WHEN THE LAKES ARE GONE: THE POLITICAL ECOLOGY OF URBAN RESILIENCE IN PHNOM PENH

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Abstract

This dissertation examines how simultaneous social-ecological transformations including environmental change, climate uncertainty and urbanization affect low income residents in Phnom Penh, Cambodia. Low income residents often reside in informal settlements which themselves inhabit marginal spaces in the city including roof tops, riverbanks, and land on the urban periphery. In Phnom Penh, many communities in the peri-urban zone depend on agriculture for their livelihood. Yet, this way of life is being compromised by changes to weather patterns, water quality and most pressingly urban expansion, as the wetlands they use to farm are being filled with sand to create new land on which to build luxury condos and expansive shopping malls.

This thesis focuses on how low income residents, in particular urban farmers on the outskirts of Phnom Penh, live with and influence the ongoing social-ecological transformations that are shaping the city. I employ a mixed qualitative and quantitative methodology, including interviews, focus groups and a household survey to examine how patterns of urbanization in the past 25 years have created situations of both social and ecological marginalization in Phnom Penh. I show how the changing legal framework of land ownership has influenced access to land and housing while analysing how urban farmers have responded to these changes. The following research questions underpinned the study:

1. How are low-income residents of Phnom Penh affected by the process of environmental change (including climate change)? How do other forms of socio-economic marginalization influence this?
2. What are the historical conditions that have shaped the present reality for low-income residents of Phnom Penh in terms of their vulnerability to environmental change?
3. How are low-income residents responding, individually and collectively, to the changes they are experiencing as a result of urbanization and environmental change? What are the outcomes of these actions?
4. How is the concept of 'resilience' being employed as a policy objective in Cambodia? Does the presence of a resilience agenda improve conditions for low-income residents facing challenges related to environmental change in urban areas?

I combined the theoretical fields of resilience and political ecology, to take advantage of their complementary understandings of the interaction between humans and nature. This theoretical combination highlights the importance of scale, focusing on the loss of agricultural livelihoods at the village level while also acknowledging the role of national policy and politics in shaping the priorities of urban development. My use of political ecology focuses on issues of agency to show how farmers are actively employing strategies to sustain their failing crops, such as increasing the use of chemical inputs, which tragically further undermines their precarious finances as well as the ecosystem they depend on. Farmers deploy short term strategies in an effort to retain a foothold in the city in the hopes that their children will be able to leverage their education to pursue opportunities outside of farming.

I further draw on discourse analysis to show how the term resilience is employed in policy and by government officials at the national level to frame climate change as a managerial problem which can be solved with technical solutions and external funding. I argue this obscures how problematic decisions such as the in-filling of urban lakes are caused, not by failures of capacity but by political priorities, aligned to the interests of wealth creation for a small elite. While resilience has been embraced as a policy priority in Cambodia, it has not translated into practices which protect urban ecosystems or lessen social inequalities.

Dedication

For Jesse. You were never far from my thoughts throughout this journey.

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Chapter 1: Introduction

Cambodia is amongst the countries most vulnerable to climate change globally (University of Notre Dame, 2019). Temperature increases and unpredictable rainfall are anticipated to impact the country's largely agricultural economy (Royal Government of Cambodia, 2014). Agriculture remains critical to Cambodian society and the economy, and both government and civil society programs promoting climate change adaptation are prioritized in rural areas. In contrast, climate change adaptation programming is far less common in urban areas. In Cambodia's capital, Phnom Penh, the prosperity of the city disguises high levels of vulnerability amongst certain residents, often those with lower incomes including many practicing agriculture within the city limits. Inadequate housing, frequently found on marginal land such as lakes and riverbanks, exposes low income households to risks such as landslides and flooding (Flower and Fortnam, 2015). Even so, climate change adaptation does not feature as a priority amongst urban development strategies.

Over the last forty years, Cambodia has emerged as a place of significant growth, opportunity and change. In the aftermath of the Khmer Rouge and the period of internal conflict which followed, the economy opened, economic growth soared, and relative political stability was achieved (Chandler, 2007). Phnom Penh is at the centre of this transformation. The capital is becoming a modern, global city, with expanding employment opportunities and a rapidly rising built environment. The benefits of this physical and economic growth are substantial, but they have not been accessible to all. There are estimated to be more than 26,000 families still living in informal settlements in the city in inadequate housing and without access to clean water (STT, 2018, p. 9). Exposure to climate risk is strongly related to socio-economic inequalities (Ribot, 2014), as historic patterns of urban development create multiple forms of mutually reinforcing exclusion (Swyngedouw, 2006; Heynen et al., 2006). The changing climate will exacerbate existing vulnerabilities and bring new challenges to Phnom Penh, but it is one of multiple social-ecological processes that are concurrently shaping the city's future.

Other forms of environmental change are also occurring alongside climate change, including the loss of urban ecosystems as the city's lakes and wetlands are filled in to create new land for development (Miahle et al., 2019). The marginalization of low income residents has been exacerbated by urban planning policies and practices which prioritize private, luxury developments often displacing low income settlements to the periphery (Ong, 2011). In Phnom Penh, the proportion of poor settlements in the outer districts increased from 69% to 79% between 2009 and 2017 as low income residents were pushed out of the city centre (STT, 2018, p. 12). Rising real estate costs and uncertainty in the legal framework as it applies to land ownership has made it difficult for low income residents to access housing, particularly in the city centre (Nam, 2017). Forced evictions of low income settlements from the central districts have also contributed to this shift, as high value land has been claimed by powerful actors in the public and private sectors (STT, 2016; McGinn, 2015). In the city's outskirts infrastructure is scarce and employment opportunities are limited (STT, 2016). The impact of these multiple social-ecological changes is deeply embedded in the social and historical context.

As land becomes scarce and expensive in the city centre, developers are turning towards the city's periphery for new real estate opportunities. In Phnom Penh's environs, multiple satellite cities are now under construction (Paling, 2012; APUR, 2019). This has required the in-fill of extensive aquatic areas to create land for development (STT, 2015; Miahle et al., 2019). Due to Phnom Penh's location on an extensive floodplain at the confluence of the

Mekong, Sap and Tonle rivers, the city is surrounded by lakes and wetlands. The central districts alone previously encompassed 25 lakes, 60% of which had been completely filled in by 2015 (STT, 2015, p.68). The remaining lakes are a source of agricultural livelihoods used for fishing and farming, both for consumption and sale in local markets. But, as this research will show, the stress from changes in the environment such as unpredictable weather patterns and water contamination is causing hardship for urban farmers. Fluctuating environmental conditions are influencing growing seasons, suitability of crops and the prevalence of pests, making an already marginal livelihood even riskier. To date, the capacity of urban farmers to adapt to these changing circumstances is not well documented. This research examines the social and ecological repercussions of the loss of these urban lakes and wetlands. Agricultural livelihoods which depend on the lake are quickly deteriorating, leaving thousands with no income and raising questions about food security. Furthermore, the wetlands provide critical ecological services to Phnom Penh, notably flood protection and wastewater treatment, as the city has no central sewage treatment facilities (APUR, 2019).

This research centres on the development of Phnom Penh's largest satellite city – ING City, which, when completed, will cover more than 2,000 hectares of the city's southern zone and require the near complete in-filling of two of its largest remaining lakes, Tompun and Cheung Ek (APUR, 2019). These two lakes are home to numerous low income settlements whose residents grow aquatic vegetables on the surface. Farmers are struggling to adapt their practices to increasingly hostile conditions, as erratic rainfall, water pollution and intense heat kill their crops. Escalating precarity has pushed many to take on unmanageable levels of debt, causing enormous stress and anxiety. Until now the farmers have attempted to persist under these conditions but the loss of these lakes to in-fill will be catastrophic. Few farmers have any alternative options, having already abandoned their rural homes as rice farming became unviable after successive years of drought.

At the city level, the wetland ecosystem of Tompun and Cheung Ek lakes plays a critical role in flood and wastewater management at the city level, yet its absence has not been accounted for in municipal infrastructure plans (Nishikawa, 2018). This failure to prioritize the public good is not an isolated event. Urban planning practices in Phnom Penh have traditionally been weak and frequently following, rather than leading private sector developments (Paling, 2012). This study reveals how urban expansion has occurred with little structure and less public debate, serving the interests of private developers and contributing to the exclusion of the city's low-income residents and the loss of critical natural assets.

In this research, I seek to understand the reality of environmental change in Phnom Penh. First, I explore how existing patterns of inclusion and exclusion create situations of social and economic marginalization and how those patterns are interwoven with ongoing changes in the urban environment. This change does not happen passively but involves city dwellers as active agents of creating and resisting change. As such, the lived experiences of Phnom Penh's residents and the ways they negotiate their relationship with their environment as well as their position within the urban dynamic is central. This perspective is complemented by an analysis of the discourse of resilience in Cambodia, particularly in relation to the practice of urban planning. The following research questions guide this study:

1. How are low-income residents of Phnom Penh affected by the process of environmental change (including climate change)? How do other forms of socio-economic marginalization influence this?

2. What are the historical conditions that have shaped the present reality for low-income residents of Phnom Penh in terms of their vulnerability to environmental change?
3. How are low-income residents responding, individually and collectively, to the changes they are experiencing as a result of urbanization and environmental change? What are the outcomes of these actions?
4. How is the concept of 'resilience' being employed as a policy objective in Cambodia? Does the presence of a resilience agenda improve conditions for low-income residents facing challenges related to environmental change in urban areas?

To address these questions, I employ a theoretical lens which combines the fields of resilience and political ecology, incorporating elements from how both fields understand urban environments. Resilience has emerged in academic and policy circles as a useful frame for understanding social-ecological change. As a theoretical construct, social-ecological resilience seeks to challenge the idea that systems exist at a stable equilibrium (Holling, 1973; Martin-Breen and Anderies, 2011). Instead, resilience highlights the ongoing dynamism and multiple forms a system may take (Allen et al., 2014; Folke et al., 2010; Davoudi, 2012). With respect to urban development, resilience-based approaches promote multi-sectoral, multi-scalar and flexible solutions, designed to address uncertainty and multiple risk factors particularly with respect to climate change (Bahadur and Tanner, 2014; Friend and Moench, 2013). Despite the popularity of resilience as a concept, this idea has been critiqued for failing to adequately account for issues of power relations and other forms of inequality (Béné et al., 2014; Weichselgartner and Kelman, 2014; Welsh, 2014). This limits the concept's applicability for studying realities of social-ecological change, which must be contextualized to be properly understood. In response to such critiques, Brown (2016) developed a framework bringing together resilience and political ecology. Political ecology deals explicitly with power and politics, acknowledging the influence of systemic factors at multiple levels in shaping individual decision making (Neumann, 2005; Svarstad et al., 2018; Ahlborg et al., 2018). Brown has used this attention to politics to weave agency into her concepts of resourcefulness, rootedness and resistance which provide the foundation for studying how resilience is built through everyday actions.

This study assesses the case of ING City using Brown's (2016) resilience framework. Resilience is employed as a lens through which to examine the co-occurring processes of environmental change and urbanization in Phnom Penh, with particular attention to urban farmers, who are uniquely affected by these phenomena. The farmers are themselves a diverse group with multiple ways of exerting their agency. In this research, I document the reality of farming in one village on the shore of Lake Tompun, dedicating attention to the historic changes that have occurred in the past forty years. I employed qualitative methods, including 47 interviews with farmers to learn about their challenges and give context to the decisions they are making to sustain their livelihood. Focus groups (n=24) were particularly useful to explore how farmers perceive the future of their village, the lake and Phnom Penh as a whole. The depth of these methods is complemented by a household survey (n=100) which focuses more narrowly on adaptation strategies, barriers and channels of support. This data is used throughout this manuscript to support the claims of the research.

Given the widespread usage of resilience in policy circles internationally (UN-Habitat, n.d.; Meerow and Stultz, 2016; UNDP, 2014) and within Cambodia (Royal Government of Cambodia, 2014; Royal Government of Cambodia, 2018), an examination of resilience as a policy priority complements the case-based analysis. Using discourse analysis, I explore how resilience is used and by whom as well as the implications of a resilience agenda on the reality of climate change adaptation priorities. This policy analysis draws many comparisons with the extensive literature on the exploitation of Cambodia's natural resources (see for

example Milne, 2015; Schoenberger and Beban, 2018). I conclude that resilience principles have failed to be widely implemented despite the term's inclusion in high level strategy documents. This is due in part to issues of institutional and human capacity but more significantly to the neopatrimonial nature of Cambodian politics. Patronage permeates the political system, preventing transparency in decision making and distorting relationships of accountability. Political power and economic interests are so tightly interwoven that private profit for the Cambodian elite is prioritized even where it grossly compromises the public good, such as the in-filling of Lake Tompun, Phnom Penh's natural wastewater treatment system.

This research presents a new look at an old truth in Cambodia. There is a growing body of research connecting the exclusion and dispossession of ordinary Cambodians to the commodification of natural resources and the neopatrimonial nature of the state (Milne, 2015; Beban et al., 2017; Dwyer, 2015) but this been restricted to rural areas. Despite important work on the influence of private sector actors in urban development (Paling, 2012) and the centrality of informal or shadow decision making in the real estate sector (Fauveaud, 2016a), the same links have not been made between the exploitation of urban ecosystems, the dispossession of low income urban dwellers, and the politics of neopatrimonialism. This research will address that void.

This monograph comprises the following chapters:

Chapter 1: Introduction

The introduction gives a brief overview of the important themes that I address throughout the text. This includes the key theoretical areas of resilience and political ecology as well as introducing urban agriculture in Phnom Penh which is the context for the primary case study for the research.

Chapter 2: Literature Review

In the literature review, I establish the conceptual foundation for this research through an analysis of the relevant fields of theoretical work. The literature review aims to comprehensively assess the current and, where appropriate, historical, literature in the fields of resilience and political ecology, with a particular focus on urbanization. I also include a discussion of how political ecology has been applied in Cambodia to understand the commodification of the country's natural resources. Weaving together these strands, the chapter outlines the approach adopted to analyse the data collected throughout the field research.

Chapter 3: Methodology

The methodology chapter provides an overview of the approach and methods used to conduct this research and to ensure validity and credibility of the analysis. Recognizing that knowledge is created through the interactions between researcher and subjects, the chapter includes an examination of my positionality in order to acknowledge how the findings have been shaped by my particular characteristics and experiences. It also addresses the challenges and limitations faced throughout the research and the strategies used to mitigate them.

Chapter 4: Unpacking Land and Climate in the Cambodian Context

The focus of this research is to examine the current reality of urbanization and environmental change in Phnom Penh, Cambodia. This chapter provides the reader with a brief overview of the cultural, geographical and historical context of Cambodia, as it relates to this research.

Drawn primarily from secondary data, the chapter sets out the background information that I have deemed essential to understand the importance and relevance of the chosen case study. The chapter also provides insight into the contextual factors that may underlie the motivations and decisions of some of the key actors in this study.

Chapter 5: Life on the Margins of Phnom Penh: Past and Present

In this chapter, I introduce the primary case study as well as secondary locations that were considered for this research. I give an overview of the data produced through the field research. For each study location, I describe both the experience of environmental change of the residents as well as evidence that relates to their socio-economic marginalization. This chapter focuses on showing how a situation of untenable vulnerability for urban farmers has been created in the main research site, through the co-occurring processes of urbanization and environmental change.

Chapter 6: The Political Ecology of Everyday Resilience in Phnom Penh

Employing Brown's (2016) approach, which merges the complementary fields of political ecology and resilience, this chapter tells the story of how residents of one village on the outskirts of Phnom Penh are experiencing the simultaneous processes of urbanization and environmental change. The chapter will focus on the multiple strategies that community members employ to adapt to the changes that they are experiencing. These strategies are framed as 'everyday forms of resilience' to highlight the active role that men and women play in shaping their own future. I acknowledge that these strategies may in fact reproduce inequitable power relations and contribute to environmental degradation.

Chapter 7: The Governance of Resilience in Cambodia

In this chapter, I explore how resilience is used in Cambodian policy at both the national and municipal level. Specifically, a discourse analysis is applied to key texts as well as interviews with policy makers and other stakeholders to unpack the concept of resilience and how it is understood and applied in the Cambodian context. The aim of this analysis will be to shed light on how language is employed to frame problems in ways that justify particular solutions to challenges, including what type of knowledge is considered valid and who is given authority to make decisions. This analysis will show the roles played by state actors in Cambodia in creating the conditions that exacerbate inequality.

Chapter 8: Conclusion

Finally, this monograph concludes with a summary of the arguments elaborated over the previous chapters. I provide policy recommendations to strengthen the delivery of resilience policies in Cambodia, which are also applicable to other developing contexts. I follow with theoretical recommendations for future work in the field of political ecology and resilience. Acknowledging that even with the broad scope of a PhD study there are many questions that cannot be addressed, the chapter ends with suggestions for a proposed research agenda that could move forward the study of resilience in Phnom Penh and in Cambodia more broadly.

Chapter 2 - Theoretical Framework

Cities and nature are often casually juxtaposed, implying that urban centres are unnatural (Gandy, 2002). However, acknowledging the fundamental role that nature plays in shaping urban areas, scholars are making use of numerous theoretical lenses to explore different aspects of the relationship between society and nature in the urban context. This has become increasingly pressing as global environmental challenges such as climate change have captured public and political attention. Examining the process of urbanization and its impact on urban ecosystems in Phnom Penh, this research draws on an urban social-ecological framework to reveal how drivers of change – social, political and environmental – interact at different levels to manifest Phnom Penh's unique urban reality. The incorporation of political ecology literature infuses this analysis with attention to history, power and marginalization.

I begin this chapter with an overview of resilience, emphasizing the field of social-ecological resilience and how this perspective has been taken up by urban scholars. I explain why my analysis will further draw on political ecology, paying particular attention to literature addressing the commodification of natural resources in Cambodia from a political ecology perspective. I conclude this chapter by describing the blended conceptual framework of political ecology and resilience that I draw on before turning to my case analysis.

2.1 Resilience, Urban Resilience and Transformation

Resilience has become a popular framing in a number of different fields from psychology (Buikstra et al. 2010) to disaster risk reduction (Kelman et al., 2015). In the field of international development, the concept emerged from a strand of thinking with roots in the field of ecology, further influenced by human development and disaster literature (Brown, 2016). In one of the field's foundational texts, Holling (1973) employed resilience with respect to ecological systems to show how stability could be found at multiple equilibria, in contrast with the understanding of the term in the field of engineering which was linked with the ability to return to status quo or a stable equilibrium. Holling's understanding of resilience challenged ideas about linear development in ecosystems, showing instead that ecosystems could gravitate towards more than one identity or 'basin of attraction' and that shifts could occur rapidly (Martin-Breen and Anderies, 2011). Resilience theory also introduces ideas of thresholds where change in one variable can lead the system to a tipping point, causing it to change state. This reorganization is one phase of what is known as an 'adaptive cycle', a term used to illustrate how complex systems go through phases of growth, expansion, collapse and reorganization (Folke et al., 2010). These adaptive cycles can be nested, interacting across scales, a dynamic known as 'panarchy' (See Figure 2.1).

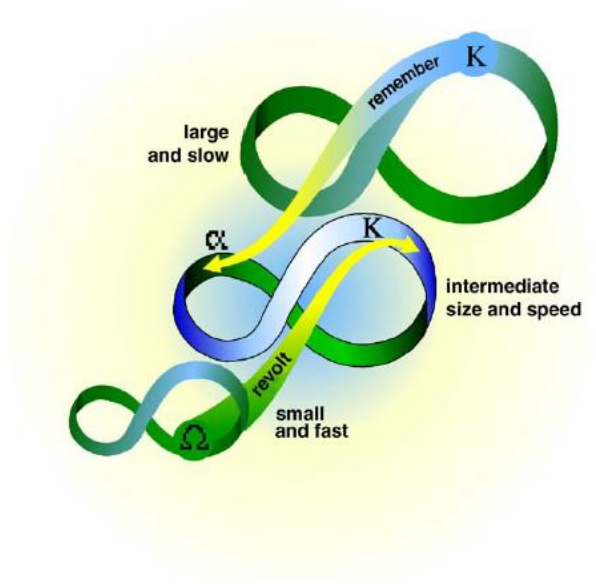

Figure 2.1 Panarchy
Source: Folke, 2006 (adapted from Gunderson and Holling, 2002)

Drawing from such ecological foundations, scholars considered how resilience could bring the social and natural sciences together to offer a new lens to study environmental challenges (Béné et al., 2018). This is evident in the early work of Carle Folke and Fikret Berkes (1998) who coined the term social-ecological resilience. Here, the focus continued to be the 'system', with the idea of combined 'social-ecological systems' becoming central to resilience thinking (Brown, 2013). Social and ecological elements are seen to co-exist in combined systems which operate at multiple scales and through multiple feedback loops, in line with the idea of panarchy (Davoudi, 2012). This has opened a fruitful debate about how social-ecological elements interact across scales and in response to stimuli, leading to situations of variability rather than rigidity (Allen et al., 2014). The idea of resilience in social-ecological systems also introduces notions of complexity and non-linearity in how change occurs, implicating both social and ecological variables. This multi-scalar approach highlights how local conditions are influenced by national or even global processes, both social and ecological. Identifying diversity in and interaction between scales, including geographical scale and temporal change of variables, is critical to understanding resilience (Gallopín, 2006).

A resilience perspective is predicated on the notion that uncertainty is inevitable and therefore it is impossible to plan for every outcome. Instead, through the capacity for self-organization (Berkes et al., 2003; Davoudi, 2012; Folke, 2006) or social learning (Pahl-Wostl, 2009) resilient systems respond to changing conditions, even when that change is unpredictable. This has made resilience an appealing framework in fields with a high degree of uncertainty, including climate change adaptation. In social-ecological systems, the capacity for adaptation depends on not just tangible assets but also social capital, such as the ability to act collectively (Adger, 2003; Béné et al., 2014). Institutions also play a strong role in shaping the relationship between social and ecological resilience, particularly in resource dependent communities, given their importance in governing rules and norms regarding use and access to resources (Adger, 2000; Folke and Berkes, 1998).

As it is employed in the field of international development, resilience also includes elements of a disaster risk reduction approach. This field traditionally adhered to a definition akin to engineering resilience where the goal was to return to pre-disaster conditions, often referred to as 'bouncing back' (Martin-Breen and Anderies, 2011; Brown, 2016; Béné et al., 2018). In

the disaster literature, risk is typically external and acts as a shock or stress which forces the system to cope or respond. The Intergovernmental Panel on Climate Change's definition of resilience is typical in this regard, stating that resilience is:

> …the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a potentially hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions. (Lavell et al., 2012, p.34)

Though heavily criticized (see Section 2.1.1 Critiques), the simple and intuitive message of 'bouncing back' has been extremely influential in policy making (Meerow and Stults, 2016).

Since its adoption in the social sciences, resilience has proven to be an extremely flexible term, able to absorb a range of qualities. Such malleability explains, in part, why resilience is increasingly popular (Turner, 2014; Leach, 2008). One of the areas to which resilience is being widely applied is the study of urban dynamics. When applied to urban areas, the focus on combined social and ecological systems is retained as is the interaction of urban systems at varying scales through feedback loops (i.e. panarchy) (Bahadur and Tanner, 2014; Tyler and Moench, 2012). This framing shows how social elements shape but are also influenced by the dynamics of nature, including the importance of water, food and energy to urban environments. Although the system remains the foundation, there have been calls for this perspective to be supplemented with attention to actors and institutions (Tyler and Moench, 2012) or other concepts such as wellbeing (Friend and Moench, 2013) or sustainability (Weichselgartner and Kelman, 2014).

Urban resilience has become increasingly popular among practitioners and planners who are seeking out ways to manage the complexity of urban environments with the added uncertainty of global environmental change, including climate change. Urban resilience is used as both a policy goal (a positive end to strive for) as well as a conceptual or analytical framework for understanding urban challenges or as a metaphor to promote cross-sectoral collaboration (Béné et al., 2018). The attributes of 'resilience thinking' (Folke et al., 2010) such as adaptability, flexibility and self-organization are identified as advantages over traditional urban planning, particularly to meet the uncertainties of climate change which are resistant to solutions developed through a 'predict and plan' approach (Quay, 2010). While conventionally urban systems were designed to be robust or resistant to failure, an urban resilience approach implies that systems should be designed with the ability to adapt or self-organize in the face of change, even when unexpected, through strategies such as redundancy (Tyler and Moench, 2012).

Drawing from scholars who have written about the need to integrate social issues into the definition of resilience (Brown, 2013, Adger, 2000, O'Brien et al., 2009), urban resilience frameworks have highlighted the need for questions of equity and inclusivity to be part of a vision of city resilience (Bahadur and Tanner, 2014, Jabareen, 2013, Tanner et al., 2009). This is particularly true for cities in the Global South where multiple priorities need to be met with scarce resources and without the accumulated resilience that has been generated through advances in infrastructure and institutions in many developed contexts (Satterthwaite, 2013). Urban resilience scholars have advanced the idea of trade-offs to show that pursuing resilience in one area may come at the expense of another (Bahadur and Tanner, 2014; Friend and Moench, 2013; Martin-Breens and Anderies, 2011). Such is the case when preventative infrastructure is deployed to protect economically valuable urban cores from flooding at the expense of low income settlements on the periphery (Marks and Lebel, 2016). While issues of equity and trade-offs are recognized, analysing the contextual

factors which *create* situations of inequality, in other words the political economy of urban resilience, is a weakness of the literature (Béné et al., 2018).

The governance of urban resilience is one of the central challenges of translating theory into practice. Governing resilience is thought to require attributes such as accountability, transparency (Friend et al., 2014), and institutional coordination (Brown et al., 2012). The integration of local knowledge and the participation of multiple stakeholders, including citizens, encourages a diversity of perspectives that helps to understand resilience from different viewpoints and benefits adaptation decision-making (Bulkeley and Castan Broto, 2013; Weichselgartner and Kelman, 2015; Chu, 2018). Olssen et al. (2006) have shown that 'shadow networks' outside of bureaucratic institutional structures are important for informal knowledge sharing and innovation that can improve the governance of resilience. However, in many cases policy makers still employ resilience with a techno-scientific slant as a lens for risk management, leading to policies that reinforce the status quo rather than challenge power asymmetries (Beilin and Wilkinson, 2015; Leach, 2008).

In response to the need for a more explicitly political approach to resilience, theorizations have expanded to see resilience as a spectrum (See Figure 2.2). The resilience spectrum goes from persistence at one end through incremental adjustment followed by transformational change at the other (Béné et al., 2014; Pelling et al., 2015).

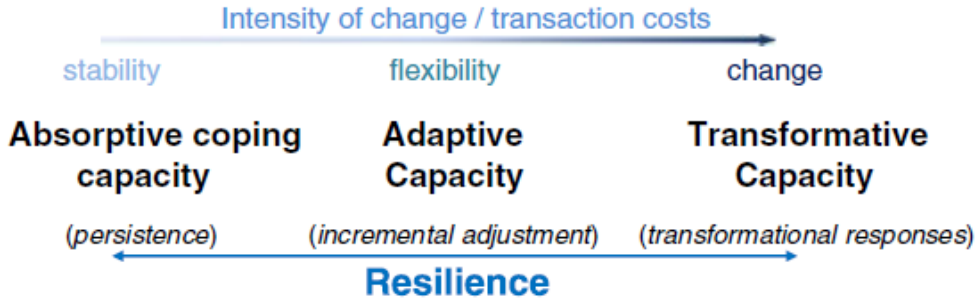

Figure 2.2 Resilience as a Spectrum
Source: Béné et al., 2014

In the resilience spectrum, the persistence of a system refers to changes that are made in response to a shock or stress that help the system to retain the same structure and function (Béné et al., 2014). This is in line with an understanding of resilience as an ability to 'bounce back'. The mid-point of the spectrum is incremental adjustment which refers to modifications that move systems to other equilibria through small step changes. Incremental adjustment may lead to transformational change by pushing a system beyond a threshold or tipping point (Pelling, 2011). Finally, transformation refers to a fundamental change in the structure of the system. Although much of the use of resilience in the field of international development assumes resilience to be positive, change and even transformation can of course also lead to negative outcomes, or both positive and negative simultaneously, depending on perspective.

Each area on the spectrum represents a different capacity of the system (Béné et al., 2014). For instance, persistence requires absorptive capacity that will allow the system to remain stable in the face of shocks or stressors. Adaptive capacity meanwhile, helps the system to be flexible, adjusting to new realities through incremental adjustments. Finally, transformative capacity is necessary to lead systems through a process of deeper change that may be required if stressors push the system beyond their existing parameters. Each of

these capacities can exist simultaneously within a social-ecological system and how and when each is called upon is an important area of current research, particularly with respect to how urban stakeholders can or should promote transformational change (Béné et al., 2014; Bahadur et al., 2015). These capacities may also appear or influence resilience at different scales (e.g. household vs community level).

Transformation has proven to be the most complex element of the spectrum for scholars to unravel. While the idea of transformational change is not new to resilience (see for example: Folke, 2006 ; Folke et al., 2010; Brown and Westaway, 2011), there is little consensus as to what constitutes transformation as well as the conditions through which it can be brought about. Yet, increasing concern about the inadequacy of the global response to pressing environmental concerns, and in particular climate change, has brought increased attention to the concept of transformation as an object of study. While there continues to be significant overlap with resilience ideas, transformation is also being studied independently (Mapfumo et al, 2017; Fazey et al., 2018) as well as alongside issues of sustainability (Olsson et al., 2014; Scoones, 2016). Importantly, all of these approaches are linked in their desire to understand profound change through an appreciation of both social and ecological variables.

Early work in exploring the potential links between resilience and transformation remained close to the ecological roots of resilience. For example, Nelson et al. (2007) describe transformation as situations where thresholds are crossed (intentionally or inadvertently) to create a fundamentally new social-ecological system. Change could occur at any scale and a transformation at one scale could contribute to resilience at higher levels (Folke et al., 2010). However, transformation is highly subjective and the depth, breadth and speed of change required for something to be classified as a transformation as opposed to adaptation is difficult to determine (Fazey et al., 2018). In social-ecological systems, transformation can occur due to changes in ecological, economic or social variables (Walker et al., 2004; Nelson et al., 2007). These changes may be either untenable or just undesirable, meaning that values also play a role in shaping transformation (Pelling, 2012).

Manuel-Navarrete and Pelling (2015) offer a more explicitly political take on transformation where transformational change is one that “offers new political spaces to address risks and inequalities unmet by development” (p. 558). This definition recognizes limitations in the current development paradigm and suggests that those deficiencies require more than incremental adjustments to resolve. This overtly political position rejects an acceptance of the status quo by acknowledging that persistent inequalities are related to power and politics. A focus on transformation can help resilience approaches to move beyond technocratic solutions to integrate concerns of rights and entrenched power structures (Bahadur and Tanner, 2014).

Social contract theory can further help to show how social and ecological elements can interact to create the conditions for transformation (Pelling, 2012; O’Brien et al, 2009). Used extensively to understand the rights and responsibilities that accrue to both citizens and duty bearers under democracy (O’Brien et al., 2009) and the mechanisms used to ensure quiescence in authoritarian regimes (Cook and Dimitrov, 2017), the idea of the social contract helps to raise important questions about legitimacy and governance. In an era of uncertainty related to climate change, this may include how threats from changing weather patterns will challenge governmental legitimacy and consent to rule (O’Brien et al., 2009). Pelling (2012; 2011) shows how disasters can open up spaces for transformational change by highlighting governmental inadequacies that might otherwise go unnoticed, thereby creating crises of legitimacy and catalysing a breakdown in the social contract. As part of an assemblage of factors, environmental change may help to highlight weaknesses in a

government's ability to fulfil its obligations towards its citizens, spurring collective action to meet local needs (Martin-Breen and Anderies, 2011) or the emergence of informal networks within governance structures that may propose new models of governance (Olssen et al., 2006). A catastrophe such as a major hurricane may even catalyse political action towards a societal transformation (Pelling, 2011). Nevertheless, Pelling and Dill (2006) have shown these cases to be rare.

If, as many scholars are now suggesting (see for example: Fazey et al., 2018; Scoones, 2016), the response to urgent issues such as global inequality and climate change requires more than incremental adjustments, then it is also crucial to determine what factors can bring about, and ideally guide, transformative change. Adger (2003) argues that the ability of societies to undertake adaptation and/or transformation is "bound up in their ability to act collectively" (p.388). He employs the concept of social capital, or how relationships are leveraged for individual or collective good, to demonstrate how social relations (including institutions) influence relations with other forms of capital, specifically natural capital. Building on this idea, Barnes et al (2017) posit that social networks (relationships between individuals and groups) are important for building transformative capacity as they facilitate the exchange of information and resources and the building of trust. This is critical to establishing the foundation for collective action that will increase transformative capacity. This contribution is useful for understanding whether transformation can be intentionally brought about. To those who argue it is possible to achieve such 'deliberate transformation', issues such as who decides the direction of change are critically important (O'Brien, 2012, Fazey et al., 2018) as there is no guarantee that transformational change will necessarily lead to social justice and instead could result in new forms of marginalization.

2.1.1 Critiques

While the theoretical meaning of resilience has become expansive, it has also faced criticism. Blending social and ecological elements has been a particular challenge for the social-ecological systems literature as societies and ecosystems are fundamentally different in many ways (Duit et al., 2010). To some, this makes the application of the same theory and models to profoundly different fields problematic (Welsh, 2014). In the resilience literature, the social and the ecological are often presented as two separate but interconnected systems (Brown, 2016). Constructing this division risks downplaying the extent to which they are co-constituted. Furthermore, a focus on systems can underplay the agency of individuals within the system (Coulthard, 2012; Béné et al., 2014) and the importance of cultural and personal influences such as values, ethics and identity in shaping decision making (Pelling, 2012). Systems language tends to 'naturalize' the system as the unit of analysis thereby depoliticizing the processes involved in its production (Turner, 2014; Watts, 2015).

Notably, critiques of the resilience agenda have emerged alongside attempts to operationalize it. With respect to urban resilience, a number of studies and initiatives have gone forward to identify key characteristics of a resilient city and how they can be achieved (UN-Habitat, n.d; Albers and Deppisch, 2013; Woolf et al, 2016). These frameworks typically exist alongside traditional methods of urban planning but provide an ambitious agenda for cities to achieve social, economic and environmental priorities and to implement management strategies to cope with uncertainty and changing conditions. However, the application of resilience to the complexity of the urban planning in practice encountered a number of significant challenges. The most pertinent of these critiques are summarized here.

First, resilience has enjoyed such widespread usage that it is frequently employed without an accompanying definition, leading to ambiguity in its meaning (Colding and Barthel, 2019). In both academic literature as well as development practice, resilience is commonly assumed

to be a positive trait (Meerow and Stults, 2016). In this sense, resilience is one of the latest in development buzzwords whose malleability and normative usage lend it to being used to solicit buy-in from diverse stakeholders (Cornwall, 2007). While there is value in the term as a rallying cry, resilience offers limited strategic direction unless it is more deeply interrogated. For example, there is little discussion of how to identify situations that may in fact be incredibly resilient but undesirable (Leach, 2008): authoritarian governments are one example, poverty is another. These things are resilient in the sense that they persist even in response to efforts to remove them, yet few would argue that they are the preferred outcome of development policy and practice. The lack of attention to the normative nature of the term has led resilience to be criticized for promoting the status quo (Ziervogel et al., 2017; Weichselgartner and Kelman, 2015; White and O'Hare, 2014).

A related critique is the application of resilience in settings such as disaster risk reduction where resilience is seen as a beneficial property that would allow disaster-affected communities to return to their pre-disaster state, or 'bounce back' (Kelman et al., 2015). This usage of the term hews closely to ideas of engineering resilience which constitutes only one part of resilience, as it does not take into account the idea of multiple stable states (Walker et al, 2004). The idea of 'bouncing back' has been widely challenged in academic and grey literature in recognition of the absurdity of promoting the return to conditions which were likely sub-optimal, including widespread poverty and inequality (Weichselgartner and Kelman, 2015; Pelling, 2012). Even so, the understanding of resilience as the ability to 'bounce back' has been shown to persist amongst policy makers (Meerow and Stults, 2016). This has been difficult to change as many powerful institutions are locked in to framings focused on stability (Leach, 2008) and are often benefitting from and therefore generally disinclined to reject the status quo.

Resilience can also be seen as (intentionally or not) downloading responsibility for risk management onto the poor and marginalized (Welsh, 2014). This is due in part to the tendency for resilience to be defined externally, by policy makers, development practitioners or other 'experts' who expect community members to be resilient in the face of external threats, rather than addressing wider inequalities in social relations (MacKinnon and Derickson, 2013). This is in line with critiques that have been levelled at the field of adaptation, which overlaps significantly with resilience studies. In the adaptation field, scholars such as Ribot (2011; 2014) have warned that it is not enough to simply identify inequalities, but their root causes must be understood in order to facilitate appropriate solutions. The tendency to accept the current situation as neutral without delving into the systemic problems that have created situations of inequality and injustice has led to resilience being criticized as conforming to a neoliberal agenda (Friend and Moench, 2013; Watts, 2015). Critically, in the policy realm this influences the types of solutions proposed, with a neoliberal reading of resilience favouring solutions in technological or market fixes rather than the promotion of social justice (Béné et al., 2018).

In this light, resilience must continue to be interrogated to be effective as a policy priority in the field of international development, including in the study of urban areas. As it stands, resilience is not inherently a 'pro-poor' agenda (Béné et al., 2014). This stems from the focus on external forces acting on systems and a neglect of internal dynamics that also influence change. In the academic literature, scholars have increasingly highlighted the need to understand social values and the dynamics of power that shape human interactions in order for resilience to be relevant to the social sciences (Leach, 2008; Brown, 2013; Friend and Moench, 2013; Welsh, 2014). This implies the inclusion of an analysis of power relations, decision-making and governance processes and how these factors affect the vulnerability of

different individuals and communities when applying a resilience lens to the study of social-ecological systems (Weichselgartner and Kelman, 2014).

2.2 Political Ecology

Despite the move towards politics associated with the recent transformation literature, resilience theories on the whole still struggle to adequately integrate questions of power. In response, tentative steps have been made to connect resilience and political ecology, based on the commonalities the two approaches share in their interest in human - environment relations and their appreciation of interconnections between scales (Turner, 2014). There is significant complementarity to be found in bringing the two together to understand change with respect to the relationship between humans and nature.

For Blaikie and Brookfield (1987) political ecology draws together ecology and political economy, emphasizing "…the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself" (p.17). Political ecology often adopts a position of critical realism which accepts the existence of a material reality but notes that human knowledge is only a partial representation and therefore it is important to understand how it is constructed (Neumann, 2005). Early work highlighted the ways in which political, economic and environmental marginality interacted to create situations of both environmental degradation and poverty (Bryant, 1998; Neumann, 2005; Peet and Watts, 1996). For example, Susanna Hecht (1985), thought to be one of the founders of the field of political ecology, showed how focusing on environmental degradation associated with livestock farming in the Amazon had overlooked the commodification of land and associated historical patterns of capital accumulation that created the conditions for overexploitation. The insightful analysis on intersecting forms of marginality and a recognition of how the forces of global capitalism have impacted local communities, have made political ecology one of the dominant fields for examining the relationship between humans and the environment across the global South (Walker, 2005).

Much early work in political ecology was strongly influenced by structuralist tendencies and specifically structural Marxism (Blaikie, 1997; Taylor, 2014; Stone-Jovicich, 2015). This has since been complemented by more place-based studies which bring attention to the factors that influence differential access to resources between groups and individuals and how that impacts human relationships with nature (Turner, 2014). Political ecologists showed that "patterns of accumulation, access to and control over resources, and changing class structure" created the conditions that made certain individuals or groups susceptible to marginalization (Watts, 2015, p.34). These case-based studies are deeply grounded in historical analysis which show how current conditions have been shaped over time through the co-evolution of nature and society. In particular, how power and politics have been used to shape laws and market conditions that influence ownership and control over resources are central to political ecology (Peet and Watts, 1996). This is an important distinction from the resilience approach where systems-based thinking risks accepting current conditions at face value, rather than interrogating the underlying, historic socio-economic inequalities that shape differentiated risk. This localized approach to political ecology helps to explain how poverty and inequality have emerged as the enduring legacy of historic injustices such as colonialism.

These different approaches have led to multiple, though overlapping, theorizations of power in political ecology. Power is central to political ecology as unequal power relations shape questions of contestation over use and access to natural resources (Bryant, 1998). Svarstad et al. (2018) suggest that there are three main ways to interpret power: i) actor-oriented, which focuses on the concept of agency where power is exercised through actors; ii) neo-

Marxist, where agency is constrained or enabled by social structures; and iii) discursive, or the power produced through the use, adoption and reproduction of specific discourses. While some forms of power may be emphasized over others in a given analysis, they are not exclusive categories. For example, social structures can be interpreted as defining relationships between agents and therefore the power structure between them (Dowding, 2008). In all cases, power is relational and can create contradictory effects through the same action (Ribot and Peluso, 2003; Ahlborg and Nightingale, 2018). Power is also multidirectional with even those perceived as marginalized able to employ strategies of resistance (Scott, 1985).

Discursive power shows how the study of political ecology is as much about meaning as material practices (Bryant, 1998). As language is not neutral but can be used as a tool to serve particular interests, how language is used and particularly who controls it is critical to understanding how knowledge is produced. The existence of a dominant discourse can have constraining effects on policy making such as framing problems in particular ways which limit who can participate in decision making as well as the choice of solutions (Hajer, 2003). Much of the discourse analysis in the field of political ecology takes Foucault's work as a foundation, with a focus on how discourse creates and reinforces relations of power (Scoville-Simonds, 2009). Work in this area has highlighted the politics behind the use of language and the ways in which discourse can shape reality to suit a particular agenda and therefore a particular set of solutions (Adger et al., 2001; Ferguson, 1994). For example, at the global level, many environmental issues such as climate change are framed in 'managerialist' language, which see institutional or policy failure as the root of environmental problems; however when applied to the local level this framing fails to illuminate the complexity of environmental debates (Adger et al., 2001). In the creation of a dominant discourse, particular words, phrases and metaphors come to stand in for complex ideas, limiting the breadth of participation in decision making as well as the choice of solutions (Hajer, 2003). Ghertner (2010) shows how a discourse of 'green aesthetics' has evolved to exert significant influence over decision making in Dehli resulting in the clearance of slums that are portrayed as polluting while simultaneously approving the construction of shopping malls, despite their impact on green space and their contribution to the overconsumption of resources.

In addition to an emphasis on understanding dynamics of power, political ecology is also concerned with the need to critically examine how knowledge is produced and used. Since its early days, the field has embraced a critical examination of how knowledge is produced and legitimized, leading to increased interest in and appreciation for diverse forms of knowledge (Peet and Watts, 1996). Scholars have questioned the legitimacy in privileging certain bodies of knowledge, often Western science over others, including local or traditional knowledge (Stone-Jovicich, 2015). Furthermore, the production of environmental knowledge has often overlooked the issue of gender, ignoring women's interests, concerns and experiences (Elmhirst, 2015; Bryant, 1998). Research such as Forsyth (1996) has shown the value in integrating locally-based knowledge into environmental management in order to benefit from experiential learning gained from local experimentation. Yet traditional knowledge must itself be unpacked as it is not infallible or static and will also be infused with power relations (Peet and Watts, 1996).

While political ecology was initially predominantly focused on rural areas, its core ideas are equally applicable to the relationship between humans and nature in urban environments. Urban environments are not separate from rural areas and the two can be considered intrinsically connected. People, material, goods, information and energy all circulate between and within both rural and urban areas (McGee, 2008). The connections between the two are

not limited by proximity but extend through both time and space. Keil (2003) argues that "what we call "the urban" is a complex, multiscale and multidimensional process where the general and specific aspects of the human condition meet" (p. 725). Using the metaphor of metabolism, Swyngedouw (2006) argues that urbanization can be understood as:

> …a process of continuous de- and re-territorialization of socio-ecological metabolic circulatory flows, organized through predominantly capitalist social relations sustained by privately or publicly managed socio-physical conduits and networks and nurtured by particular imaginaries of what nature is or should be. (Quoted in Swyngedouw and Kaika, 2014, p. 465 and Swyngedouw, 2015, p. 611)

Urban political ecology challenges the division between society and nature by employing the concept of 'socio-nature' (Heynen et al., 2006) to show how the two – cities and nature - are not just interacting but dialectically constituted. Urban political ecology sees urban areas as hybrid, where the social and the physical are inseparable (Gabriel, 2014; Heynen et al., 2006). This provides the foundation for an analysis which goes beyond the study of the city and calls for an expansive perspective, incorporating diverse spatial and temporal scales of change.

