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Urban Climate Resilience in Southeast Asia

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Urban Climate Resilience in Southeast Asia

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Preface

This volume brings together several distinct research endeavours that are all supported by a unique international collaboration: the Urban Climate Resilience in South East Asia (UCRSEA) Partnership Network. Originally conceptualized by the scholars who applied to the government of Canada for financial support, the partnership's goal was to enhance capacity, in terms of both scholarship and political action, to address climate change impacts within secondary cities of Southeast Asia. We wanted to build on very exciting work being done under the auspices of global foundations, such as the Rockefeller-supported ACCCRN (Asian Cities Climate Change Resilience Network), but focus specifically on perspectives that highlight environmental justice and social inclusion in the Mekong region. We all brought to the undertaking our in-depth knowledge of urban spaces in the region and, with it, a commitment to enhancing urban governance as well as a conviction that people in smaller cities in Cambodia, Myanmar, Thailand, and Vietnam are facing devastating challenges from global environmental change.

The UCRSEA Network consists of many entities including university departments and faculties and government ministries and nongovernmental organizations based in Canada and the South East Asian countries we listed. Much of the research for the project—which focuses on the connection between urban poverty, vulnerability, and climate change adaptation/mitigation—relies on graduate students and other young scholars based at the partner universities. In their exuberance to conduct path-breaking work, many of our contributing authors followed a creative path towards answering the common questions we posed to them at the inception of our project. Thus, while all of the work presented in this volume sets out to answer the same three foundational questions (see Chapter 1), many of the research initiatives ended up being responsive to site-specific dynamics and focusing on how to improve the capacity of vulnerable communities and groups to respond proactively and effectively to climate change concerns. Given our willingness to let the situation drive the research methods, it is not surprising that we have not found it an easy task to undertake a classic synthesis of research findings.

Nonetheless, the co-directors of the UCRSEA Partnership Network, Dr. Pakamas Thinphanga (a programme manager at the Thailand Environment Institute) and Professor Amrita G. Daniere (a professor in the Department of Geography and Planning at the University of Toronto) along with one of our collaborators, Dr. Matthias Garshagen (head of Vulnerability Assessment, Risk Management and Adaptive Planning at the United Nations University in Bonn, Germany), have created a coherent whole out of many divergent threads. In particular, we have identified shared insights from fine-grained data collection across a myriad of small urban centres in the region. These insights span both the theory and the practice of creating better urban governance for the most vulnerable in South East Asian cities. As urbanists, we value research that not only advances how we understand cities to function but also what we can do, on the ground, to give communities and individuals more of a voice regarding how their cities deal with increased flooding, unanticipated migration, longer periods of drought and extravagant heat waves, as well as urbanization patterns that exacerbate all of the effects of these social and environmental changes.

It was very important to all the collaborators in the UCRSEA partnership that we produce a book that brought together the work of our most inventive and motivated scholars in one place. The goal is to share the knowledge we have all gained from their combined research to both address emerging debates and also offer key recommendations that can help urban residents to achieve long-term resilience. All of the work presented here focuses on the dynamics of power relations and looks to increase the role and voice of the traditionally marginalized in shaping their future urban spaces. We look forward to continuing this work with our many junior and senior colleagues across the globe in the near future. We hope, as well, that the work highlighted in this volume offers inspiration to both scholars and policy-makers about how to more equitably address climate impacts among the most vulnerable in their cities.

Mississauga, Canada — Amrita G. Daniere
Bonn, Germany — Matthias Garschagen

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The editors thank a number of organizations and individuals—without them, the compilation of the research in this book would not have been possible. The project's genesis lies in the formation of the Urban Climate Resilience in Southeast Asia (UCRSEA) Partnership Network, an International Partnership for Sustainable Societies (IPaSS) grant funded by the International Development Research Council (IDRC) and the Social Sciences and Humanities Research Council (SSHRC) of Canada. The UCRSEA Partnership is composed of a host of institutions based in Canada and within the sub-Mekong region, particularly in the countries of Thailand, Cambodia, Vietnam, Myanmar, and, recently, Laos.

The partners in the network include the Royal University of Phnom Penh (Cambodia); National University of Laos; Mercy Corps Myanmar; Renewable Energy Association Myanmar; Swanyee Development Foundation (Myanmar); University of Yangon (Myanmar); Chulalongkorn University (Thailand); Chiang Mai University (Thailand); Khon Kaen University (Thailand); Mahasarakham University (Thailand); General Department of Administration for Nature Conservation and Protection, Ministry of Environment (Thailand); Rajamangala University of Technology Lanna (Thailand); Thailand Environment Institute (Thailand); Center for Environment and Community Research (Vietnam); Center for Natural Resources and Environmental Studies, Vietnam National University; and York University (Canada). The partnership endeavours to build research capacity and engender grass-roots understanding around the issue of urban climate change resilience, particularly among academics and non-profit activist organizations in secondary cities of Southeast Asia. In particular, we recognize the significant roles played by the Thailand Environment Institute and the Munk School of Global Affairs and Public Policy at the University of Toronto. The Partnership Network relies extensively on the logistical support provided by these two primary host institutions.

Much of the research we reported here relies on in-depth interviews conducted with residents, community leaders, civil servants, and activists. These individuals and groups were generous in sharing their knowledge and time with us. We are very

grateful for their assistance and hope that the dissemination of their shared insights regarding the challenges they face will result in tangible improvements to the resources and solutions that emerge in response to the challenges posed by urban climate change.

Professor Amrita G. Daniere singles out the intellectual collaboration of Professor Lisa B. Welch Drummond of York University and the generous efforts of a number of graduate students and postdoctoral fellows associated with the UCRSEA project, including Joanna Kocsis, Yanjun Cai, Gwen Pulliat, and Vanessa Lamb, among others. The financial support of the University of Toronto Mississauga as well as the Department of Geography and Planning at the University of Toronto were crucial to her ability to co-direct the project and oversee several of the research initiatives described in this volume.

Finally, we both recognize the excellent work of Jacqueline Larson, our dedicated copy editor. We also need to thank Celia Braves for her exceptional cartography skills in creating all the maps in this book. Most importantly, all the scholars involved in creating this volume acknowledge the patient and exceptional guidance that Project Manager Angie Agulto provided for the UCRSEA Partnership.

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Chapter 1
Why Focusing on Urban Climate Change Resilience in Southeast Asia Is Relevant and Urgent

Amrita G. Daniere, Matthias Garschagen and Pakamas Thinphanga

Abstract This volume brings together primary research conducted in secondary cities of Southeast Asia. It provides readers with improved knowledge regarding issues of vulnerability, governance, and climate resilience. The goal of the book and the Urban Climate Resilience in South East Asia (UCRSEA) project is to suggest possible next steps, even as urban systems are dramatically changing in the face of socioeconomic and environmental challenges. The chapter summarizes specific examples from the book drawn from Cambodia, Myanmar, Vietnam, and Thailand. As the authors document, urban citizens most directly affected by climate change lack access to power and need to be able to participate in the creation and implementation of climate-adaptation strategies if they are to be more effective.

Keywords Urbanization · Vulnerability · Adaptation · Resilience · Governance

Urbanization and a rapidly changing climate present enormous challenges to cities everywhere, but particularly in Southeast Asia. In 2017 alone, we witnessed deaths caused by floods in Myanmar and typhoons in the Philippines. These events join the ranks of the more devastating Cyclone Nargis in Myanmar in 2008, the 2011 floods in Thailand and Cambodia, and Typhoon Haiyan in the Philippines in 2013. Much of the suffering and damage from these disasters occurred in urban areas that feature high concentrations of exposed people and assets, often combined with high levels

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of social vulnerability. However, these climate-related disasters are not unexpected given that the area is one of the world's most hazard-prone and vulnerable regions (UNU-BEK 2017). Increasing the region's disaster risk further, climate change will likely lead to an increase in the frequency and intensity of extreme weather events, especially heavy precipitation, storms, and droughts (Hasson et al. 2016).

Urbanization is a key dimension of the region's ongoing socioeconomic transition—and it has multiple problematic feedbacks with disaster risk. Urban productivity is well recognized as a crucial component of economic growth in the region (Glaeser 2011). But it also creates inequality and social marginalization—which provide the breeding ground for social vulnerability, especially in the disaster context. Scholars agree that climate change threatens social and economic stability and development and that more effective urban planning to mitigate and adapt to the impacts of climate change can promote sustainable urban fabrics (Simonis 2011; Yuen and Kumsaa 2011). Urban policy and investments in infrastructure and service provision that enhance economic productivity through limiting the costs that climate change impacts impose thus contribute directly to the economic well-being of both cities and countries. In addition, improved decision-making can better protect the conditions of everyday life for the urban poor, who are usually the hardest hit by natural disasters and have the least personal resilience to facilitate 'bouncing back' (Ahsan et al. 2011; Steele et al. 2012; Whitehead 2013).

The academic literature on climate change adaptation and resilience argues that because the effects of climate change represent a failure of the market, planning for these impacts requires the state's re-engagement as well as new forms of governance (Giddens 2009). Most researchers define climate change resilience as pertaining to a system's ability to absorb shocks and adjust to change to maintain its main functions despite hazards and perturbations (Adger et al. 2005; Manyena 2006). Work in this field highlights the need for new governance based on flexible and adaptive institutions capable of dealing with uncertainty and risk in ways that are representative and participatory (Birkmann et al. 2010, 2016; Tyler and Moench 2012). Scholars also argue that governance actions at the municipal level, which are close to the problems on the ground, have to play a larger role—with a more prominent voice—in addition to national-level action (Barber 2013; UNDP 2012; UN 2017). These recommendations raise both conceptual and practical challenges. On a conceptual level, flexible institutions often do not mesh with the established principles of rational bureaucratic governance and the clear delineation of function and practice that typically underpins good governance reforms. On a practical level, vested political and commercial interests and patronage networks—that hinder grassroots engagement and access to information—undermine transparent and accountable governance (Friend and Moench 2013).

This book responds to a clear need to examine the situation first hand in cities of the Global South, particularly in the smaller cities of Southeast Asia. The chapters in this volume result from different researchers working in different cities in Southeast Asia with a clear focus on urban vulnerability and resilience to climate change in a specific contemporary situation. Taken together, they provide examples of success and failure that can be used to guide future policy regarding civic engagement and

the role of social capital—and how to use this knowledge to contribute to a more resilient community.

We hope that our evidence-based research (all of which was conducted within the past two years) can provide policymakers, scholars, and activists with the kind of knowledge they need to pursue more inclusive decision-making around climate change adaptation. The book contributes to the broader debates in the theoretical and practical spheres around the desirability and/or feasibility of enhancing climate change resilience in cities of the Global South and elsewhere. Much of the original and insightful work we include here was conducted by young scholars in Southeast Asia who will form the next generation of decision-makers in the region and beyond. The Urban Climate Change Resilience in Southeast Asia (UCRSEA) project (we say more about this later) supported the work of all of the authors to give them the opportunity to develop and implement innovative research agendas and create scholarly networks in a subject area and region of critical importance. This book represents the tangible form of their thinking and creating so far.

1.1 Urbanization Trends and Small- and Mid-Sized Cities in Southeast Asia

Over the past years, academic and political attention has focused on megacities and for good reasons. While the region did not have mega-urban agglomerations with over 10 million inhabitants around the turn of the century, they have rapidly grown since then (e.g., Jakarta, Manila, and Bangkok). These megacities now host over 10% of the region's population. Their size and rapid growth lead to very specific implications for disaster risk: hazard-zone occupation, massive social vulnerabilities, and the lack of adequate infrastructure development and planning (Kraas 2003).

However, small- and mid-sized cities in Southeast Asia require special attention. They have been neglected in academia and policymaking despite their massive demographic importance: 65% of Southeast Asia's population live in cities smaller than 500,000 residents (UN-DESA 2018). This ratio is projected to decrease by only a few percentage points by the year 2030. Small- and mid-sized cities often receive less political attention than megacities. They have very limited financial resources and low levels of capacity in terms of human capital and their administrations.

Understanding the development opportunities as well as challenges specific to these cities is all the more relevant considering that small- and mid-sized cities have so far received far less scientific attention than larger cities in the countries of Southeast Asia. Too often lessons transfer from studies on megacities (e.g., Ho Chi Minh City, Manila, or Bangkok). But secondary cities work very differently in terms of social realities, human and financial resources, political autonomy, and so on. Governance processes and adaptive capacities are far less understood in mid-sized cities, so we need empirical analytics like those in this book. Figure 1.1 provides a map of the region that includes the specific locations of the secondary cities our contributors describe and analyze.

Fig. 1.1 Map of case study cities in Southeast Asia (Made with Natural Earth)

1.2 Risk, Vulnerability, Adaptation, and Resilience

This book follows the conceptual understanding of risk, vulnerability, adaptation, and resilience that the Intergovernmental Panel on Climate Change (IPCC) used in its Fifth Assessment Report. The potential for harm and the expected levels of loss and damage that result from the interaction of vulnerability, exposure, and hazard are the focus of much scholarly discussion (based on Agard et al. 2014; UNISDR 2004; Wisner et al. 2004). Hazards are usually defined as the potential occurrence of a natural or human-induced physical event, trend, or impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources (Agard et al. 2014). In the context of this book, natural hazards are often flooding, sea-level rise, or heat stress. Exposure refers to the presence of people, livelihoods, species, or

ecosystems, environmental functions, services, and resources—that is, infrastructure or economic, social, or cultural assets in places—that could be adversely affected by one or multiple hazards (based on Agard et al. 2014).

Our authors understand vulnerability as the predisposition of an element (e.g., a human individual, a social group, a city, and an economic sector) to suffer harm, loss, and damage when affected by a given hazard (Garschagen 2014, based on Agard et al. 2014; Cardona 2004; Wisner et al. 2004). Vulnerability is often understood in a dialectic relationship with coping capacity, which describes all strengths and resources available within an exposed element (e.g. community, sector, and organization) to take action that mitigates or reduces the level of harm, loss, and damage experienced by a given hazard event. Coping can take place shortly before, during, and after the hazard strikes. In contrast to adaptation, coping is rather short term or reactive and does not aim to alter the larger principles of its surrounding system (Garschagen 2014).

Adaptation in the context of climate change is a process to reduce risk by reducing exposure, vulnerability, and/or—where possible—mitigating natural hazards (Garschagen 2014). Adaptation therefore refers to the process of adjustment to actual or expected climate and its effects (Agard et al. 2014). There is increasing recognition in academia and practice that adaptation can—or should—follow different paradigms. These can range from resisting to change (e.g., by bulking up cities against increasing flood risk), to facilitating incremental change (e.g., by accommodating future flood risk through flood retention areas) or even fundamental systemic transformation (e.g., by fostering retreat in the most hazard-exposed areas) (Solecki et al. 2017).

Resilience is increasingly used to not only describe system properties but also as a normative guide to climate change proofing. The IPCC defines resilience as the capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance by responding or reorganizing in ways that maintain the systems' essential function, identity, and structure, while also maintaining their capacity for adaptation, learning, and transformation (Agard et al. 2014). Resilience therefore includes notions of short-term coping capacity as well as longer-term adaptation and transformation. However, in contrast to adaptation, which has a procedural aspect, resilience refers primarily to the capacity of a system. In this book, we take this to mean a given city and its social communities.

1.3 The UCRSEA Project and Framework

Southeast Asia has experienced high rates of urbanization for the past 20 years and this is expected to continue and even intensify in the future. This growth has implications not only for urban hazard exposure but also for the quality of urbanization and other dimensions of vulnerability—urban residents' susceptibility as well as state and nonstate capacities to cope with natural hazards and climate change impacts. In 1950, just 15% of Southeast Asia's population lived in urban areas. The figure went

up to 25% in 1980, and is roughly 50% today (UN-DESA 2018). In absolute figures, this growth corresponded to 170 million urban residents in 1950, 360 million in 1980, and 650 million today (UN-DESA 2018). Forecasts predict that by the middle of this century, 65% of the region's population (i.e., 780 million residents) will live in cities.

The UCRSEA Partnership is a research network that was created several years ago to provide support to and forge connections between scholars, bureaucrats, organizations, and eventually communities interested in working on climate change and urbanization issues in Southeast Asia. There are 15 formal partners consisting of academic institutions, government ministries, and nongovernmental organizations from Cambodia, Laos, Myanmar, Thailand, and Vietnam as well as three Canadian universities.[1] The project seeks to address climate change and urbanization challenges through a multi-method approach that brings together a range of stakeholders in the region to foster new dialogue, create new knowledge, and build new skills to improve the resilience of urban societies to the impacts of climate change.

UCRSEA partners are encouraged to focus on governance issues (i.e., the process of decision-making) and how they affect resilience. In brief, scholars and practitioners are encouraged to operate from the principle that decision-making processes that build resilience for vulnerable groups are likely to be participatory and inclusive, and allow those individuals and groups most affected by climate hazards to play an active role in determining how best to avoid them. Many authors argue that resilience requires local governments to be accountable to all its citizens—including the most marginalized populations—which is very different than current practices in many states (such as the countries in Asia where the project is based). Proactive attempts to build climate resilience require coordinated actions by many different actors (government agencies, community groups, individuals, private companies, and international organizations). New mechanisms for collaboration between these groups are typically needed. UCRSEA supports innovative research, particularly scholarly inquiry that utilizes the partnership's focus on urbanization as dependent on complex systems and requiring innovative governance based on flexible and adaptive institutions capable of dealing with uncertainty and risk in ways that are representative and participatory (Folke et al. 2005; Tyler and Moench 2012).

1.4 Core Research Questions

The partnership-supported research seeks to address at least one of the three research questions that form the core of the IPaSS project. These questions emerge from the

[1]The UCRSEA Partnership is financially supported via a five-year International Partnership for Sustainable Societies (IPaSS) grant from the International Development Research Centre (IDRC) and the Social Sciences and Humanities Research Council (SSHRC) of Canada.

partnership's concern with patterns of rapid urban growth, weak governance, and vulnerability to the impacts of climate change in the Mekong region.

1. ***How will climate change affect the poverty and vulnerability of urban residents in Southeast Asia?***

Much of the climate change literature argues that the poor are the most vulnerable to climate change (World Bank 2010). Current definitions and measurements of poverty in urban areas are widely critiqued as being inaccurate and incomplete (Mitlin and Satterthwaite 2013). Cities are also associated with increasing levels of inequality. At the same time, climate change creates new sources of vulnerability that put those who are not currently poor at risk. The nature of urbanization creates new dependencies on complex systems of water, food, energy, and transport, and these systems are often beyond the capacity of individuals and administrations to manage (Friend and Moench 2013). The disruptions caused by climate change create vulnerabilities and thus threaten ambitions for equitable sustainable development. All social organizations become more complex in multi-ethnic, multi-class urban spaces. To ensure effective public policy for poverty reduction, economic growth, social inclusion, and disaster risk reduction, we need to develop practical methodological frameworks for assessing current urban poverty and well-being as well as future vulnerability.

2. ***What does knowledge, from both academic literature and action research, tell us about creating climate resilient urban governance that is both inclusive and equitable?***

Both urbanization and the challenges of climate change require new forms of governance that highlight the importance of citizen rights and accountable institutions (Giddens 2009; UN-Habitat 2011). Resilience theorists argue that the risks and uncertainties of climate change require a shift from policy and planning processes involving 'prediction and action' towards more learning-oriented, flexible, and adaptive processes (Tyler and Moench 2012; Lebel et al. 2006). Cities need more informed, deliberative governance processes that bring together diverse disciplines and experience to create flexible, adaptive, and learning-oriented institutions (Folke et al. 2005; Munton 2003). This approach has been applied elsewhere to create a template for sharing complex scientific information with lay people in terms that are relevant to their situations. Shared Learning Dialogues (SLDs) represent a process whereby different stakeholders and different knowledges (including scientific disciplines and 'local knowledge') are brought together in a facilitated, informed public dialogue that assesses trends and trajectories, emerging vulnerabilities, and future climate change risks. In this way, SLDs put urbanization and climate change in the public domain while promoting social learning and innovation. However, the continuing research challenge is how to create public spaces where informed and inclusive discussion can take place in different political contexts.

3. ***How can we strengthen the agency of individuals, groups, and institutions to improve economic, physical, and social well-being in urban areas, particularly in response to climate change?***

Scholars identify a number of reasons that governments in Southeast Asia have been unsuccessful at aiding natural disaster victims. These include poor coordination, lack of monitoring and evaluation, rigidity, lack of transparency, corruption, and processes by which well-connected individuals (elites) can dominate and corrupt community-level planning and governance (Lebel et al. 2011; Manuta et al. 2006; Dasgupta and Beard 2007). Governments cannot be expected to independently solve the challenges of adaptation for the region's urban poor. The challenge lies in how governance actors and institutions can improve adaptive capacities to climate change (Lebel et al. 2011). In urban areas that are characterized by a diversity of ethnicity, class, and interest, supporting social justice through collective adaptation means that actions must be framed in terms of rights and governance. How urban actors can create new mechanisms of collective decision-making, engagement, and linkages to formal state institutions remains a pressing research concern.

1.5 Common Themes and Issues of Concern

The chapters in this volume all draw on original and very recent fieldwork conducted in traditionally overlooked cities of Southeast Asia and on the common UCRSEA conceptual framework we elaborate above. They each focus on one or more of the three core questions and, consequently, when read together they articulate and highlight recent knowledge and experience dealing with climate-related issues in urban Southeast Asia. Because the authors all seek to integrate material from their fieldwork with the most recent theoretical work around topics such as resilience, vulnerability, and climate, the chapters make significant contributions in terms of both theory and practice. Not only do the authors address key debates occurring in critical geography, political ecology, and elsewhere but they also establish what is actually occurring in secondary cities in current ongoing processes. Many of the scholars included in this book speak with first-hand knowledge of place as they bring a critical eye to the structural dynamics affecting urban residents.

One of the primary concepts that almost all of the chapters explore is vulnerability. The notion of vulnerability is situated within frameworks of systems vulnerability, urban livelihoods, political ecology, and structural violence at multiple scales—from the level of neighbourhoods, cities, regions, and beyond. Many of the authors choose to anchor their discussions about vulnerability at more than one interconnecting scale. Through the lens of the poorer neighbourhoods in Dawei, for example (Chapter 2), both systems and people-centred approaches help explicate people's vulnerability to climate change impacts as well as other nonclimatic stresses. The chapter also situates the discourse of vulnerability within the broader transitioning urban systems in Myanmar. Similarly, in Chapter 3, Danny Marks uses the perspective of political economy to assess vulnerability in Khon Kaen by focusing on informality in the context of water access. Legal boundaries, formal rules, and institutional practices can work to increase people's vulnerability to droughts in slum communities. Angelica de

Jesus-Bretschneider in Chapter 4 takes a supranational perspective and finds that the socioeconomic conditions apparent at the regional and local scales have their roots in international and national labour practices. In fact, the policies around labour and employment practices that national governments implement may most significantly affect the vulnerability of many city residents the most, in this case Myanmar migrants in Phuket. Her work links structural violence to significant levels of deprivation and powerlessness. Building the capacity and reducing the vulnerability of migrants across the region has to address agents, systems, and institutions at a foundational level if their situation is to improve.

A second common theme in most of the chapters deals directly with the tensions arising from the concept of resilience in terms of urbanization and climate change. The growing interest in applying resilience as an approach sometimes fails to achieve intellectual coherence—there are different meanings and various social and political objectives regarding resilience in planning theory and practice (Davoudi et al. 2012; Davoudi et al. 2013; Hambleton 2015). The dominant misuse of resilience promotes a depoliticized, managerial, or technical view of urban planning that neglects fundamental social conflicts and hierarchies of power, especially when it comes to structural inequalities embedded in oppressive power systems (Hambleton 2015). According to most critiques, the resilience framework has been commonly implemented as a reactive and technological approach rather than including power and politics as well as integrating the issues of social, economic, and environmental well-being to plan cities more proactively (Mehmood 2015).

Almost all of the work on urban issues and climate change impacts that respond to these critiques calls for effective, multilevel, and place-based leadership to respond to inequality, exclusion, and climate change in the context of urban and regional governance. It is important to offer a correction to enhance resilience theory and practice (Hambleton 2015). Resilience should be considered as a long-term strategy to tackle modern urban problems. Rather than focusing on technical solutions suggested by engineers and bureaucrats to manage impacts, resilience must support social innovations through place-based creativity among affected communities and stakeholders to help improve social relations, cultivate empowerment, and fulfil people's needs (Kelman et al. 2016).

Given their location in one of the most disaster-prone regions in the world, Southeast Asian cities aspire to resilient urban governance to help tackle uncertain hazards in the rapidly growing region. For example, in Chapter 5, Hue Le and Ly Ha document how most secondary cities face innumerable challenges. Most structures—including buildings, roads, and water infrastructures—are constructed without meeting regulations or adhering to best practices. The governance of Ninh Binh in peri-urban Vietnam is fraught with tensions between economic development and environmental protection. Many of the community members feel disenfranchised and suffer both economic and physical consequences of a poorly planned Enterprise Zone located within the confines of their community. Rather than reaping the benefits of more secure employment and better infrastructure, community members experience more vulnerability and have few avenues through which to enhance their possible resilience to the impacts of increased flooding, shorter growing seasons, and more polluted air and water.

Graham Reeder, in Chapter 6, explores how the city of Bagos in Myanmar might achieve more effective governance in the face of climate impacts by relying on local knowledge and context-specific solutions to flooding, connecting the historical contexts with broader regional conditions in Myanmar. Within the transitioning and contesting urbanization of Battambang, Cambodia (Chapter 7), the resistance of marginalized individuals plays a limited role in local power dynamics and the cultural origins of policymaking—it fosters a more inclusive sphere of decision-making to address uneven social and spatial conditions. As Try Thuon and Yanjun Cai note in their richly detailed account of the circumstances facing residents with poor access to land security, the political reality of life in secondary cities can undermine many attempts to enhance livelihoods and future prospects. The elite's political control, wedded to the economic speculative value of land in even a secondary city, is such that many individuals have to resort to everyday practices of resistance to enhance climate resilience in their circumstances. Even in cities experiencing economic growth while the climate causes hotter and longer periods of drought, there are few efforts to address common issues together through inclusive discussion.

Much of the book's last section focuses on improving well-being in urban areas to respond to climate change, which generally requires strengthening the agency of individuals, groups, and institutions. Furqan Asif examines material, relational, and subjective well-being through the practices of migrants and nonmigrants in coastal Koh Kong, Cambodia (Chapter 8). He finds interesting interactions between migration and social well-being that link to climate vulnerability. In particular, residents in the coastal region that is quickly becoming more urban than rural seem to have very little incentive to work together to create better environmental or livelihood conditions. As in other countries and places, institutions and agencies take a very limited role in building resilience or limiting vulnerability. On the other hand, the opportunities afforded to many young workers to learn new skills, earn additional income, and share knowledge may provide a pathway to improved well-being in the short run as well as greater voice in their circumstances in the longer term. In Chapter 9, Thao Hoang and Gwenn Pulliat explore the case of Trang An, Vietnam, focusing on ecotourism development as a contextual force that can bring transformation to climate adaptation at the same time that such transformations may lead to emerging vulnerabilities that originate from uneven power dynamics and access to resources. There is a tension between protecting and developing environmental resources, such as waterways and landscapes. It does not resolve itself equitably between those who own the resources and those who labour in the tourist venues. The result is enhanced vulnerability for some who have limited space to comment on or critique the developers or the state. Finally, in Chapter 10, Gwenn Pulliat examines Lao Cai, a city on the border with China, where there are overt contradictions between climate policy implementation and ambitious urban development plans. Here, as in many of our urban settings, the local capacity of resources and knowledge for effective climate change adaptation and mitigation is critical but absent. Residents affected by increased flooding, landslides, and rampant development investments see little improvement in their livelihood situation while decisions about their city and neighbourhoods take place without consultation. Even in a country with a relatively strong

history of environmental legislation as well as investment in public services, urban residents need to uncover new ways to influence practices and policies.

1.6 Summary

Martin, Marschke, and Win (Chapter 2) situate their vulnerability analysis in Dawei, a secondary coastal city in southeastern Myanmar that is undergoing rapid urbanization. Looking at the poorer neighbourhoods in Dawei, the authors examine both systems and people-centred approaches to understand the vulnerability of residents to climate change impacts as well as other nonclimatic stresses. Specifically, they describe the exposure of Dawei's urban systems to various climatic and nonclimatic stresses and consider how access to infrastructure and services plays a role in local sensitivities, and how this affects people's daily livelihoods. The chapter also connects the discourse of vulnerability with the broader urban systems in Myanmar. The authors call for improvements in current urban systems and livelihood options to address the drivers of vulnerability.

Marks (Chapter 3) utilizes a community-based case study as well as an actor- and discourse-based methodology to investigate how slum communities' residents in Khon Kaen in northeastern Thailand are exposed to climate risks, particularly drought. He relies on a political economy approach to explore vulnerability in Khon Kaen and investigates informality in the context of water access. He notes that legal boundaries and formal settings can improve people's vulnerability to droughts in the slum communities and finds that socioeconomic conditions from the national and regional levels significantly affect their vulnerability in the sphere of cities. Informality can be more effective in building resilience compared to the formal approaches.

Through her case study of Myanmar migrants in Phuket, Thailand, De Jesus-Bretschneider (Chapter 4) links structural violence with vulnerability to address critical concerns with the poverty-neutral approaches of existing climate resilience frameworks. She relies on qualitative methods, based on interviews with 80 Myanmar migrants in Phuket to assess and demonstrate a dimensional perspective on vulnerability. Existing agents, systems, and institutions in Phuket perpetuate patterns of discrimination, marginalization, and increasing climate vulnerabilities for Myanmar migrants. Transformations of climate resilience must address this constellation of existing frameworks to connect with individuals, community groups, cities, and nations.

Le and Ha (Chapter 5) examine the vulnerabilities and challenges that flooded communities face in the peri-urban area of the city of Ninh Binh in Vietnam. Qualitative and quantitative data include household interviews, focus group discussion, and key informant interviews with government officials. Applying the Framework for Climate Vulnerability Assessment in urbanizing Ninh Binh, they argue that regulations for unplanned, unregulated buildings and underdeveloped water infrastructures are lacking. In peri-urbanizing Vietnam, the tensions between economic develop-

ment and environmental protection are visible and significant. Inclusive and gender-responsive governance responses are greatly needed.

Using qualitative mixed methods, Reeder (Chapter 6) investigates how floods have been governed in the context of climate change near rapidly urbanizing Bago in the greater Yangon region of Myanmar. He explores flooding and the development of a risk management framework historically as well as the role of political ecology in considering disasters and their extension to urban areas. To implement more effective resilient governance, Reeder calls for the application of local knowledge and context-specific solutions to flooding, connecting the historical contexts with broader regional conditions in Myanmar.

Thuon and Cai (Chapter 7) examine social resilience among residents of Battambang, a Cambodian town undergoing urban growth and increasing regional connectivity. Adopting concepts from the political ecology of resilience and James Scott's metaphor of everyday forms of resistance, the authors critically examine people's strategies for dealing with challenges embedded in transitioning and contesting urbanization. Through participant observation, document analysis, focus groups, and key actor interviews, the authors argue that the resistance of marginalized individuals can play a role in local power dynamics and policymaking to foster a more inclusive sphere of decision-making to address uneven social and spatial conditions.

Asif (Chapter 8) applies a comparative approach to examine the material, relational, and subjective well-being of migrants and nonmigrants in Koh Kong. By exploring select fishing villages in coastal Cambodia, he uncovers how migration has affected social well-being, what trade-offs have been made, and what it means to be a migrant for people from fishing villages who face significant environmental and economic changes. He situates migration and social well-being within a broader discourse of climate change in the region.

Many transitioning cities in Southeast Asia encounter dilemmas between growth and ecotourism in the context of climate adaptation. Hoang and Pulliat (Chapter 9) adopt a contextual vulnerability framework to examine the urbanizing Truong Yen commune in the Trang An scenic landscape complex, a natural and cultural UNESCO World Heritage site in the Red River Delta of Vietnam. The case of Trang An represents the dynamics of community-level vulnerability. The chapter explores ecotourism development as a contextual force that can bring transformations to climate adaptation. Such transformations also lead to vulnerabilities that originate from power dynamics and uneven accesses to resources.

On the border with China, Lao Cai experiences tension between climate policy implementation and ambitious urban development plans. Pulliat (Chapter 10) utilizes two interconnected sets of interviews to examine the implementation of environmental policy in this expanding secondary city in Vietnam. In spite of its official willingness and policy endorsement for a more climate-resilient urban development, the city's local capacity regarding resources and knowledge for effective climate change adaptation and mitigation is critical but absent.

Together the chapters in this book provide readers with a more thorough understanding of vulnerability, governance, and resilience through first-hand evidence and narratives from secondary cities in Southeast Asia. The goal of the book and the

UCRSEA project is to suggest possible next steps, even as urban systems are dramatically changing in the face of socioeconomic and environmental challenges. Much of the research work we present here finds that effective vulnerability assessment and resilient governance require that cities and regions connect to individuals, communities, and beyond to include various voices, utilize different forms of knowledge, and mobilize diverse resources through interdisciplinary and multi-sector approaches. Those who are directly affected by climate change (socially, economically, and ecologically) need to be involved in discussions about climate adaptation strategies (Evans 2011). A major challenge to such participation is that in cities of the Global South both large and small, there are typically very limited opportunities to contribute to dialogue on local climate issues. As our authors document through myriad examples, problems arise from a lack of willingness to encourage people to participate, socio-spatial restrictions that make participation difficult, or institutions that fail to facilitate public discussion and input

It is clear that a fundamental element of resilience and one reason that there are often operational problems and misunderstandings about its measurement and significance is the fact that resilience is an overarching concept with multiple meanings that depend on how it is used (Bahadur and Thornton 2015). The authors strive to include in their chapters clear definitions of resilience and what aspect of resilience is being measured because these elements are subject to change depending on local context (Carpenter et al. 2001). In many circumstances, in fact, resilience at one scale can actually come at the expense of resilience at another scale (Chelleri et al. 2015). This means, as many of the scholars in the book note, that careful consideration must be given to who benefits and who loses when applications of resilience are applied. By addressing the shortfalls of the stand-alone perspectives of engineering, ecological, and social types of resilience, urban resilience can and should evolve as a proactive rather than reactive view of planning by transforming and empowering local communities (Davoudi et al. 2013). Communities should serve as a significant actor in resilient place making through their capacity for learning (preparedness), robustness (persistence), and ability to adapt and innovate changes (transformability).

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Part I
Understanding Vulnerability: Neighbourhoods, Cities, and Nations Beyond

Chapter 2
Bridging Systems and People-Centred Approaches in Urban Vulnerability Research: Insights for Resilience from Dawei, Myanmar

Taylor Martin, Melissa Marschke and Saw Win

Abstract Dawei, a coastal secondary city in southeastern Myanmar, is poised to face significant social and environmental change. Dawei's location at the head of the Dawei River estuary, just 30 kilometres from the Andaman Sea and 350 kilometres to the west of Bangkok, has attracted increasing attention from foreign investors. Namely, to develop a Special Economic Zone, build the largest deep-sea port in the region, and connect Dawei by road to the southern economic corridor of mainland Southeast Asia. Little is known about how these developments will affect Dawei, nor how climate change will interact with such changes to shape urban vulnerability. In this chapter, we examine how Dawei's urban systems are exposed to various climatic and non-climatic stresses and investigate how this plays out through people's everyday livelihoods. Our analysis then turns to how people cope and adapt to social and environmental change, illuminating how social capital and the ways that people relate are fundamental to shaping resilience. We situate this analysis within the larger context of Myanmar's political and economic transition, highlighting both the challenges that this transition poses to vulnerability and the possibility of shaping a resilient future.

Keywords Vulnerability · Livelihoods · Environmental change · Urban socio-ecological systems · Secondary cities · Myanmar

Asian cities, where more than half of the planet's urban population lives, are rapidly urbanizing. This trend will continue. By 2050, Asian cities will have grown by 1.25 billion people, with much of this growth anticipated to take place in secondary cities

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with a population of 500,000 or less (UNDESA 2014). With such rapid urban growth comes a host of social-ecological challenges. Rapid economic development exacerbates environmental change as cities develop and draw on ecosystems for the provisioning of basic services (water, energy, transportation, and food). Such services are not drawn upon equally. The world's poor have limited access to basic water and sanitation, and often live in slums and hazard-prone areas that are extremely exposed to climatic disturbances (Satterthwaite and International Institute for Environment and Development 2007). Understanding these vulnerabilities is a growing area of concern in development research and policy,[1] particularly in rapidly urbanizing smaller cities that often lack basic services, have higher rates of poverty, and have limited institutional and financial capacities to prepare for, mitigate against, and adapt to climate change (Middleton and Krawanchid 2014; Satterthwaite 2006).

Myanmar is experiencing rapid socioeconomic and environmental changes. Although 70% of Myanmar's population of 51.4 million people continue to live in rural areas (Ministry of Immigration and Population 2015a), urbanization has grown steadily between 2000 and 2010 at 2.8% annually (UNDESA 2014; World Bank 2015a). Myanmar's urban growth is low relative to other Mekong region countries. Between 1992 and 2010, cities in Myanmar grew by 24% compared with cities in Vietnam by 880%, Cambodia by 360%, and Laos by 600% (Ouyang et al. 2016). Such low urban growth is linked to Myanmar's political and economic isolation having been subject to almost 50 years of authoritarian military rule (Ouyang et al. 2016; World Bank 2015a, b).[2] Myanmar's current government—democratically elected in 2015—has adopted a policy of economic liberalization that will likely accelerate the country's transition from a largely agrarian society to one that is increasingly urban. Projections estimate that 55% of Myanmar's population will be urban by 2050 (Ganesan 2017; UNDESA 2014). As migrants from rural areas seek perceived opportunities in Myanmar's emerging cities, challenges persist in addressing the financial and human resource constraints of municipal governments to provide basic water supply, sanitation, drainage, and wastewater facilities to existing and growing urban populations (ADB 2013).

Myanmar's urban development challenges are compounded by high levels of exposure to climate-change hazards such as extreme drought, cyclones, intense rainfall, flooding, storm surges, and sea-level rise (Eastham et al. 2008; NECC et al. 2012). Climate data suggest that since 1977 Myanmar has experienced both a gen-

[1] Urban Climate Resilience in Southeast Asia Partnership (UCRSEA); Mekong Building Climate Resilience in Asian Cities (M-BRACE); Asian Cities Climate Change Resilience Network (ACCCRN).

[2] Following the military coup d'état in 1962, the adoption of socialist isolationism led to the steady decline of Myanmar's economy (Rieffel 2012). In response to the eruption of mass democracy protests in 1988 and the perceived failure of the Burmese Way to Socialism, General Than Shwe seized power, pledging to oversee Myanmar's disciplined transition to democracy (Farrelly and Win 2016). Throughout the 1990s widespread cronyism on behalf of the military elite in newly privatized state enterprises and the imposition of western sanctions stifled any real strides in economic liberalization (Rieffel 2012).

eral warming trend and a decreasing level of precipitation (NCEA 2010), while also experiencing a later-onset monsoon. For example, the duration of the rainy season has decreased to 105 days from the average of 145 days, exacerbating already serious water scarcity in many parts of the country at the end of the dry season (Swe et al. 2015). Persistent challenges stemming from multidimensional poverty and low levels of human development (Eastham et al. 2008; World Bank 2015) compound such high levels of exposure.

Poverty and vulnerability to climate change are not synonymous and require careful deliberation when framing research and policy imperatives around vulnerability (Friend and Moench 2015). A part of this challenge is to disentangle the complex dependencies that form between ecological, technological, and institutional systems within and outside the immediate urban area of large urban centres and emerging secondary cities (Friend and Moench 2015; da Silva et al. 2012). Considering cities as complex, adaptive socio-ecological systems can help us to assess the shocks and stresses that affect infrastructure and the basic supply of services to urban areas (da Silva et al. 2012) and that ultimately have an impact upon urban populations. However, the uptake of systems approaches in vulnerability research does not necessarily consider how questions of power and resource access shape vulnerability within the urban environment. In attempts to bridge these questions, researchers have begun to advocate for more people-oriented approaches to consider how vulnerability is differentially distributed across social groups based on system access (Friend and Moench 2013, 2015; Friend et al. 2015). Others have taken these questions further by framing research beyond who is vulnerable and to what to consider the structural-relational drivers behind the vulnerability of certain groups (Cuomo 2011; Tschakert et al. 2013).

In this chapter, we explore how research might bridge systems and people-centred approaches by analyzing vulnerability in one of Myanmar's emerging secondary cities: Dawei. Drawing from systems (Turner et al. 2003a) and livelihoods (Scoones 2009) perspectives, we link a macro-level understanding of the broader systems and processes shaping the vulnerability of urban systems with a micro-level understanding of vulnerability across two areas of Dawei. Specifically, we examine how Dawei's urban systems are exposed to various climatic and non-climatic stresses and how access to infrastructure and services shapes local sensitivities, investigating how this plays out in terms of people's everyday livelihoods. We then turn to how urban vulnerability is manifest for the poorest and most vulnerable groups, while considering how social capital and the ways in which people relate are fundamental to shaping resilience. By situating this analysis of vulnerability in Dawei within the larger context of Myanmar's political and economic transition, we highlight both the challenges that this transition poses to vulnerability and the possibility for shaping a resilient future.

2.1 Bridging Systems and People-Centred Approaches to Vulnerability Research

Vulnerability, as defined by the Intergovernmental Panel on Climate Change (IPCC), refers to the 'degree to which geophysical, biological and socio-economic systems are susceptible to, and unable to cope with adverse impacts of climate change' (2007, 27). Definitions of vulnerability typically share three key elements: exposure, sensitivity, and the ability to cope or build adaptive capacity (Bruno Soares et al. 2012; Carter et al. 2015; Miller and Bowen 2013). Exposure is an external component of vulnerability that refers to the preconditions and positioning of physical assets, infrastructure, and populations in relation to climate-related stimuli and impacts (Costa and Kropp 2013; Pachauri et al. 2014). Sensitivity, in contrast, is an internal component of vulnerability, defined as the extent to which populations or assets are subject to change as a result of being exposed to a given hazard (Krellenberg et al. 2014; Kuhlicke et al. 2012). While exposure and sensitivity interact to determine a given impact's intensity, coping and adaptive capacity shape how systems and populations respond to and manage stress and disturbance (O'Brien et al. 2006).

Broadly speaking, there are three schools of thought that focus on vulnerability analysis: (1) biophysical approaches (Ambraseys and Jackson 1981; Liverman 1990), (2) social approaches (Adger and Kelly 1999; Blaikie et al. 1994; Pelling 2003), and (3) integrated approaches (Ford 2002; Gallopín et al. 2001). The biophysical approach is based in the natural hazards tradition, which conceptualizes vulnerability according to biophysical sources of exposure and its potential impact relative to the sensitivity of the system under analysis (Bruno Soares et al. 2012; Romero Lankao and Qin 2011). Social approaches focus on the inherent and contextual aspects that render systems, areas, and populations vulnerable to climate change (Bruno Soares et al. 2012; Ford et al. 2010; Romero Lankao and Qin 2011). They draw from theories of political economy, political ecology, and livelihoods to emphasize the social, economic, and political determinants that cause populations to be differentially vulnerable to sources of exposure (Romero Lankao and Qin 2011). Although social approaches provide a strong understanding of the contextual and causal sources of vulnerability, scholars criticize them for lacking a complete understanding of biophysical hazards and impacts (Bruno Soares et al. 2012; Cardona 2004). By contrast, integrated frameworks of vulnerability merge approaches to conceptualize biophysical and social systems as interconnected and modelled according to the coupled human–environment system or the social–ecological system (Bruno Soares et al. 2012). Such approaches aim to understand the multiplicity of stresses and processes that contribute to the vulnerability of systems and populations, while regarding these processes as constantly changing based on feedback loops that form within and between system components (Bruno Soares et al. 2012; Folke 2006; Liu et al. 2007).

Despite similarities, approaches vary in their consideration of scale, feedback loops, biophysical and social components, and political economy (Blaikie et al. 1994; Birkmann 2006; Cutter et al. 2000; Reed et al. 2013; Turner et al. 2003a, b). Turner and colleagues' sustainability systems vulnerability framework (2003a) (Fig. 2.1) uses nested scales of analysis to assess vulnerability—which is considered according

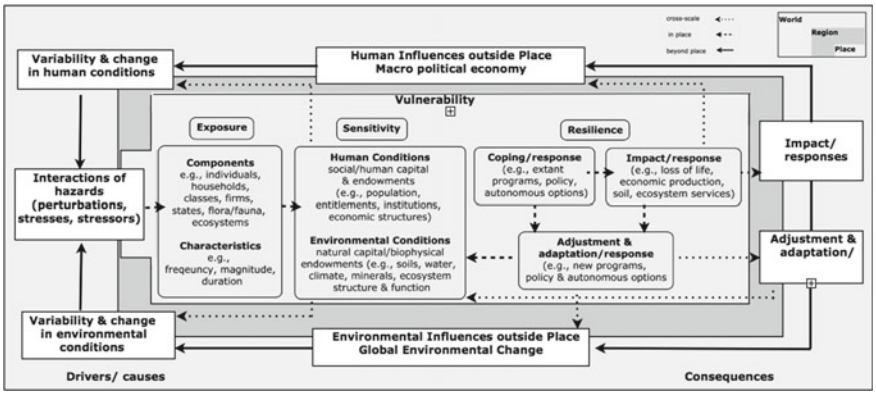

Fig. 2.1 Sustainability systems vulnerability framework. (Adapted from Turner et al. 2003a, b)

to elements of exposure, sensitivity, and resilience in the form of impacts and coping and adaptation responses. Exposure to stresses stemming from wider drivers of socio-ecological change interacts with the sensitivity of specific places, systems, and populations via human and environmental conditions, leading to a range of responses in the form of impacts, coping, and adaptation. The framework is grounded by principles that attempt to balance systems and people-centred approaches by acknowledging the role of local stakeholders in defining issues related to vulnerability and recognizing the differential vulnerability of social groups and households.

Livelihood approaches have been widely applied in vulnerability research to consider households' capacities and assets to pursue livelihood objectives or cope with shocks and stress (Ashley and Carney 1999). Livelihood approaches originally emerged from the seminal work of Amartya Sen in the 1980s, and the work of Chambers and Conway in the early 1990s (Sen 1980; Ashley and Carney 1999; Chambers and Conway 1992; Scoones 1998). A livelihood analysis focuses on the activities and resources that people draw on to earn a living. The capacities and constraints of households to pursue livelihood objectives largely depend on the combination of human, social, physical, financial, and natural capital—in other words, endowments. Institutional structures are fundamental to shaping households' endowments, and in turn their entitlements, meaning people's command over household resources based on access to different capital and services (Ashley and Carney 1999).

In the highly monetized character of cities, financial capital is essential in determining access to goods, food, shelter, and water (Miekle 2002). In the absence of financial capital, however, social capital becomes even more essential to urban survival for the poorest and most vulnerable who may rely on neighbours to access food or water, or depend on networks of relief to cope during times of need (Farrington et al. 2002).[3] To assess vulnerability, we explicitly consider shocks and stresses in relation

[3]Social capital refers to the networks of relationships and mutual support that people draw on to access resources within and external to a community (Farrington et al. 2002; James and Paton 2015).

to people's capital. For example, shocks can destroy and damage assets directly and force people to abandon their homes or dispose of assets, whereas stresses tend to be more benign, often affecting the rates of return to livelihood strategies in the form of seasonal shifts in prices and employment opportunities (Ashley and Carney 1999; Scoones 1998). In response, people draw on their range of available capital to cope with and adapt to shocks and stress.

Our work seeks to bridge systems vulnerability analysis with livelihood approaches to understand how vulnerability is manifest at the community and household level. In combining these approaches, we aim to bridge a macro-level understanding of the broader systems and processes shaping the vulnerability of urban and supporting ecological systems with a micro-level understanding of certain groups' vulnerability. By framing vulnerability according to the livelihoods, entitlements, and priorities of households, we want to understand 'what is it people are concerned about and why, and how can it be addressed?' (Tschakert 2012, 155). These questions are at the heart of our research in which we view social agency, equity, and representation as key to understanding how vulnerable groups frame issues of vulnerability, inclusive of concerns that are directly and indirectly related to climate change.

2.2 Understanding Dawei

Dawei is a coastal secondary city in southeastern Myanmar. Its location on the Andaman Sea, 350 kilometres west of Bangkok, combined with the wealth of natural resources in the region has attracted increasing attention from foreign investors[4] in terms of coal mining and speculation related to a planned special economic zone (SEZ). Large oil and gas companies are keen to further develop the vast offshore natural gas reserves located northwest of Dawei (Rieffel 2012). Developers view the deep-sea port (which will be the deepest in the region) and the SEZ as part of a 135-kilometre development corridor between Dawei's SEZ and Thailand's Kanchanaburi Province, effectively establishing Dawei as a node on the Asian Development Bank's regional economic corridor.[5] Despite the scale of planned industry, Dawei's current economy remains driven by agri-

Network can either be vertical (patron/client) as in the case of bridging social capital or horizontal in the form of bonding social capital (shared interests, familial bonds, and kinship); formal through membership to organizations; or informal based on relationships of trust and reciprocity (Ashley and Carney 1999).

[4]Foreign Direct Investment (FDI) has fueled economic growth in Myanmar—8.4% as of 2016 (Asian Development Bank 2016). Projections suggest that Myanmar may attract up to USD 100 billion in FDI over the next two decades (Chhor et al. 2013). Questions remain about whether FDI will result in broad-based economic development because 98.1% of total investment approvals since 2000 have been in the extractive and power sectors (Bissinger 2012).

[5]Dawei is the final/beginning destination on the Greater Mekong Sub-region/Asian Development Bank's Southern Economic Corridor where the Phu Nam Ron road links Dawei to neighbouring Kanchanaburi Province in Thailand, through Bangkok, Phnom Penh, and onward to Ho Chi Minh City (ADB 2015).

culture, forestry, mining, fisheries, and to a growing extent, tourism (UNDP 2014). Local people struggle to earn their livelihood, however, and underemployment has led to an extensive out-migration of household members from the Dawei District into neighbouring Thailand. More than half of the total population from the Tanintharyi region, where Dawei is located, work in Thailand (Ministry of Immigration and Population 2015b), often in the fishing and construction sectors (Fig. 2.2).

We used qualitative research methods for data collection and analysis in three sequential phases spanning household, community, urban, and district levels. Phase 1 involved a situational analysis of the social, economic, political, and ecological context of the Dawei District through a careful review of secondary data from government documents, grey literature, and newspaper articles. Phases 2 and 3 focused on two sample subgroups to understand how urban vulnerability is manifest at the community and household level. The second phase involved semi-structured key informant interviews ($n = 18$) and focus groups ($n = 2$) with representatives from the Development Affairs Organization (the most decentralized government agency), Dawei University, and nongovernmental and civil society organizations. Questions probed into social and environmental change, urbanization, past and potential shocks and stresses, urban infrastructure and services, and vulnerable populations.

The third phase, completed through snowball sampling, involved household semi-structured interviews ($n = 41$) within two sample subpopulations. Our questions probed into peoples' livelihoods, everyday challenges, coping and adaptive capacities, and access to infrastructure and services. We used NVivo, a qualitative computer software programme, to help with coding and analyzing participant interviews. We shared our findings with community members, civil society groups, and government representatives through project briefing reports and workshops to verify findings and continue the research dialogue.

