

Adaptation Strategies for Water and Agricultural Sectors in SouthEast Asia

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ADAPTATION
KNOWLEDGE
PLATFORM



REGIONAL CLIMATE CHANGE
ADAPTATIONKNOWLEDGEPLATFORM for Asia

Acknowledgements

Regional Climate Change Adaptation Knowledge Platform for Asia
(Adaptation Knowledge Platform)

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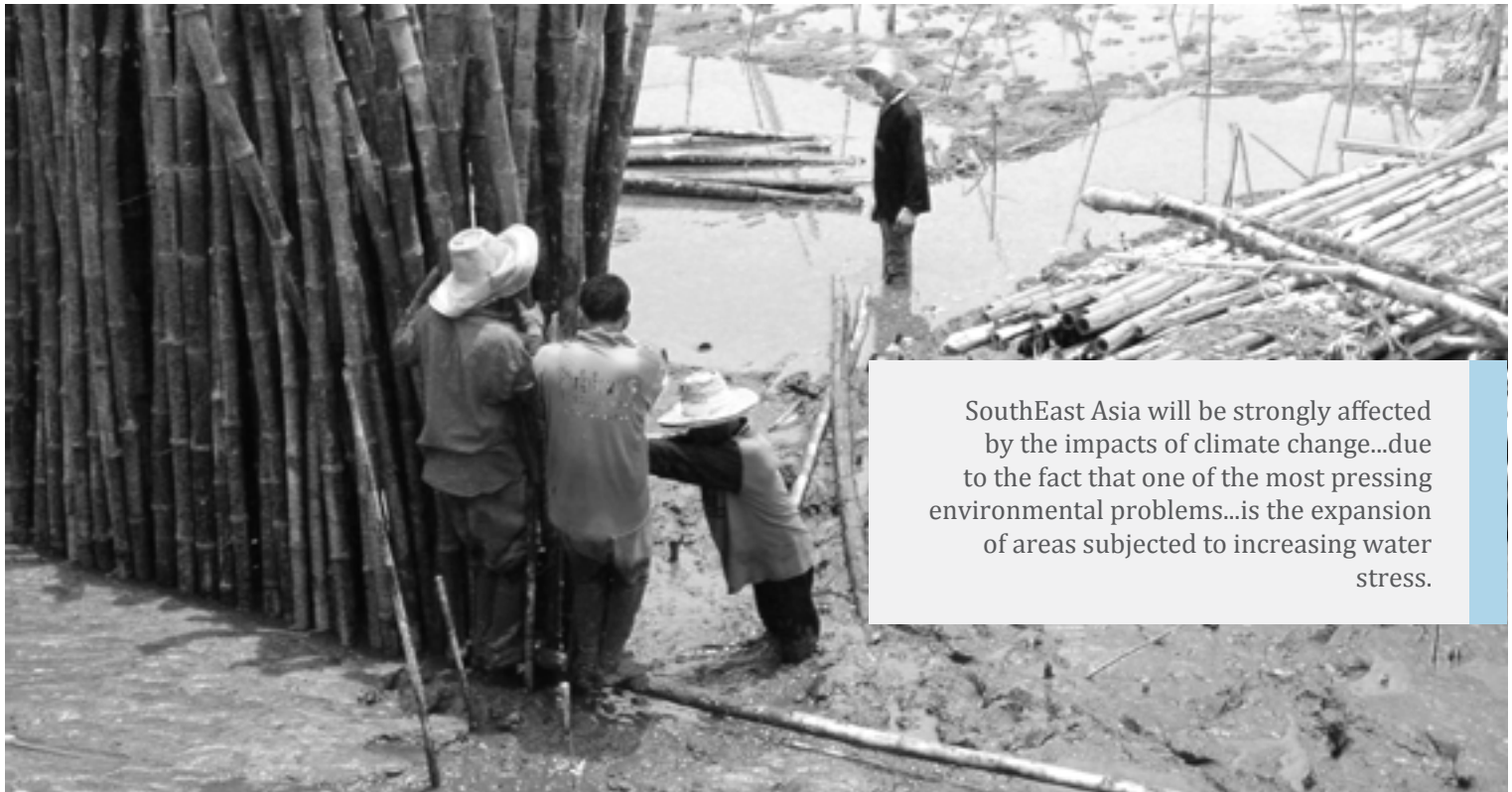
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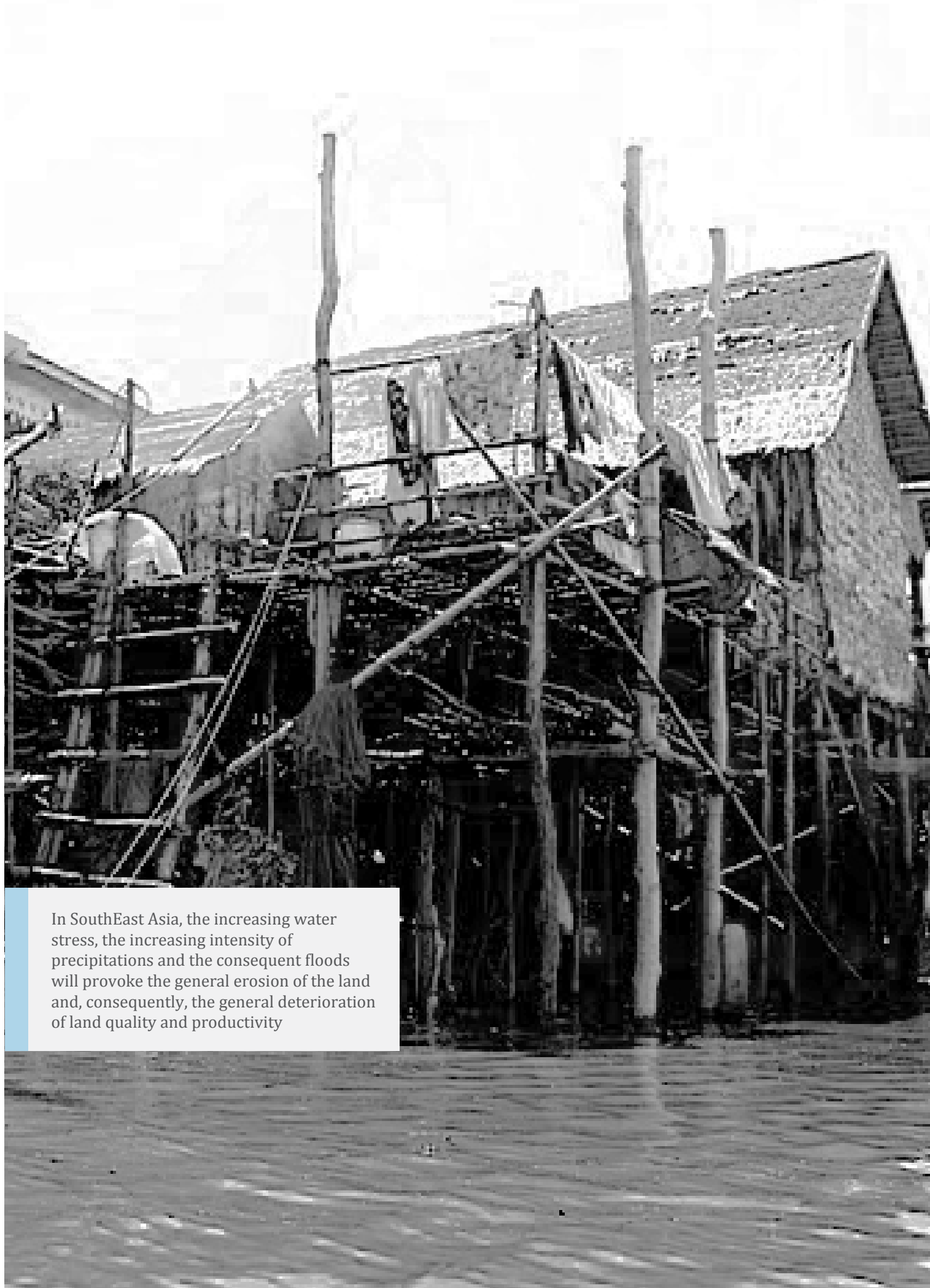
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BACKGROUND

