Resilience governmentality: Rationality, apparatus, and subjectivity in building urban resilience in Indonesia

ERWIN NUGRAHA

Abstract

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There is a growing recognition of the need to apply the concept of resilience to govern cities and their urban populations with regard to the risks associated with climate change. Whilst resilience has expansively attracted urban policymakers, practitioners and scholars, this study focuses on resilience not as a 'ready-made' or 'pre-existing' object but as a relational object for which a more detailed understanding is required. Rather than seeing resilience through its linearity, this study alternatively seeks to understand the premise and assumptions behind resilience planning and consequent actions. This study aims to analyse the actual rationalities and techniques for governing the cities and their urban populations in relation to climate change risks in two Indonesian cities, namely Bandar Lampung and Semarang. This study focuses on how efforts to build urban climate change resilience function as a distinctive form of governmentality.

This study analyses how particular mentalities are invested in the process of governing through a set of rationality, apparatus, and subjectivity by using governmentality as an analytical toolbox. The data collection involved conducting semi-structured interviews and observations, as well as collecting reports and policy documents. It focuses on two cities in Indonesia that were members of the Asian Cities Climate Change Resilience Network (ACCCRN). The findings of this study suggest that (i) Building urban climate change resilience is problematised upon a multitude of rationalities of anticipation, reactivity, and survival; (ii) Resilience becomes a regime of practices that emerges into an assemblage of knowledge, actors, institution and network, and (iii) In both cities, "Climate Human" is exemplified as a multiplicity of urban subjectivities in the form of survival and adaptable subjects. Resilience governmentality emerges as a new approach for governing cities and their urban populations from climate change risks. Resilience is not apolitical. It is embedded within the governmentalisation of specific knowledge-power and politics of urban life.

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List of Abbreviations

ACCCRN	Asian Cities Climate Change Resilience Network
APEKSI	Asosiasi Pemerintah Kota Seluruh Indonesia (Indonesian Municipality Association)
BAPPEDA	Badan Perencanaan Pembangunan Daerah (Local Development Planning Agency)
BAPPENAS	Badan Perencanaan Pembangunan Nasional (National Development Planning Agency)
BAU	Business-As-Usual
BINTARI	Yayasan Bina Karya Lestari (Indonesian Foundation for Sustainable Development)
BPBD	Badan Penanggulangan Bencana Daerah (Local Disaster Management Agency)
BPPLH	Badan Pengelolaan dan Pengendalian Lingkungan Hidup (Local Environmental Agency)
CBVA	Community-based Vulnerability Assessment
CCROM SEAP	Centre for Climate Risk and Opportunity Management in Southeast Asia at Bogor Agriculture University
CRS	City Resilience Strategy
DNPI	Dewan Nasional Perubahan Iklim (National Council on Climate Change)
FGD	Focus Group Discussion
IIED	International Institute for Environment and Development
ICCCAD	International Centre for Climate Change and Development
ICLEI	International Council for Local Environmental Initiatives
IPCC	Intergovernmental Panel on Climate Change
ISET	Institute for Social and Environmental Transition
KLHK	Kementerian Lingkungan Hidup dan Kehutanan (Ministry of Environment and Forestry)
MCI	MercyCorps Indonesia
MUSRENBANG	Musyawarah Perencanaan Pembangunan (Annual Development Meeting)
NDC	Nationally Determined Contributions
RAN-API	Rencana Aksi Nasional – Adaptasi Perubahan Iklim (National Action Plan – Climate Change Adaptation)
RAN-GRK	Rencana Aksi Nasional – Mitigasi Perubahan Iklim (National Action Plan – Climate Change Mitigation)
RIB	Rumah Informasi Biopori (Biopore Information House)
RPJMD	Rencana Pembangunan Jangka Menengah Daerah (Local Medium Term Development Plan)
RTRW	Rencana Tata Ruang Wilayah (Spatial Plan)
UCCR	Urban Climate Change Resilience
UNDIP	Universitas Diponegoro (University of Diponegoro)
UNFCCC	United Nations Framework for Climate Change Convention (UNFCCC)
UNILA	Universitas Lampung (University of Lampung)
VA	Vulnerability Assessment

Declaration

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Statement of Copyright

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Any errors in the thesis do, of course, rest solely with the author.

Chapter 1: Introduction

"I ask you to contemplate this, my brothers,
Do not disobey your fathers and mothers.
Let their experiences serve as an example,
So that your own life will be forever tranquil."
– Muhammad Saleh in *The Tale of Lampung Submerged*
(Saleh, 1883, p.123)

"We have entered a time when the wild has become the norm."
(Ghosh, 2016, p.8)

1.1. Entering the wild

It was not a typical summer day when I arrived in Langkapura. As far as I observed, the weather was dry, even though it was only the beginning of the dry season. On the other hand, the wet season was reported to enter new trends of extremely wild and heavy rainfall in Bandar Lampung City, Indonesia (Tribun Lampung, 2016; VIVA, 2016; Republika, 2017). The name "Langkapura" originally comes from the phrases "langka" and "pura", which literally translates as "the absence of lies." Langkapura is located in a water absorption zone, which provides water conservation and flood protection to downstream areas in Bandar Lampung (Asian Cities Climate Change Resilience Network (ACCCRN), 2010a). I met Hamid[1] during my fieldwork visit to Langkapura in May 2014. His family are native residents and one of the earliest to establish a settlement in Langkapura District[2]. Langkapura is one of the oldest districts in Bandar Lampung. It was developed during the Dutch colonial period and was known as an area of rubber plantations in the early twentieth century (Swart, 1911, p.125).

Hamid took me on a short tour of a local river not far from his house. As we investigated the water level and its flow rate, he explained that the river was much

[1] The person's name is a pseudonym. I have chosen to use pseudonyms throughout the thesis in order to protect the research respondents' identities. When a pseudonym is used in the thesis, it will be indicated with a footnote.
[2] District is an administrative division of a city or regency administration in Indonesia. In Bandar Lampung, there are 20 districts ("kecamatan") and 126 sub-districts ("kelurahan").

deeper than the current level when he was younger. I asked him to describe the depth, and he rested his hand on his chest. Hamid was a relatively tall guy for an Indonesian. He was approximately 2 meters or 6' 7". As he plunged his feet into the river, the water level only reached the middle of his knee. He remembered the times, back then, when he jumped and swam into the water without worries. When we were there, he would be sure to be in danger in doing so due to the large rocks in the river and the shallow water. As we were standing on a nearby springwater, he criticised the rapid urbanisation, environmental degradation, and climate change. He warned that if this situation continues, his local community will suffer further from the lack of water resources. As I recall from my previous interview, he mentioned the urgency of recharging as much groundwater as possible to bequeath spring water for future generations instead of making them a generation of "rainy tears."

More than 150 years ago, the average temperature in Bandar Lampung was mild, ranging from 30 to 30.56 degrees Celsius during the daytime and 21.11 degrees Celsius during the nighttime (Steck, 1862). However, the recent scientific evidence conducted as part of the Asian Cities Climate Change Resilience Network (ACCCRN) showed "significant upward trends of temperature in each season" in the last 100 years (ACCCRN, 2010a, p.39). The average maximum temperature reported was 30.57 degrees Celsius, with a minimum temperature of 25.34 degrees Celsius (ACCCRN, 2010a). In 2013, the city observed one of the "wildest" floodings, which affected 20 districts and 80 sub-districts (National Agency for Disaster Management (BNPB), 2015). The city had entered the wild extremes of climate change – either too dry or too much water (Sitadevi, 2016). "A changing climate", summarised in The Intergovernmental Panel on Climate Change (IPCC)'s *SREX Report*[3], has led "to changes in frequency, intensity, spatial extent, duration, and timing of extreme weather and climate events" (Intergovernmental Panel on Climate Change (IPCC), 2012, p.5) which have occurred disproportionately throughout the world.

There is no doubt that climate change is already happening. The IPCC's Fifth Assessment Report of *Climate Change 2014 Synthesis Report* recognised that

[3] SREX Report, known as the Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, is a scientific report produced by IPCC to assess "the scientific literature on issues that range the relationship between climate change and extreme weather and climate events ('climate extreme') to the implications of these events for society and development." (IPCC, 2012, p.2)

"warming of the climate is unequivocal… the atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen" (IPCC, 2014b, p.2). Meanwhile, climate change impacts have continued to unfold and affect "natural and human systems on all continents and across the oceans" (IPCC, 2014b, p.6). Hence, anticipating and reducing impacts from climate change not only "must be complementary and concurrent" (Mastrandrea and Schneider, 2010, p.62) with reducing greenhouse emissions in the atmosphere but also urgently and immediately required. In a world of changing climate, "resilience" as a new discourse challenges climate change adaptation and emerges within various policies in different arenas of climate, urban, development and disaster risk reduction, expanding from international agreements to national laws and inspiring transnational climate partnerships to urban agendas (for example Paris Agreement, Sustainable Development Goals, The New Urban Agenda). In the 2015 Paris Agreement, it is stated that undertaking climate change adaptation alone is not enough to reduce and anticipate "the adverse impacts of climate change" but that actions are also required to "foster climate resilience" (United Nations, 2015, p.22). Resilience is defined as "the capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance… while also maintaining the capacity for *adaptation*, learning and *transformation*" (IPCC, 2014a, p.127 - original emphasis). Resilience has developed from experts' early discussions, which signifies it from stability into contemporary discussions as a new style of governance to face risk, crisis, and uncertainty. This will be further discussed in Chapter 2 of the thesis (specifically in Section 2.3). Resilience has appeared as a policy imperative to overcome climate change risks and uncertainties.

In an urban setting, building urban climate change resilience has developed into a "formula" to cure the deficiencies and incapacity of urban systems to imminent threats, external disturbances, or any internal changes. Moreover, resilience continues to influence how urban systems, institutions, and citizens should respond, organise, and reconfigure their urban governance. Resilience is increasingly utilised as a formula to overcome and cope with any problems of cities and urban life in a changing and disruptive world. As we enter a new age of climate change, resilience becomes an undisputable and seamlessly applicable recipe with which cities and their urban populations are governed against climate change risks and uncertainty.

However, resilience is not an apolitical agenda. This thesis rejects the notion of building urban climate change resilience as instrumentalist and technical in solving the multiple predicaments of climate change. In order to do that, the research aim was to decentre studies of urban resilience from a reductionist to a post-structural research approach. In a post-structural approach, our understanding of resilience assumes that there was no possibility of universal knowledge, yet it is constantly constructed and negotiated as part of the "formation of meaning" (Lupton, 1999, p.29) within "political and cultural heterogeneities" (Cote and Nightingale, 2012, p.484). In this study, building urban climate change resilience is no longer understood as programmatic designs and technical solutions to reduce vulnerabilities and engage with preventive actions to measure, mitigate, and minimise effects from climate change, but arguably has entered into the management of "domains of life" (Anderson, 2015, p.60). Within the post-structural perspective, climate change is arguably becoming a new problematisation in urban governance and climate change experiments, which defines how the urban population will be governed, who will be involved in governing them, what measures will be implemented, by whom and how. In examining the concept and application of resilience, it cannot be defined as a technocratic process for managing climate risks and maintaining a city's functions but also as an endeavour for "resilientisation" through which governing the cities and their urban population have been problematised and articulated. New lines of inquiry have evolved to analyse, examine and criticise from this point of view regarding the politics of climate change adaptation and representational meanings of urban resilience (for example, Castán Broto, 2017; Klepp and Chavex-Rodriguez, 2018; Taylor, 2015). My approach to studying resilience was examining it as an epistemic approach of *situated resilience*, described as a mode of inquiry to analyse, examine, and investigate resilience as a relational object. *Situated resilience* offers a more tactile and strategic analytical approach to analyse and evaluate any agenda, policies, actions, interventions, and projects for building urban climate change resilience. The research focused on analysing urban climate change resilience, particularly on the notions of governmental rationalities, apparatus, and subjectivities from research case studies, using governmentality as an analytical toolbox.

This research focused on analysing the Asian Cities Climate Change Resilience Network, known as "ACCCRN." In order to respond to increasing risks and mitigate the negative impacts of climate change, the US-based Rockefeller Foundation

initiated the ACCCRN programme in 2007. Both cities of Bandar Lampung and Semarang in Indonesia joined and were early members of the initiative since 2009. The ACCCRN programme was a regional initiative to implement climate change adaptation and urban resilience in second-tier or medium-sized cities in South Asia and Southeast Asia, including Indonesia, Thailand, Vietnam and India (ACCCRN, 2009b). Anna Brown and her colleagues (Brown *et al.*, 2012, p.532) from The Rockefeller Foundation describe that ACCCRN's aim was "to catalyze attention, additional funding and action on building climate change resilience of cities as a whole – and within that ensuring that the resilience of vulnerable and poor communities is also enhanced." Even though ACCCRN was officially terminated by the end of 2016, the legacy of the initiative continues to flourish by expanding to 30-40 cities in the Philippines and Bangladesh (ACCCRN, 2017). The initiative evolved as a leading regional network for professionals and practitioners in building urban climate change resilience across the region. Later on, Semarang also joined 100 Resilient Cities (100RC) in 2016, another global initiative pioneered by The Rockefeller Foundation that focused on building urban resilience to the physical, social and economic challenges but beyond climate change[4].

In the following sections, the thesis discusses the relationship between resilience and international development. It followed with a discussion on the overall context of climate change and policy development and the setting of agendas and actions for building urban climate change resilience in Indonesia. The following section discusses the research framework and an introduction to the aims and objectives of the research. The chapter later explains the contribution to the knowledge and the structure of this PhD thesis. More broadly, the chapter aimed to provide a background to the research and direct readers to the following chapters in the thesis.

1.2. Resilience and development

Resilience and development are strongly related to each other as a conceptual idea. Both ideas serve to seek a desirable change in human society. Coaffee and Lee (2016, p.5) assert that "resilience is ultimately about change." In an urban setting, resilience is associated with a new way of doing things differently, such as an enhancement of planning, design, and development amid a combination of internal

[4] Info about the ACCCRN and 100 Resilient Cities were found from: https://www.acccrn.net/ and http://www.100resilientcities.org/ (accessed on 7 January 2017).

and external shocks and stresses (Coaffee and Lee, 2016). On the other hand, Power (2003) associates development with the notions of good change, progress, and enhancement. Both ideas also carry similar notions in relation to the instrumental aspects as a means or alternative for achieving purposeful ends, addressing knowledge deficiency, which means alleviating the lack of the ability or capability of doing the otherwise, or governance process which affects how a change should be achieved. Resilience and development are known as policy metaphors in developing and developed countries, but they are more prominent in developing countries due to the pressure to respond to intensified risks in these countries.

There is a strong role from international development agencies in the internationalisation of resilience, especially in developing countries. Resilience gained international recognition with the publication of the fourth Intergovernmental Panel on Climate Change (IPCC) report in 2007, which highlighted "unequivocal evidence of warming climate" and, therefore, the practices have become "a central organising metaphor" (Coaffee and Clarke, 2016, p.2). Since then, international development agencies have played different roles in developing various resilience frameworks and internationalising resilience agendas with this underlying rationale around the world. However, each initiative from the international development agencies has its distinct socio-material aspects, socio-cultural processes, and political conjecture in order to govern life under threat and insecurity.

The UN-Habitat and the World Bank both have international initiatives that focus on increasing the resilience of cities to disasters and climate change impacts by providing guidance for climate action planning at the city level (Jha *et al.*, 2013; UN-Habitat, 2015). These guidances serve to provide "fundamental principles and framework" (UN-Habitat, 2015, p.1), which inform different steps for conducting climate planning and actions towards resilience. While The World Bank recognises the challenges of operationalising resilience, as a handbook, it provides a "practical rule of thumb" to guide local stakeholders to "incorporate the management of disasters and climate risks into urban investments" (Jha *et al*., 2013, p.1). United States Agency for Disaster Development (USAID) also has a framework to understand and address the risks of climate change in development (Unites States Agency for International Development (USAID), 2014). The framework promotes a 'development-first' approach, which focuses on understanding and analysing the inputs, conditions, pressures, and adaptation measures to secure development goals

despite climate change risks and impacts (USAID, 2014). Whilst these climate planning and actions have been at the forefront of aiding local actors and stakeholders in preparing for climate change, they were started as a top-down initiative that does not take into account the different governance mechanisms and socio-political processes at the local level. The premise that this "resilience" guidance provided is that if a city follows these climate action planning processes, it will contribute to securing its resilience and protecting its urban inhabitants.

Moreover, state agencies also have played an essential role in setting up agendas and actions towards resilience in Indonesia. In the National Action Plan for Climate Change Adaptation published by the National Development Planning Agency (Badan Perencanaan Pembangunan Nasional (National Development Planning Agency), 2013), resilience is part of an integral process for undertaking climate change adaptation in order to reduce vulnerability. It is part of an integral action to protect national development goals by undertaking resilience actions in different sectors (economic, social, and environmental) and territorial (small islands, coastal, and urban areas) (BAPPENAS, 2013). The Ministry of Environment and Forestry has also adopted the term "resilience" in its regulation, which encompasses a new policy strategy to maintain and increase the essential function, identity, and structure of a particular region or system in the face of climate change (Kementerian Lingkungan Hidup dan Kehutanan (Ministry of Environment and Forestry), 2016). Lastly, The Ministry of Public Works and Housing has developed resilience strategies to set up new standards for urban infrastructure to accommodate climate change risks (Kementerian Pekerjaan Umum dan Perumahan Rakyat (Ministry of Public Works and Housing), 2016). While these agendas, actions and programmes by international development and state agencies around resilience have contributed to broadening our understanding of resilience and development, ACCCRN has its own merit, which focuses on different material processes and governance mechanisms for conducting resilience, such as experimentation and transnational cities network.

There are a number of reasons why this study selected ACCCRN as the focus of this research. More specifically, there were two aspects of selection: (1) *Geographical context*, which means ACCCRN provides distinctive case studies that specify medium-sized cities in the Global South as a central target of the resilience programme. While there has been more representation of medium-sized cities in the academic literature recently (Lamb *et al.*, 2019), there was very little focus on these

cities at the beginning of the ACCCRN programme. (2) *Experimental context*, which means ACCCRN has a unique position to inform how urban climate experimentation takes place as an organic process rather than a top-down agenda, and an opportunity to evaluate its programme and projects not as programmatic designs and technical solutions but more as an interplay of forms of knowledge, geometry of powers, and technologies of government within Indonesia's urban governance.

1.3. Climate change and building resilience in Indonesia

This section provides a concise review and discussion of climate change governance in Indonesia, including policies and institutional changes at the national and local levels, different priorities for climate change mitigation and adaptation and urban priorities within the national climate change agendas and policies. The section also identifies how climate policies have emerged in Indonesia. Furthermore, the section provides the context in which climate change adaptation and resilience agenda have been governed and constituted in Indonesia. In order to discuss the building of urban climate change resilience in the research's case studies, the thesis discusses the broader context of climate change and the urban agenda in Indonesia. The thesis also introduces the context of neoliberalism in Indonesia and how this influences climate change governance and urban policies in Indonesia. Undoubtedly, neoliberalism, when viewed as a mode of life rather than macroeconomic policy, has affected how climate change governance at the urban level is undertaken, shaped and practised – rather than pre-emptively accepted directly as a policy imperative.

As one would expect, the overall agenda of climate change in Indonesia lies between the dichotomy of climate change mitigation and adaptation. Indonesia is reported as one of the biggest carbon emitters in the world (Grantham Research Institute on Climate Change and the Environment (Grantham Institute), 2017), and forest fires and deforestation have been major hurdles for Indonesia. Peat lands and forestry, respectively accounting for 45% and 35% of carbon emissions, are among the biggest contributor sources for carbon emissions in Indonesia (Dewan Nasional Perubahan Iklim (National Council on Climate Change), 2009). However, Indonesia is also highly vulnerable to climate change hazards, such as floods, drought, and sea level rise. It was reported in the *First Nationally Determined Contributions* (NDC) by The Indonesian Government that 80% of total disasters occurred as climate-related hydrometeorological disasters (Republic of Indonesia, 2016).

Globally, several international organisations and researchers (for example Intergovernmental Panel on Climate Change (2014b); Hoegh-Guldberg *et al.* (2007); Hallegatte *et al.* (2016); Mearns and Norton (2010)) have reported that due to global warming and ocean acidification, the potential livelihood impacts, including coral bleaching and disrupted fish species distribution, threaten the coastal communities' catch potential and fishery jobs. More significantly, Indonesia is one of the high-risk countries with an approximated distance of a number of people living <10 meters elevation and <10km from reefs (Ferrario *et al.*, 2014). More precisely, Indonesia has the second longest coastline in the world, for which sea level rise may significantly affect 42 million people living in low lying coastal zones (Republic of Indonesia, 2016). Low-elevation coastal urban areas and small islands such as coral atolls are among key hotspots of societal vulnerability in Asian cities, such as Indonesian coastal cities (IPCC, 2007). Based on the *Climate Change Vulnerability Mapping in Southeast Asia Report*, some areas in Indonesia are among the most vulnerable ones in Southeast Asia, including West Sumatra, South Sumatra and the Western and Eastern parts of Java Island (Yusuf and Fransisco, 2009). Some dominant climatic hazards, especially in the Western and Eastern parts of Java Island, are drought, floods, landslides and sea-level rise (Yusuf and Fransisco, 2009).

Meanwhile, colonial development contributed to the concentration of population and economic activities in coastal areas throughout Indonesia (McGranahan *et al.*, 2007). As a result, the most populous and rapidly growing cities or towns in the early 20th century are located in coastal areas, including Jakarta, Semarang, Surabaya, and Cirebon (Karsten, 1958). These cities or towns are mostly located on Java Island, where Karsten (1958, p.10) characterised Jakarta, Semarang and Surabaya as "towns with a very rapid, 'American' rate of growth, doubling their population in twenty years or less, even down to ten (rapidly growing)" and Cirebon as "those growing at a rate which significantly higher than of Java as a whole." International trade has also contributed significantly to human migration to the coastal urban areas (McGranahan *et al.*, 2007). These conditions still continue in the 21st century as Indonesia is among the most populous countries, after China, India, Bangladesh and Vietnam, with 41 million of its population living in the Low Elevation Coastal Zone (LECZ) (McGranahan *et al.*, 2007). In 2010, rapid urbanisation resulted in 50% of Indonesia's population living in urban areas, which are mostly located in low-lying coastal zones (Republic of Indonesia, 2016).

Indonesia has engaged in international climate change governance since the establishment of the United Nations Framework Convention on Climate Change (UNFCCC) in the early 1990s, but the first *Action Plan to Respond to Climate Change* (RANPI) was only launched during the 13th Conference of Parties in Bali in 2007 (Grantham Institute, 2017). After the successful COP13's United Nations Climate Change Conference, which set out the Bali Action Plan and Road Map, Indonesia's domestic commitments to reducing carbon emissions and anticipating climate change impacts began to flourish. In 2008, the National Council of Climate Change (DNPI), which consists of 17 Ministers and is chaired by the President to coordinate climate change policies and international positions under a unitary governmental body, was established (Grantham Institute, 2017). Previously, climate change policies were managed under the State Ministry of Environment, which in 1992 established a National Committee on Climate Change and Environment (Kementerian Lingkungan Hidup (Ministry of Environment), 1999). In 2008, the National Development Planning Agency (BAPPENAS) outlined the first comprehensive report, the so-called "Yellowbook", which integrated climate change policies into development plans at the national level: Mid-term Development Plan (RPJMN 2010-2014) and Annual Work Plan (RKP 2009 and RKP 2010) (Badan Perencanaan Pembangunan Nasional (BAPPENAS), 2008). These were the initial foundations for further overall integration of climate policies into national and local development planning in Indonesia.

During the G-20 Leaders' Summit in 2009, former President Susilo Bambang Yudhoyono pledged the *first* ambitious 26/41 national commitment for carbon reductions, which outlined a voluntary target to reduce greenhouse gas (GHG) emissions by 26% and up to 41% below business-as-usual (BAU) with international support by 2020. The President called this the pathway for Indonesia as "part of the solutions" to the climate crisis (Yudhoyono, 2009, no pagination). The "heroic initiative" signifies Indonesia as the first developing country to formally declare its international commitment under the "common but differentiated principles" at the international level (Nugroho, 2011, pp.150-153).

A new wave of reintegration of climate change mitigation and adaptation policies into national policies and actions began in 2011. Under the President Regulation No 61/2011 of the National Action Plan of Greenhouse Gas Emission Reduction (RAN-GRK), the Indonesian Government established a further plan to

reduce GHG emissions in order to achieve the 26/41 national commitment. The RAN-GRK Plan takes a sectoral approach from five priority sectors: forestry and peat lands, agriculture, energy and transportation, industry, and waste. The pathways of decarbonisation into a new climate economy were translated into stabilisation of food security and low carbon application in agricultural productions, land management and deforestation mitigation, transitions into renewable energy, sustainable and environmentally friendly public transportation, management of domestic waste and promotion for reduce, reuse, recycle (3R) and energy audit as well as efficiency from the industrial sector (Republic of Indonesia, 2011). Even though the RAN-GRK Plan mentioned some action plans that targeted the urban level, including sustainable transport, waste management and GHG inventory, the Plan is only mandated for the provincial governments to outline their detailed plan for reducing greenhouse gas emissions – and voluntary contribution from the urban.

Table 1. 1 Climate change governance milestones in Indonesia

No	Year	Milestones
1	1999	Indonesia First National Communication submitted to United Nations Framework for Climate Change Convention (UNFCCC)
2	2007	The first Action Plan (RANPI) to prepare for climate change launched to strengthen commitment at 13th Conference of Parties (COP) in Bali
3	2008	National Council on Climate Change (DNPI) was established to coordinate climate policies and actions across ministerial agencies
4	2009	President Susilo Bambang Yudhoyono pledged a 26/41's commitment at G-20 Leaders' Summit
5	2010	Indonesia Second National Communication under UNFCCC
6	2011	National Action Plan for Greenhouse Gas Emission (RAN-GRK) became new Presidential Regulation No.61/2011
7	2013	National Action Plan for Climate Change Adaptation (RAN-API) published by BAPPENAS
8	2015	New restructuration of DNPI and REDD++ under the Ministry of Environment and Forestry
9	2016	The Indonesian Government ratified the 2015 Paris Agreement and first Nationally Determined Contribution was submitted to UNFCCC

As part of the national institutional restructuring, the President, Joko Widodo, dissolved the National Council on Climate Change (DNPI) and REDD++ (Badan REDD) in 2015 (Kompas, 2015). Both roles in climate change mitigation and adaptation moved to be under the Directorate General of Climate Change in the Ministry of Environment and Forestry (MoEF). At the urban level, as the effects of 2016 Government Regulation 18/2016 of Local Apparatus, some local institutions are dissolved, such as the City Planning Agency (DTK) into the Local Development Planning Board (BAPPEDA) and Waste Management Agency (DISBERTAM) into Environmental Agency (BPPLH). The President continued to reduce the number of national institutions as well as to align and integrate national-local institutions. For instance, DISBERTAM is integrated into BPPLH to align with MoEF.

Furthermore, in the National Medium Term Development Plan for 2015-2019 (RPJMN 2015-2019), Indonesia's transition into a green economy is elaborated into "inclusive and sustainable growth, increasing value added of natural resources with the sustainable approach, increasing quality of the environment, disaster mitigation and tackle climate change" (Grantham Institute, 2017, no pagination). This emphasised Indonesia's role in post-2015 Millennium Development Goals (MDGs) into Sustainable Development Goals (SDGs). In the RPJMN, Indonesia continued to align national development policies with global climate change commitments.

Urban areas come into detailed consideration after the publication of the 2013 National Action Plan of Climate Change Adaptation (RAN-API) by BAPPENAS. The RAN-API Plan has a specific sub-sector for urban areas that emphasises strategies for spatial planning adjustment to climate change risks, sustainable urban environmental management, resilience infrastructures, capacity building and research. This Plan also sets out priority regions for pilot activities, including Semarang City and Bandar Lampung City. This national commitment comes along with emerging international commitments to support Indonesian cities in preparing for climate change, shocks, and stresses, such as the Asian Cities Climate Change Resilience Network (ACCCRN) and 100 Resilient Cities (100RC).

In 2016, the Government of Indonesia ratified the 2015 Paris Agreement. In addition, the Ministry of Environment and Forestry, in 2016, introduced a new Regulation for Adaptation Planning and, in 2017, introduced the Government Regulation for National Spatial Plan, which outlines integration between disaster risk reduction and community resilience. The new 2016 regulation outlines a resilience-

building process that involves undertaking risk identification, climate risk assessment, selection of climate adaptation actions, and policy integration. It highlights resilience in government regulation as a new policy strategy to "cope with climate change impacts while maintaining and increasing essential function, identity and structure" of a particular region or system (Kementerian Lingkungan Hidup dan Kehutanan (Ministry of Environment and Forestry), 2016, p.3).

All of these come together with the global commitment from the Government of Indonesia (GoI) to support the implementation of the 2015 Paris Agreement. In November 2016, the Government submitted its first Nationally Determined Contribution (NDC) to the UNFCCC Secretariat. In the NDC, the Government recognises its development pathways to decarbonisation and climate resilience to "strengthen its climate resilience by integrating its adaptation and mitigation efforts in development planning and implementation" (Republic of Indonesia, 2016, p.11). Amidst its progress in climate change policies and actions, Indonesia has been critiqued for not taking climate leadership at the international level, especially in the South East region (Jotzo, 2012). With increasing international and domestic commitments to build responses to climate change, it is significantly important to analyse and evaluate resilience not only as a policy imperative to solve the problems of climate change. Moreover, it is particularly important to examine urban climate change resilience in the broader sense of knowledge–powers of why and how an international initiative of ACCCRN tries to seek, manage, reorient, and reconfigure things at the urban level in the Indonesian context.

1.4. Research framework

This section outlines the research framework that analyses urban climate change resilience using the analytics of governments or governmentality analysis, which is provided in summary in Table 1.2. The focus of this study was to analyse and examine how particular mentalities are invested in the process of governing the cities and their urban populations. The research focuses on studying urban climate change resilience using different components of the analytics of governments. Urban climate change resilience is also understood here as an urban climate change experimentation in which new interventions are tested and implemented to explore different governing practices for undertaking planning and actions on climate change.

Before going into the research framework, it should be pointed out that "urban climate change resilience" might be used interchangeably with "urban climate resilience" or "urban resilience" in the thesis. The notion of "Urban Climate Change Resilience (UCCR)", as introduced by ACCCRN, is to signify the efforts to build the resiliency of urban systems, institutions, and agents to prepare for climate change hazards by performing dedicated planning and actions in an urban setting (da Silva, 2016; Moench *et al.*, 2011). However, "urban climate change resilience" will be widely used throughout the thesis for simplicity and coherency.

In the research, the analysis of urban climate change resilience in two Indonesian cities focuses on providing new understanding and reconceptualisation of "how we conduct government and how we govern conduct" (Dean, 2010, p.38). The thesis relates the building of urban climate change resilience to the geometry of knowledge-power and politics of urban life. The thesis focuses on how resilience has become the governing rationality applied to govern risks from climate change. It focuses on the questions of *how* rationalities are involved in building urban climate change resilience, in the development of the apparatus of resilience through a multitude of tactics, techniques, technologies and networks of powers, and in the conduct of conduct by urban individuals, communities, and populations. It is understood in this study that resilience is not in its 'pure' form but has emerged as a new policy narrative or paradigm in an urban setting against climate change.

In the research, the analysis, evaluation and critiques towards resilience are understood as not "pre-given, singular entities with fixed identities" (Willems-Braun, 1997 in Shaw *et al.*, 2010, p.19). Resilience is understood from its epistemological perspective as *situated resilience*, which assumes there is no possibility of universal knowledge of what resilience *is*. Instead, it is constantly being made, remade and un-made throughout a multivariate of histories (further discussed in Section 2.3.2). The research contributes to analysing and examining how resilience has become a specific regime of truth in which policies and practices have responded to climate change and how they have been governed.

Furthermore, governmentality was used as an "analytical toolbox" (Rose *et al.*, 2006, p.100) to analyse a manoeuvre of strategies and practices for which urban climate change resilience is being reconfigured in daily lives. The research analysed the actual rationalities and techniques for governing the urban settings and populations in two Indonesian cities that have experimented with climate adaptation

planning and actions. This analysis involved examining the assemblage of strategies, practices and actions to encourage the free conduct of individuals, which aim to build an imagined community that has independence and is empowered for self-capacity and self-organisation, which are no longer central to government duties. The research focuses on governmentality as a set of conceptual and methodological guidelines (Walters, 2012) to analyse the "genealogy of the emergence" of resilience as rationalities, "deconstruction and deployment" of discourses within urban agendas, policies, projects, and activities within case studies (Shaw *et al.*, 2010, p.21).

The research is interested in the analytics of government because it offers a different "array of questions" (Barry *et al.*, 1996, p.5) that serve to evaluate urban climate change resilience as a "performative operation" (Anderson, 2010, p.783) upon historical contingent and heterogeneous elements that make possible the conditions of possibility, specifically from three modes of analysis: rationality, apparatus and subjectivity. Rationality was useful in identifying, analysing, and evaluating tacit premises and assumptions upon which urban climate change resilience is thinkable, visible, doable, and manageable. Apparatus was useful in evaluating the emergence of resilience as a regime of practices, the multiple governing elements that constitute its development, and social relations in the context of two Indonesian cities studied in the research. Subjectivity was useful in analysing different formations and relations between individuals and the collective as an act of forming individual conduct. Each element of the analytics of government requires a specific set of data and analytical approaches, as provided in Table 1.2. The research framework presented in Table 1.2 informs about the connection between research objectives and the specific analytical questions, specific and different analytics of governments that inform the analysis, and finally, the type of data and analytical approaches that were conducted in the study.

Table 1. 2 Research framework

No	Research objectives	Analytical questions	The analytics of governments	Data and analytical approaches
1.	To evaluate rationality(ies) that informs urban resilience	How does building urban climate change resilience become visible in ACCCRN? What forms of knowledge that arose from and informed the experimentation? How does resilience thinking render particular climate change problems governable?	Rationality as means to analyse the act of seeing and thinking to identify, analyse, and evaluate tacit premise and assumptions	*Data*: semi-structured interviews, texts and visual data *Analytical approaches*: problematisation, visibility and rendering technical
2.	To analyse who the actors are and what kinds of urban institutions that are deployed to manage urban resilience	How does the network of instruments of urban resilience become embedded in the practice of urban governance? How does this regime of practices inform the relation between urban resilience and neoliberalisation of nature?	Apparatus/assemblage/*disposif* as means to analyse the act of acting to analyse and evaluate multiple mechanism, techniques, and technologies	*Data*: semi-structured interviews, texts and visual data *Analytical approaches*: technologies of government, network of instruments, and geometry of powers
3.	To evaluate what subjectivity(ies) that are sustained to manage urban population for building resilience	What forms of conduct are expected from urban population to build resilience? How are these capacities and attributes to be fostered in order to sustain urban resilience in ACCCRN cities in Indonesia?	Subjectivity/conduct of conduct as means to analyse the act of forming to analyse and evaluate formations and relations between individuals and collective	*Data*: semi-structured interviews, texts and visual data, observation *Analytical approaches*: techniques of the self: sensing, acting, and becoming, and counter conduct

1.5. Research aims and objectives

The research is a combination of the *what* and *how* to examine and evaluate urban climate change resilience building. At the heart of this research is a concern to understand: (i) What has happened in urban climate change resilience building that informs on how governing the climate has been initiated, tested and implemented within case studies?, and more critically, (ii) How has urban climate change resilience engaged and experimented with the will to govern urban life? The research interacts with the problematisation and production of truth for building resilience, the geometry of powers and conduct of conduct that emerges in case studies.

The aim of this research was to analyse the actual rationalities of urban resilience and techniques for governing cities and their urban populations, as well as how this regime of practices is being manifested into urban subjectivities. The study focuses on two coastal and medium-sized cities in Indonesia, Semarang and Bandar Lampung City, which joined an urban climate change resilience initiative of ACCCRN in 2009. In response to the aims, three objectives of this research are:

1. ***To evaluate the rationality(ies) that informs urban resilience.***

   The first line of research inquiry in the study involves the analysis of governing rationality in the building of urban climate resilience. The analytics of government in this inquiry focus on the act of thinking and knowing about the problematisation and visibility of climate change as the problems to be solved. This objective encompasses research questions as follows: (i) How does building urban resilience become visible in ACCCRN, (ii) What forms of knowledge that arose from and informed the experimentation of urban resilience in ACCCRN, and (iii) How does resilience thinking seek to render particular climate change problems governable.

2. ***To analyse who the actors are and what kind of urban institutions that are deployed to manage urban resilience.***

   The second line of research inquiry in this study involves the analysis of technologies of government deployed in the building of urban climate resilience. The analytics of government in this inquiry have focused on the act of acting around the network of instruments and geometry of powers to enact actions towards building urban resilience. This objective includes some research questions as follows: (i) How does the network of instruments of urban resilience, such as the mechanism,

techniques and technologies, become embedded in the practice of urban governance in ACCCRN, and (ii) How does this regime of practices inform the relation between urban resilience and neoliberalisation of nature.

3. ***To evaluate what subjectivity(ies) that are sustained to manage urban population for building resilience.***

The third line of research inquiry in this study involves the analysis of 'conduct of conduct' on building urban climate resilience. The analytics of government in this inquiry focuses on the act of forming individuals and collective conducts of the urban population towards the techniques of the self and counter conduct. This objective includes some further research questions as follows: (i) What forms of conduct are expected from the urban population to build urban climate change resilience in ACCCRN, and (ii) How are these capacities and attributes to be fostered in order to sustain urban resilience in ACCCRN cities in Indonesia.

1.6. Contribution to the knowledge

This research contributes to the bodies of both theoretical and practical knowledge. It serves to extend our analytical approach to building urban climate change resilience from the perspective of critical geography and broadens our understanding of the politics and governance of climate change adaptation.

The focus of this research to study resilience is through an epistemic approach of *situated resilience*, which is described as a mode of inquiry to analyse, examine, and investigate resilience as a relational object. The idea of *situated resilience* offers a more tactile and strategic analytical approach to examine and evaluate any agenda, policies, actions, interventions, and projects for building urban climate change resilience. The research also rejects an overarching 'truth' about what resilience *is* but instead critically examines it from the basis of micro- and relational-politics. There is no possibility of achieving a universal knowledge of resilience; instead what we are able to know is the multiplicity of resilience as a mobile, locale, and relational object. The thesis has exemplified an attempt to de-centre disagreement about what resilience *is* towards the ontopolitics of resilience. In order to do this, the research suggests that climate change and urban research should engage with a post-structural approach to study resilience. In the thesis, the critical understanding and application of *situated resilience* were applied as a research methodology. The thesis contributed

to the rejection of any forms of positivism and redirected the study of urban climate change resilience into the politics of being and becoming. More critically, it calls for the study of urban resilience to pay attention to the ontological qualities and relations of how it has been unrevealed in the real world.

1.7. Structure of PhD thesis

The section outlines the structure of this PhD thesis, including short summaries of each chapter and relevant discussions.

The second chapter discusses literature reviews relevant to the research, which consist of a review and discussion of governmentality, resilience, and experimentation. This chapter will discuss the reasons for the selection of the three theoretical literature, position the study within the literature, and introduce to the readers, more specifically, the focus of my research. This thesis focuses on governmentality as a set of conceptual and methodological guidelines to analyse urban climate change resilience. It discusses governmentality as an art of government, which offers reconceptualisation and analytical thinking to examine resilience as a form of distinctive governmentality. This is followed by the discussion on governmentality as analytics of government, which offers an analytical procedure around three key analytical components: rationality, apparatus, and subjectivity. In the following sections, the thesis discusses the evolution of resilience from socio-ecological to economic policy and later distinguishes the thesis's approach to resilience within *situated resilience*. Sections then follow on urban climate change resilience as experimentation.

The third chapter discusses the methodology, research methods, and ethical considerations of the research. This chapter provides the background for the research methodology and explains the analytical procedures in order to provide readers with an understanding of how this study was conducted and how the analysis was undertaken. This section also provides the reasons for selecting the various case studies, the mechanisms for data collection based on the research aims and objectives directed to study case studies, the research analysis, and the coverage of ethics and confidentiality.

The fourth chapter discusses the birth of resilience governmentality. This chapter analyses the styles of thinking and ways of reasoning in which a regime of practices of urban climate change resilience is being enacted, reconfigured, and

practised. While this chapter discusses some examples from ACCCRN in both cities, the purpose is to understand how climate change becomes a problem that needs to be solved and how governmental programmes can be enacted. This chapter focuses on discussing the first research objective in order to analyse and examine multiple tacit premises and assumptions upon which urban climate change resilience is rationalised – problematised, contained, and calculated – within ACCCRN, both at the programme and project levels. It is understood that building urban resilience is problematised upon a multitude of rationalities of anticipation, reactivity, and survival. The chapter discusses the idea of resilience governmentality and introduces further discussions on social regulation and control in the next chapter.

The fifth chapter discusses the emergence of resilience apparatus. This chapter discusses the emergence of a new resilience apparatus. Building urban climate change resilience has been fabricated within the circulations of different sets of apparatuses, involving knowledge, networks, resilience plans, and the object of governance/living beings. This chapter focuses on discussing the second research objective in order to analyse how ACCCRN has emerged as an architect of urban resilience apparatus and how this interrelates with the conjunction of neoliberal urban governance in Indonesia. The chapter summarises how ACCCRN, as an apparatus, becomes an assemblage of persons, techniques, and a regime of practice of a milieu of thought in which a set of problems become governable and manageable. While Chapter 4 introduces political or governing rationality upon which a fabric of thinking towards resilience building becomes an object of concern, this chapter emphasises how resilience apparatus assembled into forms of organisation and institutional practices that shape the new direction of social relations between the state and their population in urban space in both ACCCRN cities in Indonesia.

The sixth chapter discusses the rise of climate human. In the preceding two chapters, the thesis discusses the rationalities and techniques around which urban climate change resilience has operated as a distinctive form of governmentality. This chapter focuses on the third research objective in order to analyse and examine two propositions for the formation of Climate Human in conjunction with the premise of 'relation to ourselves' as survival subject and adaptable subject. In building urban resilience, knowledge-power has been translated within the circulations of the care of the self, within resilience as a governmental reason and within the interrelation

between “Human” and “Nature.” This chapter discusses “Climate Human” as a dialogue between humanity’s past and future in the age of climate change, nature/culture division and forms of counter-conduct.

The seventh chapter discusses research synthesis, research contributions and limitations, as well as future research agenda and policy implications. In the research synthesis, the thesis reflects on the aims and objectives of the research and summarises research findings from three discussion chapters. This chapter draws on research connections, development, and limitations from the previous three discussion chapters. It will be followed with some suggestions for future research agendas and policy implications.

Chapter 2: Governmentality, resilience, and experimentation

"Government is the right disposition of things
arranged so as to lead to a suitable end."
(Guillaume de La Perriere in Foucault, 2009, p.96)

"One can be termed stability …
But there is another property, termed resilience."
(Holling, 1973, p.14)

"Climate experiments are where governance is *located*,
… when policymakers, researchers, businesses and communities are
charged with finding new paths."
(Evans, 2011, p.225 - emphasis from original)

2.1. Introduction

This study focuses on the analysis of urban climate change resilience from non-reductionist and post-constructionist approaches. This means rejecting the notion of urban resilience as something that is known to be a 'pre-defined' and 'already-made' object and understanding it as something that is brought into 'reality.' In order to do that, three interrelated concepts are utilised to reveal the 'truth' about building urban resilience from these research case studies: governmentality, resilience and experimentation. In this chapter, the thesis also discusses the position to study urban resilience using these three conceptual theories, which then become the basis for analytical methods for this study, which is later discussed in Chapter 3.

Although Michel Foucault was the first to coin the idea of governmentality, in this study, literature review and discussions on governmentality were extended beyond Foucault. Foucault himself considered governmentality as an ongoing project. Hence, the thesis followed Foucault and his interlocutors, such as Mitchel Dean, Tania Li, Nikolas Rose, and William Walters, to name a few, to discuss several concepts within governmentality. In this research, the thesis focuses study on governmentality as a set of conceptual and methodological guidelines (Walters,

2012). In this sense, governmentality provides a strong analytical tool to analyse the conjuncture of urban resilience in the age of climate change from the perspectives of knowledge–power and assemblages of powers and networks.

In this chapter, the thesis discusses governmentality in relation to "social regulation and control" (Lupton, 1999) and "conduct of conduct" (Dean, 2010). Considering this, the analytics of government is useful to examine urban resilience and how it has emerged as a governing rationality or "the will to improve" (Li, 2007). Using governmentality, the thesis analysed how particular mentalities are invested in the process of governing urban resilience and population which involved three analytical approaches: rationality, apparatus, and subjectivity.

