Chapter 10

Sharing Interlocal Adaptation Lessons

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10.1 Sharing Lessons from Case Studies

As seen in the previous chapters, Asia is one of the regions most vulnerable to the impacts of climate change, as it represents more than 60% of the world's population, making it the growth center of the world. The climate in East and Southeast Asia is incredibly diverse and includes many climate zones, from tropical to subarctic. The impacts of and adaptations to climate change in this region are also diverse. A variety of adaptation practices have already been employed to minimize the risk of climate change among the countries in this area, and a number of similarities and ongoing challenges are apparent. Therefore, to adapt more effectively to climate change, it is essential for these countries to share their knowledge and experiences with each other.

Table 10.1 summarizes the impacts and adaptations discussed in this book, which mainly deals with “agriculture and natural resource management” and “disaster risk reduction and human resource development”. This book discusses numerous impacts and diverse adaptation measures, both hard and soft. The impacts on these two sectors are classified in Table 10.1, with some overlap.

Table 10.2 shows some of the extracted lessons discussed in this book. The following commonalities and implications were observed:

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Table 10.1 Summary of impacts and adaptations discussed in this book

	Impacts	Adaptations
Agriculture and natural resource management	Water scarcity (Pulhin et al.; Vongtanaboon)	Participatory water (or watershed) management
	Crop production (Ishikawa & Furuya; Matsuura & Sakagami)	Projection, changes in planting dates and cultivars
	Food supply and markets (Ishikawa & Furuya)	System of rice intensification (SRI)
	Ecosystem service depletion (Pulhin et al.; Balderama; Bengen et al.; Oktarina et al.)	Different tillage practices or crop rotations
	Mangrove forest decrease and fishery resource (T.H.Nguyen)	High temperature tolerant rice cultivars <= > market impacts (e.g., price)
		Information communication technology (ICT). Smart agriculture system for corn and dialogical tools such as GIS and 3D mapping
		Stakeholder involvement, e.g., fishery livelihood, oil palm biomass utilization for climate smart agriculture (Young) human resource development
Disaster risk reduction and human resource development	Sea level rise (SLR) and erosion (Yasuhara & Murakami; Tamura & Pham; Q.V. Nguyen)	Monitoring the current situation (e.g., SLR, coastal change, LS)
	Land subsidence (LS; Yasuhara & Murakami)	Projection = > “reactive” to “proactive” adaptation
	Coral reefs (Bengen)	Zoning based conservation (e.g., mangrove planting and Casuarina trees outside of mangrove)
	Mangrove decrease (Bengen; Q.V. Nguyen)	Hard and soft protection (e.g., dike, mangrove, and multiple protection, and early warning)
	Flooding and disasters (Pulhin et al.; Balderama; Sakurai & Ito; Tong et al.)	Watershed management (participatory approach and ICT)
	Earthquake and Tsunami (Sakurai & Ito)	Sustainable livelihood
		Community-based disaster risk reduction (CBDRR)
		Disaster risk reduction education (DRRE)
		Raising awareness => Stakeholder involvement

Table 10.2 Some lessons learned in the book.

Part I: Agriculture and natural resource management	
Participatory climate change adaptation using watershed approach: Processes and lessons from the Philippines	1. Recognizing the different scales of adaptation through a watershed approach
	2. A participatory framework for catalyzing collective action among stakeholders
	3. Solution-based analysis that incorporates local knowledge
	4. Community-based adaptation needs to be effectively linked to higher scales of governance to enhance the resilience of communities and ecosystems
Climate change adaptation practices towards sustainable watershed management: The case of Abuan watershed in Ilagan City, Philippines	A good example of watershed management is how to align and plan the interface of a project framework to involve local governments and facilitate its effective adaption among stakeholders.
Economic evaluation of adaption measure of rice production in Vietnam with supply and demand model	A supply and demand model for rice production was developed for an economic evaluation of adaptation. Climate change adaptation measures for continued rice production, such as adopting short-duration or salinity-tolerant cultivars, have been introduced and evaluated.
Coastal-small island ecosystems and conservation perspectives within adaptation efforts (<i>in Indonesia</i>)	Sustainable small coastal island conservation management requires thorough participatory planning. The design requirements may include:
	1. A complete set of data and information
	2. Evaluation of program relevance in relation to the conditions in particular areas
	3. Evaluation of program impacts on the environment and communities
	4. Involvement of stakeholders and communities in planning
	5. Dissemination of information strategies
Part II: Disaster risk reduction and human resource development	
Geotechnical approaches to disaster risk reduction in Japan and Vietnam	1. Inundation of coastal regions undergoing a combination of sea level rise and land subsidence (LS) is more serious than in regions without LS. Multiple adaptive measures can be adopted.
	2. The concept of adaptation should be shifted from being reactive to proactive, as doing so would lead to increased overall resilience.

