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

Graham Reeder

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

Keywords Myanmar flood · Climate change · Flood governance

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

G. Reeder (✉)
York University, 4700 Keele St., Toronto, ON M3J 1P3, Canada
e-mail: grahamreeder@gmail.com

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

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

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

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

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

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

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

6.1 Flood Management

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

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

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

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

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

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

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

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

6.2 Resilience

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

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

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

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

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

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

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

6.3 Myanmar's History of Urban and Environmental Governance

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

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

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

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

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

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

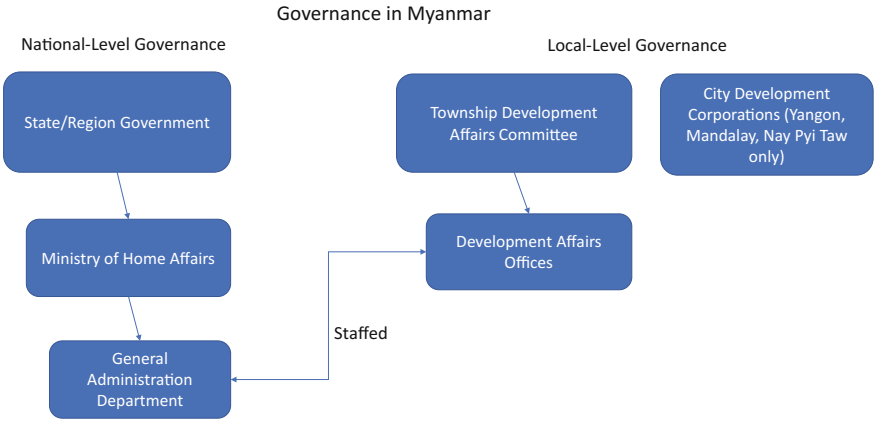

Fig. 6.2 Basic structure of national and local governments (Chart by Graham Reeder)

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

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

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

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

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

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

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

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

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

6.4 Regional Context

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

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

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

6.5 Study Population and Sampling

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

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

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

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

6.6 Flooding as a Hindrance to and Result of Development

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

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

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

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

6.7 Discussion

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6.8 Arguments and Findings

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

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

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

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

6.9 Research Contributions and Implications

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

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

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

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

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

6.10 Limitations and Future Research

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

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

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Graham Reeder is currently studying law at Osgoode Hall Law School in Toronto, Ontario. He joined the UCRSEA research project during his Masters of Environmental Studies degree at York University where he specialized in Urban Planning. Graham has worked in the climate change adaptation field for over eight years and on four continents.