Chapter 6

Towards a Resilience Food System and Building Adaptation Roadmaps

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CHAPTER 6

Towards a Resilient Food System and Building Adaptation Roadmaps

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In terms of mainstreaming disaster risk reduction (DRR) and climate change adaptation (CCA) into developmental planning to ensure food security, the most vulnerable sectors and value chains include the agricultural and water sectors, and the food, fisheries, and livestock value chains. Several papers presented at a regional workshop on this topic applied an analytical framework involving a combination of sector-wide reviews (using secondary sources on impacts, policies, and institutions) and several case studies of implementation experiences. These case studies, which covered several countries in the Association of Southeast Asian Nations (ASEAN) region and abroad, helped workshop attendees and contributors gain a deeper understanding of the barriers to achieving better adaptive capacity. This chapter discusses the general conclusions drawn in that workshop.

6.1 Disaster and Climate Change Impacts on Food Security

Climate change and related natural disasters are a looming global reality. The ASEAN region, which is already home to 300 million people living on less than $1.25 a day, is projected to be the region most affected by the impacts of disasters and climate change. Given their substantial dependence on agriculture, heavy reliance on ecosystem services, dense population concentrations, high levels of economic activity in coastal areas, and relatively poor health services, the poor in these countries are at a significant risk of the impacts of future disasters and climate change. Thus, this region contains a vast latent need that will have to be met.

Multiple authors have found that people in the ASEAN region, especially the farmer community, are more vulnerable to disasters and climate change than originally thought. It is estimated that more than 50% of farmers and their dependents, which accounted for around 350 million of ASEAN population, have been affected by disasters and climate change. Research by the Economic Research Institute for ASEAN and East Asia and

other studies indicate that agriculture is the most vulnerable sector. In the ASEAN region alone, disaster risks and climate change combined are projected to drive up the price of rice by as much as 37%, as water scarcity, droughts, and floods reduce rice yields by 14%–20% over the next 30 years. The number of malnourished children in Southeast Asia is projected to increase by 16%, to 11 million. A warmer and drier climate and more frequent and intense extreme weather events are projected to reduce the gross domestic product of all ASEAN countries. In addition to this gloomy scenario, an insufficient capacity to adapt to disaster risks and climate change impacts, inadequate infrastructure, meager household incomes and savings, and limited support from public services is creating a veritable time bomb.

6.2 Adaptation and Resilience Strategies

Building resilient value chains and adapting to climate change is a challenging developmental problem. Efforts to adapt to disasters and the changing climate are connected to many aspects of development, and the implementation of adaptation activities is closely linked to a wide range of other activities, including natural resource management, agricultural technology, disaster preparedness, infrastructure improvement, health systems, and poverty alleviation, amongst others. Furthermore, the effects of disasters and climate change vary over time and places in the region, creating unique, dynamic adaptation needs in each country. When dealing with the physical impacts of climate change and natural disasters, each country's institutional and socioeconomic circumstances affect its capacity for resilience capacity and adaptation. In this tangled context, it becomes challenging to determine how adaptation measures should be designed, who should design them, and where investments should be prioritised.

Fortunately, many policies that are good for economic development in general also offer effective strategies for adapting to disasters and climate change. Such no-regret strategies include (i) investment in adaptive research on food security; (ii) improved water management to deal with extreme rainfall events; (iii) governance of common natural resources; (iv) transportation and communication infrastructure, as well as regional and international trade facilitation; (v) private-sector participation in insurance and credit markets; and (vi) the facilitation of migration to allow poor victims to take full advantage of changes in the climate and economic landscape, which are intertwined with an increase in the frequency and scale of disaster events.

There is an urgent need to integrate these resilience and CCA strategies into sectoral and regional development programmes. Adaptation policies, including long-term weather forecasting, dissemination of technology, and the creation of drought- and flood-resistant crop varieties, will require planning and investment at the national and international levels. Almost 70% of the water in ASEAN is used for irrigation, livestock rearing, and inland aquaculture activities. Therefore, improving water management by understanding water flow and water quality, improving rainwater harvesting, storing water, and diversifying irrigation techniques is critical. Other steps that can be initiated to blunt the impacts of climate change are greener practices, better erosion control and soil conservation measures, sustainable agro-forestry and forestry techniques, and better town planning. Since the affected communities are often constrained by access to credit, facilitating better access to credit is a related area that needs attention. In addition, catastrophe or weather-risk insurance and index insurance (i.e. insurance linked to a particular index, such as rainfall, humidity, or crop yields rather than actual loss) can be used as new climate risk-management tools. Making these improvements and building climate-resilient rural roads in the region will cost about $3.0 billion–$3.8 billion annually from 2010 to 2050 (ADB, 2009).