The first neighbourhood is Karapyien South—a peri-urban area that we selected for its flood exposure and sensitivity in water access and livelihoods. The majority of households moved to the area in the last 10 years and squat on government land because people cannot afford rent or land title. The second neighbourhood is Kyetsarpyien—a semi-urban area we selected based on the exposure of groundwater to saline intrusion and the residents' precarious livelihoods. Kyetsarpyien is a slum where many families live together in the same household (Table 2.1).

Respondents noted that these were two poor, vulnerable areas within Dawei. Names are local, given to these particular micro-neighbourhoods (in Myanmar, cities are broken down into ward tracts, which are neighbourhoods in terms of area and often in terms of social aspects). Neighbourhood A is more recent with households renting land or squatting on land. The rent is cheaper here than in other parts of Dawei since it is located on a flood plain. Neighbourhood B, in contrast, has been established for over 20 years. Its households gain land title through the support of a former factory owner.

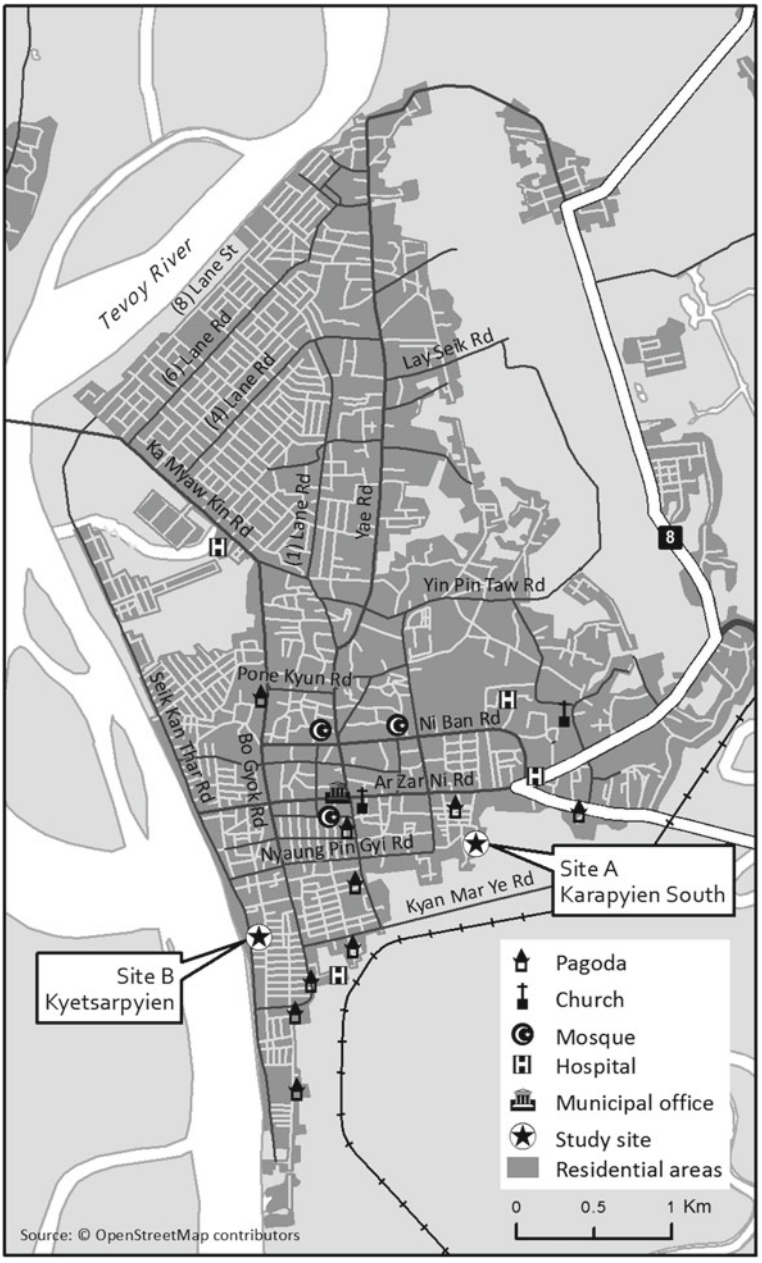

Fig. 2.2 Map of research area. (*Source*: OpenStreetMap contributors)

Table 2.1 Comparison of neighbourhoods

	Neighbourhood A: Karapyien South	Neighbourhood B: Kyetsarpyien
Location	Southeastern Dawei, a peri-urban environment (next to a tributary to the Dawei River, paddy fields, and a monastery)	Southwestern Dawei, a semi-urban environment (next to Dawei River)
Average household size	5.5 persons	9.6 persons
Average time in area	Less than 10 years	More than 20 years
Land title	Home ownership: 16%; renting: 31%; squatting: 53%	Home ownership: 100%

Note: Average household size includes extended family members living within household. Comparison is based on primary field data collected by Taylor Martin and Saw Win and key informant interviews.

2.3 Exposure: Dawei's Urban Systems

Dawei's urban systems are exposed to various climatic stresses, including water supply and flooding, and non-climatic stresses such as land speculation and general development. In terms of climatic stresses, over two-thirds of Dawei Township obtains its groundwater from shallow and tube wells (Ministry of Immigration and Population 2015b). Water scarcity is prevalent in the pre-monsoon season (March to May), and saltwater intrusion is an issue throughout the year in riverbank areas. One interviewee noted that 'about eight metres from the river bank … they cannot dig a well because of salty water' (KI.18). Rising temperatures and the increased prevalence of drought augment exposure to seasonal water scarcity, whereas saline intrusion in riverbank areas is exacerbated by sea-level rise, which is anticipated to increase between one-quarter and one-half metres by 2100 (Ministry of Environmental Conservation and Forestry, Ministry of Transport, and United Nations Environment Programme 2012). Urbanization compounds exposure to existing climatic stresses—growing residential and commercial demand without differentiation of supply will inevitably undermine sustainable rates of groundwater recharge.

Conversely, annual flooding is prevalent in southwest Dawei in the monsoon season (July–August) when periods of heavy rainfall coincide with high tide on the Dawei River. Exposure is highest in lowland riverine and peri-urban areas and along creeks and streams. More concentrated rainfall combined with anticipated sea-level rise is expected to have an impact on the meteorology and hydrology of Dawei and thereby heighten flood exposure (Ibid. Naing 2008). Anticipated population growth and urban expansion in flood-prone areas—a significant aspect of Dawei—will most likely also exacerbate flooding.

Non-climatic stresses affecting Dawei's wider ecological systems also influence exposure to risk. For example, land speculation and resulting deforestation around

Dawei's SEZ and road corridor to Thailand (Woods 2015) are likely to have severe implications for water supply and flooding.[6] Large-scale mines backed by Chinese and Thai investors, such as the Heinda and Bawapin mines (among others), have resulted in the widespread contamination of surface water in the Dawei District (Tarkapaw Youth Group et al. 2015). Rapid development compounds vulnerabilities, including from seven coal-fired power plants that have been developed or are in the works (Ibid.).[7] One interviewee explained, 'water resources … [there is] more and more damage from extracting natural resources, logging, mining … If you go along the road to the border [Thailand], only two to three rivers are maintained as original, so almost every river area is damaged, already polluted' (KI.11). Although these stresses are not necessarily climatic or urban in scale, they have serious implications for the wider ecological systems that support the functioning and provisioning of ecosystem services in Dawei.

2.4 Sensitivity: Access to Dawei's Urban Services

Table 2.2 indicates how urban services vary across the two neighbourhoods within the city of Dawei. Karapyien South (site A) exemplifies the vulnerabilities affecting a peri-urban informal settlement where infrastructure development and the provisioning of services lags behind the growth of the community. In contrast, urban infrastructure and services are relatively more developed in Kyetsarpyien (site B), exemplifying a space in the city that has developed over a longer time frame and is more connected to services. Although both these sites represent low-income communities within Dawei, differences in access to basic infrastructure and services illustrate how entitlements are unevenly distributed between social groups within an urbanizing context.

In neighbourhood A, access to electricity, sanitation, and drainage is limited and infrastructure is rudimentary. The majority of households depend on the nearby monastery for drinking water and neighbours for household use. By contrast, the majority of households in neighbourhood B have access to electricity, sanitation, and drainage infrastructure, however rudimentary. Households depend on private suppliers for water, drawing from the municipal system for everyday use and tankers or bottle distributers for drinking water because groundwater is saline. In both study sites, municipal waste collection is limited so households either burn or dispose of waste behind their homes, or for Kyetsarpyien (B) households, by directly disposing waste into the Dawei River.

[6] Deforestation is linked to the loss of surface and groundwater, as well as downstream flooding caused by increased sedimentation and the loss of natural drainage in upstream areas (Rays of Kamoethway Indigenous People and Nature and Tensasserim River and Indigenous People Network 2016).

[7] According to Tarkapaw Youth Group et al. 2015, coal-fired plants are approved through high-level connections, without the appropriate environmental or social impact assessment or local consent.

Table 2.2 Access to basic urban services in two neighbourhoods

	Neighbourhood A	Neighbourhood B
Electricity	Majority of households lack electricity because of unaffordable operating and installation costs. Insecurity of land tenure is a disincentive to invest in installation.	Majority of households have electricity. The electricity company provided subsidies to households to enable installation.
Sanitation infrastructure	Pit latrines constructed from bamboo baskets; some households share with neighbours. A few households connect their latrines directly to the stream.	Pit latrines constructed from concrete rings; a minority of households either share or have flush toilets. Sanitation infrastructure improving in this area over time.
Waste collection	No municipal waste collection: households either burn waste in the dry season or dispose of waste behind their homes where it collects in the nearby stream.	Municipal waste collection but service is irregular and unreliable. Households burn waste in the dry season or dump waste into the Dawei River.
Drainage	No built drainage infrastructure. Water collects in shallow pools underneath homes in the rainy season. Any natural drainage is blocked by the build-up of sediment and garbage.	A wooden trough lines the road in front of households. Drainage channels are littered with waste and filled with stagnant water.
Water supply	Water comes from a limited number of private shallow wells that are affected by seasonal fluctuations in temperature and rainfall. Drinking water is collected from the monastery and available throughout the year.	Ground water is saline. Drinking and household water is bought from private suppliers. Households' water is piped in from the municipal system for everyday use (not drinking) whereas drinking water is serviced from tankers or bottled distributers. Some households collect rainwater in the rainy season.

Note: Based on primary field data collected by Taylor Martin and Saw Win and key informant interviews.

Differential access to infrastructure and services between study sites shapes the sensitivity of each community to stresses affecting groundwater. In Karapyien (A), seasonal fluctuations in groundwater quality and quantity in household wells are exacerbated as a result of demand exceeding supply, so households have to travel greater distances to access water. In contrast, although groundwater is saline in Kyetsarpyien (B), the various means of supply mitigate its sensitivity. Differences between study sites illustrate how the entitlements available to households shape sensitivity, while highlighting differences within poor urban areas in terms of access to basic infrastructure and services.

Both neighbourhoods experience annual flooding in the monsoon season although the duration, intensity, and resulting impacts are far greater in Karapyien (A). Here, flooding occurs two or three times annually with water levels upwards of two metres and lasting between two to seven days. The severity of flooding has increased in recent years, which households attribute to the decreasing quality of natural drainage

which is blocked by sediment and solid waste. During severe floods, transportation is difficult or impossible and household infrastructure is damaged.

In Kyetsarpyien (B), flooding is modest and limited to the western edge of the ward occuring when periods of heavy rainfall coincide with high tide on the Dawei River. Flood levels reach up to people's ankles and last between one and two hours. Although flooding in Kyetsarpyien does not pose any immediate impacts on households, flooding in Dawei at large negatively affects those engaged in livelihoods dependent on the transportation of goods from surrounding areas. Cascading impacts from flooding on transportation and access to markets illustrate the direct and indirect impacts of flooding on peoples' livelihoods.

2.5 Livelihoods in Dawei

By analyzing people's livelihood strategies, we can contextualize households' sensitivity to shocks and stress. Although in both neighbourhoods people rely on a mix of seasonal livelihoods, in Karapyien (A) households rely on wage labour to a greater extent than in Kyetsarpyien (B). Common livelihoods in Karapyien include construction and transportation for men, while women engage in plantation processing or selling goods and vegetables. In Kyetsarpyien (B), fishing is a common livelihood activity. Men catch fish and shrimp in the Dawei River, and women sell the products in the market. Both women and men work as porters transporting goods.

Extremely wet and unfavourable working conditions during the southwest monsoon result in depressed local economic activity in the rainy season. Consequently, nearly 60% of households interviewed are engaged in seasonal livelihood activities in which transportation, construction, and fishing predominate. One interviewee explained, 'in the rainy season, we have no work. We earn no money. At this time it is very difficult' (HH3.S1.M). To cope, households adopt secondary livelihoods as casual labour but employment is unstable and income unreliable. Consequently, households struggle to afford their daily expenditures: more than half of the households we interviewed in neighbourhood A mentioned this challenge, relative to less than a quarter of households in neighbourhood B. Even so, across both neighbourhoods, the most vulnerable were those living from 'hand to mouth', namely, female-headed households, the elderly, and those suffering with chronic illness.

As a result of unstable livelihoods, many households borrow money in the rainy season, reflecting the seasonal cycle of household finances. One household explained, 'we have no regular jobs. For example, my husband has no job today—he has to do daily wages or hard labour. If he can do he [can] pay for our household. If he cannot we borrow money' (HH1.S1.F). The challenge of seasonal debt is more widespread across households in Karapyien (A) (26%) than Kyetsarpyien (B) (14%), highlighting differences between study sites in the severity of impacts from seasonal livelihoods on household finances. The lack of stable employment for many households in turn undermines their capabilities to pursue livelihood objectives, buffer shocks and stress, and address underlying drivers of vulnerability.

Table 2.3 Livelihood challenges across two Dawei neighbourhoods

Challenges	Description
Health	Health shocks and chronic illness negatively affect households through lost income, healthcare costs, and not being able to work. Health has a seasonal dimension: wet environmental conditions in the rainy season combined with poor drainage are linked to an increase in dengue fever.
Work	Seasonal livelihood opportunities and low earnings mean households have limited financial resources to buffer shocks and stresses.
Debt	Low earnings and limited savings lead households to borrow money to pay for health costs and cover expenditures during periods of seasonal unemployment. Households are caught in a poverty trap caused by a seasonal cycle of earning, saving, spending, and borrowing.
Living costs	Rising food and living costs compound the financial difficulties that households experience.
Education costs	The inability to afford tuition costs hinders the development of human capital and the upward mobility of households.
Land title	Lack of home ownership presents a source of insecurity for households (neighbourhood A).
Relocation	Squatting households fear relocation from government. Rising land and housing prices compound the financial strains facing landless households (neighbourhood A).

Note: We conducted 41 household interviews across the two neighbourhoods.

Across both neighbourhoods, health and finances emerged as two outstanding themes in the discussion of challenges that households face (Table 2.3). Health shocks and chronic illness were the most widespread challenge in light of unaffordable healthcare costs, impacts on livelihood activities, and the incurrence of debt to compensate for lost income. In the words of one interviewee, 'I have a bitter experience about this. I got this problem and I have to take a rest for ten days. At this time there is no income so I need to borrow money from other people … My earning just covers the daily spending. When there is a health problem, I cannot control' (HH.12.S2.MF). Households are highly sensitive to falling into debt as a result of sudden illness, highlighting the relationship between health, livelihoods, poverty, and ultimately, vulnerability.

The lack of land title among households also affects peoples' livelihood security. In Karapyien (A), households squat on government land or rent property in the rice fields. While renting households struggle to pay rent, squatting households face a great deal of insecurity because they fear they will be relocated. Even in areas such as Kyetsarpyien (B) where households hold land tenure, the incurrence of high debts causes households to sell their homes. For example, during the time we were conducting fieldwork, four households (of 22) sold their homes because of their need to pay off debts. The instability of land tenure and home ownership for low-income households illustrates how vulnerability is shaped by the causal chain of exposure, sensitivity, and coping strategies that can lead to even more precarious situations for the urban poor.

Households adopt various coping and adaptation strategies to mitigate the impacts of shocks and stress on well-being. For example, in response to high flood levels, households collectively mobilized resources to build a bamboo raft used to transport households to the nearby monastery. The monastery serves as a place of sanctuary while also managing resources donated from the wider community to aid in flood relief. Households have adapted coping strategies in response to the increasing severity of flooding—communities can learn from past experience and mobilize resources in response to increasing levels of risk. One community member who was instrumental in building the raft explained, 'the water level used to take time so we had time to prepare and carry things. In recent years it is very quick so this is why I suddenly got the idea that I need to make some options' (HH14.S1.M). Despite community efforts to adapt coping responses, households noted the need for more coordinated efforts to improve natural drainage to reduce the severity of flooding and its impacts.

In Kyetsarpyien (B), the contribution of multiple earners and remittances to household income help to buffer the impact of seasonal livelihoods on finances. One interviewee explained: 'so even if we are not in good condition for business we are so-so. Our daughter works in the porter service in the market, and our son is the same. We have the same challenges, and even so, we face the challenge like a forest. There is the wind and the storm—if there is only one tree, it is easy to collapse. How about the forest? We can prevent together' (HH19.S2.M). In Karapyien (A), given the smaller household size, individual households depend on networks of support within the community to cope during times of need. They often spoke of neighbours sharing food or lending money during difficult times: 'we are living as a family and we support each other. Each family. Everybody supports each other. If one family suffers, other families support' (HH8.S1.M). Despite differences between study sites, the strategies that households used to cope and adapt to stress illustrate the role of family and community in supporting one another, both of which indicate the importance of social capital in resilience.

2.6 Bridging People and Systems in Dawei

The analysis of vulnerability in Dawei illustrates the interconnectedness and, ultimately, political nature of socio-ecological systems. Stresses borne from climatic- or human-induced environmental change that are not necessarily urban in scale ultimately have place-based implications for urban systems, such as water supply or flooding. However, the wider context of political and economic transition in Myanmar allows for a greater understanding of the drivers of human and environmental change in Dawei's urban areas and supporting ecological systems. Regional integration and the influx of FDI into the Dawei SEZ and the extractive sector drives environmental change in the district: integration drives speculative deforestation,

and the extractive sector pollutes water resources (Tarkapaw Youth Group et al. 2015). Consequently, there is significant cause for concern in how Myanmar's newly democratically elected government plans for and manages the environmental risks that come with greater economic liberalization (UNDP 2015). Myanmar's rural-to-urban transition is also being played out in Dawei, and is likely to accelerate with greater regional integration as the Phu Nam Ron road corridor to Thailand is further developed. Given existing gaps in the basic supply of infrastructure and services in Dawei, formidable challenges face local government attempts to keep up with the demands of a growing urban population and economy.

Climate change coupled with stresses from economic liberalization represent the 'double exposure' of ecological and urban systems and populations. This double exposure exacerbates existing stresses and compounds institutional challenges to manage Myanmar's political, economic, and demographic transition. In Dawei, climate change compounds issues posed to water supply and flooding: rising sea levels augments the exposure of groundwater to saline intrusion, while interacting with stresses of groundwater depletion as a result of growing urban demand. Rising temperatures and the increased prevalence of drought exacerbate existing issues of water scarcity in the late dry season, while more concentrated rainfall compounds flooding in the monsoon. Given the weak organizational capacity and limited resources of the municipal office, civil society and religious organizations are integral to mobilizing resources to cope with impacts. While recognizing the importance of civil society in aiding relief, long-term adaptive measures will require greater planning and coordination on behalf of municipal, township, and district-level governments—a significant challenge considering the legacy of Myanmar's highly centralized governance structure. As we have seen with other countries in the region that have undergone decentralization, building capacity for local government takes time, both in terms of local staff capacity but also buy-in from civil society and the national level (Marschke 2012).

Despite the wider context of how stresses driving human and environmental change in Dawei are shaped by political economy, vulnerability is ultimately manifest at the local level. Although Dawei's urban systems are exposed to water scarcity and flooding, vulnerability is differentially distributed across the urban environment based on people's access to resources and social power. The most vulnerable groups are engaged in precarious livelihoods and situated in hazard-prone areas with limited access to infrastructure and services (Swyngedouw and Heynen 2003). Although both Karapyien (A) and Kyetsarpyien (B) are representative of lower income groups, their relative vulnerability to stresses affecting urban systems differs based on their access to infrastructure and services, and locale within the urban environment. In Karapyien (A), households' sensitivity to stresses affecting water scarcity and flooding is heightened by their limited entitlements to sources of water supply or drainage infrastructure. Comparatively, in Kyetsarpyien (B), despite the direct exposure of groundwater to saline intrusion, the varied forms of water supply for households mitigate the neighbourhood's sensitivity. Differences between neighbourhoods illustrate how access to infrastructure and services shapes vulnerability within the urban

environment, while also highlighting how challenges in the supply of basic services in urbanizing areas ultimately manifest in low-income communities.

However, using a systems lens to analyze household vulnerability falls short in really understanding how people experience vulnerability in their everyday lives beyond access to particular services. Adding a livelihood lens enables us to assess how people view vulnerability in light of their capabilities and daily struggles, in which questions are not necessarily framed according to 'how do you get water?' but 'what is it people are concerned about and why?' (Tschakert 2012). In raising these questions, we find that the most poignant sources of vulnerability for households concern those related to health shocks and chronic illness, unstable livelihoods, debt, and insecure land tenure. Although not necessarily synonymous with vulnerability, poverty traps households in a cycle in which low returns and seasonal income undermine people's capabilities to buffer shocks and stress, achieve livelihood objectives, reduce vulnerability, and improve well-being. Households experience vulnerability differentially, each facing their own unique challenges that shape their respective sensitivity and coping and adaptive capacities based on their portfolio of human (labour supply, health), natural (groundwater, natural drainage, and livelihood resources), financial (earnings, savings), physical (land tenure, housing, and infrastructure), and social (support networks) capital.

While shocks and stress have the potential to cause households to fall deeper into poverty, we also find that they present opportunities to showcase the resilience of human beings in mobilizing resources and supporting one another to cope and adapt to changing social and environmental conditions. For example, during periods of low seasonal earnings, households cope by adopting alternative livelihood strategies while also depending on one another—multiple earners make even the most destitute conditions bearable through shared household earnings. In the absence of financial capital, strong social networks also aid people in coping and adapting to stress. For example, households in Karapyien rely on one another by sharing food, resources, and loaning money among neighbours in periods of financial need. Bonding social capital helps households adapt coping strategies to respond to increasing exposure and sensitivity. For example, Karapyien households adapt coping strategies in response to increasingly severe flood levels, demonstrating how communities can learn from past experience and mobilize resources to increase resilience.

Wider social networks that bridge social capital also play a role in supporting communities to cope and respond to shocks and stress. Monasteries provide drinking water to low-income households and a place of sanctuary during floods. They also mobilize resources from civil society groups to enable wider efforts to relieve affected communities. Although the role of social capital in coping with stress is widely documented in the literature, its relation to resilience in Dawei is in part situated in the deeply rooted culture of Theravada Buddhism in Myanmar, where relieving the suffering of others is an important concept (Jaquet and Walton 2013). For the poorest and most vulnerable groups, social norms help in the face of stresses and shocks (but see also Okamoto 2011). The monastery is a literal source of relief (water, shelter) while also representing a space where social norms and kindness can be mobilized.

2.7 From Vulnerability to Resilience: Implications for Governance and Transformative Change

Although the discussion of how people cope and adapt in the face of adversity presents an uplifting view of resilience to vulnerability, it does not detract from the need to consider the structural–relational drivers that lead to the vulnerability of low-income groups. Accordingly, 'the overemphasis on human, physical, natural, social, and financial resource deprivation among urban slum residents … distracts from the larger structural and relational drivers that keep the balance tipped towards persistent marginalization' (Tschakert et al. 2013, 345). In considering households' entitlements to land, livelihood opportunities, and infrastructure access, we can move beyond the discussion of differential exposure and sensitivity to understand how institutional structures and processes shape the spatial distribution of resources, social power and vulnerability in urban environments. Larger questions arise when considering the drivers of vulnerability for low-income groups stemming from weaknesses in Myanmar's wider social protection and health environment. Framing the analysis of vulnerability according to these structural relational drivers is essential to address systemic inequality for climate change adaptation or resilience for the poorest or most vulnerable.

Vast changes in Myanmar's political and economic environment continue to unfold under the recently elected democratic government and evolving process of decentralization. These changes pose risks that have serious implications for vulnerability. Although economic liberalization presents great opportunity for growth, weaknesses in governance and environmental safeguards raise concerns about whether and how drivers of environmental change will be managed. Economic liberalization and greater regional connectivity will likely rapidly accelerate Myanmar's rural-to-urban transition. How the government manages this process at the local level will have profound implications for shaping vulnerability in years to come as climate change impacts become increasingly more pronounced and the breadth and density of Myanmar's cities increases. Significant structural challenges and needs remain, including improving local services, better urban planning, and building capacity of decentralized government actors to fulfil their roles and responsibilities (Arnold et al. 2015).

It is critical to consider what kind of future the Myanmar government wants to work toward. Will it be one that widens discrepancies between the haves and have-nots and exacerbates drivers of vulnerability via unsustainable resource extraction and industrial development? Or will it be one that addresses structural inequalities and builds resilience by considering social and environmental values in decision making and long-term planning in view of human and environmental change? How democracy is translated at the municipal level will be critical in determining whether local institutions will be more accountable and responsive to the needs and priorities of civil society, or address structural inequality in access to infrastructure and

services. This moment in Myanmar's history has the potential to either exacerbate vulnerability and structural inequality or pave the way for a deliberate transformation that considers environmental decision-making, social equality, and climate change in how the country develops in years to come.

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Chapter 3
Water Access and Resilience to Climate-Induced Droughts in the Thai Secondary City of Khon Kaen: Unequal and Unjust Vulnerability

Danny Marks

Abstract Much of the research conducted on urban climate vulnerability has not explored drought in cities but instead the impacts of flooding. Studies that examine vulnerability to climate-induced urban water shortages have primarily focused on the entire city or regional scale, and less on the community scale. Using two slum communities in Northeast Thailand as a case study, I address this gap using a political ecology framework to study climate-induced droughts in 2015 and 2016. In keeping with recent scholarship, I view droughts as not only natural but also as a result of social and political processes. To investigate the residents of the two communities' vulnerability to these droughts, I explore the governance processes affecting vulnerability and potential strategies that might reduce vulnerability. In addition to applying a historical and multiscalar approach to the drought, the research relies on a two-tiered methodology that combines community-based case studies with actor- and discourse-based analysis. Slum communities in Khon Kaen have been doubly marginalized by both the national and municipal governments, which weakened their resilience to the two most recent droughts.

Keywords Water access · Drought · Urban political ecology · Secondary cities Climate resilience · Khon Kaen · Thailand

In 2015 and 2016, Thailand experienced its worst droughts in decades. In 2016, almost 30 of the country's 77 provinces were declared drought affected by the Department of Disaster Prevention and Mitigation. In 2015, rainfall was 46% lower than normal and water levels were 45% of Thailand's reservoir capacity (Thaitura-

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paisan 2015). Experts believe that the effects of climate change, together with El Niño weather patterns, caused drier and unusually hot weather across many parts of the country (Wright 2016). Overall, the country's total internal renewable water resources fell 18% from an average of 3.9 million cubic metres between the years 1988 and 1992 to 3.3 million cubic metres each year during the most recent four years, 2013–2017 (FAO 2018). Much of the media's focus was on the suffering that farmers experienced as a consequence of the drought. During both years, farmers experienced sharp drops in crop yields, particularly rice (Rakkanam 2016). However, a story that went unreported was that some urban slum communities also suffered heavily from the drought.

The study of climate change's effects upon urban populations in Southeast Asia is becoming increasingly important (Mitchell and Laycock 2017). The region, particularly countries in the Greater Mekong Subregion (GMS), is urbanizing rapidly, with cities growing five times faster than those in countries belonging to the Organisation for Economic Co-operation and Development (International Centre for Environmental Management 2015). As in most of Asia (Rumbach 2016), urban growth in the GMS is projected to occur primarily in smaller urban centres in the coming decades. Because of their geographical locations (Yusuf and Francisco 2009), these small- and medium-sized cities are highly vulnerable to the risks posed by climate change, particularly floods, droughts, and sea-level rise. But as the 2011 floods in Bangkok illustrated, these risks are compounded by the ecological changes produced by rapid and often unplanned urbanization, such as land-use change, the filling in of canals and land subsidence (Marks 2015), and by municipal and provincial governments' limited capacity to sufficiently mitigate these risks in secondary cities in the GMS (Garschagen 2016). For example, in Thailand, disaster governance in urban areas has been undermined by incomplete decentralization alongside persistent fragmentation along ministerial and sectoral lines (Marks and Lebel 2016).

At the same time, vulnerability to climate risks within these cities is not uniform because the 'social production of urban space unevenly spreads the vulnerability to hazards, exposure to risk and ecological breakdown' (Murray 2009, 171). Urbanization is a contested political-economic process of exclusion and marginalization, creating new landscapes of power (Swyngedouw 1997). Political-economic processes contribute to climate risks unequally and therefore affect small cities in the GMS. Socioeconomic inequality is rising in the region (Asian Development Bank 2012; Phongpaichit and Baker 2015). Power structures are highly unequal and autocratic, with limited political space for reform (Garschagen 2015; Marks 2015). Because of their limited assets, the location of their homes, and the state's failure to protect them, the poorest often suffer most from the effects of climate change (Collins 2010).

However, other than the work of Richard Friend (e.g., Friend et al. 2014), Matthias Garschagen (e.g., Garschagen 2015) and my study of the Bang Bua Thong municipality in Central Thailand (Marks and Thomalla 2017), little research exists on vulnerabilities to climate risks in secondary cities in the GMS. There is limited scholarship on how the governance of these risks affects the poor and what can be done to reduce their vulnerability. In this chapter, I focus on a Thai secondary city: Khon Kaen. Because it grew rapidly in the past few decades and recently experi-

enced floods and droughts, the city is a good site for investigating urban climate vulnerability in secondary cities.

Most of the research conducted on urban climate vulnerability has not focused on drought but on flooding. For example, in the book *Climate Change and Cities* (Rosenzweig et al. 2011), the word *floods* appears 42 times and *heat wave* appears 15 times, but the word *drought* appears only once. Studies that have examined vulnerability to climate-induced urban water shortages have primarily focused on the entire city or regional scale, not the community scale (e.g., Gober and Kirkwood 2010; Rain et al. 2011; Revi 2008).

I seek to address these gaps by examining how urban climate-induced drought affected two slum communities in Khon Kaen where I conducted fieldwork. I explore the vulnerability of the poor to these droughts and the governance processes affecting their vulnerability. Using a political ecology framework, I examine how their vulnerability was partially caused by natural or climate factors and was also a result of unequal social and political processes that doubly marginalized them at both the national and urban scales.

3.1 The Political Ecology of Drought

So, what is a drought and how do droughts arise? The historically dominant paradigm views droughts and other disasters as caused by nature. This approach separates society from nature, viewing hazards as disorders or interruptions by the natural world. They are external to the human world and affect communities in arbitrary ways (Oliver-Smith 2004). In response, society seeks to control nature by building infrastructure to protect its population from these 'acts of God' and by warning them in advance of their occurrence (Lebel et al. 2011).

In the 1980s, scholarship from anthropology, sociology, and geography (e.g., Waddell 1977 and Watts 1983) began to question the dominant paradigm and to take 'the naturalness out of natural disasters' (O'Keefe et al. 1976). This approach culminated in Kenneth Hewitt's milestone book *Interpretations of Calamity from the Viewpoint of Human Ecology* (1983) that critiqued the dominant paradigm. Hewitt argued that most disasters are not accidental but are defining features of the society and place where they occur. The risks they pose stem primarily from 'everyday life' firmly rooted within the social structures that shape everyday experiences. His work opened up the possibility for an alternative paradigm of disasters that separates them from natural hazards and begins to view solutions away from technical fixes and towards political economy (Pelling 2003). Another influential work in this field is Sen's analysis of famine (1981). Sen argues that famines would occur among certain groups, even in the absence of food scarcity. This is a result of a variety of social, political, and economic factors, such as low wages, unemployment, increasing food prices, and weak food-distribution systems. He also argues that famines never occur in functioning democracies because they uphold the basic rights of their citizens.

Building on these foundations, a number of social scientists became known as critical hazard geographers. They began developing an alternative paradigm, the vulnerability approach (Cannon 2000; Oliver-Smith 2004; Wisner et al. 2004). This approach sees disasters as occurring only when they affect humans. How disasters affect humans is the result of both geophysical events and socio-political conditions within a society. Wisner et al. (2004) contend that vulnerability is significantly affected by political economy variables, such as degree of access to power, effects of public policies, and lack of disaster preparedness. Their pressure-and-release model links macro-level social processes to micro-level vulnerability, showing how actions at larger scalar levels, such as the national or global, create vulnerability at the local level. Vulnerability is therefore dynamic with both spatial and historical components—it combines one's exposure to a drought and one's capacity to cope. I draw upon this notion of multiscalar vulnerability, examining the ways in which slum dwellers' vulnerability in Khon Kaen has increased because of their marginalization at both the national and urban levels.

Urban political ecologists further suggest that unequal economic and political power play a crucial role in influencing vulnerability to disasters in cities. Analyzing the city from a political economy perspective, Swyngedouw focused on the 'power geometries and social actors who carry them out' because they determine who can gain access to or control resources or other components of the environment (2004, 23). He describes cities as 'hybrids' or 'cyborgs'—combinations of nature and society, including class, gender, and ethnic relations (Swyngedouw 2006). In many cities, state and market institutions have protected the lives and the interests of the elite while failing to protect marginalized groups or, worse, increasing their vulnerabilities (Collins 2010). Since the state normally undertakes measures to reduce its citizens' vulnerability to disasters, such as by constructing infrastructure and creating land-use plans, the state potentially plays a key role in determining individuals' vulnerabilities. However, the state is not an impartial actor—nor is it monolithic—but composed of many different actors with differing interests. In most countries, elites have harnessed the state's resources to reduce their own vulnerability while, in some cases, increasing that of others. Thus, vulnerability to the effects of climate change in a city, including drought and floods, is largely determined by political-economic processes and power relations.

In particular, political ecologists argue that hydrological configurations in cities are historical products of society, technology, and nature (Boelens et al. 2016). Interventions that alter these configurations are always 'political in character' and 'contested' (Swyngedouw 2009, 56). Political ecologists argue that water scarcity is not absolute and natural but socially produced (Bakker 2000). While physical conditions certainly affect scarcity, so do insufficient monetary resources and political and economic clout. Consequently, access is a processual 'bundle of power', both political and economic, rather than a 'bundle of rights' (Ranganathan and Balazs 2015, 410). The discursive framing of scarcity as a natural phenomenon often 'serves the interests of the elites' (Otero et al. 2011, 1299).

As land prices have risen in city centres in Southeast Asia, slum communities have been evicted from these spaces and suburbanized to peri-urban areas with lower land

prices (Phelps and Wu 2011). Ranganathan and Balazs (2015) called these spaces the 'urban fringe' to denote their marginality both physically and politically to an assimilated city. These unincorporated areas are generally located within a 'no-win waterscape' (Jepson 2014) because they often lack access to safe, affordable, and reliable drinking water, and instead have to source it from groundwater. Daniere and colleagues (2016) have discussed how slum communities on the 'urban fringe' in Bangkok and Hanoi suffer from limited access to potable water. Their limited access makes them more vulnerable to droughts. Since little has been written about the production of water scarcity in secondary cities in the region, I seek to address this gap here.

3.2 Khon Kaen: A Case Study

While scholars have valuably demonstrated that vulnerability to disasters is affected by political economy variables, few have focused on the effects of these variables upon slum communities in secondary cities in the Global South. I chose Khon Kaen as a case study because it is a secondary city and it was severely affected by the 2015 and 2016 droughts. The city continues to face a significant drought risk. My case study analyzes the political economy of slum communities' vulnerability to climate risks, particularly to drought. I also examine whether vulnerability to drought is evenly distributed among communities within Khon Kaen and compare government assistance to slum communities versus other groups.

To conduct this analysis, I first sought to learn how discourses on water access and drought shaped governance processes in Khon Kaen, such as the water supply system. This component constitutes the 'actor and discourse-based methodology'. I first conducted a review of the academic and non-academic literature focusing on the political economy, urbanization, and water policy of Thailand, including newspaper articles. Next, I conducted nine in-depth key informant interviews with local and provincial government officials, officials from the Community Organization Development Institute (CODI)[1], and slum community leaders.

Second, I investigated the situation within communities to understand how governance processes affected people's vulnerability to drought. To gauge this, I conducted an in-depth questionnaire with 26 residents of the two slum communities—nineteen women and seven men. These questionnaires consisted of questions about the interviewees' demographic and socioeconomic profile, community characteristics, their type of access to water, monthly cost of water, and effects of the drought. Urban communities in Thailand are recognized as legal entities and receive a small monthly budget from the municipality or, in the case of Bangkok, the district office (Douglass

[1]CODI is a public organization that oversees the Baan Mankhong project. The project provides infrastructure subsidies and housing loans to low-income communities to support upgrading wherever possible and, if not, to develop new homes close by. Support is provided not only to community organizations formed by the urban poor for projects but also to their networks (see Boonyabancha 2005).

and Zoghlin 1994). I acknowledge that, as Cannon argues (2008), communities in Thailand and elsewhere are social and administrative constructs composed of numerous actors, a number of which have internal conflicts and divisions. I walked from door to door to find interviewees with the goal of making the survey findings as representative of the communities' view as possible. All interviews were conducted during a six-week period between March and April 2017 (a year after the 2016 drought) and in Thai with the help of an interpreter who transcribed and translated into English.

3.2.1 Site Selection: Rop Muang 1 and Lao Na Dee 12 Communities

Called the 'gateway to Isaan' (the Thai name for the northeast region of the country), Khon Kaen has a population of around 150,000 and is one of the four major cities in Isaan. Although not the most populous city in the region, it is the provincial and regional capital. For many decades, the northeast region of Thailand has lagged behind other regions in the country, particularly Bangkok. This gap has widened in recent years because of more rapid productivity growth in the Bangkok and central regions (Sondergaard et al. 2016). Since as early as the 1960s, the national government has sought to rebalance the uneven economic weight of the capital. The government designated Khon Kaen as an 'urban growth pole' for the region, pouring industrial development funds into improving the city's infrastructure (Glassman and Sneddon 2003).

However, the city has not yet fully accomplished this task. Instead, it has become an intermediary destination for migrants leaving and returning to the region (Elinoff 2013). The province of Khon Kaen has the highest poverty rate in the country (Wongpredee and Sudhipongpracha 2014). Many of the city's poor live in slums, most of which are located on narrow strips along railway tracks or canals. People live there because this land is owned by the state and so they do not have to pay rent to live there. Moving to another area is unaffordable. This space is also on the outskirts of the city which means it is convenient for people to travel into the city while not having to live in a crowded area. However, since the State Railway of Thailand (SRT) or Royal Irrigation Department (RID) owns most of these strips, slum dwellers are under constant threat of eviction to make way for continuing infrastructure development, canal dredging, or railway expansion (Yap and De Wandeler 2010) and they are not legally entitled to state-provided services such as water and electricity.

A CODI official estimates there are 15 slum communities located along the railway (personal communication, 24 March 2017). Residents started moving to these areas in the 1980s but not until after the 1997–1998 economic crisis did many of these communities begin to fill up. The economy shrank by 11% in 1998 and both the urban and rural poor suffered. During this time, the train tracks 'provided space for destitute migrants coming from the countryside' (Elinoff 2013, 170). Recently, low commodity prices, declining demand for commodities from China, and inflation

have hurt rural farmers (Janssen 2016), pushing them to sell their land to wealthier landowners and migrate to slums (Lao Na Dee 12 community leader, personal communication, 28 April 2017). New migrants purchased informal claims to pieces of land from previous residents or made claims and built houses along the railway, inching deeper into the peri-urban edge of the city or in adjacent municipalities (Elinoff 2013).

The SRT has always considered the residents of these spaces trespassers (*phubukruk*) because they encroach upon spaces to which they have no legal claim (SRT official, personal communication, 26 April 2017). Although residents moved there as early as the 1950s, it was not until the 1990s that some communities could gain access to services such as electricity and water (Elinoff 2013). Although all have access to electricity as of 2017, some still lack access to water. It was only with the implementation of CODI's Baan Mankong project in 2003 that some communities could obtain a lease to rent the land from the SRT. However, some settlements still do not have a lease. In 2016 and early 2017, the SRT evicted 200 residents from the Theparak railway community to make room for the construction of the planned high-speed railway (The Isaan Record 2017).

One of these communities along the railroad is Rop Muang 1. While geographically located on the edge of the city, it legally lies within Muang Gao municipality, a neighbouring municipality that is 'half urban and half rural', according to a Muang Gao municipal officer (personal communication, 6 April 2017). Residents started settling here around the year 2000. The second case study community is named Lao Na Dee 12. It is situated next to Rop Muang 1, on the edge and within the boundaries

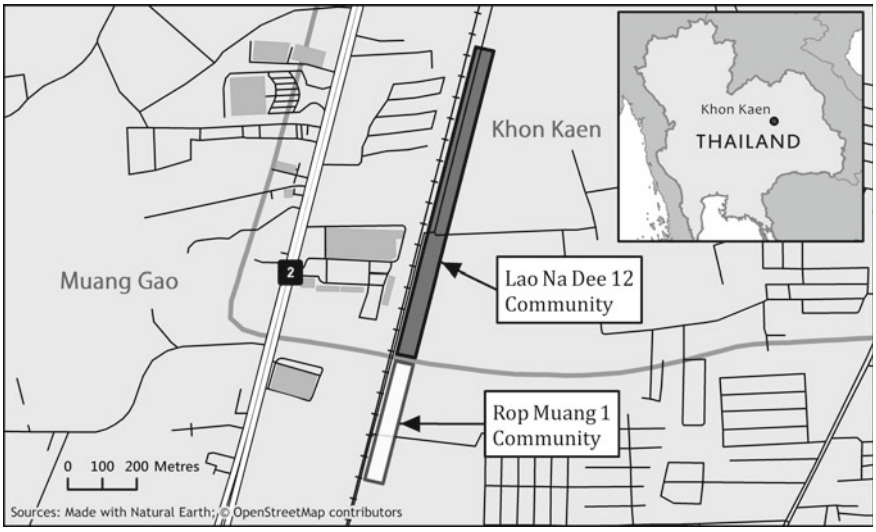

Fig. 3.1 Map of two case study communities (Made with Natural Earth and OpenStreetMap contributors)

of Khon Kaen municipality (see Fig. 3.1). People started moving to this area in the 1990s, but it was not until 2005 that it was legally established as a community.

3.3 Residents' Vulnerability to Limited Water Access and Drought

Of the 26 interviewees, 16 resided in Rop Muang 1 and the other ten resided in Lao Na Dee 12. The majority of residents in both communities have low-wage, precarious jobs, in particular as construction or day labourers (*khon rap jaang*), but also as security guards, cleaners, and other insecure types of employment. Their average household income was 15,300 baht per month (USD 486),[2] ranging from 2000 baht to 50,000 baht per month (between USD 63 and 1587), and the average household size was 3.6 persons with a range of two to six persons (see Table 3.1). On average, income per person was 4300 baht (USD 136) per month. Most households earned the minimum wage (300 baht per day or about 8000 baht per month) or even less because some did not have a full-time, reliable source of income. People have limited assets to purchase water or to cope with the adverse effects of drought.

Based on the surveys, the four main reasons people gave for moving to these two communities were (1) land was cheap, available, and free and many could not afford to live in the city centre; (2) the location was convenient for them to commute to their workplaces in the city or nearby suburban areas and to send their children to nearby schools; (3) they sold their farmland and decided to move to the city in search of a job; or (4) they were evicted from other slum communities along the railway.

3.3.1 Access to Water

In Rop Muang 1, the community members have yet to negotiate a lease with the SRT to rent the land they reside on so they still do not have the legal right to live there. One reason the community does not have a lease is a conflict within the community between those who want a more official status and are willing to pay annual rent for the land and those who do not want to pay any rent. One resident (#10) who makes only 6,000 baht (USD 190) per month was opposed to obtaining the lease. She said, 'We are already very poor and we cannot afford to pay rent [for the lease to SRT]'. Many in the community remain fearful that the SRT will evict them as long as the community does not have a lease.

While they do have access to electricity (but have to pay higher-than-normal rates) residents do not have access to tap water. According to a Muang Gao municipal officer, one reason the residents of Rop Muang 1 do not have water is that the municipality does not have a large enough budget. He said that if the municipality

[2] As of March 2018, one US dollar was the equivalent of approximately 31.5 Thai baht.

Table 3.1 Incomes, access to water, and monthly water bills of residents in the two communities

Name	Gender	Age	Community	Job	Income (in 000s)	Persons in household	Access to tap water?	Monthly water bill
Resident #1	F	17	LD 12	Construction worker	5.5	3	No	500
Resident #2	F	63	RM1	Construction worker	10	4	No	650
Resident #3	F	23	RM1	Laundry shop employee	9	4	No	800
Resident #4	F	20	RM1	Cleaner	20	4	No	900
Resident #5	F	38	RM1	Housewife	12	3	No	400
Resident #6	F	50	LD 12	Vendor	30	6	No	400
Resident #7	F	58	RM1	Plastic recycling business	30 but 10 to bank to pay debt	5	No	620
Resident #8	M	68	RM1	Farmer	2.5	3	No	400
Resident #9	F	52	RM1	Convenience store owner	6	4	No	350
Resident #10	F	56	RM1	Basket weaver	13	5	No	700
Resident #11	M	70	RM1	Shopkeeper	15	6	No	400
Resident #12	M	52	LD 12	Convenience store	5	2	No	260
Resident #13	F	30	LD 12	Makes road signs	25	3	No	1300
Resident #14	F	56	RM1	Maid	14	3	No	340
Resident #15	M	57	RM1	Sells charcoal	25	3	No	350
Resident #16	F	43	LD 12	Construction worker	10	2	No	180
Resident #17	M	63	LD 12	Construction worker	8	2	No	800
Resident #18	F	35	RM1	Construction worker	20	5	No	400
Resident #19	F	52	LD 12	Fruit seller	50	3	Yes	400
Resident #20	F	46	LD 12	Electrician	34	3	Yes	220
Resident #21	F	68	LD 12	Restaurant owner	10	5	No	260
Resident #22	F	32	RM1	Convenience store owner	10	4	No	850
Resident #23	F	65	RM1	Food vendor	2	2	No	350
Resident #24	F	35	LD 12	Food vendor	30	3	No	320
Resident #25	M	45	LD 12	Construction worker	4	3	No	600
Resident #26	M	62	RM1	Food vendor	13	3	No	840
Average					15.3	3.6	Yes: 8% No: 92%	523

Source: Interviews with residents by the author

had a larger budget, it could pay the Provincial Water Authority (PWA) to instal water pipes to run through the community. He lamented that Khon Kaen municipality had a larger budget than his municipality. He also stated that he would need permission from the SRT to build infrastructure in this community because it owns this land (personal communication, 6 April 2017).

Another reason, according to a CODI official, is that the mayor of Muang Kao does not care much about the poor (personal communication, 24 March 2017). The official stated:

> The mayor does not have a vision to help the poor. He is only concerned about the big businesses, like shopping centres, factories, and housing estates. His focus points are them … The main voters are factory workers and shopping centres—and owners of these places tell them to vote for mayor—so they'll vote for him. The poor people are only a small group and cannot affect the election.

CODI can help the community only if the municipality shows interest. However, the mayor has not replied to any of the CODI officer's letters expressing their willingness to assist slum communities there. The official observed that the mayor 'was not interested in joining a meeting [to discuss how to help slum communities]. He is not interested in solving this issue'.

A PWA officer explained that PWA prefers to lay pipes along a main road. Because Rop Muang 1 is not situated on a main road, it would be expensive for them to lay a pipe there. The officer explained, 'Before we can lay we pipe, we have to conduct a survey if we will make profit from the investment'. The SRT is also expanding the railway to build a high-speed train. The officer stated, 'It not clear yet if SRT will take this land back. So we do not want to invest if SRT will take the land back' (personal communication, 25 April 2017).

All of the residents access water through two means. They buy drinking water from a private company that sends trucks to drive through the community selling ten-litre jugs of clean water for 15 baht per jug. They also access tap water by pumping groundwater. Some of them have their own mechanical pumps, while others have pipes that allow them to access pump water from their neighbours—they pay the neighbours for the groundwater. The cost of pump installation ranges from 10,000 to 20,000 baht (USD 317 to 635) and they have to pay the electricity costs to charge the pumps, which can be up 500 baht (almost USD 16) per month. The average monthly water bill (including the approximate cost of electricity to run pumps) for the 16 interviewees was 600 baht per month, ranging from 340 baht to 1,300 baht (see Table 3.1). Both residents and the Provincial Water Authority estimate that this amount is higher than it would be if people used tap water, which costs 300 baht or less per month. On average, these people have to pay at least two times more for water than if they had access to tap water.

The second community, Lao Na Dee 12, is situated next to Rop Muang 1, within the boundaries of Khon Kaen municipality. The community successfully negotiated a lease with the State Railway of Thailand (SRT) in 2015 and in February 2017, a month before I started conducting interviews there, the community leader successfully pushed for the construction of a main water pipe that runs through the

community. It was financed by CODI and supported by the Khon Kaen municipality. Now, according to a municipal officer, all slum communities in the municipality have access to water and electricity. These efforts were pushed by the Khon Kaen municipality and CODI who have circumvented the law which states that encroachers upon public land are ineligible to access public utilities (personal communication, 6 April 2017). However, according to the community leader, the vast majority (over 80%) of the residents still do not have access to tap water (personal communication, 27 April 2017). Since most of these residents work at or below minimum wage and many are in debt, they cannot afford to pay the one-time fee of 5,100 baht (USD 162) to the PWA to instal a water meter required to have tap water. One resident stated, 'People here want to use clean tap water but a lot of people have money issues. For me and many others, it is too expensive to pay the meter installation fee'. According to a PWA officer, PWA does not have a project to instal meters for free. The CODI officer also stated that their internal regulations prevent them from financing meters to residents because CODI can only fund community-wide, not individual, costs.

Like the residents of Rop Muang 1, most residents of Lao Nao Dee 12 continue to buy drinking water from trucks and to use groundwater for other purposes. Some of them pump their own groundwater, whereas others draw water from the community-owned water pumps. Two of the ten interviewees had access to water and eight did not, which are similar figures to the community leaders' estimates. Monthly water bills ranged from 180 baht per month (a household which has tap water) to 800 baht per month (a household which does not). The average is 395 baht (USD 12.50) per month.

In both communities, residents complained about the problems of pumping groundwater. The groundwater is inconsistent, of poor quality, and, according to residents, 'sticky'. The pressure can be weak and the water 'comes out slower'. Some people have to shower multiple times just to clean themselves, store water for times when the groundwater is inconsistent, and in general, suffer from lack of sufficient water. One Lao Na Dee 12 resident (#13) said, 'groundwater is not enough during the dry season. It is more difficult during the dry season—it is harder to pump water'. Many also complained about the higher costs they had to incur. For example, one explained, 'It is expensive to use groundwater but it is necessary' (#8).

One reason the average cost of water is cheaper for residents of Lao Nao Dee 12 is that they can use the water pumped from the communal groundwater source for a monthly fee of 100 baht, but there were drawbacks to this too. Since the amount of groundwater is limited, access is rotated throughout the day and the pressure is inconsistent. One resident (#7) explained, 'The community only supplies groundwater to one side in the afternoon and other side in the morning. And some days I have to wait two days. And some days the pressure is weak. Tap water would be constant and less stressful'. Another resident (#19) who had previously used the communal groundwater said, 'I'm not happy with the groundwater. Sometimes water is cut off. Water flow is inconsistent. One zone gets water in the morning but mine gets it in the evening'.