As discussed earlier in Chapter 1, resilience is understood not in a 'pre-defined form' or 'already existing object' but more as a *relational* object. This chapter outlines the concept of resilience and (neo)liberal governmentality. Both concepts are essential to understanding how climate change governance has been undertaken in many cities in developing countries. The adjustments for anticipating climate change impacts in urban areas have been translated into the vocabulary of resilience and urban resilience. Furthermore, resilience has been translated into a multiplicity of various 'translations', such as bouncing back, bouncing forward, resilience approach, resilience indicators, resilience objectives and so on.

This chapter is structured around these three key conceptual ideas of governmentality, resilience, and experimentation. In the following section, this chapter discusses the development of the governmentality concept since Foucault originally developed it and, more specifically, about those three areas of analysis: rationality, apparatus, and subjectivity.

2.2. Governmentality and (neo)liberalism

This section briefly discusses the origin of governmentality, its relation with (neo)liberalism and the analytics of government. This section reviews the literature that leads to the pathways of governmentality analysis in Chapter 3. In the research, governmentality is understood as an analytical tool for critiquing urban resilience. This section will provide foundations for what governmentality is and what it means for governing the cities and their urban population. In Section 2.2.1, the thesis discusses the art of government and then follows this in Section 2.2.2 with a

discussion on the analytics of governments with a key aim to further the development of a resilience research framework.

2.2.1. The art of government

Governmentality was first developed by Michel Foucault during his lectures at the College de France between 11 January – 5 April 1978. These lectures are part of a broader theme of "Security, Territory and Population". The first lecture mentioning governmentality was held on 1 February 1978. He introduced governmentality as an attempt to reconfigure the relationship between the state and population, rethinking the idea of powers and reconceptualising rationalities beyond sovereignty. During his lectures, Foucault describes governmentality as a recollection of these components (Foucault, 2009, pp.108-109):

> "First, …the ensemble formed by institutions, procedures, analyses and reflections, calculations, and tactics that allow the exercise of… power that has the population as its target, political economy as its major form of knowledge, and apparatuses of security as its essential technical instrument. Second, … the tendency… towards the pre-eminence… of the type of power that we can call "government" and which has led to the development of a series of specific governmental apparatuses (*appareils*), … to the development of a series of knowledges (*savoirs*). Finally, …the process, or rather, the result of the process by which the state… became the administrative state… and was gradually "governmentalized."

In particular with governmentality, Foucault challenges the thinking over "how to be governed, by whom, to what extent, to what ends and by what methods." (Foucault, 2009, p.89). By focusing on *governmentality* rather than *government* or *governance*, the focus of analysis shifts towards how "the political form of government" (Foucault, 2009, p.89) is being exercised as an assemblage of strategy, tactics, techniques, instruments and powers within an apparatus or *dispositif*. Since Foucault developed the idea of governmentality, many scholars have further developed, interpreted, and re-iterated his idea in the discussions over social regulation and control, sovereignty, and governmentalisation of risk (see for example Dean, 2010; Lupton, 1999; Ewald, 1991) In this research, governmentality offers

reconceptualisation and analytical thinking to examine urban resilience as forms of distinctive governmentality, from the perspective of powers and political practices.

Nurturing powers

Foucault used the term "governmentality" as an interchangeable term for "the art of government" or "the rationality of government" (Gordon, 1991), which is defined as "a way or system about the nature of the practice of government" (Gordon, 1991, p.3). When he explained governmentality, Foucault opposed the idea that "to govern" particularly fits with Greek literature, which means to steer "the ship, to designate the activity of the person" (2009, p.122). His exploration found that "to govern" means: "to follow a path or put on a path", "to conduct someone", and "the relationship of command and control" (Foucault, 2009, p.121). More specifically, "to govern" refers to the control one may exercise over oneself and others, over someone's body, soul and behaviour" (Foucault, 2009, p.122).

However, in this conceptualisation of how "to govern", governmentality studies reject the notion of power as merely "physical force or violence" (Gordon, 1991, p.5). Gordon (1991, p.5) defines power as "action on others' actions" upon which "individuals are free to act in one or another" way as moral, ethical and technical agents through "an open set of practical and ethical possibilities." Power is also understood in its plurality. This means pluralising powers is not a singularity but more as a conjecture of multiple histories as "an endless and open strategic game" (Gordon, 1991, p.5). In this sense, powers are nurtured into their multiplicity of how to govern. Walters (2012, p.14) argues power is "multiple, relational, heterogeneous and pervasive." In relation to urban resilience, the notion of 'nurturing powers' is significantly important in unpacking the relationship between the actors, institutions, programmes, tactics, techniques, and urban populations being established, operated, and circulated in cities. Hence, it is important to understand building urban resilience not in a pre-defined but more as a reconfiguration of powers. Therefore, three various forms of power that are central to conceptualising urban resilience building in this study are the following: biopower, disciplinary, and pastoral power.

Foucault discusses the idea of "pastoral power" to explain the relationship between the state and population as the relationship between a shepherd and his flock (Foucault, 2009). A pastoral power is "a power of care", "an individualising power" and "a power exercised on a multiplicity rather than a territory" (Foucault, 2009,

pp.127-129). This kind of power is strongly based on the relationship between who exercised the power and whom conduct was being governed and directed towards the goals of government.

Manifesting (neo)liberal

The critique of how 'to govern' in governmentality studies has also turned to re-discover from such practice of governing a specific object. Quoting Guillaume de La Perrierre, Foucault describes that "government is the right disposition of things arranged so as to lead to a suitable end" (2009, p.96). He argues that one of the most important issues in government is the introduction of the economy into political practices (Foucault, 2009). That a good government is equal to "economic government" (Foucault, 2009). Li (2007, p.18) argues, "the objective of government is to sustain and optimize the processes upon which life depends", or as she described it, the "will to improve." This means "ensuring the well-being of the population and augmenting its prosperity" (Li, 2007, p.12). This then turned us to Walters's (2012, p.29) argument that "governmentality is nothing more than liberalism."

John Stuart Mill's liberalism is centred on the concept of a liberal society as being "the only kind of society in which men are confident of their own manifold possibilities" (Gray, 1989, p.2). Liberalism, or further liberal governance, believes in the role of men as "an autonomous agent" of "human nature and self-development" in order to achieve freedoms (Gray, 1989, p.2). However, David Harvey, in his influential book *A Brief History of Neoliberalism,* describes neoliberalism:

> "In the first instance a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets, and free trade" (Harvey, 2009, p.2).

Brown (2015, p.30) later defines neoliberalism as "an order of normative reason that, when it becomes ascendant, takes shape as governing rationality extending a specific formulation of economic values, practices, and metric to every dimension of human life." Some characteristics of *homo oeconomicus* and neoliberalism include (Brown, 2015): (i) Entrepreneurialism; (ii) Human as an ensemble of entrepreneurial and investment capital; and (iii) The emergent practice of networking. In this

approach, neoliberalism becomes less interventionist in the model of the market and instead focuses on the form of rules and how we become involved with the mechanisms with which we are governed. In the research, neoliberalism becomes part of the conceptual framework for understanding, analysing, and criticising the practice of urban climate change experiments. Walters (2012, p.144) suggests that neoliberalism as a tool can "provide some very useful, even essential coordinates for any map work", even though this doesn't mean substituting analytic to "specific logics, tendencies and styles of conduct and counter-conduct."

2.2.2. Analytics of government

Governmentality is understood to be more than just the re-conceptualisation of powers and the practice of politics. It is also an analytical procedure of regimes of practice in the world making, in which the truth is assembled, governed, and reconfigured. Walters (2012, p.40) suggests we should think of governmentality as "a set of methodological and conceptual guidelines" that are useful for analysing the specific kinds of politics and government and understanding the conduct of conduct of the population. Rose *et al*. (2006 in Walters, 2012, p.45) also pointed out that "governmentality as a set of analytical tools rather than a social or political theory." This will help to have an analytical tool that is "a flexible and revisable set of 'analytics' of power and government" (Walters, 2012, p.49).

In this study, the analytics of governments is intended to unpack or reveal the truth about how specific regimes of practices operated in building urban resilience in these research case studies. Using the analytics of government, the research focuses on how the problems of (urban) life become visible and materialise within the post-constructionist approach. It begins with a problematisation that does not aim to formulate and test hypotheses but rather to approach the specificity of governance (Walters, 2012).

Hence, governmentality provides a deeper investigation into social regulation and control, political order, and technology of government (Dean, 2010; Ewald, 1991; Gordon, 1991; Lupton, 1999; O'Malley, 2008). This doesn't mean that such an intervention will be undertaken under a state-centric approach or a singular generalised action. Government is being argued here as "a collective activity" engaging in "multiple, heterogeneous and a collective product" (Dean, 2010, p.27) and "plural" (Dean, 2010, p.18) ways of the mechanism of powers and order of

reasons. The act of government involves multifarious agencies, authorities, employing different reasons for actions, and internal to practice of the self or to the state (Dean, 2010; Foucault, 2009)

Mitchel Dean (2010, p.33 – emphasis from original) explains that an analytics of government is concern on "*how* we govern and are governed within different regimes, and the conditions under which such regimes emerge, continue to operate, and are transformed." This means focusing on the *how* as its central question. Stripple and Bulkeley (2015, p.51 - emphasis from original) argue that as indicated in its semantic words *governing* and *mentality*, in general, "*governmentality* deals with how particular mentalities – ways of thinking and acting – are invested in the process of governing." This mentality of government aims to deploy "techniques and procedures for directing human behaviour" (Stripple and Bulkeley, 2015, p.51). This means bringing governmentalities into the questions of regime of practices where powers and authority lie (Dean, 2010). In this study, the analytics of government is considered as three key analytics of: rationality, apparatus, and subjectivity.

Rationality

In the study of analytics of government, governmentality studies involve ways of seeing and knowing, problematisation and the production of truth. Rationalities, as described by Miller and Rose (2008, p.16) as "styles of thinking, ways of rendering reality thinkable or problematize in such a way that it was amenable to calculation and programming." They argue that there is the single unified reason for action as a rationality, instead "varieties of rationality" as forms of reason (Miller and Rose, 2008, p.16). Dean (2010, p.33) characterised these as "(1) Form of visibility, ways of seeing and perceiving and (2) Ways of thinking and questioning, relying on definitive vocabularies and procedures for the production of the truth." As part of the analysis of governing rationality is problematisation, which Dean (2010, p.38) describes as "a calling into question of how we shape or direct our own and others' conduct… how we conduct government and how we govern conduct." Problematisation involves questioning the emergence of problems in relation to an order of reason, the authorities who define the phenomenon as problems, the criteria in relation to which specific persons, sectors, or forms of conduct to be seen as problematic and the kinds of dividing practices (Rose, 1989). By focusing on "how" questions, governing rationality brings in to evaluate different knowledge-power and

forms of thought to "unify and rationalize techniques and practices in relation to particular objectives, diagnoses of existing ills, schemata of evaluation and so on." (Dean, 2010, 39).

"A regime of practices", Dean (2010, p.32) argues, is "irreducible to the explicit intentions of any one actor but yet evinces an orientation toward a particular matrix of ends and purposes." The analytics of governments, or governmentality analysis, then needs to discover and put emphasis on the rationalities behind specific interventions, whether it aims to build an economic government, an effort of the will to improve or a different rationality. Brown (2015, p.116) argues governing rationality or political rationality must be understood as 'constitutive' knowledge, in which a regime of practice becomes known as "the condition of a particular socio-political assemblages of forces." Political rationality or governing rationality is known as not just ideologies but constitutes a fabric of our thinking about and acting upon the problems of concern (Barry *et al.*, 1996). Gordon (1991, p.3) discusses the rationality of government as a way of thinking about the nature of the practice of government, its capability to make some forms of activity thinkable and governable, render technical and the object of governing with research questions might involve who can govern, what governing is, what or who is governed. It involves employing problematisation through which a regime of practices are questioned, interrogated and investigated upon which particular language, forms of knowledge, expertise, grid of analysis and evaluation have taken place (Dean, 2010).

In this research, thinking through (governing) rationality was useful to identify, analyse and evaluate "the tacit premises and assumptions" (Miller and Rose, 2008, p.3) that made urban climate change resilience building thinkable, visible, doable, and manageable as "heterogeneous range of things" (Dean, 2010, p.39). Dean (2010) further gives some research question examples: what problems are to be solved, what objectives are to be sought, to 'picture' who and what is to be governed, to questions the relations between who governed and is being governed… diagram of power and authority… social and urban space (p.41). In his analysis, Dean (2010, -.43) argues that problematisation should inform the changing relationship and dynamic between the "ideals of government, diagrams of citizenship and the formulas of rule they generate." The idea of governing is never fixated within a singular history but occurred, multiplied, and reconfigured "multiple times, moving at different speeds and according to their own trajectories, multiple forms of reason, formed in specific

locales in relation to particular problems" (Miller and Rose, 2008, p.16). In order to analyse case studies, the research employed rationality to examine and evaluate various forms of materiality through which the idea of governing resilience becomes visible, including graphs, documents/texts, sets of regulations, guidelines, etc.

Apparatus/assemblage/dispositif

Second, the study of analytics of government involves ways of acting and deployment of *techne* of government: technological power and network of instruments as part of an apparatus. Originally developed by Foucault (1980), an apparatus is understood by Agamben (2009, p.14) as "the capacity to capture, orient, determine, intercept, model, control, or secure the gestures, behaviours, opinions, or discourse of living beings." While Foucault (1980) describes an apparatus as follows:

> "The apparatus itself is the system of relations that can be established between these elements … the nature of the connection that can exist between these heterogenous elements … opening out for it a new field of rationality … The apparatus thus has a dominant strategic function" (pp.194-195).

Within this apparatus, then technologies or *techne* of government are deployed. Miller and Rose (2008, p.16) describe technologies of government as "assemblages of persons, techniques, instruments for the conducting of conduct", or regimes of practice or milieu of thoughts in which a set of problems is being rendered instrumental, governable, and manageable. Dean (2010, p.33) recalled this as ways of acting, which means intervening and directing that is made up of "particular types of practical rationality ('expertise' and 'know-how') and relying upon definite mechanisms, techniques, and technologies." In practice, Dean (2010, p.40) suggests seeing this assemblage as "they should be approached as composed heterogeneous elements having diverse historical trajectories, as polymorphous in their internal and external relations, and as bearing upon a multiple and wide range of problems and issues." The idea of government as a set of relations between multiple actors, agencies and activities that result from various distributions of powers and divisions (Dean, 2010). In the analytics of governments, a regime of practices is understood be never identical within a particular institution or system where various forms of cooperation, overlap, section, fragmentation and contestation should be examined (Dean, 2010).

In this research, thinking through (governing) apparatus was useful to evaluate not only the 'bodies of knowledge' behind urban climate change resilience building in the case studies but, more critically, the emergence of resilience as a regime of practices, multiple governing elements that constitute its development, diverse processes and relations that inform how these elements are assembled into forms of organisation and institutional practices (Dean, 2010). In the analysis, apparatus is involved in the 'making' of governing, where specific techniques, instrumentalities and mechanisms are operated, goals are to be achieved, and a range of effects are to be proliferated (Dean, 2010). As suggested by Miller and Rose (2008), the research analysed tools, techniques, personnel, materials, and apparatuses in which urban climate change resilience is being imagined and invested in the act of governing and shaping the conduct of urban population individually and collectively.

Subjectivity/conduct of conduct

Third, the study of analytics of government involves ways of forming, conduct of conduct, and understanding it as part of biopower/biopolitics of mentalities of government. Within this particular regime of government, power operates through the conduct of people's conduct (Senellart, 2007 in Stripple and Bulkeley, 2015), or "a form of activity aiming to shape, guide or affect the conduct of some person or persons" (Gordon, 1991 in Stripple and Bulkeley, 2015, p.55). Foucault (2009) refers "conduct" to two things:

> "Conduct is the activity of conducting (*conduire*), of conduction (*la conduction*) if you like, but it is equally the way in which one conducts oneself (*se conduit*), lets oneself be conducted (*se laisse conduire*), is conducted (*est conduit*), and finally, in which one behaves (*se comporter*) as an effect of a form of conduct (*une conduite*) as the action of conducting or of conduction (*conduction*)" (p.193).

Foucauldian governmentality is related to the idea of "conduct of conduct" which its definition contains two specific aspects of: (i) "To conduct which means to lead to direct or to guide", and (ii) "Conduct which refers to our behaviours, our actions and our comportment" (Dean, 2010, p.17). This articulates the ways in which governing is initiated, re-iterated, and enacted. Dean explains, "human conduct" is the object to be "regulated, controlled, shaped and turned to specific ends." (2010,

p.18). The focus in governmentality studies, then, is to understand and unpack "the regulation of a heterogeneous range of things" (Dean, 2010, p.18) in which human conduct is to be deliberated and directed (Dean, 2010). Dean explains, "government concerns the shaping of human conduct and acts on the governed as a locus of action and freedom" (2010, p.23). Barry, Osborne, and Rose (1996, p.13) recognises subjectivity as "a matter of the technologizing of humans."

Agamben (2009) stressed the relationship between living beings or substances and apparatuses and the act of forming these into subjects. He called it "a subject that which results from the relation and, so to speak, from the relentless fight between living beings and apparatus." (Agamben, 2009, p.14). Subject is never exists "outside of history", instead always "historicized" as a product of heterogeneous knowledge, power and discourse (Sharp, 2009, p.74); and/or eventalisation, or the conditions that constitute an event, where there is the possibility of "human being as target" and "the object that was simultaneously a subject" (Miller and Rose, 2008, p.6-7) and capable to undertake "counter-conduct." (Dean, 2010, p.21)

In the research, thinking through subjectivity was useful to analyse and examine different formations and relations between individuals and collectives through which governing resilience operates in case studies. The research aim was to examine the 'relation to ourselves' by the urban population in order to evaluate different attributes of subjectification in my case studies: qualities, capacities, and statuses.

This research focuses on governmentality as a main theoretical framework and uses urban climate experiments or urban climate change resilience as an entry point for theorisation. The governmentality theory helps to analyse what urban resilience is through different forms of rationality, apparatus, and subjectivity. Foucauldian governmentality has recently been taken up in climate change studies as an analytical tool to evaluate, examine and criticise how climate change adaptation and urban resilience have been enacted, governed and reconfigured. Governmentality offers a rationale to analyse strategies and practices around the 'truth(s)' about climate change risks that then become the basis for action. The governmentality theory also helps to reiterate, investigate, and analyse the nexus of resilience, governmentality and neoliberalism, which is the main focus of this research. Urban climate change resilience emerging in experimental cities as a form of climate change has intersected with the idea of governmentality and neoliberalism.

2.3. The evolution of resilience

Resilience is ubiquitous. Resilience has gained its "renaissance" in the age of climate change (Bahadur *et al.*, 2010). In recent years, its application has expanded from ecology to engineering, psychology, economy, security studies and nation-building (Folke, 2016; Hansen, 1976). Folke (2016), in his reviews of the growing application of the resilience approach, estimated over 1.25 million searches on resilience appeared on Google Scholar. Rogers (2017, p.19) argues that it is a moving target, which means "different things to different people depending on the context within which it is encountered." It has occupied many disciplines, from psychology and engineering to social studies. More recently, in urban studies, resilience has invited many scholars to study its relation to urban governance, powers, and politics.

Cavelty *et al.* (2015, p.3) called resilience "a new superhero." This multifaceted concept has pervasively attracted scholars as an alternative to static conditions of stability into the new vocabulary of resilience (Holling, 1973). In this section, the thesis examines the birth of the concept from its etymology, the early development of the resilience concept by Crawford Stanford Holling and Frederich Von Hayek and the latest application in contemporary studies.

This section provides an analysis of the evolution of the resilience concept and its contemporary interventions of experimentation of urban climate change resilience. The concept of resilience has developed from an early resilience that signifies resilience from stability into contemporary resilience as the new style of governance to face risk, crisis, and uncertainty, and its latest iteration involves the analytics of resilience. In this research, the study is more interested in this latest discussion on the proliferation of resilience as "a way of life" (Doig, 2014, no pagination) or a process through which our "domains of life" (Anderson, 2015, p.60) are being moderated and governed.

In order to understand the emerging concept of urban resilience, this section outlines the genealogy of resilience as a concept and its relation with urban climate experiments and governmentality studies. Urban centres are not only becoming sites for urban change climate experiments towards resilience but also exemplify how the problems of climate change being moderated. Urban climate change experiments reconfigure our thinking and analysis about how we understand in urban centres.

2.3.1. Genealogy of resilience

Before I begin with my review of the genealogy of resilience, it is worth briefly exploring the etymology of resilience. The earliest record of resilience is in French, *resiler* known as early as the 1520s, which means "draw back" or "withdraw from an agreement" (Online Etymology Dictionary, 2017[5]). Rogers (2012) summarises how resilience term is a term that evolved as a metaphor for dealing with disaster. He (2012) describes that the Latin root of resilience has a number of variations. He found that the Latin word *resilientia*, as it appeared in 1540, means "a sense of avoidance" or "action of rebounding" (Rogers, 2012, p.142). Another synonym for this in Latin is *resilio*, which means "to jump back" (Klein *et al.*, 2003).

Moreover, in the Concise Oxford Dictionary of English Etymology, resilience (Hoad, 1966) originated from *resile,* which means "draw back, shrink or recoil." Moreover, Rogers (2012, p.142) found that resilience appeared in Francis Bacon's Sylca Sylvarum (1659) as a repercussive of "resilience of echoes" or "a characteristic of a sound." Rogers (2012, p.142) argues that besides resilience, meaning "a characteristic of 'things'", it is also "ways of thinking, doing, acting as characteristics or traits of individuals, institutions and organisations."

Similarly, the word resilience is not a new concept in the Indonesian language. There are several synonyms of resilience term in Indonesian, which are[6]: "tangguh" (strong), "tahan" (to withstand), "lenting" (bounce back), "pulih" (recover), "anjal" (elastic), and "bandel" (persistent), and the latest entry of "resiliensi" (resilience) entered recently in the Indonesian dictionary. Each has a similar concept but differences in practice, except for the word "resiliensi", which follows the 2016 ministerial regulation. These different terms provide unique difficulties when applying the concept of resilience to local knowledge and practice. One of the challenges is how to bridge an understanding of the Eurocentric notion of resilience with local understandings of resilience, which is a bit problematic.

Between Holling and Hayek

Two prominent early thinkers of resilience are Crawford Stanford Holling and Frederich Von Hayek. Both of them are from different disciplines but come with a

[5] Accessed online from an Online Etymology Dictionary on 12th January 2017: http://www.etymonline.com/index.php?allowed_in_frame=0&search=resilience

[6] Synonyms for resilience were searched from the Great Dictionary of the Indonesian Language (KBBI): http://kbbi.kemdikbud.go.id/.

shared understanding of complexity, uncertainty, and resilience. From the ecology discipline, Holling (1973) tries to question whether an equilibrium view is really static and gives little insight into the transient behaviour of systems. He then proposed the idea of resilience, rather than stability, to conceptualise and examine it in relation to external disturbance or stressors (Holling, 1973). He describes resilience, as distinct from stability, as "a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between population or state variables" (Holling, 1973, p.14).

On the other side, Hayek, a distant interlocutor and an economist, articulates the discourse of market complexity and promotes resilience in understanding it as "a form of neoliberal economic governance sensitive to the powerful self-organising capacities of the market" (Zebrowski, 2017, p.69). Finally, in relation to these emerging debates, Walker and Cooper (2011, p.157) conclude that we should instead examine resilience "by a movement of thought that is truly counter-systemic."

Multiple resiliencies

Since resilience is interpreted widely and applied to almost everything, it is particularly difficult to define what resilience truly is. In his review, Anderson (2015) argues instead of calling it "resilience", we should start examining the resilience of many. He emphasises that "resiliencies" instead of resilience is " a fractured, multiple, empirical field rather than a series of generic characteristics." (Anderson, 2015, p.62). Therefore, resilience appears in not vacuum space, which applies to the politics of resilience and urban life.

Some scholars have debated the usefulness of using resilience in examining urban and environmental issues (Klein *et al.*, 2003; Cannon and Müller-Mahn, 2010). Cannon and Müller-Mahn (2010) argue that using resilience has misdirected the focus on the ecological system rather than the socio-economic system where people are 'at risk' and lose focus from the causal processes that people in the first place are 'at risk.' So far, resilience has been populated across many disciplines and contested with different meanings. In this study, rather than accepting resilience in its definitive form, the approach in the study is examining it from its epistemological perspective: what can be known and the approach to knowing resilience, which the next section discusses in more detail.

2.3.2. Epistemological approaches to resilience

In *The Routledge Handbook of International Resilience*, which is a collection of international scholars' studies on the subject of resilience, resilience is examined and studied to offer more constitutive knowledge about how resilience as a concept has developed. In the introduction, Chandler and Coaffee (2017, p.6) describe resilience as "an ongoing transformative process of building engaged communities through experimentation and grasping momentary and fluid connections and interrelations in a highly context-dependent way." Resilience can only be understood through its mobility and resonance; thus, there is no 'universal knowledge' of what resilience is (Rogers, 2017). This study particularly neglects the generalisation of resilience as something 'taken-for-granted', 'ready-made object' or 'pre-existing form.' Instead, the study involves analysing and examining 'ways of knowing' multiple resiliencies. The questions about "what resilience is" concern epistemic: what we know about resilience and how resilience is being known. In this section, the thesis focuses on different epistemological approaches that deal with our understanding of "resilience" as knowledge and multiple sites for research and analysis (Shaw *et al.*, 2010).

In this section, the thesis discusses three distinct epistemological approaches to studying resilience, which are called in the study as *lived resilience*, *negotiated resilience*, and *situated resilience*. These epistemological approaches differ in how each engages with resilience in relation to its mode of inquiry and key analytical concepts. In turn, the study focuses on urban resilience from the post-constructionist approach, which is related to *situated resilience*. This epistemological approach is less discussed scholarly from specific case studies. The study's aim was to generate new 'spaces' for critical discussion on how resilience is being known or made known in order to understand its operationalisation in world-making. This section illustrates these epistemological approaches in more detail in the following paragraphs.

Lived resilience

This epistemic process is considered a conservative approach to resilience. *Lived resilience* is described as a mode of inquiry to analyse, examine, and investigate resilience as an independent object. Within this epistemology approach, resilience can be known. It already exists 'out there' in the world so that we can observe, develop, measure, and/or compare spatially and temporally across systems of interest. Resilience is known as something that is discrete. In the early development

of the resilience concept, Holling considered resilience specifically to be measurable (Holling, 1973). This approach, known as positivism, assumes resilience as something that is observable as "facts that exist outside the observer who remains impartial in the process, and that all results can be subject to testing, leading to a systematic and reliable progression of knowledge" (Pettenger, 2007, p.2).

As a result, the main concern of *lived resilience* is to study internal relationships within a unit of analysis, including ecological systems, social organisation or individuals, on how they organise internally and respond to external disturbance. Resilience is understood by the characteristics, attributes, and capacities of particular systems of interest that behave to be 'bounced back' to pre-existing equilibriums (Chandler and Coaffee, 2017). Resilience from *within* determines the "linear causal chains" towards the distinctions between the system of interests and the external disturbance (Chandler and Coaffee, 2017). The research inquiry of *lived resilience* engages with specific modes of actions and behaviours of systems to respond to those external problems, such as adaptive capacity, adaptiveness, and responsiveness. Moreover, Giddens (2011) discusses resilience as behaviours of systems from two aspects of adaptive capacity and internal properties, as follows:

> "Resilience can be defined as *adaptive capacity*, the capacity not only to cope in the face of external changes or shocks, but, whenever possible, to respond actively and positively to them. It can be a property of the physical environment, of an individual or a group. …In the second, it refers to *qualities of character* – the ability to make the best of adverse circumstances, or actively to triumph over them" (Giddens, 2011, p.164 - emphasis added).

Even though resilience within this epistemology revolutionised traditional or modernist approaches to focus on self-regulating processes and system approaches to problem-solving, the idea of *lived resilience* needs to include a broad sense of the interconnections of the problems. So far, it only focuses on the binary between the system of interest and external threats, shocks or stresses and the linearity of actions. However, recent debates about the resilience concept have expanded to its connection with justice and the regime of governance, which, therefore, expands these discussions into the nature of resilience and the politics of governing urban life. This epistemological approach to resilience is discussed as *negotiated resilience*.

Negotiated resilience

Negotiated resilience concerns with interrelational and multiple interpretations that facilitate resilience to become a mode of governance. The possibility of resilience to exist is *negotiated* within multiple agents, institutions and social relations that surround its meanings. Hence, the focus is shifted towards how resilience gets translated. Resilience as a 'mode of governance' informs the complex interplay of this concept to be operationalised, negotiated or contested (Rogers, 2017, p.13). Resilience is being contested around multiple and diverse spaces of contestation, struggle, possibility and potentiality. Within this epistemology, the research questions might involve how resilience can serve, facilitate and reconsider social justice or otherwise diminish those social relations.

Leila M. Harris and her colleagues originally introduced "negotiated resilience" in *Resilience: International Policies, Practices and Discourses* journal (2017). In their article, resilience is negotiated as "a process of negotiation, rather than as a definitive goal of outcome" (Harris *et al.*, 2017, p.2). The main concern in *negotiated resilience* is multiple translations as a mode of governance. The research inquiry about resilience is then focused on different 'possibility of change' (Rogers, 2017, p.14) and 'bouncing forward' abilities (Chandler and Coaffee, 2017) being negotiated to accommodate the external disturbance, for example, transformation (Pelling, 2011), resourcefulness, inclusive resilience, and climate-resilient development. Expanded from this debate and in relation to sustainability, Eakin *et al.* (2017, p.186-187) mentioned that "sustainability is fundamentally about the normative decision process involved steering a system to a preferred state, whereas resilience emphasizes a system's capacity to resist disturbance and shocks."

While both epistemological approaches to studying resilience, *lived resilience* and *negotiated resilience*, serve as essential inquiries to inform about different kinds of system approaches and modes of governance towards threats, shocks and stresses, both approaches underlying assumptions are that resilience *already exists* (known as *lived resilience*) and recognise that *need to exist and being facilitated* (known as *negotiated resilience*) in order to maintain social relations. In *lived resilience,* resilience is assumed to be a property of a system and situated in a specific historical and geographical context. However, this study offers something quite different. Rather than seeing resilience through its linearity, alternatively, we should approach resilience as a 'non-predefined' object. It means to examine resilience as a style of

thinking, logic, reasons, and/or framing in which a set of practices is being contested, practised and applied to accomplish social orders and become a regime of truth. In order to do this, the study of (urban climate change) resilience in this research is more related to the third epistemological approach of *situated resilience*.

Situated resilience

This new line of inquiry of resilience is to investigate it as something called *situated resilience* (see for example: Cote and Nightingale, 2012; Murphy *et al.*, 2017; Tschakert and Tuana, 2013; Fisher, 2016; Simon and Randalls, 2016). *Situated resilience* is described as a mode of inquiry to analyse, examine, and investigate resilience as a relational object. Resilience exists upon which there is no possibility of universal knowledge. Instead, it is always being made, remade, and un-made throughout a multivariate of histories. Resilience does not exist on its own, but it is reflected within "political and cultural heterogeneities" (Cote and Nightingale, 2012, p.484) through different forms of knowledge, problematisation, and the production of truth which make it visible, and upon how the geometry of powers in which resilience is being exercised are circulated. This doesn't mean that resilience is not experienced by any systems or agents, but its conditions of existence are bounded by its plural rationalities. The problems with resilience are not only the transliteration from socio-ecological science to social science but also upon which it exists. It is influenced by the post-constructionist approach to studying resilience, where the 'truth' is historically relative and never neutral, and here the focus is shifted towards the conditions upon which resilience is being brought into 'reality.'

In this epistemology, governmentality studies offer a strategy and rationale to analyse strategies and practices around the truth about resilience that become the basis for action. Governmentality has become a mode of inquiry (Stripple and Bulkeley, 2015; Bulkeley, 2016) to analyse resilience as social order or social regulation and control (Lupton, 1999). Evaluating resilience as a social order means examining resilience not as a "pre-existing form" (Anderson, 2015, p.64) but more as an object of inquiry (Barnett, 2005) that will lead us to non-deductive knowledge of what resilience *is*. The analytical procedure interrogates "the relationships and practices that constitute resilience and the effects of particular articulations and deployments" (Fisher, 2016, p.35). The potentialities of this epistemology are to open up how resilience affects different "domains of life" (Anderson, 2015, p.60), its

emergence as an apparatus and the beginning to shape the domains of life of so-called resilient subjects (Aranda *et al.*, 2016). Thus, with this epistemological approach, we can dismantle the relationships between resilience and neoliberalism not as necessary conditions but as contingent histories.

In addition, temporality and resilience also provide profound re-conceptualisation of an event and the future on this matter. Resilience sees the future as an indeterminate or non-deterministic future. There are no conditions upon which we can *completely* figure out the future. In reviews of "hopeful resilience", Halpern (2017) criticised that "resilience is tied to the concept of a future that is always a version, perhaps a derivative replica, of another moment." We could understand this as resilience sees the future as open and flexible; resilience opens up itself into a future as a metaphorical figure that we cannot control but only be tamed. Within this resilience thinking, the future can only be known as conditional and temporary.

Furthermore, the relationship between critical geography and governmentality studies is beginning to unpack "how" governing the urban has been interpreted, enacted, and elaborated. For example, in the context of a smart city, it has been translated into "smartmentality", or smart governmentality, whose application lies in its moral order, reproduction, and mentalities (Vanolo, 2014) or adaptation as biopolitics where securing the urban populations means expanding state's control (Turhan *et al.*, 2015).

This study utilised this *situated resilience* in examining the case studies. Within this epistemological approach towards resilience studies, thinking *situated resilience* offers a new conceptualisation of powers, micro-politics, and relational approach from analysing and investigating the case studies. Resilience as a governing rationality offers an opportunity to analyse its practice, forming, and deforming to become exist. In this research, the study examined how resilience is being practised, contested, and applied for building urban climate change resilience in relation to this *situated resilience*. To do this, the study examined building urban resilience efforts using the analytics of governments: governmental rationalities, apparatuses, and subjectivities. In the study, governmentality offers a post-constructionist approach to studying risk, resilience and climate actions. More detailed accounts of how these concepts are operationalised to analyse the case studies are provided in Chapter 3.

A summary of these three epistemological approaches to resilience is provided in Table 2.1 Different epistemological approaches to resilience.

Table 2. 1 Different epistemological approaches to resilience

Theory development	Mode of inquiry	Key concepts	Example questions	Proponents
1. Lived resilience (Type 1)	• Resilience can be known • Inward-outward • Independent	• Stability versus resilience • Multiple equilibriums • Behaviours of systems: capacity and internal properties	What are the different attributes of resilience? How to operationalise, measure, and monitor resilience building?	Chandler and Coaffee (2017); Giddens (2011); Holling (1973)
2. Negotiated resilience (Type 2)	• Resilience is contested • Regime change • Interrelational	• Multiple spaces of resilience • Modes of governance • Bouncing forward rather than bouncing back	What resilience concept has to offer to urban governance, in the face of risk, crisis and uncertainty?	Chandler and Coaffee (2017); Harris *et al.* (2017); Pelling (2011); Rogers (2017)
3. Situated resilience (Type 3)	• Resilience is brought into 'reality' • Knowledge – power • Relational	• Rationality, apparatus, subjectivity • Micro-politics, geometry of powers, e.g., Biopower • Representation politics	How urban life became administered by tactics and techniques of resilience? What forms of knowledges and powers facilitate resilience?	Cote and Nightingale (2012); Fisher (2016); Murphy *et al.* (2017); Simon and Randalls (2016); Tschakert and Tuana (2013)

2.4. Urban climate experimentation

Since the early 2010s, there has been growing interest in applying the concept of urban resilience. In this sense, urban resilience is a site for interventions where resilience as a concept is tested, applied, and examined. It involves applying urban resilience as tools, approaches, and modes of intervention. As discussed by Eakin *et al.* (2017, p.188), urban space formed "asymmetric relationships of influence and control." Its application is then very much tied with the ideas of experimentation, especially in response to climate change impacts. Urban resilience can be defined as deliberate experimentation into urban space and politics for managing climate change risks. Coaffee and Lee (2016) describe "urban resilience" as follows:

> "an integrated multi-scalar activity involving a range of activities which shape and manage the built fabric so as to reduce its vulnerability to a range of hazards and threats. It is concerned with both the spatial form and redesign of the built environment as well as the processes that help shape it" (p.68).

In the next two sections, the thesis discusses the idea of an experimental city and the different spectrum of climate experimentation in relation to urban resilience.

2.4.1. The experimental city

Cities around the world have started to respond to and undertake actions against climate change. Those cities have begun to undertake urban climate experimentation, which is described as an effort to test and explore new and innovative ways of adaptation planning, undertaking partnership and knowledge production, experiencing different techniques of governance, and shaping urban transitions (Anguelovski and Carmin, 2011; Castán Broto and Bulkeley, 2013; Boyd and Juhola, 2015, Bulkeley, 2010; Bulkeley, 2013; Evans, 2011). Cities have become sites for struggle, transformation, and innovation in building urban resilience to climate change. The process is understood as "a socio-institutional process rather than the outcome of scenarios of vulnerability with some anticipated adjustment" (O'Brien and O'Keefe, 2014, p.95) and also exhibits urban politics and the involvement of diverse actors to make it visible (Lassa and Nugraha, 2014). Within the context of urban experimentation, there are also two distinct forms of drivers, exogenous and endogenous drivers, which influence, moderate, and affect the implementation of climate adaptation planning and actions locally across the urban sites, see Table 2.2.

Table 2.2 Differences between endogenous and exogenous drivers

No	Elements	Endogenous driver	Exogenous driver
1	Shared agenda	To achieve city agenda, demonstrate leadership, and build image of the city in national or international arenas, in the absence of guidelines	
2	Origin of motivations	Internal, response to city vulnerabilities or recent disasters	External, linking to funding for adaptation, enhance environmental leadership
3	Driving forces	Local champions, include manager and staff at city department, civil society actors;	National policies or mandate, international agreements, transnational networks
4	Goals	Reducing future risks and vulnerability, advancement of local priorities	Advance local development goals and agenda, foster adaptation planning
5	Approaches	Multi-actors' discussion within city management, development of local adaptation plans to maintain or improve local municipal systems	Pre-designed programme with information and financial resources provided connection with the existing development agenda and sustainability programs
6	Resources	Locally generated resources, such as: staff, budget, office, and dedicated regulations	Mostly supported by exogenous actors or providing cities with incentives, provision of monetary and technical assistance to cities
7	Exemplar cities	New York, London, Durban, Sydney, Barcelona, Venice, Munich	Bandar Lampung, Semarang, Surat, Can Tho, Hat Yai, Quy Nhon

Source: Adapted from Anguelovski and Carmin, 2011; Carmin *et al.*, 2012, and Carmin *et al.*, 2013

Globally, the origin and direction of adaptation planning policy can be from within or outside the cities. In urban climate experimentation, these two drivers shape, initiate, and accommodate climate adaptation planning and actions into urban governance. These endogenous and exogenous drivers have moderated urban climate experimentation across the world (Anguelovski and Carmin, 2011; Carmin *et al.*,

2012; and Carmin *et al.*, 2013). Endogenous drivers underpinning urban adaptation usually come as a response to existing city vulnerability or trigger by recent disasters that have severely damaged the city. Normally, local champions who sit as managers or staff at a city-level department or civil society actors are the ones who take the initiative to drive change in cities. The goal is mostly to reduce risks from future hazards and current vulnerabilities and as an advancement of the local development agendas. The process involves multi-actors for conducting assessment and planning for adaptation plans and maintaining locally generated resources such as local staff, budget, office, and dedicated regulations (Carmin *et al.*, 2013). Carmin *et al.* (2013) discuss endogenous driver as the practice of institutionalising local climate agendas, which involves processes of sense-making, deliberation and agenda setting, and adoption and endorsement of climate adaptation policy agenda.

Exogenous drivers usually aim to facilitate international funding to enhance the environmental agenda and strengthen city governance in developing countries. These drivers are commonly pursued as consequences of national policies, international agreements or a transnational network. Some examples of these international drivers include ICLEI-Local Government for Sustainability, UN-Habitat's Cities and Climate Change Initiative (CCCI), the World Bank, Asian Development Bank, The Rockefeller Foundation's Asian Cities Climate Change Resilience Network (ACCCRN) and 100 Resilient Cities (Anguelovski and Carmin, 2011; Carmin *et al.*, 2013). The goals are to advance the local development agendas and foster adaptation planning. In Indonesia, it was undertaken with incentives and the provision of monetary and technical assistance to the cities involved (Lassa and Nugraha, 2015). These distinctions between driving forces, endogenous and exogenous drivers are not to ignore that both can simultaneously happen within a city and mutually co-shaped the city's climate risk governance.

Furthermore, it is also worth recognising that climate adaptation and disaster policymaking do not happen 'in one go' and involve different stages that lead to a decision to endorse certain policies. Such processes often involve agenda setting, contestation of policy formulation and drafting (Birkland, 1997; Birkland, 1998). Different actors are involved in shaping the processes that lead to complexity and uncertainty. Different stages include agenda setting, exploring options, cost and benefit analysis of the options, and making a rational choice about the best option

(Keeley, 2001) that influence the endorsement of certain policy drafts and translating such policy into programs, projects and actions.

Bulkeley *et al.* (2015, p.23) argue that socio-technical transformation in urban experimentation provides "a means of reordering and reconfiguring the systems and structures through which urbanism is constituted." In this sense, the city is known as an actor in socio-technical transitions and regarded as a theatre of action (Bulkeley *et al.*, 2015) but also as an experimental laboratory (Evans, 2011) and site for problem-solving and mediation (Ong, 2011). Moreover, cities as players are also playing key roles in shaping socio-technical transitions at the national level (Geels, 2011). The process might as well involve multiple actors and social groups within complex multi-actors processes (Geels, 2011). Therefore, understanding the policy arena, narratives, actors involved and policy spaces of disaster and climate governance in cities is importantly crucial (Keeley, 2001; Keeley and Schoones, 1998). Schipper *et al.* (2016) recognise the connection between reducing disaster risks, increasing resilience through climate change adaptation and achieving sustainable development. More importantly, a more radical change towards transformational resilience is needed to facilitate the effective implementation of international agendas locally, such as Sustainable Development Goals (SDGs) and Sendai Framework for Disaster Risk Reduction (SFDRR), to actually reduce vulnerabilities and future risks rather than exacerbate them (Schipper *et al.*, 2016).

The role of cities: actors, urban arena or laboratory

With regard to the role of cities in urban experimentation, Geels (2011) has introduced the notion of multilevel perspective (MLP) in socio-technical transitions. The MLP involves analyses of three levels (Geels, 2011, p.15): niches as the locus of innovations, socio-technical regimes, and an exogenous socio-technical landscape. The socio-technical approach is different from neo-classical economics, ecological modernisation, and deep ecology. Unlike these other forms of environmental thought and practice, the socio-technical approach is as a means of co-evolution of social and technical elements and interacts within complex and multiple social groups (Geels, 2011). In this context, cities as sites for urban transformation or theatres for socio-technical transitions have multiple roles influencing the national level. Geels (2011) mentioned that the roles of cities include: (i) Cities as primary actors, which means city government plays an important role in managing and organising transformation,

which sometimes undertaking experimental projects, (ii) Cities as initial seedbeds for transitions, which perform an avenue for the creation of niches and the performance of entrepreneurial experiments, and (iii) Limited roles for cities, that delineate its capacity to influence infrastructure change and transformations of existing national-level system with powerful actors. These roles further signify the contribution cities play in influencing transformation and shaping the socio-technical transitions locally and at the national level.

Some experimental cities are also known as early adopters, amid a lack of adaptation protocols or guidance, which have undertaken an initiative to implement local climate adaptation planning and actions. These processes involve undertaking a test and trial, implementing small projects, partnering with different organisations and aiming at the end to build urban resilience and protect their populations. Related to this, Brown *et al.* (2012, p.534) describe urban resilience as "the capacity of an individual, community or institution to dynamically and effectively respond to shifting climate circumstances while continuing to function at an acceptable level."

Moreover, the experimental city is not limited only to the actor and arena but also intertwines with the idea of a centre or laboratory (Evans, 2011). Ong (2011, p.10) describes urban as sites for "problem-space in which a cast of disparate actors… define what is problematic, uncertain, or in need of medication and then go about solving." The experimental city brings together a collective thought on the role of cities both as actors and sites for future agenda, as explained by Evans *et al.* (2016, p.1) below:

> "The concept of experimentation feeds on attractive notions of innovations and creativity (both individual and collective) while reframing the emphasis of sustainability from distant targets and government policies to concrete and achievable actions…."