To date, several countries have piloted initiatives to promote mainstreaming, and several efforts are underway to build select national action programmes for adaptation through more comprehensive planning documents. There has also been speculation as to whether environmental impact assessment statements, Sustainable Development Goal targets, and/or the Sendai Framework for Disaster Risk Reduction could provide an effective vehicle for mainstreaming adaptation into sectoral planning and achieving food security. However, most of these efforts are still in the early stages. Likewise, the national climate change plans recently released by several countries under the Paris Climate Agreement have not yet been operationalised, and it is unclear how they will interact with other national planning efforts and the ASEAN Community Vision 2025. The multilateral funds pledged for CCA across developing countries currently amount to about $400 million—far below the $4 billion–$86 billion needed annually, as estimated by several experts and aid agencies. Thus, from a financing perspective there are potential benefits of enhancing coherence between DRR and CCA.

6.3 Opportunities to Enhance Adaptive Capacity

Policy-making bodies within ASEAN concerned with DRR, the impact of climate change, and food security cannot wait for the academic and international communities to resolve all existing uncertainties, as there is little to be gained by waiting another couple of years before taking concrete steps to deal with these issues. This is particularly true in Cambodia, the Lao People's Democratic Republic, Myanmar, and Viet Nam where extreme events are already imposing severe burdens on farming communities and economic growth, which very much depends on the performance of the agricultural sector. The crucial role of information and products in developing resilience and adaptation solutions must be emphasised. Available climate and disaster information must be examined to ascertain where the need for systematic observation is most pressing. Collaboration between national and international providers of climate information, the research community, users in all sectors, and decision makers is crucial, as is generating awareness amongst different user communities of the usefulness of such information. There is an urgent need for climate change assessment tools that are more geographically precise and useful for sectoral policymaking, and reviewing programme and scenario assessment. Economic diversification to reduce dependence on climate-sensitive resources could also be an important adaptation strategy. It is necessary to encourage improved food security through crop diversification, the development of local food banks for people and livestock, improved local disaster preparedness, and better food preservation capabilities. Further, since climate change and natural disasters have gender-differentiated impacts, gender diversification (an area that has been neglected thus far) can bring wider perspectives to decision making, and women can contribute significantly to this process.

Thematic and country papers discussed at the 2017 Kuala Lumpur conference introduced several methods for measuring the impacts of disasters and climate change, as well as adaptation concepts and cases of mainstreaming. These measures have been applied in many countries over several years. One lesson for policymakers is that resilience and adaptation policies for food security must be tailored to local business continuity plans, because the local impacts of disasters and climate change vary significantly from place to place. Policymakers must be careful when transferring interventions from one country to another to ensure that the interventions are appropriate to the new location. Technologies, management practices, crop varieties, and financing models that have proven successful in one country need to be evaluated carefully before being introduced in another country to ensure that they will remain successful as the climate changes.

The development of infrastructure and human capacity at the institutional level may support or prevent good practices from being extrapolated from one country to another.

In some circumstances, ASEAN may benefit from policies designed and implemented in developed countries, and certain best management practices and new technologies may be transferrable from developed to developing countries. For example, water-saving technologies, stress-resistant crop varieties, early warning systems, and innovative financing systems created in developing countries could be modified by international and regional research institutes to the conditions prevalent in developing countries. These could then be introduced carefully with full support systems, such as institutions and financing, in place.

In large countries such as Indonesia, Malaysia, Thailand, and Viet Nam, factors such as climate, landscape, institutions, and local capacities may vary a great deal across the country. Such countries need to be careful in designing different policies for different regions within the country. Even small countries must be careful not to adopt uniform policies from different regions. One way to address physical and structural differences in a country is to develop different policies depending on a set of climatic conditions, disaster risks, and existing infrastructure and institutions in the country's various regions. Further, countries' economic and institutional abilities to implement adaptation measures may also vary. It is possible that communities facing similar situations will be affected differently, depending on other physical and economic or institutional conditions that they may face. Both physical and economic conditions may affect the type of adaptation relevant to each location and the ability of the community residing in each location to adapt. Therefore, policymakers should tailor information, planning tools, and financial mechanisms to the assistance that each location will receive.