In both communities, the majority of residents believed that it was unfair that they did not have access to tap water, whereas other communities, such as middle-

class housing estates and other slum communities, could access water. Seventy-two percent felt it was unfair; 12% thought it was fair; and 16% thought it was neither. Those who felt it was unfair stated:

- 'Those people with money have water. But for me, I don't have money, so I don't have access to tap water'.
- 'It is not fair. Tap water should be provided to each household. Everybody should access water equally'.
- 'No, it's not fair. The government doesn't take care and care about poor people. They should provide water'.

Many residents feel that access to tap water should be a right. Their belief is in accordance with the 2016 constitution drafted by the military government. Section 72 states that 'the state shall provide quality water resources adequately for the consumption by people'. The residents feel that the government discriminates against them.

3.3.2 Impacts of the 2015 and 2016 Droughts

A senior provincial Royal Irrigation Department officer believes that drought is the biggest water problem facing Khon Kaen province. He stated that '2015 was a bad year. There was a drought all year round. In 2016 there was a drought only during the dry season … I believe that climate change contributed to the drought in 2015 … 2015 was a crisis year' (personal communication, 3 April 2017). A report by the Department of Disaster Prevention and Mitigation (DDPM) corroborated his claim about climate change (DDPM 2015). In June 2015, the water level in Ubolrat dam, which provides water to the city of Khon Kaen, dropped below 10% (*The Nation* 2015). To ensure there would be enough water for consumption and industry during the year, the national government decreed that farmers could not use any water to grow a second crop of rice. The ban meant that farmers were unable to grow rice for most of the 2015 crop year (Fernquest 2015), while residents of Khon Kaen who had access to tap water did not face hardships.

The residents of the two case study communities likewise experienced privation. They mentioned that the drought in 2015 was by far the worst they had faced in their lifetimes. First, they could not pump groundwater because the aquifers were empty. Consequently, they had to spend more of their meagre incomes to buy water from the water trucks. For example, one respondent paid quadruple what she normally paid—1,600 baht per month compared to 400 baht per month—while another paid triple: 1,500 compared to 500 baht. One respondent stated, 'Water was expensive for me during the drought. We had less money' (#15). Another interviewee (#14) had to 'dig three new wells within the past two years [2015 and 2016] because of the droughts. It costs 20,000 baht to build one well'. Another consequence of not being able to use groundwater was that respondents had less water to use. One resident (#19) said, 'The drought impacted me a lot. There was not enough water to use to

cover all the houses in the community. Water in my tank was not enough'. Another concurred, 'We had a problem with a water shortage during the drought. We didn't have enough water to use or shower' (#1). Some residents had to travel downtown to buy water.

Second, the drought adversely affected some residents' livelihoods. Smallholder rice farmers who owned plots nearby lost money because they could not grow crops during the drought. One resident (#16) declared, 'There was not enough water to farm so I lost money'. Another lamented, 'The drought had a very big impact. I didn't have water to farm … I didn't have income that year. I was in debt during that year' (#9). A resident (#18) who normally fishes for food could not catch fish during the drought because the nearby ponds and lakes did not have enough water in them. One family who ran a small recycling business experienced losses. A woman (#8) in that family stated, 'We did not have enough water to wash the plastic before we send it the recycling machine. So we had to stop working … We lost half of our income'. Another resident decried that the drought affected her cooking, 'I couldn't cook rice. For sticky rice, we need to soak it but couldn't soak it because there was no water' (#22). These examples clearly show that the urban and rural poor suffered during the drought, whereas the urban middle-class were much less affected.

3.4 The Thai State's Role in Producing Communities' Vulnerability to Drought

Actions of the Thai state on the national and urban levels have doubly marginalized these two communities, further increasing their vulnerability to drought. Through its policies, the Thai state has marginalized the poor. Since 1960, in the manufacturing sector, business owners have accrued higher profit margins primarily through increases in labour productivity, meaning that workers have been squeezed out of their share of the income gained from their output (Hewison 2014). The country's minimum wage declined in real terms between 2000 and 2008. Although in 2013 it did increase under the Yingluck government,[3] a coalition of labour unions believes that it is 'far too low' given the country's rising inflation. The unions assert that it 'is barely enough for an individual to live a humble life let alone supporting a family' (Thai PBS 2017, n.p.).

One reason for the low minimum wage is that labour unions are prohibited from political involvement which enables employers to set the minimum wage. The country's taxation policies, in particular, a regressive rice tax, low property and income taxes, and exemptions that benefit the wealthy (some of whom evade taxes), have been 'redistributive, from the poor to the rich' (ibid., 854). State and commercial banks have provided limited access to credit for members of the informal sector and small enterprises (ibid.). Thus, 'in urban areas, where workers have made

[3]She had campaigned to increase the minimum wage in 2011. This election pledge was popular with the poor.

significant contributions to economic growth, few have gained adequate rewards for their labours. Indeed, workers' lives have been characterized by relatively low wages and poor conditions' (Hewison 2002, 307–308).

Many of these residents are former smallholder farmers who abandoned agriculture because of land problems and the stagnation of rice prices. They have been financially squeezed by the increasing monopolization of agribusiness in the sector. As a whole, agribusiness's influence in planning and governance of the sector increased after the 1998–1999 economic crisis (Goss and Burch 2001). Thus, the urban poor's limited assets not only reduce their ability to access water and to cope with droughts but also leave them too little income to move.

On a broader level, the Thai state has prioritized the residents of Bangkok and central Thailand while neglecting the northeast. According to 2012 statistics from the World Bank, 72% of public funds were spent in greater Bangkok, but only 17% of Thais (officially) lived here (Joehnk and Cookson 2015). The vast majority of industrial credits that banks offered during the past few decades went to medium and large-scale enterprises, most of them located in the Bangkok region, whereas little lending was directed towards other provinces. Consequently, deposits from other regions effectively financed credit expansion in Bangkok. Glassman contends that by acting passively, the nation's government failed to curb the Bangkok-centric lending (2004). 'Few other cities in Asia so solidly occupy the centre of gravity of the national economy and its links with the outside world' (Douglass 1995, 57) the way Bangkok does.

State agencies whose actions directly affect these communities offer no assistance and in some cases, hurt them. PWA sought to deflect blame for not providing these houses their constitutional right to water. For Rop Muang 1, there is a regulation that unless these residents have a temporary housing registration, state agencies cannot provide them utilities. PWA claims that it costs a significant amount of money to lay water pipes and, as a state-owned enterprise, the organization needs to make sure it can recoup money from any investment. Similarly, for Lao Na Dee 12, PWA states that installing a water meter requires a significant investment and so it cannot instal meters for free. It seems that the agency is inflexible—its priorities focused more on breaking even than providing water to the poor.

Similarly, the SRT blames poor people for their predicament and, particularly, for encroaching upon its land. A senior officer said he would like all of these slum communities removed from SRT's land and wishes the residents lived elsewhere (personal communication, 26 April 2017). However, the Muang Gao municipal officer disagreed with this sentiment: 'The SRT should not evict them. Instead, it should find a way to support people who have nowhere to go and no choice but live there'. If the SRT changed its mindset, it could help reduce these people's vulnerability to risks, such as by giving them permission to build water pipes. Instead, the SRT has evicted some communities. In 2016, many residents were forced to demolish parts of their houses to clear space for the railway expansion (Elinoff 2017). The residents are concerned that in time, they will have to make further demolitions or will even be evicted.

Land prices have recently skyrocketed, pricing out the poor from rents beyond these communities. The Khon Kaen mayor said that land prices have increased three-fold in the past few years (Elinoff 2017). While the National Housing Authority (NHA) has constructed a limited number of housing units for the poor in the city, it has faced the problem of securing sufficient land on which to house most of the poor. As a state-owned enterprise, NHA must comply with long and tedious procedures to obtain land for public housing. These procedures are in place to prevent corruption, but make it difficult for the NHA to compete with private developers to buy land. Consequently, the NHA has been able to purchase land in only remote locations that are unsuitable for low-income communities (Sheng 2002). Overall, not only the national government but also the Khon Kaen and Muang Gao municipalities have failed to provide enough low-cost, public housing for the city's poor.

At the municipal level, the Muang Gao municipality has failed to provide the poor with access to tap water for the reasons I discussed. The wealthier Khon Kaen municipality certainly does better by informally providing infrastructure to the residents of Lao Na Dee 12. However, it could do more. The municipality could provide meters for free or at least with zero-interest loans so that poor residents could buy the meters themselves. According to officers of both municipalities, neither of them has adopted any climate change action plans to prepare for droughts and other climate risks or to build their residents' capacity to cope with these risks. In contrast, the city of Klang in Rayong has removed concrete-covered areas to make way for tree planting and cleaned up rivers and streams (Shutidamrong et al. 2013). The city of Hat Yai has also created a climate change resource centre and conducted climate change capacity-building events (Archer and Dodman 2015).

Residents of slum communities in Khon Kaen have been doubly marginalized. They have been marginalized not only by the national government whose policies favour the wealthy but also by municipal governments who have failed to provide them with adequate access to water and help them cope with droughts.

3.5 Differential Vulnerability to Climate Risks at Multiple Scales: Climate Injustice?

This study shows that vulnerability to the risk of drought is not uniform among Khon Kaen's residents. The middle class living in the inner city have better access to tap water than the rural poor in the outskirts do. During the 2015 drought, the provincial government gave priority to providing water to the urban middle class rather than the urban and rural poor. Concurrently, broader political-economic variables, including government policies, reduced the urban poor's capacity to cope with the drought.

The study raises questions of climate injustice. According to the Environmental Justice and Climate Change Initiative, climate justice is a 'vision to dissolve and alleviate the unequal burdens created by climate change. As a form of environmental justice, climate justice is the fair treatment of all people and freedom from

discrimination with the creation of policies and projects that address climate change' (quoted in Russell and Moore 2011, 18). To complement this definition, Paavola and Adger (2006) usefully argue that a just response to climate change must first incorporate the principle of prioritizing the most vulnerable—those most in need in terms of redistribution. These people's rights also must be recognized so their voices are included in decision-making processes. Barrett (2013) adds that a comprehensive analysis of climate justice must be multiscalar.

This case study reveals climate injustice in three interrelated scales. At the global level, as Fussell and Klein (2006) argue, Thailand and other developing countries face a 'double inequality'. They have contributed little by way of the world's emissions (Thailand's is less than 1%) but have a lower capacity to cope and recover from the adverse effects of climate change compared to developed countries. At the national level, Bangkok's emissions are the highest in the country (Croci et al. 2011) but the government has poured the most resources into building infrastructure and the adaptive capacity of Bangkokians while giving the lowest priority to Isaan. Livelihoods in Isaan have also been hurt by the enactment of a regressive rice tax. At the urban level, state agencies have prioritized improving the capacity of the middle class while failing to help one of the most vulnerable groups in the city—slum dwellers along the railway. Thus, at all three scalar levels, the most vulnerable have not been prioritized.

3.5.1 Importance of Power in Determining Urban Vulnerability

Urban policymakers continue to present technical solutions as responses to climate change. In most urban climate change plans, there is little discussion of justice, focus on vulnerable communities, or consideration of the social and cultural consequences of climate change (Hillier et al. 2013). As a result, as McCallum and colleagues contend, 'the "imagined communities" of the metropolitan plans are the middle class, not those most vulnerable to climate change impacts' (2011, 6). Many urban scholars and practitioners have framed adaptation responses to climate change around a discourse of city system resilience. However, as Friend and Moench (2013) point out, this discourse of urban resilience rarely emphasizes issues of equity or power relations within a city. Nor does it argue that the urban elite should bear the costs in the interests of the most vulnerable. Consequently, this discourse can be easily manipulated by vested interests. This discourse also assumes that communities in cities are monolithic entities. However, as in Rop Muang 1, this idea is a myth: many communities have conflicts that reflect inequalities in power. The case study shows how the legal boundaries of a city, which are often the boundaries used by studies of urban resilience, can make those outside the city more vulnerable. We need to take these findings into account in both research and when considering possible solutions.

My findings reveal the relational dynamics of vulnerability into which power relations are interwoven. Taylor valuably introduces the concept of 'adverse inclusion' in which 'the relative security of some social groups is achieved through the production of insecurity among others' (Taylor 2013, 318). He also emphasizes the importance of analyzing power relations because they determine the ways in which 'inequalities between different social groups are produced and reproduced over time' (ibid.). In Khon Kaen, slum residents' labour as construction workers, cleaners, vendors, and other low-wage jobs is necessary for the city to operate and also to expand, such as in the construction of new roads, water pipes, housing estates, and shopping malls. The surplus value created by slum-resident labour is a key component of profits that the middle class and the elite gain, as well as in taxes collected by the municipality and national government. However, the poor have little power to increase their assets or improve their communities' infrastructure, particularly water pipes and meters.

3.5.2 Possible Avenues Forward

My findings show the importance of analyzing how political economy drivers at both the national and local levels affect urban vulnerability to drought. The 2015 drought interacted with a range of social, economic, and political factors to adversely affect slum dwellers. Given that the political leadership in Thailand is a military junta, the structure remains highly unequal and has become more autocratic with limited political space for reform. Despite this challenging context, there are several avenues through which the urban poor's long-term vulnerability to droughts can be reduced.

NGOs and community-based organizations could initiate a microfinance programme that carries zero or low interest to enable the very poor to pay the meter installation fees. Alternatively, modelled on what South Africa's Johannesburg Water Utility has done (Gunatilake and Carangal–San Jose 2008), PWA could create a programme that would connect tap water and meters for free and then charge small extra amounts per month to pay for the installation costs. Other beneficial programmes are community-based plans to help residents plan ahead for drought and find ways to better recycle and store water. At a higher level, the national government could provide more livelihood support to these communities, which would raise their coping capacity to face droughts and other effects of climate change. Such support would entail better education, improved social safety nets, and better public housing for the poor. Finally, the national government could find ways to increase revenues and capacities of local government units, and thus enable local governments to better support the poor in their jurisdictions.

3.6 Conclusion

Little research has been conducted on the ways in which political economy factors in secondary cities in Asia affect the urban poor's vulnerability to drought. Vulnerability is affected by a range of social, economic, political, and biophysical variables. I have suggested several concrete ways to reduce vulnerability. The political ecology lens I used revealed the importance of power relations and relational vulnerability within a city, which many studies of urban climate resilience fail to incorporate. My analysis shows just how slum communities in Khon Kaen have been doubly marginalized, by both the national and municipal governments. Finally, I also demonstrate how vulnerabilities to the 2015 and 2016 droughts were instances of multiscalar climate injustice.

The findings of this chapter show that climate-induced drought, a new source of vulnerability, exacerbates poverty, causing some residents to fall into debt, and harms their well-being. It also emphasizes the importance of legal boundaries: Rop Muang 1 is more vulnerable because it lies outside the boundaries of Khon Kaen. Informality can be more effective in building resilience compared to formal approaches.

Elite-led practices have heightened slum communities' vulnerability to droughts in secondary cities of Southeast Asia. While the elite benefit most from these cities' capitalist transformations, the urban poor have become most vulnerable at both the micro- and macro-levels. Because of where the poor live and their lack of assets and limited support from the state, they became the most vulnerable at both the micro- and macro-levels. Urbanization has caused vulnerability to disasters to become highly unequal. A comparison of these findings from a major drought with research conducted on other climate risks in secondary cities in other Asian countries would be useful to observe how differing socioeconomic conditions and conditions, power relations, and forms of governance affect vulnerability to climate change.

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Chapter 4
Migrating Towards Vulnerabilities: The Impacts of Structural Violence on Myanmar Migrants in Phuket, Thailand

Angelica de Jesus-Bretschneider

Abstract The concept of climate resilience is widely criticized for its neutral and apolitical approach to planning for climate change. Resilience practitioners typically conduct vulnerability assessments to identify how institutions, systems, and actors are at risk from climate change. They mainly focus on climate exposure, sensitivity, and the adaptive capacities of essential infrastructure systems such as settlement areas, water supply networks, and food systems. Resilience practitioners do not emphasize the inherently political nature of vulnerability and the broader social structures that create or reinforce vulnerabilities, especially for marginalized people. My research on the lives of 80 Myanmar migrants in Phuket, Thailand, serves as a case study for the importance of taking a directly political approach to planning for climate resilience. I provide empirical evidence on the vulnerabilities of Myanmar migrants in Phuket, Thailand, as embodied structural violence. People who are underrepresented in policymaking and planning processes in Thailand, including Myanmar migrants, often bear the disproportionate costs of climate change. Thus, resilience practitioners must advocate for an explicitly political, inclusive, and participatory approach that incorporates the experiences and knowledge of all people.

Keywords Climate resilience · Structural violence · Migration · Myanmar Thailand · Phuket

Resilience practitioners can take an overtly political approach to building a system's climate resilience using structural violence theory so that the political, economic, social, and cultural factors (which I refer to as structures) that underpin climate vulnerabilities for marginalized people are recognized and addressed. Many

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Fig. 4.1 Location of Phuket, Thailand (map by J. Allen 2017)

policymakers, planners, and researchers (i.e., practitioners) working on climate-change-related issues broadly apply the concept of climate resilience to complex systems like cities, provinces, or countries. Systems are made up of institutions, (sub)systems, and actors (Tyler et al. 2016). Climate resilience refers to a system's ability to absorb climate change disturbances and then reorganize and learn in a manner that it is still able to retain the same function and identity (Adger et al. 2005; Cutter et al. 2008; Tyler et al. 2016) (Fig. 4.1).

Despite its popularity, scholars criticize climate resilience for its neutral and apolitical approach to planning for climate change (Bahadur and Tanner 2014; Béné et al. 2012; Friend and Moench 2015; Garschagen 2016). An emerging body of literature urges practitioners to combine resilience with other theoretical frameworks that specifically focus on social justice and equity (Bahadur and Tanner 2014; Béné et al. 2012; Friend and Moench 2015; Garschagen 2016). In this chapter, I aim to accommodate critical concerns about the apolitical and neutral approaches to

existing resilience theory and practice. I build on theoretical discussions on resilience. In particular, I argue that structural violence scholarship can push resilience theory and practice in the needed political direction. Structural violence refers to the economic, political, social, and cultural dynamics that systematically cause human suffering and constrain human agency to meet personal needs and goals (Galtung 1969). My research on the lives of 80 Myanmar migrants in Phuket, Thailand, serves as a case study for the importance of taking a directly political approach to planning for climate resilience. I provide empirical evidence on the vulnerabilities of Myanmar migrants in Phuket as embodied structural violence.

Structural violence theory begins from the viewpoint that broader structures are what reduce a person's agency to meet personal needs or goals, thereby putting them in harm's way (Christie 2001; Galtung 1969). For example, Farmer et al.'s (2006) study of structural violence in clinical medicine highlights that racism, a form of structural violence, was embodied as excess mortality among African Americans in Baltimore who did not have insurance. The scholars argued that race, which linked to insurance status in the United States, determined who had access to adequate standards of healthcare (ibid.). I assess the concept of vulnerability for Myanmar migrants from the notion that socially embedded structures put a person in harm's way by making them vulnerable to climate hazards, risks, or disturbances. Climate vulnerabilities are, therefore, the embodied forms of structural violence.

Integrating structural violence theory is important during the vulnerability-assessment stage of resilience practice. Resilience practitioners (e.g., planners, researchers, and policymakers) typically conduct vulnerability assessments to identify how components of complex systems are at risk from ongoing or pending climate change impacts. They then design resilience strategies around such assessments (Cutter et al. 2008; Tyler et al. 2016). Practitioners mainly evaluate the exposure, sensitivity, risk, and adaptive capacity of essential infrastructure systems, such as roads, water supply networks, food supply, and settlement areas (Tyler et al. 2016).

For example, the United Nations Human Settlement Programme (UN-Habitat) conducted a climate vulnerability assessment for Hoi An, Vietnam (UN-Habitat 2014). The report shows how infrastructures such as drainage systems and housing are vulnerable to climate hazards (e.g., storms/typhoons, flooding, salinity, and coastal erosion). The government of Fiji (in partnership with the World Bank and the Africa Caribbean Pacific–European Union Natural Disaster Risk Reduction Program) conducted a climate vulnerability assessment for the island nation (Government of the Republic of Fiji 2017). The assessment report focuses on interventions to address land-use planning issues, poor financial investments in health and education infrastructure, as well as social protection policies and plans for postclimate hazards.

Even though these types of technocratic interventions are necessary, especially with regard to public safety, resilience critics argue that these patterns of vulnerability assessments and their linked strategies promote welfarist approaches to resilience, for instance, by improving water systems and resettling households to reduce climate risks (Friend and Moench 2015). However, such strategies do not directly address the broader structures that many argue are the root causes of vulnerabilities (Béné et al. 2012; Cretney 2014; Kaika 2017; Friend and Moench 2015). In a similar vein to post-

development scholarship, critical resilience thinkers highlight that current resilience approaches mainly ease global socio-environmental inequities, which thus allow for people, especially the poor and marginalized, to merely absorb and withstand climate hazards (ibid.).

Evidence from a six-month, ethnographic field study (September 2015 to March 2016) on the lives of 80 Myanmar migrants in Phuket suggests how structural violence in Thai society creates vulnerabilities there, especially for Myanmar migrants. Practitioners can critically assess the dualistic nature of institutions, systems, or actors using structural violence theory to assess potential trade-offs that could occur when supporting resilience. Strengthening components of a complex system could create or reinforce vulnerabilities for others, especially marginalized populations whose voices are typically excluded in local planning practices, including the voices of Myanmar people.

4.1 Relevance of Structural Violence Theory to Climate Resilience

A structural violence lens is relevant for examining critical concerns pertaining to the apolitical and neutral approaches of existing climate resilience frameworks. A structural violence focus highlights the uneven distribution of inequities in society that also create vulnerabilities (Leatherman and Goodman 2011). The theory considers the historical forces, as well as the social, economic, and political processes that create marginalization (Peña 2011). Structural violence is an avoidable harm towards human life; its violence is the cause of a 'difference between the potential and the actual, between what could have been and what is' (Galtung 1969, 168). The harm from structural violence appears ordinary in our ways of viewing the world, which thus causes the harm to be repeatedly ignored (ibid.).

Unequal access to resources, political power, education, and health, just to name a few, are real forms of structural violence that reduce a person's agency to meet their needs (Farmer 2004; Galtung 1969; Waltz 1959). Structural violence also encompasses institutional racism, disease-ridden environments, stigmatizing social norms, and barriers preventing underserved populations from accessing adequate services such as health care (Lane et al. 2004). Structural violence can be caused by actors as well as macro-level entities, such as federal bureaucracies, institutions, social environments, and policies that form the context in which disproportionate marginalization, exploitation, and oppression regularly occur (ibid.).

If practitioners do not adequately address the structures that create vulnerabilities for marginalized people in society, then resilience strategies may fail to create long-term equitable solutions (Kaika 2017). I argue that because Thai society is generally organized along hierarchies, which are often based on age, occupation, wealth, and nationality (Gullette 2014), practitioners should recognize that social norms, including discrimination towards migrants, must also be addressed when

building a system's resilience. Low-income migrants, such as those from Myanmar, are generally considered the 'other' in Thai society (Human Rights Watch 2010). They are considered the lowest of the low in terms of social hierarchies in Thailand (ibid.).

4.2 The Social Construction of Migrants' Vulnerabilities in Phuket

My research on the lives of 80 Myanmar migrants in Phuket is a case study on the importance of taking an overtly political approach to planning for climate resilience. I collected data through interviews, photovoice, and observations. Photovoice is an arts-based and participatory research method that has grown in popularity in social sciences (Haque and Rosas 2010). Photovoice consists of two stages: (1) individual participants taking photographs and (2) individual participants and the researcher discussing the photographs (Kwok and Ku 2008). Research participants included both migrants and key informants, such as government officers and nonprofit workers in planning, environmental management, public health, and migration. Phuket is a suitable location to study vulnerabilities as embodied forms of structural violence because climate vulnerabilities (e.g., participants living in flood-prone areas) and structures (e.g., discrimination against migrants) are significant throughout the province (Mekong-Building Climate Resilience in Asian Cities [M-BRACE] n.d.; interviews with key informants 2016).[1]

For example, increasing temperatures and sea levels threaten the coral reefs surrounding the island, as well as the local tourism industry and water systems (M-BRACE n.d.; Raksakulthai 2003). Phuket remains a renowned tourist destination with a bustling construction industry and an infamous fishing industry. The island attracts thousands of low-income labour migrants from bordering countries such as Myanmar, Cambodia, Vietnam, and Laos (Arnold and Hewison 2005; Walsh and Ty 2011).

Migrant workers are heavily discriminated against in their day-to-day experiences in Thailand (Mon 2010; Walsh and Ty 2011). Qualitative data from fieldwork also reveal that Myanmar migrants in Phuket are oppressed and made vulnerable to climate change impacts because of structural violence. Many Myanmar migrants work in Phuket's precarious fishing and construction industries. Migrants also experience discrimination and harassment in local villages and workplaces. I observed that Myanmar migrant participants also live in inadequate housing located on hazard-prone land with limited access to essential services such as water.

International research organizations and aid agencies, such as the Institute for Social and Environmental Transition-International and the US Agency for International Development, respectively, have reported on Phuket's vulnerabilities to climate change and its need for resilience strategies (M-BRACE n.d.). However, a comprehensive resilience strategy does not yet exist for the province (interviews

[1] I am not sharing names or places of work of key informants to protect their identities.

with key informants 2016). Thus, it is an opportune time for practitioners to consider applying an overtly political resilience-planning approach in Phuket that considers the social construction of vulnerabilities of all inhabitants on the island, including migrants.

Championing for migrants' rights in decision-making and planning for resilience in Thailand is especially significant in today's realities of escalating concerns regarding climate-change-induced migration. For example, the United Nations Development Programme and the Overseas Development Institute continue to emphasize major planning and policymaking challenges linked to the complex relationship between climate change and migration (Stapleton et al. 2017). Researchers also argue that because climate change has a strong link to the environment and livelihoods, climate change will worsen environmental degradation and livelihood opportunities, thereby trapping certain communities in one place or pushing others to relocate nationally or across borders (Bedarff and Jakobeit 2017; Chapman and Tri 2018; Hugo 2013; McAdam 2010). Thus, this chapter also serves as a foundation for the considerations that practitioners must make when planning for resilience in an era of increasing climate change and migration concerns.

4.2.1 Institutions

Because climate change contributes to increasing migration flows in the Mekong region (Kim and Mihn 2016), migration systems must be able to adequately meet the needs of current and future migrants (Stapleton et al. 2017). Thus, migration institutions and actors in Thailand could potentially argue for their need to be resilient to climate change by enhancing their abilities to organize and control migration flows into Thailand. Governance systems are constrained by inefficiencies caused by fragmentation and elitism (Lebel et al. 2011). However, the current design of migration institutions in Thailand also puts Myanmar migrants in harm's way. A political analysis of current migration governance processes between Thailand and Myanmar provides an example of an institution that has inherent structurally violent characteristics, particularly towards migrants.

A bilateral arrangement exists between Thailand and Myanmar under a memorandum of understanding (MoU) to formalize migration into Thailand and to mitigate irregular border crossings. Unclear information along with weak regulation and enforcement of the MoU on both parts of the Myanmar and Thai governments create significant room for regularly exploiting Myanmar workers (Hall 2012).

During the migration process, research participants were generally ill informed about how to migrate to Thailand using the MoU. They were also unaware of the costs involved. Myanmar migrant participants hired agents, also known as migration brokers, who are supposed to be experts on the MoU process. However, research participants said that brokers either gave incorrect information or extorted them to pay extremely high fees. When participants were asked about how they moved to Thailand and how much they paid to do so, there were inconsistencies in costs. Some paid more than others. What was consistent was that none of the research participants

entered Thailand through the MoU even though they hired a migration broker. For example, one participant said:

> I had no passports or documents before coming here but I think it was easy to travel here. I know some people who come to Thailand sometimes have to sleep in the forest or mountains but I never had to experience that. I paid the agent 8,000 Thai baht (CAD 328).

To reduce irregular border crossings, the Thai government swiftly implemented a new Royal Decree on Managing the Work of Aliens (B.E. 2560 2017) on 23 June 2017 (Baker McKenzie 2017). Unfortunately, very few people have explored or evaluated the negative implications this decree has on labour migrants, the migration process, work experiences, or the inequities that migrants experience in Thailand (Hall 2012).

For example, the royal decree is creating mass panic among both documented and undocumented migrants to flee Thailand, which leaves ample room for human traffickers and corrupt officials to exploit migrants' situation (Sawitta Lefevre 2017). The current migration institutions, which include existing policies and migration broker practices, must be challenged and transformed because current policies and practices are making Myanmar migrants even more vulnerable.

4.2.2 Systems

Towns, cities, provinces, and nations are linked across multiple scales through various systems such as regional food systems, trade systems, infrastructure systems, and ecosystems (Moench et al. 2011). Managing, developing, and maintaining such systems is integral to ensuring the well-being of places and the people who inhabit such places (da Silva et al. 2012; Moench et al. 2011). Resilience practitioners recommend building systems' resilience to maintain their functions and linkages in the face of shocks and stresses resulting from climate change (Moench et al. 2011; OECD 2014). Key systems in Phuket, such as water systems and food systems, which are vulnerable to climate change (M-BRACE n.d.), also function in a way that discriminates against Myanmar migrants and increases or reinforces their vulnerabilities.

For example, many Myanmar migrants live in rental housing units in Phuket. Research participants described how their landlord shuts off their water supply for three to four days of the week because they believe the landlord wants to save money on water bills. This happens despite the fact that Myanmar renters pay a certain fee for water supply in the rental units. The problem with this scenario is the inequitable access to water that Myanmar labour migrants experience. People spend nearly half of their monthly income, which is approximately CAD 317, on rent and utilities. Still, the supply of water is available for only less than half of the week.

Everyone on the island, including Thais and tourists, faces water shortages. When local water infrastructures cannot deliver water, many people call private water trucks to buy water. However, the waiting period for water is often long, and potentially longer for Myanmar migrants than Thai locals. Local Thais on the island reported that waiting for a water truck is quite normal but that they usually wait for only one

or two hours. However, migrants said that they wait for at least five hours, while a few said that they sometimes wait until the next day. One female participant said:

> Last April, we tried ordering water in the morning but the trucks only came in the evening. This happened for several days in a row. When we would come home from work, we would be very, very hot. At that time, we had to buy bottled water from the store so that we could bathe. Normally, we only use bottled water for drinking.

4.2.3 Actors

The word *actor* refers to an individual (e.g., farmer, consumer), household (e.g., as a unit for consumption, social reproduction, education, and capital accumulation), or a representative of private- and public-sector organizations (e.g., government departments or bureaus, private firms, and civil society organizations) (Moench et al. 2011). Resilience supporters argue for increasing the capacity of actors to anticipate and take action on external changes and stresses (O'Brien et al. 2009). This implies strengthening actors' ability to resist change and maintain the status quo (ibid.). However, when we use a structural violence lens to examine existing functions and characteristics of different actors in Thailand, we see that Thai actors continue to stigmatize and harm Myanmar migrants.

For example, it is not customary or expected for Thai people to engage with migrants in social activism or local knowledge-building practices for important matters such as disaster risk management, environmental management, or public health. When I spoke to three government officers in Phuket, no one was aware of any campaigns or programmes that involved migrants. Myanmar migrants are not treated as equals or as people deserving consideration in Thailand. When I asked participants how they felt about being a Myanmar person living in Phuket, many said that they felt as if Thai people looked down on them. For example, one person said:

> Sometimes I'm happy to live in Phuket. Sometimes I'm not happy because Thailand is not my country. There are some Thai people who put pressure on us. They talk a lot and say, "Why don't you go back to your country?"

Several participants also explained to me that local police officers treated them unfairly and exploited them for money. One said:

> I paid the police 500 baht [$19 CAD] each month for two years. Before, when I heard someone speak about the police, I was very scared. I was always thinking about places where I could hide myself from the police.

Many local employers abuse and exploit migrants (Hall 2012; Walsh and Ty 2011). The fishing industry in Phuket, a food system that is under threat from climate change, functions in a way that continues to disenfranchise migrants. One can argue that the fishing industry is under threat because of increasing water temperatures and sea-level rise disturbing the ecosystem of the fishes. However, the multibillion-dollar industry in Thailand is also renowned for its human-trafficking practices, and

other malpractices that bring harm to migrants and the environment from overfishing (Hodal 2016).

Research participants recounted stories of co-workers not returning to shore safely. Migrants also described instances when employers confiscated migrants' documents so that they could not run away and work somewhere else. Migrants work for very long hours, for very little pay, under very difficult circumstances. For example, one worker said:

> Even if there is a storm we have to work. If workers know that a heavy storm is coming before we leave the shore, we can bargain with the boat owner to not go out for work. But if we go out already and then it starts to storm, we have to work.

4.3 Recommendations

Creating climate-resilient urban governance that is both inclusive and equitable requires practitioners to take an overtly political approach to building resilience (Bahadur and Tanner 2014; Béné et al. 2012; Friend and Moench 2015; Garschagen 2016). This means putting the experiences, knowledge, and perspectives of marginalized people in society at the forefront. Adding structural violence analysis during the vulnerability-assessment stage affords practitioners the critical and political lenses necessary to identify the pros and cons of supporting the resilience of a system.

Using a structural violence lens, practitioners can assess how systems function and possibly create harm and vulnerabilities for marginalized people, such as Myanmar migrants in Phuket. Instead of arguing for systems to be resilient to a shock or stress, climate-resilient actors must challenge the status quo (Kaika 2017). Planners and policymakers should actively engage with marginalized groups such as Myanmar migrants in resilience-building processes.

After the focus of resilience practitioners transforms to an overtly political one by incorporating a structural violence lens, climate resilience strategies can then address the structural violence in Thai society and can help to produce long-term resilience that is inclusive and equitable.

Resilience strategies have yet to be created for the island of Phuket. Now is an opportune time for resilience supporters to lobby for political approaches to planning for resilience by acknowledging the rights of all inhabitants on the island to participate in decision-making and planning processes. Tackling social norms—such as discrimination in Thai society—that reinforce structural violence and vulnerabilities for migrants, requires practitioners to:

- expand public participation in resilience building;
- advocate for improved policies and practices for migrants; and
- promote collaborative relationships between governance actors at multiple scales.

4.3.1 Expand Public Participation in Resilience Building

Increasing public participation in resilience building can address structural violence and social norms, such as discrimination in Thai society (Lebel et al. 2011; Marks 2011). Resilience practitioners can promote fair and inclusive public engagement processes for all stakeholders and inhabitants in Phuket, especially migrants. Representation by and on behalf of marginalized and oppressed populations is an essential pathway for bringing issues of equity and justice to the forefront when setting priorities and strategies for climate action (Lebel et al. 2011).

The United Nations Framework Convention on Climate Change (UNFCC) has highlighted the importance of engaging residents in participatory urban planning processes (Broto et al. 2015). However, participation, as a concept, is often critiqued for maintaining existing power relationships (Cooke and Kothari 2001). Questions have been raised about the extent to which participatory processes enrol token representation of marginalized people and whether marginalized participants are given opportunities to interrogate the motivations of experts and other stakeholders (Broto et al. 2015). Nevertheless, participation can still be a tool for empowerment, citizenship, and promotion of the civil right to shape planning decisions (Gaventa 2004).

Ultimately, participation is a messy and open-ended process that requires negotiation between stakeholders (Barton et al. 2015; Broto et al. 2015). Still, participatory planning processes should be used to decentralize decision-making power from elite groups in Thailand, to promote the co-construction of knowledge, and to push planning for resilience beyond technical solutions to a more fundamental discussion on alternative and political courses of climate action (Swart et al. 2003). A bottom-up housing programme in Thailand is a positive example of planners putting marginalized people at the centre of decision-making and planning.

The Community Organizations Development Institute (CODI), a Thai public organization, implemented the Baan Mankong Collective Housing Program from 2003 to 2011. The programme improved the lives and housing conditions of 90,000 households across Thailand (Norford and Virsilas 2016). Traditionally, upgrading informal settlements in the country is administered and funded solely by the government or a third party. Residents, especially those living in poverty, are generally excluded from planning and implementation processes in the housing sector (ibid.) However, the Baan Mankong Program facilitated a community-driven housing upgrade for informal settlements (CODI n.d.).

As part of this unique programme, people living in informal settlements worked closely with local government officials, specialists, universities, and nongovernmental organizations to strategize community housing upgrades. Once plans were finalized, CODI channelled infrastructure subsidies and housing loans from the Thai government directly to households in informal settlements (Boonyabancha 2009). The programme allowed communities to upgrade their infrastructure and living environment according to priorities that they set. Communities also managed their own upgrading budgets and chose technical assistance that they themselves deemed appropriate (ibid.).

The success of the Baan Mankong programme is linked to the decentralization of the planning process for informal housing communities in Thailand (CODI n.d.). This programme demonstrates that significant planning issues, such as housing for the poor, should not be dealt with solely through top-down, welfarist solutions. Instead, local partnerships and the integration of knowledge and experiences from civil society can resolve broader structural issues of exclusion and fragmentation (Boonyabancha 2009). Similar principles should be applied to planning for climate resilience throughout Thailand.

4.3.2 Advocate for Improved Policies and Practices for Migrants

Resilience practitioners can also promote the rights and humane treatment of low-income labour migrants in Thailand. Promoting migrants' social inclusion can tackle existing discrimination in Thai society (Faetanini and Tankha 2013). Although providing migrants with 'official papers' for living and working in Thailand (e.g., identification card, work permit, visa, and passport) will afford migrants basic entitlements such as work, housing, and regular border crossings, documentation is also a dominant threat over the lives of many migrants in Thailand. Migration experts have expressed concerns about the 'legalization' of people through identity documents (Hall 2012).

'Official documents' are often tied to human rights issues, such as the coercion, fear, and everyday concerns of those on the bottom rung of social hierarchies (Abu-Zahra 2008). Identification documents are repeatedly used for coercion and control by those in a position to discriminate against those who are targets of coercion in society (ibid.). Research participants expressed their fear of Thai authorities who exercise arbitrary carding or 'stop and search' practices with migrants. Despite some migrants having official documents, many are still pressured by Thai authorities who threaten to confiscate migrants' official documents.

Thus, it is not enough to facilitate processes for migrants to acquire appropriate documents to live and work and Thailand. A profound transformation in public attitudes towards migrants is also needed. Misconceptions and negative attitudes towards migrant workers often lead to discrimination in society and the workplace. They also contribute to a society in which social exclusion and human rights abuses are tolerated (International Labour Organization (ILO) 2018).

Resilience practitioners can advocate for the rights of migrants and a more positive public perception of migrants in Thai society. Planners and policymakers in Phuket, for example, can foster greater public dialogue on the rights of migrants and their positive contributions to the province and country by promoting learning opportunities between diverse stakeholders such as migrants, Thais, the media, academics, the private sector, and policymakers (Huguet et al. 2012). Resilience practitioners in Phuket can learn from two education-based advocacy projects in India and Thailand.

In 2011, the United Nations Educational, Scientific and Cultural Organization (UNESCO) conducted lectures at the School of Planning and Architecture in New Delhi about the challenges, priorities, and success factors for developing a rights-based approach to urbanization in India, which included the inclusion of migrants in planning practices (Faetanini and Tankha 2013). The lectures encouraged bachelor and masters students to promote the 'right to the city' for migrants, and that the inclusion of migrants in planning is necessary for creating a sustainable urban development that promotes cultural diversity, social cohesion, and human rights (ibid.).

Recent research from the ILO reports that the general public in Thailand have limited understanding about the need for migrants in specific sectors, the positive contributions that migrants make to the Thai economy, and migrants' rights to fair and equal treatment (ILO 2011). In 2013 and 2014, the ILO, the International Organization for Migration, the United Nations Economic and Social Commission for Asia and the Pacific, and World Vision International supported an advocacy and awareness campaign in Thailand to promote a positive image of migrant workers.

The Saphan Siang (Bridge of Voices) advocacy programme sought to increase interactions between Thais and migrants. The campaign placed young Thai volunteers with organizations interacting with migrant workers, specifically in Bangkok, Chiang Mai, and Pattani. The youth ambassadors were also encouraged to share their experiences on social media. In 2014, there were 35 news pieces in traditional and online newspapers, dozens of articles on student websites, and three interviews with local radio stations about Saphan Siang. Youth ambassadors reported having developed a sense of empathy towards migrant workers and a greater awareness of what migrant workers can contribute to Thailand (ILO 2015).

Changing public attitudes is a colossal task that requires an extensive amount of time. However, there are a number of opportunities to implement similar education programmes and awareness campaigns in Phuket. The province has two universities, Phuket Rajabhat University and Prince of Songkla University. A nonprofit organization in Phuket, called Diocesan Social Action Center of Suratthani Catholic Foundation, also works directly with Myanmar migrants on the island. Resilience practitioners could replicate such learning models at local universities and nonprofit organizations.

4.3.3 Promote Collaborative Relationships Between Governance Actors at Multiple Scales

Fostering relationships to plan for climate resilience requires engaging stakeholders in different political and social hierarchies as well as across multiple scales (Cloutier et al. 2015; Lebel et al. 2011; Sherman and Ford 2014). Partnerships can support policy coherence between different sectors affected by climate change such as the environment, migration, transportation, and housing to reduce inefficiencies and increase effectiveness (England et al. 2017).

Current resilience scholarship and frameworks promote shared-learning processes (Tyler et al. 2010). A more inclusive planning process that values collaboration and shared learning also helps address equity and justice concerns, particularly for poor and marginalized communities (Chu et al. 2015). Building relationships between different governance actors will also help address inefficiencies within Thailand governance systems (Lebel et al. 2011; Marks 2011). Strengthening networks between state actors and nonstate actors will also help build knowledge on the vulnerabilities of marginalized groups in Thai society (Lebel et al. 2011). Resilience practitioners in Phuket can therefore continue to promote shared-learning and cross-scalar, interinstitutional approaches while encouraging participation from migrants.

The Municipality of Quito, Ecuador, is an excellent example of a governmental body that has applied an interinstitutional and shared-learning approach to address the disjointed planning practices of multiple governance actors at multiple scales (Chu et al. 2015). UN-Habitat has identified Quito as an excellent case study for a climate resilience planning process that has prioritized public involvement, especially of marginalized populations, as well as interinstitutional collaboration (UN-Habitat 2015).

Given that the national government had not yet implemented national laws or policies on interinstitutional climate action, the local government body of Quito positioned itself as a leader in addressing local climate change challenges in a participatory manner (Carmin et al. 2012). In 2006, Paco Moncayo, the former mayor of Quito, championed the vision of forming an environmental secretariat in Quito to provide a nation-wide and international example of inclusive and collaborative approaches to planning for climate change in the Global South (Chu et al. 2015). The secretariat includes multiple government departments such as the Risk Management Unit, the Territorial Planning Office, the Health Department, the municipal water company, and members of the scientific community (ibid.).

The secretariat implemented successful strategies for increasing local awareness on climate change issues and building different stakeholders' capacities to address climate-change-related challenges, including gaining the support of powerful water companies to invest in water resource issues arising from glacier retreat (Obermaier 2013). The secretariat's primary goals consisted of holistically assessing the urban challenges linked to climate change and ensuring that assessments and strategies were useful and meaningful to the most vulnerable people in Quito. Broad community representation and participation through public engagement in local decision-making was the central pillar of Quito's approach to planning for climate change. The secretariat facilitated knowledge alliances between government actors, academics, technical experts, and local citizens, including youth and indigenous people (ibid.).

Over the past several years, the Municipality of Quito has progressively refined its set of climate resilience actions, with extensive public input (UN-Habitat 2015). The municipality's first concerted effort at climate action planning was its Climate Change Strategies Plan, which was approved in 2009. In 2012, Quito released its Climate Action Plan (2012–2016) (ibid.).

Resilience practitioners in Phuket could also focus on identifying local champions for climate change issues in Phuket, and build a similar collaborative entity between different governmental units and stakeholders on the island. The newly formed unit could then focus on developing a climate resilience strategy for the province that respects the rights of all inhabitants, including migrants, to participate in the planning process.

Because the island of Phuket is an internationally renowned tourist destination, the local government could capitalize on this popularity to bring local climate change and migration issues to broader national and international audiences. For example, the Municipality of Quito hosted international conferences on climate change and participated in joint initiatives with multilateral organizations. Quito partnered with UN-Habitat to create the Manual for Local Climate Change Management as a means to share Quito's knowledge and best practices in creating interinstitutional climate change strategies (Carmin et al. 2012). Taking an explicitly political and transformative approach to resilience planning is imperative, especially in Phuket, Thailand.

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Part II
Creating Resilient Urban Governance: Facing Floods in Southeast Asia

Chapter 5
Flood Vulnerability and Resilience in Peri-urbanizing Vietnam: A Case Study from Ninh Binh Province

Hue Le and Ly Bui Ha

Abstract Vietnam has experienced massive peri-urbanization in recent decades. Its level of urbanization increased from 19.6% in 2009 to 36.6% in 2016. Peri-urban areas are caught between development and conservation needs, between economic development and environmental protection, and between cultural preservation and sustainable development. In the context of more frequent extreme weather events, rapid peri-urbanization puts higher stress on local water systems and resources. This chapter examines the vulnerabilities and challenges from the flooding that communities face in the peri-urban area of the city of Ninh Binh. Qualitative and quantitative data from household interviews, group discussion, and key informant interviews found that flooding is annually 70–80 cm high and lasts up to one week in the village and its surrounding areas. Flooding forces villagers to abandon cultivated land which adversely affects incomes. Flood damage is made worse by sewage water from the Khanh Phu Industrial Zone that spreads throughout Phu Hao village, killing cattle and fish. Surface water is severely polluted during the rainy season and polluted water has caused water-borne diseases. Unplanned, unregulated building along with underdeveloped water infrastructures for supply, sanitation, storm drainage, and pollution pose severe challenges to the area's already strained adaptive capacity.

Keywords Flood · Vulnerability · Resilience · Peri-urbanization · Vietnam

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Like other countries in Southeast Asia, Vietnam has undergone massive peri-urbanization in recent decades. The country's level of urbanization increased from 19.6% in 2009 to 36.6% in 2016. Peri-urban areas are subject to heavy pressures because they are caught between development and conservation needs, economic development and environmental protection, and cultural preservation and sustainable development. With more frequent extreme weather events, rapid peri-urbanization can put higher stress on existing local water systems and resources, especially when flooding occurs.

Many scholars agree that marginalization is a critical concern in the governance of peri-urban areas (Allen 2010; Dávila 2006; Hudalah et al. 2007; McGranahan et al. 2007; Simon et al. 2006). Peri-urban areas have lost rural values without the benefits of more positive urban attributes. In handling the complexities of this transformation, governance is beset by administrative separatism, agencies' overlapping remits, or incompatible functional and territorial jurisdictions at the different levels. Deficits in public administration and governance can potentially erode the adaptive capacity of peri-urban populations and, especially, affect its poor and low-income households and the communities' resilience to climate change hazards and water stresses. However, these same problems are less severe and of less importance in the urban core districts which are better designed compared to peri-urban areas.

Regions of rapid peri-urbanization are characterized by marginality. More frequent extreme weather events have affected local people's water resource use, livelihoods, and health and safety—all of which vary across gender, socioeconomic status, and class. These converge with the local or meso-level politics shaping resource distribution, disaster management, and the water sector. There is a pressing need to understand the mutually reinforcing dynamics between severe climate change effects, socially differentiated vulnerabilities, and peri-urban-related water stresses that combine to affect people's capacity to adapt to climate change in their livelihoods and everyday lives.

In Vietnam, several innovative approaches have recently been developed to classify social vulnerability and explore adaptation strategies for the future, particularly for the most vulnerable regions, rural and urban communities, and households (Huynh and Resurreccion 2014; McElwee et al. 2010; McEvoy et al., 2014; Le 2007; Nghiem et al. 2009; Nguyen 2007; OXFAM 2008; Tran 2007). Nevertheless, there is little known about how people vary in their adaptation strategies to climate-related water stresses in the peri-urban areas, about the drivers and constraints shaping their vulnerabilities to these stresses, and about the opportunities shaped by the conditions in peri-urban areas.

In this chapter, we examine the vulnerabilities and challenges posed by the flooding that communities face in the peri-urban area of the city of Ninh Binh. Our analysis pays explicit attention to (a) local socioeconomic development policy and the establishment of the Khanh Phu Industrial Zone; (b) impacts caused by flooding and lack of regulations, unplanned built environments, and underdeveloped water infrastructure; and (c) the varying adaptations of different social groups of households.

We also explore how institutional adaptation programmes and actions together with household responses have collectively determined the resilience of the system.

5.1 Research Methodology

5.1.1 Research Site

Ninh Binh province is located in the south of the Red River Delta/Northern Delta. Bordered by Ha Nam and Nam Dinh in the east and northeast, and Thanh Hoa and East Sea in the south, Ninh Binh province has two cities and six districts including Ninh Binh and Tam Diep city and Hoa Lu, Gia Vien, Nho Quan, Yen Khanh, Yen Mo, and Kim Son districts. Yen Khanh district is located in the southeast side of Ninh Binh city. In the city's development plan to 2020 with a vision toward 2030, Khanh Phu is one of two communes of Yen Khanh district that will be merged into Ninh Binh city's area (Truc Quyen 2016). It is the commune we focus on, especially Phu Hao village. Figure 5.1 illustrates the area.

Khanh Phu commune is located in the north of Yen Khanh district, Ninh Binh province, 5 km from the city centre. The total area of Khanh Phu is 5.92 km^2. It has a population of 5,500 people. This commune has eight villages, including Phu An, Phu Long, Phu Tan, Phu Hai, Phu Cuong, Phu Son, Phu Binh, and Phu Hao. Khanh Phu is bordered by Khanh Hoa, Ninh Phuc (Ninh Binh city), and Khanh An (Yen Khanh

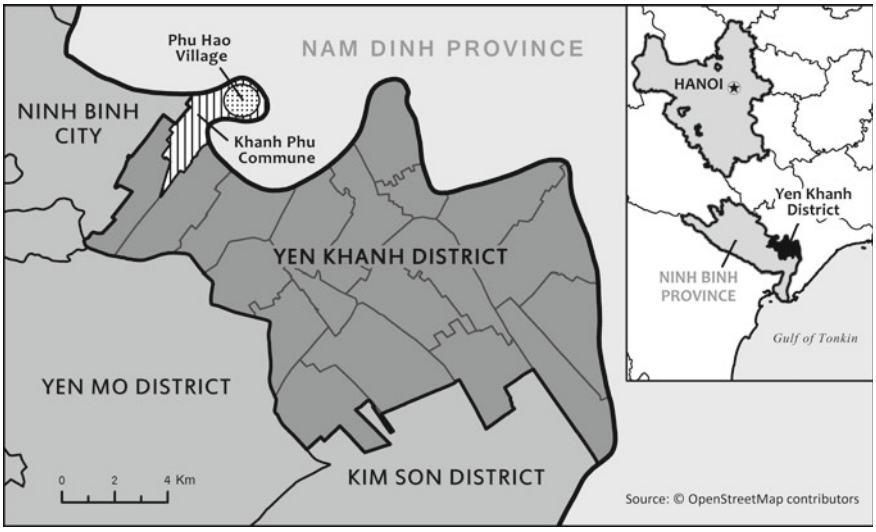

Fig. 5.1 Location of the research site (*Source:* OpenStreetMap contributors; adapted from 2008 atlas map by Truong Dao)

district). Ninh Phuc Port, located in Khanh Phu, is the major port serving Khanh Phu Industrial Zone. Khanh Phu Industrial Zone lies on two communes—Ninh Phuc (Ninh Binh city) and Khanh Phu (Yen Khanh district). This zone occupies three-quarters of Phu Hao village, covering almost all of the village (Khanh Phu People's Committee 2016).