Urban political ecology has taken the central tenants of political ecology and applied them to the study of urban environments. For instance, concerns with power dynamics remain fundamental. Swyngedouw (2004; 2006) argues that metabolism, as it is used in his description of urbanization, refers to a process of both destruction and creation, and is infused with relations of power between social actors and as part of broader social struggles including class, race and gender. This is echoed by Keil (2003) who states that: "the regulation of our relationships with nature in cities—is ultimately a question of democracy, governance, and politics of everyday life in cities" (p. 729). Access to and control over urban nature depends on the distribution of power, leading to uneven development and injustice in the process of urbanization (Cook and Swyngedouw, 2012). In contrast with the tendency of resilience scholars to underappreciate dynamics of power, urban political ecology views it as central.

The focus on urbanization rather than the city as unit of analysis is an important, if sometimes overlooked, distinction in urban political ecology (Angelo and Wachsmuth, 2014). Yet, there is value in specifying if it is a thing (city) or a process (urbanization) that is under interrogation (Harvey, 2007). A focus on the city is useful from a planning perspective but this view has the tendency of treating cities as fixed or stagnant, awaiting interventions from municipal governments to address problems or map out visions for development (Gandy, 2002). This approach privileges a particular way of viewing the world, where government-led planning is paramount, side-lining other actors and forces that contribute to the creation and evolution of cities. Instead, urban areas can be more fruitfully studied through a focus on urbanization, which seeks to highlight a process which is situated spatially but not limited to simply a 'space'. Urbanization is shaped not only (perhaps not even primarily) through government-led planning mechanisms but also through an assemblage of "transnational ideas, institutions, actors and practices" (Ong, 2011, p.4) and in particular, the impact that city (and rural) dwellers have on the space around them on a day to day basis. This process includes decisions related to the built environment, transportation and other infrastructure, food production, waste management and the development of urban cultures. In turn, urban space also shapes social practice. As David Harvey (2003) writes: "We individually and collectively make the city through our daily actions and our political, intellectual and economic engagements. But, in return, the city makes us" (p. 939). This helps bring to the foreground the importance of understanding the everyday practices of urban inhabitants.

2.2.1 A Political Ecology of Cambodian Resources

A rich case-based literature exists, employing many elements of a political ecology approach, to understand the role that natural resources have played in the formation of the modern Cambodian state. The commodification of resources, starting with timber and continuing with land, has been part of an often violent process of exclusion facing rural and indigenous people in Cambodia (Milne, 2015; Baker and Milne, 2015). In contrast, the large scale extraction of luxury timber, minerals, and the creation of economic land concessions for plantations of sugar (and other high-value export crops) has directly contributed to the enrichment of the Cambodian elite. This includes private business owners, politicians and high ranking military officers (Beban et al., 2017). The exploitation of Cambodia's natural resources has been enacted using both legal and illegal (as well as quasi-legal) mechanisms, making the case that the illicit aspects of natural resource exploitation are not peripheral activities but fundamental to the formation and continued making of the Cambodia state in its current form (Milne, 2015).

In response to the large scale enclosure of land for resource extraction (also known as land grabbing), affected populations employ diverse strategies of not only resistance (both oppositional and covert) but also inclusion, where claims are made for incorporation into new livelihoods for example (Hall et al., 2015). Strategies are situational, informed by present conditions as well as historical realities. A pattern of state neglect or the presence of external allies may influence whether resistance is perceived to be possible (Park, 2018). Furthermore, realities of class, gender, generation and other identities present different lenses through which to see both conflict and opportunity, meaning that collective resistance cannot be assumed (Hall et al., 2015). In Cambodia, the absence of resistance to widespread corruption has been noted and attributed to the trauma of conflict, particularly the Khmer Rouge period (Strangio, 2014). This widespread and intergenerational trauma has been characterized by Cambodian psychiatrist Sotheara Chhim (2012) as a cultural form of post-traumatic stress syndrome which includes an inability to trust, social withdrawal, submissiveness to authority and fear. He calls this specifically Cambodian phenomenon *baksbat* or broken courage. Scholars in Cambodia have insightfully described the active resistance to land grabs, including women's participation (see for example Park, 2018; Lamb et al., 2017; Beban and Work, 2014; Brickell, 2014), but there is less discussion of alternative strategies such as acquiescence and incorporation, particularly in the case of urban dispossession.

The literature related to dispossession through the commodification of resources in Cambodia typically characterizes the Cambodian state as being neopatrimonial, understood as a form of domination where legal-rational bureaucratic institutions co-exist and in fact merge with patrimonial relations, where power relations are also personal relations (Erdmann and Engle, 2007). Under Prime Minister Hun Sen, a vast network of patronage relationships has been established where money is continually passed up the pyramid in exchange for favourable treatment and access to opportunities (Un, 2006; Springer, 2011; Verver and Dahles, 2015). Both formal and informal strategies are employed together to secure the resources necessary to maintain this culture of patronage. This can be seen clearly in the logging sector where land registration (formalization) has occurred alongside threats and bribery (informal) to displace rural communities from their homes to make room for economic land concessions (Beban et al., 2017). Given the importance of the wealth and relationships generated through these transactions to the formation of the Cambodia state as it exists today, and particularly the consolidation of the Cambodian People's Party (CPP) as a hegemonic power, the merging of formal and informal mechanisms of state control is a central element of the neopatrimonial system in Cambodia. Though the Cambodian state

may be considered a ‘weak’ state by some metrics, leading to calls for capacity building from the international community, in its ability to drive economic growth and devise ways for the elite to accumulate money and power, it is in fact strong (Verver and Dahles, 2015; Baker and Milne, 2015).

Resistance to this neopatrimonial form of governance is deterred through a combination of control mechanisms and legitimation strategies designed to minimize political opposition and public protest. Schoenberger and Beban (2018) have shown how fear is used in Cambodia as a tool to control populations, both through threats and violence but also through more subtle forms of intimidation such as surveillance. Alongside this fear, acquiescence is cultivated through legitimation strategies that build loyalty or goodwill towards the government. Ensuring that the Cambodian people feel the government and its actions are legitimate facilitates the continued operation of the neopatrimonial regime (Beban et al., 2017). Mechanisms of legitimation are multiple, including maintaining the façade of democracy through the holding regular elections, despite a strangling of any real political opposition through the crack down on independent media, civil society and opposition politicians (Morgenbesser, 2019). A key legitimation strategy of the Cambodian People’s Party is the giving of ‘gifts’ of infrastructure and public goods such as schools and maintaining peace and order, which are highly prized after decades of conflict (Hughes, 2006). Given directly by Prime Minister Hun Sen or in the name of his associates, these gifts are deployed strategically (often in advance of an election) and constitute the main channel through which development is enacted, far exceeding services delivered through formal government budgets (Milne, 2015). In exchange for the gifts received, the people are expected to continue to participate in the performance of legitimizing CPP rule, including voting in elections. This context of institutionalized corruption and patronage as well as development through gift giving has created a highly distorted social contract in Cambodia. Expected channels of accountability between the people and the government as well as between government institutions are weak or non-existent (Un, 2006; Un and So, 2011). Instead, what could pass for a social contract seems to exist between the people and the CPP and Hun Sen directly (Hutt, 2016).

These questions concerning the relationship between natural resources and governance in Cambodia have been the topic of considerable debate, but this perspective has only been weakly applied to urban areas, despite the parallels between so called ‘land grabs’ in rural areas and the process of forced or coerced relocations in urban areas to make way for profitable land deals. Rural land grabs typically involve the large-scale transfer of land under local control to powerful (often transnational) actors (Steel et al., 2017). This process is mirrored in the loss of urban or peri-urban land to speculative land dealings and to mega-projects or satellite cities, which are employed to promote the image of a ‘world city’, a place of success and wealth (Goldman, 2011; Steel et al., 2017). While some scholars have addressed the international involvement in urban development (Paling, 2012) and the importance of power in the real estate sector (Fauveaud, 2014; 2016a; 2016b), there is as yet little research that looks at urbanization in Cambodia through the lens of political ecology and resilience, incorporating an understanding of the importance of the transformation of nature in urban areas.

Furthermore, while this literature has admirably tackled the social and political ramifications of land grabs and the widespread commodification and extraction of resources in Cambodia, the ecological impacts have received far less attention. In Phnom Penh, this oversight is particularly problematic due to the extent that large scale land acquisitions have often taken place on urban lakes and wetlands, resulting in the loss of biodiversity, flood protection and wastewater treatment capacity (STT, 2015). The loss of urban ecosystems will affect Phnom

Penh's residents and the surrounding environment well beyond the loss of homes and livelihoods in the immediate area. As such, attention to the ecological implications of urban expansion connects the immediate and local impacts to wider concerns at the city or even regional levels.

2.3 Drawing on a 'Political Ecology of Resilience' to Examine Urbanization

Recognizing the potential gains for bringing together the fields of resilience and political ecology, Brown (2016) applies a political ecology analysis to resilience in an effort to develop a theoretical approach uniquely suited to the field of international development. Brown's political ecology of resilience attempts to re-imagine resilience such that it balances the importance of structural forces with an understanding of agency as well as the dynamics of power in which they operate (Brown, 2016). Her work draws on different elements of political ecology, including Piers Blaikie's foundational work which operates as a "political economy of natural resource management" (Brown, 2016, p.16). The research agenda for political ecology set out in *Liberation Ecologies* (Peet and Watts, 1996) was exceptionally influential in her work. A subset of elements from this research agenda are particularly relevant to this research, including an understanding of political economy, an appreciation of power dynamics, the use of discourse analysis, and an awareness of historical context.

First, Brown highlights the need to deeply explore the political economy component of political ecology by identifying the "causal connections between the dynamics of economic growth and development, and specific environmental outcomes" (Brown, 2016, p.16). The relationship between economic growth and the multiple and reinforcing forms of marginalization that affect poor people in the developing world is central to political ecology but until now has been understated in the study of resilience. Second, her approach highlights the need to foreground the study of politics by focusing on 'everyday forms of resilience' in direct response to one of the main criticisms of resilience as being too weak on assessing relations of power (Brown, 2016). Related to this, is specific attention devoted to the study of environmentalisms and environmental movements and the importance of their role in promoting a diversity of knowledges and practices related to resilience (Brown, 2016). Discourse analysis was highlighted by Brown as a way to examine how different forms of knowledge are produced, which are privileged and how they become institutionalized. Finally, Brown argues that political ecology can show how resilience can benefit from drawing on historical perspectives to show the evolution of social relations and environmental change. These priorities have helped to shape the analytical lens of this research.

Applying these insights to social-ecological resilience, Brown developed a three-pronged approach focusing on *resistance, rootedness, and resourcefulness* (Brown, 2016, p.185). Unlike Béné et al.'s (2014) resilience spectrum which assesses resilience as an outcome, Brown's approach seeks to uncover the elements that support or hinder efforts to build resilience. At the centre of Brown's approach is the lived experiences or everyday forms of resilience. This prioritizes the way change is perceived and responded to by individuals and groups whose decision-making can then be understood as resilience making practices, the end result of which can be bouncing back, adapting or transforming (Brown, 2016). This means that Brown's framework encompasses all activities that build absorptive, adaptive and transformative capacity, in line with Béné et al.'s (2014) work.

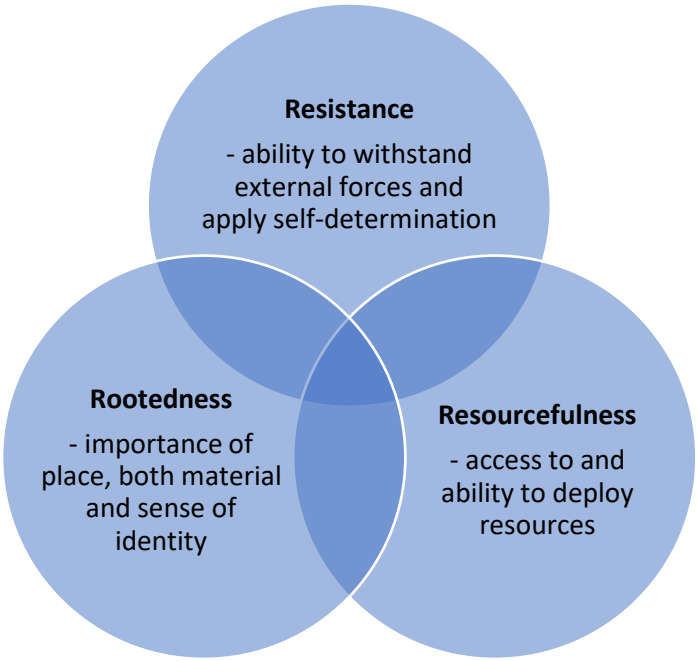

Figure 2.3 Building Everyday Resilience
Based on Brown (2016)

Brown (2016) notes that *resistance* means something different in the natural and social sciences. In the natural sciences, it is more closely associated with stability in the face of change whereas in the social sciences, it is often used to describe "the exercise of subordinate power" (Brown, 2016, p. 195). However, both of these characterizations can be seen to highlight agency. Resistance, within this approach, implies not necessarily an attempt to prevent change but rather an attempt by individuals or collectives to withstand external forces and therefore employ "strength, self-determination, agency and power" to determine their own future (Brown, 2016, p.194). Resistance recognizes that drivers of resilience decision making are multiple, including changing weather patterns but also other forms of environmental modifications as well as political, institutional and cultural change. Resistance is the opening through which to explore environmental movements and other means employed to challenge power relations. A focus on agency necessitates the integration of power relations as well as structural forces to understand how situations of inequality are produced and contested.

Rootedness in this framing encompasses the multiple ways that place, both material and symbolic, is important in building resilience. This includes attachment to place or the role of place in forming identity as well as the physical aspects of place such as the natural and built environment that influence everyday practices of resilience (Brown, 2016). Brown stresses that rootedness need not always be positive and in fact could be a force which divides or alienates (Brown, 2016). This understanding of rootedness can help to explore the concept of trade-offs, where building resilience in one place or at one scale may decrease resilience at others.

Resourcefulness refers in part to the issue of access to resources that individuals and groups may draw on to build resilience. However, Brown's conception of the term also includes the capacity and initiative to employ those assets at the appropriate moment, meaning that resourcefulness is critical to both responding to shocks as well as to "strategise, plan and manage change on a daily basis" (Brown, 2016, p.199). Brown's understanding therefore uses resourcefulness to include innovation, social learning and

social capital, which are important elements of resilience. In this view, ideas of local or indigenous knowledge are critical in order to understand how resources are identified and employed in the face of change. This relates to the idea of rootedness and the importance of place to building resilience, as resources, assets and their associated strategies will be strongly situational.

Drawing on ideas of rootedness, resistance and resourcefulness, this study offers an in-depth examination of how individuals and groups in Phnom Penh are responding to the co-occurring processes of urbanization and environmental change. This analysis will show how residents are engaged in coping with or adapting to changing social-ecological conditions, recognizing that this is a snapshot in time of a continual process. Brown (2016) recognizes shortcomings in the use of systems language, such as capturing the influence of ecology in social-ecological systems. To this end, she proposes extending the concept of agency to non-human actors, in line with notions of hybridity or 'socio-nature' which are central to the urban political ecology literature. This study will limit the use of systems language and instead focus on the process of urbanization from a political ecology perspective, which sees the urban environment as a hybrid of society and nature.

This research investigates the agency of residents of Phnom Penh to shape the creation of urban space, as well as the influence of ecology on the same process. However, acknowledging that these everyday practices do not occur in a vacuum and are in fact shaped by both structural forces and the agency of other actors, notably the neopatrimonial character of the Cambodian state, the research additionally provides an analysis of the contextual factors that shape the environment in which adaptation decisions are made. To this end, I will undertake a discourse analysis of resilience policy at the local and national levels. Using the principles of political ecology outlined above, this assessment will examine the way knowledge of resilience is produced and operationalized in the Cambodian context to reproduce existing power structures. This will question the outcome of resilience policy and whether it is compatible with ideas of transformational change, particularly as it relates to the social contract in Cambodia.

This work will draw on the framework set out in Adger et al. (2001) which used discourse analysis to show how dominant and competing discourses have been created with respect to various environmental issues at the global level, including climate change. Their work identified a strong 'managerial' discourse at the global level, which frames climate change as a problem of institutional failure that requires the correct application of policy measures (particularly market based) in order to solve it. This is in contrast with a 'populist' discourse which employs a narrative of inequality but often portrays people in the developing world as passive victims. Their approach used three entry points which I will also include in this research: "analysis of regularities in expressions to identify discourses; analysis of the actors producing, reproducing and transforming discourses; and social impacts and policy outcomes of discourses" (Adger et al., 2001, p.684). My approach will balance a linguistic analysis of text and speech with an interpretation of how language is employed to reproduce relations of power. As discourses reflect the social practices in which they are produced (Hajer, 2003), I will examine the actors involved in shaping, employing and contesting resilience discourse in Cambodia. Finally, I will explore the implications of the existing discourse around resilience for climate change policy and urban planning in Phnom Penh.

Chapter 3: Methodology

3.1 Research Questions and Analysis Overview

Recognizing the lack of research available on the impact of environmental change on urban poor communities in Cambodia, this research looks at how processes of urbanization and environmental change are experienced by low-income residents in Phnom Penh. The study has identified an important knowledge gap in terms of understanding how marginalized urban communities influence and respond to these processes of change. Key questions guiding this research include:

1. How are low-income residents of Phnom Penh affected by the process of environmental change (including climate change)? How do other forms of socio-economic marginalization influence this?
2. What are the historical conditions that have shaped the present reality for low-income residents of Phnom Penh in terms of their vulnerability to environmental change?
3. How are low-income residents responding, individually and collectively, to the changes they are experiencing as a result of urbanization and environmental change? What are the outcomes of these actions?
4. How is the concept of 'resilience' being employed as a policy objective in Cambodia? Does the presence of a resilience agenda improve conditions for low-income residents facing challenges related to environmental change in urban areas?

These research questions have been modified since this study was initiated. Changes have been made in the wording of questions to avoid (to a certain extent) the use of language that could be considered ambiguous or politically charged. Additionally, questions have been modified to be more inclusive of the historical factors that have shaped the present day conditions of low-income residents and the need to recognize the interconnection between multiple processes of change, in this case urbanization and environmental change, that impact the ability of all people to secure their present and future needs.

This chapter will give an overview of the decisions taken in the design of the research and the factors affecting its delivery. This includes a discussion of the limitations of the study which are identified in each section and elaborated on in Section 3.4.2 Limitations.

3.1.1 Positionality

As a foreign researcher in Cambodia, the way I was perceived by my interlocutors heavily influenced the results of my research. While I made every possible attempt to conduct myself respectfully and with sensitivity, the reality of being visibly an outsider meant perceptions and assumptions on both sides influenced my relationship with the residents of the village where I conducted my field work. Although accompanied by a local Research Assistant, I was conspicuous in the community where the majority of the research took place, which was on the outskirts of Phnom Penh. In 8 months of near daily visits I saw only one other foreigner. I tried as much as possible to conduct myself in a manner that showed respect for my respondents and their culture such as dressing modestly, greeting people formally in Khmer, removing shoes etc. My Research Assistant played an important role in providing advice about cultural norms and conduct. As a gesture of appreciation for the time spent with me, I brought grapes or other fruit for all interviewees.

Many people assumed that I was working for an NGO. This perception of my reason for being in the village likely shaped the type of information I was given. It is possible that respondents were inclined to discuss the things they needed and that they expected an

NGO worker to be interested in such as upgrading infrastructure, rather than going into depth about their personal reactions to the change they were witnessing. With the help of my Research Assistant, I tried to explain my role as a student and that I was not going to be starting any projects in the village. This explanation was widely accepted, and people seemed curious to speak with me regardless. I ended every interview by offering time for the respondent to ask me questions about myself or my research. For the most part this offer was not taken up but on a few occasions, particularly with older men and women, they asked questions about life in Canada and why I had chosen to come to Cambodia.

As a former employee of international NGOs, this interpretation of my positionality was not unexpected, though I was keen to distance myself from any organizations working in the village as I wanted to remain independent of pre-existing relationships and the expectations that they might carry. My experience working for NGOs made me very interested in how village residents perceived the support they received and by the end of my research I became quite sceptical of the value of much of the work being undertaken. Though interviews with NGO representatives would tout the benefits of their activities, for the most part awareness that they were even present in the village was very low.

Within the village where most of my research was conducted, my age and gender were not a barrier to access although I acknowledge they doubtless shaped my experience in ways that I am unaware. Having given birth to my son shortly before beginning my field work, I had expected the reality of motherhood to be an opportunity to build a connection with my interviewees. However, the disparity between the socio-economic environs in which I was raising my child and the reality of life in an urban informal settlement made attempts to use this as a common ground feel disingenuous. Rather than trying to share information about myself, I focused on creating a sensitive and respectful space for people to tell their stories by asking engaging questions, showing interest in answers and allowing the conversations to grow organically. As I returned to the village regularly, I would also try and greet individuals that I had interviewed and follow up on conversations previously held. Although I was welcomed warmly by men and women of all ages, in general men were less willing to be interviewed, a situation that was also experienced by the Khmer men that delivered the household survey and so is unlikely to be a reaction to my gender.

Though I was made welcome in every home I visited, the political climate in Cambodia for the duration of my research was one of suspicion, which certainly influenced my behaviour and presumably that of my interviewees. The same month I began my field work the Cambodian courts dissolved the opposition political party, forcing hundreds of their members to either change allegiance, quit or flee the country (Sokhean and Dara, 2017). Several local human rights NGOs had also been blacklisted for accusations of collaborating with foreign powers to undermine the government (Sokhean, 2017; Kijewski and Chheng, 2018). By framing my research as a study of climate change rather than giving too much emphasis to issues of inequality or governance in my letters of introduction, I was able to avoid raising red flags with officials. Nevertheless, I halted my research during the election campaign period in July 2018 in order to avoid causing issues for my research participants, my assistant and myself. I was advised that any sort of public gathering, such as interviews outside of homes could raise suspicions and I did not want to bring negative attention to my field site.

Being a young woman was a slight disadvantage when interviewing senior officials, both government and civil society. While many spoke enthusiastically with me about their work, others were reluctant to engage with me and one memorable interviewee was openly hostile.

This tone was set at the beginning of the interview and was therefore not a result of any probing question I may have asked. Instead, I experienced an attitude of impatience despite the fact that all interviews were conducted voluntarily. I interpreted this as an attempt to claim power, perhaps out of a sense of discomfort with being questioned by a foreign researcher. This may have been exacerbated by my inability to speak sufficient Khmer which could have put pressure on respondents to speak in English. To counter this possibility all interviewees were given the option of conducting the interview in Khmer with a translator present.

This attitude was not the norm but it did colour a number of my interviews. Interestingly, this attitude was more common with representatives from local NGOs whereas I found government officials at both the local and national levels to be professional and forthcoming. In a few cases, interviewees were visibly nervous about being interviewed. This was mostly the case when organizations were approached for an interview and it was delegated to a junior member of staff. At these times, the representatives appeared uncomfortable to speak with me, resulting in either confused or very brief answers to my questions. I dealt with this challenge by trying to make the conversation informal and giving lots of scope for them to speak about their own work, regardless of its relevance, in order to build trust and a level of comfort before moving on to my specific questions. This strategy was successful and interviews typically finished with a congenial tone.

In addition to my own positionality, the presence of my Research Assistant, PHAN Soumy[1] had its own influence on the interview process. Very much the embodiment of the young, modern Cambodian, Soumy also appeared as visibly an outsider to the villagers of my study site. Yet, his experience as a journalist made him adept at sparking conversation with anyone, facilitating interviews and eliciting critical information. He also developed his own intuition for the direction of the research and would often suggest pertinent follow up questions based on his thoughts about the responses given. He was open and unpretentious in his demeanour which put people at ease, despite the unusual nature of being approached by a foreign researcher.

3.2 Qualitative and Quantitative Research in International Development

This research starts from the position that there is value in pursuing research that is context specific and grounded in the reality of a particular case (Flyvbjerg, 2006). It further accepts that the knowledge produced through the study of human activity is the result of the interaction between researcher and research participants and therefore sees critical self-reflection as part of the research process (Kobayashi, 1994; Haraway, 1991, Roulston, 2014). Given this understanding, the results of this research are necessarily context specific and derive from the complex history, both individual and collective of the research subjects as well as my own. As such, qualitative methods are the most relevant for uncovering the depth and breadth of knowledge necessary to paint a detailed picture of a particular case. Qualitative methods, such as interviews and focus groups are adaptable, allowing the researcher to direct the research while also providing flexibility for interviewees and additional information to influence the direction and content of the research (Chambers, 1983). In this research, qualitative methods were also used in an iterative manner, with previous findings being incorporated into and therefore shaping subsequent interview questions.

[1] Soumy expressed his preference for his name to be referenced in the traditional Khmer manner, surname in capitals followed by first name.

While the use of qualitative methods allowed this research to deeply explore a specific case, it does not prevent the use of this material for understanding broader trends and concepts. Lund (2014) argues that a case is defined by the researcher's choice of concepts to use as lenses through which to view their material. For example, this research begins with the prioritization of livelihoods and therefore a focus on the household level, rather than looking at urban systems which could equally have illuminated this particular case. It is through the process of generalization and abstraction through these lenses that a specific case draws broader lessons and contributes to both general knowledge and the production of theory. The abstraction from case to theory requires a process of evaluation of data which can appear to fit poorly with the openness of qualitative methods (Baxter and Eyles, 1997). This study used saturation methods as well as triangulation to increase the rigor and validity of the claims that are made based on the data collected on this specific case.

Due to the desire to have relevant findings for public policy, qualitative research methods were complemented by a household survey in order to derive substantiating quantitative data. Although qualitative data does not inherently require quantitative data to prove its legitimacy or use, a bias towards quantitative or what is perceived to be more 'scientific' data is often observed amongst policy makers (Picciotto, 2012). As such, the household survey was delivered after the majority of the qualitative interviews were conducted and was designed to generate evidence for straightforward messaging to a policy audience about the risks and adaptation strategies identified within the study area.

3.3 The Study Design

This research primarily relied on qualitative methods in recognition of the subjective nature of the lived experience of environmental change and urbanization. The main approaches were interviews and focus groups which were complemented by personal observations. Additionally, a quantitative survey was conducted which focused on adaptation practices of one community as well as the barriers to action. These methods were chosen in an effort to triangulate findings. As far as possible, information was confirmed through multiple sources and/or methods. An overview of the research methods is provided in Table 3.1 and each method described in more detail below. As this study tried to take into account the differing experiences of men and women in the study area, the number of respondents is broken down by gender in the summary table.

Table 3.1 Methods Overview

Activity		Number	Individuals Reached	Male	Female
Semi-structured Interviews	**Village Level**	47	66	21	45
	Key Informants	36	45	33	12
Focus Groups		4	28	7	21
Household Survey		1	100	22	78
Personal Observation			N/A		

3.3.1 Case Study Selection

This research identified and examined communities experiencing the simultaneous impacts of urbanization and environmental change in Phnom Penh, Cambodia. During the initial scoping phase, I conducted interviews in three locations representing areas of the city that were reportedly vulnerable to natural hazards, including floods, storms and heat. These locations were chosen based on a review of secondary materials, including NGO research on urban disaster risk which identified areas of flooding (Flower and Fortnam, 2015). In addition to biophysical risk, the scoping identified areas of socio-economic deprivation in order to include representation of low income residents in the study. Recognizing that vulnerability to climate change intersects with, but is not exclusive to households living in poverty, I identified areas of the city that were primarily low income or containing mixed demographics. This was achieved through secondary research, interviews and direct observation. In addition, all the locations assessed are home to informal settlements. While this study did not set out to look at informal settlements specifically, the overlap between the marginalized populations of Phnom Penh and the communities living in informal housing meant that a large number of interviewees lived in these housing arrangements. Informal settlements are versatile and claim any available space including riverbanks and rooftops, both of which were included in this study.

I also included experience of climate and/or environmental change in my selection criteria for a research location. First contact was made with one community through a local NGO working on disaster risk reduction in Phnom Penh. Program staff from the NGO facilitated introductions but did not stay to listen to any of the interviews. Approximately ten interviews were conducted in this location, on the southeast side of Phnom Penh. However, I did not pursue this further as most of the environmental challenges were historical in nature and recent infrastructure upgrades undertaken by the local government meant that flooding and other natural hazards were not urgently an issue. The learning from the interviews conducted has nevertheless been incorporated in this research where applicable.

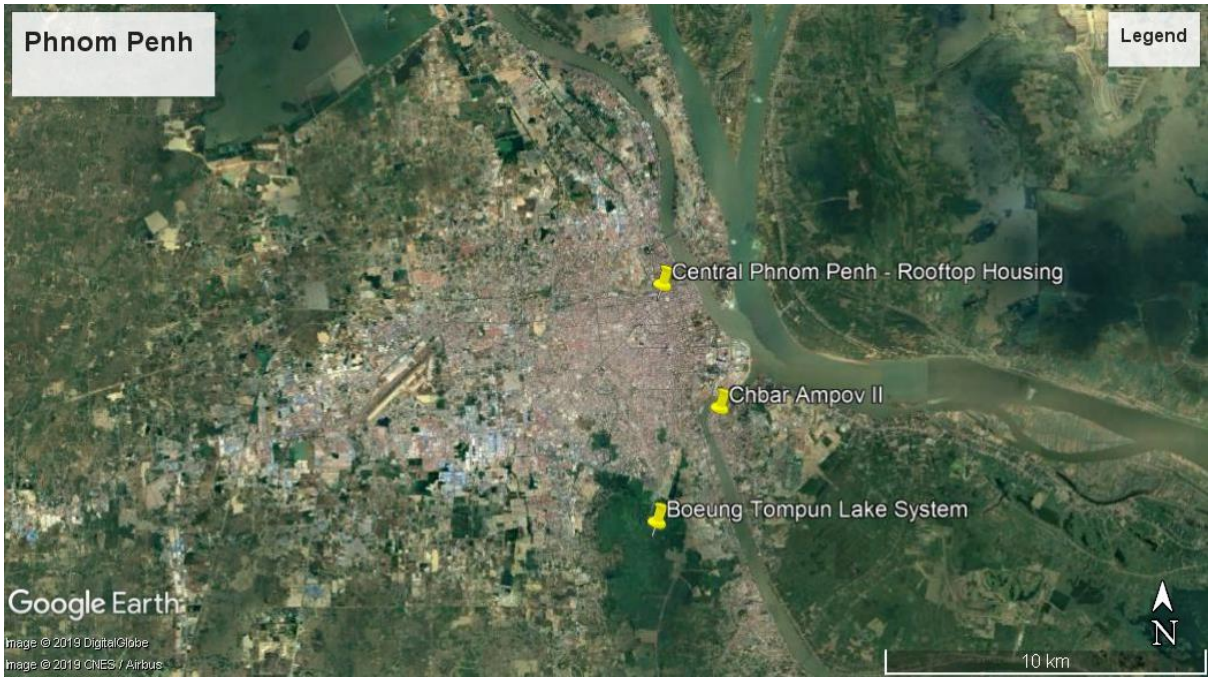

Figure 3.1 Map of Phnom Penh with Case Study Locations
Source: Google Earth, 2019a

Subsequently, a small number of interviews were conducted with residents of a rooftop settlement in central Phnom Penh. Informal rooftop housing is a unique feature of the city and I made initial attempts to find out more about it. A potential site was identified by my Research Assistant under my direction and contact was made by approaching residents directly after walking up from the street. I returned to the rooftop on two other occasions and did four interviews in total. While these interviews were fascinating and told an unusual story of the formalizing of an informal housing arrangement over time, as well as families eking out a living in the city centre, security concerns forced me to abandon this site.

Increasingly, the number of informal settlements is decreasing in the centre of Phnom Penh and rising in the outskirts (STT, 2018), due in part to evictions and relocations of poor communities from valuable inner city real estate as well as rural-urban migration. A peri-urban community was therefore included in the initial assessment and became the primary focus of this research. My Research Assistant had previously been to the area with another foreign student completing his Master's in photojournalism and was already familiar with the community. We initially set up an interview with an existing contact but after that I initiated the majority of the interviews informally by approaching people at their homes or in local businesses. The interviews were conducted in the afternoons as most residents worked as farmers and were away from their homes in the morning.

This research is primarily focused on the results of interviews and focus groups from one site on the outskirts of Phnom Penh, while incorporating evidence from two other sites as well as interviews with informants from government, civil society and other stakeholders. Findings are therefore representative of this specific case but contribute to wider knowledge creation by confirming or contradicting existing theories, specifically those related to urban resilience.

3.3.2 Observation

I was resident in Phnom Penh for the entire duration of the field work period of approximately one year from November 2017 to December 2018[2]. This extended period of residency, which included relocating my family to Cambodia, greatly facilitated the immersive experience which allowed me to become familiar with the social-ecological context of this study. As an inhabitant of the city, living within a 15-minute motorbike ride of the study area, I experienced the changes in season alongside my interlocutors as well as bearing witness to local events that shaped the political and economic context such as the dissolution of the main opposition party in November 2017 and the subsequent elections in July 2018 which saw the ruling party re-elected.

First-hand observation can be an important complement to interviewing as it allows the researcher to verify or add to what has been reported during interviews (Roulston, 2013). In living close to my study site, I was able to visit regularly over the course of a full year which was of immense value in understanding the daily lives of the research participants. For example, I witnessed how conditions changed depending on the season. I saw how the community coped with intense heat during the hot months of April and May as well as how they managed flooding during the rainy season, particularly in July and August. As a Phnom Penh resident, I also became familiar with the institutions that govern the city from the local Sangkat councils to the Phnom Penh Water Supply Authority. While this is not knowledge that required residency to obtain, first-hand observation certainly contributed to the depth of my familiarity with the context of my research.

[2] I arrived in Phnom Penh in October 2017 and continue to live in the city to the present day (January 2020).

Throughout my stay in Phnom Penh, I also made connections, both personal and professional with the NGO community. This was a distinct advantage in terms of being able to attend events that related to my research area. For example, as my field work was finishing a consortium of NGOs was beginning a community consultation process related to developing a 'Master Plan' which would set out a vision for the future development of the area led by community members. This was intended to be used by village residents in negotiation with municipal authorities or to attract private sector investment for their vision. Both the process and the final result of this consultation gave great insight into the priorities of the community as well as the ways they are perceived and treated by the NGOs that work there. My ongoing presence in the study area and Phnom Penh in general allowed me to be on hand to witness this.

3.3.3 Interviews

In total, 47 interviews were conducted with residents of low-income areas in Phnom Penh, with 66 total respondents (See Table 3.2). Interviews were typically conducted at people's homes or occasionally at their place of work. Most interviews took approximately one hour and interviewees were encouraged to go about their day as usual while we were present, such as preparing food, greeting neighbours or pausing to take a phone call. Often family members, friends or neighbours would join an interview as it was in progress. This was noted in interview transcripts.

The majority of the interviews were conducted with women (68% of total respondents). Men were often absent from the research locations, being employed in other areas of the city in the construction industry or working as tuk tuk drivers, for example. At other times, men were present in the home but were sleeping, watching tv or otherwise engaged in private activities. Men often told us when approached directly for interviews that it would be better if we spoke to their wife. These were good natured exchanges and seemed to indicate a general sense that their wives were the ones that did the talking, rather than a reluctance to engage with the research specifically. These men often stayed to listen to the interviews but spoke only a little. In other instances, men were observed occupied with card games and other forms of informal gambling while women were at home, resting, cooking and caring for children and more amenable to being approached for interviews. This experience was replicated in the delivery of the household survey, to be discussed below, which was delivered by two male enumerators.

Table 3.2 Breakdown of Village-level Interviews by Location and Gender

Location	Male	Female	Total
Beoung Tompun area	17	29	46
Chbar Ampov II	3	12	15
Rooftop	1	4	5
TOTAL	**21**	**45**	**66**

The interviews were guided by a set of six question areas but flowed organically based on the responses given (See Appendix A). The areas were: demographics/livelihood strategies, experience of urban development, experience of environmental change, knowledge of climate change, individual or village-level adaptation strategies, support from local government or civil society. After the first four months this structure was changed slightly due

to reaching saturation levels in some areas while other ideas emerged. The revised interview structure included questions related to community cooperation and information sharing as well as expanding the scope of questions related to NGO interventions (See Appendix B). This revision helped to better understand what facilitated or prevented community organizing.

Key informant interviews were also conducted with government and civil society representatives (See Appendix C). These individuals were identified through online research, professional contacts and snowball sampling. Targeted sampling was also used when organizations were identified as playing a significant role in urban resilience in Phnom Penh in general or in the case study areas specifically. A total of 36 interviews were conducted of which fifteen were NGOs or civil society members, six were from the UN and other international organizations, five were donor representatives and nine were government representatives (local and national). I conducted one further interview with two local academics. Interestingly, but perhaps unsurprisingly, these interviews were predominantly with men with only twelve female respondents. All but six key informant interviews were conducted in English and transcribed either by myself or my Research Assistant. All quotes provided are direct. Slight modifications to quotes have been made to ensure clarity in a written format such as the elimination of repeated words, verbal pauses (um, so, etc) and grammatical mistakes where it did not substantially change the content of the sentence (e.g. changing a plural to a singular). Major grammatical changes were not made so as to ensure transcription did not interpret the quotes too heavily.

I assigned numbers in Nvivo to all transcripts or notes of interviews. These numbers were assigned arbitrarily and do not represent the chronological order in which these interviews were undertaken. The numbers are used throughout this text to reference specific interviews, such as when quotes are included. For example, “Flooding here can last for months.” (Interview_1, 2018). This method for referencing quotes was chosen to protect the anonymity of respondents but relevant characteristics such as age, gender or workplace (in the case of institutional informants) are included as appropriate.

Table 3.3 Breakdown of Key-informant Interviews by Gender[3]

Type	Male	Female	Total
NGO	14	5	19
Government	8	3	12
International Organization	5	2	7
Donor	4	2	6
Other (e.g. academics)	2	0	2
TOTAL	**33**	**12**	**45**

[3] See Appendix D for full list of organizations

3.3.4 Focus Groups

In addition to individual interviews, I conducted four focus groups in the main study site. Three were held in June and one in July 2018. The focus groups were organized with the assistance of village residents who had previously been interviewed and had shown an interest in the research and a willingness to support the study. Two focus groups were left open for anyone to attend, although many of the participants were long term residents of the village. Both focus groups were well attended by both men (6 total) and women (9 total) and contained a mix of ages (Range: 26-61). All but one of the participants practiced farming as their main livelihood strategy. This was not specified as a requirement but does reflect the general demographics of the village. I conducted an additional focus group with a group of four women who do not have their own plot of land but are employed as labourers to harvest crops from other farmers. Finally, I arranged a fourth focus group with nine young people (age 11 to 14) from the village (one boy and eight girls), which was also attended by their teacher.

I led all four focus groups with translation provided by my Research Assistant. I used a prepared list of themes to guide the discussion but again, allowed it to flow organically (See Appendix E). The themes were similar to those of the interviews, including experience of environmental change and urbanization but the focus groups included an emphasis on the future. I asked participants to discuss what they thought the village would look like in ten years as well as their personal feelings about that future and what plans they had for themselves and their families. The focus group with young people was slightly different and allowed them to discuss their experience of how the community has changed in recent years, particularly with respect to the construction of the road into the village. The youth focus group also explored their aspirations and intentions with respect to pursuing farming as a livelihood strategy.

3.3.5 Quantitative Survey

To complement the qualitative data, I developed a quantitative survey and arranged for its completion in mid-June 2018. The survey consisted of 23 questions, although the specific length varied depending on the answers given by each respondent (See Appendix F). There were four questions that were only asked of people who indicated that farming was their main livelihood strategy. Over the course of two weeks, I tested and refined the survey questions before finalizing the structure of the questionnaire. While the results of the draft version of the survey have been archived, they have not been included in the analysis due to the extent of modifications that I made to some of the questions. This included adding and removing options from questions that offered a choice of multiple responses. I wrote the survey in English and my Research Assistant translated it into Khmer.

After the questions were finalized, we recruited two enumerators to conduct the full-scale delivery. The enumerators were students, both men in their early to mid-20s, who were recruited by my Research Assistant through a local university. They were given an honorarium for their participation as well as travel expenses and phone credit. One of the enumerators worked in communications for a local NGO who was present in the area and was therefore already familiar with the village whereas the other had no direct experience with the area or the field of international/community development. Neither had previous experience as a survey enumerator.

Data collection was undertaken with Kobo Toolbox. Kobo Toolbox (www.kobotoolbox.org) is a free online tool that was initially designed for taking surveys in the humanitarian sector. The survey was uploaded into the online tool and data was collected in the field using an

app which sent the data back to the website. The enumerators downloaded the app to their phones, and I trained them on the use of Kobo Collect (the data collection app). I then downloaded the data from Kobo Toolbox for further analysis in Excel.

For the purpose of the survey, I divided the village into two sectors (See Figure 3.2). Sector A (marked in blue) included the paved road leading into the village from the main road and a small portion of the unpaved road near the lake and Sector B (marked in red) covered the large part of the unpaved road. I assigned each enumerator to a sector and they went house to house to deliver the survey in their sector. Before leaving for the field they were given copies of the survey in both English and Khmer, a letter of information on University of Ottawa letterhead which detailed my research and included my contact information and a map of the village. The map was provided by a member of the community and had been generated by a community mapping exercise run by a local NGO. With the help of my Research Assistant, I trained the enumerators on the specific survey questions so that they understood not just the language but also the intention behind the questions and could learn from our experience of delivering the survey during the trial phase. On the first day, my Research Assistant and I accompanied the enumerators who first watched us deliver a survey and then were asked to complete their own while we watched and supported them.

Figure 3.2 Map of Prek Takong Muy
Source: Google Earth, 2019b

After their training was complete, each enumerator completed at least 50 surveys independently. There are approximately 350 houses in the village so 100 was chosen as the saturation point as it was within the means of two enumerators but also large enough to paint a clear picture of the views and opinions of the community. Using the map, they conducted one survey per household unless more than one family were living in the same building. Thanks to the use of Kobo Toolbox, I monitored the data regularly as it was uploaded and therefore, I was able to check in with my enumerators to clarify any concerns and redirect their efforts as needed.

Residents chose who would answer the survey questions and this was overwhelmingly women (78%, n=100). The enumerators visited the village at different times over the course of one week (morning, afternoon and early evening) in order to reach a variety of respondents. They made notes of which households were unavailable so that they could return to them on different days. Thus, the sampling for the survey was intended to cover as much of the population of the village as possible. The large response rate compared to the total population size gives confidence in the validity of the findings but does not discount the possibility of some effects from the bias of the enumerators.

3.3.6 Discourse Analysis

This research employed a discourse analysis to: (a) key texts governing the climate change and urban planning policy environment in Cambodia; and, (b) 36 interviews with policy makers and other stakeholders. This analysis looked specifically at the use of the term resilience: who used it, how they used it and in what context. The main criteria for choosing which policies to examine was relevance to the research questions and influence on the decision making. Two such influential documents guiding environmental policy in Cambodia are the National Climate Change Strategic Plan and the National Strategic Development Plan. At the municipal level, accessibility of policy documents was an issue as many are not published publicly. I examined four plans: the Land Use Master Plan (the portion available to the public), the Drainage and Sewerage Plan, the Sustainable City Plan and the Transport Master Plan. I chose the Land Use Master Plan and the Sustainable City Plan as primary targets of the discourse analysis due to their influence on local decision making and relevance to climate change and resilience. The Drainage and Sewerage Plan is a highly technical document produced by JICA and therefore not representative of Cambodian policy priorities. I was never able to confirm the existence of a local level climate change plan. In addition to these texts, interviews with key informants were designed to provoke discussion about the meaning of resilience, its relevance to the Cambodia context, how it came to be a policy priority and the impact that it had on the role of the interviewee.

Discourse analysis is a frequent tool of political ecology, linking forms of knowledge production, institutions and power relations at multiple levels (Peet and Watts, 1996). Hajer (2003) defines discourse as, “a specific ensemble of ideas, concepts, and categorizations that is produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities” (p.16). Although there is no definitive set of tools to be used for discourse analysis, this research used the works of Wodak (2001) and Fairclough (2010) as a guide. Fairclough (2010) seeks to find a middle ground between the Foucauldian school of thought which focuses on power and a purely linguistic analysis by developing “ways of analysing language which address its involvement in the workings of contemporary capitalist societies” (p.10). Fairclough as well as Wodak recognize the importance of language, in both speech and text, as manifestations of power. This approach aligns well with the critical realist perspective often present in political ecology which

acknowledges the existence of a preconstituted reality but recognizes that our knowledge is always situated and contingent (Scoville-Simonds, 2009).

The form of discourse analysis used in this research balances concerns of power with an analysis of how resilience is employed in speech and text to examine the assumptions, omissions and metaphors that accompany its use. I applied a number of strategies in coding and analysing policy documents and interviews. These included attention to context (what other concepts were used in association with resilience), word choice (particularly for metaphors and terms which relate to the resilience spectrum such as coping, 'bounce back' and transformation) and actors - 'who' is associated with resilience in Cambodia. The analysis of interviews also took into account body language and other forms of non-verbal communication such as hesitations, intonations and laughter to interpret the speaker's feelings towards the subject matter. These clues were included in my notes during the interviews or at the transcription stage and then integrated into the analysis in Nvivo.