(continued)

Table 10.2 (continued)

Developing sustainable and climate-resilient livelihood in Giao An commune, Giao Thuy district, Nam Dinh province (<i>in Vietnam</i>)	For human capital:
	1. Organizing short- and long-term training courses depending on livelihood characteristics to equip local residents with the necessary knowledge and skills to carry out production activities.
	2. Organizing community events combined with contests related to climate change
	For social capital:
Community-based disaster risk reduction education in Japan	1. Studying how to create more effective production groups, teams, and areas
	1. CBDRR is at the core of any type of risk reduction.
	2. Local disaster risk must be understood for the determination of measures to reduce disaster risk in the community.
	3. In Japan, expectations of enhancing CBDRR have been emphasized while local communities have been weakened. Three cases of disaster risk reduction (DRR) in Japanese schools and communities provide some lessons to enhance adaptive capacities.
The practice of education for disaster risk reduction in Vietnam: Lessons learned from a decade of implementation 2010–2020	Review of DRRE in Vietnam
	1. Close cooperation between local authorities and the Department of Education during project implementation has been critical.
	2. Projects that consider sustainability from the outset, i.e., from the project design stage, will achieve greater efficiency and sustainability.
	3. Incorporating indigenous knowledge into DRRE projects is valuable.

1. Climate change impacts are already evident in many regions and sectors, as shown in Table 10.1. People are adapting to current climate risks and need to adapt to future risks at the same time.
2. Two main approaches to climate adaptation have been developed to address adaptation: a top-down scientific approach and a bottom-up regional approach, as discussed in Chap. 1. The scientific approach can contribute to adaptation strategies such as monitoring, projection, impact/vulnerability assessments, and adaptation policy planning. These cycles are periodically checked and implemented.
3. The regional approach, which involves collaboration among experts and stakeholders and incorporates traditional and indigenous knowledge, can enhance adaptive capacities for communities and regions. Because the impacts of climate change, vulnerabilities, and priorities vary substantially depending on regional characteristics, both regional and scientific approaches can support information sharing in relation to decision making.

Stakeholder involvement and collaboration with national and local institutions are required for adaptation. This book covers both adaptation research and activities among some East and Southeast Asia countries to fill the gaps between scientific and regional approaches. Some tools or methods for enhancing this collaboration include a participatory framework, community-based adaptation, and education in relation to resource management and disaster risk reduction. In this context, local and indigenous knowledge plays an important role in the formulation of adaptation governance and related strategies (IPCC 2007).

10.2 Discussion of the Three Aims of This Book

This book had the following three aims, as mentioned in the preface.

1. Promote interlocal lessons learned by sharing climate change adaptations, such as through “agriculture and natural resource management” and “disaster risk reduction and human resource development”
2. Develop new adaptation measures and research approaches that can consider the regional nature of East and Southeast Asia
3. Share practical adaptation options that have permeated society in each country/region

Regarding 1), the lessons learned and rooted in each country or region are drawn as summarized above. However, promoting them “interlocally” is still required as a next step. For example, participatory climate change adaptation using the watershed approach reported by Philippine researchers could be practically applied in other countries and regions. However, it is necessary to consider not only the differences in the natural environment and ecosystem of the area, but also the customs and culture of the specific procedure, including how residents and stakeholders can participate. If the place changes, it is natural that the method must also be changed.

Needless to say, the researchers, local governments, and citizens in each country or region must be careful about this point when attempting to apply the practices of other countries or regions to their own. This book does not always provide concrete examples of how to apply the climate change adaptation practices reported here in each country or region to other places. We think that it needs to be frankly acknowledged that this book is only intended to be a catalyst for doing so.