The region has a tropical monsoon climate with four different seasons. There are two dominant monsoon winds—the southwest wind during the summer and northeast wind in winter. Summer and autumn in this region have high temperatures and humidity. From May to October, typhoons and storms occur with strong winds and heavy rains. The volume of rainfall in summer and autumn from May to October is significantly higher than in the winter and springtime from November to April (ninhbinh.gov.vn, 2018).

Since the early 2000s, the Ninh Binh People's Committee planned to establish several industrial zones located in Gia Vien, Hoa Lu, Nho Quan, Yen Mo, and Yen Khanh districts to promote industrial and economic development. In 2004, Khanh Phu commune, Yen Khanh district, transformed 351 ha (including agriculture and residential land) into an industrial area, creating a new Khanh Phu Industrial Zone (IZ). In 2005, the industrial zone started operation. A glass-manufacturing factory was the first to move there, then others followed later. Currently, the zone is almost filled with factories, which are quite diverse—from shipbuilding, steel productions, and advanced material processing to fertilizer manufacturing, garment factories, warehouses, and logistic services.

Since the factories of the Khanh Phu industrial zone commenced operations, Phu Hao villagers have lost productive land and livelihoods. They have also experienced high rates of unemployment and a polluted environment. According to key informants, the polluted water resources and air have caused the death of cattle and fish and lower crop yields. Phu Hao village has sunk because it is surrounded by the Day River dyke and the elevated area of the factories. This makes Phu Hao a suitable area for carrying out research on peri-urban vulnerability to climate-related hazards, including floods, water-borne diseases, and health problems.

5.1.2 Research Approach

To analyze vulnerability and resilience to floods in a peri-urban area we follow the Climate Resilience Framework (CRF) developed by the Asian Cities Climate Change Resilience Network (ACCCRN) (Tyler and Moench 2012). According to the framework, three elements of urban resilience—namely, systems, social agents, and institutions—should be considered along with exposure to understand the flood vulnerability of peri-urban communities. *Exposure* denotes the nature and degree to which a population or system is subject to environmental or socio-political hazards (Adger 2006), and can be indicated by the magnitude and frequency of the hazards that the population experiences (Luers 2005). Regarding *systems*, we explore the conditions of the natural and built (infrastructure) environment that affect the flood

impacts. *Agent capacities* are assessed by examining different social groups' capacity for preparedness, response, and recovery. Finally, we carry out an institutional analysis to investigate the strengths and weaknesses of institutions (laws, policies, and organizations) that enable or constrain agents' abilities to adapt to flood and water-related hazards (Tyler and Moench 2012).

5.1.3 Data Collection

We collected data in March and December 2017. We used mixed methods of data collection, including desk study, stakeholder consultation meetings, key informant interviews, household interviews, focus group discussions, and field observation.

Desk study: We collected relevant information from various resources such as data from governmental organizations at levels from the province to communes including published reports/documents from the provincial, district, and commune People's Committees and from research institutions. These data includes social, financial, economic, and environmental reports.

Stakeholders meeting: We organized a meeting with various stakeholders in Ninh Binh Province, such as the People's Committee of Ninh Binh city (PCC); the Department of Natural Resources and Environment (DONRE); the Department of Science and Technology (DOST); Department of Construction (DOC); Department of Education and Training (DOET); Provincial Union of Science and Technology Associations (PUSTAS); and the representatives from several communes and wards of Ninh Binh city. In that meeting we aimed to identify the groups most vulnerable to climate change and the climate hazards with the most impacts on stakeholders, which warrant further study. We found that heavy and sudden rains and high temperature in the rainy season had the most impact on local communities.

Household interviews: A sample of 103 households, including rich, upper-middle class, middle-class, and poor households in Phu Hao village was selected for semi-structured interviews (Table 5.1). We conducted semi-structured interviews with the head or spouse of the head of each of 103 households sampled. In the household surveys, we raised questions related to different assets to understand how local people access available local resources and how they use them to cope with flooding. Extreme weather events within the last 50 years were also identified and benchmarked for discussion and investigation.

Key informant interviews: We used this method to obtain and gather needed information about Phu Hao community. The informants were from the Ninh Binh provincial Department of Planning and Investment, Department of Natural Resources and Environment, Department of Construction, Department of Industry and Trade, Department of Science and Technology, and the Ninh Binh Industrial Zone Authority. Those informants not only have in-depth understanding of the study's issues but also were knowledgeable about Phu Hao community, and the Khanh Phu Industry Zone which is directly polluting Phu Hao village.

Table 5.1 Number of sampled households in the field research

Village	Rich	Upper middle class	Middle class	Poor	Not answered	Total
Phu Hao, Khanh Phu Commune, Yen Khanh District	5	34	59	5	0	103

Source: Field research, 2017

We used the personal interview technique with guiding questions as a semi-structured interview. There were twenty key informants selected for interviews. They were provincial, district, and commune authorities; village heads; heads of civic organizations such as the Women's Union, Youth Union, Farmers Association, and elderly villagers.

Focus group discussions: We conducted three group discussions with ten people in each, including a women-only group, a mixed group with both men and women, and a group with members of the Village Management Board and representatives from civic organizations, such as the Women's Association, the Farmers' Association, the Veterans Association, and the Youth Union. We also conducted a wealth ranking.[1] The other topics we examined included: local people's livelihood and occupation, rights and reproductive health, use and dependence on resources for daily living (water, energy, transportation, and other natural resources), use of time, personal autonomy, and social networks. We also discussed involvement in public and civil organizations involved in rehabilitation and preparedness for disaster.

Field observation: Based on the information collected from interviews, we tried to figure out the actual living conditions as well as the environmental conditions of the community by taking photos. Those photos serve as evidence to support research findings that inform proposed recommendations.

5.2 Research Findings and Analysis

5.2.1 Descriptive Statistics

The study surveyed 103 respondents from Phu Hao village, all of whom were household heads or their spouses. Twenty of these households (19.4%) were led by women. The average household size surveyed was 3.5 persons, which is lower than the aver-

[1]Group discussion with ten people from different social groups of households helped us to understand the criteria for rich, upper-middle class, middle-class, and poor households—what their main livelihoods were and what their housing looked like as well as other challenges people faced in the village.

Table 5.2 Past flood events in Phu Hao village

Year	Event
June 1968	Heavy rain and storms occurred. In the heaviest one, 17 houses collapsed but no one was killed. The state gave people some baskets of potatoes to help them survive while they were rebuilding their houses. At that time, house walls were made of mud mixed with soil. No rice was given.
1980	Heavy rain caused severe flood, resulting in loss of potatoes and other crops. Fields were covered with water. The cooperative lost all its fish.
2016	Heavy rain occurred twice. The highest water level in relation to ground level reached between 70 and 80 cm and lasted up to two weeks. Sewage water from Khanh Phu Industrial Zone was spreading throughout Phu Hao village and causing death to cattle and fish. Surface water was heavily polluted in rainy season.
August 2017	Heavy rain caused flood. The highest water level in relation to ground level reached 35 cm and lasted less than two days, but lead to loss of crops and rice.

Source: Key informant interviews in the field, April and December 2017

age household size of the entire country (3.8), but equivalent to the figures of both rural and urban areas of the Red River Delta (3.5) (General Statistic Office 2015). There were 184 males and 176 female members, denoting a sex ratio of approximately 1.045, which is a bit higher than the national sex ratio of 1.028 (General Statistic Office, Statistical Yearbook of Vietnam 2016). Only 140 out of 360 people were currently working, signifying a dependency ratio of around 1.57.

The mean age of survey respondents was around 56.32. On average, they attended school for around seven years, with most respondents (76.7%) having finished one to eight grades. Only 19 people (18.4%) had attended high school, and less than 2% had a high school or college degree. The sample was highly native: 97.1% of the respondents had lived in the area for more than 20 years. All of the respondents were Catholic.

5.2.2 Exposure and Impacts of Flood and Other Hazards

Through focus group discussion and household interviews, we were able to summarize several prominent flood events from the last 50 years and their impacts (Table 5.2). Major floods do not occur frequently in the study area—local people remembered only the events in 1968 and 1980. However, inundation caused by heavy rain occurs on a regular basis each year, having various impacts on the livelihoods of local communities.

According to the narratives of key informants and households, the water level usually increases by between 30 and 70 cm during floods. This triggers the blowout of sewage water from industrial zones to all areas in Phu Hao village. As a result, the water becomes heavily contaminated and causes death to cattle and fish. Floods like this occurred twice in 2016. In addition, surface water is heavily polluted during

the rainy season. In the dry season from December to May, Phu Hao villagers suffer from lack of water for agriculture activities in recent years.

> In April 2004, the Binh Dien fertilizer plant left around 15,000 tons of nitrates outside, which was then washed by the rain into the industrial zone's drainage ditch. Combined with wastewater from Chai Chen Screw Plant, this lead to mass mortality of fish and the rice did not produce any grain because of the high protein concentration. Rice yield was only fifteen quintals per hectare, while the normal yield in the area is 75 quintals per hectare. Fish that reached maturity and were ready to be harvested by 15 households in the village receiving water from the drainage ditch of IZ were all killed. Cattle were also killed after drinking water from the drainage ditch.
>
> The compensation of several tens of millions VND was not satisfactory. Thousands of people here are suffering from air pollution and polluted water from earth wells as well as boreholes because of industrial wastewater leaking into the groundwater. Every day from 7:00 PM until the end of the night, the air is so stuffy, breathless, and smelly that we have to wear masks to sleep.
>
> Local villager, key informant, 2017

5.2.3 Socio-Ecological Systems and Infrastructures

Khanh Phu Industrial Zone started operating in 2005. Currently, the zone includes shipbuilding industries as well as steel production, advanced material processing, fertilizer factories, garment factories, and logistic services. All the taxes and environmental fees from the factories are paid directly to the provincial level, with the local community getting benefits from only factory employment. Khanh Phu's economic growth rate has been increasing. In 2017 the economic growth of Khanh Phu was 6% compared to 5% in 2016. The three main economic sectors of Khanh Phu are agriculture, fisheries, construction, and services. Agriculture and fisheries account for 37.51% of Khanh Phu's production value, industry construction represents 49.46%, and services make up 13.03% of the economy.

The percentage of households that are poor (according to multidimensional poverty criteria) in the commune is 3.05% and near-poor households make up to 6.83%. In 2017, of 2,603 people who were of working age (males from 18 to 60 and females from 18 to 55), there were 1,912 people with permanent jobs while 691 people had part-time jobs. Over 1,000 people worked as builders, masons, or electricity- and water-related employees with salaries of about 5–7 million Vietnam dongs per month (approximately 220–310 USD).

The expansion of industrial zones has coincided with the decline in agriculture production. Because of arable lands converting into industrial areas, the land available for growing rice has significantly diminished. Previously, people grew two crops of rice per year, but now they produce only one crop in spring. Other crops include maize, potato, sweet potato, winter melon, black, green, and soya beans, and some traditional herbs. The reductions in agricultural products are also attributed to the shortage of labour since most young people become workers in industrial zones rather than farmers.

5.3 Infrastructure

Housing is classified into three main types: permanent, semi-permanent, and temporary. In Phu Hao, the majority of the households owned permanent houses. Only 13 households (less than 18%) (three upper middle class, seven middle class, and three poor) owned semi-permanent houses and three middle-class households (less than 3%) in the sample had temporary homes.

Public infrastructure for water management and flood prevention in Phu Hao is poorly planned and managed. The controlling canal of Khanh Phu Industrial Zone is over 4 km long, snaking around Phu Hao village and the cultivated area of 17 ha of agricultural land belonging to 300 households. However, the canal is located just 100 metres from Phu Hao village, provoking strong smells that disrupt the activities of about 375 households with 1,450 people affected (Fig. 5.2).

Khanh Phu Industrial Zone is built on ground that is one metre higher than the village foundation. Because Phu Hao village is trapped between the industrial zone and the Day River dyke (which is about seven metres higher than the field and the industrial zone), Phu Hao is regularly flooded during summer. According to key informants, the villagers of Phu Hao have experienced multiple flooding for more than 10 years since the industrial zone started operation. In the rainy season, with the rainfall of about 50 mm, rice fields are also flooded. If the sun is out, the hot water

Fig. 5.2 Canal surrounding Phu Hao village and the agricultural area. In 2014 and 2015, it was polluted during the heavy rain, causing death to fish and other aquatic organisms (*Source:* Field research, 2017)

causes the rice to die. The village is often flooded four times per year and each time lasts about one or two weeks. Phu Hao presently has only 35 ha^2 and only the spring crop is grown. This has adversely affected more than 200 households in the village.

5.3.1 Agent Capacities

5.3.1.1 Income

The Vietnam economic reforms that started in 1986 have brought about the following changes: (1) they eliminated the cooperative's monopoly on agriculture and forestry, (2) they introduced short-term land-use rights (up to 20 years for agriculture and 50 years for forestry), and (3) they encouraged privatization and market liberalization. As in other places in the Red River Delta, the market liberalization period saw significant diversification of household income strategies in Khanh Phu commune. The most significant one allowed individuals to work as waged labourers in the industrial zone.

There is high inequality of income across households. Diversification from agricultural income into sources of non-agricultural income was considered one cause of the increase in inequality. This has been exacerbated by the booming industrial zones in the region. Full-time employment in the private sector and full-time employment in nearby factories have contributed to inequality in household income. Table 5.3 shows annual cash income per capita for each group and the overall distribution of incomes per capita for each household group in the village.

Table 5.3 shows the sources of cash income for the four income groups in 2017. The upper middle- and middle-class households in the sample had the most diverse sources of income, while the rich had the least diverse. Khanh Phu in general and Phu Hao is traditionally a farming community. While the data show that the four groups earned income from farming, this source accounts for a very small percentage of the total household income. The rich earned 0.15 million VND per member, accounting for less than 1% of the total household income. The upper middle class earned 0.9 million VND per member which made up 1% of their total income. Middle-class households made 0.1 million VND per member constituting 1% of the total income and the poor made 0.27 million VND per member accounting for less than 2% of their total income.

In contrast, the income sources of full-time employment in nearby factory and full-time employment in the private sector contribute a very significant percentage to total household income and are considered one cause of the rise in inequality. The rich, upper middle-, and middle-class households earned from full-time employment in the private sector. The poor were the only group that did not earn any income from this source. Our data analysis shows that the upper-middle-class households earned the most per member—4.5 million VND or 34% of the total income. The rich earned 3.2 million VND per member making up 15% of the total household income and

Table 5.3 Net cash income sources/year/group of household/capita in 2017 in Phu Hao village

	Type of households				Total
	Rich	Upper middle class	Middle class	Poor	
Farming	147,368 VND	91,167	101,075	266,666	38,090,002
Animal husbandry	–	671,532	383,010	–	163,240,000
Aquaculture	–	–	139,784	100,000	27,500,000
Wage income for farm jobs	–	160,583	322,580	–	82,000,000
Full-time employment in government sector	–	188,321	258,064	4,000,000	133,800,000
Full-time employment in private sector	3,157,894	4,466,861	1,868,279	–	1,019,460,000
Part-time employment in government sector	2,526,315	182,481	268,817	3,200,000	171,000,000
Part-time employment in private sector	–	1,723,357	2,044,623	–	616,400,000
Full-time Employment in nearby factory	11,684,210	1,919,709	787,096	6,666,666	731,400,000
Part-time employment in nearby factory	–	671,532	688,172	–	220,000,000
Own small local enterprise	–	306,569	978,494	–	224,000,000
Contribution by relatives working outside the community/country	–	–	139,784	–	26,000,000
Other	3,779,578	2,923,436	1,775,698	1,600,000	826,602,800
Total	21,295,368	13,305,554	9,755,483	15,833,333	4,279,492,802

Source: Field research, 2017

the middle class earned 1.9 million VND per member constituting about 19% of their total income. Furthermore, the rich and the poor earned the most per member from full-time employment in the Khanh Phu Industrial Zone, followed by the upper middle and the middle class. The rich earned 11.7 million VND per member from this source of income, accounting for 55% of their total income. The poor earned 6.7 million VND per member from this source of income, also accounting for 55% of their total income. The upper middle class earned 0.8 million VND per member making up about 8% of total income.

The rich households were the only group in the sample that did not earn income from full-time employment in the government sector. The poor earned the most per member at 4 million VND accounting for more than 20%, while the middle class made 0.3 million VND and upper middle class made 0.19 million VND per member accordingly. The figures also reveal that the rich and the poor were not engaged in animal husbandry at all. Only the upper middle and middle class engaged in this activity and earned 0.7 million per member accounting for 5% of the total income and 0.4 million VND making up less than 4% accordingly. Similarly, the upper middle and the middle class were the only two groups that earned wage income for farm jobs, but that accounted for only a small percentage of their total household income. Only the middle-class and poor households were engaged in aquaculture and this source of income constitutes a relatively small percentage of their total household income. The upper middle and the middle class were the two groups who owned small local enterprises such as construction, house repair, or painting. The upper middle class earned 0.3 million VND per member from this source of income accounting for 2% of total income and the middle class made less than 1 million VND which constituted 10% of their total income. The figures also show that the poor were the only group with income from remittances from relatives working outside the community.

In summary, traditional income sources such as farming, animal husbandry, aquaculture, and state wage accounted for small percentages of the total household incomes and contributed less to inequality than their overall share of income. In contrast, nonfarming activities, such as full-time employment in nearby factories and full-time employment in the private sector contributed more to inequality than their overall income share. These were the income sources driving inequality. The rich were more often the households that could take up off-farm opportunities created by the Khanh Phu Industrial Zone which has emerged as a major source of income since 2005. In total, the middle class earned the least per member compared with the other three groups followed by the upper middle class. The poor earned even more than the upper middle and middle class. The reason these wealthier classes are in the poor group is that they had household members suffering from health problems. Three out of five poor households had members who were suffering from cancer and so medical expenses absorbed a disproportionately large part of their income.

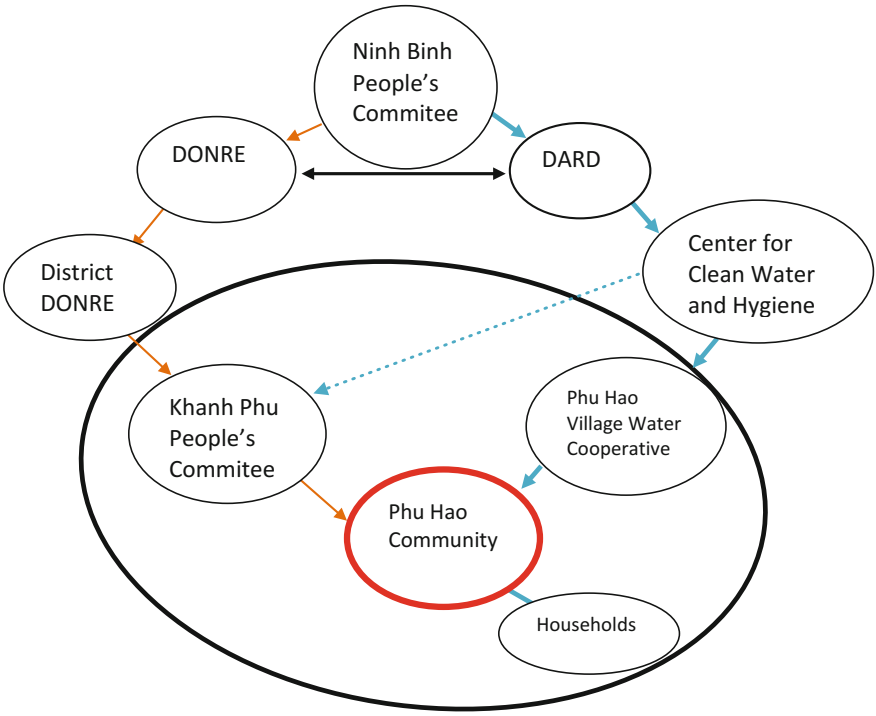

Fig. 5.3 Mapping institutions responsible for supplying clean water in Phu Hao village (*Source:* Field research, 2017)

5.3.2 Institutions

A village cooperative (*Hop tac xa*) provides services such as clean water, sanitation services, the commune's market management, and other kinds of basic services. In 2017, this cooperative invested in expanding the water system and upgrading kiosks in the Ve Market to meet the local community's demand (Fig. 5.3).

5.4 Drivers of Vulnerability, Water Stresses, and Impacts

When Khanh Phu commune lost 300 ha of its best land upon the establishment of Khanh Phu Industrial Zone (IZ), the villagers were promised that they would be provided jobs in the industrial zone and that they would have a much better life. Interviews with key informants during the field research revealed that almost all houses and remaining rice paddies in Phu Hao village are trapped between the IZ and the Day River dyke. The whole village and its surrounding area flood for about one week every year when 50 mm of rainfall occurs. Cultivated land in Phu Hao is

abandoned for six months from June to November every year because of flooding. Consequently, the income of the poor and old households is adversely affected. Many people have lost one crop per year while others have lost two crops per year.

In Khanh Phu commune, 800 out of 6,000 people of working age are hired by the IZ (Khanh Phu Commune People's committee 2016). According to the Phu Hao village head, 200 out of 850 people of working age are hired to work in the IZ in Phu Hao. In group discussions, people told us how Phu Hao villagers were promised jobs before their land was taken away by the IZ, but in fact people from other villages/communes that did not lose land were also offered jobs. Many interviewees expressed their worries that social evils would occur in the context with loss of land and no jobs available.

Phu Hao villagers depend on the so-called 'clean water' source from the Day River, which receives sewage from upstream, including Hanoi and Ha Nam province, before emptying out into the East Sea. A clean water project was funded and supported by the Ministry of Agriculture and Rural Development in 2003. At present, the Phu Hao Clean Water Cooperative is managing the clean water. Because of the terrain in Phu Hao, groundwater is not available and so surface water is used. A big hole was dug, and surface water is pumped from the Day River into the hole. Sometimes oil, grease, black scum, and even leeches are seen in the water. The water price is 6,600 VND (approximately 0.30 USD) per cubic metre. Interviewees reported that the clean water system is far below the demand of local people and the workers at the water station are poorly trained. Water storage and treatment processes are also inadequate. Therefore, most people have to buy a water filter and often spend a whole night to purify enough water for their home use. The rich can buy high-quality water purifiers for 10 million VND and the poor buy them for 5 million VND. In group discussions villagers said they want the waterhole to be dug deeper and with walls to keep out water buffalo and cattle. They also want water to be treated and filtered better to ensure quality. Authorities need to ensure water quality and health for the villagers. They reported that a staff member from the commune's People's Committee was sent to the village to take water samples for water quality assessment. However, villagers never received the inspection results. Results from group discussions and field observation confirmed that there was no sewage plan designed for the whole community during the time the research was being carried out. Polluted water has caused water-borne diseases for locals such as red eyes, itchy rashes, and dermatitis.

In addition to water-related hazards, air pollution is also a massive problem for the local community. The air is polluted all year round by emissions from factories in the IZ and coal dust from the uncovered coal on the dock in the village. Polluted air has affected the life and health of the locals and caused respiratory diseases. In December 2017, all villagers protested the Ninh Binh Coal Company that had been heavily polluting the area around the kindergarten. All the children's hands and faces were black with coal dust. The villagers were furious, and the local government had to call for a meeting between the company and the villagers. Agreements were finally reached, according to which the company had to follow the Vietnam Law on Environmental Protection of Vietnam. If the company violates the law, it will be penalized or even requested to stop its operation in Phu Hao village.

Table 5.4 Household members who are chronically sick or disabled

		Type of households				Total
		Rich	Upper middle	Middle	Poor	
Is there anyone in your household who is chronically sick or disabled?	No	1	30	37		68
	Yes	4	3	19	5	31
Total		5	33	56	5	99

Source: Field research, 2017

Table 5.4 shows that the majority of the rich and the poor and more than half of the middle class were sick. The upper middle class had the smallest number of household members who were sick. Most of the heads of the upper middle and the middle households are between 50 and 70 years of age and they do not work in the IZ. Most of the sick people have been suffering from cancer, stomach problems, kidney stones, and chronic bronchitis among other ailments.

5.5 Gender and Resilience

Le Masson (2016) argues that adopting a gender approach requires projects to recognize social differences, roles, expectations, and the needs accorded to women and men and between people within these gender categories. This means going beyond the women/men binary to look at the intersection between and interaction of different social identities (e.g., gender, status, ethnicity, class, age, religion, and disability). With this bigger view in mind we hoped to gain a better understanding of the underlying causes of people's vulnerability to climate extremes and longer-term climate change as well as their resilience capacities (Gaillard et al. 2017; Morchain et al. 2015).

In Vietnam in general and in Ninh Binh in particular, the persistence of patriarchal values in society situates women in the private sphere, constrains women's freedom of movement, and respects men while disregarding women. Phu Hao is no exception. Interviews with the head of the village revealed how persistent patriarchal norms at the village level have lead to women being virtually excluded from lucrative jobs. According to the head of the village's Women's Union, female-headed households account for 15% of the total number of households in the village. Almost all of those household heads lost their husbands and are middle aged. But they are not hired by factories in the Khanh Phu Industrial zone or in any other factories in the region. Only women who are between the ages of twenty and 35 are employed in the industrial zone. Focus group discussions revealed that most older women household heads stay

at home taking care of their grandchildren so that their children could work away from home and send remittances home to support the family.

Based on household data and focus group discussions, we found that women are largely expected to respond to water crises and the health effects of flooding, and manage water conservation at home in anticipation of water shortages. Women are also responsible for linking up with support systems. According to key informants, if household members—men and women as well as children—are sick from water-borne diseases, women care for the sick. When heads of the households were asked 'who usually solicits help from others during water stress periods?' the majority of them said 'mostly wife and daughter'. Men are supposed to do 'big things' and fetching the water is considered a 'small thing'. Results from focus group discussions show that women seem to be busier than men in Phu Hao village. In addition to taking care of all the housework and their children and grandchildren, they also seek help from others to cope with any problems such as financial problems or flood.

Younger women are expected to give birth to boys. As a result of great economic progress in recent years, women in Khanh Phu, in general, and in Phu Hao, in particular, are supposed to have more children and especially boys than they did in the past. Having a large family is also considered a symbol of wealth. This has placed a burden on women's shoulders and the population has dramatically increased.

5.6 Conclusion and Recommendations

The case of Khanh Phu illustrates how the commune is subject to heavy pressure from development of the Khanh Phu Industrial Zone and associated environmental problems. The villagers notice water stress, water pollution, and air pollution and are concerned. Cattle and fish were killed, and the villagers' health has been adversely affected, although no technical research has been carried out yet to directly establish the causal relationship between degraded water quality in the commune and the health status of the local population. Water pollution has also resulted in the scarcity of clean drinking water.

Since 2003, clean water has been supplied to households in Phu Hao village. However, many people complain about the quality of the clean water supplied to households and a number of households use rainwater and rely on deep boreholes when the clean water becomes scarce in February. Most people have bought water filters. The rich buy high-quality water filters that cost twice as much as the filters bought by upper-middle- and middle-class households. The poor depend entirely on the water supplied by the cooperative for drinking.

Local institutions have responded to water stress and air pollution by facilitating face-to-face discussion between the Khanh Phu Industrial Zone entrepreneurs and Phu Hao villagers. This has helped ease villagers' anger to some extent. However, because of a lack of local participation in the design and building of the water supply station, local people are not satisfied with the water's quality. Villagers have become more vulnerable than ever because the local institutions are weak in man-

aging complex peri-urban systems that are nested, interlinked, and operating across administrative boundaries. The lack of regulations, an unplanned built environment, and an underdeveloped water infrastructure for supply, sanitation, storm drainage, and pollution pose more severe challenges to an already-strained and ill-developed existing adaptive capacity in the area.

Our findings also show that women and female-headed households have become more adversely affected than men as a result of persistent patriarchal norms at the village level. Accessing equal opportunities and enjoying equal rights is part of developing women and/or marginalized people's absorptive, anticipatory, and adaptive capacities to build their resilience to climate change and disasters.

To resolve the situation that villagers in Khanh Phu face, the local institutions must be strengthened. They urgently need a clear delineation of responsibilities and strong coordination among the Ninh Binh Industrial Zone Management Board, the Ninh Binh Provincial Department of Natural Resources and Environment, the Ninh Binh Provincial People's Committee, and the Ministry of Natural Resources and Environment so that appropriate policies for managing industrial zones will be designed to make use of the local comparative advantages in the development process and, at the same time, ensure green growth, efficiency, and security for all residents.

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Chapter 6
Urban Governance of Flooding in Myanmar: A Case Study of Bago

Graham Reeder

Abstract Urban flooding poses significant challenges to cities in Southeast Asia including loss of life, human displacement, and damaged infrastructure. As cities in the region grow and as the effects of climate change worsen, urban flooding is becoming more frequent and severe. This research situates flood governance in Bago City, Myanmar, in the literature on environmental governance and urban political ecology, investigating how local governance actors interpret the significance of flooding and how they promote urban climate governance. Using the 2015 Bago floods as a point of entry, results were derived from semi-structured interviews with (10) government officials and (22) key informants. Broadly, this research found that government officials interpreted the 2015 floods as extreme but also as an example of the government's increasing capacity to respond to disasters, that local and regional governments lack the human and capital resources to take on the greater responsibility for flood management that they wish to, that government often fails to act on their knowledge about external causes of flooding such as land use and climate changes, and that government officials strategically adopt neoliberal paradigms advanced by international networks while reinterpreting them to advance their own goals of expanding the role of the state.

Keywords Myanmar flood · Climate change · Flood governance

Myanmar was hit by a series of devastating floods over a three-month period from July to September 2015 that resulted in 103 deaths and displaced an estimated 1 million people in 12 of the country's 14 states. President Thein Sein declared a state of emergency, the first declaration of its kind for a natural disaster since 2008 when Cyclone Nargis devastated the country, killing over 138,000 and displacing nearly 1 million people—the most significant environmental disaster to have affected the country since recording began (Fritz et al. 2009). Bago Region, a large area in the centre of the main southern coast of the country, was one of the country's hardest-hit regions, along with Ayeyarwady and Sagaing regions. Bago City (hereafter referred

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to as Bago) is the region's capital as well as its largest settlement with a population of just under 300,000 and a region-wide population of nearly 6 million. Located 91 km northeast of Yangon, the city is undergoing rapid urbanization and is among the fastest growing in the country. A Special Economic Zone with half a dozen garment factories and the Hanthawaddy International Airport project are both under construction on the outskirts of the city. The central government expects them to bring significant development to the area. Growth in the greater Yangon region, and Bago's location on the Yangon-Myawaddy highway corridor that connects Yangon to Thailand and much of Southeast Asia, provides evidence that Bago is poised to become among the major emerging secondary cities of Southeast Asia (Fig. 6.1).

Countries that are located in geographically sensitive regions and lack material resources to prepare for global environmental change are particularly vulnerable to the impacts of climate change. In 2017, the Global Climate Change Risk Index ranked Myanmar the second most vulnerable country to climate change on earth. Myanmar already faces two major impacts: drought in the central dry zone and increased flooding along its rivers and coastline (Kreft et al. 2016; Wassmann et al. 2009). In this context, climate change impacts are a significant problem for Myanmar. Government, development-concerned institutes, nongovernmental organizations (NGOs), and grassroots groups (MoNREC 2017) are preparing for climate impacts there. My research focuses on local and regional government agencies because of their increased role in the management of everyday life resulting from governance reforms.

Myanmar is among the group of 45 countries known as the Least Developed Countries (LDCs). As the world's poorest countries, LDCs have unique vulnerabilities to climate change impacts derived from their lack of financial and institutional capacity to manage climate risks (Huq et al. 2004). The cruel irony of climate change is that despite having contributed the least to the problem in the first place, LDCs are among the most vulnerable in the world to climate change. 'When disasters strike, LDCs are forced to depend on external aid, as they lack the resources and money to deal with the problems themselves. The LDCs also lack the resources and money to conduct adaptation studies and implement resulting strategies' (Huq et al. 2004, 27). Coastal zones and low-lying delta areas in Asia, such as those in Myanmar, Bangladesh, and Cambodia, are increasingly at risk from sea level rise and more frequent and severe storms (IPCC 2014). Climate change is expected to add stress to the Bago Region in particular, with decreased rainfall expected during the winter and summer and increased rainfall expected during the rainy season (Ye Htut et al. 2014).

In light of the growing international focus on climate impacts in urban areas, in this chapter, I focus on how floods are governed in the context of climate change in Bago, Myanmar. Does the open-endedness of climate adaptation and resilience create an opportunity for context-specific solutions? To answer these questions, we need to look at how government actors at the subnational level in Myanmar prepare for flooding. Three subquestions link government interpretations of flooding to their exposure to climate change discourse:

Fig. 6.1 Bago city (*Sources:* GADM and OpenStreetMap contributors)

1. How do government actors interpret the significance of flooding, and the 2015 floods in particular?
2. What role do they see for the government and other actors in flood preparedness?
3. What roles do climate change and/or other external factors play in driving floods and/or shaping government agency responses to floods?

My research approach relies on qualitative mixed methods. I conducted semi-structured interviews with government officials in Bago and key informant interviews with local academics, religious officials, NGOs, and residents. I found that the extent to which flooding is framed as a disaster is not consistent across Bago, let alone Myanmar. Despite years of experience with flood management, the region and the country now predominantly favour engineering-focused responses to disaster risk.

6.1 Flood Management

While the literature focuses on causes and responses to disaster events, there is a dearth of literature exploring how flooding interacts with competing discourses and power relations in terms of climate change impacts. Although human settlements have experienced and managed floods for as long as people have lived on earth, the study of flood risk emerged only in the mid-twentieth century as a much more complex issue than previously imagined. Dundes notes that while 'modern technology and medicine have succeeded in eliminating many of the dread diseases and in reducing the dire consequences of natural disasters which have plagued mankind over the centuries', they have 'failed to check the ravages of fire and flood' (Dundes 1988, 1). Premodern methods of managing floods consisted mainly of either migration or attempt to keep flooding away from the settled population by building embankments, channels, and elevating structures. Throughout the mid-twentieth century, engineers and emergency managers harnessed new tools including flood-proofing, early-warning systems, building codes, and land-use management. These new tools started from the premise that some flooding is inevitable and that complex engineering systems to prevent flooding had their limits (National Research Council 2013). Towards the end of the twentieth century, the scholarship on flood control reoriented toward the notion of flood risk management and insurance became a major component of flood response. Despite this new scholarship, engineering-based flood control solutions remain the dominant approach to floods in practice in many contexts, including in Myanmar (Liao 2012).

Contemporary scholarship views flooding as more than simply an engineering problem, particularly in light of contemporary insights from fluvial geomorphology that show how river flow patterns vary greatly over time (Milly et al. 2008). Although many scholars continue to stress the centrality of flood control measures (Birkland et al. 2003; Godschalk 2003), climate change has driven a shift in paradigms that bring approaches from the fields of resilience, adaptation, and disaster risk reduction to the fore (Berkes 2007; Liao 2012; Zevenbergen and Gersonius 2007).

As Chapter 1 discussed, a number of important contributions to the study have been made in the field of urban political ecology. Pelling's (1998) work on the political ecology of hazards illustrated how social capital relations that emerged from noneconomic functions are a necessary component of coping with flood hazard in Guyana. It showed how hazards exist 'both as discursive constructs and as

actually felt phenomena … operating at the level of political discourse as well as political action' (250). Pelling also brought urban flooding into focus by highlighting the unique vulnerabilities and resources of urban regions as opposed to rural communities, which are typically the focus of development and relief interventions. James and Paton (2015) applied Pelling's social capital lens to examine disaster recovery in Myanmar, specifically in the context of Cyclone Nargis, and found that governance practices were more significant than the existence of active social capital in determining the outcomes of disasters. These insights, in particular, drive my focus on how government understands, and therefore responds to, flooding.

Bankoff challenged scholars to think about the social and historical context in which hazards are construed as disasters, particularly the colonial process of framing the non-Western world as unsafe for European conquerors and therefore in need of intervention (2004, 26). Collins (2010) disrupted the previous assumption that marginalization is the ultimate producer of exposure to disaster by showing how the poor and otherwise marginalized can possess unique assets in facing hazards that wealthier communities may not.

Southeast Asia has emerged as a priority region for scholars who study urban flooding. It is the most rapidly urbanizing region in the world and has a long history of flooding that is clashing dramatically with new urban landscapes (Garschagen and Romero-Lankao 2015; Rosenzweig et al. 2011; UN-DESA 2012; UN-HABITAT 2011), particularly in low-lying or coastal areas (McGranahan et al. 2007). Myanmar, in particular, is among the top ten fastest-growing economies globally (World Bank Group 2017). These social and physical transformations are occurring alongside dramatic political and economic transformations. Garschagen notes that 'cities in those countries are most often the forerunners of administrative reform, changing political economies and transforming power-actor-networks' and calls for an integrated approach to analyzing urban risk governance in Southeast Asian countries that places 'the shifting political negotiation of responsibilities for risk reduction and the adaptation of the very institutions for risk governance at the centre of attention' (2015, 600–601). Marks (2015) argues that incomplete decentralization in Thai cities has resulted in a political imbalance that makes cities particularly vulnerable to flooding without giving them the power to respond effectively or equitably. These shifting dynamics are no less present in Myanmar, which has received significantly less attention from scholars and international development organizations alike.

The use of resilience as a concept in connection to social systems came from ecology and gained popularity in the late 1980s (Holling 1973; Janssen and Ostrom 2006). Unlike ecological resilience, the resilience of social systems broadens its focus to include foreseeing and adapting to potential changes (Adger 2000; IPCC 2014). Walker et al.'s (2002) definition of resilience as the degree to which a system is capable of learning and adopting new solutions follows a similar line of thought. Resilient systems are able to absorb larger shocks without having to fundamentally transform. To some extent, however, changes in social and ecological systems are inevitable, and can allow resilient systems the possibility of developing new capacity, adapting themselves to match new circumstances (Folke et al. 2002). Folke et al.'s definition of resilience establishes a link to the concept of *adaptive capacity,* which

they define as the ability of social and ecological systems to cope with novel situations without losing options for the future (2002). Arguing that building resilience is the key to enhancing adaptive capacity, they consider resilience particularly through its links to adaptation in their study.

6.2 Resilience

The resilience of social systems is closely linked to the ecological systems that sustain them. While this is particularly observed among communities where livelihoods strongly depend on natural resources, it remains true for communities whose ties are less direct. Social systems' capacity to adapt and develop is highly dependent on the support capacity of the ecosystems they rely on, as well as their ability to access those ecosystems. Reducing this capacity may lead to increased vulnerability in the social system unless a new support ecosystem can be accessed. Likewise, the resilience of an ecological system depends on its healthy management by the communities that rely on it. This dynamic interdependence between social and ecological systems, in which human activities are capable of dramatically changing the environments upon which they depend, is known as socio-ecological resilience (Folke et al. 2002).

Adger (2000) questions whether the linkages between social and ecological resilience are straightforward, particularly when it comes to the resilience of communities' dependence on ecological systems. The globalization of commodities has complicated the relationship between the well-being of societies and their natural environments. For example, a crash in the price of rice could devastate a community that relies on it as a cash crop without having any impact on the health of the natural system. Conversely, a wealthy city can rely on imports from distant ecological systems to maintain a resilient population in an unproductive ecosystem (Adger 2000).

Tensions can emerge between the short-term success of a community and its long-term resilience (Sapountzaki 2007). Short-term management or development efforts, such as investing in monoculture development or paving a landscape with concrete, may lead to a decrease in the long-term resilience of the system such as a loss of biodiversity or an increased susceptibility to flash floods. In these cases, the resilience framework favours the long-term health of a community or a system over short-term gains and promotes development that can be sustained. In this sense, resilience is often associated with the concept of sustainable development (Perrings 2006), where social and ecological development is seen as intertwined and long-term projects.

Key factors that make resilience difficult to assess are the unpredictability of environmental change, technological development, and political shifts. Tsunamis, agrochemicals, military coups, and comparable events have resulted in unpredictable dramatic shifts in resilience for communities, especially in Myanmar. Sapountzaki (2007) stresses the differences between individual and societal resilience, noting that certain stakeholders or social groups can be excluded from the development of resilience in a wider community.

While some scholars present vulnerability as the converse side of resilience (Folke et al. 2002), the concept of vulnerability comes from a different tradition altogether and has a crucially distinct meaning in the context of flood studies. The idea of resilience can be described as coming from a positivist tradition found in risk management and environmental studies that seek to measure and verify social and ecological systems. The concept of vulnerability derives from a constructivist tradition that views conditions as culturally situated and normative, taking an individualized approach to development that attempts to avoid imposing external metrics of success or failure on distinct communities and individuals (Adger 2006; IPCC 2014). Miller et al. describe vulnerability 'as a condition, encompassing characteristics of exposure, susceptibility, and coping capacity, shaped by dynamic historical processes, differential entitlements, political economy, and power relations, rather than as a direct outcome of a perturbation or stress' (2010, 3).

Given the massive popularity of resilience as both a theoretical framework and a development buzzword (Cornwall 2007), it is perhaps unsurprising that critiques of resilience abound. Walker and Cooper argue that the success of resilience in 'colonizing multiple arenas of governance' reflects its ideological fit with neoliberalism. They observe that the concept of resilience has become 'a pervasive idiom of global governance', being 'abstract and malleable enough to encompass the worlds of high finance, defence and urban infrastructure' (2011, 144). Swyngedouw and Heynen (2003) argue that the apolitical ecology of resilience privileges social structures that are established, often defending those shaped by unequal power relations and injustice. O'Malley (2010) points out that the way resilience is mobilized by state agencies and other expert power holders in a top-down fashion places the onus of being resilient on communities and the vulnerable rather than the state or the elite. Finally, MacKinnon and Derickson argue that resilience policy relies 'on an underlying local-global divide whereby different scales such as the national, regional, urban and local are defined as arenas for ensuring adaptability in the face of immutable global threats', but that in reality, 'the processes which shape resilience operate primarily at the scale of capitalist social relations' (2013, 254–255). These critiques of what resilience has come to mean in many development contexts indicate that situations that mobilize resilience discourse require close scrutiny.

Particular attention to 'urban resilience' in cities located in the global south began to emerge in the past decade (Dai et al. 2015; IPCC 2012; MacKinnon and Derickson 2013) as a result of rapid urbanization in developing countries as well as growing threats to urban communities by hazards associated with climate change, including droughts, floods, and powerful storms (Cannon and Müller-Mahn 2010; Friend and Moench 2013). Ford et al. claim that this is because 'developing nations are believed to be particularly susceptible to the impacts of climate change … [because of] the dependence of livelihoods on climate-sensitive sectors … climate sensitive-infrastructure … and limited adaptive capacity to cope with impacts' (2015, 801).

6.3 Myanmar's History of Urban and Environmental Governance

Myanmar's history is too rich and its politics too fast-changing to summarize adequately here. Instead, I endeavour to summarize contemporary scholarship that concerns public sector reform, urban governance, and environmental governance in modern Myanmar.

Hook, Than, and Ninh divide Myanmar's experience of public sector reform into four eras, noting that, 'while there were many changes over these years, there was also much continuity':

1. post-independence democratic governments from 1948 to 1962,
2. the Revolutionary Council years from 1962 to 1974,
3. Burma Socialist Programme Party rule from 1974 to 1988 and
4. the military regime from 1988 to 2011 (Hook et al. 2015, xi).

Under these systems, a small group of senior generals and ministries developed policies and the civil service primarily played a policy-implementation role. This resulted in a civil service that lacks policy development and consultation experience and capacity, making participatory governance a challenge (Hook et al. 2015).

Since 2011, a fifth era of reform has been characterized by a growing share of power for elected representatives, diminished but still significant power for the military, and decentralized decision-making from the capital of Nay Pyi Taw to the states, regions, districts, and townships (Hook et al. 2015). In 2008, the military regime established a new constitution that allowed for multi-party elections at the union (national) level as well as within the 14 regions and states. States and regions are divided into districts, which are further divided into townships, which are divided into village tracts in rural areas and wards in urban areas. Myanmar does not have a system of elected local governments but instead has Development Affairs Offices (DAOs) that are staffed by the Ministry of Home Affairs at the union level and advised by a local semi-elected Township Development Affairs Committee (TDAC). Since 2011, the TDAC elections have introduced Myanmar citizens to local-level electoral politics and pushed the union and state/region governments to allocate larger proportions of their budgets to local priorities (Nixon and Joelene 2016). Unlike Bago, larger cities such as Yangon, Mandalay, and Nay Pyi Taw, have city-development corporations that provide municipal services, but elections in these cities were still in development (Hook et al. 2015).

The TDAC is composed of a majority of locally elected members and oversees the work of the DAO, which is staffed by the General Administration Department (GAD) under the Ministry of Home Affairs—one of three important ministries that remain under the control of the military under the 2008 constitution. This means that while elements of the regional and local government are under democratically elected control, a significant amount of the civil service is controlled by the military. Former military officers still occupy almost all senior civil service positions, constituting 'an administration within an administration' (Hook et al. 2015) (Fig. 6.2).

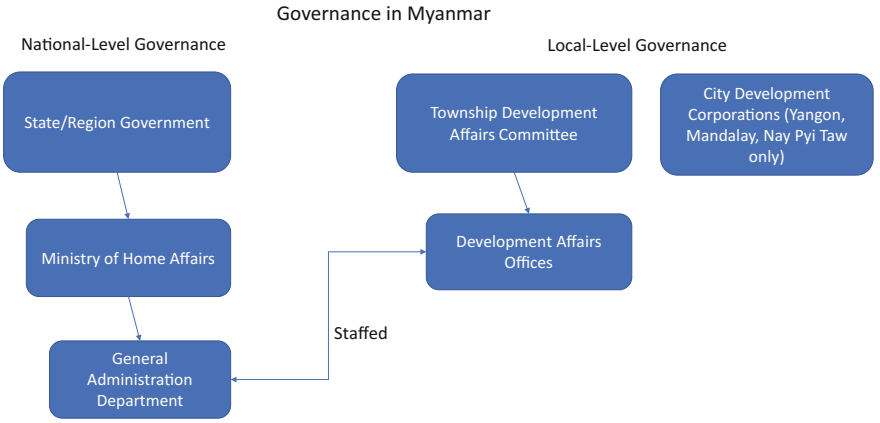

Fig. 6.2 Basic structure of national and local governments (Chart by Graham Reeder)

As a result of the inexperienced civil service, expert advisors have come to play a significant role in union-level governance. Advisors mostly include Myanmar citizens who have been educated abroad, many of whom were once exiled pro-democracy activists or UN officials (Hook et al. 2015). The fact that the civil service is entirely run through the General Administration Department (GAD) under the Ministry of Home Affairs, one of the few large ministries still under the control of the military, means that democratic reform is kept at arm's length from its management (Chit Saw and Arnold 2016). GAD offices are uniform in size, regardless of township population. They each consist of 34 staff who all report to a township administrator and assistant director. Because GADs are responsible for population and land registration as well as tax collection, most are staffed almost entirely by clerks and accountants, leaving little room for urban planning, engineers, or environmental assessments (Chit Saw and Arnold 2016).

The prominence of the Ministry of Home Affairs in municipal-level planning and development is controversial. The GAD is widely perceived to have accepted and facilitated land grabs and other forms of corruption, making it difficult for citizens to trust it with the increased powers and financing that it will receive as powers and responsibilities are devolved to the local level (Chit Saw and Arnold 2016). DAOs are, for better or worse, the only form of truly devolved government in Myanmar. They are unique in that they raise all their revenue from their own township and have significant discretion over spending. Though DAOs are staffed by the GAD, the TDAC that oversees them has ultimate decision-making power and is composed of a majority of locally elected members (Arnold et al. 2015).

Jones (2014) has critiqued dominant discourse about Myanmar's reform for falling into the trap of treating development and reform as apolitical. He argues that the country has ignored the empowerment of a small class of crony capitalists who have benefitted enormously from the liberalization of trade. 'The turn from politics to development and the generally oppressive political climate have demobilised the

old resistance organisations and channelled "civil society" organisations towards apolitical "development" activities, leaving most people with no collective political voice' (Jones 2014, 152). He also challenges the idea that international sanctions helped empower citizens and crippled the military government. He notes that in 2011 the military was at its largest in history and that constrained development hindered labour militancy, marginalized small farmers, and empowered land grabs in the borderlands.

Myanmar is among the most fertile and mineral-rich nations in all of Asia and has long been a country with 'stunning ecological diversity' (Smith 1994). Its ecosystems vary from rainforests, tropical islands, mangroves, and rice-growing plains in the south to temperate Himalayan peaks and evergreen forests in the north (Myint 2007). Over 50% of Myanmar's total gross domestic product (GDP) is generated in the agriculture sector, which employs 60% of the country's workforce. Rare mineral mining and teak forestry through state enterprises provide major sources of revenue for the government, with the result that deforestation has devastated vast swaths of the country's landscape (UNDP et al. 2000).

In 1992, the Myanmar SPDC government established a National Commission on Environmental Affairs (NCEA) along with a policy framework that would form the roadmap for developing a national environmental action plan. Myint (2007) wrote that the NCEA's establishment under the Ministry of Foreign Affairs signalled the SPCD's true intentions, arguing that the NCEA effectively served as an international public relations stunt to relieve international pressure and clean up the military government's image abroad. Myint fails to recognize, however, that many global south governments have established environmental commissions or offices under or in partnership with their foreign affairs ministries, largely because of their reliance on international partnerships and finance to implement environmental and conservation initiatives (Duda and El-Ashry 2000). However, the critique that the NCEA failed to substantively curb rapacious resource exploitation among the forestry and mining state enterprises rings true. The Myanmar Ministry of Natural Resources and Environmental Conservation was by and large exclusively focused on ensuring that Myanmar exploited as much of its vast mineral wealth as possible, with conservation concerns an afterthought. Perhaps more significantly, the NCEA provided sufficient justification for the SPCD government to treat Myanmar's rivers and other waterways as 'governable spaces' (Rose 2001), extending governmentality (Foucault 1991) to riverine and coastal territories and creating a new mechanism by which to manage space and human activity (Maclean 2007).

Myanmar's environmental governance has made significant strides in the period since constitutional reform. The Ministry of Natural Resources and Environmental Conservation finalized a Climate Change Strategy and Action Plan for 2016–2030 in July of 2016, in partnership with the European Union, UN-Habitat, UNEP, and a number of local and international NGOs and expert technical advisors. The plan acknowledges flooding as a particular cause for concern in the context of climate change, particularly its impact on agricultural production. The action plan addressed this by developing hydrological analysis capacity to survey flood-prone areas (MoNREC 2017). The ministry has also recently finalized a national climate

change policy. Still to be publicly released, it will touch on agriculture, irrigation, energy, transportation, industry, health, and social welfare ministries (Sway 2017).

Seint Sann Zaw's work on institutional change in the wake of Cyclone Nargis highlights 2008 as a key moment in the 'opening up' of Myanmar to the world, setting the stage for the presence of the international community in the form of government aid, foreign direct investment and INGOs, and marking Myanmar as a fledgling democracy in need of 'aid' (Zaw 2016). Nargis also shook public confidence in the managerial power of the SPDC military government and is widely viewed as a key event in the democratic reform process.

6.4 Regional Context

Beginning in July 2015, unusually heavy monsoon rainfall caused rivers and creeks to overflow with rainwater, flooding low-lying surrounding areas across the country. The causes of the flooding are widely disputed and include mismanaged irrigation projects, deforestation, higher-than-average rainfall, and Cyclone Komen, which struck land in Bangladesh in late July (Burki 2015). The floods resulted in 103 deaths and displaced up to 1 million people within Myanmar. Although the Ayeyarwaddy Delta region felt the worst effects, Bago Region was among the hardest hit, particularly in the rural northwestern region and the greater Bago urban region. All of the region's 28 townships and half of its village tracts were affected, and up to 100,000 displaced people came to Bago to seek shelter and emergency relief.