3.4 Data Collection

3.4.1 Translation

Upon arrival in Cambodia in October 2017, I engaged a private tutor and studied the Khmer language for two hours per week. I had wanted to have a basic understanding of the language to be able to follow the general flow of interviews and say a few short phrases. However, given the difficultly of Khmer for a native English speaker, I also engaged a Research Assistant to provide translation support for interviews. Interviews with community members were conducted in Khmer with translation from my Research Assistant. Quotes provided within this text are therefore paraphrased from what was said in Khmer. My Research Assistant's English language skills were exceptional and my confidence in the translation I received is high. However, there were a number of phrases critical to this research that resisted straightforward translation (see Section 3.4.2 Limitations).

3.4.2 Limitations

A number of limitations influenced the delivery of this research. First, was the time of day that I visited the research site. All interviews were conducted in the afternoon which was convenient for speaking with farmers who work in the early morning and are typically at home and available to speak later in the day. However, this meant that I did not often speak with people who worked in other occupations such as factory workers or in construction as they would be off-site during the day. Despite this, I made the decision not to visit the village in the evening or early morning to remedy this due to security concerns which village residents brought to my attention. I was made aware by my research participants that muggings were common after dark, due in part to the poor street lighting. Given the long days worked by factory and construction workers, it was not possible to seek them out during daylight hours. Since the number of people reported by the household survey working in other sectors appears to be low, this issue is not thought to dramatically impact the research findings. Instead, the research focuses primarily on the impacts of environmental change on farming.

For the household survey, despite the large percentage of households reached compared to the overall number of families in the village (approximately 30%), the small target population (just 350 households) complicated efforts at random sampling while also reaching a minimum sample size. As such, enumerators were asked to apply a quota sampling technique whereby they approached every house in the village, marking on their maps the ones that were not available and returning to them the next day. The risk associated with this

strategy is that some houses may have been avoided or only minimum efforts made to reach them due to the bias (conscious or unconscious) of the enumerators. However, the large sample size compensates significantly for the limitations in the randomization of responses. Information from the survey was also compared with interview data for verification purposes.

Another limitation of the survey was its inability to reach certain populations who were not present in the village at the time the survey was being taken. While efforts were made to visit the village at different times of the day as well as on the weekend, issues with security prevented the enumerators from delivering any surveys in the evening. Furthermore, the survey would not have reached any of the households living in stilted houses on the lake. Therefore, the responses are limited to village residents and do not reflect the concerns of families on the lake. A small number of interviews were conducted with families on the lake and thus a number of their particular challenges have been incorporated into the results of this research from those discussions.

As three different individuals (my Research Assistant and two enumerators) delivered the survey, it is possible that the meaning of questions and/or responses was slightly changed when they were asked and answered. Efforts to ensure consistency in how the questions were asked included providing enumerators with a written translation of the survey, conducting a training on the survey questions and co-conducting the first two surveys in the field with each enumerator (the first led by my Research Assistant with the enumerators watching and then each enumerator led a second with some guidance provided). However, the difficulty in explaining unfamiliar concepts to the survey respondents meant that a certain amount of improvisation was necessary. I conducted a debriefing session after the survey was completed to get feedback from the enumerators to find out what challenges and difficulties they had that may have affected results and any unexpected findings that would not have been clear in the raw data. I included the notes from this session in the research findings.

The responses for all research methods (interviews, focus groups and the survey) have a higher number of women responding. This means that the experiences of men are underrepresented in this study. Where possible, I have analysed my data in a gender disaggregated manner to identify trends in the responses of women and men. These have been included throughout the text. However, more work disaggregating the experiences of urban farmers, not only between genders but also in terms of age, would be valuable.

A further difficulty was encountered in communicating complex terms in a short time in another language. The first such term was climate change itself and while I intentionally chose not to use the term and instead talk more generally about changes in the environment, interviewees often interpreted this narrowly and wanted to talk about the current weather, particularly if it was an extraordinarily hot or cold or rainy day. Survey enumerators also had this difficulty despite being Khmer speakers. We attempted to remedy this by giving people a specific time frame to focus on such as; *What was the weather like when you first moved to the village or what was the weather like when your children were young?* The second term that caused issues in translation was resilience. I attempted to ask people about different elements of resilience using terms such as happiness, security and well-being but the responses I received did not fully address the concept. However, this process gave insights into the relevance of the term to the residents of the village and other concepts that are more significant to them with respect to their aspirations and desires.

Finally, I was hampered by a lack of transparency in the decision making processes related to urban planning in Cambodia. Certain critical documents such as the Phnom Penh Land Use Master Plan were difficult to obtain and verify. Furthermore, I had difficulty securing

interviews with key actors: I only managed to speak with one representative from Phnom Penh Capital Hall, while all interview requests at ING Holdings, the main private sector actor in my study location, were refused or ignored. This lack of transparency is included as an object of study as it speaks to the difficulty that citizens and civil society representatives have in participating in or resisting the direction of urban development.

3.5 Data Analysis

3.5.1 Transcription

Interviews conducted in Khmer with translation were transcribed simultaneously for key themes and phrases but not necessarily full quotations. I then reviewed all notes and added details, including my impressions such as tone of voice or laughter. The majority of interviews were also recorded and therefore when a particularly interesting statement was made, the audio recordings were reviewed by my Research Assistant and direct translations and transcriptions were made either of the entire interview, or more often the important segment. In the case of interviews conducted in English, which made up the majority of interviews with civil society and government representatives, I took notes simultaneously in the interview but also transcribed the audio recordings verbatim after the fact. Occasionally, through snowball sampling, interviews were conducted with representatives from organizations that were subsequently found to have little to do with the study area or the subject matter of this research. In these cases, I did not transcribe the interviews but the notes and audio files were kept in case they were needed. For the most part, I did the transcription myself but approximately five interviews were transcribed by my Research Assistant and then I reviewed them afterward.

3.5.2 Coding and Analysis using Nvivo

Upon completion of data collection, I uploaded interview and focus group transcriptions into Nvivo (version 12). I chose Nvivo as a data analysis tool due to its ability to facilitate the storing and analysis of qualitative data. In addition to interview transcripts, important policy documents were also added to Nvivo so that they could be coded using the same structure.

Coding of the data took place over a period of approximately 3 months. First, I read and reviewed the complete set of interview transcripts to review the emerging themes and ensure accuracy of the data (Yin, 2010). In some cases, I returned to the audio files to clarify or elaborate on a point that was unclear in the written record. Based on this initial read through a list of ‘nodes’ was developed which formed the basis for the coding of data. Key themes from the research questions guided the selection of first level nodes. These included resilience, adaptation, urbanization and governance. During the second reading of the interview transcripts, I coded passages either to one of the initial nodes or a new node that was created as further themes emerged. Coding helped to identify patterns and consistencies in the data which emerged as themes in this manuscript (Saldaña, 2009). The coding process was also useful in identifying responses that were inconsistent with other interviews and therefore noteworthy in their uniqueness. By the end of the coding process there were approximately 40 first level nodes, 120 sub or ‘child’ nodes and a small number of sub-sub nodes.

Table 3.4 First-level Nodes

Node (first level)	Number of files it appears in	Number of total references
Adaptation	40	92
Background	12	18
Climate Change	48	129
Community organizing	14	18
Corruption	9	12
Debt	26	36
Demographics	42	93
Don't know where to code	9	10
Education	20	31
Family support	7	7
Farming benefits	7	10
Farming challenges	30	95
Financial Management	1	1
Fishing	6	10
Future Plans	26	46
Government	20	96
Green Space	5	7
Health	16	20
Housing	23	38
Information sharing	11	17
Infrastructure	48	116
Institutional support	35	72
Intersectionality	18	30
Khmer Rouge	6	6
Land	42	98
Livelihood	45	100
Local Government	31	44
Marginalization	23	29
Market	5	6
Memorable Quotes	18	24
Migration	24	33
Policy	15	34
Religion	2	2
Resilience	39	106
Rice	5	6
Seasonal Floods	17	23
Uncertainty	25	48
Urban Planning	18	77
Urbanization	39	99

After completing the process of coding all of the interviews, I reviewed the nodes to eliminate ones which were not used or merge fields with significant overlap. In some cases, nodes that contained a lot of data were split into more specific nodes. I then reviewed the data with the

key themes from the proposed theoretical framework in mind. This process continued throughout the writing of the monograph. I regularly reviewed my notes to verify the validity of conclusions that I developed and to retrieve quotes to use as supporting evidence of claims.

Quantitative data from the household survey was analysed first using the in-built capacity of Kobo Toolbox which can generate reports on headline figures. Secondly, I exported the raw data to Microsoft Excel which I used to analyse both headline data and more in-depth analysis. For example, the data was reviewed to determine how people who identified farming as their only livelihood responded to questions regarding environmental change compared to other livelihood groups. I also looked at survey responses by gender to track key differences between the responses of women and men.

Chapter 4 - Unpacking Land and Climate in the Cambodian Context

4.1 Historical Briefing

Phnom Penh's geography is remarkable, dominated by the three rivers which meet at the city centre: the Mekong, Sap and Bassac Rivers. The city's location in a low-lying delta region means water has been an integral part of the city's history. Lakes and wetlands are found throughout Phnom Penh and the surrounding region. At one point these lakes played multiple roles in the urban fabric, as sites of recreation, supporting local food production, and providing flood protection through capturing rainwater run-off during the monsoon season (STT, 2015). However, as the city and its population has grown many of Phnom Penh's central lakes have been filled in to create land for urban development (Doyle, 2012a). This has generated new challenges in this rapidly growing city, from displacement of low income communities to concerns about flooding and wastewater management. As Phnom Penh looks towards the future, the city's officials as well as its residents are seeking ways to manage these challenges.

Phnom Penh's population has only recently been rebuilt after being reduced to almost nothing under the Khmer Rouge. In 1979, the Khmer Rouge evacuated the capital and dispersed the population throughout the countryside, to perform forced labour on collective farms (Osborne, 2008). The regime saw the cities as "breeding grounds for counterrevolution" (Chandler, 2007, p. 257). Peasant farmers were held up as an ideal while enemies of the revolution, including urban dwellers, the educated and ethnic minorities were treated harshly and often killed. During the four year rule of the Khmer Rouge, around 25% of Cambodia's population was killed or succumbed to starvation, over-work and fatigue (Chandler, 2007, p.259). Tragically, the country's most educated, including those with skills in urban planning were amongst those targeted (Fauveaud, 2016a). Though Phnom Penh is now a thriving, modern city, this loss of capacity is evident in the limited urban planning mechanisms the city has had to guide urban development over the past forty years (Paling, 2012).

When the Vietnamese invasion in 1979 removed the Khmer Rouge from power, it launched a new period of extended violence and political uncertainty as multiple parties struggled to take control of the country. It was during this period of occupation that Cambodia's current prime minister, Hun Sen began his political career. A Khmer Rouge defector, Hun Sen fled to Vietnam and returned in 1979 as Minister of Foreign Affairs in the Vietnamese-backed puppet government (Morgenbesser, 2018). A charismatic and politically savvy leader, he quickly rose to power and has remained in control since the 1990s (Strangio, 2014). Hun Sen and the Cambodian People's Party (CPP) have secured virtual hegemony by eliminating any political opposition and building networks of patronage throughout the country (Chandler, 2007; Un, 2006; Hughes, 2003; Eng, 2016). The CPP's consolidation of power culminated in the dissolution of the only viable opposition party in November 2017, forcing members of sub-national governments that had been elected as opposition members to join the CPP or lose their position (Morgenbesser, 2019). The result of this action was that the CPP was effectively unopposed in the 2018 national election winning 100% of the seats (Ben, 2018a). The Cambodian government is now operating a virtual one party system. Notably, this victory passed with no public protest in Cambodia, indicating the degree to which dissent has been silenced (Morgenbesser, 2019).

Under Hun Sen's rule the country's resources including forests, minerals and agricultural land have been plundered for the private profit of CPP senior officials and their allies (Hughes, 2003; Milne, 2015; Beban et al., 2017). A visible symbol of this entanglement between senior politicians and entrepreneurs is the awarding of the title '*oknha*'. Traditionally a title bestowed by the royal family, it is now used by the CPP and specifically Prime Minister Hun Sen ostensibly to honour businesspeople who have made significant financial contributions to national development projects. However, the use of the title also serves to symbolically initiate the recipient into the 'elite pact' whereby they can expect favourable treatment in their business ventures in exchange for financial support and loyalty towards the CPP (Verver and Dahles, 2015; Beban et al., 2017). The patronage system that has resulted to prop up this elite pact is so complex and entrenched that the state apparatus is virtually inseparable from the CPP (Verver and Dahles, 2015).

This deep rooted patronage system enmeshed with a modern bureaucracy has led many to characterize the current Cambodian regime as neopatrimonial (Morgenbesser, 2018; Dwyer, 2015). The CPP's legitimacy amongst the Cambodian people is maintained through a combination of coercion and inducement. The elite pact is leveraged to invest in tangible projects such as schools that can be gifted to communities on behalf of the government, often in the name of Hun Sen himself (Milne, 2015). This strategy builds legitimacy through generating goodwill, which combined with shows of intimidation such as the jailing of opposition politicians and other mechanisms to elicit fear in the population, are enough to keep the CPP securely in control (Schoenberger and Beban, 2018). This has given the country's elite almost free reign to exploit the country's natural resources to their own ends.

Despite the fact that large parts of the country's wealth have been siphoned off for private gain, Cambodia has experienced a significant economic transition. Under the United Nations Transitional Authority in Cambodia (UNTAC) the door was opened to a free market economy (Springer, 2011; Hughes, 2003). This transition led to double digit GDP growth in the late 1990s and early 2000s and around 6-7% consistently since 2010 (World Bank, 2018a). The country achieved lower middle income status in 2015 (World Bank, 2019). However, the riches from this period have not been spread evenly. The country's Human Development Index value was 0.582 in 2017, placing it in the category of medium human development (UNDP, 2018). Cambodia's capital, Phnom Penh has grown into a modern metropolis while the countryside remains largely agricultural. Even within Phnom Penh inequality persists, with luxury developments transforming the landscape of the city centre and low income residents being pushed further afield (STT, 2018).

4.2 Urban Development in Phnom Penh in the Post-Khmer Rouge Period

Like many countries in Asia, Cambodia has one major urban centre, Phnom Penh, with other cities being significantly smaller, both in terms of population and physical size (World Bank, 2015). Governor Khuong Sreng, a member of the CPP, has led Phnom Penh Capital Hall, the municipal authority since he was appointed in 2017. The city is made up of twelve districts (khans), which are further sub-divided into 96 sangkats, the lowest administrative unit (Phnom Penh Capital Hall, 2019). The urban population growth rate for Phnom Penh has been one of the highest in the world for the past 20 years (Peou, 2016). Over this period, Phnom Penh has tripled in size and is now home to approximately 1.5 million inhabitants, more than all other urban areas in the country combined (ADB, 2014). The capital is responsible for approximately 50% of the economic growth in Cambodia (Sasin and Sokha, 2015), making it a centre of growth and advancement. However, many are still excluded from this wealth. The Multidimensional Poverty Index of UNDP indicates 7% of the city's population lives in poverty (OPHI, 2018, p.9). However, many are facing forms of

exclusion including fragile food security, insecure land tenure and inadequate housing and lack of access to basic services (UNICEF, 2014).

Phnom Penh's particular pattern of urban growth has resulted in many improvements in public services and economic opportunities but it has also produced ecological degradation and forces of social exclusion. Private developments, and significantly (but not exclusively) foreign investments in high end real estate such as high rise condos and satellite cities have exerted a strong influence on Phnom Penh's recent urban expansion (Miahle et al., 2019; Nam, 2017; Fauveaud, 2016b). The lack of planning capacity within Phnom Penh's municipal government and an absence of political will to enforce what plans do exist, means private developments dictate urban form (Paling, 2012; Tudehope, 2012). The resulting process of urban expansion is fragmented and elements of the urban fabric that are not profit-making, such as urban green space, are not prioritized.

This lack of a high level vision has jeopardized the ecosystems that at one time supported the city. Situated entirely on a floodplain and with no central sewage treatment facilities, Phnom Penh is dependent on its lakes to perform essential services including flood protection and wastewater treatment (World Bank, 2018b). Between 2000 and 2015, an average of 1000 ha of built up area was added to the city every year (Miahle et al., 2019, p. 9). Much of this growth has occurred through a process of in-filling, where natural land, and specifically lakes and wetlands were converted into urban land; as of 2015, 6000 ha of aquatic environment had been filled (Miahle et al., 2019, p.9). A 2015 study indicated that of the 25 bodies of water which had been in the city's central districts prior to 1997, 15 had been completely filled in and 8 partially filled (STT, 2015). With the assistance of Japan, an ambitious, multi-phase program is underway to improve the city's inadequate drainage infrastructure; unfortunately it is costly, addresses only the central districts and will not replace the role the wetlands play in treating the polluted water before it is returned to local waterways (JICA, 2016).

Furthermore, historic patterns of settlement in Phnom Penh have marginalized low income residents who struggle to access appropriate housing. During the city's repopulation after the Khmer Rouge period, land and housing costs skyrocketed thanks to the influx of funds associated with the UNTAC expatriate workforce (Miahle et al., 2019). A class of wealthy Cambodians has also developed since the opening of the economy, putting further pressure on the local real estate market (Nam, 2017). With limited access to housing in the city centre, low income settlements sprang up on river banks, alongside open sewage canals and perched on rooftops (STT, 2018) (See Figure 4.1). The land claimed by these settlements is often marginal and exposed to biophysical risks such as flooding as well as having uncertain tenure status (STT, 2018; Flower and Fortnam, 2015). Over time, many informal settlements have gone through a process (often incomplete) of formalization, through the construction of roads and other infrastructure, land titling and the sale of hand-built homes to new tenants, such that the boundaries between the formal and informal housing markets are blurred.

Figure 4.1 Informal Settlement on the Rooftop in Central Phnom Penh
Source: Beckwith, L. (2017)

The legal situation regarding land ownership after the Khmer Rouge period complicated (and continues to complicate) housing issues for low income residents. As residents gradually returned to Phnom Penh after 1979, issues of land ownership emerged as a complex issue. Land ownership was outlawed under the communist regime, and in the aftermath, the process for recognizing ownership or reissuing land title was unclear. This situation was not normalized until the early 1990s under the administration of UNTAC. Unfortunately, an early (1992) land law equated ownership with possession, meaning those present on a given parcel of land could claim it for themselves. This was quickly exploited by individuals savvy or well connected enough to know how to satisfy the registration requirements, setting off a massive land grab in Phnom Penh (Un and So, 2011). In 2001 a subsequent law was passed which identifies several categories of land ownership: privately held land, state-private (meaning land that was held by the state but could be sold and developed) or state-public, i.e. land which was identified as having a 'public benefit' and therefore could not be sold (Sasin et al., 2015). Under the 2001 Land Law, natural lakes are classified as state-public land up to the water line in the dry season (except in an abnormal drought year) (Sasin et al., 2015, p. 27). In theory, this should mean that lakes are not available for development but in practice, as will be detailed below, this provision is not always followed.

Following the establishment of the 2001 Land Law, the national government initiated the Land Management and Administration Project (LMAP) with funding from multiple international donors to undertake systematic land titling. Though sporadic land registration was also taking place, LMAP was intended to facilitate widespread registration of land for those who were in legal possession as outlined in the 2001 Land Law, namely those whose occupation of the land was "unambiguous, non-violent, notorious to the public, continuous and in good faith" (Sasin et al., 2015, p.23). However, this project contained a number of

notable exclusions. For example, areas “likely to be disputed” would not be included as well as “informal settlements” (Grimsditch and Henderson, 2009, p. 2-3). This has meant the LMAP process was ineffective at improving land tenure security for urban dwellers, particularly combined with bureaucratic weakness and lack of political will to fully implement the law (Un and So, 2011). The combination of rampant land speculation and tenure uncertainty has led to an epidemic of evictions in Phnom Penh as low income settlements have little recourse or protection when their land is claimed for private developments.

In 2011, a study undertaken by local housing rights NGO Sahmakum Teang Tnaut (STT) identified 77 sites within the capital where forced evictions had taken place (STT, 2016, p. 1). Many of these communities were resettled at inadequately provisioned sites far from the city centre where their physical and mental health suffered as a consequence of the lack of water, food, appropriate housing and livelihood opportunities (STT, 2016; McGinn, 2015). Compensation for these evictions, which predominantly affect the urban poor, is often incommensurate with what was lost (Connell and Grimsditch, 2016; Hughes, 2006; McGinn, 2015). As there is no national regulatory framework to guide compensation arrangements, communities usually deal directly with investors or their agents with compensation ranging from a motorcycle to a valuable housing unit (Miahle et al., 2019). Furthermore, STT’s research uncovered that after 5 years, 25% of the 77 eviction sites identified in 2011 had seen no development take place whatsoever (STT, 2016, p.2), meaning that communities were relocated without even an accompanying benefit for the city in terms of an increase in houses, businesses or jobs at the sites.

The most notorious of these developments is undoubtedly Boeung Kak (Kak Lake), which prior to its in-filling covered 90 ha in central Phnom Penh (STT, 2015). Due to its location in the city centre, Boeung Kak was home to a thriving community of households and businesses as well as contributing to flood protection by absorbing rainwater run-off (Rith and Strangio, 2009). In 2007, a 99 year lease was signed between the municipal government and Shukaku Inc, owned by CPP Senator Lao Meng Khin (with Chinese backing) which called for the lake to be filled in to allow for the construction of a satellite city, featuring high-end residential and commercial establishments (Brickell, 2014; Kry, 2014). Although technically protected as a body of water according to the 2001 Land Law, after the deal was signed a sub-decree[4] was issued in 2008, retroactively converting the area from state-public land to state-private (Collins, 2017; Kry, 2014). In order to reclaim the lake for the Shukaku development, thousands of families were forcibly evicted and their homes destroyed, either intentionally or as a side effect of the sand poured into the lake (Brickell, 2014). The eviction of Boeung Kak residents was met with vociferous resistance from the individuals who were being forced out, supported by both national and international civil society (Kry, 2014). In particular, a number of women from the community stepped forward to lead the protests with some being repeatedly arrested for their actions (Brickell, 2014).

Despite the fervent resistance to the Boeung Kak evictions, the lake was filled (although it remains only partially developed) and urban development continues to take an indifferent stance on the preservation of urban ecosystems. Urban planning was a profession hit hard by the Khmer Rouge (Fauvead, 2016a) and the city developed without any documented plan until very recently. In 2007, the French government supported the development of a city Master Plan (until 2020), the 330 page *Livre Blanc*, but it was never officially signed off (Paling, 2012). Though no public criticism was made, its failure to secure final approval suggests that senior officials had issues with at least some elements (Paling, 2012). In 2015,

[4] The existence of this sub-decree is well referenced in many publications both in the academic and grey literature. However, the specific number of the sub-decree is not available.

sub-decree 181 was issued approving a Land Use Master for 2015-2035 but very little information about what is contained in the plan has ever been released to the public. The sub-decree is just 36 pages long and it is unclear how much of the *Livre Blanc* is to be carried through (STT, n.d.). The sub-decree has never been officially translated into English or French, though informal translations exist. The result is a weak planning environment which allows for private development to operate unchecked, essentially leading the process of urban planning rather than following governmental plans (Paling, 2012). This continues to be the case even after the approval of the 2015-2035 Master Plan, since Phnom Penh officials continue to lack capacity or political will to enforce what regulations are in place (Tudehope, 2012). The lack of enforcement has also not prevented the proliferation of other plans at the municipal level, including a Transportation Master Plan, Wastewater and Drainage Plan and the recently approved Sustainable City Plan. The actual implementation of these plans depends on many factors, but none more than the availability of funding. The Wastewater Master Plan for instance, is designed and funded by the Japanese and is therefore systematically delivered (Nishikawa, 2018). On the other hand, the Sustainable City Plan has limited funding attached (Phnom Penh Capital Hall et al., 2018) and it is therefore unclear how much of it will actually be put into place.

While the Land Use Master Plan had potential to represent a forward step in regulating urban planning in Phnom Penh, historic patterns of corruption and cronyism in land speculation see patterns of informality continue to operate at the centre of urban development (Fauveaud, 2016a). With respect to both large and small scale developments, using influence, such as personal and professional connections to operate outside of formal regulations is the norm rather than the exception. As will be discussed further in this monography, decisions are made behind closed doors preventing thorough analysis and public debate (Paling, 2012). This hinders the ability of urban planning processes to address the needs of all of Phnom Penh's citizens as those without political or economic influence have limited means with which to put forward their vision for the city.

4.3 Climate Change in Cambodia

The future of Phnom Penh is not only being shaped by the processes of urbanization but also environmental change. Cambodia ranks as 135th of 181 countries in the Global Adaptation Index with both high vulnerability to climate change, including risk of drought, floods and tropical storms, and low readiness to respond to these risks (University of Notre Dame, 2019). The country's climate is dominated by a tropical monsoon, which brings a rainy season each year from mid-May to early October. Additionally, the country experiences a hot season, from mid-March to June with temperatures peaking at a maximum average of 38 °C in April (Thoeun, 2015). Climate modelling shows that Cambodia is already experiencing climatic changes. Since 1960, annual average temperature has increased approximately 0.8 °C while the number of "hot" days (those defined as more than 10% hotter than average) has increased significantly, especially during the period of September – November (World Bank, n.d.). These trends are expected to continue with temperatures rising between 1.6 and 2 degrees by 2100 and rainfall by 3% to 35%, depending on location (Thoeun, 2015).

Climate Action is one of Cambodia's six priority Sustainable Development Goals (SDGs). In its Voluntary National Review of progress against the SDGs, the Royal Government of Cambodia (RGC) (2019a) states that due to the country's vulnerability to potential climate impacts, it has integrated climate action into high level planning documents including the National Strategic Development Plan (2019-2023) and increased public expenditure on climate change programming (p. 34). In its commitments to the Paris Climate Agreement,

Cambodia's Nationally Determined Contribution to the UNFCCC is a 27% reduction in greenhouse gas emissions (RGC, 2019b). The National Council for Sustainable Development (NCSD) coordinates Cambodia's response to climate change. Established in 2015, the NCSD is a multi-sectoral body that oversees the preparation of Cambodia's climate change policy framework including setting the Nationally Determined Contribution to the Paris Climate Agreement and developing the Cambodian Climate Change Strategic Plan (2014-2023) which gives direction to the country's mitigation and adaptation activities.

Cambodia also produced a National Adaptation Programme of Action in 2006, though as a strategic document it has been superseded by the Climate Change Strategic Plan (Interview_12, 2018). Under the direction of the NCSD, the Department of Climate Change (within the Ministry of Environment) is the technical focal point for climate change within the country and has, until recently, been responsible for the oversight of two major donor funded projects: the Strategic Programme for Climate Resilience, an initiative funded by the Asian Development Bank targeting investment projects in agriculture, water and infrastructure; and Cambodia Climate Change Alliance, a multi-sectoral, national capacity building program funded by UNDP and the EU along with the Swedish and Danish governments (Department of Climate Change, 2014a). Though Cambodia is lauded for its efforts to incorporate climate change into national policy making, its response is sometimes criticized for being internationally driven and lacking a genuine commitment from local policymakers to address the country's current and future risks (Käkönen et al., 2014; Christoplos and McGinn, 2016). Furthermore, climate change planning is virtually absent at the municipal level with no publicly available plan addressing the city's climate risks or strategies to address them beyond a limited discussion in the Sustainable City Plan.

Equally important as climate science and policy however is the local, lived experience of climate. Climate is embedded in social and cultural histories and practices which make sense of weather, including what is expected or appropriate weather, what is desirable and what are the causes of fluctuations or changes in these patterns (Hulme, 2017). In a recent national survey on knowledge and attitudes towards climate, just 42% of Cambodians felt confident that they understood the term climate change (Southall et al., 2019, p. 26). However, the lived experience of a changing climate was widespread: 85% of people surveyed noted an increase in temperature during the dry season (Southall et al., 2019, p.17). The lived experience of climate is another significant inequality in Phnom Penh. During the hot season, the city's wealthier residents can escape to air-conditioned homes and offices but low-income residents have limited access to such amenities. This is especially true for those who work outside, such as urban farmers. Similarly, the rainy season is experienced as a relief from the heat but also a season of flooding, which can impact both health and livelihoods (Doyle, 2012). Rich and poor alike are affected by the traffic chaos caused by heavy rainfall but due to historic patterns of settlement as well as recent evictions and relocations, lower income housing in the periphery is more likely to be directly exposed to flooding and flood events are more likely to last longer (Flower and Fortnam, 2015). More than one third of peri-urban poor communities in Phnom Penh experienced flooding which lasted more than 3 months per year whereas overall urban flooding in the city lasts for less than one day (Flower and Fortnam, 2015, p. 16). This forces poor families into difficult decisions to cope with these conditions such as travelling by boat, missing work or even abandoning the ground floor (or more) of their homes.

The intersecting phenomena of urbanization and climate change are presenting challenges for both the residents and decision-makers of Phnom Penh. As the city grows the relationship between the city's social elements and its geography is evolving, sometimes in

harmony but often in discord. The benefits and costs of this progression are not distributed equally but relate to other dynamics, including gender, age, race and socio-economic status. This research will explore how the experience of urbanization in a context of climate uncertainty is currently unfolding in Phnom Penh. It will examine how some of the city's most vulnerable residents live with (including their influence on) the way Phnom Penh is growing. By looking at the lived experience of climate change and urbanization, this study will bring to light the multiple ways that Phnom Penh's residents seek to secure their future amidst a transforming urban environment.

Chapter 5 - Life on the Margins of Phnom Penh: Past and Present

5.1 Introduction

In order to understand the everyday practices of building resilience in Phnom Penh, we must first understand the urban context and its specific characteristics, which shape the reality of urban dwellers. In line with political ecology, this understanding is necessarily grounded in history, as the present conditions are not neutral, but the result of a particular historical process, shaped by both structural forces and the actions of agents, operating at multiple scales. Before beginning my analysis in the next chapters of how resilience is (or is not) enacted by some of Phnom Penh's poorest residents, I will first address the multiple and intersecting forms of marginalization to which they are exposed.

This chapter is guided by Research Question 1: *How are low-income residents of Phnom Penh affected by the process of environmental change (including climate change)? How do other forms of socio-economic marginalization influence this?* I examine three cases within Phnom Penh (see Chapter 3 for map of case study locations) to explore how residents perceive and respond to environmental change, and how this relates to experiences of socio-economic marginalization. The perceptions of climate change will be central to this analysis as well as the ways residents live with the perceived changes, in line with an approach that highlights practices of everyday resilience making. While three locations were initially evaluated, one area was chosen as the main case study and as such the analysis of this third location is significantly deeper. The first two cases will be presented first, before proceeding to the third location, which is where the majority of field work took place and became my main case.

Table 5.1 Overview of Case Studies

Case Study	Location	Demographic profile	Main Livelihood	Experience of environmental change	Factors of socio-economic marginalization
Chbar Ampov II	City Centre/Periphery	Mixed socio-economic strata	Market sellers, small business, casual labour	Noticing unpredictable rainfall but minimal impact on daily lives	Improvements in infrastructure co-produced by residents and local government Full access to government services (water, electricity and waste collection) Uncertain tenure status (informal settlements) – no current threat of eviction
Rooftop settlement	City centre	Primarily low income	Wage labour	Quality of life compromised by excessive heat and storms	Deterioration in condition of housing Poor access to government services (e.g. water and electricity) Uncertain tenure status – no current threat of eviction
Prek Takong Muy	Periphery	Primarily low income	Aquatic farming	Unpredictable weather patterns having serious negative impact on agricultural livelihoods	Absence of essential infrastructure (e.g. paved road, drainage) Poor access to government services (e.g. water and waste collection) Uncertain tenure status – current threat of eviction

5.2 Case Study I: Chbar Ampov II

5.2.1 Demographic Overview

Chbar Ampov II is a residential neighbourhood with a busy market as its focal point, located next to the Bassac River and minutes from one of Phnom Penh's biggest shopping malls. According to demographic data supplied by the District Governor's office, it is home to approximately 4,000 families (Personal communication, 2017). While the area is a mixed demographic neighbourhood with many middle-class families, on a narrow strip of land between the market and the Bassac River, a village made up of predominantly hand constructed wooden houses is home to hundreds of low income families (See Figure 5.1). Long-term residents interviewed as part of this study indicated that they have lived in this location for more than 20 years and over that time the village has grown and structures have transitioned from small huts to more permanent dwellings, some made of concrete and other durable materials.

The local market is the main source of employment for many low-income residents. Residents find employment either as vendors in or around the market or transporting goods for other sellers. Previously, interviewees reported that people would grow vegetables in gardens around the village but this type of gardening is no longer practiced. These days, men were also found to be employed as tuk tuk drivers and both men and women were fishing in the river. Men are also employed in the construction industry and interviewees reported that their daughters worked in the garment factories. It is common for wage labourers in industries such as construction or transportation to earn approximately 5 USD per day.

Figure 5.1 Village next to Bassac River in Chbar Ampov II
Source: Beckwith, L. (2018)

5.2.2 Experiences of Environmental Change

Interviews in Chbar Ampov II revealed that residents have noticed and are affected by environmental changes in their neighbourhood. As the village is located on the riverbank, flooding was identified as a problem. Previously, floods would cause water to enter the village and stay for months at a time (e.g. from July to December), forcing residents to use boats to move around and creating a serious hazard (Interview_32, 2017). At least two small children were reported to have died by drowning in recent years. However, a joint effort between the community and the local government to improve infrastructure in the area has helped to control flooding and stopped water from coming up from the river. In this co-financed effort, land was filled in around the existing houses and previously dirt or wooden walkways were paved. Along with housing upgrades, the in-filling has reduced the impact of the annual floods. While respondents mentioned that heavy rain would affect their livelihoods as it kept people away from the market, only one interviewee said they were seriously affected by flooding in past 2 years. She stated that the rains and floods would sometimes prevent her family members from being able to go to work leading them to borrow money from a microfinance institution to cover their costs once their savings ran out (Interview_30, 2017).

All interviewees confirmed that they believed weather patterns had changed and become more variable; hot weather was no longer restricted to the hot season but occurred unexpectedly at any point in the year. For the most part, respondents did not identify the level of heat as having a negative impact on their lives in a particularly serious manner. Only one interviewee, a seller in the market, mentioned that his wife used to be the one to staff the stall but due to her weight she suffered more from the heat and so he had taken over that responsibility (Interview_22, 2017). To manage the heat, most respondents reported using fans, throwing water on the ground to cool the area around their homes and staying inside during the day. One woman in the village stated that she would like to have more shade but they have no room to plant trees given the density of housing (Interview_31, 2017).

Although a study conducted by a consortium of NGOs ranked Chbar Ampov II as being highly vulnerable to disasters such as flooding, fire and landslides (Sasin and Sokha, 2015), interviews revealed an optimism about the development of the area. Residents were asked how they saw their community changing in the time that they had lived there and most interviewees felt that things had changed for the better. The area, especially the informal settlement, was described as being previously very dirty, trash was not collected and there was “mud halfway up your leg” (Interview_30, 2017). One older woman, resident in the area since 1991 said at that time the area was “anarchy” (Interview_32, 2017). The village had no piped water or electricity and there was just one communal toilet. Houses were small and made of wood, making them vulnerable to both flooding and fire.

By contrast, the current conditions are reportedly much improved. The area has been served with government provided water and electricity since 2008, allowing the residents to avoid expensive private suppliers. Overtime, long term residents have used their personal savings and loans to upgrade their residences, many of which are now built of more permanent materials such as concrete (Interview_24, 2017). Additionally, in 2015 a local NGO delivered a program to address waste management by training and paying local people to collect the trash while at the same time supporting community members to negotiate with the local authority for it to be picked up (Interview_36, 2017). These gains are recognized by residents and valued but are not assumed to be infallible. One family reported borrowing 1000 USD to rebuild their house after the first was burned in a fire. That loan took only a

year to pay off while the father was working but since he has lost his job transporting goods for market sellers, the family now subsists on what they can fish from the river and are uncertain about their future prospects (Interview_24, 2017). Interviews reveal this type of instability and insecurity is not uncommon.

5.2.3 Factors of Socio-economic Marginalization

The district government was unable to provide historic data on livelihoods or income in the area but anecdotal data from interviews indicates that the area is becoming wealthier. The location of Chbar Ampov II surrounding a vibrant market is likely to be a positive contributing factor. Additionally, the district benefits from easy access to the centre of Phnom Penh. In fact, the surrounding area is rapidly transforming from a peri-urban zone to a commuter community with enclosed residential developments or *boreys* under construction along the major road leading into the city. Although rumours have circulated periodically, the developments have yet to elicit any threats of eviction for the informal settlements along the riverbank. Their tenure status remains uncertain.

Thanks to the collaboration between civil society, local government and the residents of the area, investments have been made that have contributed to social inclusion within Chbar Ampov II. State provided electricity is widely available, infrastructure upgrades have reduced flood risk and informal settlements, despite the insecurity of their claim to land tenure, are not currently facing eviction. However, this does not appear to be the result of an explicit strategy to foster an inclusive community, but rather the informal villages have been the fortunate but indirect beneficiaries of infrastructure upgrades designed to protect the market from flooding and to enhance its role as an economic centre in the neighbourhood. These incremental improvements have alleviated some of the stress resulting from the risks posed by the village's marginal location on the bank of the river. Yet, there is no evidence that the underlying social and economic inequality has been actively targeted by any of these initiatives. While relations between the community and the local government are symbiotic at present, as the improvements have not come through channels which recognize or enforce their rights as citizens, their situation remains precarious.

5.3 Case Study II: Rooftop Housing

5.3.1 Demographic Overview

The second case study indicates that an advantageous location is not enough to ensure social or economic inclusion. Even when low income residents are able (or allowed) to remain within a neighbourhood as it benefits from investments of infrastructure and services, they may lack access to the benefits accrued by their wealthier neighbours. For example, a recent study on informal settlements in Phnom Penh showed that rooftop housing still makes up 9% of informal settlements in the city (STT, 2018). Many of these are located in the city centre, close to employment opportunities and urban amenities such as hospitals, yet the conditions of the inhabitants have not improved significantly over the decades they have been living there.

Residents living on the rooftop of a former guest house in the city centre participated in this research. Two interviewees had lived there more than 30 years, raising their children in small shacks that they built themselves on the rooftop using whatever material they could afford. One woman (age 60) said: "My son worked as motodop[5] driver, my oldest son. He bought bricks about 5 to 10 every day to build [the house]. Then my son built it by himself. Each day he laid around 5 to 10 bricks" (Interview_35, 2018). Families residing in these

[5] Motorcycle taxi

rooftop houses do not see their housing as an informal arrangement. These rooftop houses are bought and sold just as other real estate. One interviewee said she purchased a house on the rooftop for her children from the bank for 7000 USD, which the bank lent her to be paid back over 3 years (Interview_34, 2018). The distinction between the rooftop and the lower floors of the building is not one of category but of degree. The Deputy Village Chief (who lives in the building) explained that the residents on the first floor are well off and have their own private bathrooms whereas subsequent floors are progressively poorer until you reach the rooftop, which residents view as simply the top floor of the building (Interview_34, 2018). As you go up the building, an increasing number of households share each communal toilet with the rooftop dwellers having to go down to the floor below for their facilities. Additionally, the elevator of the building has been removed and the elevator shaft also converted into living space on each floor (Interview_34, 2018).

5.3.2 Experiences of Environmental Change

Though residents report that they have noticed an increasing unpredictability of weather patterns, this change in itself has not caused challenges. Rather, the difficulties the residents experience are related to the ongoing reality of living in dwellings unsuited for the climate of Phnom Penh. These rooftop houses have corrugated metal roofs and during the hot season the heat in their homes is unbearable. One woman (age 56) says that the heat is so strong even at night that she is sometimes unable sleep and is forced to sit outside until she is cool enough to fall asleep (Interview_34, 2018). This can be debilitating for the rooftop's older residents and complicates existing health conditions. Yet, even the cost of running a fan can be more than they can manage (see below).

Rain is also a problem for families on the roof. Although the houses have been upgraded from the thatched huts that were originally in place, the construction is haphazard, and rain flows through cracks and holes soaking the families' homes and their belongings. Storms are a bigger worry as they are exposed to strong winds on the roof and fear that their homes might topple in a particularly bad storm. Many seek shelter on lower floors, though even that is not a solution, as a bodhi tree which grows from the side of the building makes some residents fear that the entire building is at risk of collapsing. One interviewee stated that she had made three requests to sangkat and district officials to have the tree removed (it had been cut down once previously) but no one has come to take it out (Interview_35, 2018).

5.3.3 Factors of Socio-economic Marginalization

These rooftop houses provide benefits in terms of affordable housing in the city centre where other accommodation options for low-income residents are scarce. This rooftop settlement is close to places of employment such as restaurants where residents report working as kitchen or serving staff (Interview_33, 2017; Interview_34, 2018). However, because their homes are not part of the initial structure of the building, they are unable to access municipal services such as water and electricity and must rely on costly private connections through their neighbours on lower floors. Whereas the government rate for electricity is typically around 0.25 USD per kwh (STT, 2018, p.22), residents of this rooftop settlement pay almost 0.40 USD (Interview_34, 2018). This is a considerable increment given their monthly income. For instance, one household reported earning approximately 300 USD per month of which 100 USD went to cover the cost of utilities (Interview_33, 2017). One woman, a mother who raised her six children on the rooftop, makes just 80 USD per month working as a cleaner at a restaurant. She reports spending approximately 30,000 riels (7.5 USD) per month on utilities which rises to 15 USD in the hot season when she must use her fan regularly (Interview_34, 2018).

Despite the long term tenancy of the rooftop, there has been little improvement in the conditions to which residents are exposed, as evidenced by the lack of government services available to them. The greatest asset of the settlement is its location in the centre of the city close to employment opportunities. Yet, for older residents this benefit is losing its value as they are increasingly unable to work due to poor health. Two of the long term residents interviewed were beginning to tire of the difficulties associated with rooftop living such as climbing the stairs and carrying water for personal use. They felt that their best hope lay in someone coming to buy the building (Interview_34, 2017; Interview_35, 2017). Phnom Penh has had a number of high profile cases of poor communities being evicted from the urban centre and receiving compensation packages and new housing on the outskirts of the city (STT, 2016; see Chapter 4). Although the value of the compensation and the conditions of the new accommodation are debatable, these women did not see another way out of their situation which they are keen to escape. However, there is no guarantee that someone buying the building would recognize rooftop dwellers as legitimate tenants with claims for compensation. As such, their tenure status is uncertain. Furthermore, the capacity to negotiate the sale of the building has already proven to be unevenly distributed amongst the tenants, with the wealthier residents on the better equipped lower floors blocking potential sales in search of higher levels of compensation. The lack of clarity of the building's overall ownership seriously compromises the agency of the tenants and their ability to act according to their interests.

This case of a low income settlement in the inner city is somewhat unusual as most of Phnom Penh's low income residents are found on the city's outskirts; 80% of poor settlements are located in the outer districts (STT, 2018, p.7). Mixed residential neighbourhoods like Chbar Ampov II are becoming increasingly costly for the very poorest and rooftop settlements are disappearing as older buildings are destroyed or renovated. In the transitional zone of the city's outer limits, recent arrivals from rural areas meet residents who have lived in the city for generations. Factories are springing up, offering alternative employment options to a population who are still practicing many traditionally rural activities such as farming and fishing. The peripheral zone is also where the future of Phnom Penh's remaining lakes and wetlands is being contested. Though an essential part of the city's wastewater management infrastructure and the source of food and income for thousands of families, the lakes surrounding Cambodia's capital are rapidly being filled in to satisfy the demand for more residential and commercial properties for the country's middle and upper class as well as an increasing market of foreign buyers.

5.4 Main Case Study: Boeung Tompun

The Boeung (Lake) Tompun and Cheung Ek lake system is located south of central Phnom Penh and is a significant wetland for the city, providing essential wastewater treatment and flood protection functions, made increasingly important as other lakes, such as Boeung Kak, have been filled in. These two lakes are surrounded by extensive wetland areas which join the two bodies of water and which can expand by hundreds of hectares during the rainy season. This makes it difficult to determine the exact size. However, estimates suggest the Boeung Tompun-Cheung Ek lake system as a whole covers an area of approximately 1,300 hectares in the dry season extending to 2,000 hectares or more in the rainy season (Sovann et al, 2015). Additionally, the distinction between the two lakes is unclear and they are sometimes referred to as one lake, using only the name Boeung Cheung Ek (See Figure 5.2). For the purposes of this research, they will be considered as two separate entities, with the name Boeung Tompun referring to the lake closest to the city where the majority of fieldwork took place. While there are a number of communities living at various locations on

the shore of the two lakes, this research focused on the village of Prek Takong Muy on Boeung Tompun.