SouthEast Asia will be strongly affected by the impacts of climate change according to the Intergovernmental Panel on Climate Change (IPCC) Technical Paper VI entitled "Climate Change and Water" (IPCC, 2008). This is due to the fact that one of the most pressing environmental problems in this part of the world is the expansion of areas subjected to increasing water stress. In reference to the Special Report on Emissions Scenarios (SRES), it is estimated that in the next forty years, the number of people that will experience severe water stress will increase between 4 and 5 times (Arnell, 2004). Monthly precipitations are expected to decrease in number but increase in intensity. Dry seasons are expected to be more in number and longer in duration. Thus, the risks of flooding in the wet season and water shortage in the dry season are also highly increasing. The general reduction of the rivers' flow and the rise in sea level will provoke the intrusion of saltwater in estuaries and eventually cause a general deterioration of surface and ground water stocks.

These phenomena will impact strongly in the SouthEast Asian region, where 8 members of the Association of SouthEast Asian Nations (ASEAN), namely, Vietnam, Thailand, Malaysia, Philippines, Indonesia, Lao PDR, Myanmar and Cambodia are given focus in this report. In these countries, the increasing water stress, the increasing intensity of precipitations and the consequent floods will provoke the general erosion of the land and, consequently, the general deterioration of land quality and productivity. These conditions, coupled with temperature changes and low water quality and availability impacts negatively on agriculture, in general, and livestock production and the aquaculture industry, in particular. It means that the vulnerability of the population will increase because the risks on water and food security are also increasing. Strategies need to be put in place in order for the general population to adapt to the changing physical and climatic conditions. And to enhance the resilience of the socio-economic systems in these countries, cooperation between local governments and international organizations is essential.

This desktop study is conducted based on a stocktaking analysis provided by the Regional Climate Change Adaptation Knowledge Platform for Asia (Adaptation Knowledge Platform) in the ASEAN member countries indicated earlier. The purpose of this study is to illustrate the current state of adaptation, its status and possibilities, of the region. It also investigates how these ASEAN countries can learn from each other and from the scientific community, in order to define some adaptation strategies as possible next steps and priorities in the status of water and agriculture management from a socio-economic perspective. The aim of the Adaptation Knowledge Platform is to verify the state of knowledge in the different countries, identify the gaps and to try to fill them up.



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REGIONAL ANALYSIS OF ASEAN MEMBER COUNTRIES

GAPS IN ADAPTIVE CAPACITY FOR THE WATER SECTOR: IMPROVEMENT OF KNOWLEDGE

The analysis of existing studies on national and regional vulnerability and adaptive capacity led by the Adaptation Knowledge Platform underlines several problems from local and regional points of view (Adaptation Knowledge Platform, 2010). The research in the specific countries highlights:

- Lack of information and statistical analysis applied to climate and hydro-geologic changes
- Scarce connection between decision-makers and the scientific community
- Inadequate climate risk assessment methods
- Scarcity and inadequacy of technical instruments
- Scarcity of experience and financial capacity of governments in managing climate change studies, and
- Insufficient real-time information on rainfall and water level for operational schemes.

The analysis also identified principal gaps that the 8 ASEAN member countries have to address:

- No river basin system-based management
- Lack of a long run strategy in water management: different use of the water resource, such as hydropower, irrigation, fishing, are often conflicting with each others
- Insufficient coordination between agencies
- Low investments
- No clear regulation for rational use of land: deforestation and costal and river basin erosion
- Inefficient use of water, especially in agriculture, and
- Insufficient drought management.