Bago has a long history of dealing with floods and other natural disasters. Located on the banks of the Bago River, the city lies in close proximity to the larger Sittaung River, which connects to the Bago River by a canal just south of the city. The broader area is prone to recurrent flooding in the monsoon season along the river and has more recently experienced flash flooding. Historically, earthquakes and landslides have seriously affected the region, and drought conditions have occurred several times in the northern part of the region.

Myanmar is currently undergoing a radical transition in governance in the wake of constitutional reform in 2008 and successful multi-party elections in 2015. One of the biggest changes that have come with democratic reform is a shift from centralized directives and commands to a model that includes decentralized and democratic decision-making. 'As the government of President U Thein Sein has begun to reform the public sector, as part of its "people-centered development" agenda, it has decentralized decision-making from Nay Pyi Taw to states/regions, districts, and townships. Township committees have also been created, with some members drawn from society to increase the public voice in decision-making' (Hook et al. 2015, 1). Myanmar now has two tiers of government (the union and the state/region levels) with distinct responsibilities and revenue sources.

6.5 Study Population and Sampling

Given the types of data required to understand how floods are governed in the context of climate change in Bago, I relied on semi-structured interviews with government officials. Key informant interviews with flood-affected residents and local flood response actors provided the data for my analysis. The study population consisted of regional and local government officials engaged in flood response and readiness who are the primary drivers of flood policy and response in Bago. While union-level officials have influence in shaping national policy related to disasters and the environment, flood management and readiness is mainly coordinated at the region level in cooperation with local DAOs. I conducted these interviews in February 2017 and supplemented them with key informant interviews with nongovernmental actors who are involved in flood management and response in Bago. For my purposes, nongovernmental actors are defined as NGOs or other nonprofit organizations that are separate from the Myanmar state. I conducted a final set of interviews with flood-affected residents of Bago.

In total, I interviewed 10 government officials of varying seniority in both DAO and Bago Region governments; five INGOs/UN agencies involved in climate adaptation and/or disaster response; three academics at Pegu University and two at Yangon University; two monks at a Bago monastery that was involved in flood response; and 10 Bago residents who were affected by the 2015 floods—a total of 32 participants.

My study population was divided into three groups by the nature of engagement with urban flooding in Bago. They include:

(1) government agencies responsible for flood management and/or climate change impacts (referred to hereafter as 'government agencies');
(2) Bago community stakeholders who are affected by floods and also involved in managing flood impacts (i.e., 'community stakeholders'); and
(3) INGOs, UN agencies, and academics involved in Bago flood-readiness-and-response work or research (referred to as 'civil society').

6.6 Flooding as a Hindrance to and Result of Development

Government officials I interviewed universally acknowledged flooding as among the most significant challenges for Bago. Flooding has caused loss of human life, destroyed vital crops, and damaged important infrastructure in the city. Several officials noted that flooding occurs regularly in Bago, though the severity and breadth of flooding can vary greatly. The widespread nature of the flooding in the region made it difficult for officials to separate urban flooding from that of the surrounding rural areas. While some degree of annual flooding is expected in Bago, the 2015 floods were widely understood as out of the ordinary. Some government officials stressed that the 2015 floods were not only worse than usual, but they also showed that Myanmar was better prepared for flooding than in the past. One city official

said: 'Even though the flooding was almost as bad as 2008 in Bago city, the damages were much less and the loss of life was much less. This is because we are getting better with this—with preparing for floods. We have prepared more and we knew the floods were coming so we prepared. We did not pretend there were no floods like Nargis. We prepared and it helped us deal with the floods'. Overall, government officials believed the 2015 floods were significant not just for their abnormality, but for the ways in which they showed Bago's progress in flood management efforts.

Government officials universally thought that the government should be involved in flood management, but there was less agreement between them on the subject of what levels of government should take responsibility for flooding and whether the government should be engaged in risk reduction, coordination, or overseeing land-use reforms. One official argued that 'the responsibility is with the region government but it should not be. It should be with the union government—they are the ones with the most money to prepare, or they should just give us the money and we can do it but they do not. They tell us we must prepare but we do not have enough money to do it'. Another said 'I think the DAO should have more responsibility than we do now. The DAO structure is new but we have the closest connection to Bago city. We know the community and can help it better—they should let us take more responsibility'. When asked what barriers existed to flood preparedness, interviewees commonly mentioned a lack of financial and human resources. Several officials were quick to point out that the government reforms had removed a significant barrier to flood readiness. Government officials agreed that nongovernment actors, including the general public, should be involved in flood preparation.

When asked about the causes of flooding in Bago, particularly in 2015, officials identified the floods as rooted in natural causes, such as increased rainfall and higher water levels. Land-use changes were identified by some municipal officials, but not regional or national officials and failing infrastructure was also a recurring theme among respondents. Flooding is understood both as a hindrance to development and a result of it. 'The flooding is because we have too fast development. It has all happened so fast and the city is growing so fast—that is why we have the flooding. But the development is also good for the people, so we must have it, just slower'. When asked about climate change, all respondents agreed that it was an underlying cause of worsening floods, many referring back to the points they made when asked about the initial cause of flooding. According to the officials I interviewed, some of these causes are being addressed, such as wetland restoration and reforestation, while others are being ignored or are out of their hands such as land-use reform, managing deforestation, and mitigating sea level rise and other climate change impacts.

6.7 Discussion

The motivation for this research arouse from the debate in the international political sphere about urban climate impacts: that is, to what extent does the open-endedness of climate adaptation and resilience create an opportunity to create context-specific

solutions (Cannon 2000; Wisner et al. 2004; Wisner and Walker 2005)? This case study of Bago shows that local government is capable of manipulating the discourse of ecological modernization to suit their own ends, both as a means of expanding the state's managerial role and replacing traditional forms of flood management with modernist approaches.

Although Bago has a long history of floods and flood management, 2015 was the first year that the national government declared a state of disaster in the region. This was in large part a result of how widespread the flooding was. The widespread nature of the flooding drove rural residents into the city to seek food, water, and shelter as well as temporary livelihoods after their rice crops were destroyed. The regional government has since implemented planting advisories and workshops to encourage flood-resistant crops and to align planting and harvest times with meteorological data.

Residents and government officials diverged on the question of whether flooding is necessarily a disaster. One resident and café-restaurant owner framed flooding as a welcome disruption of everyday urban life:

> Yeah, we can deal with floods—it's like a holiday for us. We can close the shop and stay home, but then we have to clean the rubbish after and we don't like that. When all the tables go away with the water we don't get any compensation but if the locals see them they will bring them back. Because flooding happens here all the time, it's not a strong problem, it's a holiday. People are used to it and they see it so we don't really prepare anything—it's really just once in a while or once in a year—it's just like normal life for us. We just tie our scooters down.

Similar themes emerged from the study about the lack of a waste disposal system creating problems for residents in urban areas while the tight social networks in the city helped residents recover from the effects of floods. Residents have developed strategies such as building their homes on stilts in the floodplain and owning small boats to navigate the village when small streets flood.

Residents and government officials alike agreed that while flooding has become more frequent and worse in the last decade, the government's capacity to respond to floods has also increased. Government officials were careful to point out that flooding could not be eliminated and must be accepted as part of everyday life in Bago, but that government and civil society interventions have the potential to reduce the negative impacts of and risk associated with floods. Government interviewees also stressed that part of what made the 2015 floods significant was that the global community could see how much better prepared Myanmar was than in 2008 when Cyclone Nargis hit. Government officials saw Nargis as an embarrassing failure and interpreted the difference between the two events as a sign of how much progress Myanmar has made in the last decade of reforms.

The Myanmar government is undergoing a gradual but incomplete decentralization (Marks 2015) and empowering regional and local democratic governments to take on greater responsibility from the pre-existing military governance structures. Government officials and residents alike spoke about a marked improvement in the ability of experts and citizens to provide input and advice to improve flood readiness, but also of an expansion of the state's role in meeting community needs. An

Fig. 6.3 Waste beginning to pile up against a drainage canal grate (Photo by Graham Reeder)

important example was the union government replacing storm drains after the 2015 floods when the lack of community engagement in the project as well as the lack of waste-collection services or infrastructure meant that the drains filled with trash and were clogged by the next flood season, causing even worse flooding in certain areas of the city. State-run flood management techniques, in trying to find a quick engineering fix, ultimately worsened flooding over the long term for many residents. The assumption that modern technology would solve flooding without systems in place to ensure the viability of that technology worsened flooding and made residents more vulnerable (Fig. 6.3).

Residents and INGOs interviewed during key interviews regularly reported that temples are traditional sites of refuge for people displaced by floods, landslides, and earthquakes. Theravada Buddhism plays a vital role in Myanmar's social life (James and Paton 2015). Nearly every citizen spends at least some time as either a monk or a nun and local temples operate extensive charity networks funded by community donations. One temple in downtown Bago is surrounded by a pond that was attached to a tributary canal of the Bago River after 2015 to accommodate extra storm water. Monks reported that because of the water flow, sedimentation and pollution have killed off the natural fish and flora and that the temple is no longer a viable shelter during floods because of these changes. In this way, the government intervention to reduce flooding has replaced a more traditional approach to flood management (Fig. 6.4).

Fig. 6.4 Monastery and pond used for flood mitigation (Photo by Graham Reeder)

Although flooding has been a regular occurrence throughout Bago's history, changes driven by climate change to the surrounding environment along with deforestation and a growing urban environment driven by land-use change and river canalization have made flooding worse. Government officials recognized the futility of attempts to eliminate flood risk altogether: 'For the disaster risk, for the flood risk, they think they can reduce the risk and the disasters but 100% reduction is not possible. The challenge is, we have in the Thayarwady river region and the Bago region, we have dykes to reduce the flooding. But we need regular maintenance for the dykes. This requires regular funding from the central government. Also, advanced technology to upgrade the dykes, so that's a major issue for this kind of flood risk' (interview with regional government official). Cazdyn (2012) writes about 'the new chronic' state in which crisis is mobilized to eschew transformative solutions and create new markets in providing relief. As dykes and concrete drainage canals are built to respond to transforming urbanized landscapes, traditional flood management techniques become impossible and flood management as well as the maintenance for its infrastructure is removed from the hands of the local community and put into those of the state and the international community (Fig. 6.5).

The extent to which flooding is framed as a disaster is not consistent across Bago, let alone Myanmar. Residents regularly spoke about how some amount of flooding is considered a normal part of their lives in Bago and seemed to take pride in having a greater capacity to cope with flooding than other parts of the country do. Flooding is understood as a disaster under specific circumstances that are shaped by social and economic forces in the community as well as the state (Bankoff 2004; Pelling

Fig. 6.5 Drainage canal being dredged by hand (Photo by Graham Reeder)

1998). Disaster framing is also derived from the international discourse on Disaster Risk Reduction and in some situations, may risk inappropriately imposing a narrative of vulnerability that weakens local social networks and traditional coping methods, such as by flooding a traditional site of refuge.

Because flooding is not a new phenomenon in Bago, external factors are seen as risk amplifiers or multipliers (Renn 2011) rather than sources of flooding in and of themselves. Government officials showed nuanced understanding of how existing flood-prone environments would become more vulnerable to more extreme and more regular flooding under conditions such as increased rainfall, erosion, loss of forest cover, and higher sea levels. Residents were much quicker to point to external factors that fell within the realm of local politics, such as deforestation or poorly maintained infrastructure, than government officials, who were more comfortable discussing the

impacts of climate change. Climate change can be used as a way for local authorities to abdicate responsibility for immediate concerns within the community, shifting the blame for flooding away from their decisions to pave over a natural drainage system or encourage deforestation. However, local authorities have little say in the natural resource industry and local DAOs have found themselves increasingly at odds with union-level state enterprises partnering with international firms that cause environmental harm at the local level (Phillips 2017).

While the local government officials I interviewed attributed increased flooding to external factors, these factors did not significantly appear to affect how floods are prepared for and responded to at this time, according to key informants. Flooding was still responded to as though it were a natural phenomenon, unchanged by urbanization, deforestation, or climate change. Many of the lessons learned in other jurisdictions about how paving canals and building dykes and flood walls can worsen flooding when it becomes more extreme are not widely understood among local government officials and are not taken into consideration. As a result, significant infrastructure investments risk being wasted on short-term solutions such as concrete drainage canals that fill with litter and sediment. Local governance would do better to invest in natural drainage systems that slow water down and distribute it into natural systems that can absorb it. More importantly, I found that root causes are not being addressed, given that there are no major initiatives in Myanmar or the Bago Region that address the impacts of deforestation on flooding, and dams and other hard infrastructure riverine projects are expanding rapidly (Win et al. 2009; Zin et al. 2015). In this context, it is safe to assume that flooding will likely worsen in the next decade until transformative solutions are pursued.

6.8 Arguments and Findings

The study of urban climate change adaptation is growing in prominence among researchers, governments, and the development community, but is still understudied for most secondary cities in the global south. I explore how local and regional government understand and respond to one climate impact—flooding—in Bago, Myanmar. While my research assumes that there is no one 'right' way to prepare for climate impacts, I found that local government actors in Bago had eschewed local and traditional flood management methods in favour of heavy infrastructure solutions that risk further entrenching urban flooding for decades to come. This finding helps illustrate how the 2015 floods in Bago served as a catalyzing moment for Bago's government, showing that both the international community and local citizens were prepared to take on greater responsibility for environmental management and had made significant progress since 2008 Cyclone Nargis.

For subquestion (1), I found that government officials interpreted the 2015 floods as particularly significant, not only because they were more extreme than usual, but because Bago had responded well to the crisis. For subquestion (2), I found that while local and regional governments are keen to take on greater responsibility for flood

management, they often lack the human and capital resources to do so. Government often fails to acknowledge the pre-existing community methods of flood management and tend to view their formal interventions in a vacuum. For subquestion (3), I found that while government actors acknowledge the role of external factors, such as deforestation, land-use change, and climate change in worsening floods, little to nothing is done to mitigate these underlying causes of flooding. Instead, flooding is understood as an engineering problem to be solved with hard infrastructure.

Critical resilience, vulnerability, and adaptation perspectives were absent from the flood governance discourse in Bago, indicating that urban climate impacts in the global south could catalyze productive debate over the application of global climate justice frameworks to the local scale.

6.9 Research Contributions and Implications

For scholars of disaster risk reduction (DRR), my work serves as an invitation to consider how DRR could affect local communities where risk is transforming in the context of urbanization and climate change. My findings support critiques of approaches to disaster risk that aim to standardize and quantify across diverse local contexts, challenging scholars to consider local priorities and unexpected assets when developing indicators for a community's risk. DRR scholars and practitioners alike should approach DRR with power and cultural dynamics in mind and take seriously the empirical literature and knowledge systems that challenge the still-dominant engineering-focused response to disaster risk. My work also contributes to the rapidly growing body of work that approaches climate adaptation and DRR as interwoven responses to both static and dynamic drivers of vulnerability.

For scholars of urban flood governance, the findings can contribute to an understanding of how an emerging democracy in the process of decentralizing government roles and responsibilities approaches the challenge of urban flooding. My interviews reveal that the expanding role of government constitutes a managerial approach to the environment that fails to learn from past mistakes in flood infrastructure. Scholars must be careful to consider how new flood response and readiness methods can undermine existing community-based strategies, paying particular attention to how state-run projects may require long-term maintenance for which there is no budget and which require technical expertise outside of what those who previously managed floods have access to.

For scholars of Myanmar and Southeast Asia more broadly, this research is among the first of its kind to study local environmental governance in a secondary city in Myanmar. As the current democratic reforms dramatically reshape the governance landscape of Myanmar, this research serves as a humble contribution to understanding how the Burmese state is reshaping its relationship to both urban residents and the natural environment. Particular attention to how local residents have developed traditional approaches to flood management builds on regional

scholarship of indigenous and other community-led environmental management techniques (Ishaya and Abaje 2008; Nyong et al. 2007; Rasid and Paul 1987).

For policymakers in Bago, this work shows that government could do more to harness local knowledge about flood management, developing context-specific solutions to flooding that consider how locals coped before government intervention. In particular, paying closer attention to the role that Buddhist temples and charity networks function could help the government tap into existing robust social networks, aid-distribution channels, and emergency shelter systems.

6.10 Limitations and Future Research

Bago is chronically underresearched, and further research that includes a wider survey of Bago residents' livelihoods, knowledge, and beliefs would be timely and relevant given the city's rapid growth and emerging national economic relevance. Any research on resident responses to flooding would benefit from a longitudinal design that could offer insights into the seasonality of different responses.

A broad, discourse-based study such as this one cannot empirically evaluate the merits of different projects or approaches to flood governance and climate adaptation so as such, its findings are limited. This research contributes to scholarship on flood governance and adaptation by addressing the gap in the literature about how these concepts are interpreted differently by government actors in Bago and offer valuable insights into how adaptation and resilience operate as frameworks. As climate adaptation coalesces into policies and funding structures in the coming years, empirical research will be necessary. It should draw from the critical urban ecology literature's attention to tracing how terms like *adaptation*, *resilience*, and *disaster* risk can contribute to ongoing processes of accumulation and dispossession (Felli and Castree 2012), and evaluate the material impact of flood governance discourses for the populations that the concept aims to benefit.

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Chapter 7
Resistance for Resilience: A Reflexive Exploration of Battambang, Cambodia

Try Thuon and Yanjun Cai

Abstract As a secondary city in Cambodia, Battambang has been facing increasing flooding under the pressure of urbanization, modernization, and climate change. Like many other Southeast Asian cities, the issue of land use and management is perhaps the most contentious and significant issue in Battambang, linked closely with building urban climate resilience. This chapter utilizes a reflexive exploration to investigate urban resilience in Battambang. Using researcher interviews, this study showcases different layers of resilience with an emphasis on the conflicts of power hierarchies. We demonstrate a more proactive perspective of resilience by revealing forms of resistance among disadvantaged populations. This perspective is seldom presented in current resilience studies.

Keywords Urban resilience · Informality · Spatial planning · Resistance
Social justice

In this chapter, we explore resilience among urban residents in Battambang, a secondary city in Cambodia. Battambang is a regional hub with historical and cultural significance. It is rapidly transitioning toward modernization and urbanization, which involves increasing regional and international connectivity. The city is also experiencing the noticeable impacts of climate change such as more frequent and intense flooding. With insufficient political attention or financial support, the city's deep layers of urban politics are significantly responsible for its exposure to hazards. Conflicts around informal land use and planning worsen the city's poverty, vulnerability, and injustice. We interviewed people in the city to examine resilience by emphasizing people-centred resistance. This reflexive approach addresses the

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untold, undocumented, and hidden perspectives on resistance in the face of severe censorship and political conflicts in this growing Cambodian city. The capacity to resist is barely mentioned in resilience discourse. But negotiating a more just urban development agenda remains one of the critical components for adapting, learning, and transforming in the face of uncertain climate challenges.

Both quantitative and qualitative data collection are challenging in countries and areas where political censorship is prevalent. Quantitative data from governmental agencies is largely limited as a result of insufficient financial support, human resources, and political sensitivity. Qualitative data such as formal interviews that involve confidentiality often lack depth and authenticity because interviewees feel politically insecure so the interviews fail to interrogate the profound layers of urban development, especially political conditions.

Try Thuon worked with an Asian Development Bank project through the International Center for Environmental Management (ICEM) as the national climate specialist on climate resilience in Battambang for fifteen months starting in October 2013, when the city was affected by historic flooding. Since early 2016, Thuon has conducted periodic visits and later, more intensive research work from October 2017 to April 2018. In all, he spent more than three and a half years in Battambang for professional and research engagement. Thuon collected data mostly through informal interviews and participant observations under extremely difficult political conditions. As a researcher who seeks to investigate and disclose sensitive topics, he was at risk of potential prosecution because issues of land and resettlement are sensitive political topics. Thuon encouraged respondents to answer critical questions but he also protected their privacy and safety as much as possible. Yanjun Cai is a scholar of climate resilience and environmental justice. She has been working with international organizations, academic institutes, governmental agencies, and affected communities for environmental governance and policy in the Asia-Pacific region in the past 10 years. In this chapter, Cai designed the researcher interview and framed Thuon's fieldwork in the discourse of proactive resilience, emphasizing the power hierarchies embedded in oppressive social systems.

The researcher interview is increasingly used in social sciences to encourage reflexivity (Bolam et al. 2003; Bryman and Cassell 2006). Researchers are encouraged to reflect on their research practice (including its limitations), increase awareness of their assumptions, and recognize the nature of data (Bryman and Cassell 2006). The researcher interview can be a useful tool to deepen understanding about research processes and limits. The traditional interview approach may objectivize the social world by promoting a disinterested process of research but social scientific discourse is a constructive process and act (Bourdieu and Waquant 1992). The researcher interview, by contrast, emphasizes reflections on the different perspectives of 'insiders' and 'outsiders', highlighting the meaning of negotiation and widening human relations and power issues regarding data collection and analysis (Bolam et al. 2003; Tanggaard 2007). The practice of the researcher interview addresses the relational epistemology that acknowledges the constructive process of social science research, revealing the less visible and perhaps contentious perspectives of research work.

In many Southeast Asian cities experiencing dramatic urbanization and economic growth, land is perhaps the most essential and probably the most sensitive socioeconomic issue. In the context of modernization in Cambodia, the blueprint for urban development typically focuses on technical land issues such as top-down land-use classification, seldom making a more coherent linkage with the cultural and social background of land use. Regional and national political tensions often create injustice, exclusion, and corruption (free-rider practices in Cambodia), which affect resilience and planning. Disadvantaged populations are mostly absent from critical decision-making in urban planning and resilience governance. Land-use planning without appropriate regulations in the face of climate hazards intensifies injustice and the conflicts embedded in hierarchical power systems and social structures (Fig. 7.1).

As an at-risk city with frequent exposure to hazards, Battambang has been experiencing a critical development dilemma when the threat of flooding arises. Although building resilience is increasingly urgent it continues to be unaddressed. Resilience that does not rely on inclusion and social justice is not sustainably resilient. But in an area where conflicts cannot be openly discussed, it is extremely challenging to explore resilience in a way that recognizes power relations and social structures. And yet residents of Battambang, even those with limited resources, demonstrate how resisting current power relations is possible. They create the capacity for resilience with approaches that are rarely illustrated in mainstream policymaking and academic research. Revealing their unspoken narratives of resilience is critical to unpacking the concept.

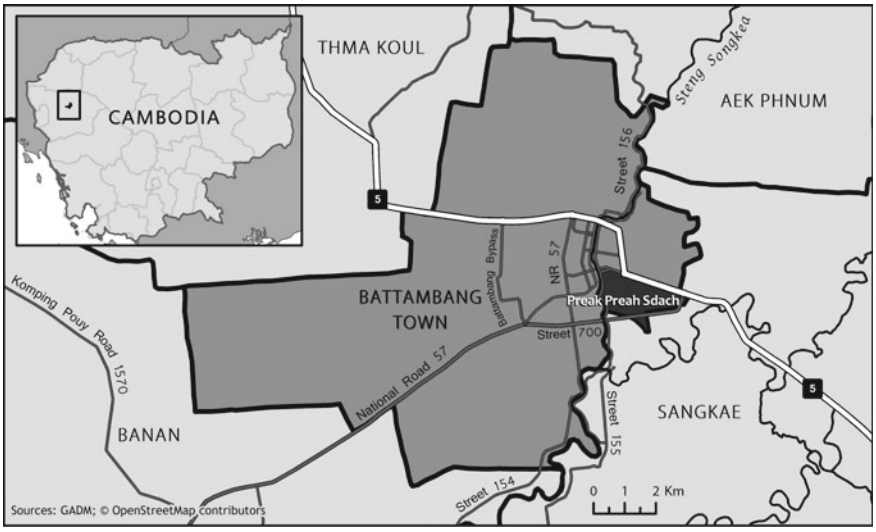

Fig. 7.1 Overview of Battambang (*Sources*: GADM and OpenStreetMap contributors)

7.1 Why Battambang?

Battambang is a strategic city in Cambodia. It has a rich cultural heritage and long historical connections to Angkor Wat (Molyvann 2003). Architecture in the city from different time periods—such as colonial buildings, ancient wooden houses, and Buddhist pagodas— reflects its historical and cultural importance nationally and regionally. Battambang is also a city with diverse natural resources. Once the 'rice bowl' of Cambodia, the city served the whole country as an agricultural centre and was also a hub for transporting rice to France. Battambang is close to the Thailand border, with historical Thai connections as well as a favourable market. The city is in the centre of the provinces surrounding Tonle Sap Lake (a large lake). It is also located within the Great Mekong Sub-region economic corridor, designated as one of the key cities in the country for upcoming dramatic economic growth. The city is well connected regionally, nationally, and internationally by highways and railroads.

Battambang is also one of many Southeast Asian cities that are exposed to climate hazards. Floods were recorded in almost every commune of the city in 2000, 2003, 2005, 2006, 2007, 2011, and 2013 (ADB 2015a; CDIA 2010). From 2014 to 2017, flooding from the river was reduced but heavy rainfall disabled many city roads and drainage systems. Flooding is expected to intensify by 2050, and both the average rainfall and maximum temperature are predicted to increase. Recently, many wetlands, paddy fields, and floodplains have been converted into massive real estate developments, markets, factories, and commercial centres. This pattern has accelerated since 2008 when the majority of upstream watershed areas were transformed into large-scale farming and economic land concessions. Flooding has grown more frequent and occurs from October to December as a result of increased flows from the Sangker River and heavier rainfall. But urban planning documents consider the issue of flooding as just one of the components in the development projects, including constructing reservoirs and irrigation works.

7.2 Floods and Climate Change

There are two types of floods: river overflow and rainfall. The majority of conservation areas and the upstream watershed associated with the Sangker River have been converted into economic concessions. Therefore, flooding happens more often as a result of poor urban planning and management. The city has been built without any appropriate controls. Many drainage systems have been constructed since colonial times, and many development projects are taking place, but there are no master plans that emphasize both urban development and flooding mitigation. The issue of flood control has not been integrated into the current planning. City planning is mostly based on modernist perspectives that see humans as the creators of disasters.

One of our interviewees, Mr. Tat Savuy, came to live next to Mr. Setra in 1996. He described how, since 2013, his house had been flooded every year up until and

including 2017. Before 2013, a natural canal released water out of town. But since 2013, flooding has been more frequent and intense, and usually lasts from June to December for about six months. Because his house is built directly on the ground, floods affect his toilet. Mr. Tat sleeps on a bamboo bed that is too close to the flood level. His chickens need to roost in the fruit trees, and his fuel wood for cooking gets wet repeatedly. His toilet uses water to flush, but it gets flooded frequently. He is forced to live with this and is invariably infected by water-borne diseases that affect his legs. His situation is typical of other households whose land is classified as informal settlements.

By 2050, it is expected that the area will have more intensive rainfalls but over a shorter period of the year. It rains even in the dry season right now (ADB 2015a). The climate pattern has changed significantly. Temperatures have become both hotter and colder. Water levels in the rivers are higher than before. Floods in the city come from all different directions. Massive upstream economic development increases the city's at-risk position. There is no proper climate adaptation system. In October and November, some people remain in their own flooded houses in fear of losing their homes if they seek refuge elsewhere. These villagers live in very poor housing structures but they are not allowed to build a solid house because of current land-use management and planning rules.

The city's governing system is largely manipulated by wealthy and powerful people, the so-called dominant strategic groups (DSG) who have access to a great variety of resources. People who do not have power—the subordinate strategic groups (SSG)—tend to be more vulnerable to climate hazards.

Battambang was once ruled by a noble class before the arrival of the colonial French. These rulers came from a mix of ethnic groups that included Thai, Chinese, Cham, and Vietnamese (Chhoung 1974). Although noble status was later abolished, some noble-class family members were integrated into the administrative structure in later regimes. These elites are now known as 'strategic groups'.

Many strategic groups are descended from 'quasi-groups', people who share common identities including ethnicity, kinship, and the class of origin—for instance, Chinese migrants largely bonded together through kinships, businesses relations, and their own culture (Evers 1973, 114). These groups have exerted strategic influence through their participation in political development, conflicts, reforms, or revolutions. The strategic groups promote their political and economic goals by supporting the activities of political leaders who represent their aspirations and interests (ibid.). Strategic groups later evolved and transformed into different social classes. Some of them became the ruling classes while others are being governed.

Evers (1973) suggests that the formation of strategic groups can reduce group conflicts. Ruling-class activities include an established distinct lifestyle, foundations for voluntary organization work, mechanisms for internal mobility within society and organizational structure, the creation of resource pools for ruling-position stability, and sharing resources through corruption and exploitation (115). Dominant strategic group members include government civil servants, military staff, primary school teachers, and Chinese businessmen (Evers 1973; Evers and Korff 2000). Professionals play a significant role in the government structure (Evers 1973). Different

professional roles from strategic groups imply their different impacts on climate resilience governance and resistance.

In 2013, the government started to recognize the urgency of climate change and flooding. However, people from urban slums kept building houses along the canal. Some of them worked outside of the country, such as in Thailand. But their families still lived in the area. Children and older parents were left behind. The numbers of these households varied in different communities, but the slums became more and more noticeable.

7.3 How City Planning Affects Resilience Building

The city was planned based on a large-scale land survey that did not seriously consider hydrological and climate change impacts. In 2009, the development guideline for municipal land-use plan 2008–2022 was developed to safeguard a sustainable municipality development and promote public benefits for the local community. The guidelines highlighted the needs to:

- ensure good living conditions and housing for the local population;
- create a successful local economy;
- improve public facilities and services (including technical infrastructure);
- meet the social, cultural, and religious needs of the population;
- develop sports and recreation facilties;
- ensure environmental protection; and
- preserve historic monuments.

The planning guideline emphasized the need to balance and harmonize private interests (investors, entrepreneurs, and house owners) and public interests such as communities of local people and environmental issues that served as the key components of land-use planning. In principle, neither public nor private interests should be given priority. The ideal land-use plan visualized:

- development zones according to the land-use categories (residential zones, mixed-used zones, commercial zones, administration zones, cultural zones, and others);
- national roads and main local roads;
- zones for technical and transportation infrastructure such as wastewater treatment plans, power stations, railway stations, etc.;
- public green spaces and sport and recreation areas;
- protected water bodies such as rivers and lakes;
- land for agriculture;
- areas for preservation of historic monuments and architectural heritage;
- areas for preservation and development of tourism; and
- areas for low-cost housing.

The plan did not address the critical issues in climate change or extreme weather events. It was mainly based on technical and administrative issues and excluded the hydrological element. Thus, most of the development and infrastructure construction sites are planned to be in the wetland and the flood-prone areas, which are very vulnerable to flood as well as long-term extreme-weather events. Many urban structures and administrative buildings have been removed and shifted to new development.

Battambang municipality covers an area of 11,544 hm^2 divided into 10 administrative communes and 62 villages. Total population in 2015 included 28,949 families with a total of 154,513 people (78,744 are females). By 2017, this population had increased to 155,584. Its first land-use master plan started with the land survey in 2003 with technical and financial support from German Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). The plan has gone through many consultations and negotiations, mostly with provincial departments, local authorities, and the ministry.

The Land-Use Master Plan for the Municipality 2015–2030 was approved in February 2015. Its vision is for Battambang to become socially responsible, environmentally friendly, and economically successful. In line with its socioeconomic goals, the development vision for 2008–2022 sees Battambang as a competitive city that becomes the regional economic centre for trade and investment in agro-industrial goods and services along the Southern Economic Corridor. In principle, the corridor is supposed to maximize economic benefits by increasing business and traffic flow along the transport corridors. Adequate infrastructure, essential services, and institutional capacity are expected to guide and manage future investments by attracting public and private sectors for urban development (ADB 2012, 2015b).

The Asian Development Bank (ADB) also proposed the Local Economic Development Project in response to the municipality's vision and mission as a green town, attracting domestic and international tourists and investments. Battambang's location as a market town along the transport corridor offers considerable opportunities as well as enormous economic and environmental challenges. The town centre is on the west bank of the river with 90% of the commercial and residential establishments.

During French colonization, Battambang was the regional administrative capital for other provinces, including Bantey Meanchey, Pursat, and Siem Reap. As part of the Southern Economic Corridor and the provincial centre, the city has reactivated itself as a centre of regional trading, economic growth, investment, education, urban heritage, and agro-industrial production and manufacturing (Battambang Municipality 2015).

Urban services and infrastructure development have also progressed dramatically in recent decades. Currently, eight markets have been established. Among these, three are newly established to accommodate modern lifestyles such as shopping malls and multi-functional market centres that include wholesale centres, entertainment facilities, residential buildings, and transportation areas.

The master plan is one of the first in the country, and divides Battambang into 14 different types of land-use zones. Agricultural zones and residential land with agriculture make up the major part of land use in Battambang as of late 2009 (74% of the city represents agricultural use) (Table 7.1).

Table 7.1 2009–2022 land-use plan for Battambang (modified 2015–2030)

Category	Existing areas size	
	In ha	In % of total municipal area
Residential zone	456.7	3.96
Residential with agriculture zone	1,379.6	11.95
Mixed-use zone	585.5	5.06
Commercial zone	42.1	0.37
Administrative zone	132.6	1.15
Culture zone	104.4	0.90
Small and medium industry zone	65.5	0.57
Public green space	17.6	0.15
Sports and recreation zone	9.1	0.08
Agriculture zone	8,557.5	74.13
Water bodies	89.9	0.78
Technical infrastructure zone	10.5	0.09
Transportation zone	64.2	0.56
Military zone	29.6	0.26
Total settlement area (in square hectometers)	2,896	
Total municipal areas (ha)	11,544	

Source: Battambang Municipality (2015)

By 2014, the total land under rice cultivation, known as agriculturally zoned land, was reduced from 8,557.5 to 6,785.6 hm^2. Meanwhile, total land classified as residential land with agriculture shrunk from 1,379.6 ha down to 972 ha (Battambang Provincial Department of Planning 2016). This reduction of agricultural land and the mixed-used land zoned as residential and agriculture has paved the way for the newly built real estate developments, manufacturing, and residential land development. Within five or ten more years, the whole town is expected to be fully urbanized. There will be no more paddy fields. Even without housing development, if all the land is occupied, there will be significant losses in rice production and other agricultural activity. This means the population within the town or even the whole province will remain at a low level. In other words, there is a great risk regarding food production and population loss if the development plans are not going to be implemented.

Currently, the approval of the master plan continues to face many delays. For instance, the land survey started in 2003 and had a final draft by 2009 but did not receive official approval until February 2016 (Kotoski 2016). Postponing the master plan approval creates more spaces for the dominant strategic groups to benefit from the current spatial arrangement and strategic resources. Any notions of climate

change adaptation are absent from this plan even though there was a destructive flood in Battambang in 2013. The polished plan looks good but its implementation is a different story. The master plan was produced by GIZ who worked closely with the government. The plan followed the guidelines but ignored the city's cultural and social practices. The hidden culture was not recognized in such a planning approach. Once the plan was released, officers urged their friends and families to invest in the land based on the planning.

7.4 The Communities We Worked with in Battambang

Climate change impacts, informal settlements, migration, and urbanization are interrelated and evident in this study site. Climate change is projected to significantly affect current land-use change as well as change in hydrological flows from upstream and down through the town to Tonle Sap Lake (ADB 2015a, b). Since the early 1980s, there have been many waves of immigration. The most noticeable one occurred when the civil war in the country ended and many refugees who lived in the Cambodia–Thai border camps returned—most of them chose Battambang.

This community is attractive in part because of its land availability, low cost of land, and unclear ownership of the available land. Prek Preah Sdach is one of the 10 communes of the town, divided into 8 villages, with 2,607 families and a population of 13,538, 7,205 of which are females.

Land reclassification for the former public garden is divided into five major blocks and two blocks are situated in O'Kchey village. It is not known how much land is in the villages: the village chief said there were 63 hm^2 in total while land within the public gardening area is around 38 metres wide and about 600 metres long (about 22,800 m^2). According to the 2015–2030 master plan, these communes have 290 hm^2 in total.

Informal settlements were officially called an important issue in the Government Circular 003 in May 2010. The policy aimed to establish the Social Land Concessions (SLC) for the urban poor who settled on public land and illegally occupied space, such as the public garden in Prek Preah Sdach. This is also called in-place development. A case study from O'Kcheay village is an example of how the SLC has been implemented to move public land into private hands. The village covers an area of 63 hm^2 in which about 22,800 square metres is part of the public garden. By 2013, 82 military families on the land made a claim that caused more chaos.

The land formerly designated as a public garden remains one of the most strategic locations in the area. It is situated along National Road (NR) No. 5, and at the junction of newly constructed NR No. 57 and NR No. 5, which runs along Battambang University as well as a number of new markets and shopping centres. Floods occur seasonally there because it is a low-lying area like a frying pan.[1] The newly con-

[1]The frying pan is the literal meaning in Khmer, which describes how the location is flooded like a lake.

structed NR No. 57, funded by China, makes this situation even worse. The project, supported by Chinese aid, often resulted in fewer social environmental safeguards. The ADB requires a lot of policy compensations and restrictions when it gives a loan, so the government collaborated with China. This road is built as a ring road to avoid heavy traffic coming into the city, and connects from the town entrance to Phnom Penh to Pailin Province (close to the Thai border). It cuts across this and other villages, such as Wat Kor village of Wat Kor commune. It blocks the drainage system, which causes fewer outlets for the water. The formal drainage system within the area remains dysfunctional, acting as a natural floodplain. Some areas look like a pond when the flood strikes. The water level can be one to two metres high by the end of the rainy season.

By 2016, four groups had settled in the village, mostly in block 1. The first group of people consisted of 114 families. The informal settlement committee kept adding people from different locations inside the town. The families to be settled here are selected by the working group mostly from government officers or institutes. Later, there were 129 families—17 of them are still seeking land to occupy. Some households formed a savings group and established themselves as a community. They elected a community leader and all families paid him an amount of around 3,000 riel per month (just under 1 USD). The saving group was designed to have all participatory members practise saving or borrowing. Families paid the money to establish the group so the community members could borrow money. Once they have enough money, they invest in construction materials. This is a common practice in rural communities, especially agricultural development. It is less successful in urban communities. The officers might not want these organizations to be successful in mobilizing people.

In this community, a local thief and the savings group leader absconded with the funds in 2013. Local residents accused the chief of bringing people from outside the town to own land in the area. These outside people are not poor. Local residents resist when they see this happening to prevent their land's redistribution. People stopped saving money when there was no financial report and the money was not returned.

The second group is made up of 82 families who came to settle here with support from Habitat Cambodia. Habitat Cambodia was one of three nongovernmental organizations (NGOs) allowed to conduct a pilot land law framework on SLC in the urban area of Battambang Municipality from May 2008 to March 2015. The current programme is called 'Strengthening Civil Society government for Land Tenure Security in Partnership with Battambang Municipality and Micro-Finance Institute (Kredit)'. It has different sources of funding including Habitat Australia, Habitat for Humanity, Canada, and the Clifford Chance Law Firm in the US. The land allocated to the second group is smaller (36 m^2), and much of the land is of poor quality. Many people in the programme use land certificates to request loans from the banks. According to the law, once a resident occupies the land for ten years, it becomes his/her land. Within six months, a resident has to build a house and stay there. Extensions for those deadlines are common in these urban poor communities.

The third group consists of the military families. It was expected to include 82 families, but only 40 of them obtained land. Initially, the land allotment was

redistributed (4.5 m × 16 m per family), so there would be more land left. The provincial land allocation committees that included some officers from the informal settlement working groups made use of this allotment rule. The military commander also obtained the concession for 82 lots. Any soldier families who needed the land were told that they needed to pay their commander a certain amount of money to get the certification without land. The military families used the certification to claim specific areas of land and appeared to own luxurious assets, such as pricey cars. Villagers started to question how people who were not really poor needed land. Later on, residents protested against those whose land allocations were larger in terms of size. The other 40 families are still seeking land, based on my interviews with them. There was a plan to reblock the land but not all the land was actually measured. Those who have larger plots did not want their land to be measured because they were afraid that the government will give their land titles to other people. Such incidents are common in the area.

The last group is the residents whose land plots are bigger. Some have plots ranging from 1,500 to 4,000 m^2. One man who is a member of the Cambodian People's Party (CPP) may have a plot as big as 7,000 m^2. His land was taken away and the 82 lots are now occupied by the newly settled populations with the support from Habitat Cambodia. A former NGO worker, he became a member of the CPP and later resigned to set up his own political party, perhaps because of this land issue.

Some of the residents first settled here in 1983, and some bought land from local people between 1997 and 1999. Land in this area is vulnerable to floods caused by both rain and water from the river. Since the construction of National Road No. 57 as well as more village access roads being paved, land prices have increased. More problems emerge. With previous experiences of being forcefully evicted from their land, these residents decided to protect and defend their land resources. The DSG often call them land thieves who occupy the state land.

In a project funded by ADB GMS town development through ICEM, from late 2013 to early 2015, we talked to people in the villages during the flooding. We tried to contact the village chiefs and previous chiefs but they did not answer our questions about land allocation. We were curious about how the 82 families built up their houses but these village chiefs did not want to talk about it openly.

Thuon conducted four Focus Group Discussions (FGDs). Each group included between three and seven people. We discussed topics ranging from the urban system and spatial planning to urban issues. FGDs with local people helped me to frame urban resilience and map out how the dominant and subordinate strategic groups played different roles in shaping resilience and urban space.

7.5 Decision-makers for Issues Related to Resilience

Based on Hans-Dieter Evers' framework (1973), DSG are more resilient than the other social classes and they are less vulnerable to political regime changes. DSG have access to both structural and strategic resources through mobilizing their dominant

power and state resources. But Evers did not pay sufficient attention to the urban poor and workers, who I refer to as subordinate strategic groups. These groups also play a role in the political structure and decision-making, particularly in the context of modernization and urbanization processes.

The formation of strategic groups in Cambodia can be viewed as the process behind formation of the Party Working Group (PWG), which is controlled by the ruling elites within the Cambodian People's Party (CPP). A complex web of power relations exists among the key members and allows them to gain control of military power, create off-budget political and business mechanisms to finance political projects, and distribute mass patronage in exploiting resources—including land, forest, and mineral resources.

A study conducted by Milne et al. (2015) shows two major roles for the PWG. First, it supported the local CPP branches in carrying out the practice of popular gift giving, which is a form of mass patronage as a strategy for winning the election. Second, they supported Cambodia Red Cross and the Party Youth Group which can attract significant financial investments. Also, the establishment of Okhna, a special honorific title, is now commonly offered to CPP-aligned business tycoons. The creation of Okhna groups consolidates patron–client economic relationships by ensuring that they connect with political elites within the ruling party (Verves 2015; Verves and Dahles 2015).

The PWG also mobilizes funds and political support by connecting with various actors, including NGOs, civil servants, foreign investors, and other international development agencies, with the objective of legitimizing their power, rather than contributing to national development (to which they assign far less priority). The PWGs and youth groups resemble the dominant strategic groups in effectively weakening the formal role of state institutions. The groups have extracted public resources and created rent-seeking opportunities to maintain a nexus of elite interest, regime survival, and exploitation of strategic resources.

These are typical strategies for dominant strategic groups who seek to control vital resources and maintain access to structure and power within the state. These groups are currently working on connecting with new graduates from developed countries and expect less resistance once these graduates are part of the established culture and organization. Their practices reflect the reality that social position, and resource allocation and distribution are often tightly controlled by the dominant group. These exclude the subordinate strategic groups that are composed of urban slum and informal settlement residents, members of the media, NGO workers who focus on improving the urban poor, and informal settlements. The SSGs mobilize themselves as a network and struggle to gain legitimacy within the current power structure.

7.6 Resilience Stories Related to Politics and Power Relations

DSG has been well established within the province through power relations, kinship connection, and intermarriage. They have become the local elites and hold powerful positions. DSG are often involved in decision-making regarding land allocation. Since 2013, those who used to live in the areas under reallocation were told not to repair their houses, and to fill up their land to adapt to more intense and frequent flooding. Other strategies included accusing those who filled up their land to avoid floods of being land thieves and calling them criminals. Some elites from the Dominant Strategic Groups told the residents: 'How dare you come here? This land belongs to the state'. Residents who were found filling up land often received arrest warrants. Some were actually arrested but they were released later. The Dominant Strategic Groups want to ensure that these residents agree to accept a land allocation of just 72 m^2.

Residents accuse the Dominant Strategic Groups of selling fake land receipts to military families. Those who were supposed to get the land were not the households listed in the documents. In the case of 82 families who did receive certificates, some were reported to come from another province. Some built houses, but they did not stay and continued to occupy other areas, such as the pagoda compound, where they sold fruits, canned foods, drinks, and other necessary goods. Some who still occupied public land did get land within the designated area but also own large farms in another province.

In another case, some families managed to get their land back with six plots after land demarcation (i.e., government measurement) but were reported to have paid the committee up to USD 10,000. Many local villagers protested eviction from their land. Based on key informant interviews and FGDs, we discovered that the official committee who dealt with land allocation was involved with land selling but mostly in secret. Flooding can intensify the conflicts of land distribution and ownership.

Floods occurred regularly within the villages since the new NR No. 57 was built because the city beltway blocks the drainage and there is no place for water to flow out. Given this situation, some families decided to fill up their land, but later faced charges. For example, Mr. Seth Ra is a retired primary school principal who has lived here since 1985. He decided to fill up his residential land (406 m^2) in August because it was flooded. In 2010, CDIA reported 50% of the commune had been flooded for more than seven days. In 2013, Mr. Seth's house and other houses in the neighbourhood were flooded for more than six months. The 82 lots that were newly settled used to be flood plains and had been filled up with support from Cambodia Habitat. This had flooded other areas where many fruit trees died, starting in 2015. Mr. Seth was accused of being a land thief. When a member of the resettlement working group asked him to meet with them about landfilling, he asked for the arrest warrant. When there was none, he suspected it was a trick. Mr. Seth decided to escape to Phnom Penh to inform the minister of education about his situation specifically:

how can a retired school teacher survive if his only possession, a residential plot, is threatened?

The land is mostly controlled by those from the Cambodian People's Party (CPP) who created the government's double system. After his retirement in 2013, Mr. Seth was active with CPP local political support and stood for election as a member of the commune council during the 2017 election. The election took place in June 2017, and the CPP lost. It lost eight out of ten communes in the town. Mr. Seth believes that the CPP will not be able to win the hearts of the urban poor or urban middle class because there are many social issues created by the local ruling elites from the government or the party. The first municipal leader was involved with the land survey for spatial planning. Then the second came and left while the third managed to stay in power for three years. Although he also came from the same commune as the first two, he still could not win the hearts of local residents. Villagers know who owned the land and who took it from other villagers and gave it to influential people or relatives.

Proper land management is essential as a response to city floods. In a discussion a municipal official who is in charge of land registration suggested that land-use plans and building regulations play a critical role in dealing with city floods and climate change impacts. The official said that: 'If we manage to control or regulate land development or construction based on the regulation at the different levels, both the municipality and provincial levels, then there will be no flooding'. Other officials acknowledged that if the subnational government did not practise a free-rider approach, there would be no conflicts.[2] If business tycoons would allocate some of their land to the urban poor resettlements, there probably would not be any opposition or uprising by the urban poor. One officer from the Land Management Department suggested:

> We should understand that the policy 003 indicates the in-place development is mostly for the urban poor, not the rich. Second, the settlement committee should ensure the land allocation for local residents should be the priority. Most of the residents are willing to sacrifice their land for the common good and urban poor. But the committee and the military leaders are coming at the same time. This causes problems for those who are willing to sacrifice their land initially and later change their mind.

The process to obtain official permissions for any construction depends on the plot size. Land size smaller than 500 m^2 is the responsibility of the municipality, from 500 to 3,000 m^2 is provincial, and land plots of more than 3,000 m^2 are the responsibility of the Ministry of Land Management, Urban Planning, and Construction (MLUPC). In practice, land use and safeguards are not adequately enforced—the use is greatly influenced by both political intervention and power relations.

One government official whose house sits on 80 m^2 has been approached by the informal settlement committee who threatened to knock it down. His house survived because he is a CPP member and in charge of the political voting support in one village.

[2]Free riders are people who receive land but did not pay or qualify for it. The practice generates tension and even conflicts regarding land distribution and management.

In addition to making alliances with the ruling political party, residents also adopt various strategies to influence decision-making and defend their land. Many meetings with those political elites have taken place in the village, both before and after the commune elections. In one case, village residents recalled that they went to submit a complaint letter to the provincial governor and knelt down in front of his house to beg to inform him of their situation. The governor refused to accept their letter and asked them to come again. The issue was publicized via social media, such as online TV channels, including Hang Meas, Sluek Rith, and Radio Free Asia in the Khmer language.

To avoid political traps, group leaders among the subordinate strategic groups are not visible—everyone acts as the leader and makes similar speeches. The ruling elites tend to arrest the group leaders to intimidate them from undertaking further resistance. They hope to force residents to accept an offer of a plot size of 72 m^2 instead of their current land ownership.

Group leaders among the subordinate strategic groups are not identifiable. Everybody who was involved with the land conflict acted collectively. The local authority tried different means to arrest the group leaders but could not find out who exactly was in charge. The authority assumed that once they arrested the group leaders, the rest would follow and accept the land division.

The O'Kcheay village chief elaborated: 'Before, we invited people to come here to set up in the village and people were willing to offer land. But now many rich or wealthy families can contribute money and materials as humanitarian aid but not give the land'. The land is now too expensive: even the floodplain areas with flooding of around two metres also cost USD 50/m^2 and those situated along the access road cost upwards from USD 200 to 250/m^2. Many residents who resisted the offer from the government also revealed that the land issue remains a critical political issue among the ruling and opposition parties in terms of gaining votes during the democratization and modernization process.

One business tycoon who owned land in other parts of the town showed his disappointment about land management and allocation within the inner city. He acknowledged that with transparency and proper management, we could turn the less valuable land into the one with higher value. However, with such mismanagement and practice, the 'golden' land value had turned into, in his words, the 'origin of fire, sweat, tears, and floods'. The less powerful people are often the victims.

Interviews with affected residents from O'Kcheay revealed that the whole province seems to be dominated by the two groups of families. Both have established strong networks and kinship relations from their positions at the commune, or as district chiefs, and at the provincial level. These families also extend their influence with higher education institutions and the private sector. Some of them have family heritage from the noble class from even before colonial times.

The subordinate strategic groups openly challenge this established web of power and kinship relations. They use knowledge of the law and access rights to overcome the dominant groups' discourse. Some of them brought an official complaint to the former provincial governor who was considered the best person in the country though he failed to deal with the issue. Protests and complaints reflect social resilience: the

urban development agenda needs to be shared with residents and engage more local participants. The result of the vote in June 2017 tested the popularity of the ruling elites from the CPP through the practice of democratic and urbanization process. People believed that the previous politicians lost because of their role in the land distribution.

One officer, part of the informal settlement working group, showed his disappointment with the fact that villagers who obtained land allocations are not poor. Those who claimed to be refugee returnees actually consist of no more than 15 families. He suggested that if we want to solve the problem of informal settlements, the Okhna should allocate their land in amounts from half to 4 ha^2 so that they can include all the people we have studied. He recalled that when the team started the land demarcation for ownership, some owners from the core town (inner city) showed up with high-value jewellery and luxurious cars and ordered the team to demarcate their land. Some of the resulting plot sizes are up to 2,400 m^2.