The experimentation in climate change adaptation in the urban arena exhibits how cities have become the sites for testing, reiteration, and innovations in socio-technical transitions. How urban experimentation has been shaped within the trajectory of climate change adaptation provides unique and challenging roles, transformation, and innovations from cities.

For example, cities around the world have recently started urban climate experiments. These cities undertook experimentation in order to manage current city

vulnerability or prepare for future climatic impacts. Based on Castán Broto and Bulkeley (2013) and Bulkeley *et al.* (2015), an urban climate change experiment is defined based on these different criteria: (i) An intervention that has emerged for purposive and strategic objectives but also recognises the open-ended nature of the socio-technical process; (ii) An intervention that aims to reduce vulnerabilities from climate change impacts or limit carbon emissions; and (iii) An intervention undertaken within an existing or imagined urban community. In climate change adaptation, urban climate experiments represent an intervention that involves multi-stakeholder groups undertaking an iterative process for adaptation planning, allocating resources and implementing adaptation actions.

In urban climate experiments, governance is a key part of achieving effective climate planning and actions for climate change (Anguelovski and Carmin, 2011; Castán Broto and Bulkeley, 2013). Experimental cities have experimented with adaptation planning and actions that involve engaging with multi-stakeholders, setting up new rules and mechanisms, and undertaking innovative adaptation or mitigation actions. In this context, urban climate governance is defined as:

> *"*The ways in which public, private and civil society actors and institutions articulate climate goals, exercise influence and authority, and manage urban climate planning and implementation process*"* (Anguelovski and Carmin, 2011, p.169).

In this sense, experimentation also provides a means to understand "how the urban governance of climate change is taking place, and how and why the urban politics travel and become embedded" (Bulkeley *et al.*, 2015, p.18). The experimentation is undertaken with testing and implementing adaptation planning and actions, and the next sections describe the current innovations, practices, and challenges for undertaking these processes at the urban level.

Institutions

Institutions also play a key role in shaping and contextualising how urban climate experiments might appear. In climate change adaptation, Dovers and Hezri (2010) mentioned that there are very few discussions on institutions. This means that there is "little attention to the mechanisms of policy and institutional change, to structures and processes within public policy and administrative systems at national

and sub-national jurisdictional scales" (Dovers and Hezri, 2010, p.219). The definition of institution in climate change is described as follows:

> "An institution is an underlying rule or pattern of behavior in a society, whereas in common use, and in much climate literature, it might mean a specific organization, a policy instrument or policy program" (Dovers and Hezri, 2010, p.221).

Dovers and Hezri (2010) argue that adaptation is a set of policy problems that requires solutions for future pathways and engaging institutions. Dovers and Hezri (2010, p.221) mention that "institutions are the means by which human societies mediate their affairs and policy is how they allocate resources and opportunities." They also signify that most literature on adaptation deals with what *should* happen rather than *how* might that happen, such as policy and institutional structures and processes (Dovers and Hezri, 2010).

Actors

In urban climate experiments, managing risk such as climate change will involve not only a single actor but also civil society, non-government organisations and private entities to interplay together for collective decision-making in managing risk (Renn, 2008). Currently, the multiple actors that are involved in climate change governance are local governments, private sectors, and national and regional governments (Boyd and Juhola, 2015). Bulkeley and Betsill (2013, p.143) argue that multilevel governance has the potential to analyse what "climate change is constituted as a political problem through this web of socio-spatial relations." Further, O'Brien and O'Keefe (2014, p.95) also argue climate adaptation is "a socio-institutional process rather than the outcome of scenarios of vulnerability." Their definition resonates with the focus on process-based results, which involves multi-stakeholders, iterative process, learning and evaluation, rather than simply product-oriented outputs such as adaptation projects. In addition, Pelling (2011, p.5) describe adaptation as "a process of socio-political transition and transformation" that involves adaptive learning, refining current governance and re-definition of our political economy in the process. And finally, more importantly, enhancing urban resilience and achieving long-term adaptation require, as Colenbrander *et al.* (2018, p.911) put it, "reform of existing social and political structures."

2.4.2. Spectrum of urban climate experimentation

Bulkeley *et al.* (2015, p.222) argue that climate change experimentation "act on the present, but in the name of (multiple) visions of the future." This means that the interpretation of what should be doing or how we are responding is very much negotiated and contested within urban politics. Climate change experimentation, thus, is integral to urban politics, entangled with the assemblage of narratives and visions (Bulkeley *et al.*, 2015). Experimentation also interacts with climate justice very closely. Bulkeley *et al.* (2015, p.221) describe that "climate justice forged and contested in the politics of experimentation." In their evaluation, Bulkeley *et al.* (2015) provide a profound conceptual framework of experimentation (see Table 2.3), which they defined as occurring within three narratives: making, maintaining, and living of urban climate experimentation. These three narratives explain why and how governing climate change takes place at an urban level as an experiment.

"Making" narrative in urban climate experimentation

The *making* in urban climate experimentation involves "defining the problem and rendering it amenable to intervention through a process of assembling the discrete elements which facilitate action" (Bulkeley *et al.*, 2015, p.33). This explanation means that the process of experimentation involves contestation over meaning and relations to structural change (Bulkeley *et al.*, 2015). This is where climate change can be understood as "an urban issue through a process of problematization" (Bulkeley *et al.*, 2015, p. 43-44). Bulkeley *et al.* (2015) also explain that this "making" in climate experimentation involves four distinct components: problematisation, alignment, rendering technical, and rendering compelling. The experimentation is undertaken as "a means of seeking to test and experience what it means to respond to climate change" (Bulkeley *et al.*, 2015, p.44).

It is argued that the process of *making* of urban climate experimentation is not neutral in climate justice (Bulkeley *et al.*, 2015). Even though some projects have recognised climate change problems with social issues such as energy poverty or urban health, but urban experiments can put people in power or urban elites to decide or prioritise future solutions (Bulkeley *et al.*, 2015). Bulkeley *et al.* (2015, p.226) gave an example of a T-Zed project in Bangalore that "the project served to reproduce existing structural inequalities within the city." In this sense, the process

of making in climate experimentation intensity the circulation for assembling resources, narratives and visions (Bulkeley *et al.*, 2015).

Table 2. 3 Making-maintaining-living conceptual framework

Narratives / Element	Making	Maintaining	Living
Key processes	Problematisation, alignment, rendering technical, rendering compelling	Upkeep, metabolic adjustment	Subjectification, contestation, resistance
Principles of climate justice:			
Recognition	Alignment, calculation	Reinforced through upkeep	Reinforced through subjectivities
Rights	–	Metabolic adjustment reconfigures access to resources/protection	Subjectivities and everyday practice central to realisation of climate rights
Responsibilities	–	Metabolic adjustment serves to rework landscape of responsibilities for response	Subjectivities and everyday practice central to realising both the prudential and ethical dimensions of responsibilities
Examples:			
T-Zed Bangalore	Multiple mediating technologies rearticulate what housing can become	Securitisation of resources and integration of innovation into housing economy	Constitution of the middle-class green consumer
VIDA Monterrey	Calculative practices mediate new configuration of housing and finance	Lack of maintenance and unsuccessful attempts to re-experiment	Experiment is appropriated within conventional living practices and norms

Source: Bulkeley *et al.* (2015)

"Maintaining" narrative in urban climate experimentation

The *maintaining* in urban climate experimentation involves "deploying tactics and techniques to both establish the experiment the face of the contradictions emergent between the intention to govern and its practice" (Bulkeley *et al.*, 2015, p.33). The process of experimentation is undertaken through upkeep and metabolic adjustment (Bulkeley *et al.*, 2015). Upkeep functions to maintain the physical and technical frames of innovation for undertaking urban climate experimentation, while metabolic adjustment provides the insertion of experiments to reconfigure existing forms of circulation (Bulkeley *et al.*, 2015).

Within the existing circulations of experiments, the *maintaining* entails processes of self-awareness, where the experiments are embedded into the normal fabric of life (Bulkeley *et al.*, 2015). This is illustrated in the T-Zed project, which is characterised by "a series of attempts to regulate behaviour by creating a sense of responsibility in residents" (Bulkeley *et al.*, 2015, p.229). It tries to enact that an act of experiments will become part of everyday life and sustain within people's behaviour. On the other hand, Bulkeley *et al.* (2015, p.230) also explain "the work of experimental maintenance has effect of normalizing claims, transforming them from possibilities into assumptions and thus redefine what constitutes acceptable urban development."

"Living" narrative in urban climate experimentation

The *living* in urban climate experimentation involves "bringing into being distinct subjectivities which are charged with specific forms of conduct and come to be contested or simply fall into neglect" (Bulkeley *et al.*, 2015, p.33). The process of experimentation is undertaken through subjectification, contestation, and resistance (Bulkeley *et al.*, 2015).

Bulkeley *et al.* (2015, p.231) explain that subjectification "involves citizens and populations regulating themselves, taking action toward solving collective problems, and shifts responsibility from institutions towards citizens." This explanation amplifies a notion of self-governing for undertaking and responding to immediate challenges that people face – in this context, climate change challenges. Citizens are also participating within an acceptable degree of freedom (Bulkeley *et al.*, 2015), which explains directive powers are not pursued by state actors but independently expressed by individuals to undertake actions that they think are needed. From the

Hong Kong experience, this process was undertaken as part of self-reproduction in which the urban climate experimentation is becoming "the systematization of everyday practices, their measurement, comparison and competition" (Bulkeley *et al.*, 2015, p.232). This dynamics also shows the amplifying attempt of self-governing in urban climate experimentation.

Those three narratives tell us that urban climate experimentation are clearly "ambiguous, both challenging incumbent socio-technical assemblages and contributing to their reproduction" (Bulkeley *et al.*, 2015, p.49). The climate experimentation interacts within the urban politics and entails contestation over power, interests, and reconfiguration of our future in climate change adaptation and the politics of governing cities and urban life.

2.5. Summary

This chapter has reviewed recent literature on the topic and summarised that the study focuses on governmentality as the main theoretical framework and uses urban climate experiments or urban climate change resilience as an entry point for theorisation. In the study, governmentality offers a strategy and rationale to analyse strategies and practices around the truth about climate change risks that become the basis for urban resilience and climate adaptation actions. I focus my research on three aspects of governmentality analysis: rationality, apparatus, and subjectivity.

In this study, resilientisation or governmentalisation of resilience is defined as a continuous process of experimentation, initiation, and practice. It follows a premise of possibility, an open-ended journey through which an emphasis on the enhancement of individual freedoms and market mechanisms is introduced. If climate change is truly a market failure, should re-examining the market into resilience building be a solution? Climate change problematisation, within resilience governmentality, which is re-oriented to make uncertainty visible and risk manageable, brings a new opportunity for the experimentation of urban governance. This new mode of governing the climate is being deployed around the idea of urban climate experiments and resilience that target the cities and their urban populations. Urban climate experiments occurring within a multiplicity of sites is a unique task, especially in an emerging, democratic, post-participatory and post-colonial country such as Indonesia. The introduction of individual responsibility and building capacity for collective actions is not only defined to increase urban climate change resilience

and become resilient individuals but also to engage with the experimentation of market mechanisms and reduction of state reliance.

What if the logic of urban climate experimentation is not towards achieving any kind of securitisation, stabilisation or experimenting with innovations per se but embedded within altering urban inhabitants' capacity towards a manageable future? The future as "temporality" and in order to manage our present, one has to 'master our future.' Moreover, our capacity to adapt to climate change is dependent upon one capacity to build urban climate resilience. In this context, climate change adaptation has been 'seen' through the lens of resilience and practised within resilience governmentality.

Chapter 3: Methodology, research methods and ethics

"The thinker is not a solitary recluse but a weaver of spaces."
(Michel Serres in Crang and Cook, 2007, p.208)

3.1. Introduction

This chapter discusses the research methodology, research methods, and ethical considerations. Overall, this chapter's aimed to provide the reader with an understanding of the background of the research methodology and of the analytical procedures used, including how this study was conducted and the analysis was undertaken. It also provides the reasons for the selection of case studies, mechanisms for data collection based on the research aims and objectives directed to study case studies, research analysis, ethics and confidentiality. Further, this chapter focuses on the positionality and reflexivity of the researcher and the researched, including people, places, projects, and documents, as an interwoven project within dynamic and challenging spaces of the research. While in the research, the researcher has carefully planned, managed, and considered all research activities; this chapter also reflects the research challenges and limitations onsite and offsite of the research field. Nevertheless, the study agrees with Jones III and Gomez (2010, p.5) that doing and learning about the research is "a rewarding experience" and opens up "a broad mind" of one's curiosity, being also very often stimulating and challenging.

3.2. Selection of case studies

This section discusses the selection of case studies, which consist of the background of the Asian Cities Climate Change Resilience Network (ACCCRN) as a programme and its implementation in Indonesia. This research study focuses on how the efforts to build resilience to climate change in two cities that joined ACCCRN, namely Bandar Lampung and Semarang. Both Indonesian cities were ACCCRN members from the programme beginning in 2009. In the chapter, ACCCRN's process is discussed at both the programme level, which involves the planning process, actors and network and at the national level of Indonesia, where the two cities are selected and involved as part of the programme. Later in the discussion, the

chapter outlines two reasons for the selection of case studies, which focus on the geographical and experimental context of ACCCRN. It also provides a geographical and economic account of both cities, a description of the experimental design of the programme and the value of comparing both cities.

Asian Cities Climate Change Resilience Network (ACCCRN)

ACCCRN is part of the broader programme within the US-based Rockefeller Foundation on building resilience to the current and future consequences of climate change (The Rockefeller Foundation, 2009). The Foundation realises that there are already irreversible impacts from climate change that cannot be countered only by reducing carbon emissions. In August 2007, the Rockefeller Foundation launched a global initiative on *Building Climate Change Resilience* to shift the global attention from climate change mitigation to climate change resilience with an initial five's year budget of $70 million. Judith Rodin, the former President of the Rockefeller Foundation, emphasises this major initiative as a response to a lack of attention "to help people and environments cope with what's already occurring and with what's coming" (Rodin, 2008, p.8). It was a call to arms on the urgency to concentrate on building climate change resilience as "the ability to plan for, survive, recover from, and even thrive in changing climatic conditions" (The Rockefeller Foundation, 2009, p.1).

Under the initiative, the Foundation focuses its attention, support, funding, and actions through different programmes internationally and domestically in the United States, including ACCCRN, Stanford University's Food Security and the Environment Program, Alliance for a Green Revolution in Africa (AGRA), in three primary areas (The Rockefeller Foundation, 2009, p.1): (i) Experimenting with and testing local approaches to building climate change resilience for institutions and systems serving poor and vulnerable communities; (ii) Promoting, demonstrating, and disseminating knowledge about these and other viable approaches; and (iii) Increasing awareness among funders, practitioners, and policymakers on the need to invest in building climate resilience.

The study focuses on the analysis specifically of ACCCRN not only because of the Foundation's intention to become a global leader in building resilience but also to analyse the Foundation's focus to (i) Shift the discourse from climate change adaptation to climate change resilience, and (ii) Situate resilience as urban climate

experimentation. In the *Rockefeller Foundation White Paper* on *Building Climate Change Resilience*, the Foundation emphasises (The Rockefeller Foundation, 2009, p.2 – emphasis added):

> "We believe that resilience is *a more accurate, positive and comprehensive term*, describing *the dynamic, systemic transformation* that is needed to respond to the consequences of climate change, especially future impacts that are *difficult to predict*."

The Foundation's statement has several analytical consequences of thinking about how (climate change) resilience 'exists' in the world-making process, where it is introduced as the new vocabulary of "truth(s)" in adapting and responding to climate change, modes of (urban) life that is dynamic, transformative and difficult to predict. This study is interested in how resilience has been brought into 'reality' in ACCCRN as *situated resilience* (see Section 2.3.2). Even though the idea of building climate change resilience is not new but the distinct conceptual framing and application of resilience in ACCCRN requires further research investigation.

The study selected ACCCRN as the case study to distinguish the Foundations' approach to building climate change resilience from other international agencies. For example, the World Bank's approach to building urban climate resilience is arguably under the type of *lived resilience* (see Section 2.3.2), where resilience is known as an observable, measurable, and comparable object (Hallegate and Engle, 2018; Jha *et al.*, 2013; Prasad *et al.*, 2009). Prasad *et al.* (2009, p.32 - emphasis added) in the World Bank's Guide for *Climate Resilient Cities*, emphasise that "resilience in social systems has the added human capacity to anticipate and plan for the future. …A resilient city is one that is *able to sustain itself* through its systems by dealing with issues and events that threaten, damage or try to destroy it." Resilience is seen as 'linear causal chains' (Chandler and Coaffee, 2017) within the behaviours of urban systems to respond to external disturbance. Hallegate and Engle (2018, no pagination) from the World Bank further argue "we… will become better able to increase resilience… if we can measure it in a quantified way." However, the study is more interested in ACCCRN because it offers a unique and specific opportunity to evaluate building urban climate change resilience as urban climate experiments that are historically relative and relational as *situated resilience*.

ACCCRN is a regional programme funded by the Rockefeller Foundation to implement urban climate change resilience planning and actions in Asia. It focuses on second-tier or medium-sized cities[7], rather than global cities, in South Asia and Southeast Asia, including Indonesia, Thailand, Vietnam and India (ACCCRN, 2009b). It was piloted in ten cities in four countries involving Can Tho, Quy Nhon, and Da Dang in Vietnam, Gorakhpur, Surat, and Indore in India, Semarang and Bandar Lampung in Indonesia, and Chiang Rai dan Hat Yai in Thailand (ACCCRN, 2009b). The ultimate impact statement of ACCCRN is that (ACCCRN, 2010d, p.2):

> "The resilience and capacity of a growing number of developing country/Asian cities in relation to current and future risks is enhanced, and through this work, the lives of poor and vulnerable (men and women) are improved."

ACCCRN is a typical exogenous driving force programme for building urban climate change resilience that offers testing adaptation protocols (Anguelovski and Carmin, 2011) and urban experimentation (Evans, 2011). In the absence of models for responding to climate change at global and national levels, ACCCRN implemented iterative and continual ways of building urban climate change resilience, from developing tools and methodologies to assess climate vulnerability to testing and piloting resilience strategies and actions at local and city levels (ACCCRN, 2009b). The programme generally aimed to "both improve the capacities of cities and their communities, while encouraging new approaches and practices among all stakeholders" (The Rockefeller Foundation, 2015, p.2), which was novel at the time to comprehensively and inclusively engage with city governments, civil societies, and local communities in each country. It focused on three areas through different programmatic phases from 2008 to 2016 (see Table 3.1), specifically on (i) The capacity to plan, finance, coordinate, and implement climate change resilience within ACCCRN cities; (ii) Knowledge, learning and deepening experience through individual and shared learning and practical knowledge by ACCRN cities and other stakeholders, and (iii) Expansion, networking and scaling up of climate change resilience (The Rockefeller Foundation, 2015).

[7] The size of second-tier or medium-sized cities within ACCCRN varies from a population of 36,400 (Chiang Rai, Thailand) to a population of 3.8 million (Surat, India). The Rockefeller Foundation focuses on these cities to distinguish climate actions in large urban centres, such as Mumbai or Bangkok, to cities that face limited capacities, finance, and global attention yet will be part of the 60% of global urban projection by 2050 (Brown, Dayal and Rio, 2012).

Table 3. 1 ACCCRN milestones

Phase	Timeline	Programme activities
Phase 1: City scoping and selection	April 2008 – September 2009	• Identify partners cities which are: experiencing rapid urbanisation, vulnerable to climate change and have the capacity to engage with ACCCRN • Identify key stakeholders and local partners
Phase 2: City-level engagement and capacity development	January 2009 – mid 2010	Shared learning dialogues with key stakeholders to: understand city-level vulnerability, identify climate change impacts, and create resilience action plan
Phase 3: Implementation and resilience projects	2010 – 2012	Work with local and international partners to implement replicable interventions identified in resilience action plan
Phase 4: Replication	Mid 2008 onwards	Undertake scaling-up through: • Networking and shared learning • Continuous monitoring and evaluation • Replication and dissemination • Leveraging additional funding sources

Sources: ACCCRN (2009a); ACCCRN (2009b)

In the implementation, ACCCRN involved diverse local and international partners through collaborative governance between donors, international experts, national partners, local governments and city stakeholders. At the programmatic level, the Rockefeller Foundation Office in Bangkok, Thailand, supervised the overall programme implementation supported by international partners of Arup International Development and the Institute for Social and Environmental Transition (ISET). In each country, ACCCRN assigns national coordinators who are directly responsible for the day-to-day management and implementation of the programme implementation at the national and city levels. In Indonesia, ICLEI Oceania was the national coordinator between March and October 2008 before being reassigned to MercyCorps Indonesia in May 2009 (MercyCorps Indonesia, 2009; ICLEI Oceania,

2008). Both Indonesian cities, Semarang and Bandar Lampung, were selected from 38 initial cities as part of a robust city selection process based on population size, the government's political will and capacity to address climate change, climate change vulnerability and geographic location of the cities (MercyCorps Indonesia, 2009). In 2016, Semarang also engaged with another global initiative of *100 Resilient Cities* (100RC) pioneered by the Rockefeller Foundation. As part of the Foundation's Centennial Challenge, 100RC is a $100 million commitment to building urban resilience in cities around the world (The Rockefeller Foundation, 2016). It focuses broadly on urban shocks and stresses, such as natural hazards (earthquakes, tsunamis) and human-made catastrophes (terrorism, economic crisis), beyond those caused by climate change (The Rockefeller Foundation, 2016).

Besides the study's interest in the ACCCRN approach to evaluate resilience, there are two general reasons for the selection of two ACCCRN cities in Indonesia as case studies: (i) Geographical context, and, (ii) Experimental context. Both contexts arguably become the basis for analysing and evaluating building urban climate change resilience in Indonesia not only as programmatic designs and technical solutions to the problems of climate change but also how it interplays within plural assemblages and a web of interactions (Robinson, 2006). This research takes account of these case studies as 'ordinary cities' (Robinson, 2006), which focus on cities: (i) As a unique assemblage of wider processes – national political economy and global initiatives in order to build urban climate resilience; and (ii) Exist within a world of interactions and flows which equally diverse, complex and internally differentiated – that forms social regulation and control. Both contexts, geographical and experimental, are important in the study conceptualisation of *situated resilience* (see Section 2.3.2) to understand how building urban resilience is reflected within "political and cultural heterogeneities" (Cote and Nightingale, 2012, p.484) through different forms of knowledge, geometry of powers, and technologies of government.

Geographical context

The geographical context of two Indonesian cities, Semarang and Bandar Lampung, as case studies provides two backgrounds on the basis of: (i) The spatial and temporal dimensions of climate change in both cities, and (ii) De-centring urban climate experimentation from global cities to second-tier or medium-sized cities.

The two case studies selected for this research are Semarang and Bandar Lampung. Both cities are known as early adopters and experimental cities in climate change adaptation and urban resilience building. They have been experimenting with adaptation planning at local level and implementing actions to anticipate climate change impacts. Both cities suffered from different climate change impacts, such as flooding, drought, landslide, coastal abrasion, dengue fevers, and sea-level rise. Both cities are located in coastal areas that made them more susceptible to climate change.

Both cities are the capitals of their provincial areas, which shows the important contribution of urban centres, population growth, and economic engines to their cities and neighbouring regions (see Figure 3.1 on the location orientation of these cities in Indonesia). Semarang is located in the northern part of Java Island. Its population, as reported in 2014, is 1,584,906, with an annual growth rate of 0.97 percent (Statistic Bureau of Semarang, 2014). As an economic engine, Semarang is strategically located in the 'development corridor' of Central Java Province (Pemerintah Kota Semarang (Semarang City Government), 2016). Bandar Lampung is located at the southern tip of Sumatera Island. With a population of 960,695 and an annual growth rate of 1.5 percent as of 2014 (Statistic Bureau of Bandar Lampung, 2015), its topography comprises plains, seashores, and hilly to mountainous areas. It was reported (Asian Cities Climate Change Resilience Network, 2010a) that only 32 percent of the entire population in Bandar Lampung has access to a public water supply, with this figure falling to 27-30 percent when considering only the poor population.

The Vulnerability Assessment conducted as part of the ACCCRN in both cities mentioned that fisherman and coastal communities are identified as among the most vulnerable groups due to climate change (ACCCRN, 2010a and ACCCRN, 2010b). In Semarang, the northern coastal part of the city faces different climate vulnerabilities, including tidal flooding, coastal abrasion, sea level rise, and land subsidence. It was also reported (ACCCRN, 2010b; TAHTA dan CWG Semarang, 2010) that low-elevation coastal districts in Semarang were subsided by up to 8-9 cm per year and sea level rise has risen per year by 7.43 cm. With their vulnerabilities, Semarang initiated climate change adaptation and urban resilience to overcome these problems while increasing environmental services, including coastal protection, mangrove restoration, and sustainable livelihoods.

Figure 3.1 Case study locations

The Mayor of Semarang had just been re-elected in 2016 when he began his another 5-year tenure as the leader of the coastal metropolitan in the biggest city in north Java. His vision was to build a ”Semarang Hebat (Great Semarang).” During the Annual Development Planning Meeting (MUSRENBANG), he delivered this vision as a foundation of two complementary agendas: (1) Semarang as a smart city applying advanced technology applications into urban management and (2) Semarang as a resilient city which promotes environmentally friendly urban development. Semarang, as a resilient city, is to be developed to become spatially planned, implement integrated drainage systems, sustainable transportation, and accommodate basic infrastructure and improve the urban environment (Semarang City Government, 2016). Under the umbrella of 100RC, this vision is expressed to transform the urban governance of the city into “a much more resilient city with an enhanced security, efficient mobility and excellent capacity, and will embrace practicing resilience as part of our culture” (Semarang City Government, 2016b, p.34). In Semarang, building resilience has broadened from responding to climate change to the embodiment of the culture of resilience in urban governance.

Based on the Vulnerability Assessment (2010) conducted by ACCCRN, Bandar Lampung realises that building resilience requires not only government actions but also local community and city stakeholders to “actively reduce climate risks and undertake adaptation to the impacts of climate change” (Mukhlis *et al.*, 2011). It is no surprise that one of the top priorities in the City Resilience Strategy for building urban resilience actions in Bandar Lampung is community empowerment (Mukhlis *et al.*, 2011). This strategic action to build community empowerment is framed under the resilience strategy in the human development sector. In the *City Resilience Strategy*, it is realised that the most vulnerable groups to climate change impacts are poor people, women who are the head of family, children and elderly people (Mukhlis *et al.*, 2011). In the Strategy, it is clearly stated to act to foster human development as “fundamental reasons” to engage in climate change adaptation (Mukhlis *et al.*, 2011). The strategies (Mukhlis *et al.*, 2011, p.61) that are listed include “public socialisation to climate change actions and impacts, developing climate change education curriculum and training, climate educations, vocational training for vulnerable, fisherman, women and young adult, financial access, early warning system development and new institutional body and network” (Mukhlis *et al.*, 2011).

Geographically, both cities also have a unique part to inform us about "the will to improve" (Li, 2007), political identity and economic reproduction (Nas, 1986; Nas, 2002; Kusno, 2000; Wertheim *et al.*, 1958). After the Reformation Era (post-1998 of former President Soeharto's regime), Indonesian cities were in "a state of turmoil" (Nas, 2002, p.1). They struggle with rapidly changing urbanisation, population growth and urban identity. Initially developed as "indigenous centres, ancient coastal trade centres and colonial settlements" (Nas, 2002, p.3), Indonesian cities are facing the problems of "21st century problems" of urbanisation, globalisation, and climate change in a changing urban society, culture and environment. The "present-day urban society" (Nas, 2002, p.4) of Indonesian cities is in the midst of these struggles, where Kusno (2000, p.212) observes, "the city is less the object of national discourses, but is, instead, its subject which is actively involved in the making and unmaking of cultures and identities, in producing national subjects that are both obedient and 'modern'." In order to transform the country development, nationally, the President of Indonesia Joko Widodo introduced the "mental revolution" in his administration.

The specificities of Indonesian cities also provide an opportunity to engage in research on the current dynamics of urban governance in Indonesia. As Indonesian national politics has shifted from authoritarian post-Suharto towards a democratic era, more participatory modes of governance, such as public participation and inclusive planning, have occurred at different levels of governance. The annual development planning framework recently shifted from top-down intervention to a more bottom-up planning process that gives greater participation to the public, from the household level to the city level to the national level, to participate in the process. This transition also provides the opportunity for engaging the public in the adaptation planning process so that it becomes more inclusive and builds a participatory process that elaborate individuals and local communities, including poor and vulnerable groups, to become active in planning, managing, and evaluating the annual plan.

Experimental context

The experimental context of two Indonesian cities, Semarang and Bandar Lampung, as case studies provide two backgrounds on the basis of (i) Urban resilience as urban climate experimentation, (ii) De-centring climate experimentation

from decarbonisation in Global North to climate change adaptation and resilience in Urban South, and (iii) Urban governance context in Indonesia.

The urban governance context has arguably influenced how urban climate experimentation in Indonesia has been enacted, observed, and reconfigured. Indonesia was colonised by the Dutch in 1602. Under Dutch rule, it was only at the beginning of the 20th century that urban areas (cities and towns) became the project of colonial governments. During this period, there was expansive infrastructure development across the country, and mainly in urban coastal areas, including train and road transportation, ports, and postal services. The struggle for development and identity continued to emerge even during the post-colonial period.

During the New Order regime between 1966 and 1998, Indonesia was arguably "one of the most liberal countries in the world" (Basri, 2012, p.35). Under President Soeharto, Indonesia became 'extremely' open to foreign capital and involved in global economic diplomacy, including by rejoining the United Nations, the World Bank and the International Monetary Fund (IMF) (Basri, 2012). Indonesia had also enhance economic liberalisation by introducing trade reforms, deregulation and full privatisation, especially in the 1990s (Basri, 2012). In the aftermath of the 1997-1998 Asian financial crisis, Indonesia's trade regime even "became increasingly open and 'extremely' liberal", especially as part of IMF's policy (Basri, 2012, p.38).

After the Reformation Era, the post-Soeharto regime which ruled from 1966 to 1998, Indonesia continued its transformations of a new paradigm in development. This development included reducing the role of government and enhancing individual capacity. Decentralisation become the new mode of governance, whereby sub-national governments have the authority for programme formulation. However, at some points, there were still some limitations, such as control of the financial budget by the national government. This Reformation Era also brought a new style of management at the city level. Some Indonesian scholars (Hudalah *et al.*, 2014; Fahmi *et al.*, 2016) argue that Indonesia cities' governments are practising entrepreneurial attitudes, cooperation and partnerships in a participatory process that has extended its project of neoliberalisation not only as an economic policy but also as a mode of governance which include new urban management practices and individual freedoms.

In the context of urban climate experimentation, both cities were also exemplified as early adopter cities to have started to undertake urban climate

experiments, which involved an attempt to test and explore new ways of adaptation planning in order to promote urban resilience. Climate change adaptation and resilience projects in ACCCRN are arguably part of urban climate experiments (Reed *et al.*, 2015). In 2009, amid a lack of adaptation protocols or guidance, ACCCRN cities commenced an initiative to experiment with adaptation planning and actions. The initiative experimented to implement an integral tool for analysing multiple urban systems, interlinking with vulnerability and agent capacity, and focusing on stability to future stressors (Moench *et al.*, 2011).

Figure 3.2 Cyclical adaptation planning

(Source: Brown *et al.*, 2012)

ACCCRN followed a cyclical adaptation planning that begins with stakeholder engagement, followed by undertaking assessment and sector studies, planning for a city resilience strategy, implementing multi-actors' collaborative interventions and ending up with learning, synthesis, and evaluation (Brown et al, 2012) – see Figure 3.2. This process is iterative in order to understand both city vulnerability and responses for building urban climate change resilience and immediately provide a channel for inclusive decision-making and participation from broader stakeholders in the cities of the case studies (Tyler and Moench, 2012).

Projects context

There are six projects that are discussed in the thesis. In both cities, the study is also particularly interested in resilience projects as urban climate change experiments and in relation to governmentality (Reed *et al.*, 2015). It was reported that from 2011, ACCCRN provided grant funding to support the implementation of City

Resilience Strategies at the city level (Reed *et al.*, 2015). In Indonesia, all of the project ideas were initially designed and developed by local stakeholders at the city level, assisted by MercyCorps Indonesia. The City Team, through MercyCorps Indonesia, submitted to The Rockefeller Foundation who then decided and approved the projects on a case-by-case basis based on donor funding criteria. As of January 2014, it was reported that The Rockefeller Foundation had approved and funded 36 city projects in 10 core ACCCRN cities with total grant support of $15.5 million USD (The Rockefeller Foundation, 2014). The type of project was a combination of "hard" and "soft" measures to address climate change problems in more than one sector in a single intervention (The Rockefeller Foundation, 2014).

In relation to the theoretical concepts, all these projects are discussed in relevance with governing rationalities, techniques, and subjectivities (see Table 3.2). The six city projects provide a thorough analytical opportunity to engage and evaluate the process of building urban climate change resilience. As argued by Reed and her colleagues from ACCCRN (2014, p.478) as follows "project themselves do not build resilience and cannot be transferred from context to context." In the discussion chapters, two projects from Semarang and Bandar Lampung are discussed to understand how the act of seeing, thinking, acting, and forming has been invested in the process of governing of urban resilience. The six city projects' objectives and timeframe in Indonesia are briefly explained in the following summary:

1. Online health information system (ACTIVED)

This project focuses on public health. It was implemented from January 2013 to December 2015 led by Health Agency Semarang. The ACTIVED project aimed to "build the health sector's climate resilience by reducing the incidence of vector-borne diseases" (The Rockefeller Foundation, 2014, p.27). The ACTIVED Project objectives are to strengthen the online health information system and early warning for dengue fever. It was conducted with different activities, from conducting a health and climate vulnerability assessment, capacity building for the health officers and pilot projects for preventive and responsive actions in the local neighbourhood.

2. Flood early warning system (FEWS)

This project focuses on disaster management. It was implemented from January 2012 to December 2014 led by Local Development Planning Board (BAPPEDA) and Environmental Board of Semarang. The FEWS project aimed to "reduce

vulnerability to and impact of flood disasters by building preparedness capacity of the most vulnerable communities and local government" (The Rockefeller Foundation, 2014, p.24). The key activities in the FEWS Project involved disaster risk assessment, development of flood forecasting system and shelters, training and pilot project.

3. Sustainable livelihoods (MANGROVE)

This project focuses on conservation. The project is titled "Enhancing Coastal Resilience by Strengthening Mangrove Ecosystem Services and Developing Sustainable Livelihoods in Semarang City", hereafter the Mangrove Project. It was implemented from January 2013 to December 2016 led by Semarang City Marine Affairs and Fisheries Department (DKP). The MANGROVE project aimed to "strengthen the mangrove ecosystem and develop alternative livelihoods for poor and vulnerable people living in 4 coastal sub-districts of Semarang" (The Rockefeller Foundation, 2014, p.28).

4. Climate education (EDUCATION)

This project focuses on climate education for teachers and students in Bandar Lampung. The project known as "Strengthening and Empowering Teachers and Student Capacities in Urban Climate Change Resilience (UCCR)" was implemented in Bandar Lampung, hereafter known as the Education Project. It was implemented from January 2012 to December 2014, led by the Project Management Unit, where the University of Lampung (UNILA) was the main implementer. The Education Project aimed to "increase climate change adaptive capacity of teachers and students through education with an ultimate goal to integrate climate change into national curriculum" (The Rockefeller Foundation, 2014, p.23).

5. Waste social business (TRASH TO CASH/T2C)

This project focuses on waste management and entrepreneurial development. It was implemented from January to July 2014 led by MercyCorps Indonesia. The T2C project aimed to "reduce flooding and health risks associated with climate change and waste management whilst helping… the fisherman through income generation opportunities provided by a waste bank" (The Rockefeller Foundation, 2014, p.24).

Table 3.2 Climate change adaptation and resilience projects

Components	Semarang projects			Bandar Lampung projects		
	ACTIVED	**MANGROVE**	**FEWS**	**EDUCATION**	**T2C**	**BIOPORE**
1. Rationalities	Non-deterministic future, Anticipation	Reactivity	Anticipation, Survival	Survival	Reactivity	Survival
2. Techniques	Calculation	Commodification	Individualization	Individualization	Commodification, Deregulation	Individualization
3. Subjectivities	Survival subject	Adaptable subject	Survival subject	Adaptable subject	Survival subject	Adaptable subject
4. Lead agencies	Health Agency	BINTARI, Prenjak Community Group	Disaster Management Agency, Disaster Preparedness Groups	Education Agency	Waste Bank	Mitra Bentala, Biopore Information House
5. Urban sectors	Health	Conservation	Disaster management	Education	Waste	Water

Source: The author

6. Water conservation (BIOPORE)

This project focuses on water conservation and rainwater management. It was implemented from January 2012 to April 2014 and led by the Local Development Planning Board (BAPPEDA) of Bandar Lampung. The BIOPORE project aimed to "reduce flood potential, increase groundwater quantity, and accelerate soil infiltration capacity by implementing an artificial groundwater recharged method" (The Rockefeller Foundation, 2014, p.22). During the pilot implementation, the Project installed approximately 20,000 biopore holes in pilot sub-districts. The project extended to city-wide implementation by installing 80,000 biopore holes to increase groundwater recharge.

3.3. Research methods

The research study employed qualitative research methods with data collection involving semi-structured interviews, policy and project document collection, observation and site visits, and research notes. The initial stage of the research involved a process for refining a research proposal, literature review and developing research methods during the first year from January 2015 to February 2016. The research proposal has received feedback and comments from doctoral supervisors and gained invaluable review and comments during the first year's Postgraduate Seminar and Progression interview. Data collection and fieldwork were undertaken afterwards for 7.5 months from March to October 2016 in which both internal reviewers and the Research Ethics Geography Sub-Committee (REGS) approved the research proposal and ethical considerations. The fieldwork mostly involved data collection and fieldwork in Indonesian cities, including Semarang, Bandar Lampung, Jakarta and Bandung. The data collection was conducted to precede the formal project termination of ACCCRN at the end of 2016; otherwise, most project partners would no longer be involved in the ACCCRN programme. During the fieldwork, I worked with city-working groups in both cities, Bandar Lampung and Semarang, and Mercy Corps, an international non-government organisation that managed ACCCRN in Indonesia. City-working groups are an ad hoc body of local stakeholders who are managing, supervising, and monitoring the local implementation of the ACCCRN programme in each city (Nugraha and Lassa, 2018) for which engaging with them is useful to gain deeper and intrinsic insights into the programme implementation, progress, and challenges. The process for research analysis and writing up the thesis

was undertaken after returning from fieldwork starting from November 2016, discussed in more detail in Section 3.4.

In this study, research methods that were employed or applied in order to collect data are associated with the research objectives described in Chapter 1. In general, the research methods for data collection and fieldwork in this study involved: (i) Semi-structured interviews with local stakeholders in Bandar Lampung and Semarang, project managers in Jakarta, donor managers in London and Bangkok[8], project partners and policy experts, (ii) Ethnographic field research, and (iii) Policy and project document collections. The selection of research methods for data collection is to correspond with the design of research described in Table 1.2 Research Framework in Chapter 1. Each research method correlates with the data and analytical approaches appropriated to analyse, evaluate, and examine the specific research objectives associated with the data collected. For example, observation is part of the ethnographic field research conducted to inform and gain life processes on how urban individuals make sense, act, and exemplify a kind of subjectivity.

There have been considerable studies on the challenges of translation in qualitative research (Pen˜a, 2007; Van Nes *et al.*, 2010) and how a researcher should address language translation in their research. In terms of "resilience" during this qualitative research, I have to strategically select the closest synonym to aid my semi-structured interviews. While at the programme level within ACCCRN and internal programme documents, resilience, as understood in the original English, is considered highly visible in the project and policy documents; however, there is no single useful translation of resilience at the time of fieldwork as that aided data collection through semi-structured interviews with local leaders and residents. As discussed in Section 2.3.1 in Chapter 2, there are different translations of resilience in the Indonesian language. I have used several synonyms of resilience in the Indonesian language, including "tangguh" (strong) and "pulih" (recover) to convey and reflect what I mean when discussing it and, more importantly, to avoid loss of meaning when conducting interviews with people who have not engaged within the internal management of the ACCCRN programme, such as school teachers, NGO managers, local leaders, and local residents. As I am a native Indonesian, I was able

[8] Some semi-structured interviews were actually conducted via Skype due to technical and financial limitations to travel to the respondents' office.

to directly communicate with research respondents in Indonesia and used English to communicate with international project partners.

Moreover, as explained, these data collections are in relation to the research objectives. More specifically, these methods are associated with the objectives in the earlier sections in Chapter 1 as follows:

1. *Objective 1: to evaluate rationality(ies) that inform the experimentation of urban resilience.* Research methods for this objective include semi-structured interviews and policy and project documents. Local stakeholders that were interviewed during the fieldwork are (see Appendix for details list) key persons that are involved in working groups in each city (Bandar Lampung and Semarang), ACCCRN managers from MercyCorps in Jakarta, ACCCRN staff members from The Rockefeller Foundations in Bangkok, ACCCRN staff members from Arup, International Institute for Environment and Development, and the Institute for Social and Environmental Transition (ISET) in and Bangkok and local project partners who managed ACCCRN project in each city, including education, biopore and trash-to-cash projects in Bandar Lampung and health and flood early warning system projects in Semarang.
2. *Objective 2: to analyse who the actors are and what kind of urban institutions are deployed to manage urban resilience.* Research methods for this objective include semi-structured interviews, observation and policy and project documents. Even though these methods have similar target groups and projects to objective one, but, in practice, the fieldwork was conducted with a different set of questions and observations to the respondents aligning with objective two. I also attended local meetings and project activities to understand who engaged in the adaptation planning and how the urban climate governance was managed and reconfigured within both cities.
3. *Objective 3: to evaluate subjectivity(ies) that are sustained to manage urban population for building urban resilience.* Research methods for this objective include semi-structured interviews, observation and site visits, and analysing policy and project documents. Even though these methods have similar target groups and projects to objectives one and two, but, in practice, the fieldwork was conducted with a different set of questions and observations that was delivered to the respondents, aligning with objective three.

More specifically, the research methods that was employed and applied in this study are described in more detail account as follows:

1. Semi-structured interviews

Both cities, Semarang and Bandar Lampung, established an ad hoc multi-stakeholder working group for managing and supervising adaptation planning. They worked together among scientists, intermediary groups, and the wider public to co-produce knowledge (Callon, 1999). Crang and Cook (2007) mention that time and place are some of the most considered in the early stage of research, and a researcher needs to consider people have valuable time in their work and daily lives. During fieldwork, I interviewed respondents at the most appropriate time and place where the interviewees agreed. I conducted semi-structured interviews in respondents' offices, houses, schools, and in the field near a mangrove site, wherever a respondent felt comfortable being interviewed and would like to be represented in the research. For example, during an interview with the local leader of Prenjak Mangrove Conservation Group, Rasdi[9] asked to meet at his mangrove site, and not only that, he took me for a short trip along the coast of North Semarang to show the coastal erosion in the past few decades but also to convey a clear message of his struggle to maintain the future mangrove site in oppose with a local plan by business investor. Interviewing the project managers from MercyCorps Indonesia also helped me to understand better the ACCCRN projects' design and implementation in Indonesia. It is clear that different respondents have different political and organisational roles in the programme management and Implementation. Even though I have carefully approached all research respondents but, not all interviews are considered successful; for example, during the fieldwork two respondents rejected interviews. In order to fill the gaps from these rejections, I approached different respondents to capture the initial purpose of the interviews and successfully gained the data and information needed. The full list of respondents is provided in the Appendix, which includes Jakarta, Bandung, Semarang and Bandar Lampung in Indonesia, Bangkok in Thailand and via Skype. Some quotes derived from interviews are notified as personal communication in the thesis.

[9] The person's name is pseudonym.

At the end of my visits to both cities, Semarang and Bandar Lampung, I conducted group presentations with local respondents. The group presentations were held with six to eight people with local key stakeholders, who are part of the working group and representing at least city officials, academic, and civil society organisation staff members, which have been an important part of my research as a forum for interaction, discussion and dissemination arising from the research. During these presentations in each city, participants have an opportunity to listen to what I have done during my fieldwork, what discussions I have covered during my research, and what research summaries I have collected so far, and they have participated in giving feedback and comments on the research. The further aims of this initiative are also to provide research insights, which might be useful for further planning and implementation of the ACCCRN programme in each city. These participants were also the ones who were involved in the adaptation planning process and arguably have the most knowledge and understanding of how the urban climate governance was managed and reconfigured within both cities, Semarang and Bandar Lampung.

