation Program, a multi-donor funded partnership, the objective of this project is to help	Multi-donor	World Bank	Policy formation and integration	2010 – 2015	Freshwater supply; Waste management <i>Regional:</i> China, Viet Nam

³⁴¹ USDS, <http://www.state.gov/documents/organization/151686.pdf>

³⁴² KC3, <http://beta.searca.org/kc3/> and ALM, <http://www.adaptationlearning.net/project/knowledge-center-climate-change-kc3-adaptation-and-best-practices-agriculture-and-natural-re>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Province of China and Viet Nam ³⁴³	government agencies and service providers better respond to risks posed by climate change in water supply and sanitation services. These will be initiated and tested by developing adaptation plans for the water and sanitation sector at the study sites of Ben Tre, Viet Nam, and Lijiang, Yunnan, China, where poor communities are a significant proportion of the population.	<i>In Viet Nam: to be determined</i>					
37. Building Capacity to Adapt to Climate Change for Selected Southeast Asian Countries: Vulnerability assessment and economic analysis of adaptation ³⁴⁴	The overall objective of the project is to build capacities for research, planning and action with respect to climate change and the economics of adaptation. The specific objectives are: a) to measure communities' vulnerability to climate change through research in selected communities; b) to produce maps of each community's relative vulnerability to climate change; c) to analyze social vulnerability of local communities in terms of gender, geographic location, ethnicity, and socio-cultural, demographic and political-economic variables; d) to identify locally appropriate adaptation options; e) to conduct an economic analysis of adaptation options; and, f) to formulate policy recommendations to enhance local capacity to adapt to climate change.	IDRC <i>Budget: CND 228,700</i>	SEARCA, IDRC, College of Economics - Hue University of Vietnam, and the Royal University of Phnom Penh of Cambodia	Assessment; Capacity building; Policy formation and integration	2011 – 2014	Government	<i>Regional: Cambodia, Philippines, Viet Nam</i>
		<i>In Viet Nam: to be determined</i>					
38. Mekong River Basin Project on Addressing Climate Change Impacts on	Helps communities assess climate change impacts on agriculture and ecosystems and strengthen adaptation capacity with respect	USAID <i>Budget:</i>		Assessment; Capacity building	2011 – 2016	Agriculture; Ecosystem conservation	<i>Regional: Cambodia, Lao PDR,</i>

³⁴³ World Bank, <http://www.devex.com/en/projects/climate-change-adaptation-for-the-water-sanitation-sector-in-vietnam-and-yunnan-province-of-china>

³⁴⁴ IDRC, http://www.idrc.ca/EN/Regions/South_East_Asia/Pages/ProjectDetails.aspx?ProjectNumber=106326 and SEARCA, <http://sis.searca.org/index.php/component/sobi2/?sobi2Task=sobi2Details&catid=28&sobi2Id=99>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Agriculture and Natural Resources ³⁴⁵	to water resources, food security, livelihoods, and the needs of vulnerable groups. The project supports the Lower Mekong Initiative.	US\$9.0 million					Thailand, Viet Nam
<i>In Viet Nam: to be determined</i>							
39. Asia Pacific Climate Change Adaptation Project Preparation Facility (ADAPT) ³⁴⁶	Increase access to financial resources for climate change adaptation investment projects; strengthen national human and institutional capacity in preparation of financing proposals; and strengthen regional knowledge platform to share information and processes on climate change projects, funds and best practices to promote replication and scaling up.	USAID Budget: US\$18.0 million	WWF, Conservation International, the Nature Conservancy, ARD Inc., NOAA	Capacity building; Knowledge communication	2011 – 2016	Government	<i>Asia Region:</i> Bangladesh Cambodia Federated States of Micronesia, Fiji, Indonesia, Lao PDR, Malaysia, Nepal, Palau, Philippines, Solomon Islands, Sri Lanka, Thailand, Viet Nam
<i>In Viet Nam: to be determined</i>							

D. Proposed Adaptation Action

Viet Nam’s Second National Communications contains a list of 54 proposed adaptation measures over the short- and long-term covering the priority areas of water resources, coastal zones, agriculture, forestry, aquaculture, energy, transportation and health (MONRE, 2010). While details are not given, this list does provide insight to the types of projects that the government is looking to undertake. In addition, Viet Nam has been identified as a potential partner in a project submitted to the Special Climate Change Fund (SCCF) and one being developed by the ADB, as presented in Table 4.