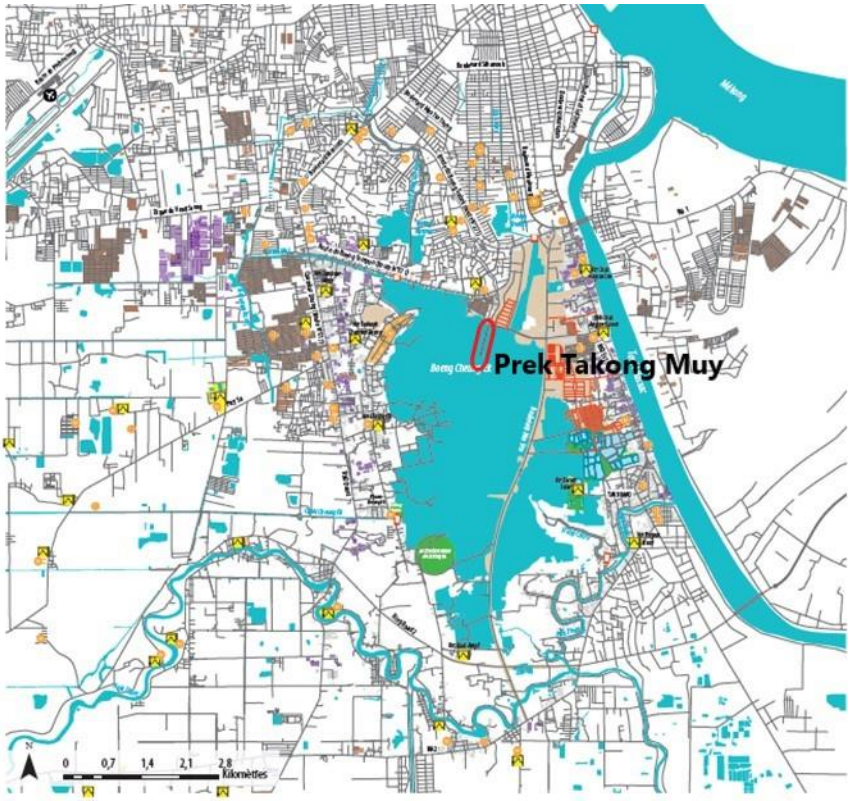

Figure 5.2 Map of Boeung Tompun-Cheung Ek Lake System
Source: APUR, 2019

5.4.1 Demographic Overview and Historical Analysis

Boeung Tompun is surrounded by small villages where rural activities are still practiced, though the area is rapidly being absorbed into the urban fabric. One such village, Prek Takong Muy, is located on a spit of land jutting out into the lake. Historically, residents report the area was covered in trees, which over the years have been cut down to clear the land for farming. Prek Takong Muy village is situated on land which is seasonally flooded and until recently boats were used during the rainy season as the primary form of transportation. The village is reached by a small road which connects it to a busy, main street in the southern part of Phnom Penh. About half of the road into the village has been paved by the District government (Interview_1, 2018). The second half of the road, furthest away from the main road, splits in two and offers two parallel dirt tracks with houses raised on stilts built along either side. Although most of the homes are simple wooden structures with sheet metal roofs, a few concrete homes have been built, including one for the Village Chief. One large home of a reportedly wealthy individual is hidden behind a high wall at the end of the paved section of road. At the furthest tip of the dirt road, surrounded by the lake, sits a large warehouse. This area is used for unloading vegetables that are brought in off the lake in boats and then weighed, stacked in trucks and taken by wholesalers to be distributed to sellers in the local markets.

Figure 5.3 Large Home in Prek Takong Muy with Gated Community in the Background
Source: Beckwith, L. (2018)

The village is home to between 350 and 400 families (Interview_2, 2018) although the commune (Chak Angre Leu) of which it is part numbers about 900 families (Interview_47, 2018). The mean household size in the village is 5.8 (n=100) and often comprise multiple generations or extended families such as parents, their adult children and grandchildren or adult siblings with their spouses and children. Data from the household survey conducted as part of this research indicates that 54% of residents have lived in Prek Takong Muy village for more than 10 years and 19% were born there (n=100). As the city is expanding southward the location is becoming more desirable and developments, including many large gated communities are springing up around the village (See Figure 5.3). The residents of these new gated communities will fall under the administration of the same local authority (Interview_2, 2018).

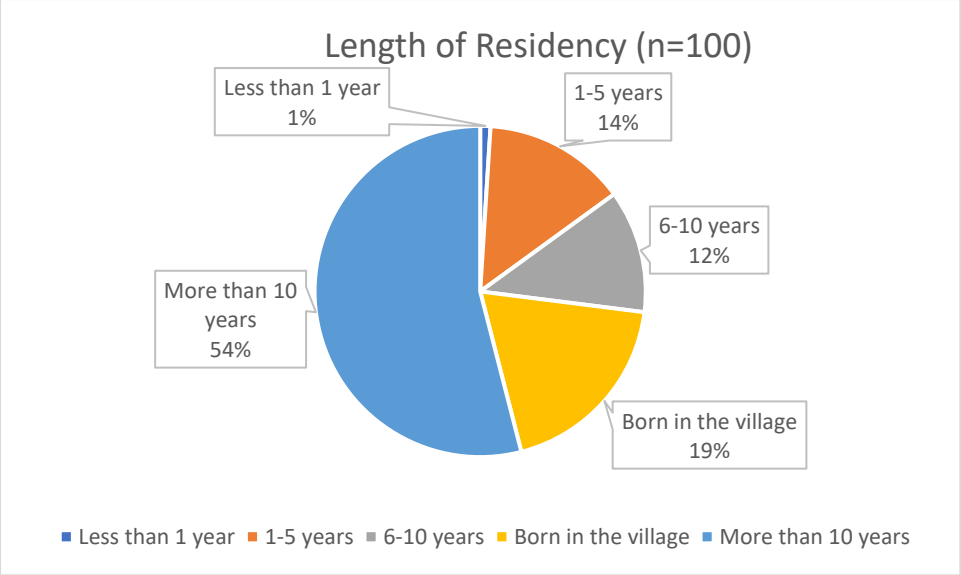

Figure 5.4 Length of Residency in Prek Takong Muy

Unsurprisingly given Phnom Penh's depopulation during the Khmer Rouge period, the origins of Prek Takong Muy village are unclear. A local councillor said that she had been working in the area since 1979 when there were only two or three houses and she was helping people find land for farming because there was a great need for food (Interview_1, 2018). One resident grandmother in her sixties said she was born in the village, so the area has been home to at least three generations for some families (Interview_48, 2017). In the days immediately following the Khmer Rouge period, the land around the village was still tree covered and though only about 8km from the centre of the city, was predominantly agricultural. In the 1980s, people who arrived in Prek Takong Muy came to farm. The lake was generously stocked with fish, there was clean and sufficient water to cultivate a range of vegetables and even in the dry season the falling water levels created an extensive shallow lake perfect for rice farming (Interview_63, 2018). This idyllic image is painted from the first-hand accounts of Prek Takong's residents and so is likely to be tinged with nostalgia, however even the village's younger residents (age 11 to 14) reported in a focus group conducted, that up until recently the area was something of an oasis: "I loved the scenery before. As I got up in the morning and came out of the house, I saw the pasture and morning glory fields. It was beautiful. It was so green" (Focus group_4, 2018).

The agricultural productivity of the lake drew new arrivals to the area, although the ambiguous status of land ownership began to cause complications soon after. Villagers report arriving in the 1980s and early 1990s and purchasing land in the village, although they could not be specific about who they purchased it from. As systematic land titling had not yet taken place the buying and selling of land took place outside of the governmental regulatory system. However, many residents have been able to secure a 'letter of ownership', issued at the village level. This is typical of the way formal and informal processes operate simultaneously in the real estate market in Phnom Penh, where land may change hands outside of the regulatory system before ultimately being recognized by the authorities. Though not as binding as full legal title, the 'letter of ownership' offers a small proof of residency which is critical in negotiations to issue full legal land title.

According to interviews, land was relatively cheap in the 1990s with a plot in the village costing around 50,000 riels or 12 USD (Interview_63, 2018). Twenty years later a similar plot would cost over 1000 USD. Additionally, villagers report owning not only the land where they built their homes in the village but also sections of the wetlands that they used for farming in

the 1980s and early 1990s. During the late 1990s this agricultural land was sold off to an "oknha" [6]. Residents are unable to say how this process started but it correlates with the period after the passing of the 1992 land law which scholars say led to an urban land grab (see Chapter 4). One resident recalled there being rumours at the time that the government was going to exert a claim on the land and as such, people felt it was best to sell before they lost their claim. In hindsight, he now believes those rumours were started intentionally to get people to give up their land (Interview_78, 2018). As the land was sold off piece by piece, residents felt forced to sell whether they wanted to or not. As one respondent put it: "He would always come to scare me: will you sell it or not? He said to my husband and grandfather, 'Do you sell it or not? I'm going to build a fence. You'll have to buy an airplane to fly out.' I was so scared as I was the last holdout" (Interview_59, 2018). This type of intimidation is characteristic of the way rural smallholders are disenfranchised as well, where threats and power asymmetries between sellers and buyers are hidden by what appears to be simply a thriving land market (Beban et al., 2017).

In addition to the fear wrought by these coercive tactics, ownership of the area that makes up the lake should simply have been illegal according to a representative from the Ministry of Land Management, as it ought to have been classified as state-public land (Interview_79, 2018). However, as part of the current plans for development of the area the government issued a series of sub-decrees transferring much of the lake from state-public to state-private land meaning it can now be held privately and developed. The initial sub-decree (Number 124) was issued in 2008 and restricted just 520 hectares of the lake system as state-public land. The sub-decree has been amended multiple times since to remove additional sections of the lake for local residents, private developers and to allocate land for the construction of a sewage treatment plan (See Figure 5.5). In this way, legal and illegal (or quasi-legal) practices operate simultaneously and in a complementary manner to facilitate the process of accumulation for Cambodia's elite. Widely held understandings of ownership based in occupation and land use have been pushed aside in favour of purchasing land through the market (Springer, 2013), while the strengthening of the legal system as it relates to land rights has legitimized the dispossession of the poor by creating the myth that they are "willing sellers" (Beban et al., 2017). Vast amounts of land (recently increased in value) have been transferred from public to private hands after the local residents have relinquished their claims through dubious land sales. In the short term, this will lead to the loss of any chance for compensation and in the long term, their livelihood, as their agricultural land is brought under development.

[6] See Chapter 2 for an overview of the importance of the honorific title 'oknha' to Cambodian politics and patronage.

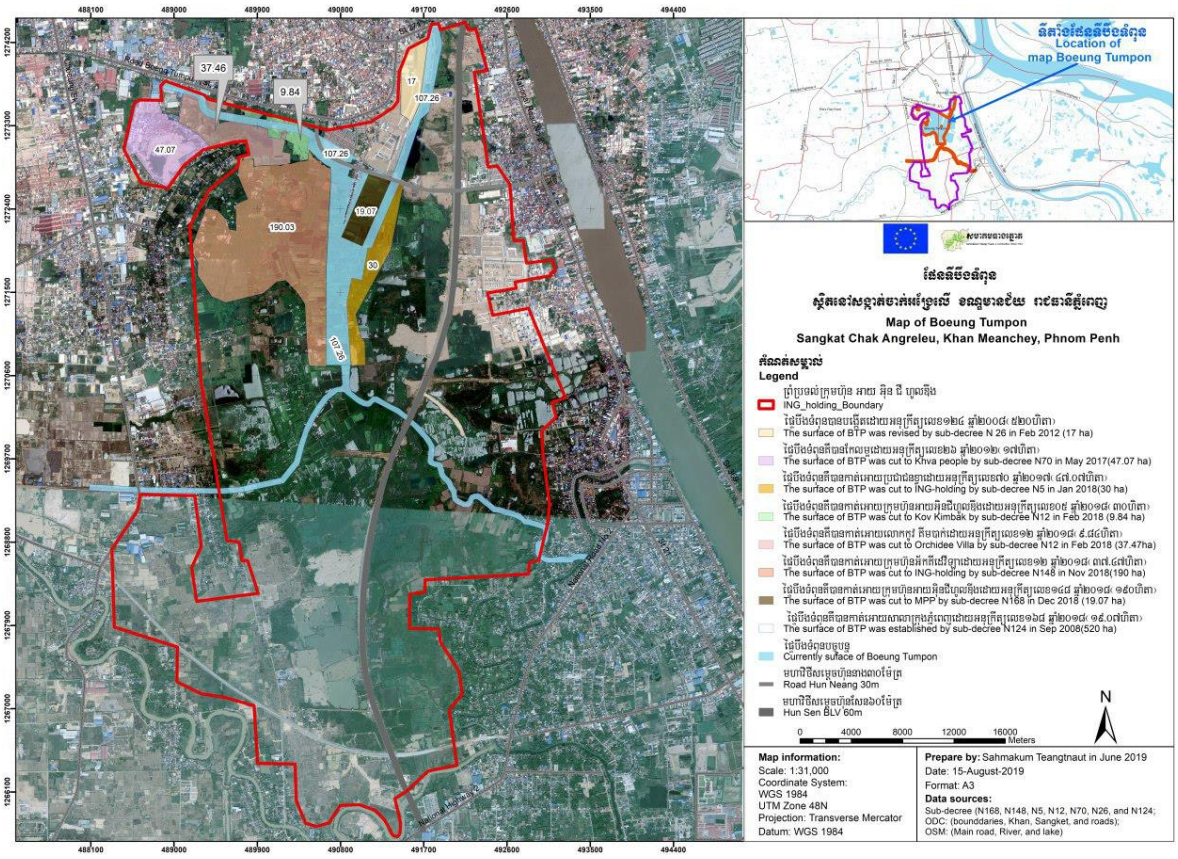

Figure 5.5 Map of Sub-decrees Granted on Boeung Tompun
Source: STT, 2019

Boeung Tompun is part of a 2,572 hectare development project known as ING City (boundary indicated in red in Figure 5.5), which is the largest of seven satellite cities planned for construction as part of a policy to make Phnom Penh multi-focal, thereby relieving congestion in the city centre (Interview_6, 2018). Phase I of the project, led by the Cambodian company ING Holdings is already underway, featuring the construction of high-end gated residential areas and luxury commercial centres. According to its website, ING City "shall be reflecting the 'Garden City Movement' with natural self-contained surroundings inclusive of residences, facilities and industry" (ING Holdings, 2015). It boasts of being fully supported by the Royal Government of Cambodia and in compliance with the 2035 Land Use Master Plan for Phnom Penh. The City's brochure describes how ING has been "reclaiming marsh areas" since 2004 to create "operational land", a process which will continue for the "foreseeable future" (ING Holdings, n.d, p.11). A City Hall official insisted that since bodies of water are protected under the 2001 Land Law, the in-filling affects only the "wetland" area surrounding the lake:

> …we had to well define in the southern [zone]. They have the lake and they have the wetland. The lake is protected and then some of wetland, farming land … private property, that's why you see many, many projects over there. But the lake still lake. Because the lake is very important. All the wastewater and rainwater during monsoon season from the central area drains into that area. It is protected by law. (Interview_6, 2018)

However, calculating the surface area covered by the sub-decrees in Figure 5.5 above indicates that all but 107 hectares have been transferred to private ownership. As the 2001 Land Law defines the boundary of the lake as the highest level of the waterline during the

dry season (except for an abnormal drought year) (Sasin et al., 2015), which for Boeung Tompun-Cheung Ek lake system has been measured at approximately 1300 hectares (Irvine et al., 2015), the development plans do not respect the letter of the law.

The construction of ING City is linked to both national politics and international geopolitics. ING Holdings is a Cambodian company and member of the AZ Group of Companies, founded by Oknha Ing Bun Hoaw (a former parliamentarian with the ruling Cambodian People's Party), Oknha Lim Rose and Oknha Lim Bunsour (ING Holdings, n.d.). The AZ Group holds influence at the highest levels in Cambodia as evidenced by the land concessions granted to another of their subsidiaries to undertake logging in a protected area (Aun and Woods, 2013). Though ING owns 45% of the development and acts as the management committee (ING Holdings, n.d.), the project is also being influenced by international actors – notably Chinese real estate developers such as R&F Group. Chinese investments in real estate in Cambodia have skyrocketed, fuelled by the need to occupy excess industrial capacity (Chen, 2018) and to ensure Cambodia remains an ally in the ASEAN region (see Chapter 7). Advertising along Hun Sen Boulevard indicates that many of the gated communities under construction are being targeted at an international market (predominantly Chinese). These connections to political and economic interests at both the national and international level mean that any attempts to challenge the direction of development would have to overcome significant and powerful resistance.

At present, Boeung Tompun receives approximately 70% of the wastewater run-off from Phnom Penh (APUR, 2019) which enters through two pumping stations (Tompun and Trabek stations) in the north end of the lake (Irvine et al, 2015). As Phnom Penh has no central sewage treatment facility, this water enters the wetland system containing multiple contaminants including nitrogen, phosphorous, *E. coli* and detergents (Sovann et al., 2015). Water flows south through the lakes before draining into a series of local rivers and eventually into the Bassac River (Irvine et al., 2015). A 2015 study showed that the aquatic vegetation in the wetlands (including that cultivated by local farmers) was very effective in treating the water before it reaches the Bassac River; for instance a 99% reduction in E. coli contamination was measured between the in-flow and out-flow locations in the lake (Sovann et al., 2015).

In addition to the in-flow of wastewater from the city, each year the lake system receives a 'fresh water pulse' which flows up from the Bassac River during the rainy season (Sovann et al., 2015; Irvine et al., 2015). Local residents report that this pulse, along with the increase in rainwater entering the city's canals, helps to dilute the levels of contaminants in the lake system during the annual floods. Local farmers described this process as essential to maintaining the quality of the water at a level adequate to grow vegetables and also to protect their health, as they are frequently directly exposed to the pollutants. However, although the development of ING City is still in its early stages, the in-filling of the lake has already compromised this pattern of water circulation. Hun Sen Boulevard, also known by locals as the "60 metre road" due to its unusual width, was one of the first major projects in the area. Built on land reclaimed from Boeung Tompun and Boeung Cheung Ek, it officially opened in April 2017. Hun Sen Boulevard's location effectively divides the lakes into two, wreaking havoc on water circulation in the lake. One small section retains access to the seasonal flood waters from the local river system that helps to clean out the contaminated water from the dry season. However, in the larger area water circulation has been compromised and the fresh water pulse has failed to reach farmers since the road was built.

Figure 5.6 Developments going up alongside Hun Sen Boulevard
Source: Beckwith, L. (2018)

The future of Prek Takong Muy within ING City is uncertain, although there are strong indications that the village will be allowed to remain and land tenure will be granted to those with appropriate paperwork. Communication between the municipal government and the villages affected by the development, including Prek Takong Muy has been scarce. Given the government's well-known history with forced evictions of urban informal settlements (see Chapter 4), it is no surprise that rumours circulated in the absence of reliable information, particularly once residents could see how the lake was being filled in. With the support of a local NGO, a group of community representatives visited City Hall to discuss the development plans with municipal officials but residents report that the meeting provided little clarity. Attendees were informed however that the development was part of a "Green City", though residents did not have any idea what that might mean. This information was offered to persuade them of the worth of what would replace their village and therefore as a strategy of legitimation for their potential displacement. Another piece of information that was frequently reported was that there was going to be a "reservoir" which might protect part of the lake from being filled (Interview_54, 2018; Interview_63, 2018). Both of these rumours are based in actual plans happening at city level, meaning that some accurate information was being transmitted to village residents. However, it was transmitted in such a piecemeal fashion that it was as though residents were playing a game of 'Broken Telephone' with municipal officials. The fear of eviction and uncertainty about whether or not they would be evicted and if so, compensated for the loss of their land has caused residents significant stress and anxiety. Prek Takong Muy residents have been assured that their village will be ringfenced within this project and are being accorded land title for their homes - although many still do not believe it.

5.4.2 Livelihoods

In Prek Takong Muy, the majority of families (69%) practice agriculture as their primary (and often sole) livelihood strategy (n=100), growing aquatic vegetables including *trakuon* (morning glory), *ploav kangkab* (frog's legs) and *kachaet* (water mimosa). The farmers are referred to locally as 'morning glory farmers', and I will also use this shorthand to refer to cultivation of all aquatic vegetables. These vegetables are grown directly on the surface of the lake, using ropes tied to poles to keep the plants from drifting away. In some areas around the lake, farmers are also growing lotus from which they sell the flowers, fruit and roots as well as keeping ducks to sell their eggs. Some are practicing fish farming in ponds constructed for this purpose. Many of those currently residing in Prek Takong Muy are the first generation of their family to move to the city and have taken to morning glory farming as a survival strategy. Leaving the rural areas due to a perceived lack of opportunity or because successive years of drought had destroyed their rural rice farms, many of these new arrivals took up jobs in the hospitality or construction industries but low and unreliable wages and poor working conditions made these positions unappealing. They were drawn to farming through social ties and for the advantage of having direct control over working hours.

While farming has been the main source of income in the area for decades, the nature of farming has changed in recent years. For instance, both rice farming and fishing used to be common in the lakes. Now however, interviewees report that the in-filling of the lake for development means the conditions are no longer suitable.

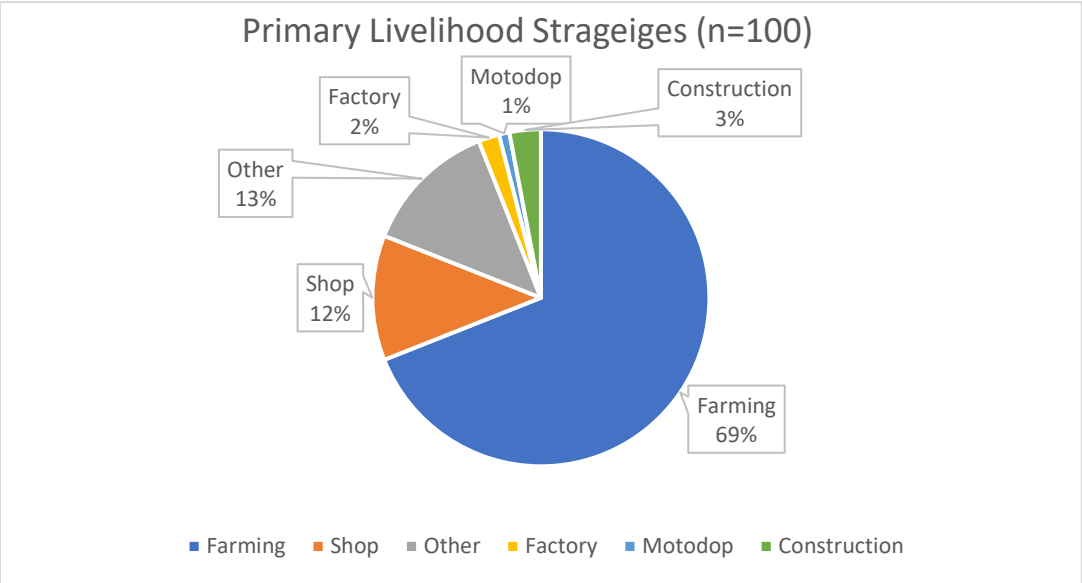

Figure 5.7 Primary Livelihood Strategies

Morning glory farming is backbreaking work: large poles are set in the water to hold the rope-beds of vegetables in place, while harvesting requires bending over the edge of the boat for long stretches of time to reach the plants. Harvest time also demands long hours of reaching into the water, which is contaminated by sewage and other run-off from the city, leading to skin irritation and infections of the fingernails (see Figure 5.9). The men and women of Prek Takong Muy village set off in their boats in the middle of the night and work until late morning, returning to rest in the afternoon to avoid the sun when its strongest. Nevertheless, even in the early morning the sun's relentless heat is oppressive. In some families, men and women divide the tasks but often they are undertaken together, with additional labour hired in to support the most difficult tasks such as putting in poles or harvesting, which is time sensitive. This gender equality does not extend to the home front

however where it was observed that women of all ages bear most of the responsibility for maintaining the domestic sphere such as cooking, cleaning, and caring for children.

Any village resident may occasionally work as hired labour when their work load permits or their finances require it. Other workers come from the provinces and reside temporarily in the village to work as hired labour before returning to their homes. Both women and men work as hired labour, as well as young and old residents. It is a common livelihood strategy for those who are not able to rent their own land to cultivate.

Farming morning glory on the surface of the lake can be capital-intensive. Rent for the land is usually paid in full at the beginning of the year and costs approximately 500-1000 USD per hectare, with farmers cultivating between one half and two hectares. Farmers must purchase poles, rope, a boat, seeds, pesticides and other inputs. It is common for farmers to have taken out loans to start farming but the precariousness of aquatic farming makes this a risky strategy. All too often a storm, heat wave or run of wet weather will destroy a harvest, leaving the family with no way to pay back their loan. Residents reported that if this happens with a private debt, the debtor may be forced to leave the community to search for ways to make money and will only be able to return once he or she can fully repay their debt (Interview_53, 2018).

In addition to farming, a small number of families run shops out of their home, supplying snacks and drinks as well as farming materials like fertilizers and pesticides. Some residents commute into central Phnom Penh to work at hotels and restaurants, a decision made easier by the recent construction of a year-round road linking the village to the city, despite the annual floods. This road (to be discussed further in Chapter 6), made with waste from the local construction industry, has also become a livelihood opportunity in and of itself. Men and women have found work either sorting through the trash as it arrives on site to remove metal, glass and other materials that can be sold or, they are acting as wholesalers, buying these materials from these informal recyclers and re-selling them. While respondents were happy to have this opportunity when farming has failed, it was not a preferred livelihood option. Interviewees reported that those who had worked at scavenging would prefer to be farming but due to the cost involved in renting land this is not always possible (Interview_50, 2018).

Interviews also revealed that some residents of the village were employed in garment factories, of which there are many in Phnom Penh. None of the garment workers were interviewed directly due to methodological constraints (see Chapter 3), but the household survey data suggests factory work contributes little in comparison to farming. Only 2% of families reported factory work as their main household income (n=100). As the factories predominantly employ young women (ILO and IFC, 2018), it is possible that their earnings are not reflected in these reports of household income. Interviews showed that there are often multiple earners living in one home whose income is not pooled and it was therefore difficult to capture an estimate of total household income. However, one focus group participant (female, age 27 and employed as a farm labourer) stated that there are young adults who actually prefer farm work to the factories because although you make less money you are paid more often (daily when working as hired labour) and do not have to wait to the end of the month for a paycheque. However, she added that many young women avoid farming if possible because of the risk of the contaminated water affecting your skin and nails and the exposure to the sun making your skin darker[7].

[7] White or pale skin is highly prized in Cambodia, as it is in many countries in Asia. This had led to a lucrative market in skin whitening products, many of which contain toxic chemicals such as mercury,

5.4.3 Experiences of Environmental Change

Respondents to both interviews and the household survey were asked if they had experienced any change in the environment or the weather in the time that they had been resident in the area. Virtually all respondents reported that this was the case. In order to respect the experiential knowledge of the research participants, care was taken during interviews to allow interlocutors to lead the discussion about the environmental changes they had experienced. Prompts were given such as "How is the environment different from when you first moved here?" or "Is the weather the same as when you were a child?" but the conversation did not initially include any specific reference to 'climate change'. That being said, in over 50 interviews and focus groups as well as 100 household surveys, just one individual said they had not witnessed any changes in the environment. The one person who answered 'no' had lived in the area only 6 months and therefore had little frame of reference for change. With almost unanimity then, low income residents in Phnom Penh are experiencing changes to expected weather patterns or local climate, alongside a deterioration in environmental conditions stemming from issues like water pollution and inadequate solid waste management.

In terms of expected weather patterns, residents of Prek Takong Muy reported feeling that the seasons have stopped being predictable with heat and rain occurring at any point during the year instead of during fixed seasons. Furthermore, people report feeling as though extremes of hot and cold have become more severe. Wind and storms are also said to be stronger and have stopped occurring at predictable points of the year, according to the residents of Prek Takong Muy. These changes in weather patterns were most often attributed to deforestation and urban expansion in the area or as a result of extreme weather in neighbouring countries. One woman explained:

> I have experienced it [changes in the weather] … look… it is already mid-rainy season and there has been almost no rain, it rained only two times. This rain is because there was a storm in China and it was just leftover storm that reached us. Cambodians are dying. We can barely depend on the rain anymore for growing rice. In my hometown, there are trees to give shade and it is cool. There is nothing here and it is hot. (Interview_76, 2018)

Following discussions about environmental change, however, respondents were asked if they had any knowledge of climate change; first using the formal term for the concept as translated in the Khmer language and then offering an explanation if necessary. While some people said they had not heard of climate change at all, many were familiar with the term from television, radio, Facebook or through conversing with their neighbours. A number of people, particularly young people and those actively involved with NGO initiatives were able to give explanations of the concept in line with a mainstream understanding of the term. The Village Chief in Prek Takong Muy and other community leaders reported learning about climate change in trainings conducted by World Vision and other NGOs. Other than these few individuals, there was a widespread tendency to lump climate change in with any information received about the weather, without making a distinction about long term trends versus short term weather forecasting. Therefore, while lived experience of climatic variability was high, awareness of climate change and an understanding of its causes and impacts was low.

causing serious health risks. See for example Stevens, L. (2016) 'Whitewash' *The Cambodia Daily.* Retrieved from: https://www.cambodiadaily.com/features/whitewash-121827/

The impacts associated with the changes to climate were numerous (Figure 5.8). First, variable weather is said to have a negative impact on the health of the residents, primarily children and older people who report fevers and colds when hot and cold days occur in rapid succession. This has an impact on livelihoods as families will pay to visit medical clinics (Interview_54, 2018). Rapid changes in weather have been reported to have caused ducks and chickens to fall ill as well (Interview_61, 2018; Interview_27, 2017). While verifying the true cause of these illnesses was outside the scope of this research, the perception of changes in weather causing sickness is noteworthy.

Furthermore, the changing weather has also had a negative impact on farming practices as too much heat can cause crops to take longer to mature meaning longer growing cycles and lower income, or it can promote the growth of pests, destroying the crops. As a result, residents are relying more and more on chemical fertilizers and pesticides which are costly, carry health risks and further contribute to the contamination of the water in which they grow their crops. Combined with high levels of debt, the increasing unpredictability of weather patterns is felt to make farming a risky livelihood.

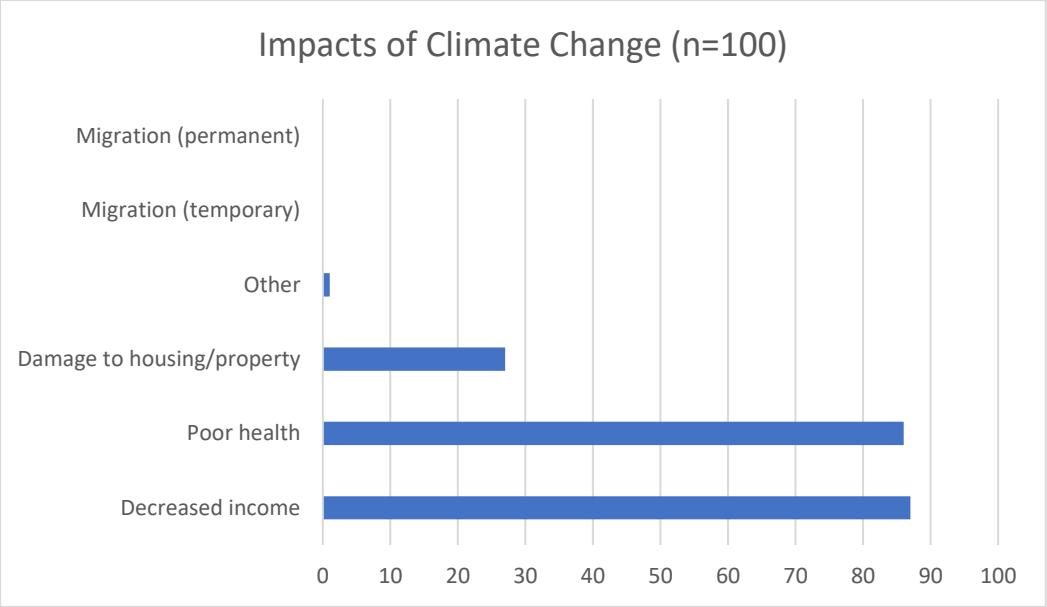

Figure 5.8 Reported Impacts of Changes in Climate

Climate variability was not the only way that residents had witnessed their environment changing. A significant concern was the perceived deterioration in the quality of the water in the lake due to decreased water circulation as a result in-filling. Farmers report that as the lake is being filled in they are no longer receiving the annual fresh water flood from the river and the water in the lake is remaining “black” and “smelly” year round (Interview_50, 2018). This decrease in fresh water circulation is specifically linked to the construction of Hun Sen Boulevard, the expansive roadway that has opened up the city’s southern environs for development. As the water quality is not regularly monitored it is not possible to confirm this observational data. However, local experts were consulted who confirmed that this deterioration of water circulation and quality is expected based on their knowledge of the lake system and the current development in the area (Interview_13, 2018; Interview_80, 2018). The poor quality of water, particularly during the dry season, as well as the change in water flow has already contributed to the elimination or significant disruption of multiple livelihood options including dry season rice farming and fishing, especially in the part of the lake closest to the in-flow of contaminated water from the city. The decline in the quality of the water associated with this loss of circulation has forced the farmers to find ways to

maintain their already precarious livelihood. Chapter 6 will detail the strategies farmers are using to keep morning glory farming viable in the face of these volatile conditions.

Residents report health problems associated with the polluted water, particularly after prolonged exposure during harvesting. Infections of the skin and nails on the hands and feet are a widespread problem (See Figure 5.9). The infections cause a burning sensation as well as physical changes to the skin and nails. This is treated daily with creams and ointments either purchased at local pharmacies or donated by charities that come to the village. One woman showed me a tube of combined anti-fungal/steroidal cream while another was using an unidentified liquid from a travel-sized shampoo bottle that she said was given to her by "religious people" who "come to tell people to go to church" (Interview_76, 2018). Another used lime juice to make the itch go away and preferred to pick in the morning when the water was cold which helps to numb the burning (Interview_51, 2018). Because the infections are widespread and persistent, receiving an official diagnosis has not been deemed necessary and most people make do with whatever treatment is available. If farmers are unable to access treatment it can make their work extremely difficult. Said one older woman, an experienced farmer:

> Look at grandma, I am already old, I still need to go harvest otherwise I will not have anything to eat…. I am 70 years old already, [without the medicine] the water 'bites' you and it becomes itchy. If we put medicine on, the water would not bite. Now I don't have the medicine, the water bites my legs and it is so itchy. (Interview_ 73, 2018)

Figure 5.9 Fingernails Damaged from Exposure to Contaminated Water
Source: Beckwith, L. (2018)

Additionally, long term residents noted that the area used to be forested which provided the village protection from storms (Interview_48, 2017). Without this buffer, houses are exposed

to high winds across the lake, which causes severe damage to houses. Houses in this area are mostly made from wood with sheet-metal used for the roof. The materials are sometimes scrounged from the trash brought in to build the road and sometimes purchased new. Regardless, the houses are precarious and not able to withstand strong winds when the area is hit by storms. At least three households mentioned during interviews that they lost their roof to a storm. This is both expensive and time consuming to replace but more worryingly poses an immediate hazard. One interviewee reported staying inside during high winds for fear of being hit by flying sheet metal if they ventured outside (Interview_58, 2018). Another said that they travel up the road to where there are stronger houses and take refuge until the storm ends (Focus group_1, 2018).

Though flooding is not a recent phenomenon, it is a seasonal environmental change that causes significant challenges for villagers. Previously, the ground that joined the village to the main road was so low it would disappear with the arrival of the floodwaters in July and the village would remain flooded for months, sometimes until December. Though houses are built on stilts it was not enough to escape the rising water and families would perch on lofts over their floors or abandon lower levels entirely for months until the floods would recede. Transportation was by boat which could be both slow and dangerous and also costly for those who did not have their own and had to pay their neighbours to transport them. A boat ride to the main road and back could cost 0.5 USD a day or 10 USD a month (though you could usually get a discount for a monthly package). This is a significant sum for families whose profit margins were already slim (Focus group_4, 2018). The additional logistical arrangements of boat travel were a headache for farmers bringing vegetables to shore to be sold each day and it was a nightmare for children trying to attend school on a regular basis. In a focus group discussion with nine local children (aged between 11 and 14 years), every one reported that they had fallen in the water at least once during a boat trip to school due to the thick vegetation on the lake surface which made it difficult to manoeuvre the boats. Despite this, only half the children reported being able to swim. If there was no boat available or if the family was unable to pay the fee, the children would attempt to wade through the water to the shore, keeping to the shallow parts, but if they got too wet they would not be able to go to school and would have to return home.

5.4.4 Factors of Socio-economic Marginalization

In response to the household survey, 55% of village residents reported that they own their home (n=100). However, the question of land ownership in the area (as well as throughout the country) has been complex, particularly due to the village's location on seasonal land which could be considered as part of the lake and therefore subject to classification as state-public land under the 2001 Land Law (see Chapter 4 for a brief description of the legal framework for land ownership in Cambodia). To support their claims to the land, homeowners have secured ownership letters issued by the Village Chief. Due to the confusion of land ownership in the post-Khmer Rouge period as well as the on-going opacity of the Phnom Penh real estate market, buying and selling of land that has not been formally titled is common (Fauveaud, 2016a). To obtain official land tenure at the municipal level, prospective owners must first obtain certificates at the commune and district levels. This can be costly and confusing, especially for low income residents who may have little formal education or experience with bureaucracy, thus the tendency to make do with locally issued ownership documents. However, the residents of Prek Takong Muy are generally aware that these letters are insufficient to guarantee recognition of tenure and are apprehensive about what this insecurity will mean for their future.

The insecurity of land tenure is also a factor in what public services are available to village residents. Government-provided electricity has been available in the village only for the past two years and even then, does not reach all of the residents, particularly those living farthest away from the main road. Furthermore, while the subsidized government rate is often less than half of what households are paying for private connections (0.25 USD vs 0.4-0.6 USD per kilowatt hour), even some families within the area served by the government find the connection fee of approximately 100 USD to access the government lines is too much for them to manage (Interview_58, 2018). Additionally, the village is not connected to publicly provided clean water and therefore all families buy their water from private vendors. When asked about whether or not there were plans to connect Prek Takong Muy to the municipal system the Commune Chief explained that the Phnom Penh Water Supply Authority (a public company with autonomous management) would not lay pipes in an area that does not have a paved road as it indicates that the settlement is not stable enough to guarantee pay back on the initial investment (Personal communication, August 14 2018). Seeing as the southern-most part of the village did not have any road at all until they constructed their own in 2017, it is unlikely that the road will be paved in the foreseeable future.

While the household survey revealed a mix between those families that own their homes (55%) and those that rent (39%), none of the respondents reported owning the land they are using for farming (n=100). Qualitative interviews confirmed that farmers are currently renting their farm land, although the price they paid for it varied between 250 USD and 500 USD per half a hectare per year. A small number of respondents have arrangements through personal contacts under which they are granted the right to farm in exchange for caring for the land. As these deals are made through social ties, they are not accessible to all village residents, the majority of which are left to negotiate the murky land rental market.

There is a distinct lack of clarity regarding who the land is rented from and even, in the case of those who previously owned land in the area, to whom the land was sold. A local intermediary collects the rent each year but the farmers themselves claim not to know who owns the land beyond stating that it is an ‘oknha’. Interestingly, some specified that they knew this person to be female. An interview with an official at the District Office for Land Management indicated that since the land is classified as state-public land, it should not be under private ownership and therefore he believed the villagers were being taken advantage of (Interview_79, 2019). Although this may officially be true, in addition to a period in the late 1990s and early 2000s when villagers report most residents sold their farm land, farmers also spoke of the land changing hands occasionally and the terms of rental being renegotiated with new owners or being taken from them to give to other farmers. This is typical of the land market in Phnom Penh whereby illegal or quasi-legal transactions outside of the formal parameters are common (Fauveaud, 2016a).

5.5 Conclusion

In this way, the historical conditions that have influenced the settlement of Boeung Tompun have shaped the fortunes of Prek Takong Muy and its inhabitants; the lake is a source of food and income but also a physical barrier, separating their homes from the expanding city, a barrier that must regularly be crossed. The residents of Boeung Tompun have had no part in the decision to fill in the lake, yet they are the first to feel the impacts. Though the difficulties currently faced by the inhabitants of Prek Takong Muy are distinct from other low income residents of Phnom Penh, such as those in Chbar Ampov II or the city centre, the interconnections between socio-economic marginalization and environmental change are common. Those who struggle to access land, public services and economic opportunities

are also feeling the effects of environmental change, through unpredictable weather patterns or increasing pollution of waterways.

As further changes are experienced in Phnom Penh, both environmental and socio-economic, the impacts will not be distributed evenly but will interact with the other dynamics in the city, including relations of power and positionality such as land tenure, gender and livelihood. This correlation of poverty and exposure to risk is a direct result of the patterns of accumulation and dispossession that are part and parcel of the city's metabolism and the political and economic forces that have shaped Cambodia's history. As such, understanding the historical creation of the city and the multiple risks and opportunities generated is essential to understanding the everyday practices of the city's residents.

Chapter 6 – The Political Ecology of Everyday Resilience in Phnom Penh

6.1 Introduction

In line with thinking from political ecology which suggests that conditions of marginalization are shaped over time by patterns of accumulation and control over resources (Watts, 2015), the preceding historical analysis highlights the role of historic changes such as patterns of settlement and land ownership in shaping the present risks facing Prek Takong Muy's farmers. As Phnom Penh grows, so too its inhabitants change, as do its ecosystems, and by doing so, contribute to the co-creation of the city. The history of Boeung Tompun clearly shows the uneven nature of urban development and the differentiation of outcomes between groups and across scales. Though members of the elite (both national and international) are profiting handsomely from urban expansion, at the city scale critical flood protection and wastewater treatment capacity is being lost, as are the livelihoods of some of the city's most vulnerable residents.

As urban political ecology recognizes the active role that city dwellers play in shaping the process of urbanization (Harvey, 2003), the myriad ways that the urban farmers of Prek Takong Muy are co-evolving with their environment is critical for understanding the lived experience of urbanization in Phnom Penh. This chapter seeks to bring together ideas from political ecology and resilience to answer Research Question 3: *How are low-income residents responding, individually and collectively, to the changes they are experiencing as a result of urbanization and environmental change? What are the outcomes of these actions?* The analysis in this chapter will put the daily practices of urban farmers front and centre to highlight how agency and power shape outcomes within the intrinsically connected processes of urban expansion and environmental change. From this perspective, the ways that Prek Takong Muy's residents live within these processes can be understood as 'everyday forms of resilience' (Brown, 2016) as they seek to secure, maintain or transform their position within the urban dynamic. This analysis will use Brown's (2016) concepts of resourcefulness, rootedness and resistance to expose the lived experience of resilience in Prek Takong Muy village (see Table 6.1).

Table 6.1 Overview of Everyday Resilience Strategies

	Key Considerations	Research Findings
Resourcefulness	Access to resources (financial, technical, social, political etc.) and initiative to apply them at the right moment; ability to strategize and plan; recognizes different types of knowledge.	Access to resources is cumulative, with some resources (such as financial and social) helping to increase access to others; due to systemic forces, resourcefulness is deployed in ways that only promote persistence or sometimes even undermine resilience.
Rootedness	Importance of material place, both natural and built environment; attachment to place and sense of identity; need not always be positive; informs analysis of scale and trade-offs.	The Boeung Tompun ecosystem is critical to resilience at the city level. Within the village, rootedness is highly variable due to the heterogeneity of settlement patterns; generally, attachment to the city is valued over attachment to the village.
Resistance	Agency; ability to withstand external forces and apply self-determination; understanding of power relations.	Collective action is rare, compromised by a distorted social contract and barriers to forming social capital such as fear and lack of trust.

Based on Brown, 2016

6.2 Resourcefulness: The Means to Manage Change

Resourcefulness considers the dynamics of access to and control over resources as well as the initiative or ability to deploy those resources at the appropriate time, in response to stressors or in anticipation of change as part of a process of planning and prioritization (Brown, 2016). Amongst the farmers of Prek Takong Muy, levels of resourcefulness are influenced by factors such as gender, age and length of tenancy. These factors may act as advantages in some situations while simultaneously weakening resourcefulness in others. What is apparent, however, is that access to resources, and in particular social capital, facilitates the application of strategies to manage the impact of urbanization and environmental change. Resourcefulness can act as a positive feedback mechanism, improving access to other resources. Unfortunately, the scale of ecological transformation impacting aquatic farming as a livelihood strategy is so vast that the majority of adaptation measures deployed by farmers serve only as short term survival mechanisms and do not contribute to overall resilience or to desirable social-ecological transformations.

The household survey revealed that farmers typically do not recognize their own resourcefulness. When asked how they were responding to the changes they were witnessing (social or environmental), individuals were often unable to think of any examples

of adaptation strategies they were employing. Only 17% of farmers reported trying to modify their agricultural practices in some way to respond to the environmental changes that they had experienced (n=100). This was most commonly through changing the location where they were planting (ideally to one with better water quality) but also included using more fertilizer or pesticides and changing the crop they were planting. Those surveyed offered that they would be interested in applying more adaptation strategies but that they faced multiple barriers. In particular, they wished to change or diversify livelihood strategies (26% and 30% of respondents respectively) but were prevented from doing so by a lack of money (87%), lack of knowledge (39%) and being physically unable (22%).