6.4 Building Adaptation Roadmaps

While the need to react to climate change and adapt to disaster risks is increasingly being recognised at all levels and by all players (albeit to varying degrees), there is a serious gap in public awareness with respect to constructive actions to address very complex adaptation issues. Increasing speculation is making it difficult to agree upon and implement the much-needed mainstreaming, further exacerbating climate risks. Thus, there is an urgent need to begin developing a common vision for a regional adaptation roadmap that involves all principal stakeholders and reconciles diverse perspectives.

Managing expectations from decision makers regarding the adaptation process is important. Successful adaptation does not just happen. A key recommendation is to plan and execute carefully a long-term national programme for supporting public participation in disaster risks and CCA aimed at educating and building the capacity of all stakeholders involved. The first step could be to develop detailed guidelines and provide training on public participation for both environmental authorities and sectoral agencies, adjusted for each sector. Significant attention should be given to building capacity at the local level to help communities understand the disaster and climate risks and linkages to sector activities, and thus garner participation in public forums. Overall, the programme should be designed and targeted in keeping with the diversity of the stakeholders.

Effective mainstreaming requires informed consensus on disaster and climate change risks, objectives, and policies based on a good understanding of the shared roles and responsibilities of all players, including sectoral agencies, ministries of the environment, ministries of planning, provincial authorities, and the affected community. This fundamental notion of shared responsibility is currently challenged in ASEAN countries by the general perceptions amongst the public, project proponents, and development authorities alike that climate change is the sole responsibility of environmental agencies, disaster response is a humanitarian assistance issue, and food security is better handled by the agriculture ministries, who are failing to implement necessary measures effectively. As the growth rates of ASEAN economies continue to accelerate, responses to disaster and climate change will come under increased scrutiny and pressure. The cases discussed in the Economic Research Institute for ASEAN and Southeast Asia papers demonstrate that, unless an increasing demand for mainstreaming is matched by adequate capacity building, it would be naive to expect substantial progress and unfair to place sole blame on the sectoral agencies.

Sectoral agencies face significant capacity constraints in meeting their existing mandates, introducing new adaption programmes and tools, and improving the effectiveness of existing ones. It is recommended that ministries of the environment and education, as well as sectoral agencies, use recent examples of several good practices to develop a medium-term capacity-strengthening action plan to meet current and projected needs, including financing requirements. Such a plan should first explore the possible capacity gains from (i) rationalising decision-making processes; (ii) upgrading climate and disaster information; (iii) decentralising responsibilities, staff, resources, and equipment to regional offices; (iv) outsourcing certain non-core functions; and (v) training to upgrade skills. It would conclude with a staffing plan, including the need for any additional positions

to meet core needs, after exhausting all options to improve processes and efficiency. The plan could then be used for negotiations with planning and financing agencies, subject to making a strong and verifiable case.

There is also a fundamental need for sectoral agencies to facilitate better climate-proofing of individual projects; build business continuity plans along value chains, boost the resilience of the sector as a whole; and improve cross-sectoral coordination, particularly at the planning stage. Case studies and sector reviews show that monitoring and enforcement of specific sources can do much to improve the situation on the ground. At present, disaster and climate factors are not considered at the time of local decisions, in spatial planning, in project design, and in technology and infrastructure selection.

All institutions can play a key role in strengthening the necessary knowledge base and technical capacity to adapt to climate change and build resilience plans. Unless steps are taken to initiate and strengthen cooperation amongst academic and research institutions, regional and international organisations, and nongovernmental organisations to provide opportunities for strengthening the knowledge base, dealing with climate change and disaster risks may be unmanageable. Although some relevant information is already available from various institutions, it is important to focus future efforts on (i) disseminating it more evenly across the country; (ii) providing high-quality and comparable sector-specific training across states and organisations; and (iii) developing targeted, well-designed, and well-delivered programmes for community learning.