This is exemplified by the scenario that even when river basins transcend the territorial jurisdictions of many countries, there is no strong coordination between national and international institutions among such countries. Intergovernmental cooperation in managing common resources such as river basins is insufficient. This has led to a very fragmented scientific research, consequently losing the opportunity of creating a common strategy to solve transboundary environmental issues. Until now, different countries act differently and independently in addressing problems, which could be efficiently solved or avoided by a shared action. The situation may be different among countries, however, the phenomenon of water stress caused by physical and climatic conditions encompass the region.

In coming up with adaptation strategies related to the water and agriculture sectors, the main problem that can be pointed out is the lack of basin system-based management, especially in the case of big river systems and wetlands like the Mekong that meander across different countries. The management of this resource should not be fragmented because mismanagement in one country could affect the others. In order to minimize problems related to this scenario, multilateral agreements have been signed by various countries that put in place management systems for transboundary river basins. In 1957, an international agreement created the Mekong Committee, which, in 1995 was renamed as the Mekong River Commission. However, this agreement was not signed by China, which is the source of the Mekong and Myanmar, another country strategically located upstream of the river basin. While the original rationale of the agreement was to create a joint management system for hydro-power/hydro-electric production, irrigation, navigation, fishing and flood control/relief, the Mekong River Commission has, hardly eminently, a political role as it is not directly involved in the practical management of the basin. It also bears no strong decision-making power.

Another international agreement, the ASEAN-Mekong Basin Development Cooperation, was signed in 1996. Nevertheless, such agreement was mostly created for the economic development of the Mekong basin. Aside from Commissions such as these, it is hoped that the constitution of intergovernmental authorities, which have autonomous decision-making power and economic independence in cooperation with local political and scientific institutions, could directly manage the scientific research and infrastructural interventions in the different basins. A combination of political pressure and economic incentives may be used to encourage countries to cooperate. Local governments and river basin management organizations have to cooperate to achieve important aims such as:

- Advanced monitoring and statistical analysis of the basin
- Constant diffusion of information and strong interaction with local institutions
- Floods and river overflows forecasting and alert system
- Rational regulation of the use of water
- Scientific study of the infrastructure that have to be realized to regulate the river's flow during wet and dry seasons
- Study and realization of security basins which provoke controlled floods
- Efficient natural resource system management
- Efficient use of water resource
- Land use planning
- Geographical relocation of population that live in places strongly exposed to a high degree of risk
- Financial assistance, and
- Transparency in information management.

The list of strategies may be long and comprehensive and it needs a long-term timetable for an overall river basin management policy to be effective. However, for the short-term, interventions have to be coordinated by local governments in cooperation with international organizations.

GAPS IN ADAPTIVE CAPACITY FOR AGRICULTURAL SECTOR AND FOOD SECURITY: IMPROVEMENT OF KNOWLEDGE.

Agriculture is the most important economic activity across the 8 ASEAN countries included in the study. Water resource dynamics, agriculture and food security are tightly linked. The analysis of the Adaptation Knowledge Platform on the state of the local scientific research underlines the following gaps and issues:

- General backward situation of the research's state
- Inadequate tools, knowledge and financial endowment
- Lack of infrastructure
- General difficulty in communicating knowledge to farmers, and
- Lack of a clear study on the long-term impact of climate change on food production.

It is possible to put forward as evidence some remarkable activities implemented by local institutions, however, they are often managed inefficiently. In Vietnam, for instance, the government is supporting research activities of agro-meteorology and rice seed development, but the lack of international networks to exchange research results hinders the effective application of significant findings and improvements throughout the region.