This study aimed to be participative and inclusive by employing participatory techniques, such as semi-structured interviews. In the study, a plurality of knowledge (Kindon *et al.*, 2007) is mostly valued to give participants the power and voice to analyse themselves the daily life that they experienced. The research is not designed for participatory research but using participatory approaches such as interviews is particularly useful for giving inclusive engagement from participants in the research. During my fieldwork, I worked closely with MercyCorps Indonesia in order to have direct communication with project officers, received recommendations for targeting key stakeholders and data collection and managed inter-city site visits and closely communicated with the city-working groups.

2. Policy and project documents

In the study of the analytics of government, Walters (2012, p.57-58) suggests that it should "start with the documents, reports, testimonies and so on that circulate in these milieux, with the proposals for revised or new practices which they outline, and the politics, programmes and strategies which take them up, contest them." Policy and project documents that were collected are project proposals, project studies and reports including vulnerability assessment, climate action plans, sector studies, and policy documents, such as national government regulations, city plans

and budgeting, mid-term development plans, and climate change adaptation-related regulations. These documents were collected with an open request to different sources, including programme donors, international partners, national coordinators, local governments such as Semarang Development Planning Agency, local project partners such as Mitra Bentala, Kemijen Community Empowerment Body (BKM), as well as local residents. Most of the policy and project documents were successfully collected except for data that was lost completely due to a fire a couple of years ago and had no digital records. These documents are then classified into different folders storage for the purpose of policy and project document evaluation. In general, policy and project documents that were collected can be classified into three different groups: (i) Project documents that inform the design, planning, and management of ACCCRN programme in general and in the context of Indonesia, (ii) Local regulations and planning documents that inform how resilience plans and actions from ACCCRN were accommodated in the local policies (see Appendix 5), and (iii) Learning documents from ACCCRN which informs lesson learned, success stories and challenges from resilience projects that were conducted.

3. Observations and site visits

Crang and Cook (2007, p.37) mention that observation plays an important role in understanding "the ways of life of actual people in the contexts of their everyday lived experiences." They (Crang and Cook, 2007) recalled the importance of the researcher not only as a participant or observer but also in developing a bridging relationship of intersubjective between *the researcher* and *the research*. I have attended some events during my fieldwork in Indonesia: (1) Semarang: ACCCRN Learning Forum, Launching of City Resilience Strategy (CRS), Annual Development Planning Meeting (MUSRENBANG), (2) Bandar Lampung: City Team Meeting, Launching of Waste Bank and Dissemination of Waste Bank; and (3) Jakarta: Resilient City Workshop by the Ministry of Public Works. During these events, I participated and observed how the discussions emerged and evolved during the event, as well as interacted with research participants to gain insights into what they thought about the events. I also attended local project activities to understand, participate in and build connections with local communities regarding their resilience project activities, for example, during a collection day at Waste Bank, as shown in Figure 3.3.

Figure 3.3 Collection day at the Waste Bank

(Source: The author)

4. Research notes

Mainly used for participant-observers, research diaries, also known as a field diary and notebooks, serve for different reasons: records of the researcher's daily learning, to make sense of research settings and (mis)understanding and stand for virtual physical present imaginations (Crang and Cook, 2007). These research diaries also serve as a live-emerging-thoughts, both channelling the researcher and researched. I have kept research notes for the collections of thoughts, ideas and fieldwork understanding during my fieldwork in Indonesia. I kept research notes throughout my fieldwork and during different data collection activities, such as semi-structured interviews, observations, and site visits. The research notes are a written recorded medium where I stored my immediate responses and posted follow-up questions to the participants' interview responses, which I could interact with later when I was revisiting it. I also have used the research notes to draw diagrams from my interviews and site visit observation and use them to build an interactive discussion with my respondents. While writing this thesis, the research notes also helped me to recollect memories and reflect from my conversations with local respondents and project events in both cities.

3.4. Research analysis

This section discusses research analysis undertaken in this study, which includes (i) Governmentality analysis, or the analytics of government, to investigate the "technology of power" and focuses on "how we govern and are govern within different regimes" (Dean, 2010, p.33), and (ii) Data coding or transcript analysis. Data coding or transcript analysis involves the iterative procedure for developing open codes, investigating antagonism, similarities and causalities, and drawing code maps with all transcripts, diaries and FGD reports (Crang and Cook, 2007). In my research, since I was comparing two cities in Indonesia, thinking about comparative research helped me to analyse and evaluate my data. McFarlane (2010) discusses that comparative research not only brings into account the similarities and differences but also examines the patterns of reality for understanding connection and causality for different case studies.

In this study, I have employed two research analyses to analyse my data:

1. **Governmentality analysis or the analytics of government**

Foucault explains that central to governmentality analysis is to investigate the "technology of power" and the problem of the state and population. The focus of the analytics of governmentality is on "*how* we govern and are govern within different regimes" (Dean, 2010, p.33). Foucault offers three specific strategies on how governmentality is used to understand behind an act of governing, which involves: (i) *Moving from the institutional-centric approach*, which means undertaking an analysis that goes beyond the problematic of the institution and discover a wider perspective on the "technology of power" (ii) *Focus on the function*, which means contextualising the analysis around the "general economy of power" (2009, p.118) (iii) *De-centring the object*, which means move away from the fact that measuring "institutions, practices and knowledge in terms of the criteria and norms of an already given object" (2009, p.118).

In order to investigate my data, I have used the analytics of government as my conceptual analytical framework to analyse and evaluate my research data. In my research, I have employed governmentality as "a set of methodological and conceptual guidelines" (Walters, 2012, p.40), which means using governmentality as an analytical tool to analyse strategies and practices for which urban climate experiments are managed and reconfigured in urban lives. The research focuses on

several aspects of governmentality (Miller and Rose, 2008, p.16) or regimes of practices (Dean, 2010), including (i) *Rationalities*, as styles of thinking, ways of rendering reality – in this research means climate change adaptation – thinkable or problematise in such a way that it was amenable to calculation and programming, and (ii) *Technologies or techne of government*, which mean as assemblages of persons, techniques, instruments for the conducting of conduct, or regimes of practice or milieu of thought in which urban climate experiments become visible and manageable. Using governmentality analysis, this study analysed how urban climate experiments have been contextualised and reconfigured within the urban lives and in the thesis's discussion chapters, more details in Chapters 4 to 6, it covers how population is going to be governed, who will be involved in governing them, what measures need to be implemented, by whom and how, what kind of rationalities are implied in urban adaptation, what does it mean for governing people and what mechanism are required for managing risks.

2. Data coding or transcript analysis

While governmentality analysis informed the conceptual framework of research analysis, data coding or transcript analysis informed the technical analytical framework in my research. Data coding or transcript analysis involves an iterative procedure for developing open codes, investigating antagonism, similarities and causalities, and drawing code maps with all transcripts, project and policy documents (Crang and Cook, 2007). I used NVivo software, see Appendix 6, to help me analyse all materials collected and undertake data coding and transcript analysis. During this process, I have also helped by thinking about my research analysis with comparative research. Again, comparative research is not only brings into account the similarities and differences but also examines the patterns of reality for understanding connection and causality for different case studies (McFarlane, 2010). Its function for a variety of reasons: to fill a gap in understanding, reveal the distinctiveness of a case, place a case in a broader context and reveal the generality or particularity of a process or theme (McFarlane, 2010). Using the case study from two cities in Indonesia, the research analyses have reviewed that "difference needs to be viewed less a problem to be avoided and more as productive means for conceptualizing contemporary urbanism" (McFarlane and Robinson, 2013, p.767). However, data coding or transcript analysis only informs the 'technical' aspect of the research

analysis. More importantly, the research writing aided to think more critically and more effectively in analysing and evaluating the data. The iterative process of writing itself and the discussions that I have had with my supervisors have also been beneficial when conceptualising this thesis.

3.5. Research ethics and confidentiality

This section discusses the ethical considerations of the research, including consent form to all stakeholders, a written and/or verbal summary of my research and data protection. The research interventions that directly involve the informants are the semi-structured interviews. This section also discusses the Chatham House Rule, a mechanism for data protection, management, and storing, which protect privacy.

The research carefully considered the relationships and power between the researcher and participants in different ways: informed consent, natural environments, and local conflict (Orb *et al.*, 2000; Shaw, 2003). This research involved human subjects and with so requires appropriate ethical considerations, such as a consent form to all stakeholders, a written and/or verbal summary of my research and data protection. All research participants have copies of the written consent and are protected against any abuse that might arise in the research. While the research explores and examines the local activities of how participants conducted their lives, I never conducted the research in invasive ways and always required participants' consent before entering the local events and activities as well as before visiting their natural environments.

Pressure has arisen between government agencies and non-government organisations when discussing sensitive projects in both cities. Both institutions, which were not specific to any single organisation, have a long track record of tension and disagreement over the politics and governance of local development, even before the research was conducted. For example, the different opinions of how waste management should be conducted have been expressed differently between the government staff members, which supports a more market-based approach and non-government staff compared to a non-government staff member, which supports a local-based approach. During my fieldwork, I never conducted semi-structured interviews where both parties, government agencies and non-government organisations, were present in order to provide a secure and trusted room for freedom of expression. During an event where both parties exist together such as a group

presentation, in order to avoid conflicts, all of my informants will automatically become anonymous and a consent agreement has been set up at the inception of the event where all respondents have agreed under the Chatham House Rule. This Chatham House Rule is to encourage openness and sharing of information under a conducive and protective environment, which is described as follows:

> "When a meeting, or part thereof, is held under the Chatham House Rule, participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed" (Chatham House Rule, 2014).

In accordance with the General Data Protection Regulation (GPDR) European Union 2016/679 that regulates data protection and privacy for all individuals in this research, this study has considered data protection and individual data, as suggested by Shaw (2003). Management and storing of data are managed into protected folders with password-protected for files that contain data about individuals. The use of pseudonyms was chosen in the thesis in order to protect the research respondents' identities. When a pseudonym is used in the thesis, it is indicated with a footnote.

Chapter 4: The birth of resilience governmentality

"Political rationality is… the condition of possibility
and legitimacy of its instruments, the field of normative reason from
which governing is forged."
(Brown, 2015, p.116)

4.1. Introduction

Rather than seeing resilience within its singular history as a unified and stable object of the phenomenon, this first discussion chapter analyses urban climate change resilience as a political or governing rationality. Within this line of inquiry, the study aimed to examine styles of thinking and ways of reasoning in which a regime of practices of urban climate change resilience is being enacted, reconfigured, and practised. While this chapter discusses some examples from ACCCRN at the programme and project level, the purpose is to understand how climate change becomes an object of seeing and knowing before calculative technologies can be enacted (which is further discussed in Chapter 5). As discussed in the previous chapters, building urban climate change resilience so far has been discussed as technical and programmatic solutions to adapt and respond to climate change risks (see, for example: Hallegate and Engle (2018); Jha *et al.* (2013); Prasad *et al.* (2009)). However, the thesis argues that there is no singularity upon which resilience exists as an order of reason in a changing climate world. In order to understand how climate change has become a problem that needs to be addressed or solved and governmental programmes can be enacted, this chapter offers an analysis of multiple tacit premises and assumptions upon which urban climate change resilience is rationalised – problematised, contained and calculated – within ACCCRN, both at programme and projects level.

This chapter discusses the first research objective of the study: "to evaluate rationality(ies) that inform the experimentation of urban resilience." In the analytics of government, rationality involves different ways of thinking and knowing around the problematisation of climate change as the problems that need to be solved and

calculated, visibility of urban climate change resilience to be seen as a regime of truth to solve the problems and different kinds of knowledge-power. The rationality of government is concerned with various forms of thought to rationalise the practice and techniques in relation to particular governing objectives and problems of (urban) life (Dean, 2010). More specifically, some research questions that were analysed in this chapter are the following: (1) How do building urban climate change resilience become visible in ACCCRN, (2) What forms of knowledge that arose from and informed the experimentation of resilience in Indonesia, and (3) How does resilience thinking seek to render particular climate change problems governable?

As discussed in the previous chapters, the approach to studying urban climate change resilience in this study is through the analytics of governments in order to understand resilience in ACCCRN as political order or order of reason. In order to do that, the discussion in this chapter appears as sequential discussions engaging with the above research questions and some case studies. The structure of this chapter begins with the analysis and discussions that concern ACCCRN at the programme level. Section 4.2 analyses and examines how ACCCRN questions climate change as a problem that needs to be solved or addressed, how the notion of resilience became visible, and who the authorities that define the phenomena as a problem. It follows with Section 4.3, which focuses on analysing and examining two resilience projects in Semarang and Bandar Lampung to evaluate a variety of rationalities or forms of reason that inform different experimentation of urban climate resilience in both cities. More specifically, both resilience projects conducted in ACCCRN cities in Indonesia inform how resilience thinking seeks to render particular climate problems thinkable and governable as well as how "we conduct government and how we govern conduct" (Dean, 2010, p.38), for example, what specific criteria are in place to define how specific groups of population will require specific forms of conduct. The chapter evaluates whether the experimentation of urban climate resilience in these projects supports or contradicts resilience rationalities at the programme level in ACCCRN. These two sections are followed by a conceptual section about resilience governmentality in Section 4.4, where it introduces ACCCRN as an effort which has engaged with a distinctive form of governmentality. There are different mentalities that are invested in the process of governing within the ACCCRN programme and projects, taking examples from Indonesian cities. The last section summarises these analyses and discussions as well as introduces further discussions

on how the resilience apparatus is assembled into different forms of organisation and institutional practices within ACCCRN in the next chapter.

4.2. Seeing resilience in ACCCRN

This section offers an analysis into a broader context of how "resilience" is seen in ACCCRN, at the programme level, as governing rationalities to solve the 'problems' of climate change. This section focuses on 'seeing resilience', which is defined as ways of thinking and knowing the problems of climate change and multiple premises and assumptions for which building urban climate change resilience becomes visible, thinkable, and doable in ACCCRN programme design, guidelines and assessment. The 'problems' with climate change in cities of the urban south are arguably not 'pre-given' and 'waiting to be revealed' (Miller and Rose, 2008, p.14) but also have to be made visible and constructed in order for urban climate change resilience to rise as order of reason to solve the problems of the climate. And consequently, as Bulkeley *et al.* (2015, p.43) argue, "solutions confer authority and agency", which informs us of the changing relationship and dynamic between the ideals of government and those who or what is being governed.

Similarly to François Ewald's (1991, p.199 - original emphasis) famous phrase, "Nothing is a risk in itself; there is no risk in reality… anything *can* be a risk", it is understood here that nothing is in resilience itself, anything can be constructed, governed and reconfigured to become part of the governmentalization of resilience. As explained earlier in the thesis (see Section 2.3.2 in Chapter 2), the thesis rejects the notion of resilience as something that *already* exists out there in the urban world. Instead, in this analysis, the thesis discusses how 'things' are being evaluated, ordered, and characterised through "a schema of rationality" to rearrange "certain elements of reality" (Ewald, 1991, p.199) of how the ACCCRN programme considers climate change as the problems that need to be solved, the adoption of resilience as new 'vocabulary' of managing and responding to the problems of climate change, and the practices of vulnerability assessment to render climate change problems governable. In the following sub-sections, the thesis undertakes analysis at the programme level to exemplify different ways of thinking and knowing in ACCCRN before turning in the discussion and analysis with two resilience projects in Semarang and Bandar Lampung in more detail.

4.2.1. Problematising climate change

Climate change has arguably become a new problematisation within urban spaces, defined here as the way in which the urban population is governed, who will be involved in governing them, what measures are to be implemented, by whom and how. It involves the production of truth and particular kinds of rationalities in cities and through urban populations to give rise to resilience initiatives. Resilience is understood here, not as apolitical. In this sub-section, the thesis evaluates climate change risks as a fact that they are never value-free, static or objective phenomena but rather are always products of ways of seeing that inform us how climate change is "a problem that can be analysed and solved" (Pettenger, 2007, p.2). Climate change needs to be examined more broadly as part of "the network of social interaction and the formation of meaning" (Lupton, 1999, p.29).

In problematising climate change, The Rockefeller Foundation has arguably re-territorialised climate change as a problem of increasing concentration of greenhouse gas in the atmosphere for which Indonesia is one of the biggest carbon emitters in the world (Grantham Institute, 2017) to the problems of responding and adapting to climate change impacts. In the *Rockefeller Foundation White Paper* on *Building Climate Change Resilience*, the Foundation recognises that while "most of the global attention on climate change has been focused on reducing greenhouse gasses… we realise that impacts of climate change have already begun to manifest…" (The Rockefeller Foundation, 2009, p.1). The Foundation emphasises that "there are [already] irreversible impacts that will continue and worsen within our lifetimes" from climate change (The Rockefeller Foundation, 2009, p.1). In the context of Indonesia, Joanne[10], a Senior Associate from the Rockefeller Foundation, explains, "Climate change in Indonesia context, people would think of like… sort of narrative like forestry, even though it was such a huge level of vulnerability to climate impacts." (Personal communication, 26 October 2016) Joanne further explains the problem with climate change is more a "hazard context" in which urban spaces are becoming more susceptible to climate change impacts.

Moreover, it is "beyond the shadow of a doubt", Judith Rodin, former president of The Rockefeller Foundation, explains in her plenary lecture at the American Association for the Advancement of Science 2018 Annual Meeting that "a climate

[10] This is a pseudonym.

crisis is upon us" (Rodin, 2008, p.1). However, this climate crisis is defined more as challenges of the urban, particularly in Asian cities. In ACCCRN, understanding the complex interaction of direct and indirect consequences of climate change impacts, urban systems, and vulnerability is an integral process before implementing any actions towards mitigating climate change impacts (ACCCRN, 2009b). Given that, Peter[11], a senior associate from the Institute for Social and Environmental Transition (ISET), the lead facilitation organisation partner of ACCCRN, suggests that initially, second-tier cites "were quite unfamiliar with the climate change issues, or at least, certainly had no clear idea what to about it" (Personal communication, 7 November 2016). As a result, Joanne reflected ACCCRN as a space of intervention upon which it tries to figure "how is climate change kind of affects *the future* for that in the city and that for, what we should be doing" (Personal communication, 26 October 2016 – emphasis added). However, what kind of future(s)? In its report, ACCCRN (2009b, - emphasis added) discusses in the following quote how knowing the future is moderated in the programme:

> "Uncertainty in climate change projections for ACCCRN cities is challenging them to explore innovative actions and strategies that are capable of being resilient against a wide range of climate conditions, rather than relying on traditional approaches to planning and engineering that assume the future climate… ACCCRN works with city partners to identify the broad trends and ranges of climate projections… and to develop resilience strategies around multiple *what-if* climate scenarios that *do not depend on precise knowledge of the future* … cities as intricate systems whose components interact in *complex and unpredictable ways*" (pp.4-5).

In a broader sense, from the above quote, ACCCRN problematises climate change as a non-deterministic future. There is no possibility upon which to 'picture' the "precise knowledge of the future" (ACCCRN, 2009b, p.4) of climate change at the city level. "The case of climate change", explained by da Silva and Moench (2010, p.5), who are from ACCCRN international partners of Arup International Development and Institute for Social and Environmental Transition, respectively, "where specific impacts cities will face are often highly uncertain and will be

[11] This is a pseudonym.

compounded by equally dynamic patterns of urbanization." Consequently, ACCCRN assumes there would be no single climate future. It is not a matter of acquiring more data, statistics, information, measurements or better projections about future climates, but the future itself will always be unpredictable within the complex nature of cities.

Climate change thus becomes an event that will need to be managed, contained, and governed within urban spaces. Climate change problematised in ACCCRN is not only an urban crisis but also an invitation to engage with a new style of thinking that embraces non-deterministic and uncertain futures. For example, one of the key elements to prepare for climate change in ACCCRN cities is to prepare for 'safe failure', which is defined as the "ability to absorb sudden shocks… or the cumulative effects of slow-onset stress in ways that avoid catastrophic failure" (Tyler and Moench, 2012, p.313). In this sense, framing climate change as unpredictable and uncertain doesn't mean the end of history for which urban life has to surrender under catastrophic climatic futures. Moreover, as Judith Rodin argues, what we needed are "better weapons – new tools, techniques and strategies … to tame the three-headed hydra of climate risk, poverty and precipitous urbanization" (Rodin, 2008, p.6).

4.2.2. Adopting resilience

In the *Rockefeller Foundation White Paper* on *Building Climate Change Resilience*, it is clear that the Foundation has a strong emphasis on replacing climate change adaptation with resilience terms (see indented quotation). The Rockefeller Foundation's adoption of resilience is a response to the Intergovernmental Panel on Climate Change (IPCC) definition of climate change adaptation in the fourth assessment report. It was described by the IPCC, quoted by The Rockefeller Foundation, climate change adaptation is "an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, and adjustment that moderates harm or exploits beneficial opportunities" (The Rockefeller Foundation, 2009, p.2). The Foundation attempted to re-emphasise actions to climate change impacts from something that is singular or linear within 'history' (understood as climate change "adaptation") of building climate resilience that emerges as a continual process of adjustments (described as "capacity over time") to non-deterministic climate futures (described as "difficult to predict"). When I asked

Tracy[12], a former senior associate at The Rockefeller Foundation, about how resilience emerges within the initial conceptual design of the programme, she defined "the whole reason we kind of went with the framing around resilience rather than [climate change] adaptation is because… adaptation is a bit more linear… kind of adapt to something specific" (Personal communication, 22 December 2016). The Rockefeller Foundation (2009) signifies the difference of (climate change) resilience from adaptation as follows:

> "Historically, the term *adaptation* has been used to describe the individual actions required to respond to climate change … Resilience, on the other hand, refers to the *capacity over time* of a system, organization, community, or individual to create, alter and implement *multiple* adaptive actions. We believe that resilience is a more accurate, positive, and comprehensive term, describing the dynamic, systematic transformation that is needed to respond to the consequences of climate change, especially future impacts that are difficult to predict" (p.2 – original emphasis).

Anna Brown and her colleagues (Brown *et al.*, 2012, p.534) from The Rockefeller Foundation reflect building climate resilience more specifically in ACCCRN as follows: "the capacity of an individual, community or institution to dynamically and effectively respond to shifting climate circumstances while continuing to function at an acceptable level." The definition has several attributes on how urban components, including any individual, community or institution, respond to climate change risks as the ability to withstand impacts, ability to recover, and ability to re-organise (Brown *et al.*, 2012) that see building urban climate change resilience as "a commitment to openness" and "nurturing uncertainty" (Brace and Geoghegan, 2010, p.292). However, during interviews, it appears that the transition that The Rockefeller Foundation would like to bring moderated through and by different international partners that have engaged in the programme.

Resilience becomes visible in ACCCRN through iteration of seeing and thinking by the donor and different international partners at the international level and national coordinator, local project partners and communities at the local level. Resilience is understood in ACCCRN beyond the finitude of meanings, but as

[12] This is a pseudonym.

alternatives of urban futures under climate change. Michael[13], senior associate from the International Institute for Environment and Development (IIED), an international partner that is involved in knowledge production and learning, captured it as "what was meant when we say the word resilience… there was a strong effort within the programme to construct and work out the definitive statement about what resilience was" (Personal communication, 22 June 2017).

In ACCCRN, resilience then broadly emerges and evolves more than a new commitment but as ways of seeing, thinking, and knowing the problems of climate change and multiple premises and assumptions for which building urban climate change resilience becomes visible, thinkable, and doable. George[14], a former senior associate at MercyCorps, describes "resilience as a framing" (personal communication, 22 November 2016). His answer was a response to the interview question when I asked him to clarify what he meant by "resilience is not measurable" (George, 22 November 2016). In another research interview I had with Peter, a senior associate at the Institute for Social and Environmental Transition (ISET), he affirms that while the Rockefeller Foundation and ACCCRN programme has totally focused on resilience, he argues, "resilience is not the goal!" (Peter, October 26, 2016). Consequently, resilience as a way of thinking has entered the domains and politics of urban life that informed urban climate experiments as indeterminate and non-causal futures involving governing rationalities. Brace and Geoghegan (2010, p.292) describe this as the conjecture of "a commitment to openness" and "nurturing uncertainty." This ontology of resilience in ACCCRN has a distinguishable stance from other international organisations, such as the World Bank.

Nevertheless, resilience as governing rationality to climate change risks obviously tells us that climate change adaptation is not neutral. Wainwright and Mann (2014, p.318) argue that "the adaptation of the political must inevitably unfold" to potentially help us understand the subjectivity and conjuncture of complex pasts and futures that defined the urban politics and power relations in climate change adaptation. Climate change adaptation is not a neutral agenda. As urban resilience appeared around the flux of diverse actors, motives and agendas, climate change adaptation is practised within which climate is reconfigured and governed. How this has been experimented with in urban resilience is discussed in the next section.

[13] This is a pseudonym.
[14] This is a pseudonym.

4.2.3. Rendering vulnerable

In order for resilience to become realised as governing rationality, the first line of the form of visibility involved "vulnerability assessment." This section discusses the techniques of vulnerability assessment in relation to this kind of knowledge-power that informs ACCCRN at the programmatic level. It is common for building resilience, the formal process to begin with anticipating climate change impacts through a vulnerability assessment. Adger (2006) describes that vulnerability assessment and socio-ecological resilience shared a "common element of interest" reflecting the connection between human and nature systems. He elaborates particularly on the human-environment interaction in both vulnerability and socio-ecological resilience thinking. He criticised that fundamentally the "relationship between vulnerability and both social resilience and the resilience of the ecosystems on which *human* well-being ultimately depends", which is quite different from the risk perspective that focuses on hazards, probability, and disaster events (Adger, 2006, p.277 – emphasis added).

In a catastrophic and forever-changing world, human and natural systems are deemed to build a response to risk and uncertainty within its unstable and open-future possibilities. Climate change vulnerability assessment is engaged more than as a technical assessment to understand "concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt" (IPCC, 2014, p.128). It has been performed for different purposes and developed initially as an impact assessment to estimate the predicted future risks from climate change, and recently as a policy assessment that informs policy-making for future adaptation measures (Füssel and Klein, 2006).

In ACCCRN cities in Indonesia, *Vulnerability Assessment*, hereafter known as VA, facilitates both a process and a product and serves as the basis for taking adaptation actions outlined in the *City Resilience Strategy* (CRS). In 2010, external researchers in Indonesia from the Centre for Climate Risk and Opportunity Management in Southeast Asia Pacific (CCROM SEAP) at Bogor Agriculture University conducted a vulnerability assessment for both cities. In Bandar Lampung, the VA study predicted that the probability of rainfall that would lead to flooding or inundation might increase slightly in in the city (ACCCRN, 2010a). Moreover, the study reported that 16.73% of local residents had been affected by flooding in one of the study areas in Bandar Lampung (ACCCRN, 2010a). In Semarang, rising sea

levels and coastal inundation will increase the vulnerability of local people living in the northern part of the city (ACCCRN, 2010b). With the cities' existing vulnerabilities, including poverty, lack of basic infrastructure and compounding effects from urbanisation and climate risks, the poor and vulnerable communities will suffer most from climate change impacts.

During the VA stage, the dominant actors included scientists or university academics as outsiders, which were facilitated by the external actors funded by ACCCRN. The ACCCRN programme encouraged the scientists to be involved with other actors, including the City Team, local authority, and the general public, during the assessment process. To ensure objective measures of vulnerability, the City Team was represented as a concerned group; nevertheless, in the VA phase, it only functions as an "informant" to the study and as a "facilitator" for coordinating the general process. This practice was depicted rather than considered expert judgement as being the only 'objective, neutral and unbiased assessment' (Lupton, 1999), The ACCCRN process considered vulnerability assessment as negotiated and constructed through social and cultural processes that involved lay judgement. One of ACCCRN's working papers published by ISET titled *Only Death is Certain, Yet You Still Get Out of Bed in the Morning: Or Observation on the Use of Climate Information in Adaptation and Resilience Practice*, describe the relationship between science and lay knowledge (Opitz-Stapleton, 2010):

> "The top-down climate science approach is not well suited for learning from or incorporating the local experiences of individuals and communities. Preliminary adaptation planning experience indicates the need for strong, bottom-up approaches that start with assessments of current vulnerability and a critical examination of the opportunities, constraints, and experiences that guide adaptation behaviours. This bottom-up approach then needs to be meshed with the top-down climate science approach" (p.v).

After conducting a VA, Bandar Lampung and Semarang then outlined their respective climate change adaptation and urban resilience strategies in the *City Resilience Strategy*, known as CRS. The Strategy was "a city-level strategy that equipped the local government to adapt to climate change and outline adaptation actions" (Nugraha, 2014, p.20). The document also functioned as a roadmap and further as a rationality for the city to prepare for the worst-case scenario if climate

change severely impacts the city (Lassa and Nugraha, 2014). Climate change adaptation actions, or more precisely, urban resilience strategies, are built on the basis of an insecure urban world and the urban population's susceptibility to climate change impacts. As evidenced by the following quotation from ACCCRN (ACCCRN, 2009b) in *Responding to the Urban Climate Challenge*, the imaginary future of resilient cities was built upon survivalism as the basis for living, adapting and thriving under climate change worlds.

> "Resilient cities can create, enable and sustain the services and institutions required for *basic ongoing survival* and are characterized by their ability to generate new opportunities. They avoid relying on solutions that depend on anticipating specific hazards, and instead take a broader, integrated approach" (p.5 – emphasis added).

In this sense, resilient cities can be understood as "insecure by design", similar to Evans and Reid's (2014, p.41) notion, which they explain as "life as a permanent process of continual adaptation to threats which are said to be outside its control." Urban life is understood within an eternal imbalance towards catastrophe and risk-changing nature in resilient cities. Further, as Anderson (2010) also argues, urban futures are imagined and problematised as being indeterminate and uncertain futures, where anticipation actions are required.

The production of truth within the urban resilience initiative involves vulnerability assessment as both are played as an integrative technique and policy-informed assessment. Resilience as a performative action requires about knowing the future to gather the knowledge about the problems of climate change in the urban. Before employing calculative technologies, described in more detail in Chapter 5, to build urban climate change resilience, a vulnerability assessment emerged as a schema of rationality, ordering elements of reality and allowing ways of objectifying socio-material components and urban subjects in both Indonesian cities (Dean, 2010; Lupton, 1999). Whereas, as Foucault mentions, the objective of government is to achieve "a series of specific finalities" (Foucault, 2009, p.99).

In both ACCCRN cities in Indonesia, Semarang and Bandar Lampung, after the vulnerability assessment was conducted then came detail resilience strategies that could be implemented through various multi-stakeholder initiatives. The next sections explain two climate change adaptation projects in relation to "vulnerable"

rationalities and different calculation techniques of urban climate change resilience in Semarang and Bandar Lampung. In this sense, vulnerability assessment also engages in the practice of subjectification or the formation of a certain type of subject (Lupton, 1999), which is later portrayed in more detail in Chapter 6 with regards to attributes of various embodiment of this vulnerable subject into urban individuals, households, and communities. In ACCCRN, rendering vulnerable means that to become exist in climate change worlds, urban populations are considered to be "ontologically vulnerable" (Grove, 2018, p.53). Grove (2018, p.53) further argues adaptability as "the means of survival in a vulnerable worlds."

4.3. Governing through resilience

The following section focuses on the analysis of resilience as governing rationality. Rather than accepting resilience as a singularity, the research focuses on how the act of governing is invested through different systems of knowing. Meanwhile, in Section 4.2, the thesis has focused on the discussion at the programme level; the following sections analyse governing rationalities at the project level. The thesis discusses this section using two case studies from Semarang and Bandar Lampung. More specifically, the thesis discusses two case studies: the dengue-fevers project (Semarang City) and the education project (Bandar Lampung City). This section aimed to understand resilience as a 'governmental' project within ACCCRN cities in Indonesia. As introduced in Chapter 3, in Section 3.2, these two case studies were selected to reflect more specifically different governing rationalities in both Indonesian cities. In the next sections, the thesis discusses in more detail two governing rationalities from case studies in Indonesian cities: anticipation (discussed in Section 4.3.1 with a case study of an online health information system) and survival (discussed in Section 4.3.2 with a case study of climate education).

Different problematisation and the production of truth in both ACCCRN cities in Indonesia have included calculation, normalisation, programming, and empowering. Problematisation, as described by Dean (2010, p.38), is "a calling into question of how we shape or direct our own and others's conduct… how we conduct government and how we govern conduct." Focusing on the *how* questions, the rationality of government brings in power and forms of thought to "unify and rationalize techniques and practices in relation to particular objectives, diagnoses of existing ills, schemata of evaluation and so on" (Dean, 2010, 39). This section involves tracing

different rationalities applied to govern cities and their urban populations, and different tactics and techniques that are employed. While, the sections discussed with two case studies of technologies of government, the aim was to illustrate how specific governing rationalities affect and influence how 'things' are governed.

Under heterogeneous governing rationalities or political rationalities or order of reasons, it is necessary that powers operate under a range of tactics and techniques so that the acts of governing become possible. The focus of the analysis in the next two sections around resilience projects is to illustrate two governing rationalities employed within urban climate change resilience projects. Moreover, from these rationalities, the thesis draws on different governing tactics, defined by Foucault as the arrangement of "things so that this or that end may be achieved through a certain numbers of means" (Foucault, 2009, p.99). It is understood in the study that governing tactics function as strategies and mechanisms to govern 'things' in order to achieve the end of government.

4.3.1. Semarang City: Online health information system

In Semarang, the ACTIVED Project provides an example of how resilience as governing rationalities operates using calculative technologies. Calculation as a governing technology in the section is discussed to understand the embedding rationalities operated within the project. It involves the ways of knowing in which the problems of climate change and health risks become knowable, solvable, and governable in the project. The main focus was to reveal different layers of rationalities operated within specific calculative technologies in the ACTIVED project. Many scholars have analysed the various forms of rationalities underlying different kinds of calculation, for example, in the fields of accounting (Miller and Napier, 1993), mobility (Patton, 2007), and territory (Crampton, 2010; Elden, 2007).

Rationality offers ways of understanding of how different things, including particular values, techniques and material forms, are linked together to build up "the calculation of means for particular ends" (Patton, 2007, p.941). Miller and Rose (2008) argue in order for a problem to become an object of governing, it had to be amenable to calculation and programming. The section then focuses on analysing and examining how specific calculative technologies in the ACTIVED project informs specific rationalities underlying a specific object of governing, in this case, dengue fevers, to become practicable, operable or solvable. The section discusses

governing rationalities within the ACTIVED project around three intersectional areas of: (1) Climate change and health, (2) Pre-empting the futures, and (3) Anticipation.

Climate change and health

The first line of inquiry to understand dengue fevers as a problem of climate change that needs to be addressed and governed emerged in the scientific assessments conducted as part of the ACCCRN programme. More specifically, it was developed in the VA conducted by CCROM SEAP and Health Assessment conducted by the Climate Change Centre, Bandung Institute of Technology. Both assessments provide insights into how dengue fever becomes visible as a climate problem and an object of governing in order to build urban resilience.

In ACCCRN, the VA is performed to understand the intersection of direct and indirect climate change impacts, urban systems and vulnerabilities as integral components before implementing resilience strategies (ACCCRN, 2009b). It was reported in the VA for Semarang City that floods and droughts are common climate threats (ACCCRN, 2010b). Based on the VA (ACCCRN, 2010b), extreme climate events such as floods and drought affected the city and local community in different sectors: residential, health, agriculture, drainage and infrastructure. More specifically, it was reported in the VA that "floods provided the greatest impact on the residential sector, transportation, and health, agriculture, fisheries, drainage and infrastructure" (ACCCRN, 2010b, p.iv). In the health sector, there has been an increasing number of infectious diseases, including dengue fevers, diarrhoea, typhoid, and respiratory infections during the events of disaster in Semarang (ACCCRN, 2010b). It was reported that the "number of infected people by these diseases was higher during flood season than during the drought" (ACCCRN, 2010b, p.iv). More significantly, floods commonly occur in low-elevation areas such as coastal areas and are affected by a poor drainage system in the city (ACCCRN, 2010b). Based on the VA, it is significantly important to understand the higher health risks such as dengue fevers, are not only due to climate change but also to situate the risks under poor urban infrastructure and rapid urbanisation in Semarang. It is the interaction of climate events, city vulnerabilities and urbanisation that made the impacts of climate change in Semarang city more severely affected the city and its urban population.

In order to understand the future risks of climate change, the VA conducted for Semarang City also has explored risk mapping as an approach to understanding risks from climate change. Risk mapping was used to illustratively provide categorical spatial-based information on the risk level at the identified area. One of the outputs is a climate risk map for the year 2050 for Semarang, provided in Figure 4.1. The map was developed based on IPCC SRESB1 emission scenario[15], which characterised the world as more integrated and ecologically friendly that are based on the assumptions of stabilised population growth, reduction in resource material intensity, and introduction of clean and resource-efficient technology (IPCC, 2018). The map is a composite result of different types of hazards: flood, drought, landslide, and sea level rise, and combined with calculation from city vulnerability indices. The map is divided into sub-districts administrative scale for the city and coloured based on their climatic risk levels: greenness colour for lower risk and redness for higher risk to climatic hazards. It is projected for year 2005, 2025 and 2050. People with 'at risk' or 'high-risk' levels are then required particular forms of knowledge and interventions to be conducted (Lupton, 1999, p.87). The map exemplifies a technique of power towards the urban population. It is understood that groups of the population that have higher degrees of risk will have to accept different exercises of power to manage the risk and warrant their safety and continuously be monitored using different instruments of surveillance such as statistics and regular observation.

The practice of risk mapping is then advocated at the national level to the Ministry of Environment and Forestry. Both organisations, MercyCorps Indonesia and CCROM SEAP have worked together to engage with the Ministry to establish a nationally accessible online vulnerability assessment. As a result, the Ministry developed and launched an online vulnerability assessment system[16] for measuring, monitoring, and analysing vulnerability, which are publicly available for the provincial and local governments. In the handbook (Kementerian Lingkungan Hidup dan Kehutanan (Ministry of Environment and Forestry), 2015), this online system serves as a tool to "feed policy formulation and national planning, for specific sectors

[15] Since 1996, the IPCC began the development of new carbon emissions scenarios. This scenario is one of the scenario families produced as part of the IPCC Assessment Report, which is generally known as a low emissions scenario. It was described that under this emission scenario, the world would transition to implement global solutions to economic, social and environmental sustainability but without additional climate initiatives (IPCC, 2018)

[16] The online vulnerability assessment is accessible at: http://sidik.menlhk.go.id/.

and local governments… also to increase community resilience" (Ministry of Environment and Forestry, 2015, p.57).

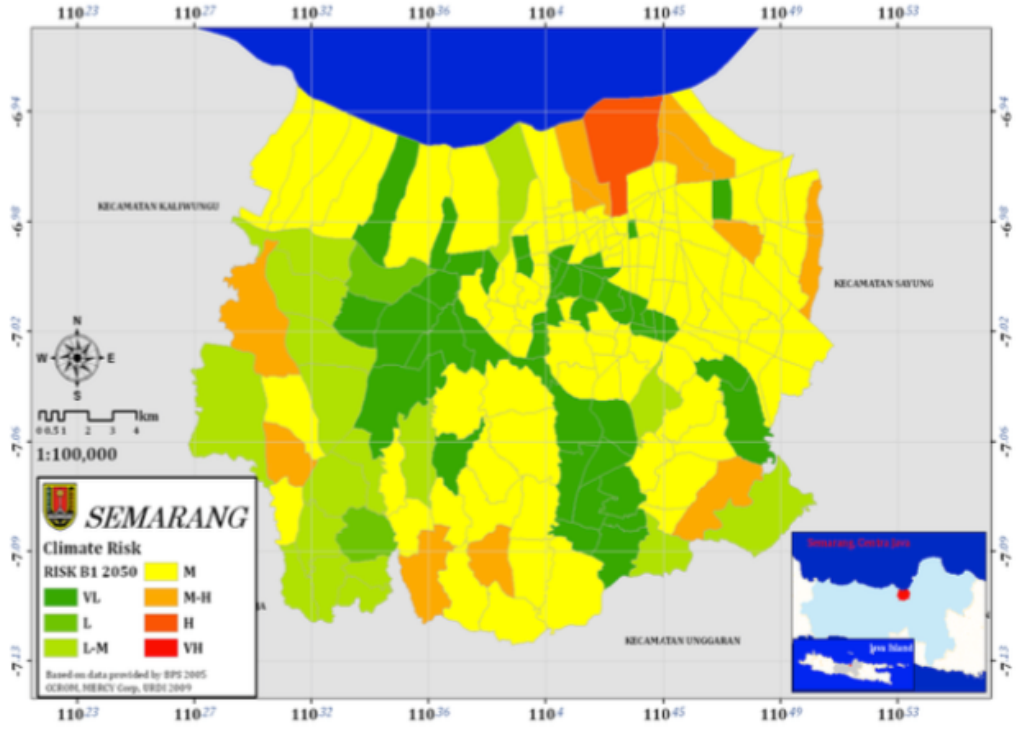

Figure 4.1 The climate risk map for the year 2050 for Semarang

(Source: ACCCRN, 2010b)

In a broader sense, risk mapping facilitated through ACCCRN at the national and city levels should be understood not only as a practice of predicting climate risks in the future but also to make climate problems visible at the local level. When I asked Tedja[17], a former senior manager of NGO Bintari, how he understood that climate change has affected the city, he explained in the indented quotes the relations between climate change, disaster events, and city vulnerability. He says the VA has helped him to connect climate change as a global issue with local development priorities at the city level. Tedja was one the key members of City Team[18] who has been engaged since the beginning of ACCCRN in Semarang. It was reported in 2015 that Semarang City was in the third position with the highest number of dengue fever

[17] This name is a pseudonym.

[18] City Team was a working group established as part of ACCCRN in Semarang and Bandar Lampung that has a mandate to coordinate, supervise and monitor climate change adaptation and urban resilience actions at the local level. In Semarang, it was then transformed into the Initiative for Urban Climate Change and Environment (IUCCE), which becoming an independent consulting body for fostering urban resilience to climate change in the city.

incidents within the Central Java Province (Semarang City Government, 2016). Tedja explained in relation to dengue fever incidents that initially there was a claim from the Health Agency that the incidents were decreasing. However, the 2014 or 2015 prediction from ACCCRN proved otherwise, where the dengue fever incidents increased due to intensive rainfall. The Agency then convinced that climate change has contributed to the increasing dengue fever incidents.

> "In fact, if we asked Semarang people about floods, coastal floods have happened for a very long time… also with dengue fevers... (However with) The vulnerability assessment undertaken as part of ACCCRN, it is more convincing that the intensity is increasing.... It is not only due to the city degradation but also climate change as the other factor" (Personal communication, 4 June 2016).

However, ACCCRN realised a lot of uncertainties in climate information, including inaccuracy of climate change scenarios, uncertainty in climate projections, and fallacy in climate modelling (Opitz-Stapleton, 2010). Therefore, vulnerable and risk status based on the VA should not be understood as an attempt to "precisely know the future" (Opitz-Stapleton, 2010, p.4) but to be used as "guidance" to inform future actions for building urban climate resilience. Aside from the Vulnerability Assessment, ACCCRN commissioned another study of Health and Climate Change Vulnerability Assessment (HCVA) in Semarang. The study was conducted by the Climate Change Center at Bandung Institute of Technology to provide a holistic assessment of the health vulnerability of climate-related dengue fever disease in Semarang (Bisri *et al.*, 2016). It evaluated dengue fever risk, conducted a review of existing policies of dengue fevers, analysed the relationship between climate parameters and dengue fever incidence, and suggested adaptation strategies to cope with dengue fever risks (Bisri *et al.*, 2016). One of the key recommendations of HCVA was to shift from a curative approach to building a bottom-up approach with a focus on preventive, while curative strategies were still conducted to cope with dengue fever risk under climate change (MercyCorps Indonesia, 2016). Iwan[19], a senior government official at Semarang Health Agency, explains that previously, the health management approach towards dengue fevers was focused on incidence base. This meant the Health Agency only responded after they received a dengue fever incidence report after the patient had been admitted into the hospital. He also realises

[19] This name is a pseudonym.

dengue fevers should be understood in relation to the changing nature of health risks under climate change, which he explained in the following quotes:

> "I just realised after [being engaged in] the ACTIVED Project… that climate change is also a factor in the health sector. Before ACTIVED, I only knew climate change, but I did not understand its impacts on the health sector… which [for example] there were hot spot locations where mosquitos eggs in Semarang hatched more quickly due to climate change" (Personal communication, 10 June 2016).

In Semarang, dengue fever incidents emerge as non-deterministic futures that need to be evaluated and examined in order for the governing of urban climate change resilience to become possible. Dengue fevers as an event are then understood not as a definitive figure of the future but are moderated using governing technologies, such as risk mapping, to 'picture' different possibilities of the future. In relation to this, dengue fevers as an event developed as part of a wider space of continuity rather than as a singular space and future in Semarang City. It goes beyond the reactive approach in which health management actions happen *after the events* have occurred but shifted towards emerging continuous events where the act of governing invested to anticipate *before the events* going to occur. It situated urban climate change resilience to govern the health risk of dengue fevers under climate change from *responding to the past* to *living in the present*. The temporal dimensions of dengue fevers do not stop once the events have been moderated, such as medically treating the patients or fogging the neighbourhood, but will continue to emerge along with climate change. Therefore, dengue fevers under climate change as a socially constructed phenomenon should not exist outside the control of the government in order to avoid calamity, instead becoming a new object of governing. As consequence, building urban climate change resilience concerns with pre-empting the futures using surveillance, prediction and prevention techniques in Semarang.