Another officer who was involved with the land measurement also expressed disappointment with the authority. Who has the right to issue? Who should own the land? Who should know what? What is beyond the municipality level? They used to suggest keeping some ponds in the village where they can work with the private sector to jointly develop them with the local people who are being relocated. But none of this officer's advice was followed and her supervisors even warned her not to work beyond her mandate.

In brief, the O'Kcheay subordinate strategic groups are resilient urban people, especially those who are affected by urban modernization. They have a common form of resistance and the ability to claim rootedness and access to resources such as jobs and services. The resilience of subordinate strategic groups involves various informal networks and supporting systems, including media support, legal knowledge, and the capacity to resist eviction from urban elites.

7.7 Political Ecology

Peter Saunders (1989, 122) suggests that urban space represents inherited inequality as well as the pattern of resource distribution, which link to spatial constraints and operation. Unjust spatial and urban resource allocation implies that different groups compete to have access to critical resources, which may be inevitable in the transitional countries. This approach also reflects the structure-agency and rule-and-resource relations in which different actors gain access and capacity to get influence (Giddens 1984). Building from Brown's (2016) work on the political ecology of resilience, we can ask resilience for whom and what for? Urban planning was mostly conducted for the elites in this research context. People without resources are left behind. Political ecology is reflected in the contested meaning of planning through the everyday form of resistance. It is the process that brings together different actors and networks with different viewpoints, values, and objectives.

For instance, we met a business couple who resisted being removed from their land. They used legal claims, social media human rights organizations, online TV, and public information dissemination. They made a scene and spread the news.

Local people like to talk about their stories. They do not trust their political systems. The city is under pressure from modernization, urbanization, and democratization. Although perhaps democratization is no longer an issue, in the context of urbanization and modernization, silent resistance exists in various forms. If people openly criticize, they will face punishment. So their resistance exists as a form of pretending to obey the orders. The villagers listened, but they did not take actions or follow what they were told. Their false compliance is a form of resistance.

7.8 What Does Social Resilience Mean in This Context?

Social resilience is the ability to resist the dominant strategic groups and unjust situations or conditions. People need better knowledge about development, healthcare systems, and infrastructure. But resistance against domination and injustice is rarely mentioned. People do a lot of training because many NGOs assume that they lack capacity. But people actually can resist. We observed that local subordinate groups managed to stage political pressure against DSG to fight against inequality.

People walked through floods every day. It influenced their daily livelihood. But they were more concerned and angry about their land getting stolen. Land ownership was critical. Without ownership, they did not feel they should or could do anything. There were two strategies that people used to build resilience in resistance.

The first was 'character assassination'. This strategy is described in anthropologist James Scott's work *Weapons of the Weak: Everyday Forms of Peasant Resistance*. It occurs when powerless people spread bad reputations about particular people, mention false compliance, and also attack their professional skills. It is a hidden form of resistance without directly confronting or challenging the dominant power systems.

Second, they use media for resistance. People have a long contact list, which includes human rights organizations and media. They know which media are corrupt and which ones are not. Some media ask to be paid to report things. Some media are persuasive. Some media receive money not to publish. One woman who has been involved with the land protest since 2012 is seeking support from some human rights organizations, including staff from the UN. Among them, some suggested: 'Fighting legal land issues against the government is like using an egg to hit a stone'. She was so angry that she responded: 'Even though the eggs do not break the stone, it will release a bad smell from the eggs'. She is willing to resist with limited resources. Psychological strength and legal claims have been the starting point in staging counter arguments against the eviction from local authorities. In block 1 of O'Kcheay village, between seven and nine families who make consistent claims for legalized ownership often draw the recommendation from Prime Minister Hun Sen who says 'the longer you live in the areas you will get ownership'. Some families who used to work with the human rights and development NGOs have a good sense of legal knowledge. Some

used to work as primary school teachers for more than 30 years and understand all the different regime ideologies in which they can utilize and adapt while facing the confrontation with DSG.

7.9 What Next?

As scholars and researchers, we engage in dialogues and can involve human rights organizations for governance or decision-making. We are very skeptical of human right organizations in the country. We have known most of them over the past few years and they often end up getting rich and benefitting themselves. We do not know whether we can find a solution for the people. Perhaps we can identify the problem, but we do not have a solution yet.

Development for elites means removing the poor from their land. The poor in O'Kcheay wish to live next to the rich because they expect to benefit from them, including the nicely paved roads, instead of experiencing floods in their houses. People need to negotiate what type of development is best for the city, not just the linear and generalized development like elsewhere. Compromises have to be made with different groups. What types of urban values do citizens want to have? What about a blended community to include people with diverse backgrounds?

In the O'Kcheay case, the land allocation for the urban poor within the area is more than enough if everybody follows the principle of the proposed land size. The land allocation committee should first deal with those who agree to occupy the small plots of land, then speak with those who own larger sizes of land. Based on our interviews, we believe the majority of local residents would agree to contribute and sacrifice if the land is actually distributed to the poor populations who need it for housing. Once the committee manages to deal with these populations, they can then bring people from outside—even their relatives who are already wealthy and the military families. The free-rider effect of decision-making should be avoided and strictly punished. When authorities fail to do so they reenact the cultural practice inherited from colonial administrative approaches.

The strategic groups in Cambodia play a significant role in forming the urban space, systems, institutions, and agents. Despite their name, the subordinate strategic groups have utilized a wide range of means such as media, local power relations, and cultural rootedness to negotiate and resist. To foster urban resilience, we need to examine how people tackle challenges with limited resources as well as cooperate with the dominant strategic groups.

In the context of conflicting land use and planning, hazards pose various socio-economic challenges to this Cambodian secondary city. Specifically, inequality and social marginalization can be intensified by the damages of hazards in a city with insufficient political attention, human and financial resources, and political autonomy. In a contested urban environment where disagreement can generate severe threats to both interviewees and interviewers, traditional data collection is not effective for collecting in-depth data. Researcher interviews can gain access to sensitive and subtle urban development and resilience discourse that cannot be documented

by other means. It reflects the complex socioeconomic dynamics in the context of urban resilience through invisible forms of resistance without directly challenging the dominant power structures. Future attention should examine how people can systemize such resistance to enhance resilience for more inclusive and just urban development.

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Part III
Improving Well-being: Forces of Migration, Ecotourism, and Urban Development

Chapter 8
From Sea to City: Migration and Social Well-Being in Coastal Cambodia

Furqan Asif

Abstract Small-scale fishing communities along Cambodia's coast have relied on marine resources as a mainstay of their livelihood for many decades. However, in the past 10 to 15 years, environmental change, increased fishing pressure, illegal, unreported, and unregulated fishing, and sand mining have contributed to a progressive decline in their catch. At the same time, economic opportunities outside the coastal village have acted as a draw and catalyzed migration to secondary cities and to the capital. This study examines out-migration of people from coastal communities to the city of Koh Kong. Using qualitative data collected from three fishing villages, I explore why people leave and why others stay in the village. In the context of city provisioning systems, the study also reveals a shift in climate-related vulnerability for coastal village migrants when they become urban residents. The study highlights the importance of looking not only at city planning, infrastructure challenges, and climate risks but also at the attendant social effects that phenomena such as migration have on people who are increasingly on the move. Such a perspective offers a more people-centred understanding of urban climate resilience in Cambodia, and potentially for other countries across Southeast Asia.

Keywords Coastal fisheries · Cambodia · Social well-being · Migration

Despite the precariousness and hardship involved in making a living from fishing, coastal communities in Cambodia have relied on marine resources as the basis of their livelihood for decades (Som 1999). However, the importance of fishing extends beyond the coast. By one estimate, Cambodia has the highest consumption of fish (marine and inland combined) per capita in Southeast Asia—up to 63.5 kg/capita/year, constituting 82% of people's dietary animal protein (FAO 2014).[1]

[1] While the majority of fish (83%) is supplied by inland fisheries, an overlooked aspect is the marine fisheries component, which accounts for 91,000 tons and is the third highest source of animal protein in the country (second highest being pig meat at 98,000 tons) (Baran et al. 2014; FiA 2011).

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Unsurprisingly, people in the coastal region of Cambodia have an *even higher* dependence on fish for meeting their dietary needs. For the coastal provinces of Koh Kong, Sihanoukville, Kampot, and Kep, average yearly fish consumption is 90.3 kg/person/year—in other words, 42% higher than the national average (IFReDI 2013). This dependency on fish for food also parallels dependency on fishing as a livelihood. The results of a study estimating fisher density in Cambodia shows that Koh Kong province (where this study took place) has the highest density of fishers by a wide margin and that coastal provinces in general (e.g., Sihanoukville, Kep) have some of the highest density of fishers (Fig. 8.1) (Nasielski et al. 2013).[2] People's greater dependency on fish in these coastal areas can be partly attributed to their proximity to marine resources along with limited alternative livelihood options. From a broader country-level perspective, the fisheries sector contributes approximately 12% to the country's gross domestic product (GDP) (FAO 2014; ILO 2013). Fisheries are integral to both the wealth and health of a large proportion of the Cambodian population.

Both this "livelihood lifeline" and coastal communities themselves are under threat from climate (and environmental) change. For Cambodian coastal communities, the threat has recently been in the form of droughts. In 2016, the country confronted its worst drought in 50 years. According to the National Committee for Disaster Management (NCDM), 19 provinces were classified as being in serious condition needing 'immediate intervention' (Chakrya et al. 2016; Crothers 2016). Seasonal weather patterns have become less predictable. Typically, the 'rainy season' in Cambodia begins in May and lasts until October. However, more recently, changes in weather patterns and events, such as El Niño, have prolonged the 'dry season', stoking fears of drought (Muyhong 2015). These droughts and prolonged dry seasons have contributed to water stress and strained fresh water supplies for coastal communities who rely largely on rainfall for their fresh water. In the past few years, several coastal communities have had to ship in fresh water from elsewhere (at a relatively high cost).

For those who have land, droughts and salt-water intrusion have strained their ability to farm and grow subsistence crops (Chakrya 2014). Compounding these challenges, negative changes have also occurred from overfishing (FAO 2014; Froese et al. 2012) and sand mining (Marschke 2014; Thompson 2017). These kinds of activities have led to anthropogenic environmental change and the deterioration of coastal habitats. In response to these combined factors that have made it increasingly difficult to make a living from fishing, coastal fishing communities have responded actively and adopted various adaptation strategies with diversification (Hanh 2011; Marschke 2005, 2012 for Cambodia), and efforts to protect or conserve their environment (e.g., planting mangroves or building seawalls) being the main responses (Marschke 1999 for Cambodia; Savo et al. 2017).

[2]The higher fisher density of Koh Kong province can partly be attributed to the province having the largest stretch of coastline compared to other coastal provinces, that is, more places to support coastal fishing communities. I use the gender-neutral descriptor for someone who fishes in recognition of the fact that, although the majority of those who "do" fishing are men, women play important roles in fishing and are often involved directly in fishing itself, in many cases alongside their husbands.

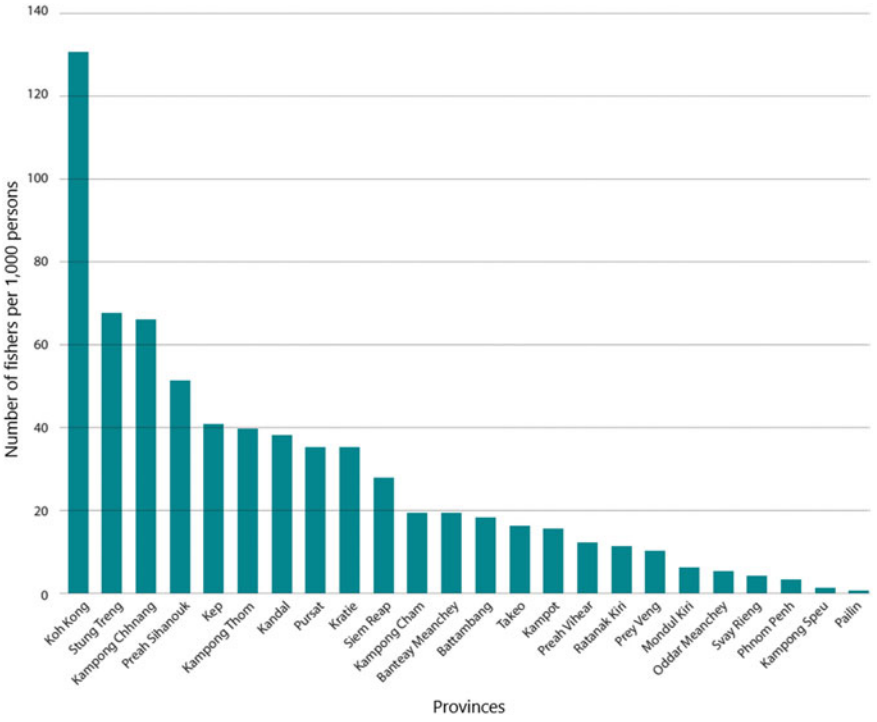

Fig. 8.1 Fisher density (number of fishers per 1,000 persons) by province in Cambodia (*Source*: Graph from Baran et al. 2014; data from Nasielski et al. 2013)

Another strategy has taken the form of increased mobility. For some fishers, this means changing their fishing grounds and labour patterns, which usually means going farther out to sea (Khan et al. 2010). In other cases, where this is not possible or where the impacts of climatic and/or environmental change are too widespread (reflected in a sustained decline in catch), fishers or those in their household are compelled to leave their village, moving either within the country or beyond (Savo et al. 2017; e.g., Heinonen 2006; Kheang 2013; Asif 2017 for Cambodia).

Steadfast economic growth in key industries (e.g., textiles; manufacturing) has paralleled (and partly fueled) urbanization in the major urban area (i.e., Phnom Penh) and, more recently, secondary cities (e.g., Sihanoukville, Poi Pet, and Koh Kong) (Warr and Menon 2015). Foreign direct investment (FDI), in two forms, plays a dominant role in this picture (US State Department 2015). The first is the creation of key industries, such as Cambodia's garment sector which accounts for roughly 600,000 jobs (38% of total secondary industry employment) (Warr and Menon 2015). The second form is the FDI's role in the development of Special Economic Zones (SEZ) in cities across the country, particularly secondary cities (e.g., Koh Kong; Poi

Pet).[3] Such investments have led to the creation of an additional 68,000 jobs (Warr and Menon 2015). In many cases, these jobs offer either equal or higher pay in generally better labour conditions compared to the traditional primary sector (agriculture). Taken together, these factors have catalyzed the migration of people to secondary cities and to the capital in the past two decades (Peou 2016).

Historically, southwest Cambodia is no stranger to migration. People have always moved in and out of the region (e.g., post-Khmer Rouge), drawn to the abundant natural resources. Given Thailand's proximity and ease of access (Marschke 2005) people often head there. Some coastal fishing households have successfully remained in the village, carving out a living by diversifying their livelihood activities (e.g., Marschke 2012). For some members of coastal fishing households, many who face uncertainty (in terms of catch) and financial and climate-related risk in earning a livelihood, emerging economic opportunities in urbanizing areas act as one of the 'pull factors', that draw them out of the fishing village. The household changes highlight the importance and significance of focusing on coastal areas—where environmental change, forces of urbanization, and people's mobilities (or lack thereof) intersect.

Scholars' increasing interest in migration (including internal migration) has coincided with dramatic socioeconomic changes that have swept across Cambodia, manifested in rising per capita incomes, increasing urbanization, and attendant migration from rural to urban areas (e.g., Phnom Penh; Battambang; Siem Reap) (Brickell 2011; Haapala 2003; Hak et al. 2011; They and Treleaven 2012; Zimmer and Knodel 2013). The changes include gender and sexual health (Nishigaya 2002); urbanization and economic dimensions, for example, remittances (Bylander 2015b; Bylander and Hamilton 2015; Lim 2007; Parsons 2016; Parsons et al. 2014); labour migration (Peou 2016; Sophal 2009; UN ESCAP 2007); those 'left behind' in the village (Hak et al. 2011; Roth and Tiberti 2016; Zimmer and Knodel 2013; Zimmer and Natta 2015); and land tenure and land management (Bylander 2015a; Pilgrim et al. 2012). With respect to fisheries, there has also been some scholarship looking at migration within inland fishing communities: the reasons behind migration, push-pull factors, and where people go (Haapala 2003); the connection between migration, environment, and water resources (Heinonen 2006); and whether migration as a livelihood strategy reduces vulnerability (Kheang 2013). Within this body of work, an exploration of individuals' migration from coastal fishing households has been largely absent.

By examining people's migration from three coastal fishing villages (Peam Krasaop, Koh Sralao, and Koh Kapic) located in southwest Cambodia to a nearby secondary coastal city, Koh Kong, I consider (a) how climate change will affect the poverty and vulnerability of urban residents in Southeast Asia; and (b) how we can strengthen the agency of individuals, groups, and institutions to improve economic, physical, and social well-being in urban areas, particularly in response to climate

[3] In 2014, there were 9 SEZs operating in the country with 20 more green-lighted to be created. Unlike many other countries, the Cambodian government has left the establishment and management of SEZs to private-sector developers (Warr and Menon 2015).

change. Coastal villagers' migration into urban areas has significant, and sometimes paradoxical consequences to their social well-being. While their livelihood may improve, their vulnerability also increases, mediated by both climate-related impacts and the capacity of urban systems to adapt and cope.

8.1 Conceptual Framework

The concept of well-being has gained increasing currency in public policy and development discourse in the past decade. It has been used in international development narratives and with partial success for development policy and practice (Diener et al. 2009; Stiglitz et al. 2010; White 2009). In the context of urbanizing cities, scholars are paying attention to the effect urbanization has on the well-being of individuals (Bai et al. 2012; Goldstein 1990). Such a conceptual framing considers and incorporates a people-centred approach to understanding urban resilience. In other words, it contributes to a better understanding of the city as a system by focusing on the social actors—individuals within the system.

The conception of social well-being is different from related areas, such as the livelihoods approach and human psycho-social development (including in disasters) (Armitage et al. 2012; e.g., Brown and Westaway 2011). Compared to these other frameworks, social well-being goes beyond material and basic needs—issues that are typically focal points in an urban context—by taking into consideration social, psychological, and cultural needs required to 'live well' while underlining relational and collective processes (Coulthard 2012; in the context of fisheries, e.g., McGregor et al. 2009; White 2010, 2013). Moreover, social well-being brings together contributions from diverse sources of development thinking and social theory (Deneulin and McGregor 2010; Gough and McGregor 2007; McGregor 2008).

Social well-being was put forward in *Wellbeing in Developing Countries: From Theory to Research* (Gough and McGregor 2007) and piloted by the Wellbeing in Developing Countries Research (WeD) group from the University of Bath (UK).[4] One of its benefits is that it offers the potential for linking human interests and ecological systems. Social well-being is a 'state of being with others and the natural environment that arises where human needs are met, where individuals and groups can act meaningfully to pursue their goals, and where they are satisfied with their way of life' (Armitage et al. 2012, 3). Social well-being is a process involving three dimensions: (1) material, for example, income, wealth, assets, and ecosystem services; (2) relational, for example, social interactions, collective actions, and relationships; and (3) subjective, for example, cultural values, norms, levels of satisfaction or dissatisfaction, belief systems, and shared hopes, fears, and aspirations (White 2009,

[4]The WeD project was a large, five year initiative involving four countries (Bangladesh, Ethiopia, Peru, and Thailand) based on a comparative study of well-being, focusing on objective accounts of livelihoods (i.e., resources and needs) and subjective measure of goals and satisfaction (i.e., quality of life) (Gough and McGregor 2007; Gough et al. 2007; White 2010).

2010). The triangulation of these three dimensions suggests their interdependence and highlights the relationship between objective (i.e., people's circumstances) and subjective (i.e., their perceptions) aspects. The subjective dimension is considered to be the apex where material welfare (i.e., standards of living) is partly derived from values and culture (White 2009). This more multidimensional perspective situates the individualistic and basic needs components of well-being within broader social, psychological, and cultural needs that are also required, but sometimes overlooked, for well-being (Coulthard et al. 2011; Deneulin and McGregor 2010).

The relevance of adopting the concept of social well-being in the fisheries context has considerable precedent. Some studies on fishers and well-being have noted that fishers view fishing not just as a means of earning an income (and a livelihood) but also as integral to fulfilling their social and psychological needs, contributing to job satisfaction, self-actualization, and their overall social well-being—fishing is *a way of life* (Binkley 2002; Coulthard 2012; Coulthard et al. 2011; Davis 2000; Pollnac and Poggie 2006, 2008; Pollnac et al. 2001). This way of life is juxtaposed with increasing urbanization and economic growth typified in Cambodia by the development of several special economic zones that act as a draw for people to move out of fishing villages to secondary cities and beyond. Thus, social well-being forms a useful approach to understanding the tension people experience and what these trends mean for fishers, their households, and for the small-scale coastal fishing sector in an increasingly urbanizing Cambodia.

8.2 Methods

This chapter draws on data collected: (a) as part of my doctoral field research conducted in southwestern Cambodia in three coastal villages: Peam Krasaop, Koh Sralao, and Koh Kapic, located in Koh Kong province (Fig. 8.2) over an 18-month period (September 2015–March 2017); and (b) through interviews with government officials in Koh Kong (6–7 April 2017), as part of a vulnerability assessment conducted for the UCRSEA project. For the doctoral fieldwork, I used structured and semi-structured interviews and a scoping survey. For the selection of the villages, I used purposive sampling (specifically, criterion sampling) (Patton 1990). I selected villages in consultation with my doctoral supervisor and with advice from Cambodia Ministry of Environment (MoE) officials. The selected villages and their village leaders had established relationships with other researchers from MoE, nongovernmental organizations (NGOs), and research organizations (e.g., International Development Research Centre). In other words, their livelihood and community history were well documented, and they were familiar and comfortable with the presence of researchers and those from outside their village, in general.

To select participants, I adopted purposive sampling, specifically opportunistic sampling (also referred to as emergent sampling) (Patton 1990). Opportunistic sampling recognizes that it is 'necessary to make decisions about which activities to observe, which people to observe and interview, and what time periods will be

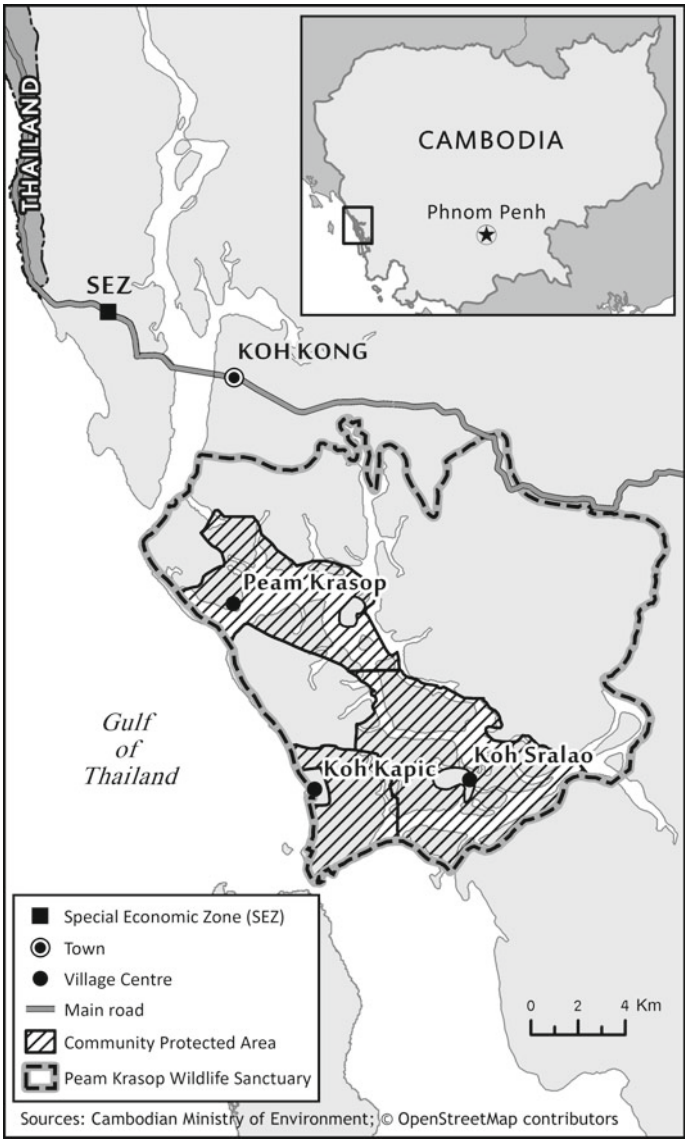

Fig. 8.2 Map of the three fishing villages (Peam Krasaop, Koh Sralao, and Koh Kapic) in southwestern Cambodia, located within the Peam Krasaop Wildlife Sanctuary (PKWS), along with the provincial capital, Koh Kong (country capital in inset) (*Sources*: Cambodian Ministry of Environment and OpenStreetMap contributors)

selected to collect data' (Patton 1990, 179) and adapt to conditions 'on the ground'. This method of sampling worked particularly well in the context of village life because of the multitude of tasks, chores, and activities villagers engaged in through-

Table 8.1 Number of participants across two central locations (village and city), with select demographic factors

Location	Interviewed	Scoping Survey	Males	Females	Average age[a]	Average # of years in village
Peam Krasaop	44	16	35	13	43	15
Koh Sralao	55	22	47	15	48	20
Koh Kapic	22	31	43	10	49	29
Koh Kong town	13	–	2	11	23	–
Phnom Penh	14	–	11	5	–	–

Source: Based on data collected by author
[a]Age data were not obtained for all Phnom Penh participants (<25%) and so were excluded.

out the day (e.g., mending nets, repairing boats/houses, preparing fishing gear, and fish/crab sorting). It allowed the research team to make decisions (on the fly) about which people to interview based on the objective of causing little to no disruption to villagers' day-to-day activities. This was especially important because life, and people's livelihoods, in the fishing village was very dependent on various independent variables, such as tide levels and time of day, that dictate and determine fishing-related activities.

I selected migrants by following a similar sampling strategy. Villagers were asked at the end of the interview if contact information could be provided in the case where they had a household member who had migrated out of the village. A total of 148 interviews were conducted, involving formal and informal one-on-one semi-structured and structured interviews and group interviews with fishers, women, village leaders, government officials, NGO workers, and migrants from the villages who lived in Koh Kong town and Phnom Penh (Table 8.1).[5]

[5]Questions relating to well-being were adapted from the *Exploring Wellbeing in Fishing Communities: Methods Handbook* (Coulthard et al. 2015) which focused on operationalizing the "3D well-being" conceptual framework. All of the interview notes and transcripts underwent qualitative analysis after being imported into NVivo 11 Professional for Windows (Version 11.4.1.1064) through thematic coding, informed by guidance from *The Coding Manual for Qualitative Researchers* (Saldana 2009). Codes were used following the three dimensions of well-being along with two codes corresponding to "doing well" and "not doing well" (related to questions asking respondents to describe a person who fit each category). The more informal portions were appended to the scoping survey. The structured interviews were used to assess the three dimensions of well-being.

8.3 Coastal Fisheries in Cambodia

Most coastal villagers, whether they are on the islands or near the mainland, live in houses made of wood with a metal roof. They are perched on long poles above the water. The houses' design gives people easy access to their boats and to the sea—their main livelihood lifeline (building a house on land is more expensive and the land itself is scarce). Days are often filled with uncertainty (*How much fish will I catch?*) and risk (*Will my gear get stolen?* or *What if I get sick?*). Fishers go out to sea before the sun rises and fish for many hours. Some are alone (e.g., if they have children that are too young to come along and help. In other cases, their spouse or a fellow villager (who they may have hired) joins them. When they are out at sea alone and something goes wrong (e.g., engine trouble or the weather takes a turn), they can be at risk of being stranded or injured. Coastal families must contend with the fact that fishing is an "expensive" livelihood. New gear must be bought every couple of years at best (the seawater corrodes the metal frames of traps easily), netting has to be replaced (or fixed), boat engine parts sometimes need replacing (or, in some cases, a new engine has to be bought), bait must be purchased (when it is not caught), and gasoline has to be stocked. These everyday realities make fishing potentially risky, both physically and economically.

There is always something that needs to be done, whether it is inspecting the condition of the traps, mending nets, or fixing a sputtering boat engine. Fortunately, almost all household members (save the very young) pitch in and help where they can. They sort through the day's catch or organize the fishing gear so the fisher can head out again the next day before dawn (for gillnet fishing). Depending on where they fish, fishers must also contend with environmental cues such as tides that dictate fishing patterns (and in some cases, if they cannot even fish at all since at low tide their boats can remain moored, depending on where they live). During the fishing season (i.e., 'dry season,' typically November–April), this cycle repeats itself, with most fishers going out to fish five to six days of the week. Some days are better than others. As the village chief of Koh Kapic says, 'it is a risky venture—some days you earn, some days you do not earn, and it depends on the season, if it is a good season or not'. During the rainy season (typically May to October), most fishers cannot go fishing because conditions at sea are dangerous with strong storms and high waves, something their small boats are no match for. A group of fishers from Koh Kapic told me, 'we are disappointed with the area during rainy season because that time it always makes our fishing equipment stay at home'. Recently, the weather has been less predictable, according to the commune chief who said, 'in the season when there are storms, there will be storms but the storms now they don't stay in the same season—always have irregular storms'.

In addition to the limited time available for fishing, coastal households have been consistently catching less. As one female villager noted, 'fishing is decreasing, we catch less and less. Like every day we earn 10,000 riel [~$2.50 US]'. We were told this has been happening gradually, starting over a decade ago when fishers started noticing they were catching less than before—now they are catching a fraction of

what they used to catch even a few years ago. When asked what caused this dramatic change, different fishers point to different reasons. Some say it all started once more people moved to the coastal village because these people heard that they could make a good living in this part of the country. Others say it is because some people have resorted to using illegal gear and fishing practices, either out of desperation or to have an advantage. People from all three villages point to sand-dredging activity in the surrounding area as a culprit for the decreases in the catch. Still, others blame the officials and government, saying that they are not providing support to address these threats to their livelihood. Most likely, it is a combination of these issues, with some playing a larger role than others.

8.4 The Three Villages

Table 8.2 briefly summarizes a few salient characteristics of each village such as approximate size, sources of livelihood, the prevalence of migration, and destination of migrants. The average number of households across the three villages was 149. Koh Sralao had the most households out of the three villages and Koh Kapic was the least populated. Across all the villages, fishing constituted the major livelihood. Peam Krasaop had the highest prevalence of fishing as the main livelihood with 82% of respondents engaged in fishing activities. In the other two villages, fishing dependency was very similar for both (just over 60%) with the rest of the economy consisting of farming and other miscellaneous livelihoods. In a sense, livelihoods are relatively more diversified in Koh Sralao and Koh Kapic villages compared to Peam Krasaop. In Koh Sralao 61% of respondents indicated that someone from their household had left the village (vs. an average of 45% across the other two villages).

The three major destinations for migrants across the villages were Phnom Penh and Thailand with Koh Kong town a destination for two of the villages (Koh Sralao and Koh Kapic). Since Peam Krasaop was connected by road to the town, those who worked outside the village (e.g., in the factory) still lived at home with their family. This also explains why the destination for migrants from Peam Krasaop was either Phnom Penh or Thailand and not the nearby town. The two mangrove estuary villages, Koh Sralao and Koh Kapic, showed the most diversity for migrant destinations, particularly Koh Kapic, which had 11 different areas in addition to the three principal ones listed (Table 8.2). Most of these destinations were other provinces or cities within Cambodia, although two were outside of Southeast Asia (Canada and the United States). This range showcases the extent, scale, and diversity of migration and how it differs across the three villages.

While some villagers choose to leave and go to different destinations (more so for the latter two villages), what is less clear is why some leave and others stay. How does the choice to stay affect their social well-being?

Table 8.2 Characteristics of the three coastal fishing villages

Location	Village size (# of households)	Livelihood	Prevalence of migration[a]	Destination of migrants[b]
Peam Krasaop	147	Fishing (82%); unemployed (12%); miscellaneous (6%)	8 out of 18 (44%)	Phnom Penh (50%); Thailand (50%)
Koh Sralao	200	Fishing (65%); farming (10%); miscellaneous (25%)[c]	19 out of 31 (61%)	Koh Kong town (28%); Phnom Penh (28%); Thailand (15%); Sihanoukville (13%); Kampung Cham (5%); Kampot (5%); Preah Veng (3%); Kandal (3%); and Malaysia (3%)
Koh Kapic	100	Fishing (62%); fish farming (6%); retired (6%); miscellaneous (26%)[d]	15 out of 32 (47%)	Phnom Penh (24%); Thailand (24%); Koh Kong town (19%); Kampung Speu (5%); 3% each from: Lam Dam village; Battambang; Siem Reap; Sihanoukville; Takeo; Kampung Treach; Kampot; Srey Ambal; Nanaimo, Canada; and the United States

Source: Based on data collected by author

[a]The prevalence of migration was calculated as a percentage out of the absolute number of households who had been asked and responded affirmatively to the question of whether anyone from their household had left the village (either revealed during an interview or answered as part of the scoping survey).

[b]Percent calculation based on total number of individual migrants. For Peam Krasaop: 8; Koh Sralao: 40; and Koh Kapic: 37. In some households, several family members had migrated which explains the higher total migrant count versus the numbers shown for the prevalence of migration.

[c]Includes sundries seller; boat mechanic; (boat) carpenter; teacher; middle person; general repair person; and thatch roofing builder.

[d]Includes sundries seller; noodle soup seller; middle person; moneylender; director of the primary school.

8.5 Peam Krasaop

Villagers in Peam Krasaop consider living well to include both material and relational dimensions of social well-being. Some group interview participants noted that 'a person is doing well if they have a lot of property and a lot of fishing equipment'. Another fisher, Mr. Chan, remarked that a person can live well in the village if they

'have two to three children working in a factory'.[6] Others explained that when a person 'helps others find a job and brings back information on their experiences and gives advice' they are doing well, while another villager, Mr. Sin, focused on community and relational dynamics. He said that a successful person is someone 'who listens to the village and commune chief and abides by the rules such as not cutting down mangroves while also working consistently and not having domestic violence in their family'.

One villager listed 'having no debt; having a motorbike and nice house; understanding each other, that is, members of the family have good relations; reliable supply of water/electricity; and school and healthcare centre close by' as important things for a person to live well. Another villager, Mr. Kao, focused on relational dimensions and the village community dynamics, noting the need for 'the husband and wife to understand each other, with no one accusing; for them to try and earn income together (and save for their children's future, for example, school fees)'. He also said that there has to be an 'alliance within the community to be established. Right now, people in the community don't help each other much'. A husband and wife living in Peam Krasaop said that what is needed is to 'not have Thai boats come and fish in our area. The government should stop sand dredging; and people should not be indebted to the banks'. They also highlighted the importance of having 'good relations with the government', and explained how the former governor of Koh Kong province 'would visit and help address community issues such as illegal fishing' but that the new governor is not as supportive or helpful.

There were two major and interrelated factors that relate to and affect villagers' material well-being in Peam Krasaop: debt and decline in catch. One villager explained that 'because the people here cannot enough catch fish or crab and cannot earn enough money, some of them borrow money from microfinance institutions'. Proximity and being connected to the town by road allows easy access to important services and jobs. A woman who moved to Peam Krsaop from another village so that her children could attend school said, 'we live nearby the hospital, the clinic, and the school so it is easy for children to go there. And the younger women—they can go to work in the factory nearby'.

Someone who is not doing well in Peam Krasaop is a person the villagers characterized as a heavy drinker and a gambler (playing cards); a person who spends unnecessarily and irresponsibly; a person who has a 'bad attitude' and bothers their neighbours. Almost exclusively, the profile of someone not doing well in the village focused on poor decision-making behavior (and actions). One villager, Mr. Mab, put it like this: 'gambling is the biggest problem in the village, followed by drinking. Some men spend all their daily income on beer… gambling is very common because there is an abundance of free time, especially for the women [compared to men]; some women hide their gambling from their husbands'.

Despite the challenges, some choose to stay because they want to be close to their family. One fisher noted, 'I want to stay here because I want to be close to my family.

[6]To maintain anonymity, names have been changed to pseudonyms.

I can do some fishing, enough to support my family… if we go outside of the village, then our children, our wives they stay here, they have difficulty living alone'.

Subjective dimensions of well-being centred on opportunities and having control over your life (i.e., agency). By staying in the village, some women feel that they are 'losing time and losing the opportunities by staying at home and not doing anything'. Feeling in control of one's life is of course heavily tied to catching enough fish. 'Right now, we have less control over our living, but when we catch more, then we have more control' and having enough income, which is also tied to having choices. One woman remarked, 'we have no choice if we don't have the money. Because we don't have the money, we don't have choice. We can only do fishing'.

Fishers highlighted one of the main benefits of fishing as being able to 'have control over ourselves, and we can control what we do… without having anyone to manage us, we can work freely'. While this autonomy is highly valued, it also has its downsides because with it comes the need to be self-directed and disciplined. As a result, some fishers say they 'want to go to factory, because when going fishing, sometimes we feel lazy, sometimes we fail to go… because no one to controls us so we don't want to go by ourselves'. Still, others are not confident about leaving the village because they feel that they do not have enough education. One male fisher stated that 'in order to go out, we need more education. If we have low education, we cannot go work outside [the village]. For example, to go to Thailand, need to know Thai language too'.

The idea of 'giving hope' or putting hope in something was a recurring theme with villagers from Peam Krasaop. Mr. Sopharin, having recently moved to the village, captured it well when he said 'some people give their hope to the factory (to get stable income) and money from this goes toward paying household debt while money from fishing goes to everyday expenses; many families are doing this and it contributes to less stress for the family. Families who do not have anyone working in the factory are more stressed'. He was commenting on the recent trend of young villagers getting jobs at the factories in the SEZ and how households have come to rely heavily on the income brought in from these jobs to service their debt and cover daily expenses. Another villager also hinted at the idea of people 'giving their hope' to microfinance institutions, saying villagers 'increasingly rely on banks/microfinance: ten years ago, people did not give their hope to the bank'.

8.6 Koh Sralao

In Koh Sralao, fishing is responsible for improving a person's material well-being and paradoxically also the cause of its deterioration. One fisher in a group interview said 'the income from fishing is the most significant for any household in Koh Srolao. It is because it is the only source of money for most of us and can allow us to buy clothes, provisions, household goods, everyday needs, and pay for all of the supplies for the family'. He continued, 'we noticed that the number of sea natural resources is sharply declining, and it has really affected our livelihoods because we can't save

as much money as before, so most households borrow money from microfinance to buy things for members to meet family needs'. This decline in catch has been quite dramatic. As one male fisher in his 50s noted,

> [before] it was quite good to earn crabs. I laid only 200 crab traps and I could get many [ten to fifteen] kilograms per day, but now I lay 800 to 900 traps, can earn only two to three kilograms per day … It has really affected my livelihood when it sharply declined like that. You know—I could not save much money as before. In the dry season, we need to save money as much as possible in the purpose of keeping it for using in the rainy season. If we could not save money, when dry season arrive, we must borrow money. We borrowed USD $800 to $1,000 per year.[7]

This decline in fish stocks has a trickle-down effect on the material well-being of other villagers as well, including those who do no fishing. As one villager who has been living and fishing in Koh Sralao for 30 years explained, 'for fishers, their earning potential has been affected but this also affects others, for example, people who run restaurants. A decrease in income for fishers means that they will not spend on eating out or on other non-essential expenses'. In this way, individual material well-being is connected to the material well-being of the whole village and is tied to the marine resources that play a central role in material well-being outcomes.

Several villagers from Koh Sralao emphasized that relational well-being, specifically social ties, was linked to improved material well-being. At the most fundamental level, fishing is labour intensive and like most labour activities, the more people who can assist, the higher the possibility for it to be productive. One fisher among a group said, 'some families who have enough members in their family to work in fishing and have good materials (fishing tools) enjoy living and fishing at Koh Srolao because they can get a lot of income per day'. For households that have difficulty borrowing money, social ties were essential. A male fisher said, 'families who are unable to borrow money from banks, those will need their relatives or friends who have enough requirements and asked them to borrow, for families that cannot borrow'.

Subjective well-being in Koh Sralao can be broadly categorized into two areas, one focused on fishing itself and the second on the village as a place. This was manifested in different ways across the interviews. For example, one male fisher in a group said, 'I have never dreamed to live outside too because this community is my hometown. And I have no other skill besides fishing… not many Koh Srolao residents wanted to relocate; most of them always regarded Koh Srolao as their hometown'. In contrast to Peam Krasaop where this idea of hometown was not mentioned in any of the interviews, several villagers in Koh Sralao brought up the fact that they felt that their village is their 'hometown' where they have spent a long time, which is why they will not leave. Holding this value was highly correlated with age. The majority of villagers who expressed this sentiment were older (50 years+). One 66-year-old villager, who agreed with her friend in a group interview, said 'Yes, me too. I won't move to another place, I will set up my life until I die in Koh Srolao because I am

[7]The same fisher noted that 'my wife bought 200 crab traps. It cost 250 dollars and I can use for three months only—after that period we will sell it to scavengers. I cannot fix it'. Meanwhile, another fisher informed us that he lays 600 traps, from which he expects to get approximately 10 kg of fish.

old'. In this instance, the importance of the village being their hometown contrasts with the acknowledgement that fishing is the only skill that they possess.

Others have different views on fishing. When I asked another group of male fishers whether they enjoy fishing, they said, 'not really. We all don't really enjoy fishing or enjoy living in this community because sometimes we feel bored in doing fishing, but we have no other options to do anything else, no skill, no start-up funds, and no place to go'. Their indifference to fishing and attitude toward it is closely tied to their material circumstances: 'we feel that we are in a trap because we must borrow money from the bank, microfinance, money lender, and "middleman" every season'.

Not surprisingly, most villagers closely tie their subjective well-being to their material well-being. One 30-year-old who had recently moved to Koh Sralao and had been living in the village for one year (at the time of the interview) said, 'during the time I lay my traps overnight, I do not sleep well and worry about my traps being stolen. But other times, when I catch "number one crab" and lots of crab in general, I am very happy'. Like residents in Peam Krasaop, villagers said that people 'give their hope to the fish and crab'. This was revealed in an interview with a wife and her husband, 45 and 43 years old, respectively, when they were asked why they did not move back to where they came from (Kandal province) since it had become difficult to make a living in Koh Sralao. They said, 'we just waited to see other years coming. Maybe everything was going to get better (sea natural sources increase following year), but we have been doing that all the time until now'. Asked how they felt, they said 'we feel like we are in trap every day because we are stuck in this place. Anyways, I can't hand this guilt to someone else because no one forced us to come here. And the rumour was true at the beginning—there were a lot of sea natural resources'.

8.7 Koh Kapic

Most villagers in Koh Kapic had experienced the erosion of material well-being, compounded by water security concerns (at the time of the interview) in a prolonged dry season with drought conditions that led to shortages of fresh water supplies (normally sourced from Koh Sralao). The village chief noted, 'you know, nowadays Koh Kapic's residents are facing water shortages. Water shortage is main issue for them. The livelihood of residents is getting poorer and poorer because they are spending more money on buying water from outside. Some years, they can't even buy water from Koh Srolao because the water supply from there is not enough for their needs'. Like villagers in Peam Krasaop and Koh Sralao, residents of Koh Kapic spoke of how the amount of 'sea natural resources has been declining from year to year'. Nevertheless, people recognized that living in the village still had many benefits including those provided by the mangrove ecosystem. One villager said, 'I enjoy that I can get food and firewood easily; easy to find and use trees to build a house'. Although it was not the norm, people who had assets found that their material well-being needs were being met so they did not have a desire to leave the village.

'I have property here, land and a farm, so I have a lot of things in the village'. In a sense, it was clear that surviving in Koh Kapic was possible, but being able to save money (an important prerequisite for supplementing reduced livelihood earnings during rainy season) had become less likely. One fisher who had been living in the village for 20 years remarked that making a living is 'better for certain families (those who run other business); not better for others [80% of residents]'.

Microfinance is considered both a blessing and a curse. The commune chief outlined how 'residents need to spread out their businesses—they need to buy boat, engines, and other fishing equipment to catch fish. But some families who have failed [at doing well]—their livelihood will get worse and worse. But others who succeed—they will say thanks to the banks'.

As it was in Koh Sralao, relational and material well-being had mutually reinforcing characteristics. During interviews, Koh Kapic residents emphasized the importance of connections both within the village and outside. One villager said households who fare better are those 'who got help from their relatives, have specific goals (plan to get job before moving), and have start-up fund to prepare for new places which they are going to live and work'. Long-time residents spoke of the erosion of community cooperation and not having support from the village officials. A former community leader who has lived in Koh Kapic since 1979 related, 'after 2008, the community faced leadership setbacks due to deaths of the commune chief and a senior community leader and since then there has been more conflict within the community since the leadership has changed. Meanwhile, other good leaders have moved to Koh Kong town and Phnom Penh [for a better livelihood]'.

Drawing a parallel with Koh Sralao, many villagers in Koh Kapic felt their identity was attached to the village itself. One said 'even though they [the migrants] are wealthier than here, I won't relocate because this place is my hometown'. There were also sentiments of contentment because 'so many of residents, they prefer what they have. Hometown is much better than other because we grew up here, got education, got married, and we have many memories at Koh Kapic. I won't relocate from here to another place even if someone build a new house for us'. Several villagers spoke of the village as their 'hometown'. One 61-year-old fisher said, 'no matter what happens to me, I won't abandon this site because I always regard this place as my hometown'. Others acknowledged that 'even if I do leave, I will miss fishing, the community, and my land'. The village chief continued, 'I feel similar, will miss the community—I have a million souvenirs here; people are safe and polite and even if I move, I will think of this place. I think the younger generation will also miss and keep the connection with the village. Even when they earn money outside the village, they give back and support the community, so they do miss it, otherwise they would not do this'. He then said, 'I have seen many of the residents who live in USA, Canada, and Korea and live in other countries—they still come and visit this community whenever they have a chance. And they always donate the gifts to residents; it is symbol that they won't abandon the community'.

Table 8.3 Number of migrants separated by reason for migrating and disaggregated by gender and two primary destinations

Reason for migrating	Koh Kong town		Phnom Penh	
	Males	Females	Males	Females
Employment	2	11	8	3
School	0	1	3	0

Source: Based on data collected by author

8.8 Migrants

Migrants from the coastal fishing villages said the top reasons for migrating involved either employment or higher education (Table 8.3). Those who spoke of education were mostly in Phnom Penh and male.[8] By contrast, employment was the sole reason both males and females migrated to Koh Kong town, which is not surprising given the prominence of the factories in the SEZ (and the factories' hiring bias for women) and lack of education institutions beyond high school. The average age of a migrant in Koh Kong town was 23 years old and in Phnom Penh, the figure was slightly higher (26).

Migrants' main reason for leaving the village was, not surprisingly, that they wanted to improve their material well-being (and by extension, their family's). For male migrants, the main drivers were the experience of instability (in income) or risk (having their gear stolen multiple times). For female migrants, the motivation was having a job and earning a stable salary to support their parents and family. In many cases, their family's poor livelihood situation was the main factor.

Improved material well-being was also dependent on having skills. Female migrants who worked in the factories were provided with skills training as part of the recruitment process. One 22-year-old factory worker said, 'No, I did not know the skill [before]. I had to train before I started the job'. In contrast, for male migrants, among their limited options was to sell their labour (e.g., in the construction sector) or engage in a low-skill, minimal-labour job. One migrant remarked that 'skill is important. But I have no specific skill. Before I used my labour as construction worker. But as a *tuk tuk* driver, no new skill is needed and not much energy needed. And you get money every day. You earn the days you work. For construction worker, you probably work 15 days in one month but you need money every day for expenses so that is the issue with that kind of work'. The seasonality of this migrant's earnings mirror that of his former livelihood and those of fishers in the village. He said, 'on average, I can save around $200 per month. But not this season [rainy season]. In rainy season I save nothing but in dry season I can save about $200 each month. In rainy season, I just live hand to mouth'.

[8]For purposes of brevity and given the focus on secondary cities in the context of the UCRSEA project, only migrants of Koh Kong are the focus for this chapter.

The importance of social ties, particularly to those in the village, was also important to the *tuk tuk* driver. When asked about his customers he explained, 'I really rely on them [Koh Srlao villagers] to earn income; my business won't work if those residents don't come [to visit Koh Kong town]'. In this way, both his material and relational well-being are mutually reinforcing. And the material well-being of the villagers is also tied to his material well-being. 'If people in Koh Sralao could not earn much income, they do not come to the market in town. If they earn more income, they will come more often to do shopping'.

Social ties also become important when it comes to leaving the village in the first place. The *tuk tuk* driver explained that 'good connections are important. Before I lived in Koh Sralao, I worked as a construction worker in the town. And those people gave me the idea of other business like *tuk tuk* business. It is really useful and beneficial for households that want to move out of Koh Srolao if they know a lot of people outside. As for me, I knew a lot of people in Koh Kong town when I worked as a construction worker before I went to live in Koh Srolao. And it made it easy for me to move'. Without having good social ties, the decision to leave is riskier. He continued: 'For some families who don't have many connections, they don't want to move because they are not comfortable with the new place and there are more risks'. This was borne out in the case of a migrant couple, both working as labourers in the construction sector, who said, 'Mr. [name withheld], the tuk tuk driver, told us about the opportunity for construction work in Koh Kong town … And first we stay with [him] before getting a job [for five or six days]'. These two migrant experiences from Koh Kong town made it clear that having high relational well-being (i.e., diverse social ties and relationships), either from past experiences or knowing the 'right' people (e.g., those who have left), are key in being able to not only leave the village but also to gain a foothold in the destination after leaving.

Migration and its effect on migrants' subjective well-being varied and, for some, involved trade-offs. When a group of female migrant factory workers from Koh Sralao was asked if they enjoy their new-found freedom, they said, 'yes, we have more freedom to make friends, go for walk, and do something else, but we always feel warm when we live with our parents because they always take care of us all the time'. While acknowledging that their own and their family's material well-being was improving ('working in the factory is a stable job; we will get salary every month'), they also said 'we miss our parents when living far from them. We always go to see them when we have a day off'. They had to manage the trade-off of living and being away from their parents and family as they worked at the factory, with the income they earned, which directly supported their household's material well-being (most remitted about 50% of their monthly salary, approximately USD $100).

For the migrants who had less stable incomes, their subjective well-being varied in concert with their material well-being, as the husband of a labourer couple from Koh Sralao village related. 'This month, I do not have regular work so not so happy and not so different from Koh Sralao but other months when I have regular work, it is better here. This month, the management of the construction work has no regular work, so I don't feel happy to move here. But the month we have regular work, we are happy'.

Having self-confidence and being able to take some risks were qualities deemed necessary to be able to leave the village, according to the *tuk tuk* driver migrant. 'Others are reluctant to do the business. They have the ability and the money, but they are reluctant to do it because they do not trust themselves [have confidence] in doing the business. They do not believe the new business will earn good income and they do not know the new business well. They think it is too much of a risk'.

8.9 To Leave or Not to Leave: The Relationship Between Migration and Social Well-Being

The decision of whether to leave the fishing village involves the intersection of all dimensions of well-being. For migrants to Koh Kong, it depends on who they are. If they are fishers, then the driver is a circular cycle involving insufficient capital because of decreasing (and unpredictable) income resulting from declining catch, which prevents them from saving money (to be used in the rainy season). A related factor is the lack of regularity or stability in income from fishing because of fluctuations in catch levels. At the same time, costs related to fishing are constant and recurring (e.g., fuel, gear maintenance, etc.). Combined with gear turnover (i.e., need for replacement) and loss/theft, the ability or desire to stay in fishing becomes increasingly difficult and financially unfeasible.