The idea that 'the poor' have limited adaptive capacity is widespread and functions as the justification for climate change adaptation interventions by NGOs and other actors within the development sector (Ireland and McKinnon, 2013). Yet, viewed through the lens of urban political ecology, urban farmers are constantly renegotiating their position within the city as well as their relationship with their environment, which can be interpreted as a form of adaptation. It is because these choices and modifications are such an integral part of their daily lives that they are often not recognized as intentional strategies, even by the farmers themselves. From this perspective, a range of actions can be identified as evidence of the resourcefulness of farmers as the financial, social, technical, political or environmental resources of the individual or household are deployed in ways that seek to maintain or secure their livelihood and well-being.

This analysis will show how land, information, and social networks play an important role in the resourcefulness of Prek Takong Muy residents. Access to these resources is mediated by power relations and dynamics such as gender, class and status within the community. This mirrors findings from studies of the land titling process in Cambodia which have shown how different actors have used their position to seek preferential access to land (Dwyer, 2015). Understandably then, the outcomes of strategies used to adjust to the changing environment are not always positive and in fact, can vary widely in terms of whether they strengthen or weaken the socio-economic status of the individuals or households which employ them. Unfortunately, while farmers must make some decisions to meet short term needs, the consequences of these choices are undermining the resourcefulness of many farming households in the long term. Strategies that diminished rather than enhanced overall resourcefulness were found to be some of the mostly widely adopted, indicating the limited power that many households were able to wield in the face of strong external pressures. The constraints to agency will be addressed again in Section 6.4 Resistance: Expressions of Agency.

6.2.1 Debt as a Coping Strategy

The use of debt to sustain a precarious livelihood is a prime example of a strategy which is weakening the resourcefulness of agricultural households. Interviews showed that most households owed money to microfinance institutions and many additionally were in debt to private money lenders. These debts were not all related to farming, some were also taken out for home repairs or to lend to other family members. Loans related to farming were typically taken out to help during the planting period. Upfront costs of planting can be high for many families, including rent, seeds, ropes, fertilizers and hiring labour as necessary. Farmers then count on the profit from that crop to begin paying off the debt, meaning that if the crop fails, they immediately find themselves in a position of being unable to make loan payments.

Loans from microfinance institutions come at a (reportedly) reasonable interest rate but they give only a small amount based on the size of the land being farmed. Most people

interviewed had been forced to take out additional loans from local money lenders that charge extremely high interest rates (as much as 15% per month) and have no formal process for defaulting. Loans taken out for farming are very high risk as the sum is usually more than the family can manage if their income fails, which is not uncommon given the volatile environmental conditions. The amount that households owe can be as high as 4000-5000 USD and repayment periods are frequently no more than two years. These families are often earning as little as 100-200 USD per month which makes these repayments a significant burden.

The level of debt means that one bad harvest can be catastrophic for the precarious finances of low income households. Some respondents indicated that they were forced to borrow from local money lenders to make payments on their debt to microfinance institutions, setting off a debt spiral. Others told stories of neighbours losing their homes or being forced to leave the village in order to find a way to pay off their debt. Said one woman explaining her own history to illustrate how easily others have lost their homes:

> First, we did not have the capital. Second, we took a loan from the microfinance. Then after we made money from it, we paid some back to the microfinance and also covered expenses for our house from that income. Then, when the weather was not good and the plants were damaged, we had to sell it [the house] if not, the microfinance would seize it eventually. That's why others lost their houses. We rented the house and tried to stay for the children to study at PSE [an NGO-run school] until they grew up and got a job and finally helped [with money], but our income was only enough for to survive. Most of them [the villagers], when they were sick and had to go to the hospital for an emergency, some didn't even have 50 USD with them, the people in this village. (Interview_56, 2018)

These anecdotes were shared to emphasise the seriousness of the situation and are indicative of the level of stress and anxiety associated with debt.

Debt is a universal phenomenon, affecting men and women as well as recent arrivals and long-term residents of the village. However, those with some form of collateral are able to access larger sums of money through microfinance institutions or banks which, while not without their own problematic lending practices (see for example LICAHDO and STT, 2019), do offer better rates than private lenders and are not known to be as heavy-handed in securing repayment (Focus group_2, 2018). Migrants from rural areas were sometimes at an advantage if they had retained land title of their rural property and were able to use it to secure a loan in Phnom Penh (Interview_70, 2018). As informal settlements were among the lands considered potentially controversial and thus excluded from systematic land titling programs including LMAP (Grimsditch and Henderson, 2009), low income residents who have been in the city for multiple generations often lack formal title for their land and therefore any collateral with which to secure a loan.

The implications of this situation are not straightforward. On the one hand, those with the ability to leverage assets as collateral have access to more favourable lending terms, whereas those without may be forced to accept high risk loans from private lenders. On the other hand, there was little evidence that individuals with access to larger sums were able to invest them in ways that contributed to longer term security and therefore may simply be managing more debt. Research on over-indebtedness in Cambodia (one of the largest microfinance markets in the world) shows that collateralized microfinance loans are leading to undesired or distress-induced land sales and subsequent landlessness when debtors are unable to find other ways to make payments (Green and Bylander, forthcoming).

Environmental degradation which harms agricultural resources is therefore contributing to the further marginalization of small-scale farmers by increasing the precarity of their livelihoods, contributing to the debt cycle and decreasing their resourcefulness.

6.2.2 Staying Afloat with Pesticides and Fertilizers

Deteriorating water quality associated with in-filling is one of the most pressing concerns of morning glory farmers on Boeung Tompun. One of the main strategies employed to sustain their livelihood in the face of poor growing conditions is the increased use of pesticides and fertilizers. Farmers report that as the water quality in the lake has deteriorated so their use of pesticides has increased:

> Ten years ago we had to use pesticides, but we didn't have to use this much. In the past, for one hectare of land, we spent around 200,000 riel (approximately 50 USD) and now we need to spend at least 400,000 to 500,000 riel (approximately 100 to 125 USD). (Interview_46, 2018)

Others noted that the increase in temperatures has also forced them to use more pesticides as they notice an increase of worms on the plants when the weather is hot. Some farmers have tried switching crops in order to find one that can survive with fewer pesticides but there seems to be no consensus amongst the farmers as to which of the three most common aquatic vegetables grows with the least amount of inputs (Interview_64, 2018).

The impact of pesticides in Prek Takong Muy is complicated by failures of governance at higher levels which allow illegal and often unsafe pesticides to be used in Cambodia. Pesticides are not produced in Cambodia but imported from neighbouring countries such as Thailand and Vietnam, and while regulations require products to be labelled in the local language, research has shown these rules to be widely flouted (CEDAC et al., 2013). Pesticides with Khmer labels are registered with the Ministry of Agriculture, Forestry and Fisheries and are reported to be more expensive, and therefore out of reach for the poorest farmers (CEDAC et al., 2013). Bottles were observed at the village which had instructions written only in Vietnamese (See Figure 6.1), suggesting that at least some of the chemicals in use in the area are unregistered. It also means that any safety precautions suggested on the bottle would likely go unheeded. This failure at the national level has direct impacts on human and ecosystem health in Phnom Penh, compromising the resourcefulness of the farmers of Prek Takong Muy as well as the health of the Boeung Tompun wetland.

Figure 6.1 Discarded Pesticide Bottle
Source: Beckwith, L. (2018)

Despite the costs, buying pesticides must be prioritized because otherwise the crop will not grow at all (Interview_49, 2018); leading families that are struggling to make profit to blame their inability to afford pesticides, as their vegetables will not grow in the polluted water (Interview_53, 2018). The increased cost of spraying has made a significant impact on the incomes of many farmers. One woman reported that her expenses have doubled and she now no longer sees any profit from her harvest after meeting the cost of inputs (Interview_54, 2018). Another said that she is no longer able to save any money and her lack of disposable income has compromised her ability to participate in family events like weddings (Interview_59, 2018). In addition to causing stress and anxiety, according to survey data, a lack of profit prevents resilience building as it hinders farmers' ability to invest in alternative strategies that might have more positive outcomes, such as income diversification.

The increase in the use of fertilizers and pesticides as a strategy to maintain agricultural livelihoods could be considered 'resourceful' in the sense that farmers are deploying the resources they have available, or their absorptive capacity, to sustain their livelihood. But taking a broader view of resilience such as the resilience spectrum (Béné et al., 2014), in the long term, pesticide use is compromising assets, both financial and ecological meaning that it is undermining adaptive and transformative capacity. Thus, pesticides allow aquatic farming to persist in the short term but do not contribute to the emergence of alternatives to the current situation that might offer better opportunities for farmers. This is a clear example of the trade-offs that occur at different time scales that resilience theory seeks to highlight (Bahadur and Tanner, 2014; Friend and Moench, 2013).

In addition to the economic impacts, frequent use of chemical fertilizers and pesticides has consequences for both ecosystem and human health. Residents noted that the loss of fish stock in the lake coincided with a change in farming practice which saw the cultivation of aquatic vegetables spread from a small area to cover nearly the whole lake. Accompanying this growth was a surge in the application of fertilizers and pesticides (Interview_57, 2018). Although the loss of the fish in the lake is likely due to a combination of factors including in-filling of the lake, industrial pollutants and increasing levels of wastewater from Phnom Penh, this example serves to show that farmers are cognizant of the negative impacts of fertilizer use but are trapped in a "simple reproduction squeeze" (Watts, 1983 quoted in Watts, 2015) which compels them to practice their livelihood in a way that contributes to the decline of the ecosystem supporting it. In terms of human health, farmers receive no formal training on the application of chemical fertilizers and pesticides and use limited if any means of protection when spraying. This puts them at risk for both acute and long term effects of exposure including asthma, depression and anxiety and cancer (PAN UK, 2017).

Yet, even with the case of pesticides the outcome is not clear cut. One woman reported that her husband became very weak and sick after spraying pesticides and after seeking medical help was told the chemicals had affected his lungs and his liver (Interview_ 56, 2018). Fortunately, their financial position allowed them to take out a loan to set up a shop in the village and after quitting farming the husband quickly recovered. They had been farming without paying rent as they were acting as caretakers for the land. This land had previously belonged to her grandfather but when he sold it, the new owner asked him to continue to manage it, until such a time as he wanted to take control of it. She now sells pesticides to other farmers and so has become one of the few at the village level to profit (at least financially) from the increased use of chemicals. This example illustrates how access to social and financial resources are connected and mutually reinforcing. Personal relationships can facilitate access to resources such as better rates on (or even free) farming land, which can then act as a safety net in times of emergency.

This story also highlights the value of a political ecology lens on resilience building that resists assumptions of homogeneity. Farmers purchase their inputs from small shops set up in the homes of other neighbours. Thus, some residents are increasing their income while others are falling further into debt. The resilience of shop keepers is enhanced at the direct expense of farmers and the communal resource of the wetland ecosystem. The relative wealth of many shopkeepers affords them protection from the precarity of farming. Interviews revealed that social connections play a strong role in facilitating opportunities to expand or diversify livelihoods, meaning that these opportunities are not equally distributed but depend on dynamics of access (Ribot and Peluso, 2003).

6.2.3 Land: A Farmer's Most Valuable Resource

The complexity of the land market is a prime example of the multiple factors that influence access to resources. In the deteriorating ecological environment of the lake, an individual's ability to secure productive farmland is a primary determinant of their ability to earn an income under the current conditions. This requires the application of local knowledge, not only regarding ecological conditions but also the social networks that govern access to land. In addition to quality, farmers must consider the length of time the plot will continue to be available before it is filled with sand (See Figure 6.2). As there has been no clear indication about when each section will be filled, farmers intend to carry on until it is no longer possible to do so. How each farmer goes about securing farmland is a telling example of how the resourcefulness of the farmers can vary widely depending on their social connections and their access to information.

Figure 6.2 Sand Deposited through Pipes fills Boeung Tompun Wetland
Source: Beckwith, L. (2018)

The lack of clarity about the timeline for in-filling makes access to farmland, particularly for newcomers, exceedingly complex. First, would-be farmers must acquire enough knowledge of the lake to know what are the 'good' and 'bad' areas in terms of water quality. These areas will change as the in-filling progresses. Currently, farmers report that the most productive area (and therefore that which requires the least amount of chemical inputs) is the part of the lake to the east of Hun Sen Boulevard, between the road and the Bassac River, where freshwater circulation has not been compromised and therefore water quality is higher (Interview_65, 2018; Focus group_3, 2018). This is information that must be learned through experience (such as working as hired labour for other farmers) or shared between neighbours, as this knowledge only exists within the farming communities.

Knowledge in hand, potential renters must then negotiate access to one of the local managers or intermediaries who act as brokers for the land on behalf of the 'oknha' who are reported to be the owners. Secondly, they must negotiate a mutually acceptable rental price. The range of annual rents reported by farmers indicates that there is not a standard price, although on average most were paying 200-300 USD per half hectare per year. Some families were able to secure land for free from personal connections (though these were very few in number) while others were paying up to 500 USD a year for half a hectare. This process highlights the importance of situated knowledge. Agricultural skill alone will not ensure productivity in the environment of Boeung Tompun as the difficulties in managing the deteriorating ecosystem require a wider understanding of the connections between social and ecological realities. Like other strategies, having access to resources including situated

knowledge and social connections is a distinct advantage, linking economic resources to other types of assets.

One exception to the variability of rental price is, perhaps unexpectedly, the relatively clean area of the lake between Hun Sen Boulevard and the Bassac River. Interviewees report that this land belongs to “the company” and is rented consistently at 250 USD per half a hectare per year. Current renters stated that this land was allocated on a first come-first served basis with agreements renewed annually and current holders given first option to renew their tenure. However, despite repeated efforts, interviewees were unwilling to reveal more about this arrangement such as the name or location of the company. It is unclear if this was a breakdown in communication between myself and the respondents or if they were intentionally withholding information, perhaps to protect a precarious but valuable informal arrangement or the exclusivity of access to prime agricultural land. In any case, the negotiations required to access any land, and particularly the most productive, is an elaborate experience of amassing and appropriately wielding resources to invest in future resourcefulness. This makes information a valuable resource, underpinning why information sharing is theorized to build trust and reinforce social networks which provide the foundation for collective action (Barnes et al., 2017). This study found very limited evidence for information sharing within Prek Takong Muy, as will be discussed further in this chapter.

6.2.4 The Trash Road: A Collective Resource

The previous examples have highlighted the ways resources are being deployed by individual farmers to secure their livelihood in the short term, often in ways that undermine their resourcefulness in the long term. However, the ability to employ social capital in order to act collectively has been posited to be fundamental to building adaptive and transformative capacity (Adger, 2003; Barnes et al., 2017); therefore resourcefulness should be examined at the village level as well. The collective employment of resources to build community resilience has the potential to complement and enhance household level strategies. In the case of Prek Takong Muy, their collaborative effort to construct a road which would allow year-round access to the village has significantly strengthened their resourcefulness.

Though the District government paved a portion of the road leading to the village, the portion that stretched into the lake remained inaccessible during the rainy season except by boat. In 2017, a local NGO came up with a scheme to link the village to the city year-round by using waste material from the city’s construction sites to fill in the low lying land around the village’s stilt-raised homes. Phnom Penh’s construction industry generates truckloads of waste and some of this material, such as rocks and soil, can be useful for informal land reclamation. The villagers of Prek Takong Muy, with the assistance of their NGO partner, set about finding truck drivers carrying construction waste who would be willing to divert their loads and deposit it in the village (Interview_21, 2018). Some interviewees suggested that these connections were made through members of the community who were working in the construction industry while others said that the drivers had previously been using the village as an illegal dumping ground. In either case, an agreement was reached that trucks would come to deliver dirt and debris to be used to build up the land around the stilted houses. Each household in the village paid 25 USD for this ‘facilitation fee’. When the money ran out before the new road could reach the end of the village, the villagers paid again, another 25 USD to ensure access all the way to the end. In addition to support with the coordination of this endeavour, the local NGO contributed 2000 USD to cover the road with soil (Interview_21, 2018).

Though rough and bumpy, not to mention a potential source of pollutants, the trash road is a lifeline for the villagers. The road has transformed the fortunes of the village. Homes are now connected to the city all year round, allowing farmers to transport their crops to market without delay and families to send their children to school without fear. The road has even opened up a new livelihood opportunity for some, who scour the debris for bits of metal and other valuable waste (Interview_50, 2018). The road is an example of the collective resourcefulness of the community. Pooling their finances and with the organizational support of a local NGO, the construction of the road shows the benefit not only of access to resources but the will to envision a future for their community and bring it into being collectively. This is a promising indicator of the potential for strategic cooperation within the community, given the importance of collective action for resilience building (Adger, 2003). It also shows the positive role that external actors (in this case a local NGO) can play in Cambodia in supporting communities to act together (Park, 2018).

In addition to its functional role, the road is intended to fulfil a symbolic role, supporting the claims that the villagers have to the land that they occupy by showing their willingness to invest in the future of their community. By building communal infrastructure, the villagers can argue that they are not squatters on public land but custodians who are taking responsibility for the development of Prek Takong Muy (although sadly, this also reflects the failure of local government to provide basic infrastructure). These types of projects have been supported by NGOs as visible evidence of ownership that the community could use to strengthen their land claims had the threat of eviction materialized (Interview_75, 2018). In collectively constructing the trash road, leveraging the resourcefulness of the community has also contributed to building their 'rootedness'. In this way, improvements to the physical environment has been one of the ways residents are enacting their desire for building resilience. It is also one of very few examples of resilience building that goes beyond persistence to make more profound changes in the social and physical dynamics that shape Prek Takong Muy's future.

6.3 Rootedness: The Importance of Place

Rootedness highlights the situatedness of everyday resilience building, including the importance of the physical place - both the landscape and the built environment. The physical location of Prek Takong Muy dramatically affects opportunities and constraints which inform the ways farmers are implicated in the processes of urbanization and environmental change. The fertility of the agricultural landscape was what once drew people to the area and laid the groundwork for the formation of the village. As the wetland ecosystem is lost to in-fill and urban expansion, the rootedness of Prek Takong Muy's farmers is transformed as well, not only their ability to earn a living through farming but their sense of belonging and attachment to their home. Although village residents are not expected to be evicted, the design of ING City will ensure their exclusion regardless through modifications of the landscape which serve the needs of wealthy at the expense of the poor.

6.3.1 An Essential Urban Ecosystem: Physical Aspects of Place

Before addressing the idea of rootedness in terms of the identity and belonging of the residents of Prek Takong Muy, it is important to recognize the depth of change that is taking place in the physical environment; that of the ecosystem of the Boeung Tompun – Cheung Ek wetlands. The lake system is a critical piece of infrastructure at the city level, acting as the lynchpin in the management and treatment of the majority of Phnom Penh's wastewater. Historically, the city was blessed with the natural infrastructure to not just manage but thrive thanks to the seasonal flooding. A system of lakes dotted throughout the city centre and encompassing huge expanses of the peri-urban zone effectively absorbed the annual floods

and fed the cultivation of rice and vegetables (See Figure 6.3). However, urban development in Phnom Penh has failed to prioritize the preservation of this green infrastructure (See Chapter 4). The process of urbanization in Phnom Penh has dramatically altered the ecosystems that were foundational to the city, erasing the lakes and wetlands and with them the multiple roles they played in the daily lives of residents, including protection of biodiversity, food security and livelihoods, microclimate regulation and as a space for recreation. Boeung Tompun is not the only lake in Phnom Penh currently being filled to create new land for construction but its role in providing ecosystem services to the city is unparalleled. The lake system currently manages 70% of the city's wastewater, meaning it is a critical piece of sewage treatment and floodwater infrastructure (APUR, 2019, p.38).

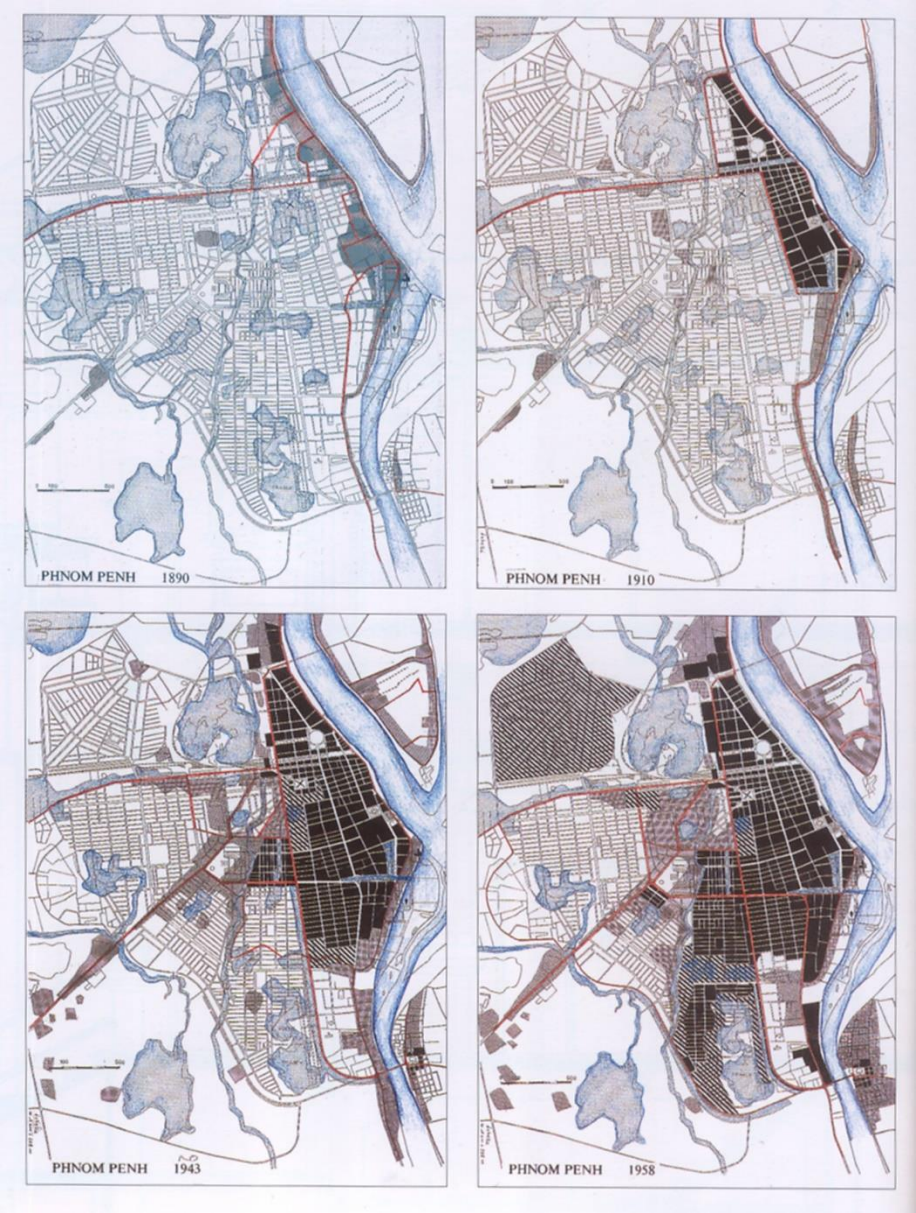

Figure 6.3 Historic Maps of Phnom Penh's Lakes
Source: Doyle, 2012b

In addition to the loss of the wetland's functional role in wastewater management, the transfer of the lakes from public land to corporately held land will fundamentally change the identity of the wetlands. While historically farmers claimed use rights to specific areas and

used those areas for private profit, their access to the lake did not diminish and in fact, in terms of wastewater treatment, even enhanced the role the lake was occupying at the city scale. However, in transforming the lake into "operational" land (ING Holdings, n.d., p.11), real estate developers are bringing Boeung Tompun under private control in pursuit of a vision for the area that is incompatible with its current functions. Evidence from first-hand observation and ING's promotional materials suggests that public benefit will not be a priority as the land reclaimed so far has already been claimed by numerous '*boreys*' or gated communities, another luxury shopping mall, a Mercedes dealership and the International School of Phnom Penh – an elite educational facility catering for the city's wealthiest and well-connected (ING Holdings, 2015). In this way, the commodification of the area is leading to a physical enclosure that is incorporating Boeung Tompun and Cheung Ek into an exclusive vision of Phnom Penh which caters to a transnational elite at the expense of its current role as a source of livelihood to low income communities and a public good at the centre of Phnom Penh's wastewater treatment system. This can be seen as an urban manifestation of the process of commodification and exclusion that has led to the loss of vast amounts of the country's natural resources and the displacement of many rural Cambodians (Milne, 2015; Baker and Milne, 2015).

There are no current plans to replace the role being played by Boeung Tompun and Boeung Cheung Ek in wastewater management at the same scale. Instead, with the transition from lake and wetland to operational land, the lake's role as public infrastructure will decline as a result of its commodification, enclosure and in-fill. Although there are plans to build a wastewater treatment plant in the lake, it is being referred to as a "pilot", with a capacity of approximately 5,000 m^3 per day; a fraction of the city's estimated need which is closer to 280,000 m^3 per day (Nishikawa, 2018). Furthermore, this type of treatment is energy intensive and expensive to run with ongoing operating and maintenance costs (Nishikawa, 2018; Irvine et al., 2015). The result of this loss of the natural treatment capacity of the wetland will be untreated wastewater flowing directly into local rivers and/or city streets.

Flooding is also expected to increase as the capacity of the lake system to retain and remove stormwater is diminished (Interview_80, 2018). Though in-filling has been underway for years the city has yet to feel any serious impacts due to the vast size of the lake system and enormous absorption capacity (APUR, 2019). However, as in-filling continues, it is only a matter of time before it has both upstream and downstream impacts. The neighbourhoods immediately surrounding the lake (which include the Cheung Ek Genocidal Centre, one of Cambodia's most visited tourist sites) will be at risk for flooding, as will the city centre if flood water is restricted from exiting the (poorly maintained) wastewater canals or if it flows too rapidly into the Bassac River, thereby threatening the city's dykes (APUR, 2019). The extent of the in-fill will fundamentally change the ecosystem on a regional scale and therefore the nature of rootedness for all residents of Phnom Penh and its environs.

In addition, the specific vision being promoted through ING City – the widespread construction of exclusive gated communities and commercial establishments targeted at luxury consumption – is part of a growing trend to construct an urban form which promotes a particular vision of the world where "'world class' spaces are planned and constructed in order to project national claims to global significance" (Paling, 2012, p.2900). Sometimes called 'worlding' (Ong, 2011), this strategy is highly visible in urban construction in Asia as elites seek entry into global spheres of political and economic influence. Though 'worlding' seeks inclusion at the global level, at the local level the manifestations of these processes of urbanization have "made these cities into spaces of extraordinary exclusion" (Harms, 2016, p.55). This further accentuates the inequality of outcomes of urbanization by actively promoting development aimed at fulfilling the aspirations of transnational elites at the

expense of the needs of the rest of the city's residents. The vision for Phnom Penh's future promoted through the development of ING City has raised the concerns of Prek Takong Muy's farmers. They are witnessing the rapid transformation of the lake around them and, taking in the enormous gated communities and wide boulevards, do not see how there will be a place for them in this version of the future. This has immediate implications for their feelings of ownership and belonging and as such their own experience of rootedness.

6.3.2 Identity and Belonging: Rootedness and Attachment to Place

Place is important in the formation of identity and sense of self, which can motivate actions to build resilience (Brown, 2016). In Prek Takong Muy, the experience of this sense of rootedness varies enormously. For some the village is the only home they know and the emotional attachment that they feel for their home is powerful. The transformation of the physical landscape around Boeung Tompun is already apparent to these residents who are intimately familiar with the lake. As one young person in Prek Takong Muy observed:

> It is very hard. I don't even know what to say. In the past, I loved the scenery. As I got up in the morning and came out of the house, I saw the pasture and morning glory fields. It was beautiful. It was so green. Now, it is full of white sand. In the past, as we opened our eyes, we felt the clean breeze and now, when we open our eyes, a cloud of dust flies in our eyes. (Focus group_4, 2018)

Thus, the change of the physical landscape is experienced as a personal loss and contributes to a sense of displacement. This is particularly true for young people who were born in the village.

However, due to the diversity of experiences, this sense of attachment is not universal. Many of those who moved to the village as adults have a more pragmatic relationship with the site – they value its proximity to the public services offered within the capital but the sense of emotional loss is dampened by the ties they retain with the rural areas or their willingness to relocate elsewhere in Phnom Penh. For those that do not own land in the village, this weak connection to place is even more profound. For example, interviews with individuals working as hired labourers revealed a lack of interest in the development plans which was attributed directly to the fact that they do not own land and are therefore not invested (financially or emotionally) in the future of the village. Said one woman when asked what she knew of the plans for development of the lake: "They talked about it, but we didn't pay much attention. They said they were filling up the lake and then they would build supermarkets...We don't have any land here, why would we care to know much about it? What we care about is harvesting morning glory (Interview_76, 2018)."

Because the city offers multiple options in terms of earning a living (or at least the perception of options), there is a strong sense of agency or choice in the identity of an urban farmer. While other studies have shown that the loss of livelihood can provoke a significant loss of identity for individuals with a strong livelihood attachment (Marshall et al., 2007), this does not seem to be the case with the farmers of Prek Takong Muy. Farming morning glory is not a 'traditional' livelihood for many farmers in the sense that they often learned the skills in adulthood after relocating to the city and after trying out other livelihood options such as construction or wage labour. Farmers give a number of reasons why they have chosen to pursue morning glory farming. The immediacy of payment is a strong factor – rather than waiting for a salary at the end of the month, with farming you receive payment as soon as you sell your crops, or every day if you work as hired labour (Focus group_2, 2018; Focus group_1, 2018; Interview_56, 2018). This is important for people who have little savings and need their income to meet their daily expenses as well as to make payments on their debts

(Focus group_1, 2018). For women, farming allows them to work only in the morning meaning that they have time to be at home to tend to their domestic responsibilities (Interview_54, 2018) and be close to their children when they are young. Furthermore, the independence and flexibility of farming is very appealing for both men and women. One man left the construction sector to learn how to farm morning glory because he found construction work too tiring. Farming, he said, is also tiring but at least in farming you are the boss so you can stop any time you want (Interview_53, 2018). The opportunity to be independent motivated many residents to choose farming over other alternatives. However, the steady loss of the lake to in-fill compromises these efforts to be in control of their own lives.

In addition to their identity as farmers, for permanent residents of the village (rather than migrant labourers), their identity as *urban* residents was extremely important to them. When discussing the uncertainty of the future of the lake, and consequently their livelihood, many rejected outright the idea of returning to the provinces, which they saw as places with no opportunity. In contrast, it was felt that being close to Phnom Penh, despite the precariousness of their current situation, brought options and therefore the possibility of better outcomes. This was a message heard most strongly from parents and those caring for school-age children. Caregivers intend to remain in the city long enough for children to benefit from the higher quality education available in the capital. One grandmother explained that for her, returning to the province is not an option:

> If they fill in the lake and don't allow us to live here anymore we will look for a new place. I don't know yet where to move to. If we had money, we would have ideas about where to buy here and there, but we don't have money. If we move back to our hometown, we would have nothing to do to earn a living. I wouldn't move, because living here allows my grandchildren to go to school. (Interview_73, 2018)

The sense of attachment felt by many residents of Prek Takong Muy is towards the city, rather than to their village, a finding which reflects other studies into the importance of scale in forming place attachment in urban areas (Hernandez et al., 2007). Prek Takong Muy residents voiced their strong connection with Phnom Penh as it is from that scale that they derive hope of their future.

This future will be built by remaining present in the city to benefit from the opportunities available, both in terms of employment as well as public services. Morning glory farming allows them to meet their present needs while their children are receiving a higher quality education than would be available in rural areas. For many parents this is an investment, with the understanding that as adults, the children will be asked to provide for the family. In the household survey, children's education was ranked as the second highest priority for households (behind earning money). This was true across both genders as 32% of men and 36% of women ranked it as their second priority (n=100). Parents and other caregivers are clear that they do not want their children to work on the lake as farmers and instead, wish for them to get a job "on the land" (Focus group_2, 2018; Focus group_3, 2018). The children themselves echoed these aspirations, with focus group participants aged 11-14 listing doctor, teacher and flight attendant as their future career plans – none wished to pursue farming for their livelihood (Focus group_4, 2018).

This prioritization of education can be interpreted as an intergenerational strategy to build resilience, where rootedness in the urban area is an investment in the resourcefulness of the next generation. Rather than resisting the nature of urbanization that is currently shaping Phnom Penh, many farmers aspire to be included within it. To this end, they plan to continue to farm as long as there is space available on the lake - drawing on the diminishing productivity of the lake's ecosystem and offering their uncompensated contribution to urban

wastewater management through the cultivation of aquatic vegetables. They do this in the hope that by doing so their children will be well positioned to claim a larger share of the benefits of Phnom Penh's future. Put in resilience terms, the livelihoods in the village are in a state of collapse (See Chapter 2, Figure 2.1 Panarchy) and as reorganization emerges, residents are looking for growth and potential in other areas and in fact at other scales of the 'panarchy' of Phnom Penh.

Despite this hope, they are somewhat pessimistic about the possibility. When asked what they think their village will look like in 10 years, many people said they expected the village would be "beautiful"[8] but that the current houses and their residents would be gone – replaced by gated communities. One long term resident shared:

> I think that it is going to be beautiful. It will be filled with concrete houses in the next 10 years. I am afraid that I will not be able to continue living here. Maybe I will be kicked out. It will be filled with condos and it is going to be beautiful and it is going to be the same as the central area of Phnom Penh. (Focus group_3, 2018)

This vision of the future as being aesthetically superior but exclusionary was widely held, but it did not provoke any organized resistance within the community. Instead, interviewees frequently expressed resignation that they would be forced to start over, suggesting that on the whole collective identity and attachment to Prek Takong Muy is weak. Strategies for resilience, such as investing in the socio-economic advancement of the next generation, were based in the family unit with little said about the fate of the wider community. During visits to the village, neighbours were regularly seen to stop by and engage in conversation but respondents said they did not talk to others about their struggles to farm, nor about their strategies to cope. One woman shared that there is no one in the village she felt she could go to to ask for help: "The majority of the villagers are poor, it's all the same, so no one is able to help (Focus group_3, 2018)." This absence of information sharing limits the building of trust and social capital and by extension adaptive and transformative capacity (Adger, 2003; Barnes et al., 2017).

While interviews did not reveal major discord within the village, they did show that very little information related to addressing the challenges of coping with urbanization and environmental change was exchanged between households. Mechanisms for information sharing in the village are muddled. In addition to the Village Chief, the village is divided into seven groups which each have a group leader, all of whom play some role in disseminating information, either door to door or through public meetings (Interview_66, 2018). While some residents said they received regular updates from these channels, others said they heard nothing. A focus group with women who work a hired labourers indicated that only long term residents are members of the groups and they, as temporary or periodic residents were not included (Focus group_3, 2018). The result is that this flow of information may reach some while excluding others, leaving the village very fragmented. Said one recent arrival:

> I haven't seen any activity or gathering among the community. People live by themselves and they live by themselves. There is no sense of community because it's more divided in this village [than in previous home]. Some people go to the lake and others stay in the village but they're playing cards. These are different kinds of people that don't seem to connect. (Interview_67, 2018)

[8] The Khmer word 'sa'at' was frequently used to describe the village in the future which can mean both beautiful and clean. Often both connotations were present in the wider description given.

Another couple who has lived in the village more than 10 years said they were also not aware of any activities being led by villagers themselves, only NGOs and they had never attended as they had never been invited (Interview_62, 2018). This indicates that the issue of information sharing is not a question of being newly arrived to the village but that patterns of inclusion and exclusion are created and reinforced over time. Residents expect this to deteriorate further as the physical landscape of the village is transformed and wealthier neighbours move in as the property values rise, a process which has already begun. One young person shared how she viewed the development in the area:

> We are happy, but at the same time we are also distressed. Why? Because it might change the way we live. Generally rich people do not come out to talk with each other like us [poor people] and usually they build fences around their houses. It feels like there are no neighbours. (Focus group_4, 2018)

This fragmented sense of community has limited the rootedness that Prek Takong Muy has been able to leverage into a shared identity or collective resilience building strategies. Instead, families strategize within the household and institutional actors have come to be seen as the primary source of support in terms of undertaking adaptation strategies. In the household survey, 55% of respondents reported receiving assistance from NGOs while only 11% and 7% said they received help from neighbours and family respectively. Perhaps even more telling is that when asked who they thought *should* support their adaptation efforts, 51% of respondents said the local government and 41% said NGOs, but 43% said no one. Unfortunately, because the local government lacks the resources (and political will) to provide this kind of support and NGOs may leave the community or change their mandate, this reliance on external institutions is a risky strategy. It also indicates an absence of social capital in the form of mutual self-reliance that could support transformative actions.

6.4 Resistance: Expressions of Agency

Understanding ‘resistance’ as an effort to rebuff potential change with robust defences, analogous to the construction of flood walls or other hard infrastructure, the farmers of Boeung Tompun are putting up significant resistance to the environmental changes they are experiencing. This is at least the case in terms of their strategy of enacting resilience in the short term. They continue to apply their resourcefulness to urban farming in an effort to stretch out the viability of cultivating morning glory as long as possible. While changing agricultural conditions can be managed (to a certain extent) by modifying practices, the impact of in-filling cannot be accommodated in the same way. Said one man in reference to the plans for the satellite city:

> At the moment, it [the development] is not affecting me at all, maybe in the near future if they fill up the lake, we will have no way to earn a living. I do not know what I am going to do. I don’t know how to make a living. When they fill up the land, everyone will have nothing to do. (Interview_61, 2018)

While a variety of ideas were mentioned for what people will do in the future, including returning to their rural homes, the lack of any official information regarding the timeline for filling in the lake has made it difficult for anyone to plan. Operating in an environment of distressing uncertainty, villagers carry on as best they can. Said one resident who identified herself as a Christian: “I just pray to God that things will work out” (Interview_48, 2017).

6.4.1 Strategies of Everyday Resistance

However, understood as exerting agency to determine one’s own future in the face of external forces, there is an absence of overt resistance from the residents of Prek Takong

Muy. Broadly speaking, there have been moments of public outrage against the commodification and enclosure of Cambodia's resources, such as the widespread support for the residents of Boeung Kak (Brickell, 2014), but resistance to neopatrimonial exploitation has so far failed to generate a mass movement. Some of this acquiescence has been attributed to *baksbat* (see Chapter 2) and the trauma experienced as a result of decades of civil war and occupation, particularly the Khmer Rouge period (Strangio, 2014). Even during times of peace, poor communities in Phnom Penh have witnessed the repeated evictions of low income settlements in the capital (STT, 2016). As noted in Chapter 2, the choice between resistance and acquiescence is situational and depends not only on present conditions but also past experiences (Park, 2018). It is therefore unsurprising that the residents of Prek Takong Muy are fearful and unwilling to engage in direct opposition to the plans for development.

Yet, failure to enact organized resistance, rather than passivity, could also be read as a logical strategy in the face of powerful opponents. The residents' approach to 'wait and see' has bought them time to strengthen their claim to land tenure through the construction of the trash road. Furthermore, they still lack specific information about the timeline for in-filling the lake and what areas will remain. To protest an uncertain future would unnecessarily draw attention to themselves and jeopardize their as yet unresolved land tenure negotiations. Instead, biding time allows them to keep the door open to alternative strategies such as requesting inclusion in alternative livelihoods (Hall et al., 2015).

Additionally, the culture of mistrust that has evolved between low income residents and the city government as a result of the history of evictions in Phnom Penh means that all information from officialdom is met with scepticism. In a conversation with one of Prek Takong Muy's younger residents (a non-farmer who is employed as a restaurant manager), he explained how he had been actively involved in discussions with government officials regarding the status of the village within the development of the satellite city. He was frustrated by the fact that villagers had been to meet City Hall and the Ministry of Land Management with neither able to provide any concrete information or a firm timeline. He shared that when City Hall asked residents to submit their letters of ownership to facilitate the process of securing formal land titles, many did not because they believed it was a ploy for the government to "steal their land like Boeung Kak" (Interview_53, 2018). This refusal to participate in a process that they believed would facilitate the dispossession of their land can be seen as an example of 'everyday resistance'. In situations where imbalances of power are such that high social penalties could be imposed for overt acts of rebellion, delaying tactics or means of disguising non-compliance are the "weapons of the weak" (Scott, 1985). These subtle tactics do not hold the same risks as direct confrontation but also do not commit the farmers to acquiescence. These strategies are also appropriate to a more individual or household level response, given the lack of information sharing or community organizing.

However, even everyday resistance carries a form of risk. Residents are now worried that if they were to be evicted and compensation offered they would be cut out as a result of not having submitted their paperwork (Interview_53, 2018). The lack of clear information about the plans for Boeung Tompun has created an immense amount of stress and anxiety for residents of Prek Takong Muy. In a focus group with long term residents of the village, there was universal consensus that the biggest challenge facing the village was the fear that they will lose their livelihood due to the lake being filled in (Focus group_3, 2018). Fear has been shown to have a strong influence on how Cambodians respond to incidences of dispossession that have occurred as a result of the exploitation of the country's natural resources (Schoenberger and Beban, 2018). While previous studies focused on fear of

violence, in the case of Boeung Tompun the fear of displacement, loss of livelihood and loss of rootedness generated through the opacity of this urban land grab similarly functions as a means to pacify the local population. This is evident in Prek Takong Muy in the way that uncertainty has kept villagers from putting up any organized resistance to the development plans. The fragmentation of the channels of communication means that when information is shared it its often incomplete and inaccurate creating rumours that feed doubt and apprehension. Village residents have been hearing rumours about possible evictions for years (Interview_50, 2018) but without any clear information, they have struggled to enact strategies to resist the forthcoming change.

6.4.2 Threats and Gifts: Mechanisms to Control Public Dissent

While village residents report that early meetings with government officials were characterized by an atmosphere of threats and intimidation (Interview_53, 2018), local officials are now keen to confirm that the process of granting land tenure for village residents is underway (Interview_79, 2018). This could be a strategy on the part of the national government to avoid a repeat of the public outrage from Boeung Kak. However, with the abolition of the opposition party in November 2017, the government has arguably never been in a stronger position politically and so hardly needs to be making public concessions. It seems more likely that the granting of land title posed no threat to the wider plans for ING City and was therefore an easy win that could be publicized to build goodwill (see for example the promotion of this 'gift' on the Cambodian People's Party Chak Angrae Leu Commune Facebook page, 2018). This is in line with work on rural land grabs where threats of violence co-exist with shows of 'good governance' in order to create a climate of uncertainty where Cambodians feel pressured to moderate their strategies of resistance (Schoenberger and Beban, 2018; Beban et al., 2017).

The granting of land tenure and other development 'gifts' (see Chapter 2), operates alongside fear as a mechanism of control through the creation of legitimacy for government actions. This process establishes the social contract as a reciprocal relationship between the people and the CPP who are the providers of public goods and therefore deserving of public trust and loyalty. In the run up to the 2018 elections officials from both the national and municipal governments arrived in Prek Takong Muy with 'gifts' such as the promise of land tenure and infrastructure upgrading which, although it is being delivered by NGOs, the government claims as their own because they have given permission for those organizations to operate. The Facebook page for the Cambodian People Party of Chak Angre Leu commune, where Prek Takong Muy is located, announced that on the 10 August 2018, his excellency Khoung Sreng, Phnom Penh Governor, along with other dignitaries, visited Prek Takong Muy and "delivered greetings from Prime Minister Hun Sen and his wife to the people of Prek Takong Muy village." Furthermore, the governor had "brought many gifts from the prime minister" such as: road paving and drainage, light poles, connection to clean water pipes and "The Prime Minister has gifted land to 300 families"[9] (Cambodian People's Party Chak Angre Leu commune, 2018).

As there are few, if any, alternative channels for the provision of public goods, the residents of Prek Takong Muy and other Cambodians are forced to accept development by gift-giving and the distorted social contract that comes with it (i.e. support for the CPP) or be left outside of the only system of protection and development offered by the state (Hughes, 2006). While farmers have made small gestures of resistance towards the way they have been excluded from the process of urbanization such as the refusal to turn over their

[9] This message was originally posted in Khmer and translated by my Research Assistant.

paperwork, they are also treading a fine line not to be perceived as rebellious and risk falling foul of the government officials whose next 'gift' might be essential to their future. For example, if the village were to be evicted, being compensated for the value of their lands and houses would be critical to allow them to rebuild elsewhere. Having witnessed the fallout from other evictions in Phnom Penh, residents are aware that compensation is not guaranteed and are fearful of being left emptyhanded. When dispossession becomes inevitable, "inadequate compensation is better than no compensation at all" therefore being seen as 'rebellious' is a risky strategy, a reality which undermines attempts at organized resistance (Hughes, 2006, p. 488).