The lack of effective mechanisms for inter-agency coordination is too often a barrier to mainstreaming and attaining food security. It is thus critical for sectoral, environmental, and financing authorities to evaluate, share, and promote national best practice examples of policies and institutional mechanisms, as well as relevant international experience that can enable early and meaningful participation of environmental agencies in the planning and design of infrastructure development projects. New priorities and programmes will require even greater cross-sectoral cooperation and integration within particular spatial zones. Local governments appear to be best positioned and to have the right incentives to ensure the coordination needed. Thus, it is important to provide them with sufficient authority and capacity to forge such coordination. Devolving more powers to and building the capacity of local governments is necessary to develop and implement CCA programmes aimed at measurably improving climate risk reduction in the areas within their jurisdiction, with the participation of all concerned sectors and affected communities.

The scale of the regional adaptation roadmap is immense. The institutional changes and large-scale improvements needed on the ground will require national commitments and consensus on a programme of actions spanning both the short and long term. Many of these measures will involve further examination and design, as well as consultations with the public, other government agencies, and the affected communities.

In the short to medium tem, irrespective of whether a programmatic approach is pursued in specific instances, a set of key policy choices are proposed that can build the adaptive capacity of the countries against disasters and climate change. These can be summarised as follows:

(i) Moving up in the policy ladder; integrating sectoral policies on agriculture, environment, and civil protection; and linking them with economic policy and national planning.
(ii) Moving down into specific investment plans now, to avoid economic and environmental costs later. Countries also need to move forward to improve the resilience of value chains and lift productivity. To stand still will be to fall behind as others move on to lower cost, more competitive, and more secure sources of inputs and connect to consumer markets.
(iii) Moving together—since global problems start at home, global solutions require local actions. Domestic leadership now will shape regional and international thinking.

It is important to reach a broad agreement quickly with all major stakeholders on these priority actions, starting with the identified list (see Table 6.1), and to develop a medium- to long-term implementation programme for the agreed actions, supported by necessary resources, monitorable targets, and clear accountability mechanisms.

These policy options by no means represent the full spectrum of criteria that could be considered in shaping the adaptation roadmaps, and most policymakers will develop a range of other specific criteria relevant to their country's particular disaster risks, climate impacts, and development concerns. However, these policy choices can support the development of an enabling institutional and policy environment that will build capacity over time; foster mainstream adaptive actions by a range of stakeholders (e.g. academia, the private sector, local governments, and civil society); and encourage successful imitative replication.

An enormous agenda is not new for ASEAN, which has risen to meet such challenges on numerous occasions. Encouragingly, various players have recently taken many steps and initiatives in setting the right direction in the ASEAN Socio-Cultural Community Blueprint.

Table 6.1: Key Proposed Actions for Improving the Adaptative Capacity and the Role of Different Stakeholders

Key Issue	Strategic Policy Choices/Actions	Responsible Institution	Timeline
Promote Public Awareness	Develop national and sub-regional program on disaster risk reduction (DRR) and climate change impacts its causes, and best adaptation practices.	Sector agencies	Short to medium term (1–3 years)
	Develop sectoral guidelines and training on public participation in adaption programs.	Ministry of Environment	Short term (1 year)
	Devise gender specific strategies to deliver the DRR and climate risk information.	Sectoral agencies	Short term (1–3 years)
	Share local knowledge with environmental and sectoral agencies to disseminate examples of when public participation improves adaptation responses.	Media, civil society	Short term (1–2 years)
Improve Scientific Capacity	Develop and regularly update public online database on disaster and climate risk indicators.	Ministry of Environment	Short to medium term (1–5 years)
	Upgrade and expand targeted research and educational programs and/or sectoral research and training scientists, institutions etc.	Sectoral ministries	Short term, then continues
	Publicize the regional knowledge centers and create its satellite offices to disseminate relevant information to affected communities.	Academia, civil society	Short term (1–3 years)
	Maximize the effectiveness of current acts and programs by developing clear procedural guidelines regarding climate change adaptation add-ons.	Sectoral ministries, local governments	Continuous
Set Feasible Standards/ Benchmarks for Structural Measures	Review best international practice procedures for infrastructure standard setting and develop national guidelines; strengthen/expand the application of zoning concepts in setting national standards.	Ministry of Environment, academia	Medium term (1–5 years)
	Strengthen the instruments of social and economic impact assessment of new infrastructures by developing as clear methodology drawing on best international practices and adjusted to national/local context.	Sectoral ministries	Short to medium term (1–7 years)
	Provide necessary climate and economic information, collaborate on the analysis and facilitate consultation with industry.	Planning commission, sectoral agencies	Short term (1–3 years)
	Provide information on social/community impacts of the proposed standards.	Civil society, academia	Short term (1–3 years)