Villagers and migrants in all the villages had four general strategies. One was to continue fishing by borrowing more money to buy the materials necessary to keep fishing. Many of the fishers who adopt this strategy say that fishing is the only skill they know for earning a livelihood. A second strategy is to sell assets (e.g., boat, gear) and use the money as a "safety net" after moving to facilitate a new livelihood (e.g., buy a tuk tuk). Fishers who do not have any assets (i.e., do not own their own boat) migrate to Koh Kong town with either some money to help them get by until they secure a job or sometimes a job is already lined up for them prior to, or soon after, their arrival (facilitated through social ties, e.g., a neighbour from their village). The third response is to stay put in the village because fishers "feel trapped" or they have "given their hope" to the fish and crab. The fourth type of response involves (generally older) fishers who do not want to leave the village in the first place because it is their 'hometown' and they plan on living out the rest of their lives there.

In other words, the decision to migrate is determined by which dimension or combination of well-being (material, relational, or subjective) plays the leading role. In some cases, both material and relational dimensions play a central role in facilitating migration while in other cases, subjective factors prevent migration from the village. The subjective dimension rests on a place's identity: the fishing village becomes materially, relationally, and subjectively constructed for certain fishers (e.g., White 2018 in the UK context). A group of middle-aged fishers in Koh Kapic captured this well when they said: 'And if it is possible to move, we will miss friends who used to work together, miss the sea crab and fish and the area which we used to travel

from one house to other houses, and especially we will miss the fresh food. For me, my children have asked me to live with them in another province but I won't move because I have regarded this site as my hometown'. Linked to subjective well-being are important preconditions that enable households to leave the village and improve their livelihood, namely assets (e.g., land, savings, education) and skills outside of fishing (material well-being). For others, the importance of having the "right" social ties played an important role as catalysts of migrating out of the fishing village (relational well-being).

If they are non fishers, the decision rests not on material and/or subjective dimensions of well-being as it does with fishers, but on relational aspects. Non fisher migrants in Koh Kong mentioned the need or responsibility to support their parents/family as the central factor that drove their decision to migrate. What these migrants valued was the regular and stable monthly salary they were able to earn. If these non fisher migrants, who were mostly young women, would have stayed in the village, they would very likely not have earned any regular income for the family, given the limited alternative livelihood opportunities available. In this way, migration has potentially significant ramifications for the social dynamics of coastal households insofar as it alters traditional cultural and gender norms and expectations by enabling young women to contribute relatively substantially to household income (Derks 2008; Savo et al. 2017; UN ESCAP 2007). For women, this involves a trade-off in their other aspects of their relational well-being since they are away from their parents and family, and for most of them, this is the first time in their life living on their own. For an unmarried Cambodian woman to live alone bucks tradition, although it has become more commonplace with the lure of economic opportunities in urban areas, more recently to Koh Kong but within Cambodia as a whole, resulting in an increasing number of women 'on the move' (Derks 2008).

8.10 From Sea to City: Climate, Migration, and Vulnerability

Fishers (and coastal communities more generally) are not only the 'front-line observers' of changing climate both on the coast and at sea but they are also some of the first to be affected (Savo et al. 2017). The impacts of climate change on coastal systems (and consequently, livelihoods) have been, and continue to be, manifold: ocean acidification (Speers et al. 2016); increase in ocean surface temperatures (Hoegh-Guldberg and Bruno 2010); more intense storms (IPCC 2014); and sea-level rise (Nicholls and Cazenave 2010) are just a few. These shifts act synergistically on fisheries production and have an impact on fishers and coastal communities (Ateweberhan et al. 2013; Brander 2007; Perry et al. 2010). For instance, a warming of the ocean can alter the movement and distribution of fish (Cheung et al. 2013; Pinsky et al. 2013) while more frequent unpredictable weather and storms increase risks to fishers out at sea (Cinner et al. 2012). These risks are compounded with the depletion

of near-shore stocks because it means that fishers must go farther out to sea in less familiar waters and spend more time fishing. As a result, they are more vulnerable to (increasingly unpredictable) storms. Having to venture further from their typical fishing grounds also becomes an economic burden since fishers have to spend more money on fuel (Savo et al. 2017). Despite efforts by some to brave unsafe and hostile weather conditions (Sarker and Hossain 2012), fishers must grapple with a reduced fish catch in the face of climate change and consequently, a reduction in their food security (Cheung et al. 2013). Aside from the factors discussed earlier that result in coastal villagers staying in the village, going from the sea to the city is another option coastal villagers are pursuing, migrating to Koh Kong town, Phnom Penh, or Thailand.

The past decade has been remarkable in terms of the scale of climate-related impacts for Cambodia. The National Committee for Disaster Management (NCDM) recorded 7,800 disaster events between 1996 and 2013. In 2016, the country confronted its worst drought in 50 years. According to the NCDM, 19 provinces were classified as being in serious condition needing 'immediate intervention' (Chakrya et al. 2016; Crothers 2016). Typically, the 'rainy season' in Cambodia begins in May and lasts until October. However, changes in weather patterns and events such as El Niño have recently prolonged the 'dry season', stoking fears of drought (Muyhong 2015). Droughts have contributed to water scarcity in coastal secondary cities like Koh Kong, while salt-water intrusion has made farming in certain coastal areas untenable (Chakrya 2014). During interviews with municipal government officials, we (the UCRSEA Cambodia project team) were told that 2017 was particularly unusual because of a lack of sufficient rainfall which has led to the town, and indeed many parts of Koh Kong province, facing drought conditions (interview with provincial government official, April 2017). Compounding this difficulty, in 2012–2013, water demand surged because of rapid growth in the industrial sector (i.e., after the SEZ came into operation with factories), along with an increase in population and development (e.g., hotels, guesthouses, and restaurants) for tourism. The effect of climate change is also exacerbating drought conditions with a longer hot, dry season (extending until May versus typically March or April). In 2014, hundreds of households in Koh Kong province were affected by a severe drought. Two reservoirs ran dry and residents were compelled to buy clean water (Chakrya 2014). Currently, the water supply system consists of three reservoirs (this infrastructure was put in place in 2005). The main reservoir, located in Cham Yeam village (Mondul Semah district) (Fig. 8.3) has a capacity of 1,100,000 m^3 with two other secondary reservoirs: one with 80,000 m^3 capacity which is used only in the dry season in case of shortage and another with a capacity of 20,000 m^3.

To increase freshwater supply, a new water storage facility is being constructed which will utilize nearby sources, for example, rivers (at a cost of approximately USD $8.5 million) by LYP Group Co. Ltd. It is expected to be completed sometime in 2018. It remains to be seen whether this will be enough to stave off future water stress for the city.

Cambodia also has a storied recent history of experiencing floods. Major floods in 2011 affected 18 out of 24 provinces, with an impact on over 1.8 million people

Fig. 8.3 The main water storage reservoir for Koh Kong town, shown here at an unusually low level amid an acute drought season in 2017 (Photo by Furqan Asif)

or 13% of the total population. They resulted in 52,000 households being evacuated (Oudry et al. 2016). Two years later in 2013, floods impacted 20 out of 24 provinces, this time affecting 377,354 households and driving 31,314 households out of their homes. Specifically, the coastal zone of Cambodia has been identified by the government as the most vulnerable to climate change impacts (Bobenrieth Erazo et al. 2012). A study conducted by Cambodia's MoE in Peam Krasaop commune (in Koh Kong province) determined that a one-metre rise in sea levels would result in the permanent flooding of 44 km^2 of land (MoE 2000 as cited in Sa 2017). In the case of the city of Koh Kong which is situated right along the coast, there are no flood or storm-surge-protection mechanisms in place, according to a government official (personal communication, 6 April 2017). The vulnerability of this area was also confirmed in a recent study that examined climate vulnerability across three communes in Koh Kong and found that Koh Kong town scored the highest on the vulnerability index (Sa 2017). By comparison, ironically, coastal communities are protected from specific climate-related impacts such as storm surges because the widespread mangroves that surround them act as a buffer and provide protection against such events. However, the vulnerability of fishers is brought to the fore when they are out at sea. In other words, although where they live might be protected from certain climate-related impacts (to a degree), their livelihoods are not. Thus, when a member from a coastal fishing household leaves to Koh Kong town, their vulnerability to climate events such as floods and storms increases given the limited adaptive capacity of the city (Sa 2017).

While some view migration as a form of adaptation to shocks and stressors, particularly climate and environmental change (Black et al. 2011a, b), ultimately it is a choice (among many) made by individuals and households. These choices involve the migrant's agency (or lack thereof), the influence of others from their social circle, and trade-offs that emerge between their subjective well-being and the material well-being of their family.[9] Those in the village who can "get by" or who

[9]Agency here is defined as 'the capacity of an individual to act independently and to make one's own free choices' (Berkes and Ross 2013, 15).

are "well off" (e.g., have a house made of concrete on land, multiple businesses, etc.) have little incentive to leave the village. Coastal villagers turned migrants are, therefore, generally among the poorer group in the community and have fewer assets (e.g., house above the water, a boat, some gear, etc.). Paradoxically, this makes it easier—but riskier—for them to leave the village. The choice can be tough. Leaving fishing eliminates their risk of physical security from a livelihood at sea (Pollnac et al. 1995, 1998). It may also increase the material well-being of the household because of the stable income earned. For some fishers from the villages, these two aspects made it easy for them to leave the village and migrate.

As was seen in this study, migration often results from hardships (e.g., not being able to make a living as a fisher). At the same time, migration also provides opportunities for individuals to acquire knowledge, income/other resources, or create social networks (thereby building social capital), which can contribute to the material and relational well-being of migrants as well as their family in the village. However, other fishers prioritize their subjective well-being, and the importance of the village as their hometown or the autonomy and freedom fishing allows. The importance of this dimension for fishers has been well-documented elsewhere, and characterized by strong place attachment/identity (Larson et al. 2013 in Australia; White 2018 in UK) and associations of 'home' with the village environment (e.g., Brickell 2011 in Cambodia), alongside notions of job satisfaction and self-actualization (Pollnac and Poggie 2006 in Alaska; e.g., Pollnac et al. 2001 in Philippines, Indonesia, and Vietnam).

Secondary cities such as Koh Kong are wholly underprepared for climate-related hazards, as the drought in recent years has showcased. But they are actively responding by improving the capacity of their services, with the assistance of the private sector. In addition to the strain on the cities' services, particularly water provisioning, there is a lack of social protection services available, in general. Both factors increase the vulnerability of migrants from coastal villages. This is significant because many migrants are already vulnerable because they are typically poor and have few, if any, social safety nets. The experiences of the migrants I spoke with also indicate that having agency is a necessary but insufficient condition for improved well-being in urban areas. In a sense, what is needed is not a strengthening of the agency of individuals per se, since arguably, many migrants from coastal villages exercise a high degree of agency. Rather, what will be important is a focus on financing and supporting key social protection services and skills training to assist already-poor and vulnerable migrants in their transition from rural to urban areas. Responses such as these can ensure that their precarity and vulnerability are not exacerbated.

The case of the three Cambodian coastal villages also highlights the importance of looking not only at city planning, infrastructure challenges, and climate risks but also at the attendant *social* effects (i.e., impacts on social well-being) that phenomena like migration have on people who are increasingly on the move from rural, agrarian landscapes to the city (cf. Kelly 2011). The study shows the utility of taking a people-centred approach to urban resilience by incorporating a social well-being lens. Such a view can bring a socially differentiated understanding of vulnerability and risk

(along with its paradoxes) not just for Cambodia but for an increasingly urbanizing (and connected) Southeast Asia as well.

Small-scale coastal communities the world over are facing environmental change related to a myriad of areas including the global marine fisheries crisis (Branch et al. 2011; Pauly 1998), overfishing (FAO 2014), climate change (Brander 2007; Perry et al. 2010), and increasingly globalized supply chains (Delgado 2003). Migration is becoming the 'new normal' (Sørensen and Olwig 2003). Understanding how the thousands of coastal households across Southeast Asia[10] adapt to these challenges becomes of practical significance, especially as emerging secondary cities' key services and capacities to adapt are put to the test. Given the limited literature on the intersection of migration and social well-being and its predominant focus on the Global North (see Nowok et al. 2013; Stillman et al. 2015 which focus on the UK and New Zealand, respectively), this study provides a valuable contribution to understanding how various dimensions are affected by migration of people in Cambodia from the sea to the city.

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Chapter 9
Green for Whom? Exploring Ecotourism as a Climate-Adaptation Strategy in Trang An, Vietnam

Thao Hoang and Gwenn Pulliat

Abstract This chapter adopts a contextual vulnerability approach to examine the urbanizing Truong Yen commune in Trang An scenic landscape complex, a natural and cultural UNESCO World Heritage site in the Red River Delta of Vietnam. Trang An exemplifies the rise of ecotourism in Vietnam as a solution to the country's need for both economic growth and environmental protection, while responding to climate change adaptation and mitigation challenges. Located in an area undergoing peri-urbanization, Trang An contributes to the fostering of a 'greener' urban development pattern while providing local communities with less climate-sensitive livelihoods. However, new vulnerabilities emerge from this transition as a result of redefined power relations and differential access to resources. Our critical approach provides a more nuanced picture of a project that is often represented as a success story. While pitfalls are inevitable in such a transformational project, the lived experience of local residents reveals the complex, elusive, and inefficient governance between the various stakeholders on the management level and begs troubling questions about environmental and social justice.

Keywords Ecotourism · Environmental protection · Green development · Vulnerability · Environmental justice · Vietnam

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In the context of rapid urbanization, peri-urban areas are places of paradoxical processes. They absorb burgeoning development pressures in the inner city while also holding the potential for solutions. Green spaces in peri-urban areas, in particular, are a prized necessity and part of the potential answer to the myriad challenges that cities face, including climate change, pollution, and public health (Adams 2018; Ahmad 2016; Kabisch et al. 2016; Munien et al. 2016).

Ninh Binh City in the Red River Delta of Vietnam, discussed in Chapter 5 of this book, is an expanding secondary city with a bold vision to become a green tourism city as well as a Level 1 urban centre of Vietnam by 2050.[1] But there is a gap between vision and reality. The city's plan to develop a clean high-tech industrial zone contrasts with the current reality of Khanh Phu industrial zone. Our colleagues found evidence of devastating environmental damage as well as debilitating effects to the climate resilience and well-being in the adjacent community of Phu Hao village, including spreading sewage water from the industrial zone and heavy pollution of surface water (see Chapter 5). Just 15 km west of Phu Hao is the cultural and natural UNESCO World Heritage Site of Trang An scenic landscape complex, one of the most sought-after ecotourism destinations in the country in recent years.

Trang An is a key component of the city's 'greening' process. Through the expansion of the urban boundaries to encompass all of the World Heritage sites within its urban Master Plan for 2030, Vision 2050, Ninh Binh City is 'greening' in terms of its physical space as well as in its approach to green-growth and economic development. Ecotourism has been promoted to facilitate linkages between environmental protection, a crucial challenge in Vietnam (Ortmann 2017), and community livelihood (Stone and Nyaupane 2016). From a broader perspective, Trang An speaks to the country's increasing interest in and investment into the tourism sector, which is considered a green or 'smokeless' industry that can contribute to a less-polluting pattern of economic growth.

Many other Southeast Asian nations beyond Vietnam have articulated a common desire to boost tourism growth and to form regional ecotourism clusters (Tourism Ministers and Heads of Delegation of the Association of Southeast Asian Nations 2017). For example, the *New York Times* and *Lonely Planet* featured Koh Kong city in Cambodia as an emerging destination where ecotourists can explore the Cardamom mountains and coastline. Likewise, Dawei in Myanmar, with its essentially unspoiled beaches, has enormous ecotourism potential, but local attempts to develop ecotourism have been competing with a Special Economic Zone, including a petrochemical industry and deep seaport (Simpson et al. 2017). Mukdahan and Khon Kaen, in Thailand, have access to national parks. In Vietnam, Lao Cai has long been a hot spot of ecotourism and cultural tourism thanks to beautiful natural and cultural landscapes that are home to different ethnic minorities living in northwestern Vietnam. Because the potential exists for local and regional ecotourism development, the experience

[1] In Vietnam, cities are classified into several categories depending on their population, economic significance, and political role. They receive a different amount of financial support from the national authorities depending on their level. However, there is no strict threshold to shift from a level to another, and promotion to Level 1 is a governmental decision. Level 1 cities are major regional hubs (while Hanoi and Ho Chi Minh City have a 'special class' status).

of one city may provide lessons for others who may also go through the *greening* process by developing ecotourism.

On one side of Ninh Binh City, the industrial zone of Khanh Phu indicates an exacerbation of the negative impacts that human-led developments and climate change have on urban residents' poverty and vulnerability. On the other side of the city, Trang An provides a case study of how a previously climate-sensitive agriculture-dominated region renewed itself to embrace ecotourism and facilitate diversified livelihoods, economic growth, and environmental protection. These antithetical trends lead to our core question: to what extent does the ecotourism project contribute to a more environment-oriented urban development and to communities' adaptation to climate change? Within local communities, how evenly or equitably are the outcomes (whether positive or negative) shared? Trang An is certainly a green project, but green for whom?

Our research in Trang An adopts a solution-oriented analysis of climate resilience. Within the development of ecotourism, how have communities adapted and transformed to meet the challenges of climate change? The case of Trang An is an example of positive practice and perhaps a potential answer to the flipside of the question 'how will climate change impact the poverty and vulnerability of urban residents in Southeast Asia?' But our fieldwork also revealed lesser-known struggles that local residents face starting in 2003. On the one hand, the local community generally welcomes tourism development along with the additional income and opportunities derived from tourism activities. On the other hand, residents described drawbacks, compromises, and new vulnerabilities emerging from the transition as serious concerns. During fieldwork conducted in the summer of 2016, we heard stories about dormant subprojects and confusion over land compensation. We also heard about experiences of unequal negotiating power of former farmers who are now employees at the Trang An ecological site. These stories and insights do not necessarily negate the claim that Trang An is a successful community-based tourism model, but they point to challenges in creating resilient governance that is both inclusive and equitable.

9.1 Ecotourism, Local Communities, and the Environment: Some History

'Green tourism' and 'ecotourism' are buzzwords currently embraced by numerous cities and travel companies. The definition of ecotourism has greatly expanded in the past decade (Honey 2008). From a rather restricted practice where tourists were affiliated with conservation organizations and looking for very specific nature-based experiences (such as birdwatching) (Fennell 2014), ecotourism has now become a term that encompasses a wide range of activities 'in which the main motivation of the tourists is the observation and appreciation of nature as well as the traditional cultures prevailing in natural areas' (UNESCO 2003). Ecotourism projects aim to preserve

the natural heritage and sociocultural environment. They support their protection by providing economic benefits for local communities, alternative income opportunities, and increased awareness about the conservation of natural assets (UNESCO 2003).

While ecotourism has become a popular tool for biodiversity conservation (Kiss 2004), the increasing number of visitors puts great pressure on local resources and may drive environmental side effects, such as pollution (Koens et al. 2009), a potential outcome that is rarely acknowledged (Place 1995). There are debates around the efficiency of ecotourism as a conservation strategy, as opposed to a strict protection (Kiss 2004; Stem et al. 2003; Stronza and Gordillo 2008)—ecotourism projects try to meet various objectives that may be difficult to hold together.

Whether the Trang An ecotourism site contributes to the preservation of biodiversity and environmental quality is beyond the scope of our study. Instead, we look at the economic and social side of the project by adopting a contextual vulnerability approach (McLaughlin and Dietz 2008; O'Brien et al. 2007). We focus on how communities evolve and benefit from this pattern of development. Kiss (2004) stresses that even success stories provide only a modest supplement to local livelihoods. If the benefits are high, they are likely to attract outsiders and, therefore, dilute the benefit for local communities. People experience different access to ecotourism development's gains. Southgate (2006) reiterates how communities are not a homogeneous group but stratified. Both the participation of local residents and therefore the benefits may not be equitably shared among the so-called community. Scheyvens (1999) concludes that the equitable sharing of benefits emerging from ecotourism among local communities should be the main criterion to consider such enterprises as 'successful', while Neto (2003) advocates for a 'pro-poor' pattern of ecotourism.

In our study, we examine the social trends underpinning the change in land use and access to resources in Trang An. Our fieldwork allowed local communities to report their own perception of the project—a perspective that is often lacking in the literature. We paid close attention to the social stratification and power relationships that derive from the project in Trang An. Trang An is located in a peri-urban area, whereas most ecotourism projects are located in rural, if not remote, areas. While the location in an urban environment reduces the adverse effects of tourism development (because the infrastructures already exist, at least partly) (Higham and Lück 2002), it increases the dilemma between conservation objectives and peri-urbanization dynamics.

9.2 Trang An: An Ecotourism Complex Within an Expanding Secondary City

Highly touted as an 'outdoor ecological museum' or a 'Ha Long Bay on land', Trang An boasts one of the most impressive karst landscapes in Southeast Asia, and a rich biodiversity profile of 500 plant species, 73 bird species, 41 animal species, and 31 reptile species (Ninh Binh's Provincial People's Committee 2015b). A UNESCO World Heritage site, Trang An benefits from a strong preservation policy. It receives

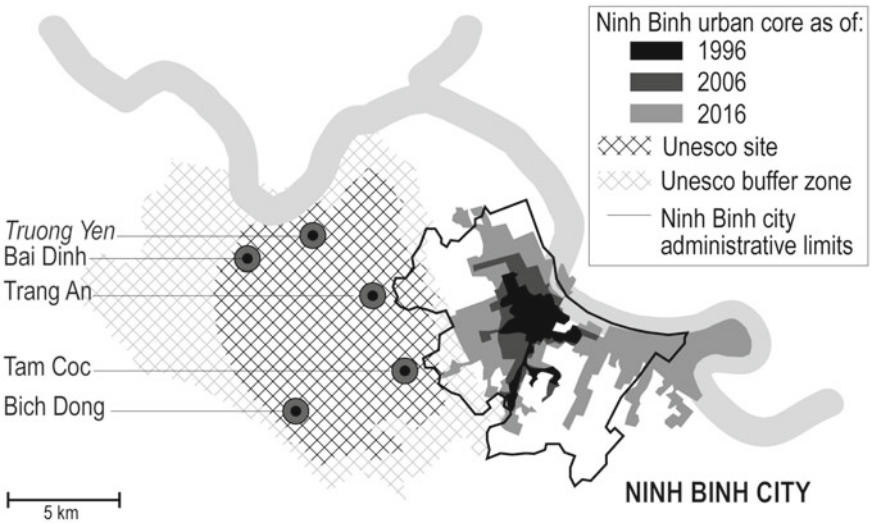

Fig. 9.1 Ninh Binh city and the ecotourism site (Map by G. Pulliat)

several million visitors each year (the Ninh Binh Department of Tourism reports that the province received 4.8 million tourists in the first half of 2017 alone) and is considered an example of best-practice community-based tourism (World Tourism Organization n.d.).

The property covers 6,226 ha with a buffer zone of 6,026 ha, and occupies a 250-million-year-old limestone massif. The Trang An scenic complex actually includes three major sites of attraction: the Trang An ecotourism site, Tam Coc-Bich Dong, and the record-breaking Bai Dinh Pagoda complex (see Fig. 9.1). It therefore combines ecological, spiritual, and community-based tourism. It is the only mixed (natural and cultural) UNESCO World Heritage site in Vietnam and the first of its kind in Southeast Asia. While the Tam Coc-Bich Dong site has been a tourist destination for decades, Trang An and Bai Dinh pagoda are new sites developed and constructed by Xuan Truong Construction Company under a public–private partnership with Ninh Binh Provincial Department of Culture and Tourism since 2003.

Although it is based on the preservation of a 'natural' site, the complex is actually settled in a peri-urban environment: only 12 km separate the urban core of Ninh Binh City and the Truong Yen commune where Trang An is located (Fig. 9.1). Ninh Binh is a secondary city. With a population of 160,000 inhabitants in 2014, it attracts people and economic investments from the Red River delta, but it remains a regional rather than a national hub (Fig. 9.2). Nonetheless, Ninh Binh benefits from its proximity to Hanoi and is expanding rapidly. About 100 km southeast of the capital city, the province is crossed by the main national highway and railway, and is located at the entry to the Red River delta, which is the second most important region of Vietnam after the Mekong Delta (Mottet and Roche 2009). Urban sprawl fuels a

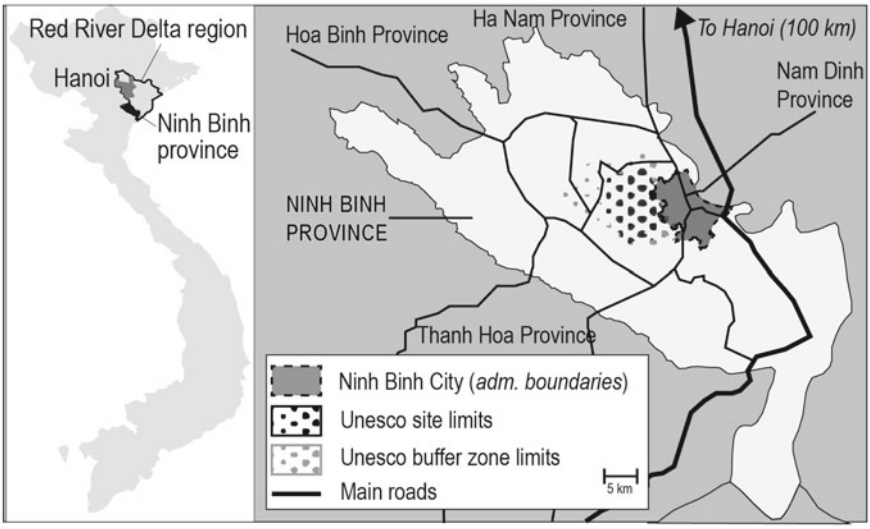

Fig. 9.2 Ninh Binh province: A regional hub in the Red River Delta (Map by G. Pulliat)

significant consumption of agricultural lands (Fig. 9.1) in the area and the national authorities intend to foster a much bigger city. According to the Master Plan for 2030, Vision 2050, by 2030 the Ninh Binh urban area is expected to be four times larger than its current size.[2] This is consistent with the national policy of urbanization and modernization as the government moves ahead with its aim of turning a poor agrarian society into an industrial, urban-based one (Vietnam Communist Party 2006).

Despite these plans for growth, the local government acknowledges the imperative of a more environmentally friendly path for urban development. At the national scale, national policy on climate change adaptation has become a high priority on the political agenda. The Vietnamese government has approved various strategic programs to frame the national climate policy, including the National Climate Change Strategy (NCCS) in 2011 and Vietnam National Green Growth Strategy (VGGS) in 2012. The NCCS also reflects the government's interest in searching for an alternative development model. Vietnam recognizes the unsustainable model of development the country has followed to this point, which includes exploiting natural resources, using cheap labour, and causing extensive environmental degradation. The National Climate Change Strategy (2011) states that 'climate change can bring about chances for us to change our thought of development and pursue a model and mode of low-carbon and sustainable development'.[3]

Urban planners have paid attention to greener urban models. To this end, Trang An is considered to be central to urban planning for Ninh Binh because it represents

[2]Decision no. 1266/QD-TTg, July 28, 2014.

[3]Republic of Vietnam, Government Portal, National Climate Change Strategy, http://chinhphu.vn/portal/page/portal/English/strategies/strategiesdetails?categoryId=30&articleId=10051283.

Table 9.1 Overview of interviews (*Source*: Thao Hoang, 2017)

Number of interviews	Interviewees' categories	Gender
1	A representative from Xuan Truong Company	Male
4	Commune and village officials	3 male, 1 female
4	Commune and village-level parastatal organization representatives (such as women's union)	3 female, 1 male
15	Local residents	10 female, 5 male

the plans' green core. The conservation of this green core together with the building of green belts and corridors are among the major guiding principles for urban development in Ninh Binh. Trang An plays an important role in various regional strategies and plans with respect to green urban development, economic development, and biodiversity conservation. But there is an increasing dilemma between the need for economic development and the urgency of environmental protection and climate change adaptation. These are the dynamics we examine in the case of Trang An Ecological Site.

9.3 Ecotourism as a Climate-Adaptation Strategy: Toward More Climate-Resilient Livelihoods

Our findings are based on 24 qualitative interviews (Table 9.1) with members of the local community in Truong Yen commune at the heart of Trang An ecological site. We interviewed residents from five villages across the commune. These interviews form the basis of a narrative about the changes in the area, with a specific focus on residents' livelihoods and their experience and perception of the spatial and economic change resulting from the ecotourism site's development.

9.3.1 Ecotourism as an Alternative Economic Development Path

The rise of ecotourism in Trang An comes with a conservation imperative that reconfigures the rights of access to local resources. The exploitation of natural resources is now much more controlled—an evolution that influences the economic landscape. The region has a long history of cement production, based on limestone quarrying across the province. This activity conflicts with the development of tourism. The UNESCO committee's impact assessment stressed the noise pollution, dust

production, contamination of waterways, and potential traffic disruption that this industry may induce (Ninh Binh's Provincial People's Committee 2015b). Limestone quarrying still occurs outside the buffer zone, but the licenses for mineral exploration that previously existed within the buffer zone have been restricted, and the government plans to close the quarries and relocate the cement factory. Planning for ecotourism has prompted the provincial people's committee to adapt its zoning to refuse building industrial projects to minimize the negative impact on tourism development (Duc 2012). These actions indicate that ecotourism has bred an alternative development model, whereas the previous economic trends were based on the exploitation of natural resources in the region.

With ecotourism and the designation of Trang An as a UNESCO World Heritage site, protection for the area is now a higher priority than development projects that could significantly harm the region's ecosystems (e.g., mineral extraction, industrial development). While our study does not assess conservation achievements, these shifts in economic trends suggest that Trang An has adopted a less-emissive pattern of development than what would likely have occurred without the designation. Compared to development that has occurred in other parts of Ninh Binh City, such as the Khanh Phu industrial zone already causing environmental devastation (see Chapter 5), Trang An is something of a model in terms of environmental protection and climate change adaptation and mitigation. At the city scale, ecotourism appears to contribute to the climate-adaptation and mitigation strategy.

9.3.2 Land Use and Livelihoods Transition

The designation of a UNESCO site has also brought about landscape transformation and land-use change in the area. Much of the Trang An ecotourism site, which now stands at the core of the natural World Heritage site, used to be paddy fields on land that was designated as agricultural land distributed to local residents. In Truong Yen, according to an official of the commune, 90% of agricultural land was turned into land used for tourism services. Along with land-use changes came other changes, including disturbances to irrigation systems for the remaining 10% of agricultural land.

These land-use changes have induced changes in livelihoods. As Trang An welcomes more tourists into the area, a variety of new jobs have become available for local people. With boating tours being the main attraction, around 2,600 boat rowers are now employed to take visitors along the scenic routes through the caves (Fig. 9.3). Other tourism-related activities have also developed rapidly within and around the area, such as guards, cleaners, construction workers, tour guides, souvenir sellers, and workers in restaurants and craft production. Ecotourism accelerated the transition from farming to tourism-related services.

Residents of Truong Yen commune traditionally relied on subsistence farming as their main source of income but the transition to more diversified livelihoods started before the development of ecotourism as a consequence of environmental

Fig. 9.3 Boat tours in Trang An (Photo by G. Pulliat, 2017)

and economic changes. Climate variability has always been an integral concern for farmers. Rice crops are particularly sensitive to any change in climate and ecological condition, so rice cultivation is considered to be highly vulnerable to climate change (Komaladara et al. 2015; Matthews et al. 1997). In Ninh Binh, reports have increasingly appeared in the news about farmers losing their entire crop as a result of flooding or pests (Bao Moi 2010; Thai 2017; Vy 2016). These incidents seem likely to be associated with the overall temperature increase in Ninh Binh (0.08°C in a decade), and residents' accounts of more extreme cold and hot days in recent years (Ninh Binh's Provincial People's Committee 2015a).

As earning a living through rice cultivation becomes more and more precarious, struggling farmers in both Ninh Binh and in other provinces turn to other livelihoods. In the Red River Delta, the combination of agricultural and nonagricultural livelihoods is widespread. As early as 2004, a study conducted by the World Bank revealed that while 78% of the Red River delta's households were engaged in agriculture, only 17% relied exclusively on agricultural income (Wells et al. 2005). In Truong Yen, a group of women we met with during fieldwork sewed blankets as an additional source of income. They said that if the sewing work was more regular and stable, they would consider abandoning their fields. While rice cultivation remains part of the households' livelihoods as an easily accessible source of income and food, it is often no longer the exclusive nor the main one. This is a long-term trend observed elsewhere in Vietnam and the rise of ecotourism has accelerated its pace.

9.3.3 A Transformational Adaptation

The Trang An ecotourism site and the larger Trang An complex megaproject can be considered a bold move toward *transformational* climate change adaptation. Following Brooks et al. (2011), we identify three broad categories of adaptation. The first category refers to *adaptation deficit to existing climate variability*. Adaptation processes and activities in this category help increase the capacity of communities and the systems on which they depend *to cope with and recover from* the effects of current climate variability. The second category concerns *adaptation to incremental changes* in climate-related risks and capacity of societies *to accommodate more frequent extremes and variability*.

While these first two categories are more concerned with developing *resistance* to climate and environmental changes, the third category involves adaptation to qualitative changes in climate and environmental transitions—converting or replacing current systems (economic, livelihood, etc.), to *create conditions for viable and more sustainable development* even at increasing risks of new climate variability and hazard manifestations. This third category of adaptation is, therefore, more transformative in nature.

Ecotourism in Trang An involves profound changes to the local communities and environment. Rather than developing resistance to risks in rice cultivation by strengthening dikes or adopting more climate-smart agricultural techniques, local communities in Trang An turn to tourism-related work to earn a living. Although boat tour operation is dependent on the appropriate water level and, therefore, is climate sensitive, the Trang An complex combines both ecotourism and spiritual tourism, which mitigates the potential adverse effects of climate on boat tours in the overall local economy. Hence, the new economic system that has emerged with the rise of ecotourism significantly increases the local community's capacity to cope with and adapt to climate risks. As such, the development of ecotourism fosters more climate-resilient livelihoods. Research in other countries has also explored ecotourism as a strategy for transformative climate adaptation. For example, both Kenya and the Philippines adopt ecotourism as a livelihood diversification strategy to become more resilient in the face of climate change (Pearsall 2017; Ogara et al. 2013).

9.4 Emerging Vulnerabilities: Old and New Inequalities

9.4.1 A Challenging Transition in a Peri-urbanizing Area

The transition in Trang An following tourism investment since 2003 is far from straightforward. While Trang An is commonly depicted as a successful, greener local development project and a model for community-based tourism by local and national authorities and international organizations such as the World Tourism Organization

and UNESCO, there is a discrepancy between the dreamy storyline of Trang An told in advertisements, and the realities of day-to-day living that the local community experiences. Informal conversations conducted during the field research with residents in Trang An revealed the lesser-known struggles and tensions in the community when local residents found themselves in the midst of changes in land use, livelihood, access to resources, and power. The relatively rapid transition from lowland rice cultivation to ecotourism-based services has socioeconomic costs.

Respondents from both the tourism-management side and local service providers in Truong Yen commune mentioned many challenges. From the tourism-management perspective, those challenges relate to urban transition and the gap between rural dwellers' habits and urban, 'modern' expected behaviours. The respondents mentioned the issue of a so-called 'farmers' mentality', which is said to be an obstacle to bringing professional tourism service to visitors and, therefore, to enhancing tourism quality. In other words, tourism managers in Trang An perceive a challenge associated with turning long-time farmers into workers in the tourism industry. This discourse around rural dwellers' lack of 'modernity' and their capacity to meet high standards of service is quite common among Vietnamese urban planners and speaks to the rhetoric of the Communist Party as well as to a social distinction process (Nguyen-Marshall et al. 2012). This is typical in peri-urban areas in Vietnam and China as a result of normative urbanization in both countries (Leaf 2011). The expansion of administrative structures into formerly rural settings encompasses an effort to '"civilize" the countryside' (Leaf 2011, 531).

Although the transition brings benefits and a new source of income for local communities, local people find that vulnerabilities have emerged in the form of skill gaps, tourism seasonality, and control of resources that complicate the transition from an agriculture-based local economy to a tourism-service-based economy.

9.4.2 The Side Effects of an Uncompleted Project

Large-scale projects, such as ecotourism development in Trang An, directly involve and change the lives of many people, especially those living in and around the ecotourism site. While the local community can be direct beneficiaries of these transformations, they can also be caught in tricky situations when projects remain unfinished or become dormant. This is the case of the Sao Khe River-dredging project. Fourteen kilometres in length, the Sao Khe flows along the citadels of the ancient capital Hoa Lu, and through the caves in the ecotourism site. It has been recognized as a national historical relic, and is also a major component of the Trang An project. Despite its key role, the Sao Khe River-dredging project has dragged on without an end date. Although it was planned to be completed in 2010, as of November 2017, the project remained dormant. It was reported that there were changes in the project investors and project planning with a major adjustment adopted in 2009 (Do 2016). However, even with the new plan, the project has yet to come to fruition. Its delay has consequences for both local residents and for the river's environmental conditions.

The lack of progress affects the flow and quality of water. One of the residents lamented that the beautiful and historically significant Sao Khe River of the past had now become a 'painful tragic scene', because of the stagnant dredging work and consequent blocking of the water. Residents questioned the way the project was proposed and carried out, but their requests through regular formal channels (commune and district meetings) have not led to any changes. Local residents' well-being continues to be more or less affected by localized flooding during rainy seasons, and by intensified water pollution from waste from mass animal husbandry and blocked water flow.

The project's delay has also caused resettlement issues. The entire length of Sao Khe River is supposed to be dredged, and new waterways are planned to extend ecotourism rowboat routes to Trang An culture park (under construction) located within the current boundary of Ninh Binh City. The plan involves the resettlement of 140 households on the Sao Khe River alone, and even more households will be affected by proposed waterways, bridges, and roads (Hoang 2009). Because of the delay, a number of households are left waiting to be resettled and compensated. The land assets inventory was conducted and recorded for all households involved in the project as early as 2007. Residents expected that compensation and resettlement would soon follow, but that was not the case. As of the summer of 2016, our interviewees still voiced concerns about how the unfinished project renders them unable to upgrade their houses, or borrow money to help with the family's economic situation, because their land and houses are not eligible as collateral. The ownership of land is a critical asset for access to formal loans so the suspension of secured access to land has much wider consequences on residents' livelihoods. The confusion around the project and the fate of their houses increases residents' uncertainty in their daily lives. They are thus relatively more vulnerable than residents outside the project zone.

9.4.3 A Case of Green Grabbing?

The transformation of Trang An from agricultural land to an ecotourism site involves not only a change of land use, but also a change of land ownership. In Truong Yen commune, 90% of agricultural land was seized for ecotourism development purposes. Based on a public–private partnership, the site is managed, protected, and promoted by Xuan Truong, a private enterprise that is now a key player in Ninh Binh Province. The company holds a 70-year lease to the Trang An–Tam Coc-Bich Dong Scenic Area. Both officials of Ninh Binh and members of the local community in Truong Yen commune commonly claim that the Xuan Truong company now owns all of Trang An. During an informal discussion, a local official said 'all this land now belongs to Xuan Truong'.

Agricultural land seizure for development purposes is very common in peri-urban areas across Vietnam and there are frequently contestations over the amount of compensation (Nguyen 2009; Nguyen Leroy 2015; Phuc et al. 2014). In Truong Yen, expropriated households received the equivalent of ten years' crop loss. The calcu-

lation was done in 2003 for crops lost over a ten-year period from 2003 to 2013.[4] Local residents in Trang An village reported that, back in 2003, local authorities told them that the compensation would be recalculated in 2013 at the time of the Land Law's revision, but no official documents made such promises. In 2013, the local community did not receive further compensation or get their land back (even the part of the land that was not touched by dredging or other work for ecotourism purposes). A resident explained: 'Most importantly, our land is wasted while the local residents don't have jobs. Tourism planning here is slow and problematic'. According to the 2003 Land Law, the right to land cultivated with annual crops expires after 20 years (Tran and Dinh 2014). With the revision of the Land Law in 2013, this right has been extended to 50 years, which aggravates residents' sense of loss over their agricultural land. A group of residents filed complaints, and even went to Hanoi to present the issue, but the issue remains unresolved.[5]

Is this case an illustration of land grabbing, or more precisely green grabbing—-land grabbing for environmental purposes (Fairhead et al. 2012; Holmes 2014)? Despite the local community's grievances, the local authority and the Xuan Truong Enterprise argue that they did exactly what was dictated by law at the time. However, the residents have expressed a great sense of loss because they were given the impression that further arrangements would occur in 2013, and because the value of farmlands extends beyond the market value of rice crops, which is the basis of compensation calculation. As Nguyen puts it, 'Value has innumerable interpretations, ranging from the emotional value of a piece of land a family has been tilling for generations to the value of long-term stability that a piece of land can provide' (in Hansen 2013, 13).

9.4.4 Toward New Power Relationships Between Local Stakeholders

The rearrangement of land ownership has deeply affected the power relationships between Xuan Truong Enterprise and residents. Locals have little leverage to negotiate with the new owner of the land, their new employer, the Xuan Truong Enterprise. An interviewee warned one of the authors that if she were to show up at Trang An boat station with a notebook and pen and introduce herself, many of the boat rowers, the majority of whom are women, would not dare to tell the truth about their working conditions and their situation for fear of getting fired. Employees of the company are unable to negotiate their employment terms.

[4]Residents received a total of VND 3.2 million (USD 153) for 360 m^2 for land that cultivates one crop per year, and VND 4.6 million (USD 220) for 360 m^2 for land that cultivates two crops per year. 360 m^2 is equivalent to one *sao*, the unit used for the redistribution of land after decollectivization in the late 1980s. As a general rule, each person received one *sao* of land in 1993.

[5]The provincial authorities are in charge of the expropriations, compensations, and conciliation in case of land conflicts.

Currently, boat rowers earn VND 150,000 (USD 6.6) per boat ride. They must wait for their turn and they get on the waiting list to row boats only by providing unpaid labour for various tasks on the tourism site (e.g., planting trees, cleaning, moving construction materials). Because many of these activities involve keeping the site clean and green, a representative from Xuan Truong Enterprise referred to these nonpaid tasks as a way of enhancing environmental awareness and protection. From the employees' perspective, however, the arrangement is unfair.

For each day of unpaid labour, a rower gets to provide two boat rides, but they have to wait for their turn according to the waiting list, which can take a long time, especially during the off-season (May–January). An informant reported on the shared sentiment of fear among employees if they voice complaints. S/he related an incident where an employee was fired because she demanded extra wages. Since most employees do not own farmland anymore, the rowboat job is often their main source of livelihood so they cannot afford to lose it and they have little bargaining power. The precarity of their situation has increased. Another resident shared: 'Before each family had about 3,600 m^2 of farmland. Now some have farmland, some don't. They don't dare to speak the truth'. The change in land use has deeply reshaped the power relationships in the area.

In the context of agricultural land conversion, alternative livelihoods are of utmost importance. However, government support, such as job training, is limited and often inefficient. In Truong Yen commune, training sessions for women to undertake blanket sewing were organized, but few participants found the training useful because there was not enough connection with and demand from the factories. While livelihoods derived from ecotourism are considered more climate resilient than rice production, they are not without climate vulnerabilities. Eco-tours in Trang An on *sampans* are dependent on the water level because the tour includes passage through nine caves. Whenever the waters are too high, or when there are weather events, tour activity is affected (Fig. 9.4). According to a member of the Xuan Truong Enterprise management team, an unusual amount of rain toward the end of 2015 caused significant disruption to tourism services at Trang An ecotourism site. The increasingly unpredictable weather as a result of climate change adds uncertainty around this livelihood.

There is a great risk that the local communities are not the main beneficiary of ecotourism (Kiss 2004; Neto 2003; Scheyvens 1999). In Trang An, there is a discrepancy between the sense of prosperity that tourism has brought to the community, and local residents' perception of increasing vulnerabilities. Those vulnerabilities relate to new uncertainty around the access to and management of resources (loss of farmlands, unclear resettlement plans, unclear management of waterways), and new uncertainty around their working conditions—several local residents now work for the managing company and are dependent on it, with little capacity to negotiate their terms of employment.

Fig. 9.4 Trang An Ecotourism Site: Service halted after tropical storm Mirinae in July 2016 (Photo by T. Hoang, 2016)

9.5 A Green Development for Whom?

While Trang An is not among the most hazard-prone or most exposed areas, the process of change in Trang An can provide an example for other peri-urban and urban centres to creatively utilize their natural strengths to self-transform and better adapt to the threats of climate change. Uncertainties and potentially devastating impacts that climate change could have on the poverty and vulnerability of residents call for proactive measures, perhaps with a transformation of socioeconomic and environmental landscapes, in addition to the reactive responses to cope with the damage once it has already occurred. In Trang An, ecotourism development can be considered a solution-oriented approach to climate adaptation, and simultaneously part of an urban greening process.

On the other hand, a closer look at the less-than-smooth transition in Trang An from an agriculture-based economy, where each household has access to farmland, to a tourism-based economy (with new power dynamics led by a powerful private company) reveals the challenges to creating climate-resilient urban governance that is both inclusive and equitable. The formal channels through which residents can raise their voices include commune and district meetings with representatives from the local communities, but the questions and opinions raised during these meetings about

the Sao Khe River (for instance) are often met with silence and inaction from the local government. 'It's discouraging', says a representative from one of the commune's parastatal organizations. It is unclear who has responsibility. Because Trang An is under the governance and management of multiple agents, local residents are blocked in their attempts to reach the elusive authority for concerns and issues—until a management process with identified players is defined, clarified, and publicized,

Our fieldwork observations also indicate that there is a lack of young people's voices and perspectives. If Trang An is going to preserve its natural and cultural heritage values, the local youth must be involved. It seems that investment (both by the state and Xuan Truong company) has been poured into creating boat tours and building a massive pagoda complex with the aim of maximizing tourism profits. But for those other key areas in Trang An where profit is in the backseat (such as conservation, environmental protection of nontourist areas, and environmental and cultural education about the site), no breakthrough has been observed. This is unfortunate because conservation and educational activities could harness the potential of the local youth. Job training should also target the youth for a longer-term vision for the community's well-being and ecotourism development in Trang An.

While some elements of the Trang An Complex, including the Sao Khe River-dredging project, remain unfinished, Xuan Truong has ambitions to expand its public–private partnership model and establish a chain of mega-ecological, spiritual, and historical tourism sites in Northern Vietnam, including projects in the provinces of Thai Nguyen, Ha Nam, and Hai Phong (Hoai 2016). This represents a new development pattern, advocating for the protection (and valorization) of natural resources. However, people have various concerns about this pattern of development. As one resident shared, 'We want our voices to be heard. When the country and its people still face much hardship, it doesn't matter the size of the statue … Like the Bai Dinh Pagoda, it could be medium-sized, and resources would be better spent on building and supporting local people's lives'.

Can Trang An be considered a model of sustainable development? In various case studies, evidence shows that ecotourism often causes the same problems as traditional tourism (Ly and Bauer 2014; McNall et al. 2016), including consuming similar resources and producing similar waste (Wall 1997). As the number of visitors in Trang An rises, one may wonder how (or whether) resource consumption, pressure on the local environment, and increased differentiation between the tourism-sector employees and the other workers will be addressed. There might be a significant gap between the theory of ecotourism and the subsequent environmental protection it should foster (Ly and Bauer 2014).

With respect to Trang An as a part of Ninh Binh's urban greening process, two questions emerge from the case study. First, Ninh Binh City's expansion to encompass all of Trang An, a UNESCO World Heritage site, within its urban boundary suggests that there will be rising competition for the use of land. In a more competitive context, what priority will be given to the protection of the site and the sustainability of the model? It is unclear how much funding from tourism service fees goes into conservation work and education—one of the core promises of ecotourism. In a

national context where conservation and environmental protection have always been a challenge, one has to question how these issues will be managed when urban development adds extra pressure on the use of local resources.

Second, if appropriately managed, the site is expected to be the green lungs of the city. As documented in the environmental justice literature, for various reasons the environmental policies often benefit wealthy areas and populations (Mitchell et al. 2015), rather than the deprived ones. Therefore, one also has to question whether the development of the site within the urban system will fuel an eviction of low-income rural populations whose land will be taken over by wealthier urban dwellers. Does this model result in yet another case of environmental injustice?

Finally, while ecotourism emphasizes environmental outcomes, it is based on the commodification of nature and natural resources (Heynen and Robbins 2005; Liverman 2004). We question (1) how green benefits are shared or not (i.e., a question of social and environmental justice), and (2) how "green" the project really is, given its imperative (we question the greening process itself). Our field research revealed a pattern of business-as-usual that puts economic profit above other concerns (including local communities' well-being). Environmental protection seems to be a new rationale for land grabbing (even if it is compliant with the land law).

9.6 The Green Band-Aids

Since the *Doi Moi* reforms were enacted in 1986, the Vietnamese party-state has incentivized industrialization and modernization, with the aim of turning a poor agrarian society into an industrial, urban-based one.[6] These changes come at the cost of substantial environmental destruction. Meanwhile, Vietnam is among the most vulnerable countries in the face of climate change. Hence, climate change has become a critical issue and the need for a more sustainable development pattern has become imperative. Ecotourism addresses several issues. In Ninh Binh, it provides substantial environmental protection, while offering more climate-resilient livelihoods to local communities. It also contributes to a greener urban development at the scale of the city.

Does ecotourism in Ninh Binh actually contribute to a more environment-oriented urban development and to communities' adaptation to climate change? This study suggests that it is the case, but that there are serious limits to this positive answer. The extent to which the urban and peri-urban environment will be protected, and greener urban planning will allow for climate change adaptation and mitigation will depend on the magnitude of negative side effects and outcomes of tourism development. The tours offered on the site, a major source of livelihoods for residents, are still climate sensitive.

[6]Doi Moi reforms are a set of open-door policies that marked the beginning of 'a market economy with socialist orientation' in Vietnam.

Our focus on residents' perception of the ongoing development project as a closer look into the transition process gives a more complicated and nuanced picture than the often-related success story. Despite its limited scope, this study shows how new vulnerabilities, as well as social and environmental justice issues, can emerge in a context of rearranged power relationships and (peri)urbanizing environments. This points to the lack of equity in the site's governance. Local communities are included in the implementation of the ecotourism project but they have little capacity to speak up and they seem to be bearing most of the cost of the transition, symbolized by increased uncertainty, while the Xuan Truong Construction Company appears to have the most powerful voice in overall decision-making.

Administrators should not draw solutions for greener cities and more climate-resilient urban planning as an opportunity for capital accumulation and land grabbing. Until matters of environmental and social justice are given the attention they deserve, and until the natural world is preserved for its own sake and not for the capital accumulation of a few, models such as Trang An can only be like green-growth band-aids. Undoubtedly, these green band-aids are needed. But at places where the voices of the more vulnerable are suppressed, the question remains: green for whom?

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Chapter 10
The Implementation Gap: Environmental Rhetoric Versus Reality in Lao Cai, Vietnam

Gwenn Pulliat

Abstract This study draws upon a case study of Lao Cai, a province recognized as one of the most important ecological regions in Vietnam, but also one of the most vulnerable to climate hazards. The province has recently adopted an action plan for climate change adaptation. However, the national authorities intend to promote Lao Cai as a major secondary city on the main route from China to Hanoi. In a context of rapid, strategic, state-driven urban development, I identify three main obstacles to effective implementation of environmental and climate change policies: (1) the pre-eminence of economic growth over any environmental goal, (2) the under-enforcement of existing regulations, and (3) a failure of environmental governance. Environmental risk management is mainly based on the reinforcement of defensive infrastructures (such as the river embankment) and the displacement of exposed people. These actions are likely inefficient in a context of increased major hazards that might put great pressure on displaced residents' livelihoods. In other words, there is a wide gap between discourse and implementation.