6.4.3 Walking Softly: Absence of Allies in Collective Action

At the city level, the in-filling of Boeung Tompun and the threats to the villages on its shores has so far failed to raise any public uprising. This lack of voiced discontent appears part of a larger trend of diminishing public protest in response to the success of the CPP's strategies to eliminate political opposition, free media and an outspoken civil society. These strategies have reduced space for rural collective action to resist the commodification and extraction of natural resources (Beban et al., 2019) and likewise in urban areas have limited the ability and will for a civil society response to ongoing forces of exclusion and appropriation. The lack of mass demonstrations after the obvious manipulation of the 2018 national elections (whereas previous elections had seen many people on the street to express their discontent with the outcome), indicates the level of unassailable authority projected by Hun Sen's regime (Morgenbesser, 2019). Public silence on the development of Boeung Tompun is also part of a tendency of Cambodian civil society to let decisions related to urban development go unchallenged, a side effect of the lack of transparency related to urban planning and decision making (Paling, 2012). The lack of information available to the public about ING City is most likely intentional, a strategy used by the Cambodian government to make opposition more difficult. With no detailed plans available, only claims that the development is in line with the 2030 Master Plan (which itself lacks details), there can be no protests against unfulfilled promises. A lack of transparency has been shown to effectively deter opposition to illicit resource extraction by blocking formal channels of resistance. For example, Milne (2015) describes court cases brought to challenge land grabs rejected on the grounds that no one was unable to identify the name of the 'oknha' that was responsible for extracting timber.

Though research on land grabs has shown NGOs to be important allies to local resistance efforts (Beban et al., 2017), this role has diminished in Phnom Penh in recent years. Operating in a climate of threats and censure (see for example Kijewski and Chheng, 2018), local NGOs are opting to engage quietly, working under the radar to provide communities with information on their rights but not leading public demonstrations or any activities that would raise unwanted attention (Interview_45, 2017). The need to maintain funding and working relationships with government prevents a strong role for NGOs in driving social change (Christoplos and McGinn, 2016). In Prek Takong Muy there are a number of civil society projects which support the community to understand their land rights to strengthen their ability to negotiate with City Hall in the face of eviction threats. While well-intentioned, Hughes (2006) has shown that this recourse to the language of 'rights' to resist disenfranchisement can be a bit of a bluff since their adversaries may in fact be above the law. Beyond that support, NGO partners have preferred to continue their work on improving local infrastructure, leaving the question of social or environmental justice of the in-filling unaddressed.

As the issue of eviction seems to have been avoided in Prek Takong Muy, with it went any civil society agitation that may have existed. Though injustice perpetrated against poor communities garners a timid response, the exploitation of nature for private gain, however critical a role it is playing in the survival of the city has not elicited any public protest. Despite appearing multiple times in the media (see for example O'Byrne and Sek, 2017; Keeton-Olsen, 2019), there has no been civil society resistance to the in-filling of Boeung Tompun and the surrounding wetlands. Phnom Penh has a growing environmental movement but it is strongly rooted in policing the consumer habits of the growing middle class, focused on messages of reducing the consumption of single-use plastic (see for example the Facebook group GoGreen Cambodia, 2019). This research was unable to identify any social movements or civil society organizations active in advocacy work around the preservation of urban nature. Said one civil society representative with more than 10 years experience in environmental conservation work in Cambodia: "No one is advocating for wetlands here. They're advocating for land rights, or for livelihoods. They're advocating probably for human health. But there isn't a voice for wetlands here" (Interview_13, 2018).

An unusual exception to this has appeared in the form of the Phnom Penh Capital Hall. In May 2019, City Hall released a detailed report which they publicized as a master plan for the development of the southern part of city, namely the area around Boeung Tompun and Boeung Cheung Ek. Although this document, available in French and Khmer, lacked the strategic direction that might be expected of a master plan, it did document a plethora of risks associated with the in-filling of the lake including: increased risk of flooding in Phnom Penh and downstream in neighbouring city Takhmao, water pollution, the loss of important sites of cultural heritage and archaeology and threats to biodiversity including the breeding grounds of a species of rare fish, to name only a few (APUR, 2019). Just two months later it was publicly announced that five of the land titles that had been issued to ING Holdings for the development of the Beoung Tompun wetland area were to be revoked due to a "failure to develop infrastructure" (Khuon, 2019). No further details have emerged and the lakes continue to be filled so conclusions remain speculative but it is clear that actors within City Hall were not universally supportive of the direction taken by the development. Though the substance of these concerns, whether economic or indeed over the value of the urban wetland, is unknown, the release of such a strongly critical report is a sliver of hope for Boeung Tompun.

6.5 Conclusion

With respect to the research question, this analysis has found that farmers are faced with profound change with respect to the physical transformation of the wetland, and on the whole they are struggling to leverage their resourcefulness, rootedness and resistance into strategies for building resilience. Some elements have proven to be strong; the evidence of the farmers' resourcefulness is abundant but only in terms of their willingness to adopt any strategy available to persist with their livelihood, even to the detriment of their own health. Their resilience strategies rely primarily on their absorptive capacity (Béné et al., 2014). The resourcefulness of farmers is severely limited by structural factors and power dynamics that prevent village residents from moving beyond a subsistence livelihood. Declining access to productive agricultural land and high levels of debt mean that farmers are trapped in a doomed livelihood without the means to invest in an alternative strategy. Furthermore, villagers' sense of rootedness appears tied more to Phnom Penh and the opportunities it offers for the future, rather than Prek Takong Muy and the exhausting labour of urban farming. This promotes strategies that look at resilience at the family level, where current conditions are tolerated in the hopes that the next generation will be able to leverage them for larger gains working "on the land", the hope of an entry point into the perceived riches of

the city. The barriers to building social capital such as the lack of trust and limited information sharing mean that collective actions, and by extension those with the potential to be more transformative, are absent.

Scholars have theorized that significant environmental change or crisis may reveal weaknesses in ability of duty bearers to fulfil their responsibilities (Martin-Breen and Anderies, 2011; Pelling, 2011). Although the process of urban expansion taking place in Phnom Penh's southern zone is manifestly unjust and unsustainable, it has failed to act as a catalyst for Cambodians to express discontent with the current social contract. The implications of the project have failed to be widely heard or understood or simply failed to generate interest as the likely impacts from flooding and pollution of local rivers are yet to be felt. Additionally, as the outputs of the development (shopping malls, leisure centres and accommodation) appeal to many middle and upper class residents, they may in fact be supportive of the plan, particularly in concert with the common narrative that the wetland is dirty and polluted place (Interview_13, 2018). As more of the lakes are filled in that is likely to change, with potentially dramatic impacts on Phnom Penh's residents, both rich and poor alike. With the capital the clear centrepiece of Cambodia's efforts at modernization and growth, evidence of the government's failure to address these threats could prove to be a motivating factor for those wishing for alternative forms of urban development. Though Phnom Penh publicly aspires to be a "Sustainable City" (Phnom Penh Capital Hall et al., 2018), actual practices of urban development do not support this vision.

The enclosure and commodification of Boeung Tompun and Boeung Cheung Ek demonstrates that rather than institutional weaknesses it is the application of government resources into opportunities for private wealth creation that jeopardize opportunities for resilience building. The privatization of Boeung Tompun, which allowed its sale to ING Holdings and other corporate entities, shows how actors within the national government use the power of the sub-decree along with the ambiguity in written laws to ensure the commodification of valuable resources for private profit. This is coupled with an absence of publicly available information related to the plan, which makes resistance difficult. This is an urban manifestation of how the neopatrimonial structures of government operate to prioritize patronage relationships at the expense of the majority of Cambodians. The following chapter explores this further.

Chapter 7: The Governance of Resilience in Cambodia[10]

7.1 Introduction

Moving from the everyday practice of resilience to its discourse, this chapter will address Research Question 4: *How is the concept of 'resilience' being employed as a policy objective in Cambodia? Does the presence of a resilience agenda improve conditions for low-income residents facing challenges related to environmental change in urban areas?*

Like many governments, Cambodia's leaders have made resilience a key platform within the policy architecture related to climate change as well as national development. High level plans feature resilience as an objective, promoting it as a goal or positive state to which the nation should aspire. Yet, the failure to protect the Boeung Tompun wetlands and the residents of Prek Takong Muy and other villages in the area, shows that this resilience agenda is not translating into a practice of urban planning that takes into account even the most fundamental characteristics of resilience that have been identified in the academic literature (as discussed in Chapter 2). After establishing the presence of resilience in relevant national policies, this chapter will use the key tenants from the field of political ecology, including the importance of knowledge and power, to explore how the discourse of resilience is built, employed and contested in Cambodia to shape how, and in whose interests, urban planning is taking place.

The analysis will make use of the three entry points identified by Adger et al. (2001): "analysis of regularities in expressions to identify discourses; analysis of the actors producing, reproducing and transforming discourses; and social impacts and policy outcomes of discourses" (Adger et al., 2001, p.684). The chapter will argue that the appearance of resilience in policy documents frames the challenges of climate change in a managerial discourse, meaning the discourse sees the root of environmental problems as failures in policy and presents appropriate solutions as technocratic, such as capacity building. In reality, the failure to protect valuable urban ecosystems and the city's vulnerable residents is political in nature, as urban land is sold off to reproduce relationships of patronage that are propping up the Cambodian People Party's (CPP) neopatrimonial regime. As such, the current framing of resilience discourse is mismatched with the kind of political solutions that are required to deliver the qualities that the resilience agenda is purported to achieve.

7.2 Cambodia's Neopatrimonial State

Lack of capacity is often identified as the reason why many policy initiatives fail or are only partially implemented in developing countries. International donors continue to call for programs to improve governance in the belief that once the necessary institutional arrangements and technical capacity are in place, the path will be clear for the success of development initiatives (OECD, 2019). For example, a recent World Bank report on Urban Development in Phnom Penh lists its first recommendation as: "Improving Institutions and Governance" without which, it goes on to say, Phnom Penh will "develop in an uncoordinated and fragmented manner, with infrastructure coming under increasing strain, increases in sprawl and congestion, worsening vulnerability to climate change, and a less

[10] Parts of this chapter are included in: Beckwith, L. and Keo, P. (forthcoming). "The Discourse and Practice of Resilience Policy in Phnom Penh" in Sanderson, D. and Bruce, L. (Eds). *Urbanisation at risk, Pacific and Asia.* Routledge.

liveable urban environment" (World Bank, 2018b, p.5). Yet Baker and Milne (2015) have argued that in Southeast Asia, what is perceived as state weakness is often an intentional strategy whereby "regimes wilfully weaken state fiscal capacity for political and economic ends" (p. 153). This can include failing to track budget expenditures to avoid making record of illicit transactions. This chapter will argue that a similar process is taking place in terms of Cambodia's climate change policies. Though resilience discourse frames climate change as a technical problem, Cambodia's main barrier to meeting its policy objectives is not institutional weakness but the fact that resilience is actively undermined by political interests.

While Cambodia maintains a façade of democracy, such as running regular elections, since the UNTAC period the country has become increasingly authoritarian in nature (Morgenbesser, 2019). Prime Minister Hun Sen has been steadily dismantling any opposition to the CPP through co-optation, threats, violence or spurious legal action against civil society, media and political opponents (Morgenbesser, 2018). A climate of fear has been created and perpetuated through political repression, and the decades of violence experienced by millions of Cambodians used as a political tool to prevent any form of opposition or dissent (Schoenberger and Beban, 2018; Ben, 2018b). Cambodians are told that it is thanks to Prime Minister Hun Sen and the CPP that they are currently enjoying a period of peace and prosperity and those who seek to challenge their control will return the country to civil war (Ben, 2018c).

Eliminating opposition is critical to the neopatrimonial character of governance of the CPP. Under Prime Minister Hun Sen's rule relationships of patronage support a pyramid of personal wealth creation (often through illegal or corrupt channels), benefiting an elite circle made up of senior government and military officials and their private sector cronies (Springer, 2011; Un and So, 2011; Fauveaud, 2016b). The result is the institutionalized prioritization of private interests over public good as funds to prop up the pyramid must continually be sourced in order to ensure the CPP remains in power. Relationships of accountability between patrons in the neopatrimonial system are strong, as without access to the wealth created through this system, the legitimacy of the CPP and Hun Sen's rule is in doubt. This places the preservation of relationships of patronage above fulfilling the rights of Cambodian citizens (Eng, 2016). It is this preservation of the neopatrimonial system, rather than institutional weakness that explains how decisions are passed that are directly in contradiction with published government policies and the interests of Cambodian citizens.

This scenario also explains why government institutions may appear weak, while at the same time the state exhibits enormous capacity for alternative forms of governance that align with these private interests (Baker and Milne, 2015). For example, urban planning mechanisms are hampered by human, institutional and financial capacity gaps. Yet, multiple studies have shown that major decisions related to land use in Phnom Penh such as the case of declaring Beoung Tompun to be state-private land, are made outside of municipal planning processes (Paling, 2012; Fauveaud, 2016a). These decrees are subsequently accommodated and legitimated by city plans. This has been the case with ING City which appears in Phnom Penh's Master Plan, yet no public documentation as to the decision making process which confirmed it is available. The tendency for major decisions to be taken behind closed doors is facilitated by limited and confusing documentation on urban planning such as the lack of clarity around the content of the approved 2015 Master Plan (see Chapter 4). The status of the owners of ING Holdings, all oknhas and at least one a former CPP official (ING Holdings, 2015), suggests that relationships of patronage are facilitating the project.

7.3 Analyzing the Discourse of Resilience in Cambodia

Cambodia's climate change policy offers a clear example of the discrepancy between the published priorities of the CPP government and the neopatrimonial reality which is the major driver of government decisions. While the country has managed, with significant support from Western donors, to produce written policies related to climate change, it continues to undermine these same policies through unjust and unsustainable urbanization practices.

As resilience is the stated goal of many of these policies it is important to assess how adopting a resilience agenda has been advantageous to the CPP's style of governance. The pervasiveness of resilience in policy documents makes it important to understand how and by whom the term is being employed, or in other words its discourse (Leach, 2008). Drawing on the framework developed by Adger et al. (2001) and outlined in Chapter 2, this analysis will show that the production and reproduction of resilience discourse in Cambodian policy plays a specific role in underpinning the power of the country's political and economic elite. This discursive power is exacerbated by the institutional culture created by the neopatrimonial governance structure which intentionally promotes a managerialist view of climate change challenges. In this framing, institutional and human capacity appear as the main barrier to implementing effective climate change policy, which allows political failures to go unaddressed.

7.3.1 Resilience Policy in Cambodia

7.3.1.1 National Level

To lead the country's response to climate change, the government has established the Department of Climate Change housed in the Ministry of Environment and reporting to the National Council for Sustainable Development, which has the Prime Minister as its honourary chair (Department of Climate Change, 2014b). This indicates that, at least on paper, responding to climate change has support from the highest levels of government. The country's strategic priorities are laid out in the Cambodian Climate Change Strategic Plan (CCCSP) 2014-2023, the multi-sectoral document which includes objectives for both mitigation and adaptation. The Vision of the CCCSP is: "Cambodia develops towards a green, low-carbon, climate-resilient, equitable, sustainable and knowledge-based society" (Royal Government of Cambodia, 2014, p.3). Of the Plan's eight strategic objectives, two are aimed specifically at fostering climate resilience. They are: "Strategic Objective 1: Promote climate resilience through improving food, water and energy security"; and "Strategic Objective 3: Ensure climate resilience of critical ecosystems (Tonle Sap Lake, Mekong River, coastal ecosystems, highlands, etc.), biodiversity, protected areas and cultural heritage sites (Royal Government of Cambodia, 2014, p. xvii)".

Furthermore, resilience appears multiple times in Cambodia's Rectangular Strategy, the country's economic and social development plan at the national level. Currently in Phase 4 (2019-2023), the Rectangular Strategy, so named because it identifies four corners which together should promote the country's social and economic development, forms the basis (within the Political Platform of the Royal Government of the Sixth Legislature of the National Assembly) of the National Strategic Development Plan and therefore underpins all of the development efforts in the country. This includes providing direction for the work of development partners. As part of the strategy to promote inclusive and sustainable development, the government has set a priority to: "strengthen the capabilities to develop and implement climate change adaptation and resiliency measures as well as explore the possibility of studying financial resiliency to respond to disasters caused by climate change" (Royal Government of Cambodia, 2018, p. 42). The document includes multiple mentions of the importance of ensuring the economy is resilient to shocks. The references to financial resilience within the Rectangular Strategy appear to be an exception rather than the norm.

Policy documents in Cambodia generally use the term resilience specifically in reference to preparing for the future effects of climate change.

At the national level, therefore, the term resilience is clearly making inroads in policy circles, particularly those related to climate change. However, as will be discussed further below, its usage is such that it appears to be employed as a buzzword, rather than a term which indicates a substantial policy agenda.

7.3.1.2 Municipal Level

Despite the documentation being produced by the national government detailing the expected risks to Phnom Penh from climate change now and in the future, such as flooding and increased temperatures, resilience does not feature as prominently at the municipal level. The key planning document at city level is the Phnom Penh Land Use Master Plan. The Master Plan was developed with assistance from the French government and released by sub-decree in 2015 (Fauveaud, 2016a). The Master Plan is intended to guide the city's development through to 2035, mapping key infrastructure and residential and commercial land use. However, it has been criticized for being too high level and failing to give the detail of what is intended at the district or commune level as well as the regulatory framework to ensure proper implementation (World Bank, 2018b).

Furthermore, while the Master Plan discusses multiple sectors of importance to the city's development such as tourism, agriculture and transportation, the portion of it that has been publicly released does not contain a reference to either resilience or climate change. An interview with a senior City Hall official responsible for the development and delivery of the Master Plan revealed the existence of a municipal level climate change plan but he said an electronic copy was not available and he had been unable to get himself a hard copy. If he wanted to review the City's proposed climate change plans, he said he would have to find a colleague with a copy that he could borrow (Interview_6, 2018). The lack of attention to climate change both in policy documents and from senior officials, indicates that climate change is not a central concern for development or planning purposes at the municipal level.

Any reference to resilience as it relates to climate change in Phnom Penh is dispersed throughout other sectoral or thematic plans. A prominent example of a municipal policy document that does highlight resilience as a policy priority is the Phnom Penh Sustainable City Plan (SCP). The SCP was developed with the support of the Global Green Growth Institute, an international treaty-based organization headquartered in South Korea. After a delay of more than a year to have the plan approved, the SCP is now projected to run from 2018 to 2030. Initially, marketed as a "Green City" plan, the SCP identifies priority investment projects through which Phnom Penh can achieve green growth, with one of its stated goals being "[p]rovide urban resilience to all citizens from natural, climatic and other risks" (Phnom Penh Capital Hall et al., 2018, p. 2). The Plan is designed to support the implementation of the Land Use Master Plan as well as key objectives within the Transport, and Drainage and Sewerage plans (Phnom Penh Capital Hall et al., 2018). The SCP was developed alongside a Green City Strategy Planning Methodology which is intended to be used by other sub-national government bodies to develop their own plans. The Methodology includes a series of steps that will lead decision-makers through a process of considering a path for green urban development, including climate resilience. These steps include: "Setting a green city shared vision, mission and urban development goals" (Step 3) (National Council for Sustainable Development et al., 2016, p. 9). This requirement for multi-sectoral and multi-stakeholder buy-in has the potential to facilitate a systems-based approach to planning which often accompanies a resilience agenda. While not guaranteed to be strong in terms of

social justice, such an inclusive approach does have the advantage of potentially improving coordination in terms of decision making related to infrastructure and other basic services.

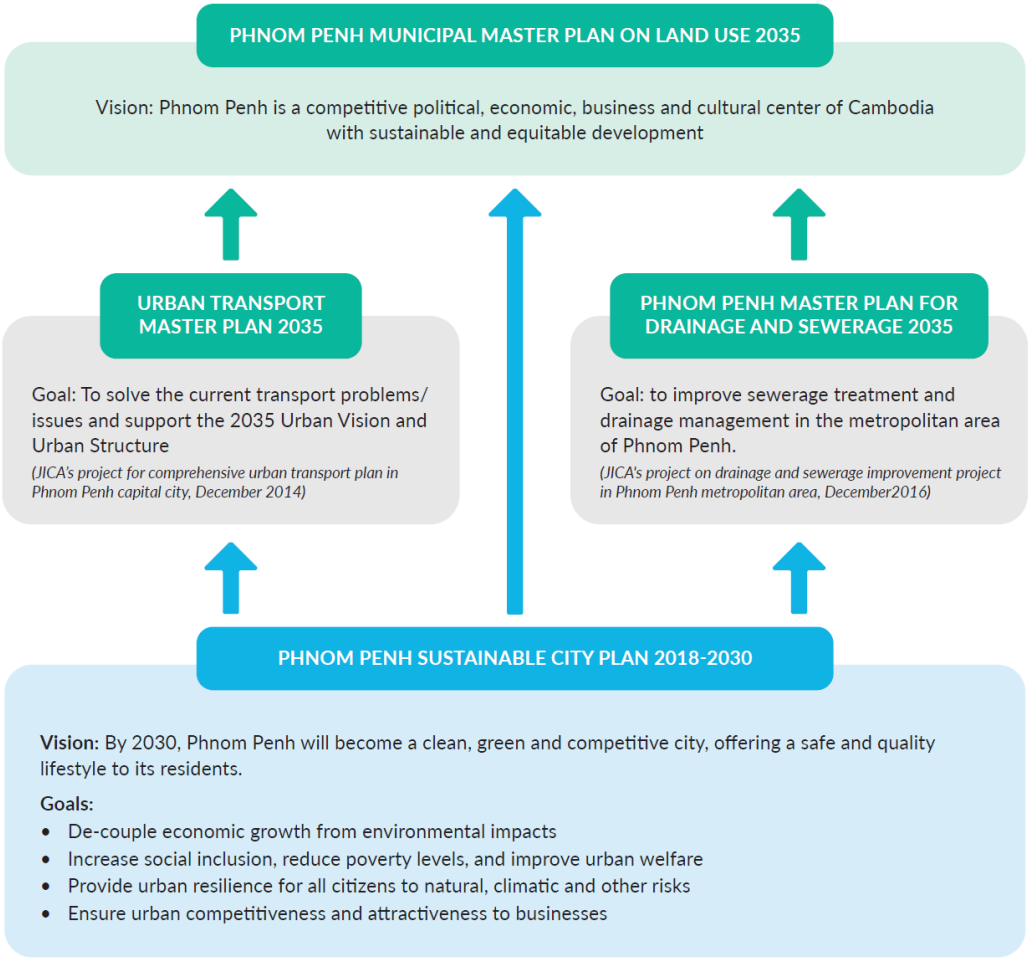

Figure 7.1 Overview of Key Planning Documents at the Municipal Level
Source: Phnom Penh Capital Hall et al., 2018, p.2

7.4 The Production of Resilience Discourse

7.4.1 Defining Resilience

Despite its prominence in policy documents at the national level and to a lesser extent at the municipal level, there has not been an attempt to define resilience in Cambodian policy. None of the policy documents analysed for this research (Rectangular Strategy, Climate Change Strategic Plan, Land Use Master Plan or Phnom Penh Sustainable City Plan) include a definition of resilience or description of what it would mean for Phnom Penh or Cambodia. Resilience is found frequently as part of the phrase 'climate resilience' as noted in the above example of the Climate Change Strategic Plan, implying an association with the country's (or city's or ecosystem's) ability to meet anticipated climatic changes. It is also subject to highly normative usage in written text. Climate resilience is presented as the desired state towards which the resources of government should be directed.

Table 7.1 Overview of Resilience in Key Policy Documents

Policy Document	Definition of Resilience (Y/N)	Normative Usage	Key Phrase
National Level			
Climate Change Strategic Plan	No	Yes	The CCCSP also envisages building resilience capacity and production skills, especially at the community level, to effectively overcome climate change impacts. (Royal Government of Cambodia, 2014, p.vi)
National Strategic Development Plan	No	Yes	…use social and environmental fund effectively to ensure economic development with low-carbon emission and resilience to climate change. (Royal Government of Cambodia, 2018, p. 42)
Municipal Level			
Phnom Penh Land Use Master Plan	N/A	N/A	N/A
Phnom Penh Sustainable City Plan	No	Yes	Climate change, and the projected increases in temperatures and flooding, could reduce the resilience of urban buildings. (Phnom Penh Capital Hall et al., 2018, p.23)
Urban Transport Master Plan 2035	N/A	N/A	N/A
Master Plan for Drainage and Sewerage 2035	N/A	N/A	N/A

Interviews conducted for this research explored how resilience was used and understood by government officials and development partners working in the area of climate change adaptation and urban development. Interviewees universally said that they used the term resilience as an objective in their climate change work. In fact, resilience was frequently in the title of the work such as the Strategic Program for Climate Resilience, the flagship of the national climate change projects, funded by the Climate Investment Fund through the Asian Development Bank. None of the interviewees, however, were able to provide a formal definition of the term. A number of policy makers mentioned that there was a definition in the

lexicon of climate related vocabulary developed by the Cambodia Climate Change Alliance (a donor-funded initiative housed within the Ministry of Environment). This lexicon simply translates IPCC terminology into the Khmer language. Yet even those who referenced it were hesitant to state what this definition is.

Interviewees were therefore invited to give their own description of resilience. All individuals interviewed had a sense of what resilience meant to them and their work and were able to give an informal definition. These definitions typically represented a vision of resilience as persistence or maintaining the status quo. Respondents equated resilience with the ability to 'cope' with climate change. As one senior official at the Ministry of Environment said; "Resilience is the capacity to survive, to cope with" (Interview_4, 2018). Similarly, interviews with individuals in positions related to disaster risk reduction mentioned that to them resilience was related to recovering from disasters or 'bouncing back'. Positions related to more complex theorizations that are present in the literature such as the transformative potential of resilience building were not mentioned in any of the interviews.

Interviews further probed how respondents saw their work contributing to resilience as an outcome. The majority agreed that resilience featured in the 'logframe' or monitoring and evaluation framework that was used to evaluate the progress of their program or department. Interviewees stated that resilience would be achieved when the outcomes in the logframe were met, even though the outcomes did not necessarily have a direct link to any definition of resilience. For example, when asked how they would know when the project is successful at achieving resilience, one respondent stated that they will know they are being successful when their model is being replicated by other projects and because they are receiving positive feedback from donors (Interview_14, 2018). This usage reproduces a very vague notion of resilience, equating it with any positive change achieved by the project.

The tendency for policymakers to take a 'persistence' or 'bouncing back' view of resilience has been noted before (Meerow and Stults, 2016). As will be discussed further below, Cambodian policy makers may have a vested interest in promoting the status quo and therefore have little incentive to push the boundaries of a resilience agenda. Instead, resilience is employed primarily as an imprecise but positive term. Interviews with policy makers at the national level confirm that resilience is often seen as the desired outcome of climate change adaptation (Interview_9, 2018), which lends itself to be interpreted as downloading responsibility onto individuals and communities, in line with one of the major critiques of resilience (Welsh, 2014). In some cases, resilience is also used as a synonym for anticipatory adaptation, or actions that might be taken to prepare for the impacts of climate change before they occur (Interview_4, 2018). The vague and normative way resilience appears in policy documents and is used by officials suggests it is being used as a 'buzzword' whereby its euphemistic and assumed positive qualities facilitate buy in from all stakeholders (Cornwall, 2007).

In Cambodia, the tendency to employ a very narrow reading of resilience is compounded by the fact that the term has entered the policy environment in English and translates imprecisely into Khmer. The Khmer word for resilience in the previously referenced CCCA lexicon is "*pheap thun*" which translates to the state of being resistant, a meaning similar to resilience as 'bouncing back' (Cambodia Climate Change Alliance, 2014, p.80). Many of the respondents to this research operate daily in both languages, meaning that they must find ways to communicate these ideas in English and Khmer. A simpler interpretation is therefore more straightforward to manage. This does not necessarily mean that it does not have the potential to be meaningful in the Cambodian context. One Cambodian informant told me: "I think the term resilience in English comes from the outside but in terms of the basis, in the

traditional adaptation practice they can say that they are safe from, they are secured in terms of flood, so basically resilience. If we compare this word to our traditional practice, it can be matched" (Interview_8, 2018). However, in its translation to the policy environment decision makers have failed to explore how resilience could better represent the richness of these traditional practices.

7.4.2 Resilience as a Rural Phenomenon

One of the constraining effects of discourse is to shape what areas are, or are not, considered legitimate targets for policy (Hajer, 2003). In Cambodia resilience is used almost exclusively in the context of rural development. For example, the Strategic Program for Climate Resilience (SPCR) has an explicit focus on rural areas. According to an interview with an SPCR employee, a vulnerability study was conducted in the initial stages of the project that identified six provinces as the most vulnerable to climate change: Kampong Thom, Koh Kong, Prey Veng, Mondolkiri, Pursat and Battambang (Interview_10, 2018). Although these six provinces do contain some of the country's major cities (Battambang city is the second largest urban area in Cambodia), the cities are not the focus of the program. Instead, interventions will target rural areas, aiming to build resilience through infrastructure (another key element of the resilience discourse which will be discussed below) as well as improving or modernizing agricultural practices. Under the SPCR's funded activities rural peasants are encouraged to adopt agricultural practices that conserve water or to invest in plant varieties that are resistant to drought. Through the application of these technical fixes, they are expected to emerge more resilient (Strategic Program for Climate Resilience, 2018a).

The invisibility of urban climate risk in policy stems in part from the legitimate recognition of the high risk faced by rural Cambodians, particularly small-scale farmers. Cambodia is still a largely rural country with approximately 77% of the population living outside of urban areas (World Bank, 2018c). The majority of rural dwellers are practicing rainfed agriculture as their main source of livelihood, particularly rice farming, and as such are exposed to expected changes in weather patterns such as prolonged periods of drought or intense periods of rainfall (Thoeun, 2015). However, the very real risks faced by rural farmers do not negate those experienced or projected for their urban counterparts. In fact, these groups may even be the same people, as the previous chapters have shown how individuals and families in Boeung Tompun move between rural and urban areas seeking economic opportunities and escaping deteriorating agricultural conditions. Yet the challenges faced by urban residents such as the farmers of Boeung Tompun are unaddressed in climate change policy in Cambodia. As one consultant working on the SPCR said in questioning the value of conducting this research on adaptation in urban communities: "Most people who live in the city, the permanent residents here, are resistant to climate change. They have capacity and effort to adapt, they can stay in the aircon." (Interview_10, 2018). The many residents who do not work in air conditioned offices are invisible to policy makers in the current resilience discourse.

7.4.3 The Managerialist Nature of Resilience

Interviews and text-based analysis revealed repeated reference to resilience being built through improving infrastructure, in line with the usage of the term to mean 'coping'. This supports findings in Lebel et al. (2018) which determined that the need for climate change adaptation projects in Cambodia is often framed as being caused by inadequate infrastructure. This is evident in written policy such as the Climate Change Strategic Plan which lists "Build and rehabilitate climate-resilient rural road infrastructure" as one of the key strategies to be used to meet Strategic Objective 1: Promote climate resilience through

improving food, water and energy security (Royal Government of Cambodia, 2014, p.14). Furthermore, an official at the Phnom Penh City Hall when asked if the term resilience featured in his work replied: “Yes, we do use that word resilience. We use it for infrastructure, upgrade infrastructure. For example, for the riverbank. Right now we do the river bank to avoid the erosion” (Interview_6, 2018). This position was echoed by other respondents both within government and civil society. For example, a consultant at the Ministry of Environment stated that in her experience resilience was a word that should be used exclusively for infrastructure: “Even working for this climate change project we still wonder [about] the words resilience and adaptation. From my knowledge, adaptation is for people, focus on livelihood and daily life and resilience is for infrastructure” (Interview_10, 2018).

In the academic literature, the models for the operationalization of resilience typically call for multi-sectoral, multi-scalar responses (see Chapter 2). In limiting its application to infrastructure, this more expansive meaning of the term is side-stepped, in favour of a narrow, technical interpretation that removes resilience from the realm of politics and places it under the control of engineers. For instance, a senior official at City Hall stated that the main risk the city was facing in relation to climate change was from flash floods after heavy rainfall and that this would be addressed by planting trees along the canals and beside lakes (Interview_6, 2018). When asked if urban heat was also a problem, he replied: “Heat wave? We don’t have any heat. I don’t think that we experience heat wave. Of course 39 or 40 but it’s still ok…..In the future we cannot predict but maybe we will experience this” (Interview_6, 2018). Meanwhile, there are ongoing reports of mass faintings at local factories where (mostly female) workers are subjected to long hours in temperatures in the high thirties (see for example McVeigh, 2017). This also suggests the multi-stakeholder methodology employed by the Phnom Penh Sustainable City Plan has failed to provoke any significant change in decision making practices such as anticipating future impacts or integrating mechanisms to manage uncertainty.

The interpretation of resilience as it appears in policy in Cambodia lends itself to a technocratic approach to building resilience. The usage of resilience is politically uncontroversial in its application to improving infrastructure or agricultural techniques. This framing also evokes the narrative that Cambodians are passive victims of the climate crisis awaiting the correct application of technology and development to become resilient. This is strongly linked to the ‘managerialist’ discourse of climate change at the global level (Adger et al., 2001). This framing, noted to be favoured by authoritarian regimes (Weisser et al., 2014), obscures the root causes of vulnerability that can often be found in power imbalances and instead favours technical solutions.

The usage of resilience as a buzzword contributes to a process of ‘discursive closure’ (Hajer, 2003) in which the complexity of the knowledge that could be understood as being part of resilience is reduced to a single expression, in this case that of ‘coping’. This discursive closure facilitates the reproduction of this discourse because it allows simple phrases like ‘coping’ and ‘adaptation’ to stand in as a shorthand for larger narratives which can be applied easily to multiple fields with the assumption of a shared understanding. However, this closure has the effect of reducing the complexity of a term or problem and therefore limiting the grounds for contestation. In Cambodia this discursive closure has contributed to the erasing of the socio-economic inequality that creates urban vulnerability.

7.5 Actors: The Resilience Consensus

Multiple actors both within and external to the Cambodian government are involved in the production of the managerialist resilience discourse. This dominant discourse is largely

unchallenged in Cambodia. As discourses reflect the social practices in which they are produced (Hajer, 2003), this acquiescence can be seen as the product of institutions of government and civil society that are invested in the reproduction of the status quo. The lack of discussion about the meaning of resilience means a shared objective is never made explicit but simply assumed. In interviews, this willingness to accept the dominant managerial discourse proved widespread. Resilience as an objective of climate change programming was equally popular amongst NGOs and other development partners working in Cambodia as it was within the national government, and it was subject to a similarly vague and normative usage. This meant there was little concern amongst civil society for the insubstantial way it is being adopted within levels of government and no efforts to use the acceptance of resilience as a policy priority to lobby or advocate for a more inclusive or transformational agenda.

Evidence collected through this research suggests that the superficial treatment of climate risk in Phnom Penh stems both from a lack of political will to address the political nature of climate risks, as well as a genuine absence of nuanced information regarding the differential risks being faced by the city's residents. The Cambodian government is of course not monolithic and many of the individuals working on climate change policy are well-intentioned, knowledgeable and committed to their work. Yet, interviews with government and donor representatives indicate that much of the impetus for climate change work in Cambodia came (at least initially) from foreign donors and their willingness to invest additional funds for climate-related programming. As those funds are much less likely to be directed to local governments (Soanes and Shakya, 2016), the lack of motivation of the city government to seek out the technical capacity to undertake planning for climate change is understandable. However, even at the national level, where much of Cambodia's climate expertise can be found, the appreciation for urban vulnerability is inadequate.

One explanation for the reluctance to engage deeply with the concept of resilience is the concern amongst both civil society and government stakeholders that resilience is simply the current donor fad. This is evident in Cambodia in the prominence of resilience at the project level, appearing as an objective wherever there are resources from foreign donors. For example, the Strategic Program for Climate Resilience seeks to "mainstream climate resilience into national and sub-national development policies, plans and projects" (Strategic Program for Climate Resilience, 2018b). Resilience is also a priority for the Cambodia Climate Change Alliance (CCCA), an initiative jointly funded by the EU, Sweden and UNDP, which "aims to strengthen national systems and capacities to support the coordination and implementation of Cambodia's climate change response, contributing to a greener, low carbon, climate-resilient, equitable, sustainable and knowledge-based society" (Department of Climate Change, 2014c). Many of those charged with delivering on these commitments to resilience saw it as 'old wine in new bottles', which did not change the substance of their work. One senior government official lamented that over his 30-year career he had seen a continuous cycle of new terminology introduced to replace the old with little substantial change in the meaning. However, he argued: "If you want their budget you have to use their word" (Interview_5, 2018).

In Cambodia, the Asian Development Bank, the World Bank, the European Union and the Swedish International Development Agency have been extremely influential in establishing the institutions the Cambodian government is using to address climate change at the national level. This is part of a global trend where international processes regarding both mitigation and adaptation have opened up new avenues for countries like Cambodia to access additional development funds (Taylor, 2014). This can have a positive impact as programs and projects are developed to address climate risks, but it may also result in

simply repackaging existing government responsibilities in climate change language. Interviews with development partners in Cambodia indicated that much of the climate change work currently happening in the country tends towards the latter. For example, a representative working on capacity building for climate finance noted that the line ministries involved in the training "think that their Climate Change Action Plan is just the way they can mobilize external resources rather than internal resources." (Interview_8, 2018). The exaggerated influence of external actors like international donors may also contribute to the use of managerial frames as the focus is on meeting project objectives rather than local needs (Lebel et al., 2018).

These examples indicate how the use of resilience language is tied into complicated relationships between Cambodia and its foreign donors. It is both a symbol of how Western donors continue to assert their influence on policy directions while at the same time, Cambodia officials find ways to appear to acquiesce to donor demands without substantially changing any of their actual priorities. This is a pattern that has played out since the time of UNTAC and through many annual donor funding conferences until Hun Sen ultimately decided to cancel them (Strangio, 2014). However, the alignment of national policies with the language of international development agenda serves another purpose for the Cambodian government. Being seen to contribute to the ideals of the international community, such as the Sustainable Development Goals, fosters legitimacy for the government's actions and creates the appearance of promoting solutions because of the assumed positive qualities carried by the use of the term resilience. Because resilience is employed with no further definition there is little to which the government can be held accountable.

The managerialist discourse of resilience promoted in large part by Western donors, frames the problem of climate change as an institutional challenge, best met by improvements in governance and institutional capacity building. Now that resilience has successfully been integrated into written policy, this logic suggests that it is simply a matter of ensuring the appropriate institutions implement the policy correctly. Identifying and correcting institutional 'weakness' is now a technical problem. This interpretation was evident both in policy documents as well as in interviews as government officials and donors cited issues of capacity as a reason why policy, once written, is not fully implemented in Cambodia.

Both the Climate Change Strategic Plan and the Rectangular Strategy identify institutional capacity as a barrier to the effective implementation of the strategies. In the Rectangular Strategy, challenges with "inter-institutional-ministerial coordination" is raised as a barrier to the government's ability to implement "concrete policy measures" (Royal Government of Cambodia, 2018, p.8). Coordination was also revealed to be a top concern of many of the government and donor representatives interviewed for this research. A senior official responsible for climate change within the Ministry of Environment said coordination was the biggest challenge for his office. He went on to explain that coordination problems arise not only from working with different line ministries as well as levels of government but also Cambodia's international donors, some of whom he said have a "different agenda" (Interview_4, 2018). In order to remedy this difficulty, a Technical Working Group (TWG) on Climate Change has been established with the support of the Cambodia Climate Change Alliance. However, a representative from an international organization closely involved with the TWG admitted that it had been slow to get started. Their meetings had been infrequent and they were hampered by the fact that much of the climate change funding is coming as Official Development Assistance and is therefore going through the Council for the Development of Cambodia, adding another layer in the management of funds and information (Interview_11, 2018).

One of the proposed solutions to the problem of coordination, in addition to the TWG, has been to deliver capacity building training on 'climate change mainstreaming' in order to disperse knowledge of climate change throughout ministries and levels of government. The Cambodia Climate Change Strategic Plan for example, makes repeated reference to the need for capacity building within the government, including climate change mainstreaming at various levels (Royal Government of Cambodia, 2014, p. 20). Climate mainstreaming in this context can be taken to mean the integration of climate change objectives into non-environmental sectors, including policy, plans and investments with the intention that this will lead to greater appreciation of the intersection between development and environmental objectives (Benson et al., 2014). Under the Strategic Programme for Climate Resilience, capacity building on climate resilience mainstreaming is being rolled out to sub-national levels of government (targeting mostly rural areas) (Interview_15, 2018). This approach presupposes that the problem preventing delivery of climate change projects at the local level is a technical one which can be solved through the production of tools, manuals and trainings on integrating climate resilience into existing plans, programs and projects (Strategic Program for Climate Resilience, 2018c). It does not allow for an interrogation of political priorities that might be hampering efforts to build resilience.

In terms of human capacity, individuals interviewed for this research stressed the difficulty in recruiting staff with appropriate skills and experience to deliver on policy agendas, particularly due to the loss of much of the educated population under the Khmer Rouge. After relative peace was restored in 1993 under the UN Transitional Authority in Cambodia, they attempted to rebuild institutions from scratch (United Nations, n.d.). The number of universities, particularly private institutions is growing rapidly with four times the number of students enrolled in 2008 as in 2002 (UNESCO, 2010). But the percentage of the population with post-secondary education is still only 6.1% (National Institute of Statistics, 2016) and universities are only beginning to provide programs related to climate change (Interview_4, 2018). Technical capacity, particularly in areas such as climate change which is an emerging field, is limited and government departments must compete with both the private sector and NGOs for the few candidates available. This has been identified as a barrier to developing realistic climate change policies at the sectoral level (Dany et al, 2017). While specialist agencies such as the Cambodia Climate Change Alliance can provide some technical support, the long-term objective is for line ministries to be capable of analysing the impacts of climate change on their own programming. Currently, key informants to this research have indicated that this is not feasible (Interview_8, 2018 and Interview_12, 2018).

To some extent then, Cambodia does face technical barriers to implementing their proposed climate change policies. However, issues raised by respondents with respect to limitations of human capacity go well beyond technical capacity of staff. Another concern is the quality of the working environment in many government departments which fails to provide incentives for employees to even meet minimum standards let alone thrive in their jobs. Salaries for many government jobs are well below the cost of living in Phnom Penh, meaning government workers may seek out other work, attending to their governmental responsibilities for only a few hours a day, if at all (Jackson and Cheang, 2014). Furthermore, the strictly hierarchical nature of the Cambodian government means that senior employees claim credit for the work of their subordinates, creating an environment where hard work achieves little recognition and motivation is therefore low (Interview_9, 2018). In this context, what is written into the policy matters little if none of it is being implemented. As one donor representative put it: "We were successful...to form the establishment of climate resilience into the policies, the sectoral policies, the manual, but we failed to function it" (Interview_9, 2018).

The Cambodian government has thus far been willing to tolerate the donor focus on institutional capacity building but this may soon be hampered by Cambodia's close relationship with China. While Western donors attempt to push through their agendas such as climate mainstreaming as part of their aid packages, China has been willing to provide their bilateral support as national infrastructure building with 'no strings attached' (Var, 2016; Milne, 2015). Cambodia's relationship with China has historically been tumultuous, with China a key ally of the Khmer Rouge and a strong opponent of the Vietnamese occupation (Chandler, 2007). As Hun Sen's control over the country has solidified, relations with China have also normalized (Chen, 2018). China is now Cambodia's largest foreign donor, recently pledging 587.6 million USD in aid over the next three years (RFA, 2019) and Cambodia is one of China's key allies in Southeast Asia, supporting China politically on controversial issues such as the One China Policy and Chinese claims to the South China Sea, even at the expense of good relations with other ASEAN members (Chen, 2018; Var, 2016).

Chinese assistance is a welcome gift for Hun Sen's CPP as they are increasingly unwilling to submit to governance conditions imposed by Western donors (Strangio, 2014). Cambodia is receiving significant Chinese support for infrastructure development as part of the Belt and Road Initiative (Chheang, 2017). The BRI is China's grand effort to stimulate regional trade and economic growth through the construction of transport and economic infrastructure to countries in Asia and elsewhere (Deng, 2018). This approach is appealing to the Cambodian government who reap the political dividends of improved infrastructure which provides visible and tangible evidence that the CPP is fulfilling their commitments within the social contract to provide Cambodians with economic development. Because it is given with no strings attached, Hun Sen and his associates are not required to submit to a host of capacity building measures to obtain it. Cambodia has so far been willing to at least pay lip service to reforms introduced by Western donors but a further turn toward China could end even this token gesture.