Pre-emptive the futures

As a result of moderating future climate change risks and uncertainties affecting dengue fever, Semarang improved its health management system for dengue fevers by developing the Health Information System (HIS) and Health Early Warning

System (HIEWS)[20] for monitoring, predicting and analysing dengue fevers incidents. Rather than reinforce the status quo with reactive response (Coaffee *et al.*, 2018) to dengue fever incidences after the occurrence, the online system in Semarang aims to increase the healthcare system capacity and provide information and preparedness to anticipate dengue fever incidents (MercyCorps Indonesia, 2016). Widoyono, the Head of the Health Agency of Semarang, realised the importance of the health system in the following quotation: "health information system (HIS) and health early warning system (HEWS) will help us to quickly respond to dengue-fevers. So that we can effectively reduce its case incidents in Semarang City" (MercyCorps Indonesia, 2015c, no pagination). The online system, which was introduced by the Health Agency of Semarang and supported by ACCCRN, contains two key components of health information and an early warning system in order to build "prevention and mitigation" efforts (MercyCorps Indonesia, 2015a, p.2).

The online system was not the first system to cope with dengue fever incidents in Semarang. The new online health management system is an improved version of the previously established reporting system by the Health Agency. Iwan, a senior government official at Semarang Health Agency, explained this new system "was originally developed from [the previous] "Sistem Informasi Manajemen Demam Berdarah Dengue" (SIM DBD) or Dengue Fever Management Information System; but this SIM DBD was only focus on case based. [The Agency received] Short messages but only the case report" (Personal communication, 10 June 2016). The new online system involves greater health management of dengue fevers with different inputs and development, including real-time monitoring and prediction, geotagging incident location-based, online and open public access, and community participation from outside health care agencies, including students, teachers, and sub-district staff members. It is an attempt to increase "vigilance" (Iwan, personal communication, 10 June 2016) to anticipate the spatial and temporal dimensions of dengue fever risk in the city, including people, place, distribution and time of the incidents (MercyCorps Indonesia, 2015a). These efforts to pre-empt future risks are developed around different key areas of surveillance, prediction, and prevention to anticipate before the events of dengue fever incidents occur.

[20] The online system accessed through a link: http://dinkes.semarangkota.go.id/hews/ (for illustration, see Figure 4.2), with different levels of accessibility for the general public and health administration officers.

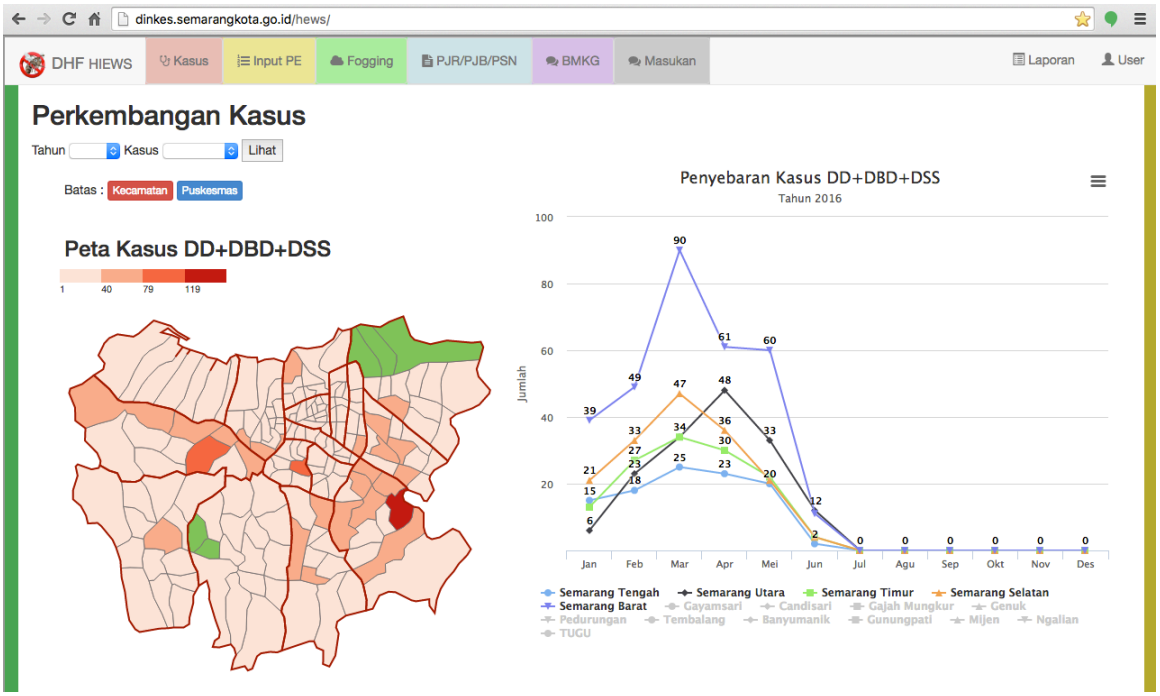

Figure 4. 2 The online information management system for dengue fevers

(Source: Health Agency, 2016)

The first technique to pre-empt the future is through surveillance, which is defined as a way of knowing to situate dengue fevers as temporal futures. Instead of knowing the precise futures, the futures of dengue fevers are conditional and could only be known through incident monitoring, input feedback, and investigation. It is situated around the epidemiological approach using the new online health system managed by the Health Agency. In the guidance (MercyCorps Indonesia, 2015a, p.2), it is described that "as an early warning system, this system will provide warning to sub-districts that affected by dengue infection based on epidemiological investigation." In the event of a dengue fever incident, the community health centre (PUSKESMAS)[21] staff members at the sub-district level conduct an epidemiological investigation to observe, verify, evaluate, and confirm the incident case report. Surveillance operates through the circular of information where initial data reported to the online health system is evaluated to assess the "risk factor" (Iwan, personal communication, 10 June 2016) of dengue fevers so that in case of high incidents, vigilance actions could be undertaken immediately as possible. It combines the

[21] Community health centre, known as "Pusat Kesehatan Masyarakat" (PUSKESMAS), is government-mandated community health clinic that provide basic healthcare at the lowest administrative level of sub-district.

online system of HIS and HIEWS as "visible 'performative' surveillance" (Svenonius, 2018, p.7) and on-the-ground epidemiological investigation as an operative action of evaluation. The new health management in Semarang is an example of surveillance as a calculating technique to accommodate non-deterministic futures of dengue fevers to become manageable and solvable.

The second technique for pre-empting the future is prediction, which is defined as a way of knowing to situate dengue fevers as calculable risk. In order for dengue fever as an event to become a risk, it must be predictable and calculable. The risk from dengue fevers is then understood as not merely random; instead, "it must be possible to evaluate its probability" (Ewald, 1991, p.201-202). In the guidance, it is described that "early warning information is [function as] prevention to increase dengue infection cases based on predictive formulation associated with weather factors" (MercyCorps Indonesia, 2015a). Predictive formulation in the new health management aimed to evaluate risk from dengue fevers as calculable and predictable, as explained by Iwan, "clearly data functions as for planning, evaluating priority scale and future trends" (Personal communication, 10 June 2016). He also further explains in the following quotation:

> "For the Health Agency at the city level, we would expect to maximise the utilisation of the data to prioritise [actions], which means to understand the trends based on the monthly report, how was the prediction, how was the distribution… whether it has expanded, shrinking or remain the same? ...This will increase [our] response; we won't be able to eliminate all cases that occurred, but we can respond quickly to avoid infection" (Iwan, personal communication, 10 June 2016).

The technique of power for predicting the future is also related to the process of normalisation. Lupton (1999) describes "normalisation" as a rationale in which norms of behaviour of individuals are identified as part of a broader population and sub-groups of the population. A person is no longer seen as a single entity but interconnected within the population they are concerned about. In terms of risk, Ewald (1991, p.203) underlines that "there is no such thing as an individual risk." That risk can only be accounted for calculation when it disperses across the population (Ewald, 1991). However this does not mean that every individual will bear the same level of risk. This is attributed in governmentality theory as a

collective risk, in which risk is located in the context of a population and set up in a broader set of rules rather than only of an individual entity. Dengue fever risk associated with climate change is managed through its relation with the whole population based on epidemiological risks and anticipation of future climatic events.

The third technique for pre-empting the future is prevention, which is defined as a way of thinking and acting on dengue fevers to mitigate the occurrence of future events (Anderson, 2010). The mobilisation of resources in building climate resilience isn't always in the forms of soft infrastructure, financial support or management mechanisms but also urban citizens' involvement. The ACTIVED Project in Semarang involved hospitals and local health centres, but more importantly, local cadres at schools and local communities. School teachers, students and local communities are requested to facilitate and provide regular data and information about mosquitos' susceptibility to the HIS and HIEWS system via short-message-service. Dr Widoyono, the Head of Semarang City Health Office, mentions that "HIEWS has helped to increase response to dengue. Everyone can perform their role and it is very beneficial in the prevention of DHF in Semarang City" (MercyCorps Indonesia, 2016, p.24). Public participation in resilience building also contributes to the ownership of the initiatives and reduces climate vulnerabilities (MercyCorps Indonesia, 2016).

Moreover, 29% of dengue fevers in 2015 were children aged five to nine years old (MercyCorps Indonesia, 2015c). The project then involved the school community, including the Education Agency, teachers and health facilitators in schools and students themselves to be prepared with training and facilitation. During the project, they trained 193 'little doctors' in 19 schools to be actively involved in larva inspection and monitoring as well as dengue fever prevention campaigns in their schools on a weekly basis. Schoolteachers later reported it directly to an online health information system using a short message service (see Figure 4.3). The picture depicts a short message sent by a schoolteacher to the online health system of HIS and HIEWS. Each Friday, a schoolteacher and the little doctors conducted an investigation of mosquito larvae in the school and surrounding neighbourhood. Whether they found or not mosquitos larvae, the schoolteacher then needs to send the data to the system via a short message. When I asked Halimah [22] about her

[22] This name is a pseudonym.

involvement in the Friday investigation and her motivation, she described, "[It was begun when] no teachers in the school wanted to come for a training… I feel pity … when I read the invitation, it was about [climate change] adaptation, the participants are also important people… I feel the [need for] emergency" (Personal communication, 4 June 2016). Halimah is a schoolteacher in a primary school. She further explained that "In the sub-district, there is an emergency to undertake climate change adaptation action since there are already endemic case of dengue fevers … why don't we participate, it will definitely benefit ourselves, our students" (Halimah, personal communication, 4 June 2016). The ACTIVED expects to increase self-awareness and prevention to dengue fever risk in school.

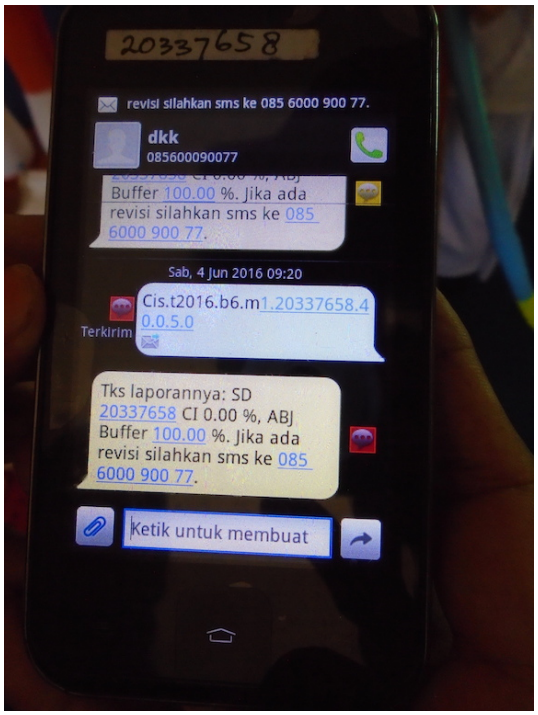

Figure 4.3 A short message from a school teacher to the online system

(Source: The author)

In the ACTIVED project, local communities have become the actors, not only recipients of governmental programmes, to anticipate climatic risks and respond to local vulnerabilities. The online health system engaged widely with local cadres, schoolteachers and students, and sub-district staff members. The ACTIVED project increases the local cadre's capacity in order to become "an agent of change" in their neighbourhood (MercyCorps Indonesia, 2016). MercyCorps Indonesia anticipates

increasing the local cadres' knowledge of dengue fevers and climate change; it is expected that the local community will be actively involved in dengue-fevers prevention and control (MercyCorps Indonesia, 2016). These local cadres are involved in different roles to support the online health information system. The Health Agency involved local community members to join together with the health community centre to raise awareness among local citizens, undertake local inspections of dengue mosquito larvae and meet regularly to mitigate case incidents.

Anticipation

The production of rationalities and strategies for risk management in Semarang involves specific methods for rationalisation and calculation. In order for climate change risks to become manageable and solvable, risk is governed by the probability of it happening. Several scholars have described risk and probability as part of the pre-emptive technologies to manage uncertainty, catastrophic events and an array of future possibilities (Anderson, 2010; Aradau and van Munster, 2011; Amoore, 2013) in order to begin with the management of resilience. In the case study, building urban climate change resilience is understood with anticipation as governing rationality. Anticipation as governing rationality is performed to "identify future events before they take place… not simply *as* the norm but *via* processes of normalization" (Amoore, 2013, p.17 – original emphasis). While it follows an anticipatory logic (Amoore, 2013), the online health system in Semarang also operates around the circulation of "spaces and objects" (Stripple and Bulkeley, 2015). In order to become spaces and objects of governance, resilience situated the health sector as a new space of governing in building urban climate change resilience that does not posit totalising actions to know the precise futures of climate and its impacts but situates anticipation with the open possibility of the future. The attempt to predict and prevent were not solely employed, but surveillance became more of a calculative technology to *anticipate* possible future events.

Moreover, anticipation as governing rationality sits in a broader sense as part of mapping tactics. Mapping as governing tactics is defined as a way of acting to stimulate, examine, and evaluate climate risks on the basis of sensing the future and climate events. Mapping is not so much engaging with cartography or territorial mapping but laying the ground for figuring out non-linear causality and non-universal knowledge of the world surrounding us (Chandler, 2018). Under climate

change, the world is imagined as a non-deterministic future where governance "only works indirectly to shape or enable the processes of interactive emergence" (Chandler, 2018, p.22) to cope with continuous threats, uncertainties and risk conditions. Hence, governing techniques that are involved within the mapping tactics are operated not to take a precise knowledge of the future but to make sense of the possible futures and events. As discussed in the ACTIVED Project, it has involved vulnerability assessment and risk mapping.

In a world of vigilance, a different calculative technology that arises is scenario planning. Walker and Cooper (2011, p.151), exemplifying from the economic field, underlines the value of scenario planning, which "relies on subjective expectations and counterfactual logic to simulate possible future states of the market." This is a different logic than the "predict-and-prevent" paradigm that further enhances the concept of "non-predictive futurological technique" (Walker and Cooper, 2011, p.151). Aside from the ACTIVED Project, Semarang facilitated scenario planning to understand the city's vulnerability and future climatic hazards and how these affect the city infrastructure and disaster events – see the following quotation:

> "Based on data trends in Semarang City, the average rainy season will last for about 2-3 months. Along with climate change, the rainy season is expected to become longer than 4-6 months.... If achievements drainage master plan has not changed and still the same as present condition, inundated areas will increase at 13%. Total flooding-days per year will also increase to 72 days" (Luhur *et al.*, 2010, pp.43-44).

In practice, scenario planning has recently been used as a technique for planning and policy formulation in urban resilience that is based on non-deterministic futures. In ACCCRN cities, climate information such as projection, climate modelling and risk mapping are used in order to respond to formulate different outcomes in the future. Using scenario planning as a tool for planning aim to overcome uncertainty in climate change and its impacts, but concurrently aid for policy formulation. Different measures securely need to be undertaken in order to mitigate the climate change impacts. This process brings ACCCRN the power to govern risk and uncertainty to become "more manageable" (Walker and Cooper, 2011, p.152).

Further, governing through resilience attempts as insurance management to the problems of urban life from climate change risks, uncertainties, threats, dangers, and

impacts. Building urban climate change resilience is situated as a way of knowing and thinking around the promise of security where it is constantly moderated and governed to anticipate the non-deterministic futures. It shifted the management of dengue fever risk similar to the logic of security where there is "a move from protection towards prevention" (Aradau, 2014, p.75). It problematises the future events of dengue fevers as surprises where the ability to completely eradicate it is absence. Building urban resilience from climate change is also circulated and multiplied within different urban spaces, such as health management, the education sector and community engagement, and different objects of governance, such as community, teachers and students. The dengue fevers intervention project engages with anticipation space to manage climate change and associated health risks. The ACCCRN programme in Semarang, through an online health information system project, engages with multiple objects of governance so that they can perform anticipation as a governing rationality towards dengue fever risk.

4.3.2. Bandar Lampung City: Climate education

In order for climate change to become materialised, it needs to involve rationalities through the object of governing. In Bandar Lampung, one of the projects that engaged with the urban population as an object of governing is through climate education. As introduced in Chapter 3, the Education Project engaged in increasing the climate change adaptive capacity of teachers and students from climate change since 2012. It was targeted at students in the 4th, 5th, 7th and 8th grades of local students in Bandar Lampung. In general, the Education Project implemented different pedagogy and andragogy techniques[23] in building urban climate change resilience, including community assistance, socialisation, training, awareness raising, and integration of climate change into the school curriculum. These activities were conducted to exemplify governing tactics that made the urban population accountable for their actions, become part of the monitoring process and alter human behaviours in building resilience. The practice of building urban climate change resilience means positioning the urban population as an object of governing, through

[23] Pedagogy and andragogy are methods and techniques of learning used in teaching. Pedagogy refers to methods and practices to educate children with learning centred on the teachers to transfer knowledge to the children, while andragogy focus on the practices in teaching (adults) learners where learning conducted as an independent and self-directed among the (adults) learners.

which their self-conduct and behaviours are the domain and reason for which urban climate change resilience becomes enacted.

While the previous section discusses the ACTIVED Project in Semarang in relation to health management as a new space of governing in building urban climate change resilience, the focus of this section is not only to evaluate the similarities and differences between the two projects but also to understand how urban population become an object of governing. This will inform the style of thinking and ways of rendering the problems of why specific urban populations become an object of governing in order to build resilience. The section discusses governing rationalities within the Education project around three intersectional areas: (1) Climate change and education, (2) Individualization, and (3) Survival.

Climate change and education

Similar to the previous section, the first line of inquiry to understand the urban population as an object of governing that needs to be governed emerged in the initial scientific assessments and evaluation as part of the ACCCRN programme. Both documents, the Vulnerability Assessment and Community Based Vulnerability Assessment, conducted for Bandar Lampung, are the first significant insights that inform how the urban population become an object of governing. Aside from scientific evidence of climate change history and futures, impacts of extreme events, and risk mapping, the VAs also inform social adaptation in the city.

In the VA (ACCCRN, 2010a), building urban climate change resilience is conceptualised around the capacity for adapting, living, and thriving under climate change. Urban populations, especially the poor and vulnerable groups, are required to accept new normalities upon which urban life is built upon the "optic of their capacity for resilience to the climatic phenomenon" (ACCCRN, 2010a, p.96). The problem of governance is then to enable "oneself to change or to change one's surroundings in order to become better suited for survival" (ACCCRN, 2010a, p.96). Survival is understood as a mode of urban life under climate change. Building urban climate change resilience distantiate oneself from their ability to completely eliminate the problems of urban life but to embrace that they lives in turbulent worlds. The means of governance is building upon the ways in which individuals, communities and public administration are able to confront "a future of permanent insecurity and unavoidable danger" (Amin, 2013, p.141). One of the characteristics

of resilient individuals is they whom "able to cope with changes which may happen to them" (ACCCRN, 2010a, p.96). More specifically, the capacity to adapt is discussed in relation to the city's vulnerability as the adaptive capacity of specific groups of the urban population, which are the urban poor (ACCCRN, 2010a):

> "The urban poor demonstrate that they are amongst the most adaptable at developing strategies as they seek to consolidate themselves in an often hostile urban context that many are unfamiliar with and initially unequipped to thrive in… what is adaptive since we are not simply discussing vulnerability, but the capacity to adapt in times of challenges. The simple existence of such large numbers of poor, finding a living, housing, building communities in often the most challenging places is testament to a high adaptive quality" (p.96).

As part of a more detailed study, ACCCRN conducted another study of the Community Based Vulnerability Assessment (CBVA) to "ascertain who are the most vulnerable groups and where are the most vulnerable places in Bandar Lampung in relation to extreme climate change events and climate change" (Taylor, 2010, p.3). It assessed that vulnerable groups in the city include children, young families, new immigrants, female-headed households, the elderly, and fishermen (Taylor, 2010). It was reported that children, especially those living in fishing communities, are often associated with illiteracy in the face of climate change (Taylor, 2010). "Access to education and job skills particularly acute in fishing communities", as described in the CBVA Report (Taylor, 2010, p.13), "where children are hardly allowed to develop literacy entering traditional fishing, preventing them from developing adaptive skills." Furthermore, the CBVA Report has a similar assessment from the first Shared Learning Dialogues (ACCCRN, 2010c), that children, in general, are among the most vulnerable groups in the city to climate change hazards, including flooding, windstorms, and landslides. Shared Learning Dialogues, known as SLDs, are a series of processes of iterative interactions to understand complex problems under the conditions of uncertainty that involve city stakeholders in a structured process of knowledge exchanges (Reed *et al.*, 2013). During these SLDs, these findings were discussed to inform, disseminate, and discuss how the city was vulnerable to climate change risks, as well as identify key vulnerable groups that required further assistance from the programme to be supported. After these SLDs, the city then developed a further climate strategies and actions.

Table 4. 1 Vulnerable sectors and groups in Bandar Lampung

No.	Climate Change Hazards	Potential Impact to Primary, Secondary, and Tertiary Sectors		Vulnerable Groups	Key Issues
1.	Flooding	Aquaculture, coastal livelihood, housing, and agriculture	Diseases (vector borne disease), infrastructure (transportation), small industry	Poor communities, children, elderly, fisherman	Lack of information, poverty, lack of drainage and waste management, lack of infrastructure on disaster mitigation, lack of funding and human capacity, lack of coordination among stakeholder, low public participation in planning process, high demand of ground water, and land use change
2.	Windstorm	Housing, public facilities	Infrastructure, economic losses	Children, elderly, disable, women, poor household	
3.	Landslide	Housing, public facilities	Transportation	Children, elderly, disabled people, women, poor household	
4.	Drought	Water supply, agriculture, salinity	Hydro-electric, energy shortage	Farmer, entrepreneur, poor household	
5.	Coastal erosion	Fishery, tourism	Migration	Fisherman, people working on fishery and tourism	

Source: ACCCRN, 2010c

It is without surprise that the actions for building resilience in the *City Resilience Strategy of Bandar Lampung from Climate Change 2010-2030* listed community empowerment to cope with climate change as its top priority strategy (Mukhlis *et al.*, 2010). Under the strategy for developing human resources, the strategy recognises "community" as part of the solutions, not only problems, which actions include curriculum development of climate change adaptation education, curriculum training for teachers and curriculum integration into local content. On the basis of this strategy, resilience building is targeted to the local communities who have high susceptibility to the impacts of climate change. It is situated that building urban climate change resilience aligns with local development strategy, which explained by Muliati[24], a senior government official in Bandar Lampung Inspectorate Division who was a member of the City Team, "the target of [local urban] development is the

[24] This name is a pseudonym.

community… so we have to increase their [adaptive] capacity… with knowledge transfer" (Personal communication, 1 August 2016). More specifically, through the Education Project, ACCCRN targeted students to be aware of their environment, change their behaviours and increase adaptive capacity from climate impacts events and impacts as evidenced in the following quotation (MercyCorps Indonesia, 2017):

> "Without *adequate knowledge* about climate change, the impacts of climate change events, and how to adapt to their impacts, the city *will increasingly be vulnerable to the impacts of climate change*… Education is one of the ways to build local community capacity to be aware and understand of climate change" (p.2 – emphasis added).

Building urban climate change resilience through education in Bandar Lampung focuses on the efforts to overcome this "inadequate knowledge" about climate change from teachers and school children in order to adapt to climate change. Similar to the previous discussion in Section 4.3.1, governing through resilience attempts as insurance management to the problems of urban life from climate change risks, uncertainties, threats, dangers, and impacts. However, building resilience through climate education situated as a way of knowing and thinking around urban life that is eternally vigilant to climate change impacts. In order to build urban resilience, it is the responsibility of the poor and vulnerable groups in the city, in this case, the school children, to increase their knowledge and develop a capacity to be able to cope with climate change. The promise of security in building urban climate resilience concerns how "susceptibility from climate change could be reduced with… increasing community capacity" (MercyCorps Indonesia, 2017, p.2) through climate education. The 'future' community, in this case, school children, are therefore responsible for the provision of their own security by preparing and developing their own capacity to face climate change risks in the present and in the future. Urban lives under the conditions of resilience are 'stubborn', which means one has to survive and thrive in non-deterministic futures and turbulent worlds in the age of climate change. This requires oneself to be living in the present where the relation to oneself is considered of what is it to becoming a "Climate Human" under climate change – which is further discussed in Chapter 6. In the following discussions, the section discusses how the Education Project aimed to test, experiment and develop knowledge transfer through climate education in order to build urban resilience.

Individualisation

The Education Project focused on increasing "teachers' and students' adaptive capacity towards climate change" (MercyCorps Indonesia, 2014b, p.5) to build urban resilience in the city. It focused on climate education on the accounts of teachers and students' adaptive capacity so that they can transfer their "knowledge and behaviours back to their neighbourhoods" (MercyCorps Indonesia, 2011, p.3). The Project not only frames individuals – teachers and students – to participate in their own development of resilience capacities but also develops around individualisation in which human agency is central for resilience actions to be conducted.

Figure 4.4 In-class teaching for climate change module

(Source: MercyCorps Indonesia, 2012)

In a broader sense, building urban climate change resilience through education is situated around individualisation as a governing technique. In individualisation, urban life emphasises "personal responsibility to life outcomes" (Lupton, 1999, p.107). More specifically, Ulrich Beck (Beck and Beck-Gernsheim, 2002, p.202) defines individualisation as "a structural, sociological transformation of social institutions and the relationship of the individual to society." Individualisation is closely related to the production of urban subjectivities, which is further discussed in Chapter 6, however, this section aims to evaluate how this specific governing technique informs us of different ways of thinking in which urban individuals are required to participate in the resilience building. The section examines how climate education as resilience-building activity has contributed to the social transformation

of teachers and students as proactive individuals who are responsible for their adaptive capacity.

The Education Project methods, in general, involved two interventions: (i) Class teaching, where integrated teaching materials of climate change are provided in class teaching materials, and (ii) Thematic working groups, where students are divided into small groups for practising activities on climate change mitigation and adaptation, including energy efficiency, composting, and groundwater conservation. The integrated teaching materials are developed around two core contents of competency standard (SK) and basic competency (KD), which are identified by the national curriculum, as well as new climate material related to climate change adaptation. The Module Drafting Team was responsible for selecting and identifying the main lecture materials which were best suited for integration with the urban climate change materials. It was then discussed with local teachers in Bandar Lampung. The integrated teaching materials on climate change supplemented some core modules in 4th and 5th grade, including natural sciences, social sciences and citizenship and 7th and 8th grade, including natural and social sciences. In order to sustain the climate education activities, the Education Project was able to gain a commitment from the Education Agency of Bandar Lampung to continue the project implementation. Lukman[25], a lecturer from the University of Lampung who engaged in the project implementation, explains, "Adaptation action by increasing teachers and students' [adaptive] capacity has taken over by the Education Agency, regulated by Mayoral Decree and received financial support" (Personal communication, 18 June 2016). In the Mayoral Decree, it is clearly stated the objective is to "create an environmentally friendly culture and promote teachers, students, and school ability to cope with the extreme phenomena of climate change" (MercyCorps Indonesia, 2011, p.23).

The two major interventions, in-class teaching and thematic working groups, were conducted in order to target climate change awareness and adaptive capacity from teachers and students. It was conducted initially at the pilot schools to test and experiment with the climate change modules. The pilot schools were selected with characteristics of the school diversity in Bandar Lampung and also considered the locations in poor and vulnerable areas. The Project team led by the University of

[25] This name is a pseudonym.

Lampung then tested the effectiveness of the module and measured the impacts on teachers' and students' knowledge and climate-risk preparedness behaviours.

In building urban climate change resilience, evidence of climate education in the Education Project suggests that climate change-integrated teaching materials facilitated teachers' and students' self-knowledge and self-improvement as part of tactics of empowering. It was reported (MercyCorps Indonesia, 2011) that pilot schools have developed climate-savvy activities. All pilot schools, which include two elementary schools and two junior high schools[26], were reported "using segregated waste bins, and the students are willing to successfully segregate waste" (MercyCorps Indonesia, 2011, p.7). In the public schools, SMPN 7 Bandar Lampung and SMPN 27 Bandar Lampung, it was also reported that tree planting is now a priority activity for students, which then requires them to maintain the trees as part of Greenery Working Group activities in the schools (MercyCorps Indonesia, 2011). Undertaking water conservation activities by routinely making biopore holes[27] and utilising compost from biopore holes also exemplified by students at SMPN 7 Bandar Lampung and SDN 1 Langkapura. Junior high school students from SMPN 7 Bandar Lampung also developed environmental concerns outside the school when they brought biopore tools to install biopore holes at their homes. When I asked Ramli[28], a teacher at one of the pilot schools in Bandar Lampung Junior High School, whether he experienced new knowledge and witnessed behavioural changes in his students, he explains they gained new knowledge and begins to witness some character building from his students in climate education in the following quotation:

> "Yes, there were already [lecture materials] on global warming, but they are still limited and not detailed enough, it is only being taught at a theoretical level. But with climate change [education], I began to understand deeper about the core concepts, its impacts [of climate change] and students can engage not only on theoretical level but actions, yes, character building has been developed from this climate change [education]" (Personal communication, 20 August 2016).

[26] In Indonesia, state elementary school is abbreviated as "SDN" and state junior high school is abbreviated as "SMPN."
[27] Biopore hole is a vertical hole on the ground with a diameter of 10 cm and a depth 100 cm to infiltrate rainwater. Biopore illustration is available in Figure 6.3 in Chapter 6.
[28] This is a pseudonym.

Self-esteem and prudentialism are arguably known as “government at a distance”, where a sense of self-responsibility emanates within the individual or community rather than having direct intervention from state government (Lupton, 1999). This is where an individual or a group of the population initiated community-based actions for collectively mitigating risks surrounding their lives, such as environmental campaigns or climate advocacy. In a similar fashion, the individual becomes “the unit for the reproduction of the social in his or her own lifeworld. Individuals have to develop their own biography and organise it in relation to others” (Beck and Beck-Gernsheim, 2002, p.203). When I asked Ramli about his motivations to engage in climate education, he explains, “It is truly an opportunity as a teacher, maybe here, as part of my devotion, dedication. So, if there is a new knowledge and coaching opportunity as a teacher that would aid me. It is part of my service” (Personal communication, 20 August 2016). Beck argues that (Beck and Beck-Gernsheim, 2002, p.4) “individualization is a social condition which is not arrived at by a free decision by individuals.” In climate education, Ramli's dedication could not only be understood in relation to his free will to choose to acquire more knowledge about climate change but, more importantly, his duties and service as a teacher. The actions for increasing their adaptive capacity as teachers and students appear to become the will to empower – not only will to improve – where teachers and students become the new sites of improvement (Li, 2007). The Education Project has shown not only an attempt to embed prudentialism into the education process through climate education but also continues to become embedded in continuous educational practice in the city.

The Project facilitates a new understanding of how the urban population is positioned around the premise and assumptions of the act of governing through resilience. It is not only that doing and becoming climate-savvy is a moral duty from teachers and students but also integral to their own development as an individual. Individualisation facilitates different ways of thinking around the premise of protection from the state to empowerment as sites of improvement (Li, 2007). From her thorough study of highlands communities in Indonesia, Li (2007, p.234) argues that a community has a “self-governing formation capable of governing itself.” The role of government is minimal and only for providing advice and assistance (Lupton, 1999). This is a substitution from large intervention and provision from state government into free and voluntary citizens. Further, Muliati also explains the distant

role of the government in relation to protection for the community, that "the role of government should only be as a facilitator, regulator, therefore [climate change] awareness should be obtained by the community. In [responding] to climate change which we experienced, even though conceptually the government responsible for planning, however action and initiative should begin from the [urban] communities" (Personal communication, 1 August 2016). In Beck's argument (Beck and Beck-Gernsheim, 2002), individualisation is "a compulsion" (p.4) of which urban individuals, including teachers or students, requires to acquire, develop, and maintain their own adaptive capacity to "constantly adapting to the conditions" (p.4) upon which they have to survive from climate change.

Survival

In this section, it is argued that educating teachers and students with climate change materials is a non-directive way of governmentality intervention. It possesses a technique of power that, through then the subject, internalised government's purpose. The individuals should become aware and continuously monitor their own behaviour towards risk mitigation or reducing the negative impacts of their behaviours. The moral enterprise of self-control and self-improvement, such as collecting waste and making a biopore, has been demonstrated by the students in Bandar Lampung. With recent flooding associated with the intensive rainfall and blockage of drainage because of inappropriate waste disposal, risk-avoiding behaviour has been introduced and tested in Bandar Lampung so that risk avoidance could become part of people's eternal vigilance (Lupton, 1999). Urban life under resilience is stubborn in which people's futures constitute a non-deterministic futures and turbulent worlds under climate change. Urban individuals, communities, and populations are *living in the present* for which their 'relation to ourselves' to their external worlds are considered to be and becoming.

Survival rationality is defined as a way of seeing and knowing urban populations as intrinsically vulnerable subjects so that survival is the basis for adapting, living and thriving under climate change. It was argued that "living happily with disasters" (Helmy, 2018, p.16) as a way of living to normalise disruptive events as an effect from the changing climate requires individuals, households, groups, and communities to build self-awareness, self-knowledge, and self-capacity in order to become resilience subjects. As mentioned in the VA (2010a) about frequent floods in

coastal areas, “If the flood is quite high, they usually fold their pants so that it will not get wet. Residents are familiar with these problems, so they do not feel bothered” (p.47). Living with disasters is becoming the daily routine of the poor and vulnerable groups. Hence, survival does not assume the complete elimination of risks and uncertainty under climate change; however, it encourages “basic ongoing survival” (ACCCRN, 2009b, p.5) as a way of living in turbulent worlds. Survival rationality sits under the broader sense of empowering as governing tactics. This empowering as a governing tactic is defined as ways of forming the conduct of conduct of urban individuals, households, groups, and locals on the basis of survival. Some governing techniques further involved focusing on empowerment through different ways of engaging individuals, households, groups, and communities to be prepared from climate change risks, such as training, workshops, and climate education.

4.4. The idea of resilience governmentality

This section introduces and discusses the new idea or concept of “resilience governmentality.” If climate change adaptation policies are recently discussed as the politics of anticipation (Beck and Mahony, 2017), then this chapter argues that the resilience agenda exemplifies the politics of reproduction. It engages with the politics and governance of climate change adaptation and building resilience, which involves new spaces and objects of governing. As a consequence, resilience has become a prominent rationality for governing risks from climate change in recent years. It is argued that there is a new governmentality that is central to the concept of resilience, called “resilience governmentality.” This governmentality involves different iterations for reproducing new knowledge-power, spaces for intervention, and empowerment programmes to direct human conducts. Resilience has been translated into a means for governing the cities and their urban populations in both ACCCRN cities in Indonesia.

What is beneath the surface is something more interesting than anything that is visible. As explained before, resilience is widely applied across disciplines. However, this research examined what opportunities we will have if we scratch the surface and try to understand how resilience has been contested, practised, and enacted in climate change adaptation programmes at the urban level. The analytics of government allows us to “reveal domination as a contingent, historical product, and hence to be questioned.” (Dean, 1999, p.50). Or in other words, as Dean (1999, p.50)

mentioned again, it "removes the 'naturalness and taken-for-granted' character of how things are done." In this study, the analytics of government means to study resilience as not something that is '*a priori*' or 'already happened' but as something that is *made* to happen.

Building urban climate change resilience is then translated that resilience is "the capacity of an individual, community or institution to dynamically and effectively respond to shifting climate circumstances while continuing to function at an acceptable level" (Brown *et al.*, 2012, p.534). It was developed as a "co-evolution of societies and ecosystem" in a changing world (Walker and Cooper, 2011, p.147). Resilience is defined as the capacity to overcome disturbance and withstand it.

More specifically, it is argued that resilience governmentality is an assemblage of rationales, tactics, and techniques through multiple techniques of power within a network of instruments undertaken within a series of government and knowledge-power that target population to become individually or communally active to withstand, perform, and transform over a continuous change or disturbance within the urban sites and politics. Within this assemblage, it is understood urban climate change resilience building has become social regulation and control, technology of government, and conduct of conduct (Dean, 2010; Gordon, 1991; Lupton, 1999; O'Malley, 2008).

Resilience governmentality emerges as a new approach to governing urban sites and their populations. It has redefined the way we imagine, experience, and practice resilience in the urban world. Resilience governmentality focuses on the capacity for self-capacity, self-organisation, and pre-empting the future rather than simply an adjustment to a continuous change or disturbance. Risk as a technology of government also becomes more prominent in urban resilience. Governing urban resilience involves multiple techniques of power, including normalisation, self-governing, and risk-avoiding behaviour within a network of instruments. This perspective also brings a multiplicity of climate narratives of making, maintaining, and living at urban (Bulkeley *et al.*, 2015).

It is argued that resilience has also become a new insurance management in urban governance. This emergence does not mean that one is to be secured from risk and uncertainty as the promise of security; however, to become resilient, one has to become free. Within this assemblage, we are free for and within individual freedoms and collective actions. Resilience is a (de)constructive idea for the management of

turbulent urban worlds. Resilience is the new practice of management and exercise of powers. This practice operates through and within the governable spaces – in which several tactics and techniques are being enacted and has a locus on governable objects. Resilience is the rationale for the management of our conduct, behaviour, and choice of lives towards the goals of non-directive governance. The objects of government in this resilience governmentality are urban spaces and human beings – their body and soul, cultural subject, and political subject. Thus, resilience is not neutral. It is to be created and framed as new subjectivities of human beings amidst current and future climatic risks within cities.

Resilience as governing rationality is performed within tactics and techniques of instrument, maintained within apparatus/agencies, and sustained within the population. The resilience apparatus then operates within a network of instruments in which consensus is being exercised through agents, institutions, techniques, mechanisms, and discipline. This leads to the birth of a "regime of resilience." In another word, the amplification of the culture of resilience into government practices emerges as the process of governmentalisation of resilience. Within this rationale, it is considered in the study that resilience as a means for creating social order – in contrast with climate change adaptation, which is engaged with an action towards an 'event.' Social order, by governing through resilience, is being delivered, practised, and enacted through diverse sites, mediums, and objects of governance in the urban. As an effect, resilience popularly becomes the vocabulary of hope, for example, "resilience dividend", "resilient community", and "resilient cities", which are managed and maintained to continue the project of governmentalisation of resilience.

4.4.1. Other resilience governmentalities?

Is there only one resilience governmentality? While the previous section has discussed so far a kind of resilience that is central to the idea of emerging actions, it is argued that there is more than one resilience governmentality. For example, another resilience governmentality focuses on the idea of centralised knowledge, such as standardisation. Standardisation is another part of the technology of power within the resilience governmentality that is recently being practised. This technique is practised by different multi-governance actors from national and local governments in Indonesia. It implies creating standardised measurements to control, monitor, and govern a particular system of interest, such as infrastructure, policy and

monitoring tools, to align with a specific resilience objective. Rogers (2013) explains that resilience has also been practised to become embedded in regulatory experimentation such as standards, toolkits and implementation guides. It brings discussion on how the concept of resilience is currently being operationalised.

The first example of standardisation is the experiment and application of resilience indicators in ACCCRN cities in Indonesia. It was initially attempted to overcome the problems for defining, measuring, and calculating the progress of resilience actions (Tyler *et al.*, 2016). The resilience indicators used in ACCCRN cities in Indonesia aim to bridge the dichotomy of expert-driven and locally-driven approaches and focus on indicators that will guide local planning and decision-making (Tyler *et al*., 2016). As briefly described below, the resilience indicators develop for critical infrastructure that is sensitive to climate change risks and support resilience building. As an example, water supply indicators could include water supply sources, quality, distribution network, public distribution utility, planning mechanisms, incentives for water demand management, information on water quality, and tariffs for water use which coherently cover city system, agents, and institutions characteristics (Tyler *et al.*, 2016). The aim of resilience indicators is that the internal city systems, its agents and institutions are being controlled, monitored and governed around which the core governing process focuses on central knowledge. The development of resilience indicators is described by Tyler *et al*. (2014) in the following quotes:

> "The tool helps users to start from the general elements of the Climate Resilience Framework (CRF), and then proceed to more specific local context and definitions. The elements of resilience [include] – systems (infrastructure and ecosystems), agents, and institutions.… Each matrix was structured around a key vulnerability issue in each city. Normally the cities found this most sensible to structure in relation to infrastructure systems or to departmental responsibilities. That way, it was easier to identify sources of data and understand who would most likely use the resulting indicators" (pp.12-14).

Standardisation is spreading, which may include the design and parameters for resilience policies and regulations. Individuals are accountable for undertaking resilience measures under resilience-specific regulation. For example, in Bandar Lampung, urban residents are requested to submit evidence for undertaking

resilience action before getting administrative service at the Sub-district Office. In another case, the Ministry of Public Works and Housing (PUPR) undertook a study to develop a standard and guidance for "resilience indicators" in settlement infrastructure, including building, sanitation, and water supply (PUPR, 2016). To advance the national target for emission reduction and resilience building, the resilience indicators are designed to increase urban resilience from climate change. Resilience as a standard does not only touch the formal standards in the form of regulation and toolkits as explained above but, in general, it becomes a systemic thinking of life for each urban individual, community, and system in which the knowledge is centralistic and forced as a top-down process – compared to another type of resilience governmentality that more towards neoliberalising individuals.

4.5. Conclusions

This chapter has demonstrated how to govern the climate and, ultimately, the city and their population through a diverse, multi-site network of instruments in which resilience planning and actions take place. As argued by Anderson (2015), the "connections between resilience and something else should not be the premise of inquiry, but must be demonstrated" (p.64). This chapter has critically demonstrated and analysed how resilience becomes governing rationality in order to cope with increasing risk and uncertainties from climate change. As evidenced in the study, resilience governmentality emerges as a new mode for governing the climate, which consequently turns to governing the urban sites and their population. Resilience as a political or governing rationality has become a way of thinking for deploying technology of powers within the urban sites through calculative technologies in order for the problems of climate to become manageable and governable. Two ACCCRN cities in Indonesia have become open sites for the operation of resilience governmentality with close interactions with the local agendas. Resilience governmentality emerges as a new mentality in which particular values, techniques and material forms are linked to set up a goal to direct urban conduct. This chapter illustrates the multiple tacit premises and assumptions upon which urban climate resilience is rationalised at the programme and project level within ACCCRN.

More specifically, this section summarises the prior discussions to answer the research questions. How does building urban climate change resilience become visible in ACCCRN? It is argued that the 'problems' of climate change arguably are

not pre-given, singular, and constant across time but have to be made visible and constructed around different forms of rationalities in order for the regime of resilience to become enacted as desirable solutions. At the programme level, urban climate change resilience becomes visible in ACCCRN as insurance management to the problems of the climate as non-deterministic and uncertain futures. Therefore, the alternative management in ACCCRN does not seek to completely figure out the future of climate in order to secure resilience but evaluates, calculates, and moderates as a continual process of adjustment where complete protection is no longer relevant. This rationale is then very relevant to the second question about what forms of knowledge arose from and informed the experimentation and the third question about how resilience thinking renders particular climate change problems governable. As evidenced from both case studies, urban climate change resilience in ACCCRN has emerged under heterogeneous governing rationalities upon which knowledge-powers operated in order for the tactics and techniques of governing to become enacted in actions. First, building urban climate change resilience produces anticipation as a governing rationality, in which resilience planning and actions are developed to anticipate any possible future events. Under the anticipation's governing rationality, ways of acting focus on stimulating, examining, and evaluating climate risks on the basis of sensing the future of climate events, such as vulnerability assessment, risk mapping, and scenario planning. It also developed around a specific problematisation in which specific groups of populations are rendered vulnerable and require continuous monitoring. Second, in relation to the urban population, building urban climate change resilience produces survival as a governing rationality, in which resilience planning and actions are developed to support the basic ongoing survival for adapting, living, and thriving under climate change threats. Under the survival governing rationality, ways of seeing and thinking focus on the conduct of conduct of urban individuals, households, groups, and communities in order to be 'free' from the dangers of climate change by conducting specific training, workshops and climate education.