Keywords Climate change adaptation policies · Environmental governance · Land use management · Urban planning · Population displacement · Vietnam

10.1 Introduction

The Hanoi–Lao Cai railway is one of the most popular railways for carrying tourists from the capital city of Hanoi in Vietnam to the renowned station of Sapa as well as

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for transporting large amounts of merchandise from China to the Red River Delta. In October 2017, it was blocked by a landslide for several days (Nhan 2017). Just before that, 46 houses were flooded in Lao Cai city in September (Viet Nam News 2017a). In 2016, ten people died, swept away by a flood, during the rainy season (Viet Nam News 2016). These are only a few examples of the environmental disasters occurring every year in the region. Lao Cai province, located in the northern region of Vietnam, is the source of many news stories about weather-related events. Landslides, flash floods, major storms, and cold waves—with such events, the region is one of the most exposed to major hazards in the country.

At the same time, the northern highlands region of Vietnam is well known for its ecological wealth. The province of Lao Cai has long been singled out for particular attention for its efforts to protect its forests, unique landscapes, and ecosystems. The consequences of environmental and climate changes in these highlands are, therefore, critical and explain why Lao Cai province is a focal point of national environmental policies.

Lao Cai is located at the border with China. It is the main point of entry between the two countries, which has been reinforced by the construction of a highway between Hanoi and Hai Phong (the main port of the northern part of the country) and the Yunnan province in China. Hence, the Vietnamese government considers the development of the city as highly strategic. The pace of urbanization has been rapid there: studying the land-use changes in the northern half of the province, Trincsi et al. (2014) found that the built-up area in 2009 was six times larger than what it was in 1999 (shifting from 12.7 to 79.6 km^2, mainly along the Red River). In a context of rapid and strategic urban development, it is important to assess how well the environmental and climate adaptation policies in the region are actually being implemented.

The antagonism between the acknowledged need for environmental protection and climate adaptation on the one hand, and urban development, on the other hand, is unique neither to Lao Cai nor to Vietnam as a whole. In Southeast Asia, the deltas and coastal areas are considered to be the most vulnerable to climate change (Adger 1999; Birkmann et al. 2010; Yusuf and Francisco 2009), while also being the most densely populated regions. The dilemma is remarkably acute. As a consequence, the infrastructure of megacities located in those areas, which host several million residents and major political, economic, and cultural centres, are given priority. Most of the political and environmental action to mitigate the impacts of climate change tends to concentrate there.

But climate change also affects other regions. Secondary cities (also called medium or intermediate cities) (Roberts and Hohmann 2014), which include urban centres that play a local and regional role in the spatial organization of a country, often combine rapid urban growth with much lower levels of public and private investment than major cities. In Southeast Asia, secondary cities absorb a significant part of the national urban population growth, whether from rural–urban migrations or from natural growth. But they often grow unnoticed, gaining little attention from national authorities, planners, or scholars. They constitute a wide range of the so-called ‘ordinary cities’ (Amin and Graham 1997; Robinson 2006). In the field of environmental protection, these cities often face inefficient legislation and

governance (Adger 2001). As such, they may be more vulnerable than larger cities to climate change impacts in many ways: their demographic growth increases the number of people potentially at risk and rapid change in the uses of land may affect their exposure to hazards at the same time as they lack the capacity to implement adaptive policies. Consequently, growing secondary cities are of particular interest when looking at climate-resilience-building policies.

10.1.1 Goal and Methods

I explore how the national prioritization of climate change policies translates into action at the local scale. Has the political discourse around climate change and the emphasis put on environmental policies affected local urban planning practices and outcomes? To examine this core question, I conducted fieldwork in July 2017 in Lao Cai.[1] It consisted of two interconnected sets of interviews:

- 23 semi-structured interviews with officials from various bureaus working on urban planning, land-use management, and environmental issues at the levels of province, city, and local people's committees. Interviewees were identified to cover most of the bureaus involved in environmental and climate policies across scales (except for the national scale).
- 45 comprehensive interviews with residents in two wards of Lao Cai city. Conversations covered residents' livelihoods and daily experience of the change in their environment. The selection process combined random selection in the wards and targeted interviews based on recommendations from either households' representatives or previous interviewees.[2]

The two wards I included are both located at the fringe of the urban core and exposed to various hazards (landslides, floods in particular): Xuan Tang and Van Hoa (see Fig. 10.1).

While the first group of interviews was designed to shed light on the actual governance of climate change adaptation and environmental policies, the second group was meant to complement the information I gleaned from the public sector and provide a narrative of the changes occurring in the city and their impact on residents' daily life.

Many cities across Southeast Asia are familiar with the discrepancy between climate urgency and (more or less) large-scale urban planning. Special Economic

[1]This research was conducted during my postdoctoral fellowship at the University of Toronto and was funded by the Social Sciences and Humanities Research Council (SSHRC) through the Urban Climate Resilience on South East Asia (UCRSEA) partnership.

[2]In Vietnam, every ward is subdivided into several neighbourhoods and one resident from each of them is in charge of the inhabitants. They are the first person that people refer to because they help residents in various administrative tasks. As a result, they often have a very keen knowledge of their ward and its inhabitants and are, therefore, unavoidable gatekeepers and a valuable point of entry to the field.

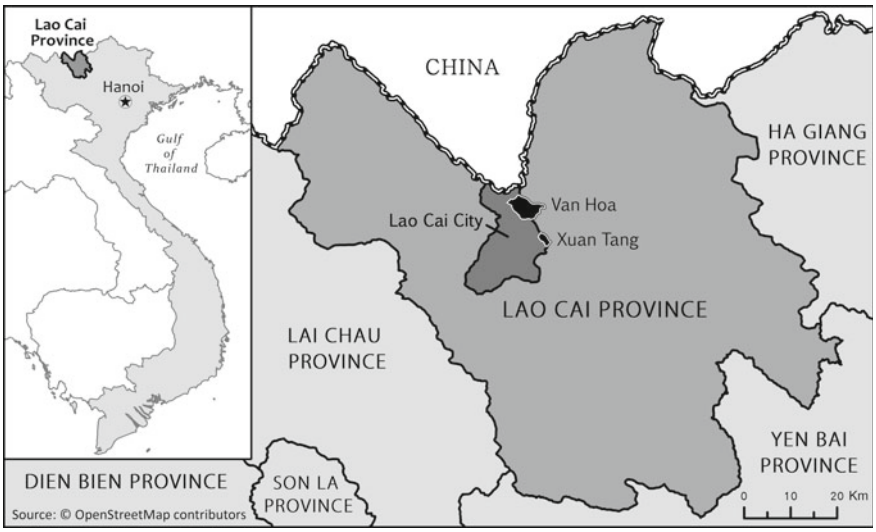

Fig. 10.1 Location of investigated wards (*Source:* OpenStreetMap contributor)

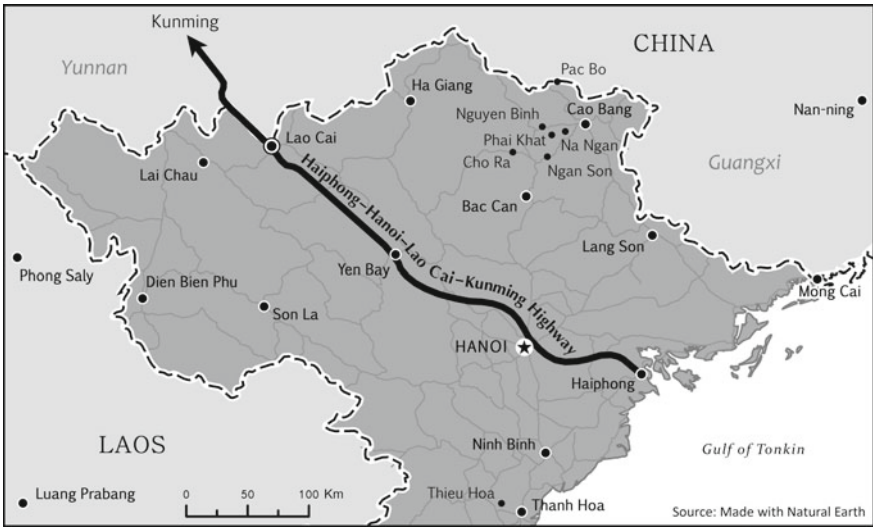

Fig. 10.2 Location map: Northern Vietnam. Lao Cai as a port of entry to China (Made with Natural Earth)

Zones are burgeoning even in areas that are prone to climate change impacts, such as in Dawei, Myanmar (Chapter 2). Many secondary cities experience intense urban development and struggle with their ability to respond to natural hazards, as the floods in Ninh Binh, Vietnam, illustrated (Chapter 5). Cities' high expectations for short-term economic growth often lead to nonsustainable solutions: the case of Cambodia

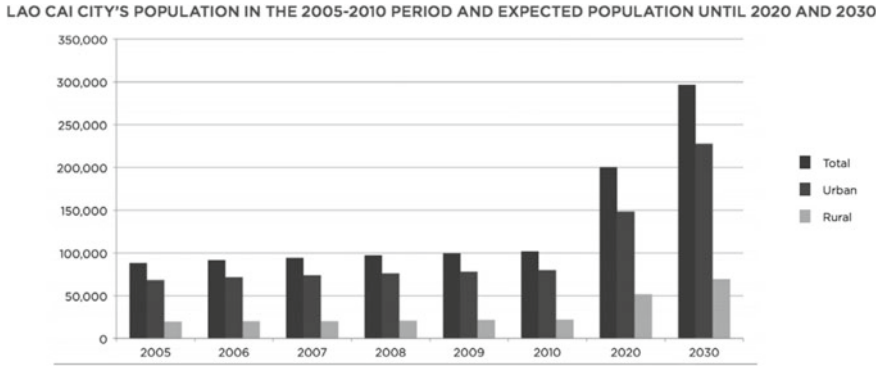

Fig. 10.3 Lao Cai city's population (*Source:* M-BRACE project, Climate action plan for Lao Cai city, ISET-Vietnam, 2014, 11)

(Asif et al. 2017) provides a powerful example of the disconnect between short-term goals and the long-term need for climate adaptation. Not unexpectedly, the situation of Lao Cai exhibits challenges that are found in many other contexts.

Focusing on how climate policies are implemented, I critically consider environmental governance within the developmental pattern that Vietnamese authorities have adopted. Because I highlight the changes in residents' livelihoods resulting from urban development and risks management, the study contributes to the analysis of the linkages between individuals' well-being and climate policies.

10.1.2 A Brief Overview of the Literature

Studies on climate policies in cities are abundant (see, for instance, Hunt and Watkiss 2011 for a review), as are assessments of policy implementation (a review can be found in Berrang-Ford et al. 2011). However, Ryan (2015) argues that these studies tend to be descriptive and fragmented. Climate policy implementation is often considered from a specific sector (e.g., the energy sector). By contrast, my research focuses on climate policies as a whole, and scrutinizes the process of implementation itself—that is, the translation of national goals and commitments into concrete actions. A few other authors have explored this translation process. Based on two case studies, Dupuis and Knoepfel (2013) argue that adaptation policies face an 'implementation deficit' because of the lack of effective actions conducted by state authorities. Other studies point to various factors related to observed deficits in implementation: lack of funding (Anguelovski and Carmin 2011; ICLEI 2017; Mol 2009), limited priority given to these policies (Chan et al. 1995; ICLEI 2017; Mitchell and Laycock. 2017), and the difficulty of integrating climate policies into sectoral policies (de Oliveira and Jose 2013). Drawing upon this literature, my research contributes to the body of knowledge on the implementation gap, while adding two distinguishing

perspectives—I specifically address the case of secondary cities—and interviews conducted at various scales draw attention to the nexus between environmental governance and its spatial expression, highlighting the social outcomes of the implementation gap. Drawing upon this literature, my research contributes to the body of knowledge on the implementation gap, while adding two distinguishing perspectives: I specifically address the case of secondary cities. And interviews conducted at various scales draw attention to the nexus between the governance of environmental policies and its spatial expression and, therefore, highlights the social outcomes of the implementation gap.

10.2 Lao Cai: The Great Expectations of a Growing Secondary City

Located in the northwestern region of Vietnam, the province of Lao Cai covers an area of 6,375 km^2 combining highlands and lower areas next to the Red River. The eponymous city is the main urban centre of the province, hosting 112,000 inhabitants on 228 km^2, according to the 2016 People's Committee statistical data. In Vietnam, the definition of 'city' is quite broad and includes both urban wards (*phuong*, 12 in Lao Cai) and rural communes (*xa*, 5 in Lao Cai), resulting in a relatively low average density of 491 people per square kilometre. Within its administrative boundaries, Lao Cai incorporates both the urban core and peri-urban areas where farmlands and forest still occupy large portions of the land.

Lao Cai city was promoted to "grade II" in 2014. Vietnamese cities are classified into four urban grades (plus a "special urban grade" for Hanoi and Ho Chi Minh City) depending on their size and socioeconomic characteristics. In theory, grade II cities have an urban population over 300,000 people, a high level of density in their urban core, and less than 20% of their population working in agriculture. To date, Lao Cai's demographic and economic characteristics (just over 100,000 inhabitants) technically meet grade III criteria rather than grade II. Because the prime minister recognizes which type of city gets categorized into grades II, I, and special class, the city's promotion clearly reveals the national government's willingness to further and quickly develop Lao Cai as a major urban centre.

An official at Lao Cai City People's Committee said, 'There are several big cities in the eastern part of the country, but in the western side, there are few of them. This is why the government intends to further develop Lao Cai: it is meant to become the main centre of the country, at the west of Hanoi' (Interview 19). This official also reported that the city is expected to become a grade I city by 2020. He explained that this political choice is driven by two main factors. First, the government desires a well-developed border city to face the Chinese province of Yunnan and the city of Kunming, which the official judged to be 'much more developed'. Second, the government wants to attract migrant workers from the surrounding areas to prevent

Fig. 10.4 The new administrative ward in Lao Cai city: An example of ostentatious urbanism symbolizing the state's ideology and aspirations (Photo by Gwenn Pulliat)

them from migrating to Hanoi or Hai Phong, and thus to promote a more balanced urban development at the national scale (Fig. 10.2).

The spatial expansion of Lao Cai city appears to respond primarily to a state-driven urban development pattern. This is quite unusual. As a result of rapid demographic and economic growth, the demand for land in most major Asian cities drives a process of densification in the already urbanized areas, along with sprawling urban development on the outskirts of the city, whether planned or unplanned. In contrast, in Lao Cai, the supply of new urban land seems to precede the demand. The expansion of the city is driven mostly by the development of public urban projects: new infrastructure (roads, a national bus station, new bridges, new border zone crossings, and so on) and, for example, the new administrative ward along a new main axis (Tran Hung Dao Street) (see Fig. 10.4). Lao Cai city has benefitted from major government investments as well as from private investors over the past decade. It has also adopted an ambitious master plan, emulating some of the principles of some major cities.

The population has grown from less than 100,000 in 2006, to 104,000 in 2011 and 112,000 in 2016. Between 2011 and 2016, the average growth rate of Lao Cai city reached 1.53% per year (see Table 10.1). However, compared to the urban growth rate at the national level, this rate is not particularly remarkable. While the national population growth rate reached 'only' around 1.08% per year over the same period, the growth rate of the national *urban* population hit 2.9% per year, almost twice as much as that of Lao Cai city.

Table 10.1 Demographic growth rate: City, province, and country

	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)	Average (2012–2016) (%)
Lao Cai city	1.97	1.69	1.16	1.24	1.61	1.53
Lao Cai province	1.49	1.45	1.42	1.40	1.45	1.44
Vietnam	1.08	1.07	1.08	1.08	1.07	1.08
Vietnam: urban population	2.00	2.10	4.00	3.40	3.00	2.90

Source: Data from the General Statistics Office and the Lao Cai city People's Committee annual report

The population growth seems to be lower than the rate of land conversion (Trincsi et al. 2014). However, the *expected* growth rate, as reported by the Climate Action Plan (see Fig. 10.3), is much higher. Again, this suggests that the urban development pattern in Lao Cai is proactive, rather than reactive: the government aspires to foster a major city, sooner than what the previous demographic growth trends would have produced. Lao Cai can be depicted as a secondary city benefitting from a voluntarist development policy emphasizing its urban core. It is expected to become a major bridging point between Hanoi and China.

10.3 The Environmental Protection Policies and the Bureaucracy: A Failed Governance

Lao Cai province has long been identified as an ecological region of major importance in Vietnam, in particular for its forests. After decades of deforestation caused by the lumber trade and agriculture expansion (among other factors) (Roche and De Koninck 2002), the government has started to implement a reforestation policy, supported by the REDD+program. Afforestation and improvement of the forests' quality are among the strategies identified in the National Strategy on Climate Change (Government of Vietnam 2011) to mitigate damage caused by natural disasters, preserve biodiversity, and absorb greenhouse gases (Saavedra and Budd 2009). Environmental protection and climate change adaptation policies have been a key component of land-use planning in Lao Cai province for at least two decades. More specifically, Lao Cai has adopted an Action Plan to Respond to Climate Change (Lao Cai core working group of M-BRACE project 2014), in collaboration with various international organizations. It envisions various actions to foster better adaptation to climate change, including raising government officials' awareness,

enhancing weather-forecasting capacity, improving drainage capacity to reduce floods, and upgrading the dike system.

However, the implementation of these policies lacks urgency. During my fieldwork, some officials insisted that the environmental protection policies are meant to be implemented in the rural parts of the province, beyond the city limits, rather than in Lao Cai city itself. Their claim does not meet the policies' goals. The city contains protected forests and has risk-management regulations, and the action plan itself is mainly focused on the city. The area of Lao Cai city also faces several environmental hazards that may affect even more people and infrastructure than in rural areas, considering the density of land occupation. Although the pressure on land use is obviously much stronger within the city limits than in the rest of the province, what happens in terms of environmental policies within these limits clearly illustrates the environmental governance of the whole province. I identified three major obstacles to an efficient implementation of environmental policies: competing for political goals and the pre-eminence of economic growth over any environmental goal; deficiency in effectively enforcing the existing regulations; and a failure of governance in environment-related action.

10.3.1 The Pre-eminence of Economic Growth and Economic Development

Lao Cai is the most important border city between Vietnam and China. Despite a long history of tensions and conflicts (Womack 2006), China is an essential economic partner of Vietnam, and these exchanges are reinforced by the agreements between China and the Association of Southeast Asian Nations (ASEAN) (Wong and Chan 2003). National authorities therefore consider it crucial to facilitate trade between the two countries. The opening of the highway between Hai Phong, Hanoi, and Lao Cai (and going further to Kunming, see Fig. 10.2) was a major milestone to this end. An interviewee from the department of urban planning at the Province People's Committee details the benefit of this location for the city:

> The location is strategic. Lots of products from the United States or from Africa, for instance, are temporarily imported to Lao Cai on their way from Hai Phong to China, and are subsequently exported to China. The use of the road instead of the railway is much more efficient, and it provides high income from customs duty to Lao Cai. (Interview 5)

The newly planned wards are characterized by large-scale urbanism. The new administrative ward along Tran Hung Dao street is an example of this particular form of development. It consists of a large avenue lined with huge hill-top buildings, broad public places, and monuments. Elsewhere, ongoing and future projects include massive buildings along the river, malls, wider roads, and even a 15,000 ha zone dedicated to logistics activities (across several districts in the province), an airport in Bao Hien, and a university campus, to name a few. This ostentatious urbanism, which symbolizes the state's ideology and aspirations (Moser 2010; Evers and Korff

2000), clearly aims to demonstrate the city's 'modernity' (Leaf 2011; Labbé 2016; Nguyen-Marshall et al. 2012). This modernity is understood to be planned, zoned, clean, and with no farmlands in the inner city, according to one of the representatives from a ward People's Committee. Because this type of urbanism is highly resource-consuming, it drives the remarkable pace of land consumption (Fig. 10.4).

The economic growth of the region seems more important than any other goal. A member of the City People's Committee noted: 'Here, priority is given to the economic development. For instance, the mining activities are supported to this effect, although they are not sustainable' (Interview 21). Mining is a powerful example of the economy trumping the environment. A significant part of Lao Cai's economy is based on mineral resources, and their extraction has proven to be particularly damaging for the forests. Mining also induces higher environmental risks (landslides, floods) (Lao Cai core working group of M-BRACE project 2014). But this economic goal is embedded in nation-wide socioeconomic development planning. A representative from the Department of Construction in the City People's Committee explained: 'It is a matter of balance in the economic development—among other things—because if we don't reinforce secondary cities, everyone will go to Hanoi or Hai Phong. The point of developing Lao Cai is for people to find jobs here, and to attract people from surrounding provinces' (Interview 19).

In this sense, the national urban planning policy aims to foster a national urban system where secondary cities like Lao Cai attract local and regional migrating populations and provide adequate services for regional residents in support of and to complement national major urban centres. Although environmental issues are taken into account in urban development policies, they are much less of a priority and should not affect the potential of economic growth. Central and local governments demonstrate a clear pro-growth orientation. Environmental protection, if it conflicts with economic interests, is subordinated to the economy. We see this sort of situation in other Asian cities and in China in particular (Lo and Leung 2000). The contradictions are more obvious when we examine how the environmental regulations are actually enforced.

10.3.2 The Under-enforcement of Existing Regulations

Lao Cai cannot be faulted for nonexistent environmental regulations: they do exist. Two-thirds of the forests within Lao Cai city (8,000 ha of 12,000 ha covered by forests) are protected. Legally, no conversion of land can occur, nor can mining or logging activities take place (those are permitted in the 'economic forest'). Theoretically, a governmental decree protects most of the rice fields in Lao Cai city to secure a local rice supply. All projects requiring an approval from the Province People's Committee have to go through an environmental impact assessment, and they must include a plan to compensate for the ensuing environmental damages, if any. These represent only a couple of examples of environmental directives that were cited by respondents during the field research. However, in practice, some regulations remain

to be applied at all. For instance, none of the respondents were able to identify the location of even one protected rice field.

The enforcement of the existing regulations is also flawed by the power relationships between decision-makers and applicants. Three interviewees specifically implicated the major companies in the construction sector, one of them detailing the case of the highly touristic township of Sapa:

> But there are different political interests behind all this. The big private companies have lots of influence, and money, and relationships with leaders, whether at the city level or the province level. (Interview 23)
>
> Sapa is a failure of Lao Cai. Nowadays, the natural landscapes are completely altered. Many investors come, and the chairmen of the local People's Committee are very happy to see them investing that widely in Sapa … In Sapa, some urbanism regulations have been developed in collaboration with Aquitaine (a French organization working on construction legislation), but they are not observed: for instance, high and large buildings are under construction, although they are supposed to be forbidden. The development of Sapa is a mess … The main building company has enough influence on political decisions to get their building permits no matter what. It is not good, it is not good for the development, but it is like that. (Interview 21)

When it comes to large-scale projects, the major companies are in an oligopolistic situation, and they have the (unofficial) ability to negotiate the projects' conditions of implementation and the regulations they will have to follow. These power relationships result in under-enforcement, or selective enforcement, of environmental laws. An interviewee in charge of the environmental impact assessment—a step regarded as a major tool to regulate the environmental cost of development projects—declared that it is rare for a project to be rejected because of its high impact. However, the interviewee makes sure that the plan of restoration is actually achieved, rather than set aside. To some extent, the environmental regulation happens ex post, more than ex ante.

10.3.3 The Failure of Environmental Policies' Governance

My interviews at almost all the levels of administration (the national level is missing in this study) revealed the complexity of decision-making, advocating, planning, implementing, and assessing the environmental policies. The role of each level is supposed to be formally determined, but in practice, a certain lack of clarity in responsibilities and duties prevails. As always in Vietnam, in theory, policy management is based on a straightforward top-down procedure: the decisions are made at the higher level and lower levels apply or enforce these decisions (see Fig. 10.5). In practice, one observes that it leads to a somewhat confused implementation and a dilution of responsibilities.

At the upper levels, officials (for example, from the Department of Natural Resources and the Environment, Department of Urban Planning, Department of

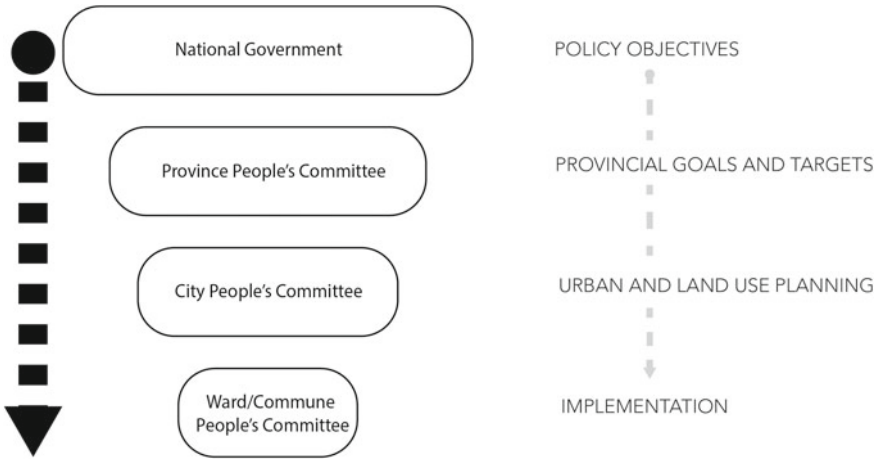

Fig. 10.5 A top-down governance

Construction) reminded me that they determine general objectives, provide guidance to lower levels, and assess the reports on activities, but the implementation of environmental policies itself is the local authorities' responsibility. However, at the local level, it is less clear which department of the People's Committee is in charge of implementing those policies because they do not necessarily have a specific bureau for the environment, and other departments are not always aware of the environmental policies. (For instance, at the local level, most of the respondents had never heard about the Action Plan for Climate Change Adaptation before.) In one of the target wards, a representative from the Bureau for Land Use declared that 'to date the local People's Committee does not have a civil servant attached to the environmental issues' (Interview 7).

Constrained by limited budgets and competing priorities, environmental monitoring and climate policy advocacy at the local scale remain scarce. The perception of environmental policies at the local level is narrower than that at the province scale, and typically more focused on local challenges than on the global ones. For instance, at the local level, the initial meaning of 'environmental policy' is linked to waste management and local pollution rather than policies involving climate change adaptation, risk management, or environmental protection (in a broader sense). Typically, as in Van Hoa, when asked to respond to the question 'What are the issues posed by climate change in this ward?' a respondent in charge of land-use management replied: 'So far I have not experienced a notable change in the climate. But anyway, there is not too much pollution here, it is not an issue in this ward. There is no industrial zone or such things, so we do not need any specific policy against pollution' (Interview 7).

At the city scale, another respondent reported that 'the city People's Committee really tries hard to protect the environment', and illustrated her point by continuing, 'the solid waste management is a good example' (the city has built a major waste management unit). This observation suggests that how officials perceive environmental challenges depends on their scope of action, and that there is a discrepancy between the national goals and the local actions in the field of environmental policies. It does not mean that they do not fit together, but that the relative priority might be different. This is reinforced by the difference in time scale: the impacts of climate change are considered long-term ones by local stakeholders, while local environmental challenges, such as waste management, are considered more urgent.

When asked about the environmental policies, local officials say that they execute decisions enacted at the upper level only and cannot make any other policy. At the city level, when discussing land-use planning and the protection of land in accordance with the Action Plan for Climate Change Adaptation, an interviewee from the office for agriculture claimed: 'Regarding urban planning, it cannot be changed [hence there is no way to apply the Action Plan recommendations] because it has already been decided' (Interview 18).

Several other people made similar statements. They mentioned the need to wait until the provincial planning or even the national environmental regulations are revised before implementing environmental policies further and incorporating those goals into other fields (such as land use and construction). At the province level, when investigating the outcomes and assessment of those policies (regarding land use, forest protection, and hazard prevention), the most common answer was 'There are reports from local People's Committees'. None of the people I spoke with were either able or willing to precisely assess the actual implementation of the provincial directions in the environmental field.

Various interviewees recognized the lack of *capacity* for implementation. Regarding the Action Plan for Climate Change Adaptation, for instance, an official from the Office for the Environmental Protection at the Province People's Committee explained that the ward and communes' People's Committees were in charge of its implementation, but that they were doing it 'according to their own possibilities'. He believes that the wards lack adequate financial resources to actually do what is expected in the plan, so they have to adjust their actions according to their means. Another official from the Department of Natural Resources and the Environment at the Province People's Committee recognizes that 'the Action Plan for Climate Change Adaptation has been adopted quite a long time ago already, but it is not clearly feasible to prevent climate change. I try my best to include the recommended actions into as many projects as possible to prevent climate change, but it is still rather limited' (Interview 13).

At some point, the extent to which environmental policies are actually implemented depends on the goodwill and the involvement of those at the helm. Increasing the involvement of local stakeholders in climate adaptation monitoring seems critical to effective implementation (Danielsen et al. 2010).

The gap between the declared goals in terms of climate adaptation and environmental protection on the one hand, and the actual implementation of such policies, on

the other hand, is substantial and often acknowledged by policymakers themselves. However, the bureaucracy fails to address the gap because of disconnected policies and competing goals where the short-term economic outcomes are given priority. Despite the broad awareness regarding specific issues, such as forest degradation, appreciation of the challenges posed by climate and environmental changes seems to be partial. As long as there is no significant pollution issue (as in industrial zones, for example), most policymakers and other officials consider those challenges as subordinate and/or out of their reach. This is consistent with Tong's observation in secondary cities in China (Tong 2007), where policymakers are reluctant to implement environmental policies if they might affect economic growth, until a higher pollution level is reached, influencing their policy preferences.

10.4 The Uses of Land: A Spatial Expression of the Gap Between Urbanization and Risk Management

What are the consequences on the ground of these failures in environmental governance? How do policies affect the use of land? To investigate the implementation of environmental policies in Lao Cai, I wanted to also shed light on the patterns of land use in the outskirts of the city and thus reveal the interplay between the various planning policies. In this respect, the commune of Van Hoa and the ward of Xuan Tang are quite similar: they are both experiencing a substantial shift in land use, their population is expected to rise, and they face diverse environmental hazards.

Located at the urban fringe of Lao Cai (Fig. 10.1), the two wards are undergoing a rapid urban transition. Major infrastructure works are under construction. The most important ones at the time of the study are the new set of local and provincial roads (Xuan Tang is located near the new Lao Cai bus station and the point of entry of the highway) and the river embankment system. These require massive consumption of land, specifically, farmlands. Of the 11 *thon* (the administrative neighbourhoods of a commune) in Van Hoa, ten are expected to be urbanized by 2020, and only one will still have space dedicated to farmlands. To date, farmlands remain in only five *thon*. Forests, which represent a significant part of the land use, are partly protected and considered to contribute to the "ecological quality" of the ward; meanwhile, farmlands are widely considered a land reserve for future urban sprawl. But in Xuan Tang, an official from the Office for the Land Use Management explained that the local People's Committee seizes farmlands *prior to* having a specific urban development project, to prepare a land reserve for future urbanization projects. Hence, the pace of change in land use from agricultural to urbanized land is high and expected to remain high. This observation is typical on the outskirts of growing secondary cities (Rimmer and Dick 2009; Schneider and Mertes 2014). However, in the specific case of Lao Cai, it begs a major question: in an environment well known for its exposure to various hazards, what are the impacts of these land-use changes in terms of risks?

The question of risk management is not missing in land-use planning. My interviews with officials in Lao Cai city and province suggest there are two main approaches to address risks: a technical one, emphasizing the development of infrastructure, such as dams and dikes to prevent floods and landslides; and a socio-spatial one, where people exposed to hazards (mostly flood and landslides) are encouraged to move away and relocate to less-exposed areas. The technical approach aims at influencing the magnitude of hazards when they occur, whereas the socio-spatial one focuses on decreasing people's exposure. Hence, the risk-management approach in Lao Cai aims at reducing people's vulnerability to hazards by taking action to improve their coping capacity and to reduce potential damages. However, the implementation of such risk management comes with questions. The first one relates to the interplay between the hazards and the urbanization process of the area; the second points to the consequences of vulnerability when residents relocate.

10.4.1 Incorporating Risks Consideration into Urban Planning: A Limited Achievement

While major infrastructures are under construction to mitigate the impact of hazards, such as an embankment system to prevent floods, the rest of the area's urban development does not seem to address local risks. For instance, an official from the department of construction at the province's People's Committee detailed how the construction of roads requires some digging on the mountains, which increases the risk of landslides. According to him, building tunnels would avoid the additional risk, but Lao Cai cannot afford this process.

Afforestation is a major environmental target of the province, but mining activities occur in economic forests and increase the risk of landslides. The representatives in charge of the department of construction explained that, while risk assessments are required prior to getting a building permit, local infrastructures do not differ from elsewhere and thus do not specifically address the higher risks, nor do they strengthen climate resilience in the long run. They mentioned the road system as an example. The new roads regularly flood during heavy rains. The infrastructures that are built specifically to mitigate the risk of flooding, such as the dikes, might induce higher risks in the future. The embankment project is clearly contributing to the urbanization of the river bank (Fig. 10.6), where the land used to be dedicated to agriculture (and is prone to erosion). The urbanized land's ability to absorb excess water is obviously lower than that of agricultural land. So while the level of the ground is higher, the risk of flooding in the future urbanized area in case of major floods still seems high. Additionally, Lao Cai authorities have limited control over the river: the main dams upstream are controlled by China, so the regulation of the water flows somewhat depends on the geopolitical situation between the two countries. Overall, the construction of infrastructures and the urban development of Lao Cai may have unclear effects on the risk that the city faces.

Fig. 10.6 Urbanizing the Red River Banks (Photo by Gwenn Pulliat)

10.4.2 Reducing Vulnerability by Relocating Dwellers: At What Cost?

In such a risky environment, the risk-management policy primarily addresses the consequences of hazards, with funding for and support to victims. But this policy is also proactive—planners expect to relocate the residents living in the most exposed areas, such as on the hills prone to landslides and the river bank with no embankment system. An interviewee explained that these residents are encouraged to move and may receive financial support to build a house in a relocation ward. For instance, in Xuan Tang, most of the residents, who were scattered across the ward, are being relocated into the 'new ward', both to prepare a land fund for urbanization and to reduce their exposure to floods and landslides. The relocation ward is located further from the river and some surfacing works were completed around the area to reduce the risk of landslide. However, this relocation and land-seizure process also results in a transition of livelihoods. Those residents who get financial compensation and can relocate to the new ward lose their farmlands and, therefore, one of their sources of income. This is a major issue in Lao Cai, as well as in the outskirts of most of the expanding cities in Vietnam (Labbé and Musil 2014; Phuc et al. 2014).

The state has the ability to expropriate people, in particular, their farmlands, and uses this ability to reshape the uses of land (Hansen 2013; Labbé 2016). Provincial authorities decide on the level of compensation, depending on the kind of land, production, location, duration of ownership, and so on. In Lao Cai, both residents

and officials at the ward and city levels felt that compensation amounts are too low, and some mentioned values from other provinces where the compensations ended up being higher. Although the two investigated wards have not seen any major protest or mobilization, this situation fuels the feeling that local residents are the losers from the urban transition (the winners are the investors who take part in the new urban development projects).[3]

The main issue that the wards were facing is this urban shift and they continue to face these continued expropriation patterns. Farmers in the outskirts of the city, settled on plots of land exposed to various hazards, were identified as among the most vulnerable groups to climate change in Lao Cai (Lao Cai core working group of M-BRACE project 2014). Officials hope that their relocation will result in a decreased vulnerability to climate change and environmental hazards. However, finding a new secure source of income is reported to be difficult. Most of the interviewees (either residents or officials) consider the vocational training offered by the People's Committee to be ineffective. Again, this is typical across Vietnam. Expropriated farmers must rely on their own network to develop a new economic activity, often in services (such as preparing meals for ceremonies in Xuan Tang) or industry. Several elderly residents did not convert to a new job and continue to farm on very limited plots of land where they have been relocated (e.g., in the garden of their new house). The interviewed residents often considered those new livelihoods to be more insecure than farming because they are often short-term activities, they may require owning a motorcycle, and the income is sometimes unstable.

The changes in the uses of space seem to increase the level of uncertainty: uncertainty regarding the occurrence of hazards, their magnitude and location, and uncertainty regarding the socioeconomic environment and the available resources. The changes in land uses reshape the vulnerability map and patterns experienced by residents of Lao Cai.

10.4.3 Managing Environmental Risks in an Authoritarian Context

While further explorations are necessary to quantitatively assess the impact of displacements on residents' livelihoods, as well as the potential costs of hazards occurring across the city, this chapter highlights some challenges that are often purposely disregarded by upper-level officials. Interviewed residents mentioned the public meetings that are held by local authorities to provide information about future planning projects, but they also stressed that their concerns were barely heard. Most respondents declared that they had limited capacity to affect what public authorities had decided, so they have to cope and adjust. When I reported residents' concerns about their livelihoods and access to land during interviews with officials at the

[3]This perception of rising inequalities caused by development projects is similar to what was observed in Ninh Binh in Chapter 5 of this book.

city and provincial scales, I was answered twice with a firm and optimistic 'they will adapt'. This answer is another reminder of the authoritarian nature of the Vietnamese state. Among planning tools, the displacement of people is an option that is relatively easy to use since the contestation against political decisions is weak and institutionalized civil society is limited (Kerkvliet 2003; Thayer 2009).

In response to the clear need to reduce vulnerability to current and expected hazards, national and local authorities have developed both incentives and coercive legal tools to reorganize the occupation of land within planned zones,[4] and they used them extensively. But these practices raise concerns about the social outcome of such policies. During the interviews, several respondents from the People's Committees mentioned that many groups from ethnic minorities, who are typically marginalized (Turner 2012a, b), were particularly vulnerable to hazards because of their location, and that they were incentivized to move. For those groups, as well as for the farmers I described earlier, the displacement comes with a shift in livelihoods which is neither easy (since they typically have limited resources) nor desired. Is it fair to make them carry the cost of adaptation? While relocation reduces the exposure in the short term to current hazards, the outcome is less clear when it comes to future hazards. As a result of climate change, the magnitude and frequency of future hazards are expected to be higher, and the potential damages may be much more severe since they will occur in more urbanized and more densely populated areas. Does this relocation policy reduce vulnerability or increase overall uncertainty?

10.5 The Implementation Gap: A Case for Future Activism?

Over the past decade, Vietnam has started to develop a significant body of policies and regulations to tackle climate change. However, beyond its noble intentions, the implementation process and its results on the ground reveal a contrasting reality. Despite its substantial power based on a proven top-down policymaking process, the Vietnamese state faces significant flaws in its environmental governance that result in a national-to-local disconnect. This disconnect is not rooted in a lack of knowledge or awareness. Mitchell and Laycock (2017) have observed in the Philippines that the need for climate adaptation is actually widely acknowledged among policymakers, practitioners, and residents but competing urban development priorities result in a failure to prioritize climate change adaptation. Similar to every environmental issue in Vietnam and to biodiversity loss in particular (Ortmann 2017), we see a striking awareness-to-practice disconnect.

Secondary cities have contradictory goals. They want to preserve their environment and promote climate-resilient urban planning, but they also have to absorb a significant part of the demographic growth to prevent further sprawl in megacities,

[4]Population resettlements are not new: resettlement programs have been broadly used by the Communist Party both at national and local scales since its accession to power (Jones and Fraser 1982).

with limited financial and technical capacities. In Vietnam, the authoritarian, centralized political organization limits local stakeholders' capacity to adopt local regulations and, therefore, further delays the implementation of national guidelines (Urwin and Jordan 2008).

My core question in this chapter is whether the political rhetoric around climate change and the emphasis on environmental policies have an impact on local urban planning. The answer bends toward the negative. While the emphasis on risk management is noticeable in planning practices, climate adaptation and environmental protection policies are far from being implemented effectively. There is an implementation gap that results in a chasm between a pro-climate adaptation discourse and the actual planning that seems to follow the 'business as usual' pattern. The options that local bureaucrats can choose, including people's displacement, put significant pressure on local residents' livelihoods while having ambiguous outcomes on long-term climate vulnerability. Are risk-management policies actually a rationale to increase the control over the population and force the transition toward a desired urban, so-called modern society?

In a country facing recurrent major environmental crises, where the cost of 'natural' disasters has rapidly increased to reach an estimated 60 trillion VND in 2017 (USD2.6 billion) and where 386 people were reported dead and missing from such events in the same year (Viet Nam News 2017b), the question of environmental policies' implementation is crucial. While the institutional channel gives limited voice to the general public and civil society, rising public concern about pollution and environmental destruction, as well as the growing contestation against expropriations, might be the seeds of change. Large protests around environmental issues have started to occur, for instance in 2016 after toxic industrial discharge resulted in tons of dead fish along Vietnam's central coastline (Hutt 2017). At least, for now, the environment has become a sensitive political topic.

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Chapter 11
Towards an Agenda for Profound Urban Climate Resilience in Southeast Asia

Matthias Garschagen and Danny Marks

Abstract The research findings presented in this volume demonstrate that any meaningful engagement with resilience building in Southeast Asia's small and mid-sized cities needs to start from a vulnerability perspective if it is to bring about sustainable and equitable risk reduction. Urbanization and other socio economic as well as political transitions in the region have in many instances aggravated rather than mitigated the exposure and susceptibility of residents in these cities to disasters and climate-related shocks. In order to overcome these vulnerability effects, four governance issues need to be addressed. First, the findings show that unequal power relations and perverse incentive structures often shape development and risk-reduction decisions in ways that allocate benefits to elites and emerging middle classes while disproportionately allocating ecological and social costs to the urban poor and marginalized, such as through evictions. Second, local governments often have limited accountability to reduce climate risks of their economically and politically marginalized constituents. Third, incomplete decentralization has resulted in national governments giving the responsibility for climate risk reduction to local governments, but often without sufficient resources. Fourth, the inherent tension in planning policies and politics between the short-term pressures for development and growth, especially in second-tier cities, and the long-term requirements for disaster risk reduction and climate change adaptation has weakened the implementation of climate risks policies. Therefore, we conclude with a call for future research on urban climate resilience to address these governance challenges.

Keywords Urban risk · Southeast Asia · Resilience · Political economy Research agenda

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The contributors in this book analyze the multiple relationships among climate change risks, development endeavours, and vulnerability dynamics in Southeast Asia's small- and mid-sized cities, which have so far been mostly neglected by both researchers and policymakers. Building on rich empirical analysis and theoretical considerations, the authors examine the enablers of and barriers to resilience building in these cities and the intricate ways that agency, inclusiveness, and equity are negotiated in the cities' risk governance.

The evidence presented in the chapters shows that despite the recent conceptual hype around resilience—and the positive convening power the concept holds—a meaningful and sustainable engagement with long-term risk reduction needs to start from a vulnerability perspective. The thick descriptions from the highly diverse case study contexts all report that the current socio economic development and growth processes in Southeast Asia's cities have not led to an automatic reduction of vulnerability across disparate social groups. The empirical observations instead suggest that the opposite is true. The ongoing political, social, and economic transitions in urbanizing Southeast Asia have often aggravated socio economic disparities and vulnerabilities. Recent shifts in the political economy have even been found to generate new forms of vulnerability. For example, after orchestrating a coup in Thailand in 2014, the military junta sought to gain legitimacy by rapidly building or expanding the country's infrastructure, including high-speed trains throughout the country. However, to clear room for these trains, the new government had to evict a number of low-income urban residents, including in secondary cities such as Khon Kaen (Chapter 3).

The rich empirical accounts presented in this book, therefore, support a note of caution that has been emerging in the literature recently. That is, despite the appeal of forward-looking and positively connoted concepts of resilience and adaptation, scholars and policymakers need to keep attention on understanding and challenging the multifold ways in which urbanization and other social, economic, and institutional transitions propel the drivers of deep vulnerability (Ribot 2011). The scientific findings presented in this book carry a deep implication for action. In brief, without a sufficient focus by policymakers and risk practitioners on these deeper drivers of vulnerability, any efforts to build effective resilience will be doomed to fail because they mask the effects of vulnerability, rather than counteracting the drivers that keep on reproducing vulnerability.

This volume's authors also reveal the relational nature of vulnerability into which power relations are interwoven and which most concepts of resilience do not emphasize (Friend and Moench 2013). Many of the case studies show that the costs and benefits of urbanization and modernization endeavours in small and mid-sized Southeast Asian cities are more often than not distributed unequally across space and class. Power as it influences decision-making, for example, regarding the placement of protective infrastructure, is a key determinant to explain these differences. While development projects are often designed to favour elites and emerging middle classes, the ecological and social costs—often in the form of unintended yet tolerated side effects—are borne overproportionally by poor, vulnerable, and marginalized groups. In particular, evictions to clear space so that industrial, ecotourism, and

transportation projects can be built mostly benefit the middle class and elite while further marginalizing the poor.

For example, in Ninh Binh, Vietnam, Khanh Phu commune lost 300 ha of its best agricultural land for the establishment of Khanh Phu Industrial Zone. The industrial zone has also made flooding worse, which causes agriculture production and thereby incomes to decline (Chapter 5). In a nearby commune in Tran An, 90% of its agricultural land was seized for ecotourism development purposes (Chapter 9). A few 100 km north, in Lao Cai, rice farmers' land has been seized to make way for large-scale projects, while the original farmers have been given inadequate compensation (Chapter 10). In Battambang, Cambodia, the municipal government has sold fake land receipts to military families, resulting in the evictions of the land's current tenants (Chapter 7). Put simply, as Thuon and Cai write, 'the development for elites is to kick out the poor' (Chapter 7).

This also means that, as Taylor argues (2013), the resilience of some groups is often achieved by reducing the resilience of others. This essay collection shows how the elite have benefitted from the labour of marginalized groups who, because of limited power to negotiate terms of labour, are forced to work in precarious, low-paying jobs that limit their capacity to face climate shocks. In Khon Kaen, Thailand, residents of low-income communities are paid minimum wage or less which 'is barely enough for an individual to live a humble life let alone supporting a family' (Thai PBS 2017, n.p.). Consequently, they struggled to cope with droughts in 2015 and 2016 whereas the middle and upper classes hardly suffered (Chapter 3). In Phuket, landlords shut off the water supply of Myanmar migrants three or four days per week because the landlords want to save money on water bills, even though the migrants pay them a fee for their water supply (Chapter 4). In Trang An, after many residents' farmland was seized for ecotourist development, rowing boats for tourists became these residents' main source of livelihood. Because they cannot afford to lose this job they have little bargaining power (Chapter 9). The findings suggest that climate-related disasters have the potential to act as amplifiers of these vulnerabilities and decrease the overall livelihood situation even further.

Not surprisingly then, the book also reveals the limited accountability local government leaders often have to their constituents. In some cases, this is because the poor are deemed unimportant voters. For example, the mayor of Muang Gao, a peri-urban municipality bordering Khon Kaen, has not provided water pipes to low-income residents because those who voted for him are mainly factory workers and shopping centre employees (Chapter 3). In other cases, local people have limited means to affect decision-making processes. In Trang An, residents have voiced their discontent about development plans during meetings with commune and district representatives but the questions and opinions they raise in these meetings are often met with silence and inaction from local government officials (Chapter 9). Without elections, residents have limited other channels to affect decisions. In Phuket, partially as a result of social discrimination, Thais rarely engage with migrants in social activism or seek to build their capacity for important matters such as disaster risk management, environmental management or public health (Chapter 5). Similar to Trang An residents, Myanmar migrants cannot vote and they have little power. Overall, these

unaccountable political systems further aggravate the vulnerability of marginalized residents, such as the urban poor and migrants.

The chapters' authors also show how incomplete decentralization has brought about challenges for urban resilience in secondary cities. A number of contributors report how local government agencies have been given limited budgets and unclear mandates from national governments to enact measures that could build urban climate resilience. There are also conflicts about which agencies should be involved in disaster risk reduction, water management, and other measures that affect adaptive capacity to climate risks. They reveal that incomplete decentralization caused by the retention of power and resources by central bureaucrats, alongside persistent ministerial and sectoral fragmentation, have undermined resilience and distributed climate risks unevenly (also see Marks and Lebel 2016). One reason that urban slum communities in smaller cities in Thailand lack access to water is that municipalities lack sufficient budgets to pay for water pipes (Chapter 3). In Bago, Myanmar, where heavy flooding arose in 2015, local and national government officials disagreed about which levels of government should take primary responsibility for flood risk reduction (Chapter 7). In Vietnam, because the UNESCO World Heritage Site Trang An is governed by multiple government agencies, local residents have had difficulties identifying which agency they should air their grievances to on the management of the Sao Khe River that runs through Trang An (Chapter 9). Similarly, in Lao Cai, environmental monitoring and climate policy advocacy at the local level remain scarce because of constrained budgets and competing priorities (Chapter 10).

Overall, the book's authors agree that centralized systems of climate governance, which largely exist in the four countries covered by the case studies (Myanmar, Thailand, Vietnam, and Cambodia), are not necessarily the best means to improve resilience in secondary cities because of the low level of accountability and the potential for unfair distributions of risk-reduction costs and benefits. Instead, a more devolved, participatory and cross-level decision-making system is needed. A number of scholars argue that the most effective and fairest form of climate governance is polycentric or decentralized with strong emphasis on coordination between different elements (Pahl-Wostl et al. 2012). More polycentric governance arrangements would help overcome existing fragmentation and capacity problems. Combined with concurrent democratization, which would improve accountability, such structures would likely distribute climate risks and burdens more fairly and be able to respond to changing risks more effectively at multiple levels and scales.

The book also explores the inherent tension that municipalities of secondary cities face between development pressures and precautionary climate resilience building. Seeking to prevent further sprawl in their countries' megacities, national leaders are pushing municipalities to create jobs and absorb population growth in their cities, including from rural migrants. This means that they must rapidly expand industries, residences, tourism attractions, and services in the cities. However, at the same time, they are told to enact climate-resilient urban planning which would include preserving green space and forests, retreating from certain coastal areas, and giving more space for water in their cities. Aggravating this challenge, there is a time scale difference between these two priorities: the first one (growth and development) is considered

more urgent whereas the second (climate sensitivity) is seen as more long term. When they have to make trade-offs, municipalities often choose short-term growth at all costs. As Pulliat asserts based on her fine-grained analysis of urban growth in Lao Cai (Chapter 10), an 'implementation gap' arises. Changing incentive structures for municipalities would be necessary to overcome this gap.

As we look into the future, the research presented in this book links to emerging debates around transformation, that is, fundamental systemic shifts in the process of adaptation and risk reduction (Solecki et al. 2017). The thick descriptions of the case studies provide important entry points into real-world observations on whether and when transformative change is needed to secure long-term resilience, how it can be achieved, and where barriers might occur. Most importantly—and spanning across very diverse contexts—most of the arguments made by the chapters' authors come to stress that changes in institutions and power relations must occur before other dimensions of transformative change can be accomplished, for example, in the built environment or social security systems. In this context, all the authors emphasize the importance for a shift in climate adaptation debates away from technocratic adaptation based on expert knowledge, towards integrative adaptation governance that involves the voices of all stakeholders, especially the most affected and vulnerable members of society in Southeast Asia's small and mid-sized cities. The involvement of these people's voices will be essential in the evaluation of resilience-building options and the scoping of transformative solutions for risk reduction.

Therefore, the findings presented in this book share a strong emphasis on the need for future climate resilience research to include the analysis of governance structures and power relations—and most importantly to not just assess the current shortcomings in these structures but to examine and suggest alternative ways to reform them so that they become more equitable and accountable. The fact that this book has convened young authors from Southeast Asia who will contribute to the next generation of risk scientists, resilience practitioners, and decision-makers, provides a hopeful outlook for such considerations to be taken up.

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