7.6 Policy and Society: The Repercussions of Resilience Discourse

The overarching implication of the managerial discourse of resilience in Cambodia is that it takes climate change off the political agenda. Climate change is framed as a technical problem, something that can be solved by resilience mainstreaming, agricultural training or improving infrastructure. By promoting a technical framing, issues of power and responsibility are obscured. The reliance on managerial solutions to address climate risk indicates an unwillingness to engage in the re-negotiation of existing institutions or power relations required to transform the inequalities that create differentiated risk. This approach privileges a certain type of knowledge and way of understanding the production of urban space. In this view, bureaucrats, urban planners and other professionals will be the ones to build resilience through the application of their scientific, engineering or technological skills. The local knowledge of the citizens of Phnom Penh including the social, cultural and ecological assemblages that influence everyday resilience making are not mentioned, nor are their vulnerabilities recognized through the lens of rights as citizens. This vision of Phnom Penh preserves the political status quo by simply 'greenwashing' the existing development agenda, very much in line with the critiques that are often levelled at resilience for being a 'neoliberal' framing (Watts, 2015).

For example, the narrative of rural vulnerability to climate change is promoted in part because it is politically convenient to overlook urban vulnerability. Populations most at risk to the impacts of climate change in urban areas are those that are already socially and economically marginalized and are therefore often viewed as undesirable. Informal settlements or 'slums' are labelled as dirty or polluted and treated as a public nuisance; such

is the case of Boeung Tompun's nickname "Smelly Water" (Interview_13, 2018). The inhabitants of these settlements are then accused of bringing about their own risk by inhabiting unsafe areas and the state of the environment used as grounds for eviction to make way for seemingly cleaner, large scale, luxury developments (Ghertner, 2011). This framing has not been actively employed in the case of Boeung Tompun because there has been little to no public resistance to the project. However, in the case of Boeung Kak, developers used the narrative of environmental risk and destruction caused by the residents (who were accused of throwing trash into the lake) as one of the ways to justify the removal of the community members in the face of strong resistance to the project (Fauveaud, 2016a). By framing urban areas as places that do not face climate risks, as the quotes from the Phnom Penh City representative imply, the responsibility for managing environmental problems is devolved to the residents themselves.

This is in line with Phnom Penh's wider approach to urban development which is driven by private interests and features little attention to questions of social justice. Poverty and equality are mentioned only once in passing in the Land Use Master Plan and no policies are set out to show how these priorities have influenced decision-making. The senior City Hall official interviewed for this research had little to say when asked how issues of social inclusion were taken into account in the development of the Master Plan except to say that there were a number of (voluntary) private sector initiatives to provide affordable housing in Phnom Penh but "not in the city centre because the city centre is too expensive." Instead he stated that low income residents could live outside the city, suggesting that 20kms away the land would be less valuable and therefore more suitable for the construction of affordable housing (Interview_6, 2018).

The tendency towards technical or managerial rather than political solutions, is facilitated by the hierarchical nature of Cambodian politics. For example, there was no open public consultation on the Land Use Master Plan (Interview_6, 2018). While sub-municipal levels of government such as district and sangkat/commune leaders were consulted during the development of the plan, it is questionable what weight community level priorities have in the face of political interests at higher levels (Springer, 2011; Un and So, 2011; Eng, 2016). The result is an entirely top-down approach to planning which represents a specific version of the future of Phnom Penh, one which sees private, luxury developments as 'green' and informal settlements as undesirable. This approach also values knowledge produced only through the practices and institutions of government and gives no scope for the integration of alternate ways of knowing the city. This vision serves the interests of political and economic elites but fails to be inclusive of the needs of low income residents whose voices are absent from institutionalized planning processes.

Within the Cambodian government, there are no doubt many dedicated individuals at all levels seeking to implement policies and programming that will help Cambodia to address its current challenges and meet the needs of the future. These people are certainly hampered by the capacity issues outlined above and yet, a question remains as to what extent the capacity building initiatives as currently envisioned by the government and its international donors will be able to prepare Cambodia to address the challenges of climate change. These capacity building programs take for granted that government officials aspire to govern in line with the principles of 'good governance' as envisioned by Western donors such as transparency, accountability and representation. While in fact, it has been noted that in post-conflict settings such as Cambodia, the agenda for governance centres much more on establishing and maintaining political legitimacy, which may indeed be in opposition to the notions of 'good governance' (Eng, 2016). The neopatrimonial structure of the Cambodian government necessarily prioritizes securing patronage relationships in order to ensure the

continuation of the regime (Strangio, 2014; Un and So, 2011). Thus, capacity building and mainstreaming activities are likely to be ineffective if delivering on policy commitments is not the real objective of politicians.

Furthermore, institutional 'weakness' has been shown to be a smokescreen behind which the illicit activities that support neopatrimonialism are allowed to flourish (Baker and Milne, 2015). In the case of Boeung Tompun, the lack of information available about the project despite its enormous impact on the city's infrastructure suggests significant influence is at play behind the scenes. The decision to fill Boeung Tompun with sand actively undermines the city's ongoing efforts to improve the capacity to manage its sewage and wastewater as outlined in JICA's Drainage and Sewerage Plan. Despite the critical role the lakes play in sewage and wastewater treatment as well as flood protection, there is a notable lack of knowledge of the details of project at the municipal level. Interviews and City Hall's own documents confirm that the ING project has been approved but key details such as plans for wastewater management are missing. This indicates that the decisions are being made outside of formal planning processes with the private developers leading the process, rather than conforming with municipal regulations. In the recently released 'master plan' for the south part of the city: "*Phnom Penh: Expansion and Transformations*"[11], City Hall has made clear its lack of oversight of the ING project stating that despite a study which showed at least 480 ha of the lake needed to be maintained for it to fulfil its role in flood protection, "[i]n 2018, ING Holdings announced on their website the lake would be reduced to 310 ha" (APUR, 2019). Recent sub-decrees (see Figure 5.5) issued by the national government have transferred even more of the lake to private developers.

In this context, the likelihood of the multitude of capacity building and mainstreaming projects successfully creating the conditions for the government to deliver on their promises of climate resilience is low. In order for these types of governance reforms to be acceptable to the Cambodian government they must refrain from directly challenging the neopatrimonial structure that supports the CPP (Strangio, 2014). However, in stripping governance reforms of politics and offering them as technical capacity building, they are incapable of addressing the systemic problems that undermine the delivery of all government programs, not only those related to resilience. In the virtual one-party system that currently exists in Cambodia, the interests of elites are served by the status quo and therefore those with the power to bring about change lack any motivation to do so.

7.7 Conclusion

This analysis indicates that the concept of resilience is employed in a manner consistent with a managerial discourse, which obscures underlying political agendas. These agendas continue to prioritize economic growth and private wealth creation in matters of urban development in order to sustain patronage relationships, to the detriment of low income communities. The inclusivity of Cambodia's economy and the long-term consequences of filling in urban lakes are swept aside. The loss of the Boeung Tompun wetland and the ecosystem services it is providing to the city as well as the livelihood and food security it provides to thousands of low-income residents clearly illustrates the disconnect between resilience discourse at the policy level in Cambodia and the practice of urban development. While resilience is increasingly found in written documents, the authenticity with which it is adopted is questionable, given the ambivalence of the officials responsible for implementing it as well as the influence of private interests directing urban development as it is currently unfolding in Phnom Penh.

[11] To date this document is only available in French and Khmer. All translations are my own.

However, the emphasis on resilience in this analysis has served to highlight a wider problem in Cambodia's national development policies and in fact, a similar assessment of any number of popular development terms including 'sustainability', 'transparency' or 'equity' would likely show a similar trend towards rhetoric over action. It is not in the adoption or implementation of resilience or any other concept that tragedies such as the loss of Boeung Tompun will be avoided but in the redirection of Cambodian political priorities away from recreating historic patterns of patronage and private profit towards an agenda that favours inclusivity and long-term national objectives. Political corruption is certainly not a problem unique to Cambodia (although it is a particularly egregious example[12]), however the continued restriction of civil rights such as the persecution of the political opposition and free media, means that avenues necessary to provide a check on government power are being lost.

This analysis does not indicate a strong likelihood that a resilience agenda will create space for transformational change in Cambodia. The basis of the social contract in Cambodia, namely economic prosperity and political stability, seem to be secure for the time-being. Neopatrimonalism has been shown to be resistant to democratization (Morgenbesser and Pepinsky, 2019) and recent trends towards less political competition and an absence of public protest indicate that change is not arriving imminently through these channels. However, nowhere is Cambodia's prosperity as evident as in its in capital and if high risk planning decisions such as the in-filling of Boeung Tompun continue to be made, their impact will eventually be felt. When the streets of Phnom Penh are flooded with sewage the government's legitimacy may start to be questioned.

[12] Cambodia currently ranks 161 out of 180 countries on Transparency International's Corruption Index (Transparency International, 2018).

Chapter 8: Conclusion

8.1 Summary of Analysis

This research constructs a portrait of Phnom Penh at a moment in time when the city is experiencing dramatic change. An analysis of Phnom Penh's urban development over the past forty years has given insight into the roots of certain enduring inequalities, both social and spatial. However, the future of the city is not yet written. Urban political ecology tells us above all that the production of urban areas is a process which is continually being shaped by systemic forces and by actors. In the case of Phnom Penh, this study has explored urban environmental change through the lens of resilience, drawing on political ecology to develop a multi-scalar perspective that combines historical dimensions, structural constraints, and the agency of individuals and groups.

Swyngedouw (2004; 2006) as well as Cook and Swyngedouw (2012) argue that the process of urbanization results in inherently unequal outcomes, with power dynamics across multiple fronts including socio-economic status influencing the distribution of risks and rewards. These ideas have helped to understand the impacts of environmental change and urbanization on low income residents in Phnom Penh, and specifically the farmers of Boeung Tompun. While Phnom Penh is a thriving, modern city in many ways, historic patterns of settlement and decades of ambiguity in land ownership laws have forced informal settlements into marginal locations such as riverbanks and rooftops and on the city's outskirts. This physical separation is compounded by other forms of exclusion such as a lack of access to public services including clean water and electricity. This was raised as a challenge at all three research sites examined for this thesis. The difficulties are such that inner city settlements are becoming scarce, with more low income residents moving towards Phnom Penh's periphery (STT, 2016). This increases barriers to accessing services (STT, 2018).

Phnom Penh's outskirts are the new battleground for the future of urban development. Urban expansion continues to favour the interests of the elite, again marginalizing those who have established themselves in the peri-urban zone. Farming once offered an appealing livelihood option for people living in this area but the loss of Phnom Penh's lakes to sand in-fill, a deterioration of water quality, and increasingly variable weather patterns have made it difficult for farmers to earn a reliable income. Compounding this uncertainty are unreliable incomes and persistent problems with debt, especially to unregulated private lenders which prevent farmers from pursuing alternative livelihood strategies. Bureaucratic hurdles in the land registry process as well as a lack of transparency in land deals means that residents retain only weak claims to land that has now become valuable as the city expands outwards.

In Prek Takong Muy, the response to these forces of exclusion has been a multitude of actions which demonstrate the farmers' resourcefulness. Adaptation strategies such as the use of pesticides and incurring debt are used to prop up an increasingly tenuous livelihood. These actions are, unfortunately, further undermining the resilience of urban farmers. This should by no means be taken as an attempt to lay the blame for this situation at the feet of those who are most affected. Instead, the analysis reveals how farmers have been forced to participate in the production of their own vulnerability as a consequence of sand in-filling and the contamination of waterways which degraded the aquatic ecosystem. The systematic denial of their rights as citizens through political repression and restrictions on civil society freedom have blocked many avenues of dissent (Schoenberger and Beban, 2018; Beban et al., 2019). Systemic factors such as Phnom Penh's opaque land market which forces

farmers to pay high rents on unproductive land as well as limited access to quality public services are just some of the roots of social exclusion as well as barriers to resilience making practices.

The analysis further revealed that the resilience making practices of farmers in Boeung Tompun are not homogenous. The extent to which farmers were resourceful, felt a sense of rootedness or participated in resistance depended on other factors. Significantly, access to assets allowed farmers to secure loans from microfinance institutions with more humane lending practices than private money lenders. Furthermore, rootedness was stronger amongst those who owned land and therefore were more invested in the future of the village. Amongst caregivers, the sense of connection with the city as a place of opportunity and possibility for their children was often more important than with the village or the lake. Overall, in line with Adger (2003) and Béné et al. (2014) the lack of social capital in the village in terms of information sharing and community organizing proved to be a major stumbling block preventing collective action that may otherwise boost resourcefulness, build rootedness and facilitate resistance. The absence of collective action makes it difficult to move along the resilience spectrum from persistence to transformative strategies.

At the policy level, this research has shown that a transformational agenda is also absent from the way resilience has been adopted as a priority within national level climate change and development policy documents. At the municipal level, the concept of resilience has barely featured at all. The discourse of resilience amongst policymakers and development partners is strongly managerial, steering the policy response towards interventions to strengthen infrastructure and build institutional capacity. In this approach, resilience is implemented by 'experts' while the lived experience of urban dwellers in their environment is not considered. This is particularly relevant within Phnom Penh where an approach to resilience which recognizes inequalities and trade-offs, present in many urban resilience frameworks such as those proposed by Bahadur and Tanner (2014) and Friend and Moench (2013), would bring into question the current patterns of urban expansion which favour the needs of the country's elite over the interests of the wider population, including the preservation of the city's lakes and wetlands. Yet with no evidence of social movements building around the protection of urban ecosystems in Phnom Penh, the resilience agenda remains weak and unlikely to lead to any significant change in the immediate future.

8.2 Theoretical Recommendations

In terms of theoretical contributions, this research offers an example of how resilience and political ecology can be used together to understand social-ecological change. The merging of these two theoretical approaches was particularly useful at creating linkages between policy and practice, and discourse and actions. Although this study focused on social-ecological change in an urban area, urban political ecology as a theoretical field was ultimately insufficient on its own to highlight all the nuances of this case. While the field has made significant advancements in theorizing the relationship between society and urban nature, insight into the ideas of discourse and knowledge remains more strongly developed in other branches of political ecology. In particular, this research relied considerably on the literature related to the commodification of natural resources in Cambodia and the ideas developed by authors such as Alice Beban, Sarah Milne, Sokbunthoeun So, Kheang Un and Laura Schoenberger, which connect environmental degradation and dispossession to the pursuit of power and profit at the national level. The study has taken those ideas and mapped them onto the urban landscape to show how similar processes are occurring in the commodification of urban land and the displacement of low income settlements.

Katrina Brown's (2016) political ecology approach to resilience has been critical to this analysis. The strength of Brown's approach lies in its attempt to bring together two complementary ways of looking at society and nature from an integrated perspective, particularly as it applies to responding to change. Brown's three Rs: rootedness, resistance and resourcefulness, have been designed specifically to understand resilience in the context of international development and global environmental change. Her approach incorporates the strength of political ecology to highlight dynamics of power which helps to disaggregate the strategies used by different groups and individuals in pursuing resilience in different contexts. Brown's efforts fill an important gap as the field of resilience continues to struggle with critiques related to its ability to address issues of equity, power and justice as well as to promote a transformational agenda, rather than a reinforcement of the status quo.

However, despite this positive start, Brown's approach is still undertheorized. Recognizing that political ecology has been criticized for being "long on critique and explanation and short on policy recommendations" (Neumann, 2005, p.37), the application of this political ecology of resilience lens to this research has revealed a number of ways the approach could be strengthened. First, both resilience and political ecology place considerable emphasis on the importance of scale. Resilience is informed by its roots in ecology which shows how interconnected systems interact across scales, leading to changes in equilibrium (Folke et al., 2010; Davoudi, 2012; Allen et al., 2014). Political ecology has since its early days sought to show how local concerns such as environmental degradation, have their roots in political economic processes at the global level (Peet and Watts, 1996; Watts, 2015). The question of temporal scale is likewise central to resilience theories, in order to recognize the variability of rates of change of multiple variables (Gallopín, 2006).

In Brown's political ecology of resilience, however the importance of scale (geographic or temporal) is not specifically addressed. Rather, the emphasis on rootedness has the potential to prioritize the local over higher levels. This is not to say that the approach does not allow for the incorporation of an analysis of scale, as this research has attempted to do by looking at both urban agricultural livelihoods at the village scale, alongside wastewater management concerns at the city scale. However, the structure of the 3Rs does not require it and therefore allows for the possibility that this critical feature of both of its constituent approaches will be overlooked. This is potentially problematic for those using analysis to seek solutions to environmental problems as change may be more likely, or more relevant at different scales (MacKinnon and Derickson, 2013).

Secondly, while Brown rightly acknowledges that theorizations of resilience have been broadening to include an examination of resilience's transformative potential, her approach lacks a way to differentiate resilience building activities that contribute to persistence versus incremental or transformative resilience. For example, this case has shown that a large number of the adaptive actions undertaken by the residents of Prek Takong Muy contribute to what could be called resilience only in that the strategies allow them to continue farming, in line with an understanding of resilience as persistence in Béné et al.'s (2014) resilience spectrum. Yet, outside pressures including the sand in-fill of Boeung Tompun are converging to form a future where farming will be impossible and farmers will need to adopt more significant, if not transformational measures to ensure their resilience. Put in terms of panarchy (Gunderson and Holling, 2002), the system is in a state of collapse and will move towards reorganization but the role of urban farmers in this new system state is yet to be determined. In this sense, Brown's framework could benefit from an integration with a more complex view of resilience as an outcome such as Béné et al.'s (2014) resilience spectrum, with scope to identify the transformational potential in everyday forms of resilience building. I have attempted to use the ideas of the spectrum to note throughout the manuscript where

different resilience outcomes are evident. Recent work by Galappaththi et al. (2019) takes the integration of these two important contributions even further, into a framework for addressing community adaptation to climate change.

Related to this, there is great value in Brown's emphasis on everyday resilience making practices. This approach recognizes the lack of genuine attention given to local knowledge in the field of international development and draws on learning from political ecology which emphasizes how the privileging of certain types of knowledge marginalizes other ways of experiencing and responding to change (Peet and Watts, 1996). In this research, focusing on the lived experience of urban farmers has revealed serious concerns about how climate change and urbanization are intersecting in Phnom Penh to exacerbate the exclusion of low income residents. The continued filling of lakes with sand is destroying the livelihoods of urban farmers and will also have serious repercussions at the city level as the capacity for wastewater management is lost. However, attention to everyday practices of resilience building must be complemented by analysis of the structural forces at play that shape the environment in which these actions take place. Taking care not to attribute all consequences to structural constraints, understanding these broader issues can help address questions of scale as well as draw attention to deeply rooted injustices that are produced outside of the local scale. In this research, the connection between structural forces and agency has been made clear in the analysis of land tenure in Phnom Penh, the uncertainty of which has caused immense stress for low-income residents. This stems from the influence of private developers on the urban planning practices of Phnom Penh, facilitated by the neopatrimonial nature of the Cambodia government which allows unchecked urban expansion in pursuit of profit for senior officials and their associates.

8.3 Policy Recommendations

Phnom Penh lacks a coherent city vision and adequate investment in public services, particularly in the outskirts or marginal areas, with not enough attention being paid to equity. The excess power wielded by private developers as a result of a lack of capacity within all levels of government contributes to this concerning situation (Paling, 2012). The nature of urban expansion reflects Cambodia's political reality: the enrichment of well-connected elites and the propagation of patronage relationships take precedent over public good. This has affected not only urban planning but virtually all areas of life in Cambodia. Although Cambodia still claims to be a democracy, the ever-shrinking space for opposition politics and civil society organization brings that claim into doubt. The political dominance of the CPP does not look set to change in the short term with little public agitation for democratic reforms.

The adoption of resilience as a policy objective with respect to climate change could have been an opportunity for the Cambodian government to embrace an agenda which is at once responsive to environmental change and sensitive to issues of poverty and inequality. However, the discourse analysis of this policy environment reveals that resilience is employed primarily as a buzzword. Its appearance in policy reveals much about global climate change financing and the influence of foreign donors and little about the needs of Cambodians with respect to climate change. The shallow meaning of resilience as simply coping with climate change is widely accepted and repeated, with no evidence of any alternative discourse emerging. There has been no attempt to explore what it means to pursue a resilience agenda in Cambodia in terms of the expansive conceptual reality that underlays the term. Yet, in a political context where corruption is rife and politicians are accountable to their patrons rather than their citizens, the choice of terminology whether it is

resilience, sustainability or another development buzzword, matters little. No development vision that conflicts with the neopatrimonial power structure is likely to be implemented.

Currently, the vision for Phnom Penh's future is shaped by only a few voices. The majority of the city's population have no say in decision making and leave their imprint simply through the day to day ways they inhabit urban spaces. There are a number of ways that actors in this sector can better support the integration of multiple perspectives into the planning and delivery of urban development. These strategies may include:

1. **International donors and development partners**: The role of aid is declining in Cambodia with a net Official Development Assistance to Gross National Income ratio of 4% in 2017 (OECD, 2018). Yet, development partners hold influence, even if this is less than in the past as the private sector and Chinese aid have become more important. Donors should invest in programming that promotes genuine participation of citizens into planning activities. The current push for 'climate change mainstreaming' is little more than greenwashing a business as usual approach. The adoption of resilience language in high level policies with no follow through is not sufficient, nor is the production of urban plans without public consultation. At a minimum, policy documents should be made available for public scrutiny and ideally open to consultation prior to adoption.
2. **Government bureaucrats**: Despite the prevalence of corruption and patronage within the Cambodian government, there are also talented and committed individuals. Many of those working on issues related to climate change and urban development were interviewed for this research and communicated their willingness to deliver high quality interventions for their fellow citizens. These individuals should use their influence to advocate for public involvement in decision making and for the respect of laws and policies to the best of their ability. Senior members of the administration can foster a work culture that values contributions from all staff, recognizes talent and supports the design of programs to promote social inclusion.
3. **Civil society**: Cambodian NGOs face a difficult decision, if they attract the wrong kind of attention they risk being forced to close but if they remain silent as citizens' rights are trampled on, are they fulfilling their mandate? There is no easy answer. After decades of violence, Cambodians value peace and widespread public protest is unlikely while the country is prospering. However, there is certainly space within Cambodia civil society for public organizing in the defence of urban ecosystems. This is not an area that has typically raised red flags for the government and therefore offers the possibility of using the language of environmental protection to challenge decisions related to urban land use. The situation of Boeung Tompun has all the ingredients for an environmental campaign which could easily be framed as an issue of conservation of critical wetland habitat, while enabling community-based natural resource management. Alternatively, the ecological devastation caused by sand being pumped into lakes from the Mekong and Tonle Rivers can be highlighted in advocacy campaigns alongside the loss of urban livelihoods.

8.4 Future Research Agenda

This study has explored the resourcefulness, rootedness and resistance employed by urban farmers in their everyday practices of resilience building. This includes individual actions such as applying local knowledge to securing farmland and a limited number of collective strategies such as the construction of the trash road. This has brought to light many of the successes and challenges of living with uncertainty in Phnom Penh's outskirts. As is often the case when exploring new territory, there are numerous questions raised that this

research was unable to answer. A few of the most promising avenues for future research are:

1. **The Aspiration Gap**: Many of the farmers interviewed through this research expressed their desire or intention to leave farming or to ensure that their children do not work 'on the lake'. However, they struggle to turn these intentions into action. Farmers spoke of how a lack of sufficient finances meant they were unable to leave their farms and take a risk on an alternative livelihood. Yet, many reported receiving significant amounts of money (in some cases tens of thousands of dollars) when they sold their land in the 1990s and 2000s and were still unable or unwilling to leave the lake behind. This indicates the situation is far more complicated than simply access to money. The factors which motivate these farmers to continue with their work or to stay, despite the increasingly difficulties they are facing, would be worthy of study. So, too, would be follow-up to see if the aspirations of these farming families are achieved by the next generation who have stated their goal to work 'on the land'.
2. **Environmental change and migration**: This research touched on the experience of migrants in the capital but it was not central to the research findings. However, many respondents spoke of moving to the capital after their rural livelihoods had failed. Future research might go further into examining migration in terms of environmental change and its impact on farming in both rural and urban areas and the patterns of movement that are created as a result. How will this movement be modified by the destruction of urban farmlands by sand in-fill?
3. **Non-farming livelihoods**: Similarly, this research focused on the experiences of urban farmers, who are deeply affected by the current development patterns in the south of Phnom Penh. However, it would be interesting to compare these experiences with others living in the area practicing non-agriculture livelihoods. Do they experience the same feelings of uncertainty and fear? Do they also see the future of their family as integrating further into the urban fabric? How are non-farming livelihoods impacted by the growth of satellite cities and the loss of urban ecosystems?

8.5 Conclusion

David Harvey (2012) writes: "high-rise apartment blocks, gated communities, and golf courses for the rich, along with high-end shopping malls do not really help to reconstitute an adequate daily life for the restive, impoverished masses" (p.63). Though this quote referred to urban development in the US and China, it could equally apply to Cambodia, and indeed nearly every country in the world. Inequality in urban development is a problem that is repeated in low, middle and high income countries. Though ubiquitous, inequality is also influenced by local realities: material, historical and social/cultural. Therefore, solutions cannot be one-size fits all but will arise at different scales through processes of experimentation, contestation and negotiation.

What is certain is a more just and sustainable society will not be realized without an examination of the unequal access to "material resources and the levers of social change" (MacKinnon and Derickson, 2013, p. 255). In order to understand the conditions that promote or constrain social change, one must delve deeply into the ways that power is produced, negotiated and contested in a given context. As centres of economic and political power, urban areas play a critical role in the promotion of the current political and economic order. As such, promoting new ways of producing urban space that is more inclusive, democratic and in harmony with ecological elements that are integral to the existence of cities, is essential.

If we are to re-design our present to achieve a more liveable future, we must start with the desire for profound change (Fazey et al., 2018). In many parts of the world, social movements are converging around the idea of an ecological crisis or climate emergency, caused by existing patterns of consumption and production as well as governmental inaction (Gunningham, 2019). These ideas are yet to find resonance with urban, middle class Cambodians who have only recently begun to enjoy the luxuries of modern capitalism. Low income residents who are marginalized from these new riches aspire to be included within it. As such, the desire for a societal transformation is largely absent. Consequently, it appears that despite the social and ecological devastation, current urban planning practices in Phnom Penh will go unchallenged in the short term. Until the full extent of the loss of urban wetlands is felt, it is unknown if the repercussions will be severe enough to elicit widespread protest. By then it will be too late for Boeung Tompun and its farmers.

References

ADB. (2014). *Cambodia Country Poverty Analysis 2014*. Retrieved from: https://www.adb.org/sites/default/files/institutional-document/151706/cambodia-country-poverty-analysis-2014.pdf

Adger, W. N. (2003). Social capital, collective action, and adaptation to climate change. *Economic Geography*, *79*(4), 387–404.

Adger, W. N. (2000). Social and ecological resilience: are they related? *Progress in Human Geography*, *24*(3), 347–364.

Adger, W. N., Benjaminsen, T. A., Brown, K., & Svarstad, H. (2001). Advancing a Political Ecology of Global Environmental Discourses. *Development and Change*, *32*(4), 681–715. https://doi.org/10.1111/1467-7660.00222

Ahlborg, H., & Nightingale, A. J. (2018). Theorizing power in political ecology: the "where" of power in resource governance projects. *Journal of Political Ecology*, *25*(1), 381. https://doi.org/10.2458/v25i1.22804

Albers, M., & Deppisch, S. (2013). Resilience in the Light of Climate Change: Useful Approach or Empty Phrase for Spatial Planning? *European Planning Studies*, *21*(10), 1598–1610. https://doi.org/10.1080/09654313.2012.722961

Allen, C. R., Angeler, D. G., Garmestani, A. S., Gunderson, L. H., & Holling, C. S. (2014). Panarchy: Theory and Application. *Ecosystems*, *17*(4), 578–589. https://doi.org/10.1007/s10021-013-9744-2

Angelo, H., & Wachsmuth, D. (2014). Urbanizing Urban Political Ecology: A Critique of Methodological Cityism. *International Journal of Urban and Regional Research*, *39*(1), 16–27. https://doi.org/10.1111/1468-2427.12105

APUR. (2019). *Phnom Penh: extension et mutations*. Paris, APUR.

Aun, P., & Woods, B. (2013, November 20). ELC in Nature Preserve Is Illegal, Government Spokesman Says. *The Cambodia Daily*. Retrieved from: https://english.cambodiadaily.com/news/elc-in-nature-preserve-is-illegal-government-spokesman-says-47379/

Bahadur, A. V., & Tanner, T. (2014). Transformational Resilience Thinking: Putting People, Power and Politics at the Heart of Urban Climate Resilience. *Environment and Urbanization*, *26*(1), 200–214. https://doi.org/10.1177/0956247814522154

Bahadur, A. V, Peters, K., Wilkinson, E., Pichon, F., Gray, K., & Tanner, T. (2015). The 3As: Tracking Resilience Across BRACED. *BRACED Knowledge Manager*. Retrieved from: https://www.odi.org/publications/9840-3as-tracking-resilience-across-braced

Baker, J., & Milne, S. (2015). Dirty Money States: Illicit Economies and the State in Southeast Asia. *Critical Asian Studies*, *47*(2), 151–176. https://doi.org/10.1080/14672715.2015.1041273

Barnes, M., Bodin, O., Guerrero, A., McAllister, R., Alexander, S., & Robins, G. (2017). The Social Structural Foundations of Adaptation and Transformation in Social-ecological Systems. *Ecology and Society*, *22*(4). https://doi.org/10.1016/S0210-573X(02)77212-2

Baxter, J., & Eyles, J. (1997). Evaluating Qualitative Research in Social Geography: Establishing "rigour" in interview analysis. *Transactions of the Institute of British Geographers*, *22*(4), 505–525.

Beban, A., Schoenberger, L, & Lamb, V. (2019). Pockets of Liberal Media in Authoritarian Regimes: What the crackdown on emancipatory spaces means for rural social movements in Cambodia. *Journal of Peasant Studies.*

Beban, A., So, S., & Un, K. (2017). From Force to Legitimation: Rethinking Land Grabs in Cambodia. *Development and Change*, *48*(3), 590–612. https://doi.org/10.1111/dech.12301

Beban, A., & Work, C. (2014). The Spirits are Crying: Dispossessing land and possessing bodies in rural Cambodia. *Antipode*, *46*(3), 593–610. https://doi.org/10.1111/anti.12073

Beilin, R., & Wilkinson, C. (2015). Introduction: Governing for urban resilience. *Urban Studies*, *52*(7), 1205–1217. https://doi.org/10.1177/0042098015574955

Ben, S. (2018a, August 16). Final poll results confirm first single-party Assembly. *Phnom Penh Post*. Retrieved from: https://www.phnompenhpost.com/national/final-poll-results-confirm-first-single-party-assembly-0

Ben, S. (2018b, December 18). PM: CPP is capable of ensuring peace until opposition destroyed. *Phnom Penh Post*. Retrieved from: https://www.phnompenhpost.com/national-politics/pm-cpp-capable-ensuring-peace-until-opposition-destroyed

Ben, S. (2018c, April 10). 'Colour revolution seriously failed': Hun Sen praises Cambodia's political crackdown in Khmer New Year message. *Phnom Penh Post*. Retrieved from: https://www.phnompenhpost.com/national-politics/colour-revolution-seriously-failed-hun-sen-praises-cambodias-political-crackdown

Béné, C., Mehta, L., McGranahan, G., Cannon, T., Gupte, J., & Tanner, T. (2018). Resilience as a Policy Narrative: Potentials and limits in the context of urban planning. *Climate and Development*, *10*(2), 116–133. https://doi.org/10.1080/17565529.2017.1301868

Béné, C., Newsham, A., Davies, M., Ulrichs, M., & Godfrey-Wood, R. (2014). Review article: Resilience, Poverty and Development. *Journal of International Development*. 26, 598-623. https://doi.org/10.1002/jid.2992

Benson, E., Forbes, A., Korkeakoski, M., Latif, R., & Lham, D. (2014). Environment and Climate Mainstreaming: Challenges and Successes. *Development in Practice*, *24*(4), 605–614. https://doi.org/10.1080/09614524.2014.911819

Berkes, F., Colding, J., & Folke, C. (2003). *Navigating social-ecological systems: building resilience for complexity and change*. Cambridge: Cambridge University Press.

Blaikie, P. (1997). Classics in Human Geography Revisited: Author's Response. *Progress in Human Geography*, *21*(1), 75–80. https://doi.org/10.1191/030913201682688977

Blaikie, P. M., & Brookfield, H. C. (1987). *Land Degradation and Society*. Abingdon, Oxon: Methuen.

Brickell, K. (2014). "The Whole World Is Watching": Intimate Geopolitics of Forced Eviction and Women's Activism in Cambodia. *Annals of the Association of American Geographers*, *104*(6), 1256–1272. https://doi.org/10.1080/00045608.2014.944452

Brown, A., Dayal, A., & Rumbaitis Del Rio, C. (2012). From Practice to Theory: Emerging Lessons from Asia for Building Urban Climate Change Resilience. *Environment and Urbanization*, *24*(2), 531–556. https://doi.org/10.1177/0956247812456490

Brown, K. (2013). Global Environmental Ehange I: A social turn for resilience? *Progress in Human Geography*, *38*(1), 107–117. https://doi.org/10.1177/0309132513498837

Brown, K. (2016). *Resilience, Development and Global Change*. New York: Routledge.

Brown, K., & Westaway, E. (2011). Agency, Capacity, and Resilience to Environmental Change: Lessons from Human Development, Well-Being, and Disasters. *Annual Review of Environment and Resources*, *36*(1), 321–342. https://doi.org/10.1146/annurev-environ-052610-092905

Bryant, R. L. (1998). Power, knowledge and political ecology in the third world : a review. *Progress in Phyiscal Geography*, *22*(1), 79–94. https://doi.org/10.1177/030913339802200104

Buikstra, E., Ross, H., King, C., Baker, P., Hegney, D., McLachlan, K., & Rogers-Clark, C. (2010). The Components of Resilience - Perceptions of an Australian Rural Community. *Journal of Community Psychology*, *38*(8), 975–991. https://doi.org/10.1002/jcop

Bulkeley, H., & Castan Broto, V. (2013). Urban governance and climate change experiments. In H. Mieg & K. Topfer (Eds.), *Institutional and Social Innovation for Sustainable Urban Development*. Routledge : Earthscan.

Cambodia Climate Change Alliance. (2014) Climate Change Lexicon.

Cambodian People's Party Chak Angre Leu Commune. (2018). In Facebook: Status update. Retrieved November 8, 2019, from https://www.facebook.com/permalink.php?story_fbid=1910669715893671&id=100008519830384

CEDAC, SAEDA, & PANAP. (2013). *Illegal Pesticide Trade in The Mekong Countries: Case Studies from Cambodia and Lao PDR*. Retrieved from http://files.panap.net/resources/Illegal-pesticide-trade-in-Lao-and-Cambodia.pdf

Chambers, R. (1983). *Rural Development: Putting the Last First*. London: Routledge. https://doi.org/10.4324/9781315835815-3

Chandler, D. (2007). *A History of Cambodia*. *A History of Cambodia* (4th ed.). Routledge. https://doi.org/10.4324/9780429495519-12

Chen, S. A. (2018). The Development of Cambodia–China Relation and Its Transition Under the OBOR Initiative. *Chinese Economy*, *51*(4), 370–382. https://doi.org/10.1080/10971475.2018.1457317

Chheang, V. (2017). Cambodia Embraces China's Belt and Road Initiative. *Perspective*, (48), 1–7. Retrieved from https://think-asia.org/bitstream/handle/11540/7213/ISEAS_Perspective_2017_48.pdf?sequence=1

Chhim, S. (2012). Baksbat (Broken Courage): The Development and Validation of the Inventory to Measure Baksbat , a Cambodian Trauma-based Cultural Syndrome of Distress. *Culture, Medicine and Psychiatry, 36*, 640–659. https://doi.org/10.1007/s11013-012-9279-6

Christoplos, I., & McGinn, C. (2016). Climate Change Adaptation from a Human Rights Perspective: Civil Society Experiences in Cambodia. *Forum for Development Studies*, *43*(3), 437–461. https://doi.org/10.1080/08039410.2016.1199443

Chu, E. K. (2018). Urban Climate Adaptation and the Reshaping of State–society Relations: The politics of community knowledge and mobilisation in Indore, India. *Urban Studies*, *55*(8), 1766–1782. https://doi.org/10.1177/0042098016686509

Colding, J., & Barthel, S. (2019). Exploring the Social-ecological Systems Discourse 20 Years Later. *Ecology and Society*, *24*(1). https://doi.org/10.5751/ES-10598-240102

Collins, E. (2017). Reclamation, Displacement and Resiliency in Phnom Penh. In S. Chari, S. Freidberg, V. Gidwani, J. Ribot, & W. Wolford (Eds.), *Other Geographies: The Influences of Michael Watts*. John Wiley and Sons Ltd.

Connell, J., & Grimsditch, M. (2016). Forced Relocation in Cambodia. In K. Brickell & S. Springer (Eds.), *The Handbook of Contemporary Cambodia* (1st ed., pp. 223–233). London: Routledge. https://doi.org/10.4324/9781315736709

Cook, I. R., & Swyngedouw, E. (2012). Cities, Social Cohesion and the Environment: Towards a Future Research Agenda. *Urban Studies*, *49*(9), 1959–1979. https://doi.org/10.1177/0042098012444887

Cook, L. J., & Dimitrov, M. K. (2017). The Social Contract Revisited: Evidence from Communist and State Capitalist Economies. *Europe - Asia Studies*, *69*(1), 8–26. https://doi.org/10.1080/09668136.2016.1267714

Cornwall, A. (2007). Buzzwords and Fuzzwords: Deconstructing development discourse. *Development in Practice*, *17*, 471–484. https://doi.org/10.3362/9781780440095

Coulthard, S. (2012). Can We Be Both Resilient and Well, and What Choices Do People Have? Incorporating Agency into the Resilience Debate from a Fisheries Perspective, *Ecology and Society, 17*(1).

Dany, V., Taplin, R., Bajracharya, B., Regan, M., & Lebel, L. (2017). Entry points for climate-informed planning for the water resources and agriculture sectors in Cambodia. *Environment, Development and Sustainability*, *19*(4), 1167–1188. https://doi.org/10.1007/s10668-016-9788-5

Davoudi, S. (2012). Resilience: A Bridging Concept or a Dead End? *Planning Theory & Practice*, *13*(2). https://doi.org/10.1080/14649357.2012.677124

Deng, Y. (2018). How China's Belt and Road Is Reordering Asia. *Harvard International Review*, *39*(4), 30–35.

Department of Climate Change. (2014a). *DCC Roles and Functions*. Retrieved from http://www.camclimate.org.kh/en/ccd/ccd-roles-and-functions.html

Department of Climate Change. (2014b). *NCSD Structure*. Retrieved from: http://www.camclimate.org.kh/en/policies/ncsd-structure.html

Department of Climate Change. (2014c). *Cambodia Climate Change Alliance - Description*. Retrieved from: www.camclimate.org.kh/en/activities/cambodian-climate-change-alliance.html

Dowding, K. (2008). Agency and Structure: Interpreting power relationships. *Journal of Power*, *1*(1), 21–36. https://doi.org/10.1080/17540290801943380

Doyle, S. E. (2012a). *Phnom Penh: City of Water*. Retrieved from: http://teangtnaut.org/wp-content/uploads/2014/10/City-of-Water-Report.FINAL_3.pdf

Doyle, S. E. (2012b). *Historical Maps of Phnom Penh*. Retrieved November 8, 2019, from: https://cityofwater.wordpress.com/2012/06/11/historical-maps-of-phnom-penh/

Duit, A., Galaz, V., Eckerberg, K., & Ebbesson, J. (2010). Governance, Complexity, and Resilience. *Global Environmental Change*, *20*(3), 363–368. https://doi.org/10.1016/j.gloenvcha.2010.04.006

Dwyer, M. B. (2015). The Formalization Fix?: Land titling, state land concessions, and the politics of geographical transparency in contemporary Cambodia. *The Journal of Peasant Studies*, *42*(5), 1–26.

Elmhirst, R. (2015). Feminist Political Ecology. In T. Perreault, G. Bridge, & J. J. McCarthy (Eds.), *The Routledge Handbook of Political Ecology*. London: Routledge.

Eng, N. (2016). Decentralization in Cambodia: New wine in old bottles. *Public Administration and Development*, *36*, 250–262. https://doi.org/10.1002/pad

Erdmann, G., & Engel, U. (2007). Neopatrimonialism Reconsidered: Critical review and elaboration on a critical subject. *Commonwealth and Comparative Politics*, *45*(1), 95–119.

Fairclough, N. (2010). *Critical Discourse Analysis: The Critical Study of Language*. Taylor and Francis. https://doi.org/10.1017/CBO9780511619793.002

Fauveaud, G. (2016a). Les pratiques urbanistiques de l'ombre des acteurs institutionnels et privés : le cas de Phnom Penh, Cambodge. *L'espace Politique*, *29*.

Fauveaud, G. (2016b). Residential Enclosure, Power and Relationality: Rethinking Sociopolitical Relations in Southeast Asian Cities. *International Journal of Urban and Regional Research*, *40*(4), 849–865. https://doi.org/10.1111/1468-2427.12433

Fauveaud, G. (2014). Mutations of real estate actors' strategies and modes of capital appropriation in contemporary Phnom Penh. *Urban Studies*, *51*(16), 3479–3494. https://doi.org/10.1177/0042098014552767

Fazey, I., Moug, P., Allen, S., Beckmann, K., Blackwood, D., Bonaventura, M., Burnett, K., Danson, M., Falconer, R., Gagnon, A., Harkness, R., Hodgson, A., Holm, L., Irvine, K., Low, R., Lyon, C., Moss, A., Moran, C., Naylor, L., O'Brien, K., Russell, S., Skerratt, S., Rao-Williams, J., Wolstenholme, R. (2018). Transformation in a changing climate: a research agenda. *Climate and Development*, *10*(3), 197–217. https://doi.org/10.1080/17565529.2017.1301864

Ferguson, J. (1994). *The Anti-Politics Machine: "Development", Depoliticization and Bureaucratic Power in Lesotho*. Minneapolis and London: University of Minnesota Press.

Flower, B., & Fortnam, M. (2015). *Urbanising Disaster Risk: Vulnerability of the Urban Poor in Cambodia to Flooding and Other Hazards*. People in Need Cambodia.

Flyvbjerg, B. (2016). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*, *12*(2), 219–245. https://doi.org/10.1177/1077800405284363

Folke, C., & Berkes, F. (1998). *Understanding dynamics of ecosystem-institution linkages for building resilience. Beijer Discussion Paper No. 112.* The Beijer Institute of Ecological Economics, Royal Academy of Sciences. Stockholm, Sweden.

Folke, C. (2006). Resilience: The emergence of a perspective for social-ecological systems analyses. *Global Environmental Change*, *16*(3), 253–267. https://doi.org/10.1016/j.gloenvcha.2006.04.002

Folke, C., Carpenter, S. R., Walker, B., Scheffer, M., Chapin, T., & Rockstrom, J. (2010). Resilience thinking: Integrating resilience, adaptability and transformability. *Ecology and Society*, *15*(4). https://doi.org/10.1038/nnano.2011.191

Forsyth, T. (1996). Science, Myth and Knowledge: Testing Himalayan Environmental Degradation in Thailand. *Geoforum*, *27*(3), 375–392.

Friend, R., Jarvie, J., Reed, S. O., Sutarto, R., Thinphanga, P., & Toan, V. C. (2014). Mainstreaming urban climate resilience into policy and planning: reflections from Asia. *Urban Climate*, *7*, 6–19. https://doi.org/10.1016/j.uclim.2013.08.001

Friend, R., & Moench, M. (2013). What is the purpose of urban climate resilience? Implications for addressing poverty and vulnerability. *Urban Climate*, *6*, 98–113. https://doi.org/10.1016/j.uclim.2013.09.002

Gabriel, N. (2014). Urban Political Ecology: Environmental Imaginary, Governance, and the Non-Human. *Geography Compass*, *8*, 38–48. https://doi.org/10.1111/gec3.12110

Galappaththi, E. K., Ford, J. D., & Bennett, E. M. (2019). A framework for assessing community adaptation to climate change in a fisheries context. *Environmental Science and Policy*, *92*(October 2018), 17–26. https://doi.org/10.1016/j.envsci.2018.11.005

Gallopín, G. C. (2006). Linkages between vulnerability, resilience, and adaptive capacity. *Global Environmental Change*, *16*(3), 293–303. https://doi.org/10.1016/j.gloenvcha.2006.02.004

Gandy, M. (2002). *Concrete and Clay: Reworking nature in New York City*. Cambridge: MIT Press.

Ghertner, A. (2010). Green Evictions: environmental discourses of a “slum-free” Dehli. In R. Peet, P. Robbins, & M. Watts (Eds.), *Global Political Ecology*. London: Routledge.

GoGreen Cambodia. (2019). Facebook Newsfeed. Retrieved November 8, 2019, from: https://www.facebook.com/groups/892120540904745/

Goldman, M. (2011). Speculative Urbanism and the Making of the Next World City. *International Journal of Urban and Regional Research*, *35*(3), 555–581. https://doi.org/10.1111/j.1468-2427.2010.01001.x

Google Earth. (2019a). Map of Phnom Penh with case study locations.

Google Earth. (2019b). Map of Prek Takong Muy.