The situation is not better in terms of typology of the policies and strategies that local governments are trying to adopt in the region. Some of these countries are actively working to pursue poverty reduction goals, food security and irrigation development. Unfortunately, there are times when these adaptation practices are badly influenced by institutional and socio-economic environments, especially at the local level. The stocktaking analysis outlines the following gaps and issues that need to be overcome:

- Insufficient financial resources
- Insufficient long-term perspectives
- Lack of integration among adaptation strategies in food security and development strategies
- Insufficient integration between institutions
- Insufficient intergovernmental cooperation
- General difficulties for farmers to access credit
- Lack of cooperation between farmers
- Poor infrastructure in some countries
- Lack of in-depth study on small and poor farmers' socio-economic conditions, and
- Partial exclusion of farmers from the diffusion of information and decision processes.

Nevertheless, there are cases wherein governments and institutions show their inability to address such situations. As such, farmers, especially the most advanced and developed, have already started to devise some adaptation strategies after having experienced the changes in production conditions. This is especially identifiable in culture shifting: more resistant crops, short-cycle rice varieties. Unfortunately, the fragmentation of production, the difficulty in accessing credit, the slow mechanization of production, and the general lack of education of farmers, do not demonstrate a tendency towards a method of production adapted to the impacts of climate change. In this case, production becomes inefficient.

There are several good initiatives led by international organizations and NGOs in some ASEAN countries that need to be replicated in the others. These initiatives could be considered as an introduction of good measures to handle similar issues in other places with similar features. For instance, FAO in the Philippines succeeded in improving rice yield from 4.5 tons per hectare to 8 tons per hectare by enhancing the efficiency of the production process.

Analyzing some of the actions adopted by the governments could be useful in trying to delineate a series of actions to fill the gaps highlighted by the stocktaking analysis. For instance, the Ministry of Agriculture and Cooperatives of Thailand has carried out adaptation measures including community-level capacity building and research initiatives on drought-resistant plant and animal species. In recent years, the needed safeguards, especially during severe droughts and floods, have been developed under the concept of "sufficiency economy". Another good example is provided by the Cambodian government on the occasion of the UNFCCC (United Nations Framework Convention on Climate Change). Their efforts were oriented to the improvement of capacity building at all levels, especially local, with several objectives. Their strategies were developed taking into consideration the following:

- An improvement of information systems to increase awareness on adaptation
- An integration of adaptation strategies for the water and agricultural sectors for the country's sustainable development, with the realization of infrastructures and economic policies aimed at poverty reduction and food security
- A critical analysis of projects and policies in order to learn from good practices as well as mistakes and failures, and
- A wider scope of information dissemination to increase awareness on the realities and immediacy of climate-related issues.

These examples illustrate that there are some countries acting more efficiently than others – gaps clearly underlined by the stocktaking analysis on which this study is based. Learning from the gaps between countries as well as on international studies, it is imperative to outline a series of strategies and policies that could be proven to be effective and appropriate from a regional point of view. The application of such policies and strategies at the local level, though, has to take into consideration the different social, political and economic backgrounds and the uniqueness of each local setting. In order to enhance resilience and reduce vulnerability, coherent policies and coordinated strategies could be proficient on a medium-term basis. And in the long run, such actions would result in improved efficiency in the economic systems of the 8 ASEAN member countries, creating a virtuous circle that permits the internalization of adaptation costs.

COUNTRY ACTIONS, STRATEGIES AND PERSPECTIVES

In all cases, the application of regional guidelines is always suggested. This section outlines the different policies and strategies that may be followed by each country.

Lao PDR

- Scientific coordination between international agencies and the hypothesized “Authority” with the local Water Resources and Environment Administration for the water sector
- Integration of the Strategic Framework of the Northern Agriculture and Forestry Research Centre (NAFReC) with other regional and local research centres, as a way for the information acquired to be reproduced and replicated in other countries.
- Development of a better forecasting system, adding the consequences of climate change to the strategic framework.

Viet Nam

- Evaluation of the applicability of the policies adopted in disaster preparedness
- Diplomatic pressure on the political system to adopt socio-economic subsidies that reduce the impact of adaptation strategies on the population
- Application of projects for development and farmers’ assistance by micro-credit.