In the preface, we mentioned that the term “interlocal”, which we describe as the concept of connecting localities, transforming points into lines, lines into planes, and finally, planes into three-dimensional objects (Fig. 10.1), is not very familiar in English (Yamori and Ito 2009). However, the range of locality needs to be clarified. For example, even in Japan, the climate and environment in Hokkaido in the north differ from those in Okinawa in the south, as do ways of thinking among residents. Ibaraki University, where the editors work, is located in Ibaraki Prefecture, north of Tokyo, where agriculture is thriving; however, this locality also differs from Hokkaido and Okinawa. One locality on a country-by-country basis may not be

Fig. 10.1 Conceptual diagram of “interlocal”

appropriate, even in a relatively small country like Japan. Therefore, further discussion is needed on this point.

Regarding 2), it can be said that the purpose of developing new adaptation measures and research approaches has been achieved to a certain extent, in that advanced cases have been reported in each country and region. The development of an economic evaluation of adaptation measures related to rice production in Vietnam corresponds to a specific example, and other examples can be given. However, this book covers only a small part of the vast number of specific themes that should be covered on this subject.

This book deals with two major themes, “agriculture and natural resource management” and “disaster risk reduction and human resource development”. Of course, we intend to deal with a wide range of concrete themes as much as possible. However, although it seems that climate change adaptation requires lifestyle changes, we have not been able to deal with how to bring about such changes. We think that the COVID-19 pandemic that continues as of 2021 will be one of the major triggers for a review of our society, life, and economy. This is one of the challenges for the near future.

Of course, 3) “sharing practical adaptation options” will be left to practice in the future. Here, we wanted to use the term “social permeation” rather than the more often used “social implementation”. This does not mean that we deny “social implementation”. However, it reminds us of only the top-down approach. If we desire that climate change adaptation measures be truly accepted and established, we should also value indigenous knowledge and discover what we can learn using a bottom-up approach. One option to emphasize such a point is to think about “social permeation”, that is, what is needed for the policy to permeate among people.

Whether it is “social implementation” or “social permeation”, we often encounter social dilemma situations when attempting to change society. Even if we know that we can benefit from working together in the long term, it can be detrimental in

Fig. 10.2 Basic structure of the social dilemma

the short term. The emergence of “free riders”, who act uncooperatively while benefiting from almost everyone else working cooperatively, complicates issues even further (Fig. 10.2). The dilemma of “tragedy of the commons” is also widely known. The issue is how to develop human resources who think about problems from a broader perspective.

10.3 A Short Note on “Adaptation”

The term “adaptation” was originally used in biology (Ito 2018). In the process of biological evolution, the term “adaptation” is used in the context of “natural selection” in relation to adapting to changes in the environment. After that, “adaptation” came to be used in psychology and sociology, but even in those fields, it basically means that living things (human beings) change according to changes in the environment. For example, when we mention “adaptation to school”, we are referring to psychological changes among students (changing humans), not changes in the school (changing the environment).

In the context of climate change, adaptation is defined as “the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its

effects” (IPCC 2014, p.1758). The object of climate adaptation includes both changing society and human systems.

10.4 The Way Forward

This book has introduced ideas regarding both research and activities for climate change adaptation among some East and Southeast Asia countries, such as Vietnam, Thailand, Indonesia, Philippines, China, and Japan. As the impacts of climate change are expected to be increasingly serious, many promising activities and projects for climate adaptation have been proposed. These adaptations can be shared interlocally among countries, regions, and residents.

To enhance the adaptive capacities of climate change, it is critical to establish a social system that can promote information collection and the sharing and raising of awareness regarding the importance of these activities. In addition, this dialogue must be promoted among researchers in diverse fields. Adaptation to climate change should contribute to other social goals, such as the mitigation of climate change and the creation of an environmentally safe, friendly, and secure society in accordance with the Sustainable Development Goals established by the United Nations General Assembly.

It cannot be said that aims of this book have been achieved through its publication alone, and some problems still remain. However, there is no doubt that this book can contribute to the creation of new opportunities to tackle these challenges.

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