As discussed earlier, while the chapter engaged with some discussions on the techniques of calculation, the main objective is to analyse and evaluate how different ways of thinking and questioning around urban climate change resilience within ACCCRN occurred to make sense of why specific governing interventions rendered manageable and governable. Those two governing rationalities, anticipation and

survival, constitute a fabric of collective thinking around why urban climate change resilience poses a specific problem of concern. As an effect, these rationales raised further questions on what the consequences of resilience governmentality to affect and develop into different technological powers and networks of instruments, which are discussed as the emergence of resilience apparatus in Chapter 5 and a new subjectivity of climate human in Chapter 6. These chapters open up for in-depth and critical discussions of the construction and reproduction of governmentalisation of resilience within ACCCRN at the programme and project levels.

Chapter 5: The emergence of resilience apparatus

"The apparatus itself is the system of relations that can be established between these elements… the nature of the connection that can exist between these heterogenous elements… opening out for it a new field of rationality…. The apparatus thus has a dominant strategic function."
(Foucault, 1980, pp.194-195)

5.1. Introduction

In order to become materialised, resilience needs to be translated into ways of providing actions, conducting interventions, and directing the cities and their urban population. In the thesis, it is argued that there is a new emergence of resilience apparatus in which building urban climate change resilience or urban climate experimentation or resilient urbanism has been fabricated within the circulations of different sets of apparatus and the object of governance/living beings, and its endless process of construction and re-production of a new subject of governing.

This chapter aimed to discuss the second research objective of the research: "to analyse who the actors are and what kind of urban institutions that are deployed to manage urban resilience." The supplementary questions for this chapter include: (i) How does the network of instruments of urban resilience become embedded in the practice of urban governance in ACCCRN, and (ii) How does this regime of practices inform the relation between urban resilience and neoliberalisation of nature? This chapter focuses on how ACCCRN is being implemented as urban climate experimentation and how it engages within the resilience apparatus and neoliberalisation that offer different forms of social formation and relations. This chapter analyses urban climate resilience by examining the programme, projects, actors, and institutions in the two cities involved, Semarang and Bandar Lampung.

As discussed earlier, the study of analytics of government involves analysing and examining ways of acting and deployment of government into technological powers and network of instruments as part of an apparatus. Miller and Rose (2008) describe apparatus as a regime of practice or milieu of thoughts in which a set of

problems is being rendered instrumental, manageable, and governable. The chapter discusses and analyses how ACCCRN emerges as an 'architect' of urban resilience apparatus and how this process interrelates with the expanding conjunction of neoliberal urban governance in Indonesia. The next section discusses how ACCCRN evolved as an urban experimentation that engages within an organic process of planning, action, and learning. Each aspect of the resilience apparatus – knowledge, actors and network, will be discussed individually to inform different socio-material formations, knowledge-power, and techniques embedded within the ACCCRN programme. Section 5.3 discusses how this emergence of resilience apparatus developed within the assemblage of strategies, practices, and actions that informed how social formations and relations are neoliberalised by resilience processes in both ACCCRN cities in Indonesia. The sections that followed discuss resilience as an urban apparatus that operated and reconfigured around different spaces and objects of government which is consistent with the premise of liberalism.

More broadly, this chapter informs readers that urban resilience emerges as an experimentation is more than a socio-ecological process but also embedded as a specific form of knowledge-power. While the previous Chapter 4 discussed the rationalities behind urban climate change resilience, this chapter focuses on engaging with analysis and evaluation on what technologies of government deployed as part of this resilience apparatus. The emergence of resilience apparatus as a regime of practices constitutes diverse processes and relations in which the governing elements are assembled into forms of organisation and institutional practices.

5.2. Making resilience in ACCCRN

The ACCCRN initiative as an urban experimentation involves a diverse and integrated process of planning, action, and learning. The initiative also engages and interacts with the intersection of endogenous and exogenous forces as the origin of urban experimentation. The discussion in the section begins by showing how ACCCRN has become 'an architect' of urban climate experimentation. Further, the following sections discuss the making of urban apparatus and how distinct governance components emerges to make urban resilience visible and how this is managed by different governing techniques and programmes.

The *making* of resilience is defined as agenda, policies, actions and interventions for building urban climate change resilience in which the 'truth' becomes

manufactured using tactics and techniques for managing climate change risks and uncertainty. It is also moderated through the reproduction of new social relations between the state and urban population that maintained the regime of practices in order to become embedded into urban lives. The *making* of resilience involves an action towards assembling knowledge, actors, institutions, and networks that reduce climate change risks. The *making* of resilience in ACCCRN discusses three conjectures of apparatus of knowledge, networks, and resilience plans. Ways of acting involve the translation of resilience concepts to the production of truth. The section discusses how resilience gets translated from architectural design towards implementable agendas, policies, and actions.

5.2.1. Knowledge apparatus

The absence of models in urban adaptation has led cities to test new ideas and approaches in adaptation planning (Anguelovski and Carmin, 2011). In 2009, amid a lack of adaptation protocols or guidance, ACCCRN cities commenced an initiative to experiment with adaptation planning and actions. These processes involved undertaking a test and trial, implementing small projects, partnering with different organisations and institutionalising into urban governance. ACCCRN programme defined their process as iterative, cyclical, and organic to build urban resilience. This process engaged in an 'adaptive model' or 'an experimentation' as an act of making urban climate change resilience visible and manageable.

The programme also facilitated knowledge-policy interaction throughout its programme implementation. The process followed the co-production of knowledge (Callon, 1999) that locates knowledge as the co-production process of "dynamic, collective learning those for whom an issue is of particular concern" (Lane *et al.*, 2010, p.18). Urban experimentation functions for testing knowledge production, building new partnerships, and creating urban sustainability (Evans, 2011). Most of the experiments are currently led by local governments, with partnerships as a newly emerging mode for governing climate change (Castán Broto and Bulkeley, 2013).

In ACCCRN, it is a typical exogenous driving force initiative for building resilience and climate change adaptation that offers learning process on testing adaptation protocols (Anguelovski and Carmin, 2011) and urban experimentation

(Evans, 2011). The initiative[29] has experimented to implement an integral tool for analysing multiple urban systems, interlinking with vulnerability and agent capacity, and focusing on stability to future stressors (Moench *et al.*, 2011). It follows a cyclical adaptation planning process that begins with stakeholder engagement, followed by undertaking assessment and sector studies, planning for a city resilience strategy, implementing multi-actor collaborative interventions and ending up with learning, synthesis and evaluation (Brown *et al.*, 2012). This process is iterative in order to understand both city vulnerability and responses for building urban resilience, and immediately provides a channel for inclusive decision-making and participation from broader stakeholders (Tyler and Moench, 2012).

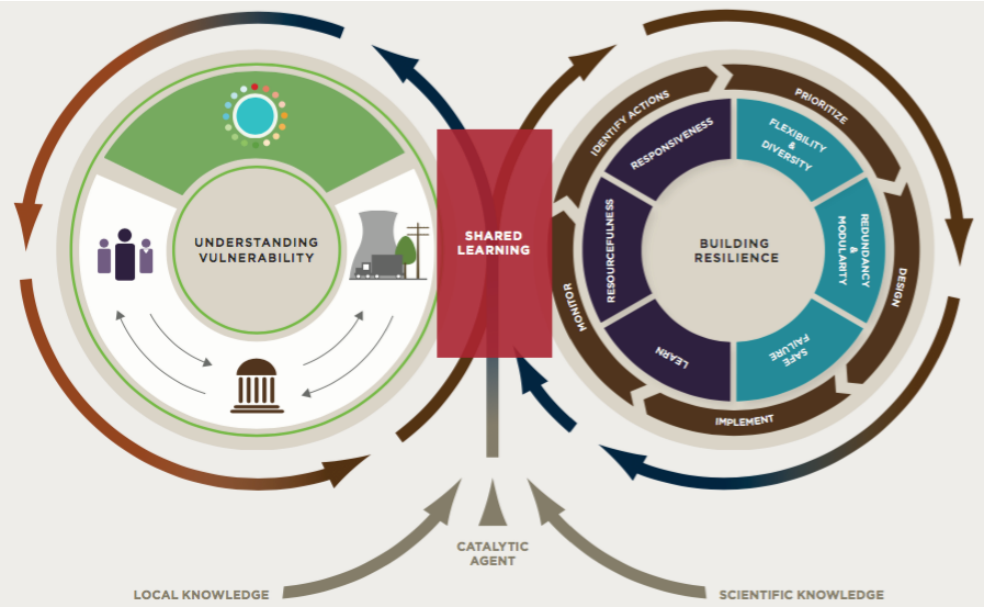

Figure 5. 1 Urban Climate Resilience Planning Framework

(Source: ISET, 2017)

The programme also developed what is called the "Urban Climate Resilience Planning Framework (UCRPF)", see Figure 5.1, which signifies that responses to climate impacts and simultaneously fostering proactive and systemic approaches to preparing for unexpected and indirect effects of the global change aimed to build urban resilience (Moench *et al.*, 2011). Urban climate resilience is defined as a combination of urban systems, social agents and institutions that are inherently stable to the climate change impacts or exposure (Moench *et al.*, 2011). Within this dual

[29] The words "programme" and "initiative" are used interchangeably to denote ACCCRN in the thesis.

cycle of reducing vulnerability and increasing resilience, urban climate experiments were conducted in ACCCRN cities including in Indonesia. The process involved a combination of understanding local knowledge and scientific knowledge under the umbrella of Shared Learning Dialogues (SLDs) as collective learning.

The programme demonstrates urban resilience as an apparatus of the intersection of knowledge networks, policy-makers, techniques, and programmes (Donovan, 2017). Donovan (2017, p.60) signifies that this process is "not linear, nor constant in space-time." Urban climate experimentation in ACCCRN clearly also exemplifies "the potential use of scientific knowledge about vulnerability and resilience as mechanisms for the exercise of biopower and governmentality" (Donovan, 2017, p.60). In their review of the ACCCRN approach for building urban climate change resilience, Anna Brown and her colleagues (2014) from The Rockefeller Foundation highlight the value of resilience to re-approach urban governance as follows:

> "The conceptual underpinnings of ACCCRN point to the need to investigate and advance action based on the appreciation and interdependencies among a range of actors and systems…. While many of these components are not novel in and of themselves, their application in concert to address long-term climate challenges in a cross-sector and collaborative approach is novel" (pp.533-534).

Experimentation in ACCCRN cities, which is defined as "urban climate change resilience (UCCR)", is commenced through cyclical adaptation planning. The experimentation starts with stakeholder engagement, followed by undertaking assessment and sector studies, planning for a city resilience strategy, implementing multi-actor collaborative interventions and ending with learning, synthesis, and evaluation, which is an organic and iterative learning process. O'Brien and O'Keefe (2014, p.95) argue that climate adaptation is "a socio-institutional process rather than the outcome of scenarios of vulnerability." As we can see in Figure 5.1, this definition resonates with the focus on process-based results, which involves multi-stakeholders, iterative process, learning and evaluation, rather than simply product-oriented outputs such as adaptation projects. The *making* of resilience in ACCCRN that seeks urban climate change resilience as a non-linear process, iterative and learning-by-doing engagement is distinctive from other approaches for building urban resilience. In responding to the non-deterministic and turbulent futures, ACCCRN developed the apparatus of knowledge that is diffused from a centralised

approach to a more experimental approach to conducting resilience.

Moreover, Pelling (2011, p.5) describes (climate change) adaptation as "a process of socio-political transition and transformation" that involves adaptive learning, refining current governance, and redefining the political economy in the process. In recent years, global organisations and international projects have brought together different adaptation protocols to respond to climate change and to integrate climate change adaptation and disaster risk reduction into the mainstream of the international development sectors and national governments, including World Bank, ADB, ICLEI, UN-Habitat, USAID, CARE, and the Adaptation Knowledge Platform. This interest shows that the ACCCRN process also performs as a multiplicity of mechanisms and techniques for bringing resilience into urban governance.

5.2.2. Network apparatus

ACCCRN programme is best described as an intermediary organisation (Hodson and Marvin, 2014), which is an agent of change that contributes to the process of achieving successful socio-technical transitions for responding to environmental risks. These two forces, endogenous and exogenous forces, interactively work in conjunction with each other and shape the dynamics, progress, and narratives around governing climate change at the urban level in ACCCRN cities. In practice, ACCCRN is an intermediary organisation that focuses on networking for initiating adaptation planning. The programme involved working with city stakeholders, ministerial governments, national universities, and international private consultants, thus creating *a web* of community of practitioners in urban climate resilience. More broadly, the ACCCRN role expanded from being the initiator and catalyst to becoming an exemplar of urban climate experiments at secondary cities, and also towards the end of the project, scaling up the initiative into the wider regional area across South Asia and Southeast Asia, including more than 40 other cities in Bangladesh and Philippines.

In particular, ACCCRN cities in Indonesia, Semarang and Bandar Lampung, engaged with multi-actors and multi-level governance at international, national, and sub-national governments. At the city level, both cities established an Urban Climate Change Resilience Network Team (known as City Team). This City Team then is part of the Indonesia City Association (APEKSI), as part of the working group in climate change adaptation, and actively advocates climate change policies to national

governments. Both cities also integrated their City Resilience Strategies into the Medium Term Development Plan (RPJMD), a five-year plan the elected mayors produced to ensure the implementation and funding for adaptation actions. At the national level, both cities also engaged with the Ministry of Environment and Forestry and Indonesia City Association (APEKSI). At the international level, they engaged with international consultancy and academics from Arup, the Institute for Social and Environmental Transition (ISET) and the Institute for Housing Studies (IHS). However, as a web of practitioners in urban climate change resilience, the ACCCRN network in Indonesia can also be understood as a set of relations between multiple actors, agencies and activities that resulted, emerged, and stimulated from various distributions of powers (Dean, 2010).

Table 5. 1 Multi-level governance in urban climate resilience

No	Level of governance	Actors involved	Mode of governance
1	Local	City Team, governmental agencies such as Local Development Planning Agency (BAPPEDA), Environment Agency (BPPLH) and Disaster Management Agency (BPBD)	Collaboration
2	National	Ministry of Environment and Forestry and Indonesia City Association (APEKSI)	Coordination
3	International	Arup International Development, Institute for Social and Environmental Transition (ISET) and Institute for Housing Studies (HIS).	Knowledge transfer and learning

5.2.3. Resilience plans apparatus

Building urban resilience to climate change in both ACCCRN cities in Indonesia is becoming a regime of 'truth' along with resilience planning and legislation. The concept of resilience began to gain attention for policy formulation in Indonesia. The first time resilience became embedded into policy in Indonesia was in ministerial

regulation for adaptation planning (Ministry of Environment and Forestry, 2016). Later, in the review of the National Spatial Plan, resilience building is required to be integral as part of spatial planning and strategies for disaster risk reduction. Within these, the resilience concept is applied to broader areas of environmental management and cross-sectoral integration, such as spatial planning and disaster risk reduction. In 2016, the Ministry of Environment and Forestry (2016) adopted the term "resiliensi" (literal translation of resilience), derived from the IPCC's definition of resilience in the Fifth Assessment Report (IPCC, 2014b), into its regulation, which applied to climate adaptation and environmental changes:

> "Resiliensi [resilience] of a specific region and/or sector to climate change impacts, which then called resilience is the capacity to cope with climate change impacts to maintain and enhance their essential function, identity, structure and capacity" (p.3).

The following sections discuss and analyse how ACCCRN developed into specific programmes and techniques and how this informs us about the kind of urban resilience apparatus that ACCCRN enacted.

5.3. Neoliberalising resilience in Indonesia

Resilience as a response to climate change problems is not singular. It is diverse. This conceptualisation means that despite its general definition as a means and an end for managing risk and uncertainty while maintaining the basic functions, how it is implemented is not within any single and unified narrative. It is multiple and interpretative. In relation to resilience and neoliberalism, Anderson (2015) reviews that "resilience involves individualism and so does neoliberalism… neoliberalism involves a catastrophic imaginary and so does resilience… resilience is associated with privatisation and so is neoliberalism" (p.63).

This section provides analytical discussions on how resilience operated in ACCCRN cities in Indonesia regarding what constitutes an apparatus and how these specific interventions exemplify a means through which an apparatus is deployed, maintained or reproduced. This section also discusses how resilience interacted with the notions of neoliberalism and resilient urbanism. What does it mean to govern a resilient city? How does resilience being implemented coexist within the sites of

neoliberalisation and urbanisation? Can resilience become the seeds for neoliberal and resilient urbanism?

There is a tendency to manage risks from climate change using non-state actor interventions rather than top-down interventions from the government. In urban resilience, an early examination of an Indonesian city (Nugraha, 2014) has shown that direct and indirect techniques of power have been initiated and explored for managing the risks of climate change. This tendency is aligned with the political purpose of neo-liberalism, which is to have fewer interventions from state government and encourage the promotion of self-help and individual autonomy (Lupton, 1999). This trend also resonates with what Brown (2015, p.36) calls "the human as an ensemble of entrepreneurial and investment capital."

Neoliberalism is not a unified or stable object of history but is understood as ranges and changes within geographical and temporal sites of urban spaces and lives (Brown, 2015). Within this conjecture of histories, the following sections analyse and evaluate "a variety of local instantiations and a range of different policies of techniques" (Brown, 2015, p.50) to conceive a relationship between the state, society, economy, environment and subject within so-called "neoliberalising urban spaces." In this matter, Brown (2015) also explains the idea of humans in neoliberalism with the practice of networking, which she describes as "so ubiquitous… that neoliberal rationality does not always take a monetary form; rather, fields, persons and practices." (p.37)

This is also involved within the assemblage of strategies, practices, and actions to encourage the free conduct of individuals, which aims to build an imagined community that is independent, embracing their self-capacity and self-organisation. It is to enhance 'the capacity' of an individual, community or institution and no longer rely on government. In the context of urban resilience, the capacity is defined by the openness, self-learning and self-awareness of individuals, communities, and institutions to pre-empt the negative effects of climate change, e.g., safe failure. Hulme (2017, p.143) argues, "global temperature is not an object which is directly tractable to human actions" and under this context, it is argued that cities and its urban population are the truly the object of governance in resilience. The uses of various techniques of power, such as surveillance, observation, and measurement, as discussed in Chapter 4, are central to the exercise of power in governmentality (Lupton, 1999). Apparatus of resilience governmentality is performed in different

calculative technologies to manage climate change risks and impacts in both ACCCRN cities in Indonesia.

The following sub-sections analyse the two case studies, Bandar Lampung and Semarang, in Indonesia. Both cities have experimented with different climate change adaptation projects that engaged in building resilience and experimentation with market mechanisms. By increasing the capacity of individuals and communities to 'enter the market', ACCCRN has shifted the stance of democratic values of neoliberalism as governing rationality from a political to an economic register (Brown, 2015). "People", in this sense, as Brown (2015) criticises, are "human capital who must constantly tend to their own present and future value." Analytically, the sub-sections aimed to analyse resilience and neoliberalism through "a mode of analysis" (Braun, 2015, p.9) that evolves as "a flexible repertoire of policy rationales and practices; rather than a static" (Peck, 2010, p.276). The analysis in the study focused on how social formations and relations are neoliberalised by resilience processes in both ACCCRN cities in Indonesia.

5.3.1. Semarang City: Sustainable livelihoods

The attempt to solve the problems of climate in economic or livelihood in Semarang started with a small pilot project to test and initiate what adaptation actions or interventions will work to address climate change impacts. As part of the pilot phase in ACCCRN, the Bintari Foundation initiated a local adaptation project to increase resilience in the Tapak district in the northern part of Semarang (Bintari Foundation, 2010). It was a short intervention for a three month period from March to June 2010. It mostly involved increasing the resilience of local coastal communities by building artificial coastal protection to protect fishery livelihoods. Coastal communities in the northern part of Semarang are reported to have already faced significant impacts from climate change, such as "increasing extreme weather, sea level rise, and rising temperature affecting salinity and mangrove plants" (Bintari Foundation, 2010, p.6). The pilot project built a coastal defence for 180 meters to protect six hectares of fishponds (Bintari Foundation, 2010). Climate change adaptation locally is conceptualised around the idea of protection to avoid disruptive events that are affecting local economic activities.

However, recognising the need for a broader intervention to address coastal vulnerabilities, the Mangrove Project was initiated in 2013. It was described by the

Bintari Foundation (2010) that while the coastal defence could be implemented with low technology application and protect coastal livelihoods, however, there is greater income uncertainty by implementing conventional fishponds. There is a much greater demand to help the communities by "increasing their income" (Bintari Foundation, 2010, p.12). The new project focused on the restoration of mangrove sites, nurturing mangrove plants and providing alternative livelihoods.

More specifically, the Mangrove Project aimed "to strengthen the mangrove ecosystem and develop alternative livelihoods for poor/vulnerable people living in 4 coastal sub-districts of Semarang" (The Rockefeller Foundation, 2014, p.28). The key activities within the project focused on increasing environmental services as well as introducing alternative livelihoods. In this sense, the new Mangrove project has changed the governing approach for building urban climate change resilience, which is described by Evans and Reid (2014) as the transition from "*freedom from* danger" (p.61 – original emphasis) to "a permanent struggle of adaptation to dangers" (p.63). Coastal communities are demanded to shift their efforts and actions to avoid, protect or eliminate the events of climate change, such as sea level rise and insecure livelihoods, to 'embrace' the impacts by developing "buffer capacities" (Evans and Reid, 2014, p.61).

Commodification

The Mangrove Project exemplify commodification in the neoliberalisation of nature to accommodate sustainable livelihoods in order to build urban climate change. However, the project implementation was conceptualised by initial assessment and market approach by organisations involved in the project. As the basis for a robust assessment, the Rockefeller Foundation invited INTELLECAP to provide a market assessment and study for the ACCCRN programme. The INTELLECAP's expertise focuses on "providing business solutions that help build and scale profitable and sustainable enterprises" (INTELLECAP, 2018, no pagination). The recommendations for market involvement in building resilience and climate change adaptation described in INTELLECAP's study *Opportunities for Private Sector Engagement in Urban Climate Change Resilience Building* for The Rockefeller Foundation (INTELLECAP, 2010) are as follows:

"Given the paucity of funds to tackle the impacts of climate change, the private

sector has a critical role to play in bringing in its understanding of the market, operating efficiencies and quality products and services that can sustain, given the business model attached. Enterprises are incentivized by market forces to produce and deliver the best product or service for their target customers at the best rate in the most efficient way" (p.5).

The idea of the market as the site of intervention was also realised by MercyCorps as the country coordinator for ACCCRN in Indonesia. George[30], a former senior associate at MercyCorps, described "climate change is a market failure" (Personal communication, 22 November 2016). He explains that "we need the market to be involved in its [climate resilience] building… they've got to be involved, individuals as citizens, country and city, we had to hold them into account" (George, personal communication, 22 November 2016). George explains that economic development is one of the core works of MercyCorps as an international development agency. In order to build urban climate change resilience, MercyCorps focuses on understanding "how social, economic and ecological systems support the people and communities… and to ensure the poor and vulnerable… have options to access and influence those systems" (MercyCorps, 2018, p.1). In a similar fashion, George argues that in addressing the market failure, what is needed is "getting people to get involved in their economy… is the core function as an agency as the whole" (Personal communication, 22 November 2016).

In the *City Project Catalogue* (The Rockefeller Foundation, 2014), the Mangrove Project activities included establishing mangrove nurseries for local community groups and vulnerable populations, planting 250,000 mangrove trees above 100 hectares of degraded coastal areas, building artificial coastal defence to protect 1,100 meters of coastline, and training the local community with climate information and for development of alternative livelihoods. In relation to economic activities to build resilience, ACCCRN described the project as follows (The Rockefeller Foundation, 2014):

"By offering more information about climate change and alternative sustainable livelihoods, the communities' resiliency will be strengthened… the ability to secure alternative livelihoods will provide greater flexibility to the coastal communities" (p.28).

[30] This name is a pseudonym.

Further, in collaboration with another MercyCorps programme, Managing Risk through Economic Development (MRED), the Mangrove Project developed sustainable livelihoods at the targeted coastal communities in northern Semarang (MercyCorps Indonesia, 2015b). It concentrated on improving the mangrove ecosystem while at the same time providing an opportunity for acquiring alternative sustainable livelihoods. The two alternative livelihoods developed in the project are eco-tourism in Tugurejo and prawn and fish processing. During the project implementation, local communities engaged to learn and develop their business knowledge and capacity, including market research, branding strategy, marketing plan, and financial forecast. When I asked Faisal[31], one of the local leaders of Prenjak Conservation Group, about his experience engaging in the project and why he thought it was important for local communities to get involved, he described his experience in the below quotation:

> "It has involved local communities in the activities … to ensure the [project] sustainability. For example, in eco-tourism, the activities are purely managed by local communities because they will feel the direct benefits. If local communities were not involved, were not engaged at all. It wouldn't continue … for myself, I was initially unaware of economic [activities], but now I can involve people" (Personal communication, 6 June 2016).

Building urban climate resilience, and consequently resilient communities, involves using a technique of empowerment by targeting the local community's capacity and capability to adapt economically and intrinsically capacity for learning and establishing a market. On the other hand, the idea to introduce alternative livelihoods is to invite private businesses to support marine economic activities by coastal communities. These local communities were trained to increase their capacity and management effectiveness to run more professional businesses and prepare to compete with others. It is concurrently implemented with the introduction of marine species that are more resilient to climate change that will provide alternative sustainable aquaculture for the local coastal community. The idea of "environmental fixes" (Castree, 2009, p.1791) as part of the neoliberalisation of environmental and resource governance has also engaged with commodification, where mangrove and coastal resources are managed under a market rule.

[31] This name is a pseudonym.

The Mangrove project informs us that Brown (2015) has argued that competition as the central principle of market rationality has replaced exchange within which political subjects of the urban lose guarantees of protection by the state. More acutely, within neoliberalising urban spaces, the "every subject", as Brown (2015, p.65) criticised, "is rendered as entrepreneurial." The conditions of coastal communities, as vulnerable groups to climate change, do not hold the facts that they have to develop new entrepreneurial spirits. This is similar to Brown's (2015, p.65) observations that for the human subject to be rendered entrepreneurial, "no matter how small, impoverished, or without resources… every aspect of human existence is produced as an entrepreneurial one." Hence, the Mangrove Project attempts to initiate sustainable livelihoods that engage with new social transformation of coastal communities to become an entrepreneurial subject. It has also engaged in new social relations between the state and urban population in which coastal communities are responsible for their own protection.

5.3.2. Bandar Lampung City: Social business

As the results from the *Vulnerability Assessment* and *City Resilience Strategy*, Bandar Lampung has prioritised managing waste problems and water conservation as its climate change adaptation and urban resilience projects. With a baseline assessment from the *Integrated Solid Waste Management Master Plan Study* (ACCCRN, 2011), there was a significant need for the management of solid waste to reduce drainage and river blockage due to waste disposal and low community awareness. The Waste Bank project was then initiated as a combination of action for resilience building and testing social enterprise (The Rockefeller Foundation, 2014). A water-based project was also initiated in Bandar Lampung through biopore as water conservation to enhance public participation by engaging with a community-based local organisation. Both projects served as an experiment of social enterprise to respond to climate change risks in the city. The section discusses a specific case study of Waste Bank in Bandar Lampung.

More specifically, waste is commonly discussed as a climate change mitigation problem. However, in Bandar Lampung, managing urban waste is also a concern as part of climate change adaptation. Poor drainage and solid waste management, especially in low-income neighbourhoods, are combinatory factors that lead to urban waste in Bandar Lampung becoming not only a source of greenhouse gas emissions

but also a triggering factor for increasing risks from climate change (MercyCorps Indonesia, 2010). It was reported that only 26.5% of the total waste was disposed of at the final disposal site (MercyCorps Indonesia, 2010). This has increased flooding and health risks due to climate change because uncollected waste is often disposed to major water bodies, drainage channels, and coastal areas – see Figure 5.2 for an example of uncollected waste disposal in coastal areas.

Figure 5.2 Uncollected waste disposals at coastal neighbourhood

(Source: MercyCorps Indonesia, 2010)

Commodification and Deregulation

It began with the *Integrated Solid Waste Management Master Plan Study* (ACCCRN, 2011). Realising the need to analyse fully the problems of urban waste, the City Team in Bandar Lampung decided to propose a solid waste management study to the Rockefeller Foundation. The study aimed to offer "a solution by assessing the appropriate integrated waste management model and… simultaneously enhancing community's livelihood by increasing economic value of recyclable waste" (MercyCorps Indonesia, 2010, p.27). The study recommended that emphasis should be placed on restructuring the existing solid waste management organisation in the city to improve efficiency and effectiveness.

One of the solutions offered was to adapt to climate change and manage climatic risk by establishing a waste bank. The Waste Bank project was later initiated "to

reduce flooding and health risks associated with climate change and waste management whilst helping to address the livelihood challenge faced by the fishermen through income generation opportunities provided by a waste bank" (The Rockefeller Foundation, 2014, p.24). The Waste Bank is located in and managed by the local community. It was run as a social enterprise where local community members are paid to collect and deliver recyclable inorganic waste to the waste bank, for which they receive cash compensation, or they can deposit the income into a savings account. It was described in the ACCCRN catalogue the general benefits of the operation of the waste bank (The Rockefeller Foundation, 2014):

> "The waste is recycled and sold by the waste bank, generating the revenue needed to sustain its operations. The interaction between community members and the waste bank is also an opportunity to educate community members on financial literacy and waste management, such as the possibility of composting organic waste" (p.24).

The Waste Bank exemplifies another effort for the neoliberalisation of nature through "an ecological fix" (Bakker, 2009, p.1782). Bakker (2009, p.1782) further explains that an ecological fix refers to "strategies of externalization and internalization of socioenvironmental conditions, in search of profit." In other words, it is simply "turning a potential threat into an opportunity" (Bakker, 2009, p.1782). In the case of Waste Bank in Bandar Lampung, the project expects to add value to "promote alternative income generation… for community members who collect waste, including those whose livelihoods are threatened by climate change" (MercyCorps Indonesia, 2014a, p.3). As reported by MercyCorps Indonesia (2010a), there were approximately 30 different waste products having market value in trash industry in the city. It ranges from paper and plastic to shredded plastic. The Waste Bank initiative also aligned with promoting the market and the involvement of individuals to enter the market while managing climatic risks and building resilience (The Rockefeller Foundation, 2014):

> "The assessment will benefit the consortium of Bandar Lampung waste banks and the 'Trash2Cash' social enterprise, with beneficiaries better able to understand the nature of the market, which *should enhance their competitiveness*. The assessment will also try to capture possibilities for private sector engagement, which will encourage city institutions to include private

sector actors in resilience planning" (p.24 – emphasis added).

The rationale for a waste bank at the community level is to introduce the market and enhance the competitiveness of locally-led social enterprises. Individuals and communities are deemed to be able to undertake an initiative to reduce risk with market mechanism and consequently to reduce the involvement of local governments in which "the market-based incentives system creates a spatially-distributed and economically sustainable waste management system that does not burden the city budget" (The Rockefeller Foundation, 2014, p.24). When I asked Muslina, one of the local leaders of Bandar Lampung's waste bank, about her experience engaging in the project, she said "I am becoming more confident… I have gained knowledge which I didn't know before, such as management… proposal development… especially since I am only a housewife" (Personal communication, 30 July 2016).

Under the ACCCRN, Agent of Change, a consortium for individuals and institutions interested in waste and environmental management, was also established to manage the organisation and management of waste banks at the city level. This effort is especially undertaken under the lack of performance by local government management on waste management, which led to Bandar Lampung being known as "the dirtiest city" in Indonesia (Kompas, 2012). Building urban climate change resilience was framed within the reduction of government spending on waste management and the introduction of market-based solutions, as expressed by Yasri[32], a senior manager at Bandar Lampung NGO PUSSBIK, who expresses his criticism in the following quotation:

> "When waste management involved private sectors… it is mostly profit-oriented, instead of as a public company that government serves as a service provider. When it's engaged with private sectors or companies, they will seek to benefit by gaining profit for their companies. I am afraid efficiency won't be achieved, instead what happens is industrialisation or marketisation of public service sectors…as has happened in the education sector in Indonesia. Waste management service will become an industry of waste service management" (Personal communication, 19 August 2016).

The Waste Bank initiative is also aligned with the new deregulation policy of the

[32] This name is a pseudonym.

national government. As part of the national restructuring of national government institutions as put into effect by Government Regulation 18/2016 on Local Apparatus, two city agencies were dissolved in Bandar Lampung, including the Waste Management Agency and the City Planning Agency. The Mayor of Bandar Lampung said he wanted to develop a new public company for city waste management run professionally as a business entity in order to "manage urban waste effectively, not only that make local communities become more comfortable and healthy, but also to avoid financial loss" (Lentera Swara Lampung, 2016, no pagination).

5.4. The apparatus of resilience

Miller and Rose (2008) argue that apparatus is an assemblage of persons, techniques, instruments for the conducting of conduct, or regimes of practice or milieu of thought in which a set of problems become visible and manageable. Originally developed by Foucault, an apparatus is explained by Agamben (2009, p.14) as "the capacity to capture, orient, determine, intercept, model, control, or secure the gestures, behaviours, opinions, or discourse of living beings." Apparatus exists in multiple forms through different regimes of actions, which are not limited to the power of the state government. Force also has taken form in the circulation of knowledge-power over beings and the subject of governing in urban resilience.

5.4.1. New terrains of resilience apparatus

Within the logic of reproduction, new terrains of knowledge-power develop as part of the urban climate experimentation in ACCCRN cities. In their review of the contribution of different resilience projects in ACCCRN, Reed *et al.* (2015) signify the future potential of urban climate experimentation in ACCCRN cities. They argue that resilience projects are creating "a window of opportunity" to facilitate changes (Reed *et al.*, 2015, p.473). Some resilience projects, as Reed *et al.* (2015, p.473) continue have led to "direct, observable, and measurable benefits that tangibly improved residents' lives." Rather than introducing a radical change in the city management and urban governance, ACCCRN experimented with a softer platform and entry points that facilitate incremental and gradual changes. Rodin (2015, p.9) sees resilience as an eternal process, which "is not (and never reaches) an end state."

As an apparatus of resilience, ACCCRN re-territorialises urban climate change resilience not only as programmatic designs and technical solutions to reduce local vulnerabilities, accommodate climate risks and increase adaptive capacity but also engages in developing apparatus of knowledge, network and resilience plans that stimulate non-centralistic governance. ACCCRN also reproduces a new terrain of knowledge-power with a pluralistic mode of governance towards organic and iterative "knowledge and information, networks, and new forms of management and engagement" (Reed *et al.*, 2015, p.473). It is argued that within ACCCRN, resilience becomes a means for governing the cities and their population. Reed *et al.* (2015) also argue the benefits and value of implementing resilience projects:

> "…resilience should facilitate a process of learning and networking among stakeholders. It should build knowledge, foster experimentation, and deepen political discourse and engagement… projects themselves *do not build resilience* and cannot be simply transferred from context to context … resilience in this way can also help *to enrich* strategic planning approaches to climate change adaptation" (p.478 – emphasis added).

This development brings into question the urban experimentation for building climate resilience not as something that is '*a priori*' and 'taken-for-granted' but to examine how it has emerged and been practised. In order to become materialised, resilience needs to be translated into ways of providing action, for intervention and for directing the cities and their urban population. This thesis argues that there is a new emergence of resilience apparatus, that building urban climate change resilience or urban climate experimentation or resilient urbanism has fabricated within the circulations of different sets of apparatus and the object of governance/living beings, and its endless process of construction and re-production of a new subject. Judith Rodin, the former President of The Rockefeller Foundation, mentions this in her book *The Resilience Dividend* (2014) in the following quotation:

> "We need to develop technologies, systems, mechanisms, and products that will prevent or protect us from the threats we can identify or predict… We will have the capacity to create and take advantage of *new* personal, social, and economic opportunities… When we do that, we can create and lead lives less shadowed by threat" (pp.7-8 – original emphasis).

Resilience has become a regime of practice to be realised into an assemblage of actors, institutions and networks in ACCCRN cities in Indonesia. The thesis argues that there is a new regime of resilience in the making, and it is continuously being experimented with through its dislocation and imperfection. This is a symptom of resilience building being inherently located within knowledge-power relations and urban politics. Braun (2014, p.51) iterates this to imagine 'government' as an ad hoc assemblage that introduces "'management' into diverse sites and practices in a piecemeal and contingent way in response to a dynamic and changing world." He then describes the 'experimentation' as central to the formation of the apparatus of resilience life (Braun, 2014). The thesis also argues that there is a new regime of resilience in the making and operated around different "spaces and objects" (Stripple and Bulkeley, 2015), such as waste service, conservation, and education that engage with local communities, schoolteachers and students, and city teams.

Moreover, the thesis argues that resilience as an urban apparatus has also reconfigured what Brown (2015, p.58) called that government has acquired a new and complex relationship through which it produced, managed, organised, and consumed with an aspect of individual freedom and a neoliberal project in place. She further explains (Brown, 2015, p.63 - original emphasis), "What distinguishes neoliberalism from liberalism here is that the state must 'govern *for* the market, not *because* of the market.'"

5.4.2. The logics of reproduction

Urban climate experiments, as Bulkeley *et al.* (2015, p.49) argue, are "ambiguous, both challenging incumbent socio-technical assemblages and contributing to their reproduction." Climate experimentation interacts within the urban politics and entails contestation over power, interests, and reconfiguration of our future in climate adaptation. But what future and by what process does it hold?

In order to become materialised, urban climate experimentation needs to realise its potential to shape a new regime in the making. If climate change adaptation is widely discussed as the politics of anticipation (Beck and Mahony, 2017), it is argued that the resilience agenda falls within the politics of reproduction. "Doing things differently, not doing different things", as Reed *et al.* (2015, p.473) mentioned, is an example of resilience vocabulary as a means for reproduction. Wakefield and Braun (2014, p.8) criticise that "resilience dispositif paradoxically

works to maintain the homogenous time of the present." Moreover, they see this resilience dispositif as "an ethics or care for the *how* in every situation: how to deactivate the governmental aspect of anything and open up new possibilities of use?" (Wakefield and Braun, 2014, p.10 – original emphasis).

Within the logic of reproduction, resilience is realised as the rationale to govern cities and their urban population through a diverse network of knowledge-power. As an organic initiative, ACCCRN has started to function as an architect of urban experimentation for building climate change resilience. Further, by re-creating a new space to "learn and reorganize" (Reed *et al.*, 2015, p.469), ACCCRN uses a different stance from the logic of climate change adaptation. In a broader sense, ACCCRN exemplifies reactivity rationale, which is interpreted as ways of seeing and knowing climate change with an adaptive cycle to build a circular model and knowledge to respond with safe failure, reinforce and enable, and resourcefulness.

Moreover, urban climate experimentation also provides pathways for the democratisation of risk and uncertainty and reinvents resilience as a governmental reason. Yusoff *et al.* (2012, p.971) called this ideal not the "reproduction of the known, but to the possibility of the new, overcoming the containment of the present to elaborate on futures yet to come." As the driver for re-producing resilience apparatus, ACCCRN immediately creates "an alternative to more conventional" development projects (Reed *et al.*, 2015, p.470) and governs it through a network of "actors, knowledge and institutions" (Dodman *et al.*, 2017). This shift entails undertaking adaptation planning that involves stakeholder engagement, assessment, planning, and implementation (Reed *et al.*, 2015). In a broader sense, ACCCRN expands to a range of experimentation that includes "shared understanding of systems, development of collaborations and network, generation of new information that is more accessible to the public, promotion of decision-making processes that display greater engagement of citizens with the state, and use of climate change information by city institutions" (Reed *et al.*, 2015, p.470).

The agenda for resilience is also strongly related to liberal governance. If risk and uncertainty are the products of liberal governance (O'Malley, 2004), resilience is the latest invention of governmental reason. Resilience represents a form of neoliberalism. Some scholars argue that climate change adaptation and resilience building has created the seeds for the production of neoliberal structures (Whitehead, 2013; Felli and Castree, 2012). Resilience, by Evans and Reid (2014), is described as

a new form of political intervention that follows the premise of liberalism to accept instability and insecurity as the new normal and embrace new ethics of responsibility and a capacity of life itself. It is considered the trajectory of urban climate experimentation in ACCCRN is also towards the "process of neoliberal urban adaptation" (Whitehead, 2013) or "the neoliberal fix" (Felli and Castree, 2012).

5.5. Conclusions

This chapter argues that experimentation within secondary cities in Indonesia engages with the practices of resilience and the neoliberalisation of nature. Governing urban resilience involves a new emerging apparatus of resilience in the making by deploying different governing techniques and programmes. This apparatus is performed through the multiplication of different actors and networks around which ways of acting are reproduced in ACCCRN cities in Indonesia. Urban climate change resilience or climate resilience experimentation, in Semarang and Bandar Lampung, is practised within the multi-actors and multi-level governance that has engaged with an agenda for the enhancement of individual freedoms, entrepreneurship, and the market. On the basis of competition and reduction of state and local government interventions, individual and collective actions for climate change adaptation are built not only to increase urban resilience but also to find the best and most effective solutions for managing climatic risks. Resilience becomes enacted as a regime of practices within the conjectures of apparatus of knowledge, networks, and resilience plans within ACCCRN.

More specifically, this section summarises the prior discussions to answers the research questions. How does the network of instruments of urban resilience become embedded in the practice of urban governance? In order for the regime of resilience to become the 'truth' it has to develop as an urban apparatus of knowledge, actors, institutions, and networks providing actions to reduce climate change risks or avoid its impacts. As the knowledge apparatus, urban resilience become embedded in the practice of urban governance as a non-linear process, iterative and learning-by-doing engagement. The apparatus of knowledge in building urban climate change resilience assumes no centralised approach and diffused into a more experimental process of adjustments through multi-stakeholders learning and cyclical process of adapting to climate change. The regime of practice also emerges a web of practitioners in urban climate change resilience as a set of relations between multiple actors, agencies and

plans that is stimulated around the distributions of powers. Moreover, this regime of practice involves different resilience planning and legislation in order for specific forms of organisation and institutional practices to become embodied in urban governance. This then turned us to the second research question about how these regimes of practices inform the relationship between urban resilience and the neoliberalisation of nature. As evidenced in the study, the regime of practice of resilience in Indonesia moderates through the reproduction of new social formations and relations between the state and urban population. The trajectory of the practice of resilience in Indonesia developed around the social formations that shifted from the efforts to avoid, protect or eliminate the events of climate change to embrace the impacts by developing resilience capacities and actions. Different forms of neoliberalisation of nature have facilitated the principle of market rationality in order to fix local environmental problems, including commodification and deregulation in the conservation and waste management sectors. It has also engaged to create new social relations between the state and population in which urban individuals, groups and communities are responsible for their own protection and rendered as entrepreneurial rather than relying on centralised securitisation.

This chapter illustrates that resilience is not only become visible and materialises with specific rationalities in order for the problems of climate change to become governable, as discussed in Chapter 4, but more critically, as explained in the chapter, building urban climate change resilience embodied multiple and heterogenous technological powers and network of instruments in order for resilience apparatus become realised into a regime of truth. In effect, this further brings us to the questions posed by Foucault on the production of subjectivity: “This bio-power was without question an indispensable element in the development of capitalism; the latter would not have been possible without the controlled insertion of bodies into the machinery of production and the adjustment of the phenomena of population to economic processes” (Foucault, 1978, pp.140-141). Moreover, the concept of resilience apparatus will always engage with “the process of subjectification” (Agamben, 2009, p.5). In turn, governing urban resilience touches the very nature of interrelation between “Human” and “Nature” as well as consequently shapes new urban subjectivities that are discussed further in the following Chapter 6.

Chapter 6: The rise of climate human

"*Tempora mutantur, et nos mutamur in illis*.
Times change and we change in them."
(Behringer, 2007, p.217)

6.1. Introduction

In the last two chapters, the thesis has discussed the rationalities and techniques around which resilience as a distinctive form of governmentality operates. Regarding urban climate change resilience in Indonesian cities, so far, it has been discussed how we govern and are governed by resilience in the face of climate change. This discussion involves analysing different ways of thinking and acting to configure forms of visibility, problematisation, production of truth, and investing in intervening with programmes and techniques of resilience (Dean, 2010). This chapter follows up on these discussions by examining and evaluating how the act of thinking and making urban climate experimentation involved ways of forming human subjects.