Philippines

- Study and implementation of the Water Balance model “WatBal”; reforestation
- Introduction of urban wastewater recycling systems
- Financial assistance to farmers; scientific assistance to research.

Indonesia

- Reforestation; introduction of urban wastewater recycling systems
- Radical analysis and reformation of agricultural production systems
- Improvement of communication systems.

Thailand

- Analysis and eventual implementation of measures adopted by the Bangkok Metropolitan Administration (BMA) as well as those recommended by the other studies
- Rationalization of water consumption; improvement of the net efficiency of irrigation
- Shifting cultivation; analysis of the studies of the Ministry of Agriculture and Cooperatives.

Cambodia

- Analysis, improvement and eventual adoption of the measures adopted for the water sector
- Serious analysis and coordination of initiatives adopted in agricultural management.

Myanmar

- Assistance to the local research institute and coordination of scientific studies on the Ayeyarwaddy River basin
- Shifting cultivation and the enhancement of efficiency in agriculture.

Malaysia

- Regulation on water and land use; regulation of river flows through Ecosystem-based and engineering solutions
- Improvement of research activities
- Analysis, improvement and eventual adoption of the Integrated Pest Management
- creation of long-term climate-conscious mindsets.

CONCLUSION

This study takes precedence from the research made by the Adaptation Knowledge Platform on the 8 ASEAN member countries and tries to provide some guidelines on the application of adaptation strategies. It also tries to specify country-specific strategies that could be adopted in order to enhance resilience through actions based on the combination of adaptation and development. The strategies and policies outlined above ensure that solutions to address the impacts of climate change are effectively managed, particularly those concerning the Water Sector, the Agricultural Sector and Food Security. Such strategies also overcome the gaps in coordination and communication at the regional and local levels and between national governments and international agencies. As the stocktaking analysis noted that governments act differently and independently, this study highlights the importance of creating unified policies and coherent strategies in order to enhance resilience and reduce vulnerability in the Water and Agriculture sectors in SouthEast Asia.



Photo credit: SEI/John Soussan

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ADAPTATION KNOWLEDGE PLATFORM

A number of initiatives have been launched to help countries build their capacity to respond to the changing climate, but many of these are undertaken independently of each other. The Adaptation Knowledge Platform addresses this challenge by building bridges between initiatives, researchers, policymakers, business leaders, and those working on climate change adaptation “on the ground”. **The overarching goal of the Adaptation Knowledge Platform is to strengthen adaptive capacity and facilitate climate change adaptation in Asia at local, national, and regional levels.** It focuses on three pillars:

- Establishing a regional system for sharing knowledge on climate change adaptation, making it easy to understand and available to those who need it;
- Generating new knowledge about adaptation that national and regional policymakers can use as they plan for climate change; and
- Promoting the application of new and existing knowledge about climate change in Asia.

Who and Where

In its first phase (2009-2011), the Adaptation Knowledge Platform will actively engage with

governmental and non-governmental practitioners, researchers, media and private sector who are interested in climate change adaptation issues in 13 countries: Bangladesh, Bhutan, Cambodia, China, Indonesia, Lao PDR, Malaysia, Myanmar, Nepal, the Philippines, Sri Lanka, Thailand and Viet Nam.

Initial Partners

The Adaptation Knowledge Platform is supported by the Swedish International Development Cooperation Agency (Sida). Initial partners are the Stockholm Environment Institute (SEI), the Swedish Environmental Secretariat for Asia (SENSA), the United Nations Environment Programme (UNEP) and the Asian Institute of Technology (AIT)-UNEP Regional Resource Centre for Asia and the Pacific (RRC.AP), which also hosts the Adaptation Knowledge Platform Secretariat.

Join us!

Join us in strengthening the adaptive capacity in Asia by sharing your projects and learning experiences through the Climate Change Adaptation in Asia and the Pacific web-portal (www.asiapacificadapt.net) or the Asia-Pacific Climate Change Adaptation Forum.

For more information on this and other ways of collaboration and mutual benefit, contact:

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