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Table 6.1: ***Continued***

Key Issue	Strategic Policy Choices/Actions	Responsible Institution	Timeline
Develop New Programs to strengthen Non-Structural Measures	Develop a focused and well packaged program for most vulnerable locations that integrate targeted structural measures with non-structural measures, including a funding mechanism for scaling up.	Planning Commission, sectoral agencies	Medium term (1–7 years)
	Develop a set of regulatory incentives to support voluntary initiatives, using existing good practices.	Ministry of Environment	Continuous
	Provide training and capacity building to policymakers and private sector operators for better no-regret adaptation management focusing on international best practices that are locally appropriate.	Sectoral ministries, academia	Medium term (1–7 years)
	Periodically update sectoral guidelines for monitoring and adding new sectors of growing impact.	Local governments, NGOs	Continuous
Improve Cross-Sectoral Coordination	Strengthen existing formal mechanisms such as Environmental Impact Assessment (EIA) Statements, Sustainable Development Goals (SDGs) an to involve environmental authorities in designing structural and non-structural measures.	Ministry of Environment	Short term (1–3 years)
	Coordinate the development of strategic adaptation framework for using global environmental financing instruments.	Ministry of Environment	Medium term (2–4 years)
	Remove the tariff and non-tariff barriers related to key stable foods items	Ministry of Trade	Short term (1–3 years)
	Empower local governments to oversee regional climate change adaptation programs and foster cross-sectoral coordination.	Sectoral agencies and civil society	Short term (1–3 years)
	Develop sectoral guidelines to overcome specific identified gaps and facilitate uptake of best practices.	Sectoral agencies	Short term (1–3 years)
Augment Financial Resources	Explore innovative financing instruments including insurance programs, catastrophe bonds, and other risk transfer products to support future developments via global climate change agenda.	International donors	Short term (1–3 years)
	Develop a consistent budgetary framework for integrating disaster and climate risks and set it as input into a consistent and realistic delivery mechanisms related to most vulnerable sectors, communities or households in a transparent way.	Ministry of Finance	Short term (1–3 years)
	Link trade and business promotion incentives to adaptation financing; make heavy representation within regional/international adaptation funding institutions and help shape allocation decisions.	Planning Commission	Short term (1–3 years)
	Develop and implement medium term capacity strengthening action plans, as well as training and staffing plan to meet growing mandates.	Line agencies	Middle term (1–5 years)

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Table 6.1: ***Continued***

Key Issue	Strategic Policy Choices/Actions	Responsible Institution	Timeline
Strengthen the Capacity for Regional Cooperation	Introduce an enhanced methodology for DRR and climate prediction at regional level; strengthen early warning systems for international river basins and economic impact assessment of collective cross border actions.	Academics from advanced economies	Short term (1–3 years)
	Share and promote regional best practice examples of mainstreaming adaptation practices in sectoral planning.	ASEC	Short to medium term (1–7 years)
	Provide technical and human resources needed for effective management of cross-border climate change impacts and make clear the roles and responsibilities of all parties involved for collective actions.	Ministry of Environment and Foreign Affairs	Short to medium term (1–5 years)
	Develop a network of regional centers within appropriate existing institutions to provide high quality training and knowledge to have high standard of professionalism across the countries.	ASEC	Continuous

ASEC = Association of Southeast Asian Nations Secretariat.

Source: Authors.

With its focus on concepts and cases of DRR and CCA, this chapter lays the foundation for a more structured and systematic analysis of how adaptation roadmaps can be built at the country level with short- and medium-term targets. Subsequent work should enrich the portfolio of policy choices, adaptation measures, methods, and cases presented here by focusing on an economic cost analysis for each action, and developing monitorable targets. This will be particularly relevant to local governments and those who devise adaptation strategies, as well as policymakers and the international community. These relevant stakeholders are strongly recommended to join forces in what must be a collective endeavour to address these issues that affect the social fabric, economic base, and ecosystem that ultimately shape the future of 650 million people living in ASEAN Member States.

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