³⁴⁵ USDS, <http://www.state.gov/documents/organization/151686.pdf>

³⁴⁶ USDS, <http://www.state.gov/documents/organization/151686.pdf>

Table 4: Proposed Adaptation Projects and Programs in Viet Nam

Name		Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1.	Increasing Climate Resiliency of the Transport Sector in the Asia Pacific ³⁴⁷			Transportation	Asia region: China, Solomon Islands, Timor-Leste, Viet Nam
			Notes: SCCF Proposal. Proposed funding from SCCF: \$30-million. Proposed co-financing: 1,089.5-million.		
2.	Promoting Climate Resilient Rural Infrastructure in Northern Viet Nam ³⁴⁸	The proposed project will demonstrate appropriate and effective methods to reduce the possible damage due to climate change and other weather factors. The technical assistance will be implemented within the proposed “Sustainable Rural Infrastructure Development Project in the Northern Mountains” (SRIDP) and subprojects under the SRIDP will be used as demonstration sites. The outcomes of the demonstrations will be used for setting out appropriate rural infrastructure design and construction standards, building implementation capacity, and taken into the design of future rural infrastructure investments.	Capacity building; Field implementation	Rural areas	Northern Viet Nam
			Notes: Being developed by the ADB, with a target date for concept approval set as March 2012. <i>Proposed budget:</i> US\$2.00 million <i>Proposed implementing agency:</i> MARD		

E. Assessment

Viet Nam has done a good job of both developing a sound vision for its adaptation priorities, and translating these priorities into action. In its latest National Communication, the government is very specific about its limitations, constraints and capacity building needs with respect to impacts and responses. These limitations include development of more detailed climate scenarios, impact assessments, and a shortage of technical experts in the field who have adaptation knowledge. As with most other countries, a shortage of up-to-date technology and capacity building needs are also cited as problems that have to be addressed.

³⁴⁷ GEF, http://www.thegef.org/gef/sites/thegef.org/files/publication/adaptation-actions_0.pdf

³⁴⁸ ADB, <http://pid.adb.org/pid/TaView.htm?projNo=41461&seqNo=04&typeCd=2> and NDF, <http://www.ndf.fi/index.php?id=115>



Current policy approaches to adaptation are limited primarily to the National Target Program, which faces serious challenges. These include: a lack of local research on vulnerabilities; lack of direction for prioritization of efforts or specific actions; a focus only on government actions, not local ones; and often a limited horizontal integration with other sectorial planning initiatives (McElwee, 2010).

For future action, key areas of focus could be identified as follows:

- Specific focus on adaptation options relevant for populations vulnerable to climate change due to their livelihoods; these include those reliant on forest-based livelihoods in the Mekong, Central Highlands and Northern Mountain regions; minorities with livelihoods based on agriculture in the Central Highlands and Northern Mountain regions; fishermen in the Central Coast; and migrants from rural areas and poor people in urban areas in the Mekong region.³⁴⁹
- Greater emphasis on agricultural production through implementation of actions such as adjustments in cropping systems, biotechnology application and marketing development; these actions could be undertaken in the context of indigenous knowledge focused on infrastructure, tourism and fisheries.
- Capacity building to enable policy formulation activities to take the next step towards on-the-ground implementation, which is lagging because of a lack of partners with the capacity to implement/manage programs.
- As Viet Nam's economy becomes increasingly dependent on industry, and less reliant on agriculture, ensuring that the implications of this transition are accounted for in adaptation planning—such as with respect to changes on land use, exploitation of natural resources, and agricultural and forest-based livelihoods.
- Greater attention to gender concerns in adaptation policies, planning and projects, as this issue is not clearly addressed in current actions.
- More focused adaptation interventions on early warning systems, especially for extreme weather events and flash-floods; involving communities in the systems' development; capacity building for local communities to use these systems; and overall education about climate change and disaster risk management.
- Combinations of adaptation options to address challenges of extreme weather events and sea-level rise should include: using ecosystem-based measures to reduce impacts, such as supporting forest and mangrove plantations; improving infrastructure, such as sea dykes and roads; and improving payments for ecosystems services to encourage community-based forest management.

³⁴⁹ Derived from McElwee (2010).



- Identify areas in the country that have not yet been effectively included in adaptation planning and prioritize these for future adaptation efforts.
- Delineate adaptation efforts both horizontally and vertically to better include different sectoral efforts and livelihood groups in the development of adaptation projects.
- Finally, often the major vulnerability of the population is related to weakened social safety nets and degrading common pool resources; therefore, when developing adaptation options, their social implications for different population and livelihood groups need be addressed.

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