Green, N., & Bylander, M. (forthcoming). The Coercive Power of Debt: Microfinance and Land Dispossession in Cambodia. *Sociology of Development*.

Grimsditch, M., & Henderson, N. (2009). *Untitled: Tenure Insecurity and Inequality in the Cambodian Land Sector*. Retrieved from: https://landportal.org/library/resources/untitled-tenure-insecurity-and-inequality-cambodian-land-sector-0

Gunderson, L. H., & Holling, C. S. (2002). *Panarchy: Understanding transformations in human and natural systems*. Washington: Island Press.

Gunningham, N. (2019). Averting Climate Catastrophe: Environmental Activism, Extinction Rebellion and Coalitions of Influence. *King’s Law Journal*, *30*(2), 194–202.

Hajer, M. A. (2003). *The Politics of Environmental Discourse: Ecological Modernization and the Policy Process*. Oxford Scholarship Online. https://doi.org/10.1093/019829333x.001.0001

Hall, R., Edelman, M., Borras, S. M., Scoones, I., White, B., & Wolford, W. (2015). Resistance, acquiescence or incorporation? An introduction to land grabbing and political reactions ‘from below.’ *Journal of Peasant Studies*, *42*(3–4), 467–488. https://doi.org/10.1080/03066150.2015.1036746

Haraway, D. (1991). *Simians, cyborgs, and women: The reinvention of nature*. New York: Routledge.

Harms, E. (2016). Urban Space and Exclusion in Asia. *Annual Review of Anthropology*, *45*, 46–61. https://doi.org/10.1146/annurev-anthro-102215-100208

Harvey, D. (2012). *Rebel Cities: From the Right to the City to Urban Revolution*. London and New York: Verso.

Harvey, D. (2007). Cities or urbanization? *City*, *1*(1–2), 38–61. https://doi.org/10.1080/13604819608900022

Harvey, D. (2003). Debates and Developments: The Right to the City. *International Journal of Urban and Regional Research*, *27*(December), 939–941. https://doi.org/10.1111/1468-2427.00257

Hecht, S. B. (1985). Environment, Development and Politics: Capital Accumulation and the Livestock Sector in the Eastern Amazonia. *World Development*, *13*(6), 663–684.

Hernández, B., Carmen Hidalgo, M., Salazar-Laplace, M. E., & Hess, S. (2007). Place attachment and place identity in natives and non-natives. *Journal of Environmental Psychology*, *27*(4), 310–319. https://doi.org/10.1016/j.jenvp.2007.06.003

Heynen, N., Kaika, M., & Swyngedouw, E. (2006). Urban political ecology: politicizing the production of urban natures. In Heynen, N., Kaika, M., and Swyngedouw, E. (Eds) *In the Nature of Cities: Urban Political Ecology and the Politics of Urban Metabolism*. *London and New York: Routledge.*

Holling, C. S. (1973). Resilience and Stability of Ecological Systems. *Annual Review of Ecology and Systematics*, *4*, 1–23.

Hughes, C. (2006). The politics of gifts: Tradition and regimentation in contemporary Cambodia. *Journal of Southeast Asian Studies*, *37*(3), 469–489. https://doi.org/10.1017/S0022463406000749

Hughes, C. (2003). *The Political Economy of Cambodia's Transition, 1991-2001*. London and New York: Routledge Curzon. https://doi.org/10.4324/9780203221754

Hulme, M. (2017). *Weathered: Cultures of Climate*. London: SAGE.

Hutt, D. (2016, August 19). The State and the CPP: Cambodia's Social Contract. *The Diplomat*. Retrieved from: https://thediplomat.com/2016/08/the-state-and-the-cpp-cambodias-social-contract/

ILO, & IFC. (2018). *Towards Gender Equality: Lessons from factory compliance assessments 2016-2017*. Retrieved from https://betterwork.org/blog/portfolio/better-factories-cambodia-towards-gender-equality/

ING Holdings. (n.d.). *Profile*. Retrieved from https://drive.google.com/file/d/0BwIj89FYLRNdVGNRN1VBNXByTlE/view

ING Holdings. (2015). *Overview*. Retrieved November 7, 2019, from http://www.ing-holdings.com/overview

Ireland, P., & McKinnon, K. (2013). Strategic localism for an uncertain world: A post-development approach to climate change adaptation. *Geoforum*, *47*, 158–166. https://doi.org/10.1016/j.geoforum.2013.01.005

Irvine, K. N., Sovann, C., Suthipong, S., Kok, S., & Chea, E. (2015). Application of PCSWMM to Assess Wastewater Treatment and Urban Flooding Scenarios in Phnom Penh, Cambodia : A Tool to Support Eco-City Planning. *Journal of Water Management Modeling.* https://doi.org/10.14796/JWMM.C389

Jabareen, Y. (2013). Planning the Resilient City: Concepts and strategies for coping with climate change and environmental risk. *Cities*, *31*, 220–229. https://doi.org/10.1016/j.cities.2012.05.004

Jackson, W., & Cheang, S. (2014, October 7). The Civil Service's Phantom Workers. *Phnom Penh Post*. Retrieved from: https://www.phnompenhpost.com/post-weekend/civil-service's-phantom-workers

JICA. (2016). *The Study on Drainage and Sewerage Improvement Project in Phnom Penh Metropolitan Area*. Retrieved from: https://www.jica.go.jp/english/our_work/social_environmental/id/asia/southeast/cambodia/c8h0vm000090vm00.html

Käkönen, M., Lebel, L., Karhunmaa, K., Dany, V., & Try, T. (2014). Rendering climate change governable in the least-developed countries: Policy narratives and expert technologies in Cambodia. *Forum for Development Studies*, *41*(3), 351–376. https://doi.org/10.1080/08039410.2014.962599

Keeton-Olson, D. (2019, March 13). Why is Phnom Penh so obsessed with filling lakes? *Eco-Business*. Retrieved from: https://www.eco-business.com/news/why-is-phnom-penh-so-obsessed-with-filling-lakes/

Keil, R. (2003). Progess Report: Urban Political Ecology. *Urban Geography*, *24*(8), 723–738. https://doi.org/10.2747/0272-3638.24.8.723

Kelman, I., Gaillard, J. C., & Mercer, J. (2015). Climate Change's Role in Disaster Risk Reduction's Future: Beyond Vulnerability and Resilience. *International Journal of Disaster Risk Science*, *6*(1), 21–27. https://doi.org/10.1007/s13753-015-0038-5

Khuon, N. (2019, July 12). ING land revoked after failures. *Khmer Times*. Retrieved from: https://www.khmertimeskh.com/50623221/ing-land-revoked-after-failures/

Kijewski, L., & Chheng, N. (2018, February 26). Equitable Cambodia allowed to reopen. *Phnom Penh Post*. Retrieved from: https://www.phnompenhpost.com/national/equitable-cambodia-allowed-reopen

Kobayashi, A. (1994). Coloring the Field: Gender, "race," and the politics of fieldwork. *Professional Geographer*, *46*(1), 73–80. https://doi.org/10.1111/j.0033-0124.1994.00073.x

Kry, S. (2014). The Boeung Kak Development Project: For whom and for what? Poor Land Development Practices as a Challenge For Building Sustainable Peace In Cambodia. *Cambodia Law and Policy Journal*.

Lamb, V., Schoenberger, L., Middleton, C., & Un, B. (2017). Gendered eviction, protest and recovery: A feminist political ecology engagement with land grabbing in rural Cambodia. *Journal of Peasant Studies*, *44*(6), 1217–1236. https://doi.org/10.1080/03066150.2017.1311868

Lavell, A., M. Oppenheimer, C. Diop, J. Hess, R. Lempert, J. Li, R. Muir-Wood, and S. Myeong. (2012) Climate change: new dimensions in disaster risk, exposure, vulnerability, and resilience. In Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M.

Midgley (Eds.) *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC)*. Cambridge University Press, Cambridge, UK, and New York, NY, USA, pp. 25-64.

Leach, M. (2008). *Re-framing Resilience: A Symposium Report, STEPS Working Paper 13*. Retrieved from: https://steps-centre.org/wp-content/uploads/Resilience.pdf

Lebel, L., Käkönen, M., Dany, V., Lebel, P., Thuon, T., & Voladet, S. (2018). The framing and governance of climate change adaptation projects in Lao PDR and Cambodia. *International Environmental Agreements: Politics, Law and Economics*, *18*(3), 429–446. https://doi.org/10.1007/s10784-018-9397-x

LICADHO, & STT. (2019). *Collateral Damage: Land loss and abuses in Cambodia's microfinance sector*. Retrieved from https://www.licadho-cambodia.org/reports/files/228Report_Collateral_Damage_LICADHO_STT_Eng_07082019.pdf

Lund, C. (2014). Of What is this a Case?: Analytical Movements in Qualitative Social Science Research. *Human Organization*, *73*(3), 224–234. https://doi.org/10.17730/humo.73.3.e35q482014x033l4

MacKinnon, D., & Derickson, K. D. (2013). From Resilience to Resourcefulness. *Progress in Human Geography*, *37*(2), 253–270. https://doi.org/10.1177/0309132512454775

Manuel-Navarrete, D., & Pelling, M. (2015). Subjectivity and the politics of transformation in response to development and environmental change. *Global Environmental Change*, *35*, 558–569. https://doi.org/10.1016/j.gloenvcha.2015.08.012

Mapfumo, P., Onyango, M., Honkponou, S. K., El Mzouri, E. H., Githeko, A., Rabeharisoa, L., Obando, J., Omolo, N., Majule, A., Denton, F., Ayers, J., Agrawal, A. (2017). Pathways to transformational change in the face of climate impacts: an analytical framework. *Climate and Development*, *9*(5), 439–451. https://doi.org/10.1080/17565529.2015.1040365

Marks, D., & Lebel, L. (2016). Disaster governance and the scalar politics of incomplete decentralization: Fragmented and contested responses to the 2011 floods in Central Thailand. *Habitat International*, *52*, 57–66. https://doi.org/10.1016/j.habitatint.2015.08.024

Marshall, N. A., Fenton, D. M., Marshall, P. A., & Sutton, S. G. (2007). How resource dependency can influence social resilience within a primary resource industry. *Rural Sociology*, *72*(3), 359–390. https://doi.org/10.1526/003601107781799254

Martin-Breen, P., & Anderies, J. M. (2011). *Resilience: A Literature Review*, The Bellagio Initiative.

McGee, T. G. (2008). Managing the rural – urban transformation in East Asia in the 21st century. *Sustainability Science*, *3*, 155–167. https://doi.org/10.1007/s11625-007-0040-y

McGinn, C. (2015). *These Days We Have to Be Poor People: Women's Narratives of the Economic Aftermath of Forced Evictions in Phnom Penh, Cambodia*. Conference Paper

No. 63, Land grabbing, conflict and agrarian-environmental transformations: perspectives from East and Southeast Asia.

McVeigh, K. (2017, June 25). Cambodian female workers in Nike, Asics and Puma factories suffer mass faintings. *The Guardian*. Retrieved from: https://www.theguardian.com/business/2017/jun/25/female-cambodian-garment-workers-mass-fainting

Meerow, S., & Stults, M. (2016). Comparing conceptualizations of urban climate resilience in theory and practice. *Sustainability*, *8*(7), 1–16. https://doi.org/10.3390/su8070701

Mialhe, F., Gunnell, Y., Navratil, O., Choi, D., Sovann, C., Lejot, J., Gaudou, B., Se, B., Landon, N. (2019). Spatial growth of Phnom Penh, Cambodia (1973–2015): Patterns, rates, and socio-ecological consequences. *Land Use Policy*, *87*(June), 104061. https://doi.org/10.1016/j.landusepol.2019.104061

Milne, S. (2015). Cambodia's Unofficial Regime of Extraction: Illicit Logging in the Shadow of Transnational Governance and Investment. *Critical Asian Studies*, *47*(2), 200–228. https://doi.org/10.1080/14672715.2015.1041275

Morgenbesser, L. (2019). Cambodia's Transition to Hegemonic Authoritarianism. *Journal of Democracy*, *30*(1), 158–171. https://doi.org/10.1353/jod.2019.0012

Morgenbesser, L. (2018). Misclassification on the Mekong: the origins of Hun Sen's personalist dictatorship. *Democratization*, *25*(2), 191–208. https://doi.org/10.1080/13510347.2017.1289178

Morgenbesser, L., & Pepinsky, T. B. (2019). Elections as Causes of Democratization: Southeast Asia in Comparative Perspective. *Comparative Political Studies*, *52*(1), 3–35. https://doi.org/10.1177/0010414018758763

Nam, S. (2017). Urban speculation, economic openness, and market experiments in Phnom Penh. *Positions*, *25*(4), 645–667. https://doi.org/10.1215/10679847-4188350

National Council for Sustainable Development, Royal Government of Cambodia, Global Green Growth Institute, & International Centre for Environmental Management. (2016). *Green City Strategic Planning Methodology*. Retrieved from https://gggi.org/report/cambodian-green-city-strategic-planning-methodology/

National Institute of Statistics. (2016). *Cambodia Socio-Economic Survey 2016*. Retrieved from: http://www.nis.gov.kh/nis/CSES/Final Report CSES 2016.pdf

Nelson, D. R., Adger, W. N., & Brown, K. (2007). Adaptation to Environmental Change: Contributions of a Resilience Framework. *Annual Review of Environment and Resources*, *32*(1), 395–419. https://doi.org/10.1146/annurev.energy.32.051807.090348

Neumann, R. (2005). *Making Political Ecology*. London: Hodder Arnold.

Nishikawa, M. (2018). *JICA's Cooperation for Water Environment Improvement in Phnom Penh*. Phnom Penh: City for All. November 29, 2018. Presentation.

O'Brien, K. (2012). Global environmental change II: From adaptation to deliberate transformation. *Progress in Human Geography*, *36*(5), 667–676.

O'Brien, K., Hayward, B., & Berkes, F. (2009). Rethinking social contracts: Building resilience in a changing climate. *Ecology and Society*. *14*(2), 12. https://doi.org/10.1177/003231870806000105

O'Byrne, B., & Sek, O. (2017, July 14). Dirty Business. *The Cambodia Daily*. Retrieved from https://english.cambodiadaily.com/features/dirty-business-2-132507/

OECD. (2018). Aid at a Glance. Retrieved January 24, 2020 from: http://www.oecd.org/dac/financing-sustainable-development/development-finance-data/aid-at-a-glance.htm

OECD. (2019). Paris Declaration and Accra Agenda for Action. Retrieved November 11, 2019, from: http://www.oecd.org/dac/effectiveness/parisdeclarationandaccraagendaforaction.htm

Olsson, P., Gunderson, L. H., Carpenter, S. R., Ryan, P., Lebel, L., Folke, C., & Holling, C. S. (2006). Shooting the rapids: navigating transitions to adaptive governance of social-ecological systems. *Ecology and Society*, *11*(1), 18. https://doi.org/10.2307/26267806

Olsson, P., Galaz, V., & Boonstra, W. J. (2014). Sustainability transformations: A resilience perspective. *Ecology and Society*, *19*(4). https://doi.org/10.5751/ES-06799-190401

Ong, A. (2011). Worlding Cities, or the Art of being Global. In A. Roy & A. Ong (Eds.), *Worlding Cities: Asian Experiments and the Art of being Global* (First Edit, pp. 1–26). Blackwell Publishing Ltd.

OPHI. (2018). *Global MPI Country Briefing 2018: Cambodia (East Asia and the Pacific)*. Retrieved from: https://ophi.org.uk/wp-content/uploads/CB_KHM-2.pdf

Osbourne, M. (2008). *Phnom Penh: A Cultural and Literary History*. Oxford: Signal Books.

Pahl-Wostl, C. (2009). A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change*, *19*(3), 354–365. https://doi.org/10.1016/j.gloenvcha.2009.06.001

Paling, W. (2012). Planning a Future for Phnom Penh: Mega Projects, Aid Dependence and Disjointed Governance. *Urban Studies*, *49*(13), 2889–2912. https://doi.org/10.1177/0042098012452457

PAN UK. (2017). Health Effects of Pesticides. Retrieved November 8, 2019, from: http://www.pan-uk.org/health-effects-of-pesticides/

Park, C. M. Y. (2018). "Our Lands are Our Lives": Gendered Experiences of Resistance to Land Grabbing in Rural Cambodia. *Feminist Economics*, 1–24. https://doi.org/10.1080/13545701.2018.1503417

Peet, R., & Watts, M. (1996). *Liberation Ecologies: environment, development, social movements*. London: Taylor & Francis.

Pelling, M. (2011). *Adaptation to Climate Change: from resilience to transformation*. Abingdon, Oxon, England: Routledge.

Pelling, M. (2012). Resilience and transformation. In M. Pelling, D. Manuel-Navarrete, & M. Redclift (Eds.), *Climate Change and the Crisis of Capitalism: A chance to reclaim self, society and nature*. London: Routledge.

Pelling, M., & Dill, K. (2006). ISP/NSC Briefing Paper 06/01: 'Natural' Disasters as Catalysts of Political Action, 4–6.

Pelling, M., O'Brien, K., & Matyas, D. (2015). Adaptation and transformation. *Climatic Change*, *133*(1), 113–127. https://doi.org/10.1007/s10584-014-1303-0

Peou, C. (2016). Negotiating rural-urban transformation and life course fluidity: Rural young people and urban sojourn in contemporary Cambodia. *Journal of Rural Studies*, *44*, 177–186. https://doi.org/10.1016/j.jrurstud.2016.02.002

Phnom Penh Capital Hall. (2019). *20 Communes Data*. Retrieved October 31, 2019, from: http://phnompenh.gov.kh/en/phnom-penh-city/facts/20-communes-data/

Phnom Penh Capital Hall, National Council for Sustainable Development, & Global Green Growth Institute. (2018). *Phnom Penh Sustainable City Plan 2018-2030*. Retrieved from: https://gggi.org/report/phnom-penh-sustainable-city-plan-2018-2030/

Picciotto, R. (2012). Experimentalism and Development Evaluation: Will the Bubble Burst? *Evaluation*, *18*(2), 213–229.

Quay, R. (2010). Anticipatory Governance. *Journal of the American Planning Association*, *76*(4), 496–511. https://doi.org/10.1080/01944363.2010.508428

RFA. (2019, January 22). China Pledges Nearly US $600 Million in Aid to Cambodia Over Three Years: PM Hun Sen. *Radio Free Asia*. Retrieved from: https://www.rfa.org/english/news/cambodia/aid-01222019164457.html

Ribot, J. (2014). Cause and response: vulnerability and climate in the Anthropocene. *The Journal of Peasant Studies*, *41*(5), 667–705. https://doi.org/10.1080/03066150.2014.894911

Ribot, J. (2011). Vulnerability before adaptation: Toward transformative climate action. *Global Environmental Change*, *21*(4), 1160–1162. https://doi.org/10.1016/j.gloenvcha.2011.07.008

Ribot, J., & Peluso, N. (2003). A Theory of Access. *Rural Sociology*, *68*(2), 153–181. https://doi.org/10.1111/j.1549-0831.2003.tb00133.x

Rith, S., & Strangio, S. (2009, March 12). New report warns of Boeung Kak flooding. *Phnom Penh Post*. Retrieved from: https://www.phnompenhpost.com/national/new-report-warns-boeung-kak-flooding

Roulston, K. (2013). *Reflective Interviewing: A Guide to Theory and Practice*. London: SAGE Publications. https://doi.org/10.4135/9781446288009.n4

Royal Government of Cambodia. (2019a). *Cambodia's Voluntary National Review 2019 on the Implementation of the 2030 Agenda for Sustainable Development*. Retrieved from: https://sustainabledevelopment.un.org/content/documents/23603Cambodia_VNR_SDPM_Approved.pdf

Royal Government of Cambodia. (2019b). *Cambodia's Intended Nationally Determined Contribution*. Retrieved from http://www.camclimate.org.kh/en/documents-and-media/library/category/137-national-report.html

Royal Government of Cambodia. (2018). *Rectangular Strategy for Growth, Employment, Equity and Efficiency: Building the Foundation Toward Realizing the Cambodia Vision 2050 Phase IV*. Retrieved from: http://cnv.org.kh/ok&task=readonline&book_id=13650&page=73&chkhashk=ED9C9491B4&Itemid=218&lang=fa&tmpl=component

Royal Government of Cambodia. (2014). *Climate Change Strategic Plan 2014-2018*. Retrieved from: http://www.camclimate.org.kh/en/policies/nccc-news/197-cccsp-2014-2023-kh-en-final.html

Saldaña, J. (2009). *Coding Manual for Qualitative Researchers*. SAGE Publications.

Sasin, P., Pern, H., Dekkers, W., Flower, B., Grimsditch, M., & Ee, S. (2015). *Human Rights Based Spatial Planning in Cambodia - Guidelines*. Phnom Penh. People In Need Cambodia.

Sasin, P., & Sokha, T. (2015). *City at Risk? Phnom Penh Hazard Vulnerability and Capacity Assessment.* People in Need Cambodia.

Satterthwaite, D. (2013). The political underpinnings of cities' accumulated resilience to climate change. *Environment and Urbanization*, *25*(2), 381–391. https://doi.org/10.1177/0956247813500902

Schoenberger, L., & Beban, A. (2018). "They Turn Us into Criminals": Embodiments of Fear in Cambodian Land Grabbing. *Annals of the American Association of Geographers*, *4452*, 1–16. https://doi.org/10.1080/24694452.2017.1420462

Scoones, I. (2016). The Politics of Sustainability and Development. *The Annual Review of Environment and Resources*. https://doi.org/10.1146/annurev-environ-110615-090039

Scott, J. C. (1985). *Weapons of the Weak : Everyday forms of peasant resistance*. New Haven: Yale University Press.

Scoville-Simonds, M. (2009). *Discourse Analysis in Political Ecology: Towards an analytical framework of environmental controversies*. Graduate Institute of International and Development Studies.

Soanes, M., & Shakya, C. (2016). *Six steps to local climate finance*. International Institute for Environment and Development. Retrieved November 11, 2019, from https://www.iied.org/six-steps-local-climate-finance

Sokhean, B. (2017, November 26). Breaking: PM says prominent human rights NGO 'must close.' *Phnom Penh Post*. Retrieved from: http://www.phnompenhpost.com/national-politics/breaking-pm-says-prominent-human-rights-ngo-must-close

Sokhean, B., & Dara, M. (2017, November 17). 'Death of democracy': CNRP dissolved by Supreme Court ruling. *Phnom Penh Post*. Retrieved from: https://www.phnompenhpost.com/national-post-depth-politics/death-democracy-cnrp-dissolved-supreme-court-ruling

Southall, E., Khuon, C., & Hor, O. (2019). *Cambodia: How the people of Cambodia live with climate change and what media and communication can do*. Retrieved from: http://downloads.bbc.co.uk/mediaaction/pdf/climateasia/reports/climate-asia-cambodia-report2019-revised.pdf

Sovann, C., Irvine, K. N., Suthipong, S., Kok, S., & Chea, E. (2015). Dynamic Modelling to Assess Natural Wetlands Treatment of Wastewater in Phnom Penh, Cambodia: Towards an Eco-City Planning Tool. *British Journal of Environment and Climate Change*, *5*(2), 104–115. https://doi.org/10.9734/BJECC/2015/12101

Strategic Program for Climate Resilience. (2018a). Strategic Program for Climate Resilience, Cambodia. Retrieved November 11, 2019, from http://spcrcambodia.org/en/category/agriculture-en/

Strategic Program for Climate Resilience. (2018b). Strategic Program for Climate Resilience: Profile. Retrieved November 11, 2019, from http://spcrcambodia.org/en/about-us-en/

Strategic Program for Climate Resilience. (2018c). TA-8179 CAM Mainstreaming Climate Resilience into Development Planning – Package A. Retrieved November 11, 2019, from http://spcrcambodia.org/en/ta-8179-a/

Springer, S. (2013). Violent Accumulation: A Postanarchist Critique of Property, Dispossession, and the State of Exception in Neoliberalizing Cambodia. *Annals of the Association of American Geographers*, *103*(3), 608–626. https://doi.org/10.1080/00045608.2011.628259

Springer, S. (2011). Articulated Neoliberalism: The specificity of patronage, kleptocracy, and violence in Cambodia's neoliberalization. *Environment and Planning A*, *43*(11), 2554–2570. https://doi.org/10.1068/a43402

Steel, G., van Noorloos, F., & Klaufus, C. (2017). The urban land debate in the global South: New avenues for research. *Geoforum*, *83*(March), 133–141. https://doi.org/10.1016/j.geoforum.2017.03.006

Stone-Jovicich, S. (2015). Probing the interfaces between the social sciences and social-ecological resilience: insights from integrative and hybrid perspectives in the social sciences. *Ecology and Society*, *20*(2), 25. https://doi.org/10.5751/ES-07347-200225

Strangio, S. (2014). *Hun Sen's Cambodia*. New Haven: Yale University Press.

STT. (2019). *Map of Sub-decrees Granted on Boeung Tompun*. Personal Communication.

STT. (2018). *The Phnom Penh Survey: A Study on the Urban Poor Settlement in Phnom Penh*. Retrieved from: www.teangtnaut.org

STT. (2016). Promises Kept? A study on the Development of 77 Eviction Sites in Phnom Penh. Retrieved from: https://teangtnaut.org/promises-kept-study-development-77-eviction-sites-phnom-penh/?lang=en

STT. (2015). *Phnom Penh's Lakes: Where are they now?* Phnom Penh. Retrieved from https://teangtnaut.org/facts-figures-28-phnom-penhs-lakes-now/?lang=en

STT. (n.d.). Sub-decree of Phnom Penh Master Plan. Retrieved October 31, 2019, from https://teangtnaut.org/sub-degree-phnom-penh-master-plan/?lang=en

Svarstad, H., Benjaminsen, T. A., & Overå, R. (2018). Power theories in political ecology. *Journal of Political Ecology*, *25*(1), 350. https://doi.org/10.2458/v25i1.23044

Swyngedouw, E. (2015). Urbanization and environmental futures: politicizing urban political ecologies. In T. Perreault, G. Bridge, & J. McCarthy (Eds.), *The Routledge Handbook of Political Ecology* (pp. 609–619). London: Routledge.

Swyngedouw, E. (2006). Circulations and Metabolisms: (Hybrid) Natures and (Cyborg) *Cities*, *15*(2), 105–121.

Swyngedouw, E. (2004). *Social Power and the Urbanization of Water: Flows of Power*. Oxford: Oxford University Press.

Swyngedouw, E., & Kaika, M. (2014). Urban Political Ecology. Great Promises, Deadlock… and New Beginnings? *Documents d'Analisi Geografica*, *60*(3), 459–481. https://doi.org/10.5565/rev/dag.155

Tanner, T., Mitchell, T., Polack, E., & Guenther, B. (2009). *WORKING PAPER Volume 2009 Number 315 Urban Governance for Adaptation: Assessing Climate Change Resilience in Ten Asian Cities*. Institute for Development Studies.

Taylor, M. (2014). *The Political Ecology of Climate Change Adaptation: Livelihoods, agrarian change and the conflicts of development*. London: Routledge: Earthscan.

Thoeun, H. C. (2015). Observed and projected changes in temperature and rainfall in Cambodia. *Weather and Climate Extremes*, *7*, 61–71. https://doi.org/10.1016/j.wace.2015.02.001

Transparency International. (2018). *Corruption Perceptions Index 2018*. Retrieved from: https://www.transparency.org/cpi2018

Tudehope, M. (2012). *A Tale of Two Cities: A review of the development paradigm in Phnom Penh*. STT. Retrieved from www.teangtnaut.org

Turner, M. D. (2014). Political ecology I: An alliance with resilience? *Progress in Human Geography*, *38*(4), 616–623. https://doi.org/10.1177/0309132513502770

Tyler, S., & Moench, M. (2012). A framework for urban climate resilience. *Climate and Development*, *4*(4), 311–326. https://doi.org/10.1080/17565529.2012.745389

Un, K. (2006). State, society and democratic consolidation: The case of Cambodia. *Pacific Affairs*, *79*(2), 225–245. https://doi.org/10.5509/2006792225

Un, K., & So, S. (2011). Land rights in Cambodia: How neopatrimonial politics restricts land policy reform. *Pacific Affairs*, *84*(2), 289–308. https://doi.org/10.5509/2011842289

United Nations Development Programme. (2014). *Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience*. *Human Development Report 2014*. https://doi.org/ISBN: 978-92-1-126340-4

UNDP. (2018). *Human Development Indices and Indicators: 2018 Statistical Update - Cambodia*. Retrieved from: http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/KHM.pdf

UNESCO. (2010). *UNESCO National Education Support Strategy Cambodia 2010-2013*. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000188018

UN-Habitat. (n.d.). *City Resilience Profiling Tool*. Retrieved from http://urbanresiliencehub.org/wp-content/uploads/2018/02/CRPT-Guide.pdf

UNICEF. (2014). Multiple Indicator Assessment of the Urban Poor. *Nutrition Works: International Public Nutrition Resource Group*, 1–68.

United Nations. (n.d.). '*Summary' Cambodia – UNTAC Background*. Retrieved November 11, 2019, from https://peacekeeping.un.org/mission/past/untacbackgr1.html

University of Notre Dame. (2019). *ND-GAIN: Notre Dame Global Adaptation Index*. Retrieved October 23, 2019, from www.gain.org

Var, V. (2016). Holding Balance Between Two Superpowers: Cambodia's Strategic Choices for Foreign And Development Policy – Analysis. *Eurasia Review*, Retrieved November 11, 2019, from https://www.eurasiareview.com/27072016-holding-balance-between-two-superpowers-cambodias-strategic-choices-for-foreign-and-development-policy-analysis/

Verver, M., & Dahles, H. (2015). The Institutionalisation of Oknha: Cambodian Entrepreneurship at the Interface of Business and Politics. *Journal of Contemporary Asia*, *45*(1), 48–70. https://doi.org/10.1080/00472336.2014.891147

Walker, B., Holling, C. S., Carpenter, S. R., & Kinzig, A. (2004). Resilience, Adaptability and Transformability in Social – ecological Systems. *Ecology and Society*, *9*(2), 5. https://doi.org/10.1103/PhysRevLett.95.258101

Walker, P. A. (2005). Political ecology: where is the ecology? *Progress in Human Geography*, *29*(1), 73–82. https://doi.org/10.1191/0309132505ph530pr

Watts, M. (2015). Now and Then: The origins of political ecology and the rebirth of adaptation as a form of thought. In T. Perrault, G. Bridge, & J. McCarthy (Eds.), *The Routledge Handbook of Political Ecology* (pp. 19–50). London: Routledge.

Watts, M. (1983). *Silent Violence: Food, Famine and Peasantry in Northern Nigeria*. Berkeley: University of California Press.

Weichselgartner, J., & Kelman, I. (2015). Geographies of resilience: Challenges and opportunities of a descriptive concept. *Progress in Human Geography*, *39*(3), 249–267. https://doi.org/10.1177/0309132513518834

Weichselgartner, J., & Kelman, I. (2014). Challenges and opportunities for building urban resilience. *A/Z ITU Journal of the Faculty of Architecture*, *11*(1), 20–35.

Weisser, F., Bollig, M., Doevenspeck, M., & Müller-Mahn, D. (2014). Translating the "adaptation to climate change" paradigm: The politics of a travelling idea in Africa. *Geographical Journal*, *180*(2), 111–119. https://doi.org/10.1111/geoj.12037

Welsh, M. (2014). Resilience and responsibility: Governing uncertainty in a complex world. *Geographical Journal*, *180*(1), 15–26. https://doi.org/10.1111/geoj.12012

White, I., & O'Hare, P. (2014). From rhetoric to reality: which resilience, why resilience, and whose resilience in spatial planning?, *32*, 934–950. https://doi.org/10.1068/c12117

Wodak, R. (2001). What CDA Is About – A summary of its history, important concepts and its developments. In R. Wodak & M. Meyer (Eds.), *Methods of Critical Discourse Analysis* (pp. 1–13). SAGE Publications. https://doi.org/10.4135/9780857028020.n1

Woolf, S., Twigg, J., Parikh, P., Karaoglou, A., & Cheab, T. (2016). Towards measurable resilience: A novel framework tool for the assessment of resilience levels in slums. *International Journal of Disaster Risk Reduction*, *19*, 280–302. https://doi.org/10.1016/j.ijdrr.2016.08.003

World Bank. (2019). *The World Bank in Cambodia*. Retrieved October 31, 2019, from https://www.worldbank.org/en/country/cambodia

World Bank. (2018a). *GDP Growth - Cambodia*. Retrieved October 31, 2019, from https://data.worldbank.org/indicator/ny.gdp.mktp.kd.zg?locations=kh

World Bank. (2018b). Urban Development in Phnom Penh. Retrieved from: http://documents.worldbank.org/curated/en/286991511862455372/pdf/121692-REVISED-Phnom-Penh-Urban-report-V8-V-low.pdf

World Bank. (2018c). *Rural Population*. Retrieved November 11, 2019, from https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS

World Bank. (2015). *East Asia's Changing Urban Landscape -- Measuring a Decade of Spatial Growth*. https://doi.org/10.1596/978-1-4648-0363-5

World Bank. (n.d.). *Cambodia Climate Data: Historical*. Retrieved October 31, 2019, from https://climateknowledgeportal.worldbank.org/country/cambodia/climate-data-historical.

Yin, R. (2010). *Qualitative Research from Start to Finish*. Guilford Publications.

Ziervogel, G., Pelling, M., Cartwright, A., Chu, E., Deshpande, T., Harris, L., Hyams, K., Kaunda, J., Klaus, B., Michael, K., Pasquini, L., Pharoah, R., Rodina, L., Scott, D., Zweig, P. (2017). Inserting rights and justice into urban resilience: a focus on everyday risk. *Environment and Urbanization*, *29*(1), 123–138. https://doi.org/10.1177/0956247816686905

Appendix A – Semi-structured Interview Questions (First round)

1. Introduction
   Who lives with you in your household?
   How long have you lived in this area?
   What is the primary livelihood strategy of your household? Who is responsible for this? Do you practice any others?
   How much is your monthly income?

2. Have you noticed your city growing/changing? If yes, in what way?
   How have these changes impacted you?
   Prompts: availability of employment, cost of living, access to services

3. What are the environmental changes you have witnessed in your city?
   Have these changes affected your job? In what way?
   Have they affected your home or family?
   What/who is responsible for these changes?

4. Have you heard of climate change? If yes, how does it affect you?
   Description of climate change and then ask if they've experienced anything like that. For example – the weather has been getting hotter, more unpredictable, rain keeps going out of season, storms that are stronger.

5. What strategies do you use to cope with the changes you're seeing?
   What have been the results? Prompts: positive and negative, aware of any impacts beyond your immediate family
   How are adaptation decisions made/by whom?

6. Are you aware of any activities implemented by the government or any other agencies? What level of government? Who makes those decisions?
   What input did you/could you have in those activities?
   Who benefits from them?
   What community initiatives are you aware of that relate to managing environmental/climate change?
   What government support is there for climate change adaptation projects at the community level? How are these decisions made?

Appendix B – Semi-structured Interview Questions (Second round)

1. Introduction
   Who lives with you in your household?
   How long have you lived in this area?
   What is the primary livelihood strategy of your household? Who is responsible for this? Do you practice any others?
   How much is your monthly income?
   If they farm – how much rent they pay, if they have any loans

2. Community activities
   Are there any ways/projects that the community works together?
   Are there any NGOs that work in the village? (Do they know about SKO or STT work?)
   Is the local government doing any projects that make the village better? (Examples: roads, drainage, waste collection?)
   How do you get information about what is going on in the village? Do you receive information from village leaders?

3. Communication
   Do you ever talk to your neighbours about farming? What sort of information do you share?
   Have you heard anything about the development of this area? Do you talk to any of your neighbours about it?
   Have you ever heard of climate change?
   Explain and ask if they've experienced anything like that
   Do you ever talk to your neighbours about it?

4. Resilience
   What would it take/what would you need for you as a family to be resilient? What about the village?
   Try this phrasing: What are the main challenges you face? What would it take for you to be able to manage those challenges? What about at the village level?

Appendix C – Key Informant Interview Questions

1. Introduction
   What is your position in the government?
   How long have you held this position?
   What are your responsibilities in terms of urban planning?

2. Have you noticed your city growing/changing? If yes, in what way?
   What do you think are the biggest challenges facing the city?

3. What are the environmental changes you have witnessed in your city?
   What have been the impacts of these changes? (Risks, livelihoods, social, political)
   Have these changes affected your job? In what way?

4. Are you familiar with climate change adaptation?
   Which level of government and ministry is responsible for adaptation?
   Are you involved in any activities related to climate change adaptation in your job?
   Are you aware of any activities/policies implemented by the government related to climate change adaptation in Phnom Penh/Battambang?
   What have been the impact of these activities?
   How are adaptation decisions made?

5. What community initiatives are you aware of that relate to managing environmental/climate change?
   What government support is there for climate change adaptation projects at the community level?

6. Are you familiar with the term resilience?
   Do you hear it used or read it within government policy?
   What has been the drive behind the term? Internal or external? (Eg. Funders)
   Are you aware of a definition of resilience in the context of your work? If so, what is it?
   Would you say your work contributes to urban resilience? If yes, how?

Appendix D – List of Organizations Interviewed

Date	Organization	Total Number of Participants Present	Men	Women	Interview Type	Language
15/11/2018	JICA	2	1	1	Donor	English
25/10/2018	Agence France du Developpement	1	1		Donor	English
29/01/2018	Swedish Embassy	1		1	Donor	English
16/01/2018	World Bank	1	1		Donor	English
26/01/2018	GIZ	1	1		Donor	English
31/05/2018	Department of Climate Change (Ministry of Environment)	1	1		Government	English
01/11/2018	Department of Climate Change (Ministry of Environment)	1	1		Government	English
12/10/2018	Phnom Penh City Hall (Department of Urban Planning)	1	1		Government	English
14/01/2019	Ministry of Land Management (Meanchey District)	1	1		Government	Khmer
16/08/2018	Chak Angre Leu Sangkat	1		1	Government	Khmer
17/01/2018	Cambodia Climate Change Alliance (Ministry of Environment)	1	1		Government	English
20/11/2018	Ministry of Public Works	3	2	1	Government	English
26/01/2018	Strategic Programme for Climate Resilience (Ministry of Environment)	1		1	Government	English
04/06/2018	Prek Takong Muy village	1	1		Government	Khmer
03/01/2018	UNHABITAT	1	1		IO	English
08/05/2018	UNDP	1		1	IO	English

15/01/2018	UNCDF	1	1		IO	English
18/01/2018	UNDP	1	1		IO	English
28/03/2019	GGGI	2	1	1	IO	English
02/07/2018	GGGI	1	1		IO	English
01/05/2018	BBC Media Action	1		1	NGO	English
03/07/2018	Urban Poor Women's Development	1		1	NGO	English
04/06/2018	Conservation International	1	1		NGO	English
09/03/2018	SKO	1		1	NGO	English
13/03/2018	Live and Learn	1	1		NGO	Khmer
15/11/2017	Urban Poor Women's Development	1		1	NGO	English
17/07/2018	People in Need	1	1		NGO	English
17/11/2017	STT	2	1	1	NGO	English
20/12/2017	Dan Church Aid	1	1		NGO	English
21/01/2018	Plan International	3	3		NGO	English
22/05/2018	Forum Syd	1	1		NGO	English
24/05/2018	World Vision	2	2		NGO	English
26/12/2017	Life with Dignity	1	1		NGO	English
28/06/2018	Wetlands Work	1	1		NGO	English
29/09/2018	Equitable Cambodia	1	1		NGO	Khmer
30/11/2018	Royal University of Phnom Penh	2	2		Other	English
	TOTAL	**45**	**33**	**12**		

Appendix E – Themes for Focus Groups

1. Development Challenges
   What are the major challenges faced by community members? (Prompts: employment, education, migration)

2. Climate related risks
   How have weather patterns changed over time? Focus on rainfall, heat, storms
   What risks are faced and how have they changed?
   Have they been exacerbated by development challenges?
   How are risks distributed in the community – geographically, by livelihood, gender

3. Adaptation
   How do you respond to risks – as an individual, group, community?
   What are the strengths and weaknesses of your strategy?
   What would you like to be doing differently?
   What prevents you from taking adaptation strategies that you would like?

4. Governance
   What groups/organizations support adaptation in your community?
   What kind of support do they provide?
   Who should be responsible for adaptation?

5. Future
   What will the village look like in 10 years? How do you feel about that future?

Appendix F – Survey Questions

Recruitment Text for household interviews

I am a researcher delivering a survey on behalf of a student from Canada. I am looking for participants to speak to me about climate change and development challenges faced by your community as well as the strategies being used to adapt. If you are interested in participating, you would be asked to answer one survey which would take approximately 30 minutes of your time. The confidentiality of all participants is assured. I am available to answer any questions you may have related to this research. Your participation would be greatly valued.

Section 1: Demographics (Location entered by enumerators – paved road or trash road)

1. Age
2. Gender
3. What is the main income source for your household? (Pick one)
    a. farming,
    b. construction,
    c. shop,
    d. motodop,
    e. factory,
    f. other
4. Are there any other livelihood strategies practiced in the household? (Can pick more than one)
    a. farming,
    b. construction,
    c. shop,
    d. motodop,
    e. factory,
    f. other
    g. none
5. How many people are in your household?
6. Do you own or rent your home?
    a. own,
    b. rent,
    c. squat/no formal tenure,
    d. live with friends/relatives,
    e. stay in employers house

7. How long have you been resident in this area?
    a. Less than a year
    b. 1-5 years
    c. 6-10 years
    d. More than 10 years
    e. Born in the village

Section 2: Climate Change

8. Have you noticed any changes in the environment? Yes/No
9. Which changes have you been affected by:
    - increased temperature (Scale of 1-5 – 1 is very little, 5 is very much)
    - variable rainfall (Scale of 1-5 – 1 is very little, 5 is very much)
    - variable temperature (Scale of 1-5 – 1 is very little, 5 is very much)
    - flooding (Scale of 1-5 – 1 is very little, 5 is very much)
    - storms (Scale of 1-5 – 1 is very little, 5 is very much)

10. How have you been affected by these changes? (Can pick more than one)
    a. decreased income,
    b. Health impacts/sickness,
    c. damage to housing/property,
    d. migration (temporary),
    e. migration (permanent)
    f. other

Section 3: Adaptation

11. What strategies have you used to cope with these changes? (Can pick more than one)
    a. changed livelihoods,
    b. diversified livelihoods,
    c. taken out a loan
    d. built house differently,
    e. moved to a new location
    f. migrated seasonally,
    g. received help from government
    h. received help from NGO
    i. changed crops, (for people farming)
    j. used more fertilizer, (for people farming)
    k. moved planting location (for people farming)
    l. none
    m. other

12. What strategies would you consider using to cope with environmental change? (Can pick more than one)
    a. changed livelihoods,
    b. diversified livelihoods,
    c. taken out a loan
    d. built house differently,
    e. moved to a new location
    f. migrated seasonally,
    g. asked government for help
    h. asked NGO for help
    i. return to home village
    j. changed crops, (for people farming)
    k. used more fertilizer, (for people farming)
    l. moved planting location (for people farming)
    m. none

13. If there are strategies that you would consider that you haven't tried yet, what are the barriers? (Can pick more than one)
    a. lack of money,
    b. lack of time,
    c. don't know how,
    d. physically unable
    e. other

Section 4: Governance

14. Have you received support from anyone with your strategies? (Yes/No)
    a. neighbours,
    b. community organizations,
    c. other family members,
    d. NGOs,
    e. local/Sangkat government,
    f. other government,
    g. church
    h. other

15. What type of support did you receive? (Can pick more than one)
    a. financial
    b. technical
    c. physical/labour
    d. food
    e. material/goods
    f. infrastructure
    g. other

16. Do you need support that you have not received? (Yes/No) If yes
    a. financial,
    b. technical,
    c. physical/labour
    d. food
    e. material/goods
    f. infrastructure
    g. other

17. Who do you think should be responsible for supporting you to adapt to these changes?
    a. neighbours,
    b. community organizations,
    c. other family members,
    d. NGOs,
    e. local/Sangkat government,
    f. other government
    g. no one/Myself
    h. none of the above

Section 5: Future Plans

18. What is the most important priority for your family? (Rank 3)
    a. children's education
    b. earning money
    c. saving money
    d. buying land/a home
    e. securing land title
    f. staying near the city
    g. living in a safe house
    h. living in a safe community
    i. health

19. What is the most important challenge facing your family? (Rank 3)
    a. environmental change
    b. debt
    c. earning money
    d. safe housing
    e. land tenure
    f. community safety/security
    g. other

20. For farmers: Do you plan to continue farming in the future? (Yes/No)
21. If no, do you plan to stay in BTP? (Yes/No)
22. If no, what is your alternative livelihood strategy? (Pick one)
    a. construction,
    b. shop,
    c. motodop
    d. factory
    e. other
    f. don't know
23. How confident are you that you can support your family with this occupation? (5 point scale – 1 very unsure and 5 – will definitely be able to support my family)