This study of analytics of government also involves ways of forming a subject, conduct of conduct, and biopower of mentalities of government. Agamben (2009) stresses the relations between living beings or substances and apparatus and the act of forming these into a subject. Building on this insight, this chapter aimed to examine this research objective: "to evaluate what subjectivity(ies) that are sustained to manage urban population for building resilience." The analysis also engages with the discussions around how the act of forming urban climate experimentation involves the ways of governing human subjects with different formations and the conceptions surrounding the human and nature connection.

This chapter discusses and analyses the rise of what is called in the thesis as a "climate human", a new subjectivity for governing urban populations in ACCCRN cities in Indonesia. Deploying governmentality analysis, the thesis examines two propositions of the formation of a climate human in conjunction with the premise of "relation to ourselves" (Rabinow and Rose, 1994) as (1) Survival subject, and (2) Adaptable subject. In building urban resilience, knowledge-power is translated

within the circulations of the care of the self, within resilience as a governmental reason, and within the interrelation between humans and nature. This chapter begins by investigating how the act of forming urban climate experimentation was designed at the programme and governmental levels in ACCCRN cities in Indonesia.

6.2. Forming resilience in ACCCRN

The *forming* of resilience involves bringing a distinctive form of subjectivities, which are performed within the circulations of the self, the conduct of conduct and the interrelation between humans and nature. There are some recent discussions that governing climate change means a new biopower in urban areas. The biopolitics of climate change has touched on the interaction between the state, sovereign powers, and climate change adaptation (Turhan *et al.*, 2015; Schmidt, 2013). Moreover, building urban resilience is understood to be not only a technical concern but also as an act of 'creation' for new subjectivities and deployment of climate rationalities in urban areas (Castán Broto, 2017). More importantly, the agenda for resilience is to locate urban citizens as an object of government that needs to be managed in order to become resilient, known as resilient subjects or resilience machines (Aranda *et al.*, 2016; Davoudi *et al.*, 2017; Ziervogel *et al.*, 2017). The focus on human subjects as the goal of building urban climate experimentation is clearly mentioned in the ACCCRN programme. We see this, for example, in the overall programme objectives that indicate that the aim towards the human subject is to ensure and enhance its capacity to prepare for climate change, from these quotations:

> "to catalyze attention, additional funding and action on building climate change resilience of cities as a whole – and within that ensuring that the resilience of vulnerable and poor communities is also enhanced" (Brown *et al.*, 2012, p.532).

> "Poor and vulnerable people (men and women) have the ability to respond in an appropriate way to current / anticipated / unanticipated climate risks. People are able to problem solve and are willing to invest time, energy, resources and be entrepreneurial. Formal and informal reinforcing systems are developed that support the ability of individuals to predict, prepare for, and recover from climate shocks. These reinforcing systems link individuals with higher levels of organization to provide information, strategies, capacities and resources needed to foster resilience" (ACCCRN, 2010c, p.2).

Moreover, the programme interventions to engage with the act of forming urban climate experimentation to resilience are mapped to the idea of new personal and culture of resilience.

6.2.1. A new persona

As we enter the wild of climate change, humans, as subjects of governing, are amenable to adjusting to changing environments and future conditions. This complex adaptation phenomenon requires a new persona. The Rockefeller Foundation, in its mission and throughout its programmes, has involved engaging with the building of this new persona. Judith Rodin, the former President of The Rockefeller Foundation, in her book *The Resilience Dividend*, has charted out this new personal as one of the intervention goals. *The Resilience Dividend* is a global invitation to think about resilience as a value that needs to be invested by local governments, communities, and individuals to respond to climate change. Moreover, *The Resilience Dividend* aims to provide "a template for thinking" about building resilience through different frontlines: structural, social, and natural order (Rodin, 2015, p.7). A new persona, known as a resilient individual or community, is to accept that building resilience should become a part of their human conduct. "There is no question that building resilience", as Rodin (2015, p.6) discusses, "must become a priority for us all." This call for resilience was written a few years after some international programmes initiated by the Rockefeller Foundation globally culminated in an endeavour for this imaginable human conduct, as Rodin (2015) identifies:

> "If we build resilience… we will have the capacity to create and take advantage of *new* personal, social, and economic opportunities: endeavours we might never have imagined possible and achievements that seemed out of reach. When we do that, we can create and lead lives less shadowed by threat, develop communities and organizations that are more productive and innovative, and strengthen societies such that they are brimming with greater opportunity and prosperity" (p.8 – original emphasis).

Using the vocabulary of "dividend", the initiatives are not only expected to provide "investments" to develop practices, processes, and networks to flourish in building climate change resilience but also to provide "the groundwork for increased awareness and action toward the resilience of poor and vulnerable communities

worldwide" (The Rockefeller Foundation, 2009, p.7). Therefore, we can see that urban climate experimentation to build resilience engages not only to render climate change governable and manageable but also acts to form human conduct.

6.2.2. The culture of resilience

The proliferation of resilience as "a way of life" (Doig, 2014) is a process through which our "domains of life" (Anderson, 2015) are beginning to emerge. As stated in the previous section, Judith Rodin, the former president of The Rockefeller Foundation, launched a global initiative of 100 Resilient Cities (100RC), reminding us that "resilience building is now on the minds of people" (Rodin, 2015, p.47). However, the new personal of resilience needed a medium to amplify its potential and action to flourish.

Urban climate experimentation needs not only techniques and programmes to be implemented as part of their action but also a new culture to make it possible to become a reality. Belinda Hewitt, a senior consultant with Arup International Development, recalls The Rockefeller Foundation agenda as the beginning of a new era of a "culture of resilience" (Guardian, 2017). Learning from her experience with The Rockefeller Foundation's 100RC and Arup's City Resilience Index, which is part of the Foundation's global agenda on resilience, this culture of resilience begins to emerge and increasingly has been embedded into the practice of urban governance. A culture of resilience requires "Mayors to have a real understanding of the value of resilience", she elaborates further, "as well as the ability to communicate… across city officials, private sectors, and wider communities" (Guardian, 2017, no pagination).

However, to comprehend resilience as a new culture, this thesis is concerned with how it has emerged in The Rockefeller Foundation as well as also analysing and examining local governments' agenda, policies, and actions on resilience building in Indonesia. Therefore, the thesis clarifies that resilience building means engaging in a set of interventions beyond physical and technical solutions, but more critically, how it has been integrated into human conduct from embodiment into local agenda, public education, community behaviours, and self-empowerment as an act of forming individual and collective conducts. For example, Chapter 4 discusses that resilience governmentality emerges as a new mode for governing the climate, which involves governing the urban sites and their population. Resilience building is

understood not as a priori but as engage, involve, act, entail, and necessitate upon particular values, technical and materials forms that are linked together to set up a goal to direct urban conduct. Following on from this discussion, Chapter 5 demonstrates governing urban resilience involves a new emerging apparatus of resilience in the making with an agenda for the enhancement of individual freedoms, entrepreneurship, and the market. This regime of practice also emerges as a set of relations between multiple actors, agencies, and plans that are stimulated around the distribution of powers. As evidenced from these examples, the thesis analysis asserts that the culture of resilience again proliferated more than as top-down solutions by the state powers or simply acted as disciplinary actions by local governments, but more profoundly engages in a collective body of subjectivities, which describes by Rose (1989, p.xii) as "ontological, epistemological, ethical and technical upon which human beings act upon themselves."

Moreover, the new personal mentions by the former President of The Rockefeller Foundation, Judith Rodin (2015), have also been practised in ACCCRN cities in Indonesia around the circulation of the self, socio-material conditions, and freedoms. The relationship between humans and nature, especially in facing greater problems from climate change, has opened new possibilities for becoming urban citizens and shaping their city's socio-material conditions. Building resilience in ACCCRN cities in Indonesia provides an avenue for forming experimentation within urban conducts. However, this identity is not single but multiple in practice. The thesis discusses these multiple subjectivities in the next following sections with case studies from the two cities, Semarang and Bandar Lampung.

6.3. Governing climate human

This section argues that a climate human operates seamlessly within the rationality of resilient governmentality. This particular assemblage is performed as rationality and techniques for governing risks from climate change. As argued in Chapter 4, resilience governmentality is an assemblage of rationales, tactics, and techniques within a network of instruments undertaken as part of a series of government and knowledge-power that target population to become individually or collectively able to live, adapt, and thrive under risk and uncertainty of climate change. The different techniques of managing the cities and urban population to climate change have led to human subjectivities of climate human. Climate human

becomes an object-turned-into-subject through these different characteristics of withstanding, performing and transforming from the effects of climate change. The figure of climate humans, understood as individuals, households, or collective communities, is being contextualised around their performance in order to ameliorate climate change impacts. The ideal of a climate human for one that adapts, lives, and thrives.

This section analyses and examines the propositions for the formation of a climate human in conjunction with the premise of "relation to ourselves" (Rabinow and Rose, 1994) in order to illustrate two subjectivities: (1) Survival subject, and (2) Adaptable subject. In this sense, relation to ourselves means defining individuals' relations with themselves and with others. Miller and Rose (2008, p.7) explain that the concern is not "who they were, but who they thought they were, what wanted to be, the languages and norms according to which they judged themselves." In this line of inquiry, the focus is then shifted not only on the subjects but also on the *subjectification* as a mode of action. The section is interested in the conception of human beings under the conditions of climate change.

Survival subject is a social and political agent whose care of the self, including awareness, conduct and behaviours, is defined by their capacity to survive *from* the events of climate change. On the other hand, an adaptable subject is a social and political agent whose care about the self, including awareness of conduct and behaviours, is defined by their capacity to adapt and respond *to* the events of climate change. The thesis discusses these subjects with different attributes of subjectification as a mode of sensing (episteme), acting (technical), and becoming (ethical). It discusses these formations of a climate human using two case studies: the flood early warning system project and the water conservation project.

6.3.1. Semarang City: Flood early warning system

Climate change clearly brings into question the human existence. As Klein (2015, p.25) reminds us, that the climate crisis is "a civilizational wake-up call…. Telling us that we need to evolve." In order to accommodate the risk of climate-related impacts, both human and natural systems need to build their ability to adapt to climate change (IPCC, 2014b). The immediate actions have become more critical as a large number of species have extinct due to climate change (IPCC, 2014b).

Moreover, a review from the Intergovernmental Panel on Climate Change (IPCC, 2014b) states:

> "Climate change will amplify existing risks and create new risks for natural and human systems. Risks are unevenly distributed and are generally greater for disadvantaged people and communities in countries at all levels of development" (p.13).

The first proposition of climate humans related to the above call for the capacity to adapt *from* climate change impacts is through survivability. The development of human survival capacity is becoming more and more nuanced in the face of climate change. The human capacity to plan, manage and act accordingly to climate change risks depends on the adaptive capacity within human systems. It is here that a climate human is deemed to be "free" from the dangers of climate change when they are capable of accommodating their ability to open learning, undertake mitigation measures and consistently build their capability to prepare for climate change. *The Rockefeller Foundation White Paper* (The Rockefeller Foundation, 2009) clearly states the demand for this survivability:

> "We see the need to build climate change resilience – the ability to plan for, *survive*, recover from, and even thrive in changing climatic conditions – as a core part of achieving our mission… Simply put, it is the ability to *survive* and recover from the effects from climate change" (no pagination – emphasis added).

This survival proposition is an inward outlook of a climate human. The performance within the self or inner capacity of the climate human relates to their capacity to withstand external disturbance and manage unavoidable changes. It is centred on the concept of "the body as a machine", described by Foucault (1978, p.139) as the optimisation of its capabilities and discipline processes. Moreover, in order to survive, urban citizens are involved in three different processes: (1) learning and adjustment, (2) autonomous resilience, and (3) collective conduct.

Sensing: Learning and adjustment

Building urban resilience in ACCCRN cities involves a circular process of learning and adjustment. ACCCRN designed adaptation planning as an iterative process to understand city vulnerabilities and adaptation responses in order to build

resilience. As an integral framework, the programme analysed multiple urban systems and how they interact to enhance the agent's capacity and focus on stability from future stressors (Moench *et al.*, 2011). This framework of accumulated learning across sectors and urban management systems starts with stakeholder engagement, followed by undertaking assessment and sector studies, planning for a city resilience strategy, implementing multi-actor collaborative interventions and ends with learning, synthesis and evaluation (Brown *et al.*, 2012). Peter, a senior associate from the Institute for Social and Environmental Transition, explains:

> "The framework really relies on a notion of resilience in which *learning* and *adjustment* are central to the whole process. So, our shared learning and iterative engagement process were important because I think that it is our view interpreting all of these from the evidence from the literature on what resilience is, what the components are…. It is our view that one of the great weaknesses in practical application was the absence of good institution mechanism for shared learning" (Personal communication, 7 November 2016 – emphasis added).

The central process of building resilience in ACCCRN cities depends on the agent's capacity to learn in the absence of climate change institutions, including human agents (Peter, personal communication, 7 November 2016). Agents are defined as collective "actors in urban systems, include individuals; households (as units for consumption, social reproduction, education, and capital accumulation); and private and public sector organizations (government departments or bureaus, private firms, civil society organizations)" (Moench *et al.*, 2011, p.47). Resilience as a response from these agents has moved from "preserving change" into an understanding "change is inevitable" (Peter, personal communication, 7 November 2016). In order to build resilience, agency represented as "the human capacity to make decisions and choices and to take action" need to be delivered to response from climate change (Moench *et al.*, 2011, p.47). Moench *et al.* (2011) further explain:

> "The shared learning dialogue (SLD) was the key tool for engaging local stakeholders in the resilience planning process and integrating knowledge of climate change from outside experts with local knowledge of development issues and planning priorities…. They provided a novel platform for building shared knowledge and commitment to action that met multiple interests" (p.24).

In ACCCRN cities, the adaptation planning process utilises thematic learning forums for the management of local vulnerabilities and future resilience actions. Local knowledge, which is separated from experts or scientific assessment, has become part of the circular learning itself. Furthermore, resilient subjects are characterised by having a diverse ability for learning and adjustment. This involves an ability to relate with data (Maliva[33], senior staff at MercyCorps Indonesia, 18 April 2016), timescale projections of the future, and embedded into local planning. By accepting the rationale of resilience and engaging with learning and adjustments, it is hoped that local communities will live in a "less shadowed by threat" condition (Rodin, 2015, p.8). Risk and uncertainty from climate change are regarded not as barriers or challenges for the future but as embracing the climate humans into resilient subjects.

Figure 6.1 An evacuation route sign

(Source: The author)

In Semarang, in order to respond to flash flood hazards, ACCCRN initiated the "Flood Forecasting and Warning System as Climate Change Adaptation Measures through Flood Risk Preparedness (FEWS)", hereafter the FEWS project. The project's goal was "to reduce vulnerability, injuries, and casualties caused by flood

[33] This is a pseudonym.

disasters through strengthening community and local government response to and preparedness by the development of flood information systems, early warning systems, and evacuation strategies, and also the identification of temporary shelters for the most vulnerable (especially the poor and vulnerable demographic groups)." (MercyCorps Indonesia, 2014, p.4). In response to the increasing risks of flooding, the FEWS project further aimed "to create communities resilient to disaster and prepared for future climate scenarios." (MercyCorps Indonesia, 2014, p.4)

Acting: Autonomous resilience

Governing climate human also involves intervening with human competencies and capacities (Rose, 1989). In order to build resilience, urban citizens need to become actively engaged to take care of themselves. The acceptance of self-knowledge and self-improvement are embedded within the human capacity to change and threats. "Human beings", as Rose mentioned (1989, p.xvi), are expected to enforce "ways of thinking, judging and acting upon themselves – techniques of the self." Further, within the concept of resilience, ACCCRN cities have embraced urban citizens to become actors rather than passive recipients of the state or city government interventions, as explained by Peter from ISET in this quotation:

> "So, if a state chooses to develop policies that reinforce urban resilience or if a city government wanted deliberately to strengthen urban resilience, I think they would come recognise the value of *citizens as actors*, rather than *citizens as recipients* of state direction" (Personal communication, 7 November 2016 – emphasis added).

This perspective aligns with the new mantra for urban development in Indonesia post-1998, which is "developing *with* community, rather than developing *for* the community", as explained by Sambudi[34], a Lecturer from the University of Diponegoro, (Personal communication, 1 June 2016 – emphasis added). This brings to the idea of "pastoral power" by Foucault (2009) about the relationship between the state and population more like a relationship between a shepherd and his/her flock. A pastoral power is "a power of care", "an individualizing power", and "a power exercised on a multiplicity rather than a territory" (Foucault, 2009, p.127-129). At the urban level, the relationship between the provincial and city governments

[34] This is a pseudonym.

changed drastically after the decentralisation era in Indonesia post-1998. The paternalistic relationship has shifted toward a partnership relationship (Hudalah *et al.*, 2014). Metaphorically, previously the provincial government was positioned as the 'parent' or boss, but recently as 'kakak' (big brother) or strategic partner by city governments (Hudalah *et al.*, 2014). The resilience programme by ACCCRN reinvents John Stuart Mill's liberal society in which climate humans depend on their autonomy to cherish and have consent over their lives (Gray, 1989).

Figure 6.2 A local resident demonstrated weather communication

(Source: The author)

The imaginary subjects of urban citizens, in order to achieve resilience, are described by multiple interviewees in the research, in which they describe themselves as becoming self-powered and independent, self-aware, confident, educated and self-adaptable communities. Resilience-building concerns are particularly towards "self-knowledge and responsiveness, both at the level of individuals and as communities" (Chandler, 2016, p.29). As part of the FEWS project, MercyCorps Indonesia with the local NGO, Bintari Foundation, established the Disaster Preparedness Group ("Kelompok Siaga Bencana", or KSB). This KSB engages in coordinating local individuals to adapt and prepare for future climate risks, especially flash flooding. One of their leader needs to communicate regularly

with the Disaster Management Agency and also prepare local preparedness plans in order to anticipate future flooding events. In an event of flooding, Rasdi[35], one of the local leaders at the Semarang Disaster Preparedness Group, mentions that even if there would be support from the Agency, in the end, they need to become an independent agent to face the risks, as describes in the quotation below:

> "When there was a flood, we ended up with the need to become *autonomous*. Because when the flash flood came, we couldn't do much. There were the Search and Rescue Team, Disaster Management Agency, and even people from the city and district governments who wanted to help us… but in the end, with limited access, we are at the end have to act upon ourselves. We are at the end, have to pull up together, to become more autonomous or independent [as individuals or communities]" (Personal communication, 9 June 2016 – emphasis added).

Becoming: Collective conducts

By building resilience in cities, the ACCCRN programme tries to engage with individuals and communities in order to increase their capacity to commence resilience. Climate humans as an object of government is articulated within the circulation of the self, taken initiatively by urban citizens and within the project of government through empowerment initiatives. These efforts are being implemented and enacted at individual and community levels through a diverse mode of mechanisms at community, educational, and organisational levels. Urban citizens become the objects that need to be educated, disciplined, and assisted in order to build urban resilience and resilient subjects. It is demonstrated from the quotation below how a local leader coordinated with local people when a flood disaster occurred. Rasdi explains in the following quotation:

> "Mr Kasir, I am sorry we need your cooperation with our collective work (*gotong royong*)… we needed more sand sacks. It was empty. How much do you need? We needed 1000 more sand sacks. But we don't any more up to those. Okay, what about 400. So then, we build our collective work. I invited

[35] This is a pseudonym.

local individuals… we have engaged local women as well, it now becoming a common practice" (Personal communication, 9 June 2016 – emphasis added).

A new kind of individual that seeks care of themselves and continuously increases their capacity to accommodate changes and stresses is required to build resilience and engage in the collective conduct of survivalism. The ACCCRN programme not only touches on the organisational or community capacity and behaviours towards climate change but also targets urban citizens' mentality and collective conduct. The object of government is no longer only about the body but also the soul. Resilience governmentality emerges as the conduct of conduct of urban citizens amidst the danger of climate change.

Different types of mechanisms were also delivered to the target population in order to make them become resilient subjects through "empowerment", "community assistance", "capacity enhancement", "facilitation and community development." To build urban resilience, "the government should regulate more controversial regulations in order to educate urban citizens to be *more responsible* for their environment", as Yasri, a senior manager from Bandar Lampung NGO PUSSBIK, suggests (Personal communication, 19 August 2016 – emphasis added). In Semarang, community development as part of empowerment is crucial to support ecological rehabilitation and strengthen local adaptive capacity. "Community development", as MercyCorps Indonesia mentions (2015, p.1), "is integral to all program processes in keeping with the dynamics of the community." Coastal communities in degraded coastal areas were invited to develop nursery apprenticeships, mangrove rehabilitation, and seawall construction (MercyCorps Indonesia, 2015b).

6.3.2. Bandar Lampung City: Water conservation

The second formation of climate humans is related to the capacity of a human as an agent to adapt and respond *to* the events of climate change. As described in the previous section, an adaptable subject is a social and political agent that can take care of the self, including awareness, conduct, and behaviours, defined by their capacity to adapt and respond *to* the events of climate change. This subject is different from the survival subject, as illustrated in the previous section, where an adaptable subject is one who not only accepts the 'truth' about climate change risks but also embraces

itself to change its conduct. The image of climate humans as an adaptable subject is introduced in *The Rockefeller Foundation White Paper*, where the foundation laid out its resilience initiative in 2008. As introduced in the quotation below from the *White Paper* (The Rockefeller Foundation, 2009), an adaptable subject is required to reject "climate impact circumstances" as it is and to accommodate the risks of climate change to be minimised and maintained within *their* capacity.

> "*Climate change resilience* is the capacity of an individual, community or institution to dynamically and effectively respond to shifting climate impact circumstances while continuing to function at an acceptable level…. It includes the ability to understand potential impacts and to take appropriate action before, during, and after a particular consequence to minimize negative effects and maintain the ability to respond to changing conditions" (no pagination – original emphasis).

The performance within the self of an adaptable subject relates to their capacity to respond to external disturbances and manage unavoidable changes. It is still centred on the concept of "the body as a machine", as described by Foucault (1978, p.139), as the optimisation of human capabilities and disciplining processes but moved beyond an action *outside* themselves. This thesis discusses and analyses further the notion of an adaptable subject using a water conservation project as a case study. In general, it discusses governing climate humans as an adaptable subject with three components: a new ethos of resilience, self-governing, and prudentialism.

Sensing the Nature: New Ethos

Ethos comes from the Greek language, rooted in *ethikos*, meaning moral or showing moral character. Adaptable subjects aren't deemed to surrender to the events of climate change, such as drought and flooding, but individuals, communities or urban populations who are accepting the new worlds under the age of climate change are yet able to develop self-awareness as well as develop conducts and behaviours to their changing environments. This subject is those who not only embrace the changing world under climate change but also remedy their actions.

The ACCCRN programme in Indonesia is mostly focused on building the capacity and ability of individuals, communities, and institutions to survive and recover from climate change. Building resilience as a response to climate change is

based upon the inevitable climatic future. With increasing carbon emissions emitted in the atmosphere above the normal level of 350 parts per million thresholds, an urgent call is to anticipate the impacts of climate change.

As introduced in Chapter 3, one of the urban resilience projects implemented to respond to climate change in Bandar Lampung was a groundwater conservation project. Bandar Lampung responded to climate vulnerability in the water sector by implementing groundwater recharge with an artificial method. This project is known as "Groundwater Conservation through Application of Biopore Infiltration Hole Technology for Climate Change Adaptation", hereafter "Biopore Project." The Biopore Project was implemented by a local non-government organisation named Mitra Bentala and targeted to make 100,000 biopore holes throughout the city (MercyCorps Indonesia, 2012). Biopore is a vertical hole in the ground with a diameter of 10 cm and a depth of 100 cm to infiltrate rainwater. An illustration of biopore holes is provided in Figure 6.3. Organic wastes are placed inside the hole to foster small pores surrounding the biopore hole. This project aimed to increase groundwater recharge and concurrently reduce vulnerability from drought, especially when the *Vulnerability Assessment* predicts that the city would expect to face longer dry seasons (ACCCRN, 2010a). Biopore holes are one of the recommended methods for rainwater utilisation based on Ministry of Environment 12/2009 (Ministry of Environment, 2009).

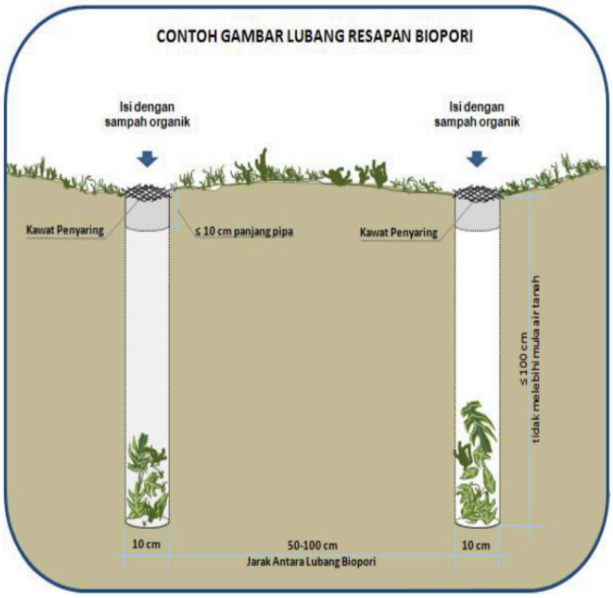

Figure 6. 3 Biopore holes illustration

(Source: Ministry of Environment, 2009)

Climate change impacts have already been felt in Bandar Lampung. Drought attributed to the longer dry season due to the periodic El Nino phenomenon and changes in rainfall patterns are among these impacts (MercyCorps Indonesia, 2012). It was reported that there were 42 flood-prone locations due to topographical attributes and increasing risks from climate change (MercyCorps Indonesia, 2012). It was also exacerbated by rapid urbanisation, insufficient water infrastructure and increasing impermeable neighbourhood surface that has increased runoff rates and altered the hydrological cycle in Bandar Lampung (MercyCorps Indonesia, 2012). It was estimated in the *Vulnerability Assessment*, as described in Chapter 4, that "the severity of water scarcity increases during extreme climate events, around 43% and 19% of its population experience water scarcity during droughts and floods respectively" (MercyCorps Indonesia, 2012, p.6). As a result, there is an urgent action for water conservation that engages local communities. Hamsah[36], a senior manager from Bandar Lampung NGO Mitra Bentala, expresses that commencing water conservation needed to involve local communities and their awareness about climate change. Further, the quotation from Hamsah below signifies that concern.

> "We also delivered [the important issues] to local communities about it – climate change adaptation and mitigation. We informed them, for example, with [the] biopore we could preserve groundwater since rainwater would infiltrate into the ground. We encouraged local communities to be aware of how soils could still infiltrate rainwater rather than wasted as discharge water" (Personal communication, 11 August 2016).

Hamsah also explains that the Biopore Project not only engaged in engaging local communities in making biopore holes in their neighbourhoods but also changed their mindset about water conservation. Furthermore, the Biopore Project understands the engagement from local communities not only as they are the population 'at risk' groups from the impacts of climate but also consider them as the key partners to project success. It is described that "support and commitment from local community is important to ensure the ownership on the project" (MercyCorps Indonesia, 2012, p.11). The Biopore Project explained that the aims of the project were "not only involve the selected local stakeholders as implementing partners, but also seek to active participation from the wider community" (MercyCorps Indonesia,

[36] This is a pseudonym.

2012, p.11). As the adaptable subject, local communities are required to confront themselves and remedy their actions. Hamsah reiterates that changing the local mindset for undertaking water conservation also engages with broader problems than climate change but also confronts the 'truth' of "increasing urban population, urban settlement and development that led to increasing impermeable surface which will reduce water infiltration" (Personal communication, 11 August 2016).

Moreover, "in fighting climate change", as Monbiot (2017, p.212) reminds us, "we must fight not only the oil companies, the airlines and the governments of the rich world; we must also fight ourselves." To anticipate and take immediate actions to the slow and rapid change from climate change is the responsibility of us all – not only the responsibility of the state and its governmental institutions. Sinevaara-Niskanen and Tennberg (Sinevaara-Niskanen and Tennberg, 2012, p.129) locate that responsibility "is no longer understood only as a relationship with the state but as one of obligation towards those for whom the individual cares most: his or her family, neighbourhood, workplace and, ultimately, community." In this sense, Evans and Reid (2014, p.6) emphasise resilience as the new ethics of responsibility.

Acting: Self-governing

According to Bandar Lampung's *City Resilience Strategy*, the percentage of the urban population served with piped water by the Public Water Company is only up to 30% (Mukhlis *et al.*, 2010). It was also exacerbated by the decreasing capacity of the water supply upstream of Way Kuripan River, which is the main water source for the Public Water Company of Bandar Lampung. It was estimated with a no-action projection that the Public Water Company would not be able to serve up to 81-85% of the urban population in Bandar Lampung (MercyCorps Indonesia, 2012). It is no surprise that the resilience strategies to solve this issue were constructing infiltration wells and increasing artificial groundwater recharge, which is the second top prioritised adaptation measure in Bandar Lampung's *City Resilience Strategy* (Mukhlis *et al.*, 2010). The project under ACCCRN funding was terminated in April 2014 but then triggered the birth of a citizen-led organisation for sustaining these adaptation actions. Mitra Bentala, a Bandar Lampung NGO responsible for the initiation of the Biopore Information House, explains in the next quotation (Mitra Bentala, 2014):

"The establishment of Biopore Information House was also unexpected in order to facilitate the project sustainability. This has become a centre for the community who want to learn and share any information about biopore initiatives. The centre also provides conservation services and engages with the local community to empower them to make biopore at their home" (p.11).

The citizen-led organisation of "Biopore Information House" (BIH) was chaired and organised by the local communities independently, with a total of 100 local cadres in 5 sub-districts. They maintained "Friday working bee" activities to work together in making biopore holes in their neighbourhood. The BIH also provided voluntary service to local communities who are interested in knowing or want to make artificial groundwater recharge. They facilitated local residents in Bandar Lampung city and neighbouring county, school children, and people from a faith-based organisation. Hamid describes his motivations for engaging in the activities in the following quotation (personal communication, 13 August 2016):

"I am interested in the (project) benefits.... From their explanations – Mitra Bentala – I can understand this makes sense. It is not complicated. So if we can empower people, we can develop further, when we implement all of it, this will be beneficial. In the beginning, it was only me, but then I invited my neighbours, my local community and a higher level of the local council. It needs a time."

Figure 6. 4 The secretariat of Biopore Information House

(Source: The author)

The self-governing approach also redefines public participation as a power for self-organisation. In Bandar Lampung, community-based adaptation for groundwater conservation emphasised that independent and voluntary action is part of citizen participation and in support of governmental objectives in development. This is also reflected in the fact that climate change risks are so close to local communities, and actions to mitigate it are part of their internal responsibility.

The ACCCRN programme, in general, initiated diverse community-led organisations to manage and initiate actions at the local level. Diverse groups of communities were established around the sectoral areas: water conservation (Biopore Information House), disaster management (Disaster Preparedness Group), mangrove conservation (Prenjak Conservation Group), and economic development (Waste Bank). It re-organises the urban governance for climate change management and decentralised institutions at the local level. It also engages to promote leadership and local champions to support for resilience initiatives. MercyCorps Indonesia (2011) explains the role of local champions in the following quotes:

> "Champions or the proactive, enthusiastic individuals who drive the project forward, can make the difference between a successful City Team and one that barely completes the minimal requirements for participation. When champions are identified, they should be fostered and encouraged through *greater responsibility* and *encouragement*" (p.15 – emphasis added).

The foundation for taking resilience-building initiatives is also to reinforce assets and resources within the cities. Tyler and Moench (2012, p.315) from the Institute for Social and Environmental Transition (ISET) define resourcefulness as the "capacity to mobilize various assets and resources in order to take action." This includes financial accessibility and agent collaboration. The capacity of agents, including communities, depends on the ability to access information and accumulate resources to take resilience responses (Tyler and Moench, 2012). Individual and community-level responses would also depend on the city institutions. Peter, a senior associate from ISET, describes that to build resilience, it is not only needed urban institutions to facilitate good governance but also requires individualization (Lupton, 1999) to take active roles to respond to their surrounding environment. Individualisation is described as "a way of exercising power" where conduct becomes engineered, and behaviours are normalised to shape new relations between

knowledge-power, authority, and urban subjectivity (Miller and Rose, 2008, p.5). Thus, individualisation, as Lupton (1999, p.199) emphasises, "awareness of risk and the responsibilities involved with avoiding risks" is dominant in late modern societies. Peter further explains the role of individual choice-making in building resilience in the following quotation:

> "I think the point of the framework is we need institutions that *reinforce* and *enable* the other elements of resilience to take a call. You need institutions that provide transparency, decision-making is made in regards to ecosystem or infrastructure, for example. How was planning being done? You need institutions that provide public information, so that *individual decision makers can respond* in their own interest to their knowledge of the effectiveness of infrastructure and ecosystem. You need institutions that are responsive to new information and can adjust" (Personal communication, 7 November 2016 – emphasis added).

As described in Chapter 4 on resilience governmentality, different tactics for governing have been implemented to deliver resilience building more effectively at the local level. It is argued that tactic of survivalism becomes the basis for which intrinsically survival and adaptable subjects emerge on the basis for living, adapting and thriving from the effects of climate change. Moreover, different techniques are being performed and practised to monitor, predict, and analyse events of climate change risks, such drought, flooding, dengue fever outbreak and so on. Within the geometric of powers, the urban population are not only become the 'data' but also become responsible actors for which initiating and managing resilience are required. It is builds upon the concerns of intrinsic "*actually existing resourcefulness*" (Evans and Reid, 2014, p.89 – emphasis from original) from the urban citizens. Furthermore, "resourcefulness", as Brown *et al.* (2016, p.124) emphasised, is "the capacities and agency of different social actors and their social ecological system to manage and shape change." Peter from the ISET explains in the following quotation:

> "And you need institution that represent the valid concerns of vulnerable and marginalized people. So the point of that this kind of institutions, if you don't have that kind of institutions you are capacity are likely to be fragile and vulnerable. And so building those institutions strengthen the capacity of organisations to respond" (Personal communication, 7 November 2016).

In general, ACCCRN in Indonesia also engaged with stakeholders not only to collaborate with actors in the cities but also to embrace responsibility towards climate change governance. The City Team in Bandar Lampung is known as an ad hoc body of multi-stakeholder groups who are responsible for planning and managing climate change adaptation and resilience building in the cities. Building resilience requires re-organisation not only at the city level but also at the individual and community levels. By initiating climate change adaptation actions at the community level, Bandar Lampung involved the local communities to take forward proactive and has embedded responsibility within themselves. In the Anthropocene-urban milieu, more responsibilities to take care of the self and nature are associated with the active participation of individuals, communities, and local organisations to further embrace their capacity to respond.

The groundwater conservation-biopore project aimed to concurrently reduce rainfall runoff and increase groundwater level. The project was implemented by making 100,000 biopore[37] holes in recharge and high infiltration areas within the city. The preliminary assessment was conducted to provide an analysis of the appropriate locations and methods for making biopore holes, prior to the pilot phase. In the initial stage, the project focused on making 20,000 biopore holes at Langkapura sub-district[38] starting in mid-September 2012. An evaluation from the pilot phase is required to consider a further 80,000 biopore holes from early 2013 to April 2014. Bandar Lampung City Government has supported, through city budgets, its commitment to developing biopore holes throughout the city. Its implementation for making biopore holes from city budgets was coordinated by the Environment Agency. The project, under ACCCRN funding, is now terminated, but it established Biopore Information House (BIH) that functions for continuing service for voluntary groundwater conservation by a locally citizen-led organisation.

Biopore Information House, as a citizen-led organisation, runs independently which chaired and organised by local communities. Their activities involve Friday working bee, community meetings, and awareness raising. This organisation, while experimenting with self-organisation, also triggers competition and self-

[37] Biopore is a vertical hole on ground with diameter 10cm and depth 100 cm. Organic waste is putted inside the hole to foster small pores surround of the biopore hole – and make possible infiltration from rainwater.

[38] Sub-district is subdivision of a city, there are 20 districts and 126 sub-districts in Bandar Lampung. Sub-district is a lower level of governmental unit under district.

responsibility in providing ecosystem services for managing climate risks. Facilitating climate adaptation involved providing facility services to implement biopore holes at neighbouring counties, school children, and a faith-based organisation. The widespread project implementation also triggered competition for the provision and innovation of different types and prices for biopore tools. It is argued that resilience building triggers competition within the market mechanism for climate change adaptation actions. This short and rather brief story outcasted the beginning of a new and political subject in order to build urban resilience. Urban citizens are deemed not only as objects of government but also required to begin their endeavour to become "a resilient subject." What will this subject look like? Hermanto[39], a senior staff from Bandar Lampung's Development Planning Agency, described this imaginary subject in the following quotes:

> "To motivate them to become a more active, independent [individual], so that they know their own needs, even though they will need support from the city government… probably the city government will help, but more importantly it will depend on their own initiatives. If I would illustrate [the relationship] is comparable to father and children. It is not that we [as the government] are running away from our responsibilities because when citizens become capable, mature enough, mentally independent… they will become resilient" (Personal communication, 12 August 2016).

Becoming: New prudentialism

The self-governing approach is closely related to new prudentialism. This approach depicts an individual who adjusts to risk-avoiding behaviour as an open person and accepts the purpose of institutional government in non-directive ways. This is where a neo-conservative approach emerges. Lupton (1999, p.99) explains that it has "progressively removes the responsibility for risk protection from state agencies." The failure of one individual to avoid risk or mitigate its negative impacts is then exhibiting his or her lack of skilfulness (Lupton, 1999). New prudentialism flourishes when an individual or a group voluntarily undertake initiatives to avoid the impacts of risks to themselves. Lupton (1999, p.100) points out that this personal

[39] This is a pseudonym.

acceptance of undertaking self-responsibility brings out "a practice of freedom, relief from state intervention."

Instead of using "Water for the City" as its slogan for the campaign, the Biopore project in Bandar Lampung used "Water for Us" to raise self-awareness and connect the risks of climate change at the individual level. In new prudentialism, an individual becomes 'attached' to the risks so that his or her actions to reduce his or her own risks are becoming part of their everyday life. Lupton (1999, p.97) explains risk "exhort individual to engage in self-regulation" and "taking steps voluntarily to reduce their exposure to risk" (Lupton, 1995 in Lupton, 1999, p.97). The amplification of self-esteem and prudentialism in building resilience to climate change is spreading through the elaboration of climate leaders, climate champions, "people at centre" doctrine, local community actions, and, more profoundly, into every human being as a compulsory action to save the planet.

Prudentialism also involves having a risk-avoiding behaviours approach for governing the population, putting more emphasis on self-control, self-knowledge, and self-improvement through the tactic of empowering. An autonomous and self-regulated individual that is active within society is central to a neo-liberal state (Lupton, 1999). The individual is expected to become "the entrepreneur of him-self of her-self", in which he or she develops an ability to pursue his or her human capital and develop their own interest and freedom (Gordon 1991 in Lupton, 1999). Their ability to both perform individual pursuits and have risk-avoiding behaviour is one of the keys to defining individual self-control, self-knowledge, and self-improvement (Lupton, 1999). These moral enterprises are never complete and will be carried out throughout the lifespan of a person. Lupton (1999, p.91) describes, "the project of risk avoidance as a technology of the self is never-ending, requiring eternal vigilance."

The multiple identities of urban citizens evolved in Bandar Lampung and also in Semarang are also around their rootedness in their communities and cities. Urban citizens who are deemed to become adaptable subjects are known as "climate cadres", "climate women", and "green teachers." The relationship of the resilient subjects with their land is expressed as "Water *for Us*" instead of "Water *for the City*" when enacting a water conservation project. In another example, Semarang City uses the new identity related to the new visions of the city's future as a smart and environmentally friendly city, known as "Semarang Hebat (Great Semarang)."

At the individual level, adaptable subjects create new identities of urban citizens for different roles. At the beginning of ACCCRN in Bandar Lampung, the programme focused on the role of women in resilience building. “Women’s roles are not only limited as a housewife”, as Mitra Bentala, which an NGO working with the community, puts it (2010, p.), “but have greater roles in educating their children and mitigating the impacts from climate change.” In this paradigm, women are not associated merely as the ‘vulnerable’ to climate change impacts, but they are encouraged to be able to take action actively. The *Community-based Vulnerability Assessment* in Bandar Lampung (ACCCRN, 2010), which was introduced in Chapter 4, mentioned that women, children, and the elderly are more vulnerable to climate change compared to men (see quotation below). Moreover, Gumede, the first female mayor of Durban in South Africa, clearly mentioned it: “Climate change is a daily issues for us, and women must be part and parcel of everything” (in Tugend, 2017). Thus, women’s vulnerability creates an opportunity for interventions to make them more resilient. The risks of climate change create an opportunity to engage with women in order to build their resilience. MercyCorps Indonesia describes this in the following quotation (2010):

> “Often having been deprived of completing their education and expected to maintain the household while their husbands work, women, particularly in urban poor communities, are often those least able to avoid impacts of climate events and also may lack the knowledge necessary to prepare for such events” (p.14).

In the Biopore project, local cadres were well-known community leaders who had a high commitment to providing socialisation, training, and assistance to other urban citizens for the implementation of biopore artificial recharge (MercyCorps Indonesia, 2012). In relation to another project, for example, the education project in Bandar Lampung, the Green Teachers Community (GTC) was established to sustain the initiative for integrated climate change materials implementation at elementary and secondary schools. A community of learners and actors in climate change is emerging to respond to climate change and build resilience. It is required to increase the capacity of individuals and the collective. Moreover, building urban climate change resilience, and thus an adaptable subject, has touched every individual and

gender as an object of governing. Ngatijo[40], a teacher and vice principal from Bandar Lampung, described it as 'successful factor' in the following quotation:

> "The success factor in reaching students to build their attention on climate change adaptation is beyond my expectation. Definitely, I am not the sole-achiever of this. Everyone in the school, the headmaster, teachers, students, and the school caretakers all are in this effort together. The credit is theirs" (Ngatijo, a teacher and vice principal at Elementary School in Bandar Lampung, MercyCorps Indonesia, 2017).

In relation to land, new identities emerge as a result of imaginary visions of the place and their cities. In the Biopore project, "Water for Us" was known better than merely as a jargon for implementing a water conservation project in Bandar Lampung. Rather than using another jargon of "Water for the City" that seemed to separate resilience actions from nature surrounding them, "Water of Us" was being used to recognise water and its contributions to people's lives and their attachment to it. That the relationship between people and the possible climate around them has created new subjectivity. Moreover, the Biopore project was also intertwined with the Education project, discussed in Chapter 4, that risk-avoiding behaviours needed to be taught and learned at schools, and is explained in the quotation below:

> "In order to become resilient, cities have to increase the citizens capacity so that they can adapt with environmental change. Education and knowledge sharing is particularly important to increase this *adaptive capacity*. At the moment, climate change and disaster materials are very limited in formal educational curriculum. Education agencies, such as elementary schools, also have limited capacity and human resources in climate change issue. Therefore, the challenge is to develop climate change materials for educational programme, and integrate it into school curriculum so that the *adaptive capacity* from our communities will increase" (ACCCRN Newsletter, 1st Edition January – March 2012 – emphasis added).

These attachments of people and place in water conservation and the city's vision, which is mentioned by Brown (2016, p.197) as "rootedness", which reflected and emphasised the power of place, community, and identity in resilience.

[40] This is a pseudonym.

Rootedness is described as a sense of belonging and bonding between people and their community or place and as an alternative to vulnerability (Brown, 2016).

Figure 6.5 Inauguration of Green Teacher Community (GTC)

(Source: Mukhlis, 2016)

6.4. Climate Human

An internationally acclaimed artist, Glenn Brown from Hexham, had an intriguing painting at Laing Art Gallery at Newcastle-upon-Tyne. The artwork titled "*In the End We All Succumb to the Pull of the Molten Core*." The painting depicts two faces of a person who "looks forward (the youth) and looks back (the old man), but they are one and the same, entangled in a complex game of sitting in the present. The heads could be trapped in religious ecstasy or they could be in outer space" (Brown, 2018, no pagination).

Climate human is a dialogue between our past and future in the climate change age. Climate human is the figure that encapsulates urban resilience subjectivities from the two case studies discussed. Rose (1999, p.xii) describes subjectivities as "a collective of ontological, epistemological, ethical and technical subject upon which human beings act upon themselves to reform or improve themselves, in order to become autonomous, free and fulfilled." From Section 6.3, a climate human is illustrated as one that thinks of the 'past', such as climate change risks, impacts, and uncertainties, by accommodating through acquiring and developing knowledge, capacity and behaviours of a survival subject, and another one that thinks of the 'future', such as climate change risks, impacts and uncertainties, by responding on

the basis of individuals and collective acts to acquire and develop knowledge, capacity and behaviours of an adaptable subject.

This section aimed to discuss "climate human" as a new subjectivity emerges from ACCCRN. However, before this thesis returns to this discussion, it discusses what the Anthropocene concept offers to revisit our understanding towards humanism in the following discussions.

6.4.1. Nature/Culture in the Anthropocene

We are at the beginning of a new epoch in Earth's history. The Anthropocene is known potentially as a new geological time scale that remarks the human influence on the environment (Crutzen, 2002; Steffen *et al.*, 2011). Even though the International Commission on Stratigraphy (ICS) has not formalised the usage of the term Anthropocene, it has now begun to occupy the debates and discussions on the impacts of human civilisation and the future of Planet Earth. It was suggested that the term was coined as early as 1873, around the beginning of the Industrial Revolution (Cruzten, 2002; Working Group on the Anthropocene, 2017). Under climate change, the Anthropocene offer new insights into the relationship between humans and climate.

The classical reading on how humans relate to their environment was written back in 400 BCE by Hippocrates. In his book *On Airs, Waters, Places*, he presents the relationship between physical, social, and behavioural settings in urban living. In recent years, there have been much more critical reviews on the impacts of humans on climate and the environment – more as popular science. Humans have always depended on the human-nature relationship, which, in the Anthropocene age, signifies understanding "ourselves as part of an earth that our actions are rapidly changing" (O'Lear and Dalby, 2016, p.4).

Furthermore, the Anthropocene signifies new relations between climate and humans. On the one hand, how climate is relevant and governed in human history. "Climate has become a political object", as Hulme (2017, p.133) stresses out, "around which different modes of governing, regulating and ordering society vie recognition, ascendancy and legitimation." The variety of climate governance focuses on how "to bring climate under human control", or in other words, "to imagine different ways that human activities could influence" the different "kinds" of climates (Hulme, 2017, p.134). In his book *Weathered: Cultures of Climates*,

Hulme mentions at least there are three scales of climate governance: local, colonial, and global climate. Each has become "an object of contestation" (Barry, 2001, p.6) by human agency to alter the climate that we are expected and able to control.

"The climate has always been in change", as Behringer (2007, p.217) identifies, we as a "society has always had to react to it." He then proposes a more nuanced question (Behringer, 2007, p.217): "The climate has always changed. How we react to it is a cultural question." Further to this, we are then able to question ourselves: what society do we want to become? How are several techniques of power and knowledge being delivered to change and alter our society? What kind of individuals or communities do we want to become? Or what kind of human subjects are we being shaped by the government of knowledge-power? as examples. "Times change", as Behringer (2007, p.217) puts it, "and we change in them."

Since its introduction, there have been many criticisms of the concept of the Anthropocene as general and its potential for formalisation. Some might argue that the term Anthropocene is similar to the term of Renaissance (Finney and Edwards, 2016). Responding to recent critics that the Anthropocene is less Earth history (Finney, 2014) and more similar to the term within Human history (Finney and Edwards, 2016), Zalasiewicz and her colleagues (2017) suggest that Anthropocene considerably carries both accounts of geologic and historic time. "The answer is *both*", as they respond (Zalasiewicz *et al.*, 2017, p.216-217 – emphasis from original), "The Anthropocene… occupies the *overlap* between geological, historical and instrumental time." This means that the Anthropocene hypothesis is connected not only to a geological era but also "are of societal, and hence political" and signifies humans as one of the main driving forces of change (Zalasiewicz *et al.*, 2017). The Anthropocene offers a deeper conceptualisation of the epistemic relation between the "Climate" and "Human" under the climate change age.

In a world of changing climate and uncertain and indeterminate futures, resilience as governing rationality and apparatuses has brought in new relations and imaginations between "Nature" and "Culture." There are no longer divisions between nature and culture, humans and the environment. David Chandler (2018, p.xv), in his book *Ontopolitics in the Anthropocene*, suggests a new understanding towards ontopolitics claims about "to know, to govern and to be a human subject" in the Anthropocene. He offers that the Anthropocene is not only understood as a geological epoch but also challenges "the modernist understanding of the

nature/culture divide" in modern societies (Chandler, 2018, p.5). "There is no longer a separation between culture and nature", he argues further, "there is no longer an 'outside' or an 'away'" in the Anthropocene (Chandler, 2018, p.7). His argument reconceptualises the argument on how adaptive governing should take place, where Chandler (2018, p.21) suggests, "governing thereby seeks to adapt or respond to the world rather than seeking to control or direct it."

6.4.2. Climate human subjectivities in ACCCRN

This brings us to the question Foucault poses on the power over life, biopower, and production of subjectivity: "This bio-power was without question an indispensable element in the development of capitalism; the latter would not have been possible without the controlled insertion of bodies into the machinery of production and the adjustment of the phenomena of population to economic processes" (Foucault, 1978, p.140-141). The thesis argues that governing the cities and urban population to build resilience has not only touched the interrelation between the climate and humans but also shaped a new subjectivity under the diminishing divide between nature/culture. This means that governing the climate is only a proxy approach to governing the urban citizens and their conducts within a multiplicity of governance at many loci and scales towards new subjectivities, as Hulme (2017, p.143) mentions:

> "Governing global temperature therefore requires, at least, governing the full range of human activities and technologies… every human practices becoming subjects….in the end, all human behaviour become subject of the totalising idea of climate governance. Governing global climate becomes an exercise in governing global society…. And yet in a different sense, society, and therefore climate too, is being eternally governed" (p.143).

This new subjectivity of urban citizens in the age of Anthropocene is called as a "Climate Human." Within this Anthropocene-urban milieu, resilience governmentality and its apparatus operate within the circulation of climate and humans. "Government", as Guillaume de La Perriere mentions (in Foucault, 2009, p.96), "is the right disposition of things arranged so as to lead to a suitable end." The emerging notion of urban resilience for managing climate change risks in urban areas begins to unpack governmental objects. Urban populations are currently an object for

interventions, through which their identity, conduct, and behaviours are being governed. This production of new subjectivity operates as "an act of creation" to explore for new identities (Nas, 1986, p.13), in order to "fabricate subjects" (Rose, 1989) and "reinstate universal humanist values" (Braidotti, 2013, p.87), within an urban milieu shaped by resilience apparatus to achieve desirable outcomes.

Since the beginning, ACCCRN designed the programme to achieve a successful climate resilience building that imagines urban citizens where "People are able to solve problems and are willing to invest time, energy, resources and be entrepreneurial. People have more choices; they feel more secure and less vulnerable" (ACCCRN, 2009c, p.1). The climate change adaptation programme operated, as discussed in Chapter 3, initially to engage with cities' institutions and deliver interventions at local and community levels. However, it also touches the social imaginations of a "climate human", which was moderated through urban citizens' capacity to respond to their environment. Joanne, a senior associate from The Rockefeller Foundation, discusses the figure of a climate human not only as an object of government but also as having the capacity to be self-aware and respond to their surrounding environment in the following quotation:

> "To be human in the age of climate change, I guess sort of aspirational idea (where) capacity as individuals needed to be cultivated… that building those characteristics of resilience… to have the capacity to be flexible to handle surprises… adaptable… build more resilience to reduce risks… we need to have more tools and approaches that can help connect people whether through financial instruments, insurance mechanism, physical moving…." (Personal communication, 26 October 2016).

Within the Anthropocene-urban milieu, urban citizens are required not only to become recipients of government interventions but also political subjects. In this sense, Joanne (Personal communication, 26 October 2016) also realises that "climate change bring winners and losers." She discusses that "we need to acknowledge that. Make sure that losers are not just people who had sort of fewer resources, smaller voices. I think that there a new strategies and approaches … for building awareness, building and investing in capacities" (Personal communication, 26 October 2016). Climate humans, at one point, reflected as political subjects that their freedoms and responsibilities are embedded within their awareness and capacity towards the care

of themselves, the nature, and their futures. However, this also reflects the depolitisation of climate humans from the ability to manage and control why people are vulnerable and risky in the first place to "our inability to cope with our internal crisis of values" (Baldwin, 2017, p.5).

The ACCCRN also profoundly provides pathways for the formation and reproduction of new subjectivities of climate humans. In its plural sense, the ideal climate human is one that adapts, lives and thrives. However, as illustrated in Section 6.3, the formation of climate humans involved two subjectivities: (1) Survival subject, and (2) Adaptable subject. Survival subject is a social and political agent whose care of the self, including awareness, conduct and behaviours, defined by their capacity to survive *from* the events of climate change. On the other hand, adaptable subject is a social and political agent whose care about the self, including awareness of conduct and behaviours, is defined by their capacity to adapt and respond *to* the events of climate change. Becoming a human during the climate change era is to confer their ability to sense their surrounding worlds (*episteme*), be aware of the kind of selves that they should seek to be through self-awareness and self-knowledge (*ethical*) and be able to survive and recover from the effects of climate change (*technical*). Hamid, a local leader, describes his motivations to undertake and coordinate actions towards water conservation in Bandar Lampung as follows:

> "When they (Mitra Bentala) introduced about biopore… it is make sense for me. It is not too complicated, and if we can implement, we will get benefits from its implementation. Then I introduced to neighbours, to local communities, and then to sub-district level. I also benefited myself. First, knowledge benefits, from that I don't understand and now I understand it… and the reasons why it was being implemented are because of global warming" (Personal communication, 13 August 2016).

Hamid's explanations reflect his intrinsic capacity to be aware of the surrounding environment during the climate change era and generated self-knowledge and capacity to mobilise, engage, and involve individuals and households to take action. Climate human sees us as moral agents (Cripps, 2013), and human is not only the creator of destruction (Lynas, 2011) but also "people as the solution to climate change" (O'Brien, 2016, p.618). These imaginary objects of government bring the human body, soul, mentality, and behaviours to become subject to

management using different tactics of power within a network of instruments. It needs to touch "the entire social body and political class" as the battle of the human race will depend not only on the debate of science but also on its interaction with cultural and social features (Boia, 2005, p.179). In the Anthropocene, Crutzen (2002, p.23) remarks this call as it "will require appropriate human behaviour at all scales…to 'optimize' climate." By targeting cities and urban populations, ACCCRN has involved not only shaping transitions and building resilience from climate change, but also intervening with individuals, households, and local communities as governable subjects. Climate and humans are truly interrelated around the circulations of the body and the embodiment of government purposes into human and social conduct. In building urban resilience, knowledge-power has been translated within the circulations of resilience as governmental reason, the care of the self, and the interrelation between "Human" and "Nature." In the Anthropocene, the interrelation between the management of natural systems and human systems is interrelated more profoundly. Climate human is a social and political subject that engages with different ways of sensing the environment, the capability to act upon ourselves, and ways of becoming with no division of Nature/Culture.

6.5. Conclusions

This section summarises that urban climate change resilience in ACCCRN cities in Indonesia has exemplified multiple subjectivities of the climate human. The climate human signifies the care of the self and the interrelation between "Human" and "Nature" through different qualities: surviving, responding, and empowering in urban lives. Urban climate experiments in ACCCRN cities in Indonesia have also exemplified new subjectivities of a climate human. This act of creation emphasising resilience as governing rationality tries to bring into being the norm and practices of resilience into common ideologies. Within the Anthropocene, this has been sustained around the circulation of humans and nature. Resilience is then translated into the agenda for building urban resilience, which involves not only the planning of new ways for governing cities and managing climatic risks but also engaged with shaping human conduct into governable urban subjects. The resilient subjects of individuals and communities are being contextualised around performance of ourselves in order to ameliorate climate change impacts: to withstand, perform, and transform. The idea of building urban resilience and resilient communities cannot be simply defined as a

programmatic, deliberate, and technocratic process for managing climate risks and maintaining a city's functions but also as an endeavour for "resilientisation" through which governing urban population has been enacted.

More specifically, this section summarises the prior discussions around the answers to the research questions. What forms of conduct are expected from the urban population to build resilience? Building urban climate change resilience is enacted around the formation and re-production of (1) Survival subject, and (2) Adaptable subject. Urban areas have become not only "sites of political struggle" (Castán Broto, 2017, p.2) but also sites for creation to shape, form, and manage urban life and its inhabitants. Moreover, ACCCRN touches on making possible new forms of human conduct (Rose, 1989). Survival subject is a social and political agent that takes care of the self, including awareness, conduct and behaviours, as defined by their capacity to survive *from* the events of climate change. On the other hand, an adaptable subject is a social and political agent that also takes care of the self, including awareness, conduct and behaviours, defined by their capacity to adapt and respond *to* the events of climate change. In relation to the different capacities and attributes fostered within sustained resilience subjects, the two subjects have distinctive attributes of subjectification as a mode of sensing, acting, and becoming. These attributes are exemplified in the case studies by forms of actions that evolve around the qualities, capacities, and status of each subject. This has also brought in new relations and imaginations in which, under climate change, that there are no longer divisions between nature and culture or humans and their environment.

The thesis argues that "climate human" as a resilient subject is beyond moral agents but becomes elevated to a political subject. Aligned with the new paradigm of development after the Reformation Era in Indonesia, reducing the role of government and enhancing individual capacity, resilience becomes a new management paradigm to cope with climate change risks. Resilience governmentality emerges as a new mode for governing the climate and, consequently, also for the urban sites and their populations. Building urban climate change resilience, and also consequently, resilient communities, has been translated using resilience as a governmental reason and interrelation between "Human" and "Nature."

Chapter 7: Conclusions

"There's a child singing a song about wisdom. Oh.
Get on the backseat or take the wheel. You will drive.
Then, we'll make some stories along the way.
What we keep are the good parts of it all.
Before we know it the old times are far. Gone."
– Barasuara x SCALLER, *Commune*
(Barasuara x SCALLER, 2017)

7.1. Research synthesis

This thesis begins with a short story about Hamid with his account of the local river and the climate risks and vulnerabilities threatening Bandar Lampung in Chapter 1. The story of Hamid continued throughout the thesis; he was involved in the ACCCRN and Mitra Bentala initiatives to initiate artificial groundwater recharge to mitigate flooding and increase groundwater recharge in his city. He recites his involvement as a recall of his morality and a call for future generations. His 'resilience' actions exemplify the developing interaction between human and their environment. This chapter analyses and examines this 'emergent' in relation to the initial research objectives and questions set out at the beginning of the thesis.

As discussed in the thesis, it becomes clear that building urban climate change resilience is more than a programmatic design and a range of technical solutions to reduce local vulnerabilities, address climate change risks, and increase adaptive capacity. In both Indonesian cities, Bandar Lampung and Semarang, building resilience is facilitated through "the will to improve" (Li, 2007) and negotiated by the urban politics of struggle and contestation. Resilience operates within a world-making practice where governing rationalities, apparatus, and subjectivities are being reconfigured. The thesis aims to invite climate change and urban scholars to re-evaluate how we engage, analyse, and examine what resilience *does*, rather than what resilience *is*, in a similar effort to Grove (2018).

One of the main ideas developed in the thesis is to focus on *re-centring* resilience. This means diffusing from the dominant body of resilience literature and de-centring into more plural and critical ways of analytical evaluations. The new lines of inquiry require scholars to analyse, examine, and criticise the politics of climate change adaptation and the representational meaning of urban resilience with a focus on the Global South. More critically, re-centring the idea of resilience with a focus on the Global South has several consequences in terms of political and methodological commitments. As *a political commitment*, re-centring resilience means engaging, developing, and deploying an alternative body of critical analysis to examine how resilience building is conducted and enacted in 'ordinary' cities of the Global South, particularly in small and medium-sized cities. As *a methodological commitment*, re-centring resilience means analysing and examining the urban climate change resilience body of literature and case studies with different research methods, such as *situated resilience* (as suggested in the thesis) or critical urban geography.

As evidenced in the thesis, one key example of engagement in resilience research as political and methodological commitment is to evaluate this in relation to the Indonesian notion of resilience. Even though Indonesia adopts the term resilience, there is no single translation that matches what resilience is in Indonesian, and more critically, this entails a critical engagement of understanding how this Eurocentric notion of resilience travels and mutates with the mix of socio-cultural-political understanding of what resilience entails. As discussed in the thesis, different political institutions – state and non-state – have different interpretations of resilience, which further invites future research to evaluate these aspects. Furthermore, this section provides a synthesis of the three research objectives described in Chapter 1 around these three distinct concepts: governmental rationality, apparatus, and subjectivity.

1. Resilience governmentality and governing rationalities

The first research objective in this study is to evaluate rationality(ies) that informs the experimentation of urban climate resilience. Governing rationalities are defined as any form of thinking about the problems of thought to be solved, managed, governed, and reconfigured (Dean, 2010). Further, governing tactics are defined as a multitude of mechanisms and strategies that form the basis for a regime of truth to reconfigure actions, enact actions, and make amends in governing things.

Building urban climate change resilience becomes visible as insurance management to the problems of the climate as non-deterministic and uncertain futures. Resilience normalises precariousness to be part of the collective future of *already vulnerable* individuals, communities, and urban populations where survival and insecurity need to be governed and rendered technical. Resilience – as survival – normalises the poor and vulnerable populations to be susceptible to external disturbance and climate change impacts upon which they need to live, adapt and thrive. Rather than asking about the fundamental conditions upon which communities became subject to risks of climate change, the promise of security under resilience is of the 'present.' Urban individuals, communities, and populations are situated to be ontologically vulnerable. The alternative management in ACCCRN does not seek to completely figure out the future of climate in order to build resilience but is evaluated, calculated, and moderated as a continual process of adjustment where complete protection is no longer relevant.

Resisting resilience does not mean negating the fact that urban individuals, communities, and populations already have an intrinsic capability to respond and adapt to the events of climate change. What this study offers are analytical and critical procedures that help to disassemble urban climate experimentation and show how resilience is operated and governed. This should raise more critical questions not about how resilience should be built but more critically about how 'risky' population groups are susceptible to the effects of climate change in the first place.

The thesis argues that resilience is not apolitical. Resilience normalises an event into the present. It reverberates urban life at the end of history and re-circulates into an ontologically unstable, uncertain, and unpredictable living. As such, resilience governmentality emerges from building urban climate change resilience in Indonesian cities. Resilience governmentality is an assemblage of rationales, tactics, and techniques within a network of instruments that form as part of a series of government and knowledge-power constructs that target the population to become individually or collectively active in order to live, adapt, and thrive under risk and uncertainty from climate change. Building urban climate change resilience from climate change is problematised upon a multitude of anticipation, reactivity, and survival. Anticipation rationality is defined as ways of seeing and knowing the climate within a non-deterministic future, instability and insecurity, and exposure to threat and turbulent worlds. Reactivity rationality is interpreted as ways of seeing

and knowing the climate with an adaptive cycle to build a circular 'model' around a basis of knowledge required in order to respond with safe failure, reinforced and enabled, and resourcefulness. Survival rationality is described as ways of seeing and knowing the urban population as an instrinsically vulnerable subject, with survivalism as the basis for adapting, living, and thriving. The conceptual framework of resilience governmentality is presented in Table 7.1.

2. The apparatus of resilience and neoliberalisation of nature

The second research objective of this study is to analyse who the actors are and what kind of urban institutions are deployed to manage urban resilience. This study analyses resilience by considering its geometric of power and apparatus. As an apparatus, building urban climate change resilience is operated through a network of assemblages, socio-materiality, and imagination. Mapping as governing tactics is interpreted as ways of acting to stimulate, examine, and evaluate climate risks on the basis of sensing the future and climate events. Governing techniques involved within these tactics are operated not to take a precise knowledge of the future but to make sense of the future and events. Some governing techniques within mapping tactics are risk mapping, scenario planning, and vulnerability assessment. Enabling as governing tactics is explicated as ways of acting to accommodate and mediate climate risks to enable, recreate or reinforce social relations between the state and population and/or reproduction of nature. Governing techniques involved within these tactics are operated to shape, direct, and enact new relations, such as real-time information systems and the commodification of natural resources as ecological fixes. Empowering as governing tactics is described as a way of forming the "conduct of conduct" of urban individuals, households, and local communities on the basis of survival. Some governing techniques involved empowerment through different ways of engaging individuals, households, and communities to be prepared for climate change risks, such as training, workshops, and climate education.

On the other hand, the regime of the practice of resilience in Indonesia has been moderated through the reproduction of new social formations and relations between the state and the urban population. The trajectory of the practice of resilience in Indonesia developed around the social formations that shifted from the efforts to avoid, protect or eliminate the events of climate change to embrace the impacts by developing resilience capacities and actions. Forms of neoliberalisation of nature

have facilitated the principle of market rationality in order to fix environmental problems, including commodification and deregulation. It engages in new social relations between the state and population in which urban individuals, households, groups and communities are responsible for their own protection and rendered as entrepreneurial.

The consequence of this analysis on the emergence of resilience apparatus is to re-evaluate what resilience *does* rather than focusing on what resilience *is*. There has been a more prominent demand for resilience as a policy imperative in recent years, which is being implemented by various international, regional, national, and local institutions. By engaging in analysing and examining what resilience *does*, the thesis provides evidence of the importance of rejecting the 'pure' form of resilience but rather engaging in understanding resilience not as a 'pre-given, singular' concept. The thesis argues there is no possibility of acquiring a universal knowledge of what resilience *is*; instead, resilience is always made, remade, and un-made throughout different histories. This also bridges the gap between research and practice regarding resilience initiatives or programmes. With the increasing demand for actions towards increasing resilience from climate change risks at different levels, the thesis invites researchers to evaluate and examine the ways of seeing, thinking, and acting behind *each* and *every* resilience action. The thesis argues that by engaging with this critical analysis of resilience, we would be able to unpack and reveal "the relation between truth and control" (Grove, 2018, p.4) and offer new transformative pathways in responding to climate change or, rather, climate emergency.

3. Climate human and resilience subjectivities

The third research objective of this study is to evaluate what subjectivity(ies) that are sustained to manage urban population for building urban resilience. The formations of climate humans are exemplified in ACCCRN within the premise of relation to ourselves, which means defining individuals' relations with themselves and with others. There are two resilience subjectivities that emerge in ACCCRN cities in Indonesia. Survival subject is a social and political agent that their case of the self, including awareness, conduct and behaviours, defined by their capacity to survive *from* the events of climate change. On the other hand, an adaptable subject is defined as a social and political agent whose their care of the self, including awareness, conduct and behaviours, is described by their capacity to adapt and

respond *to* the event of climate change. These two subjectivities are exemplified in both Indonesian cities as attributes of subjectification through the mode of sensing (*episteme*), acting (*technical*), and becoming (*ethical*). These attributes are exemplified in the case studies by various forms of actions that evolved around the qualities, capacities, and statuses of each subject. In a world of changing climate and uncertain and indeterminate futures, resilience as governing rationality and apparatus has brought in new relations and imaginations (Stripple and Bulkeley, 2015). There are no longer divisions between nature and culture, humans and the environment.

The thesis clearly invites a more critical evaluation of how climate subjectivities are *contested* and *resisted* as part of urban climate change resilience. As evidenced in the thesis resilience building not only affects different ways of forming into urban individuals and collective as a means to live, adapt, and thrive under climate emergency but also informs that climate humans are more than socio-cultural subjects. The climate subjectivities are *contested* around socio-material processes around different ways urban individuals and collectives make sense of their changing nature, acting around them to build their own capacity and become a new kind of individual. This object-turned-into-subject is not only involving the body but also the soul. However, this would also clearly open up a critical encounter on how the subject accepts or resists the disciplinary powers towards a climate subject. While there is no strong evidence to suggest a hard resistance, there is at least a silent resistance among urban individuals and communities to accept the ontologically vulnerable conditions of the poor and vulnerable in both cities, Semarang and Bandar Lampung, for example, self-critical awareness of a conflict over land tenure for mangrove conservation in Semarang, and when conservation project is no longer being sustained by local community groups in Bandar Lampung.

7.2. Research contributions and limitations

This section discusses some research contributions and limitations. The research contributes to the knowledge of resilience and urban studies, more specifically, on the ontopolitics of *situated resilience*. In the thesis, the idea of *situated resilience* offers a more tactile and strategic analytical approach to examine and evaluate any agenda, policies, actions, interventions, and projects for building urban climate resilience. This also rejects an overarching ‘truth’ about resilience but more critically examines it from the basis of micro- and relational-politics. Hence, resilience exists

upon which there is no possibility of universal knowledge; instead, what we may know is a multiplicity of resilience as a mobile, locale, and relational object. The thesis exemplifies an attempt to de-centre disagreement about what resilience *is* towards the ontopolitics of resilience. In order to do this, the thesis suggests that urban research should engage with a post-structural approach to study resilience. This thesis offers the critical understanding and application of *situated resilience* as a research methodology. The thesis rejects any form of positivism and redirects the study of urban climate change resilience into the politics of being and becoming.

Is there a unified figure of resilience governmentality? In the study, this thesis has analysed and examined specific case studies of ACCCRN in two Indonesian cities. Hence, the thesis does not assume that there would be a singular formation of urban resilience. Instead, more research is needed to unpack different formations of urban climate resilience. As illustrated in Chapter 4, there is more than one kind of resilience governmentality, for example, the centralised resilience governmentality exemplified by standardisation led by The Ministry of Public Works and Housing offers a different premise and assumptions that non-deterministic resilience governmentality led by ACCCRN in Indonesia. More critically, the study of urban (climate change) resilience should pay attention on the ontological qualities and relations of how resilience has been unrevealed in the real world-making.

I met Hamid[41] a couple of times during my fieldwork in Bandar Lampung. One thing that I noticed was his position about building resilience in the middle of the project and at the end of the project. In the beginning, he always sounded very optimistic about the project, but in the end, he expressed his desperation to continue the actions, especially when there was no support from the local residents. His actions exemplify a silent resistance to climate resilience actions in the Biopore Project. Resilience within representational politics needs to examine what it was producing, who produced it, how social relations were shaped and altered, and the knowledge-power stimulating behind it. In this sense, the research limitations lay on the geographical diversities of my case studies. As *situated resilience* does not lie on a territorial boundary, it would be interesting to examine and evaluate resilience as a relational object on a different geographical scale of the urban, such as global cities or from an initiative led endogenously by the local governments or organisations.

[41] This name is a pseudonym.

Table 7.1 Resilience governmentality

No	Governing rationalities	Governing tactics	Governing techniques	Programme activities
1	**Anticipation** *Ways of seeing and knowing the climate within non-deterministic future, instability and insecurity, exposure to threat, turbulent worlds*	**Mapping** *A multitude of mechanisms and strategies as ways of acting to stimulate, examine, and evaluate climate risks on the basis of sensing the future, climate events*	Normalisation, such as: risk mapping, scenario planning, vulnerability assessment, climate modelling	Vulnerability assessment, Health project, Flood early warning system project
2	**Reactivity** *Ways of seeing and knowing the climate within adaptive cycle to build circular model and knowledge to respond with safe failure, reinforce and enable, resourcefulness*	**Enabling** *A multitude of mechanisms and strategies as ways of acting to accommodate and mediate climate risks to enable social relations*	Calculation, such as: real-time information system, commodification (ecological fixes), demarcation	Mangrove project, Trash-to-Cash (T2C) project
3	**Survival** *Ways of seeing and knowing urban population as intrinsically vulnerable subject so far survivalism as the basis for adapting, living, and thriving*	**Empowering** *Ways of forming the conduct of conduct of urban individuals, households, and local community on the basis of survival*	Empowerment, such as: training, workshop, education	Education project, Biopore project

7.3. Future research agenda and policy implications

Some future research agendas can include the geographies of resilience, situated resilience through comparative cities such as global and ordinary cities, global north and south, and critical geography of spatiality and temporality of building urban resilience. In terms of policy implication, this research attempts to negate resilience as a policy prescription but to analyse and criticise the "ontological qualities and relations" (Povinelli, 2016) that urban climate change resilience will bring. This will facilitate progressive transformations towards building more adaptive, just, and effective climate change adaptation in urban areas. We need to be critically attentive towards what kind of urban agenda, policies, programmes, projects or calculative technologies that are being deployed as part of climate resilience experimentation.

The thesis begins with a short story from Bandar Lampung about Hamid and his concern about his local river. It had appeared during interviews with Hamid and later contact with him in June 2018 that he expressed his concerns about the future of biopore as community-led groundwater conservation. He was concerned that he was the sole fighter to continue engaging in the actions at the moment – which he found exhausting. When it is suggested in the research to reject resilience, the thesis does not invoke an understanding that building local capacities and actions – policies, agendas, finance, and plans – to adapt and respond to climate change risks is not useful. What is rejected is the positivism of resilience. Resilience is not apolitical. The politics of resilience is never neutral in its silence, and there are already counter-conducts and resistance in the aspirational of resilience to engage in the "will to improve", improvised lives, ruins, and the 'present' of urban lives.

We can no longer ignore the political consequences of climate change resilience building at the urban level; more importantly, with increasing policy attention to using 'resilience' jargon at various international agreements such as the Paris Agreement, Sendai Framework for Disaster Risk Reduction, Sustainable Development Goals, and the New Urban Agenda. In these international commitments, resilience has become one of the keywords that prominently shape the programme and project initiatives by different international development actors. The thesis argues that we need to avoid the empty promise of resilience and, more importantly, to be critical of what "ontological qualities and relations" (Povinelli, 2016) are brought in by these resilience agendas, policies, and interventions. Nothing is in resilience itself. More critically, as evidenced in the thesis, we need to unpack

the regime of truth(s) behind (urban climate change) resilience.

We need to be attentive and critical to any aspirational engagement with resilience as political acts and programmatic actions to solve the problems of climate change and urban lives. What kind of urban life, social relations, and forms of knowledge-power are informed by climate change resilience experiments, especially for the poor and vulnerable urban groups, are some of the critical questions we might need to ask. Thus, it requires policy implications at the international and domestic levels to respond to climate change problems that will serve urban justice, recognise the complexity of urban governance, and facilitate effective and long-term reduction of climate change risks to create just, meaningful, and transformational changes.

Appendixes

Appendix 1. Summary of research

PhD Research
Erwin Nugraha, PhD Student in Human Geography,
Department of Geography, Durham University, United Kingdom (UK)

Summary of PhD Research

Title of research : Risk governance and governmentality in experimental urban adaptation from Indonesian cities

Conducted by : Erwin Nugraha,
PhD Student in Human Geography,
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erwin.nugraha@durham.ac.uk

Supervisors : Dr Andrew Baldwin and Professor Harriet Bulkeley

Institutional funders: This research is funded by Christopher Moyes Memorial Foundations (CMMF) Doctoral Scholarship and Van Mildert College Postgraduate Award

Approval : This research has been approved by the Department of Geography – Research Ethics Geography Sub-Committee (REGS), Durham University.

Aims and objectives:
This research aims "to analyse the actual rationalities and techniques for governing cities and its urban population towards urban resilience and how this regime of practices being manifested into urban subjectivities." Bandar Lampung and Semarang city have joined in the Asian Cities Climate Change Resilience Network (ACCCRN) project (funded by the US-based Rockefeller Foundation) and begun to experiment with adaptation planning. As experimental cities, adaptation planning and new ways of governing climate are being tested and explored (Bulkeley, 2013; Evans, 2011). This research will focus on three objectives:

1. To evaluate rationality(ies) that inform the experimentation of urban resilience.
2. To analyse who the actors are and what kind of urban institutions are deployed to manage urban resilience.
3. To evaluate what subjectivity(ies) that are sustained to manage urban population for building resilience.

This research will look at the urban climate experimentation in adaptation planning and actions in Bandar Lampung and Semarang city. This research will conduct data collection through: (i) semi-structured interviews with local stakeholders in Bandar Lampung and Semarang, project managers in Jakarta, donor managers in London and Bangkok, project partners and policy experts, (ii) ethnographic field research,

and (iii) policy and project document collections. Initial interviews will be conducted with project managers and project partners to understand the project design and contextual set up of ACCCRN, specifically for Indonesia.

Interviews:
The aims of the interviews are:
1. To understand, capture and analyse the logic, design and current modifications in ACCCRN and 100 Resilient Cities (100 RC) projects especially for Indonesia context;
2. To understand, acquire and document different responses in climate change adaptation, network of actors involved and rules and mechanism for institutionalising adaptation planning;
3. To understand and analyse how urban climate experiments have been represented, categorized and ordered through techniques of power and network of instruments.

Potential benefits:
This research will contribute to the theory and practice in urban adaptation that has emerged and evolved in the Global South. This is particularly important since most literatures in urban adaptation often come from developed countries, and innovative projects are only stored in project reports or internal documentation. My research will also contribute to the debate, discussions and synthesize on how adaptation planning has been undertaken and how urban climate governance has been represented, categorized an ordered in experimental cities from developing countries. I will be sharing my findings with a range of stakeholders involved in ACCCRN and 100 RC projects and planning to disseminate its results to postgraduate forums or seminar and subsequent publications.

Confidentiality:
I would like to record this interview. This will be used for reference only for my PhD research and will be destroyed after use. Notes will also be taken throughout. The information provided during the interview will be used for my PhD research and subsequent publications. Interviewee will automatically become anonymous, unless you want to revoke your anonymity.

Thank you for your interest in this research.

Kind regards,

Erwin Nugraha
PhD Student in Human Geography,
Durham University, UK

Address: Van Mildert College, Mill Hill Lane, Durham UK DH1 3LH
Email: erwin.nugraha@durham.ac.uk
Mobile phone: [Inserted international and local numbers]

Appendix 2. Consent form

PhD Research
Erwin Nugraha, PhD Student in Human Geography,
Department of Geography, Durham University, United Kingdom (UK)

Consent Form

Name : ……
Affiliation : ……
Date : ……

This interview will be recorded and used for the reference for my PhD research only. The recording will be destroyed after use. Notes will also be taken throughout. The information provided during the interview will be used by the researcher (Erwin Nugraha), for his PhD research and in subsequent publications. Interviewee will automatically become anonymous, unless you want to revoke your anonymity. Please cross the appropriate box below in regards with your anonymity.

Confidentiality options (please tick one of the box):

☐ I want to remain anonymous in the PhD thesis document and subsequent publications of this research.
☐ I granted the researcher to revoke my anonymity and reveal my identity for the PhD thesis document and subsequent publications of this research.

Should you have any questions about the research, please contact Erwin directly:
- Email: erwin.nugraha@durham.ac.uk
- Mobile phone number: [Inserted international and local numbers]

Thank you for your interest in this research.

Signature Signature

Erwin Nugraha ……
PhD Student in Human Geography ……
Durham University, United Kingdom (UK) ……

Appendix 3. List of research respondents

Pseudonyms	Location	Designation
Fieldwork period: March – October 2016		
Arini	1. Bandung	Lecturer, Institut Teknologi Bandung, Bandung
Anwar	1. Bandung	Lecturer, Institut Teknologi Bandung, Bandung
Mulyono	1. Bandung	Lecturer, Institut Teknologi Bandung, Bandung
Farid	1. Bandung	Lecturer, Institut Teknologi Bandung, Bandung
Fieldwork period: April – October 2016		
Muliana	2. Jakarta	Senior Staff, MercyCorps Indonesia
Nurdin	2. Jakarta	Senior Staff, MercyCorps Indonesia
Arilla	2. Jakarta	Senior Staff, MercyCorps Indonesia
Maliva	2. Jakarta	Senior Staff, MercyCorps Indonesia
Raban	2. Jakarta	Former Senior Manager, MercyCorps Indonesia
Heliwati	2. Jakarta	Former Senior Manager, MercyCorps Indonesia
Lina	2. Jakarta	Senior Manager, MercyCorps Indonesia
Wulan	2. Jakarta	Senior Manager, Indonesian Municipality Association
Aryani	2. Jakarta	Director, Ministry of Environment and Forestry
Fieldwork period: May – June 2016		
Nandar	3. Semarang	Senior Government Official, Semarang Environment Agency
Puspa, Dalilah	3. Semarang	Senior Manager and Project Officer, MercyCorps Indonesia
Laksita	3. Semarang	Project Officer, MercyCorps Indonesia
Sambudi	3. Semarang	Lecturer, Universitas Diponegoro, Semarang
Heryati	3. Semarang	Lecturer, Universitas Diponegoro, Semarang
Hadi	3. Semarang	Lecturer, Universitas Diponegoro, Semarang
Marti, Juwono	3. Semarang	Senior Staff, MercyCorps Indonesia
Darmawan	3. Semarang	Senior Government Official, Semarang Development Planning Agency
Salma	3. Semarang	Senior Manager, Semarang NGO BINTARI
Edi	3. Semarang	Government Official, Semarang Development Planning Agency
Halimah	3. Semarang	Teacher, Semarang Primary School
Tedja	3. Semarang	Former Senior Manager, Semarang NGO BINTARI
Hatta	3. Semarang	Senior Government Offical, Semarang Disaster Management Agency
Faisal	3. Semarang	Local Leader, Prenjak Mangrove Conservation Group
Rasdi	3. Semarang	Local Leader, Semarang Disaster Preparedness Group (KSB)
Fatoni	3. Semarang	Senior Manager, Semarang NGO BINTARI
Iwan	3. Semarang	Senior Government Official, Semarang Health Agency
Darwis	3. Semarang	Senior Staff, Semarang Community Empowerment Body (BKM), Kemijen
Nasir, Rasyad	3. Semarang	Senior Managers, Semarang NGO Grobak Hysteria
Dasni	3. Semarang	Senior Government Official, Central Java Province Education & Training Body
Fieldwork period: June – September 2016		
Muharis	4. Bandar Lampung	Senior Government Official, Bandar Lampung Development Planning Agency
Lukman	4. Bandar Lampung	Lecturer, Universitas Lampung, Bandar Lampung
Musnada	4. Bandar Lampung	Senior Government Official, Bandar Lampung Health Agency
Yuda	4. Bandar Lampung	Former Senior Managers, Bandar Lampung NGO Mitra Bentala

Wahyu	4. Bandar Lampung	Senior Government Official, Bandar Lampung Environment Agency
Muslina	4. Bandar Lampung	Local Leader, Bandar Lampung Waste Bank
Muliati	4. Bandar Lampung	Senior Government Official, Bandar Lampung Inspectorate Division
Samsudin	4. Bandar Lampung	Local Leader, Bandar Lampung Fisherman Group, LKS Bahari Mandiri
Darlis	4. Bandar Lampung	Local Leader, Bandar Lampung Waste Bank
Saraswati	4. Bandar Lampung	Senior Government Official, Bandar Lampung Economic Division
Wahid	4. Bandar Lampung	Senior Government Official, Bandar Lampung Disaster Management Agency
Suci	4. Bandar Lampung	Lecturer, Universitas Lampung, Bandar Lampung
Naniek	4. Bandar Lampung	Senior Government Official, Bandar Lampung Development Planning Agency
Hamsah	4. Bandar Lampung	Senior Manager, Bandar Lampung NGO Mitra Bentala
Hermanto	4. Bandar Lampung	Senior Staff, Bandar Lampung Development Planning Agency
Hamid	4. Bandar Lampung	Local Leader, Bandar Lampung Biopore Information House (RIB)
Yasri	4. Bandar Lampung	Senior Manager, Bandar Lampung NGO PUSSBIK
Ramli	4. Bandar Lampung	Teacher, Bandar Lampung Junior High School
Rohim	4. Bandar Lampung	Senior Manager, Bandar Lampung NGO WALHI
Bakri	4. Bandar Lampung	Senior Government Official, Bandar Lampung Waste Management Agency
Fieldwork period: October 2016 – June 2017		
Lauren	5. Bangkok	Former Senior Associate, Institute for Social and Environmental Transition (ISET)
Joanne	5. Bangkok	Senior Associate, The Rockefeller Foundation
Peter	6. Durham	Senior Associate, Institute for Social and Environmental Transition (ISET)
Oliver	6. Durham	Senior Associate, 100 Resilient Cities (100RC)
George	6. Durham	Former Senior Associate, MercyCorps
Tracy	6. Durham	Former Senior Associate, The Rockefeler Foundation
Michael	6. Durham	Senior Associate, International Institute for Environment and Development (IIED)
Bethany	6. Durham	Senior Associate, Arup International Development

Appendix 4. List of interview questions

PhD Research
Erwin Nugraha, PhD Student in Human Geography
Department of Geography, Durham University, United Kingdom (UK)

Interview Guidelines
Interviewee: *Donor agency*

1. What is the current state of ACCCRN and 100 Resilient Cities implementation and where it is going to move?
2. How was ACCCRN project designed in the beginning?
3. Who is involved, how the program was designed and what is the logic behind ACCCRN program?
4. Resilience can be different thing for different people, who design the ACCCRN program and methodology to be iterative, multi-stakeholders groups and involve a cyclical process?
5. What are the flexibility that country coordinator to deliver and modified the program methodology? Who has involved in the modifications of ACCCRN methodology?
6. How was the idea, concept and practice of resilience develop throughout ACCCRN and 100 Resilient Cities? How the approaches of ACCCRN differ from other resilience projects under The Rockefeller Foundation (RF), especially 100 Resilient Cities (100 RC)? Do you think that the development of the resilience concept and practice having influence from neoliberal thinking, looking that resilience involve a process for enhancement of individual freedoms: empowerment, self-regulation, and automony – awareness, network?
7. When the project designed, how the program consider local governance context in each country and how this affect the program implementation and selection of methodology?
8. Do you think there is a different approach to risk under the resilience thinking? That risk is no longer to external, people to be secure, but to be internalized within the practice of individual and institutions and become part of our daily lives that people or city has to live under great uncertainty, undertaken continuous monitoring and planning?
9. What kind of capacities need to be develop at individual, community and institutional level? How this capacity should be developed or achieved?
10. What is the final goal of resilience building or what do you to achieved at the end of urban climate experiments project?

Interview Guidelines
Interviewee: *Partners*

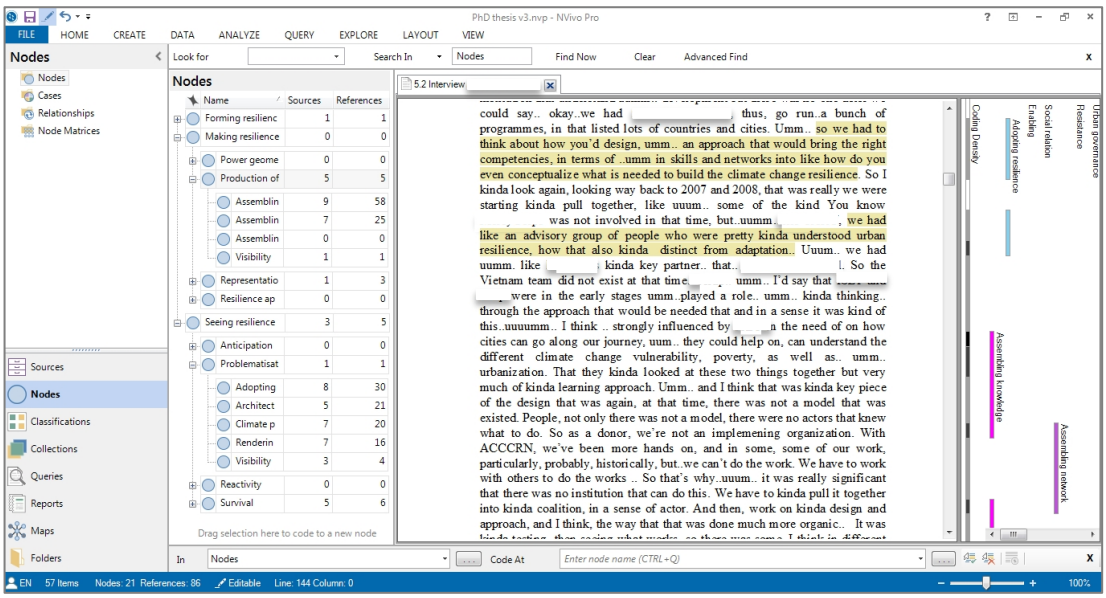
1. How was ACCCRN program initially designed in the beginning?
2. Who was involved, how the program was designed and selection of methodology?
3. What are the flexibility for country coordinator to deliver and modify the program guideline and methodology? Who has involved in the modifications?

4. How was the idea, concept and practice of resilience develop or evolve throughout ACCCRN and post-ACCCRN including 100 Resilient Cities?
5. Resilience can be different things for different people, society or organisations, how and why ACCCRN come with a resilience concept that promote iteration, cyclic process, testing, organic and learning-by-doing process? On contrary other types of resilience might involve top-down and technocratic process?
6. Do you think the development of the resilience concept and practice getting influence from neoliberal thinking, looking that resilience involve a process for the enhancement of individual freedoms (agent): self-awareness, self-organisation, empowerment, automony and networking?
7. Do you think there is a different approach to risk under the resilience thinking? That risk is no longer to external, people to be secured, but to be internalized within the practice of individual, urban system and institutions and become part of our daily lives that we have to live under great uncertainty, undertaking continuous monitoring and planning and increasing internal capacity of agents and institutions?
8. How was the approaches of ACCCRN differ from other resilience projects under The Rockefeller Foundation (RF), especially 100 Resilient Cities (100 RC)?
9. What characterice an intervention (programs, projects) to be "an experimental" rather than business as usual – and similarities and differences between experimentation in climate change mitigation adaptation with mitigation, DRR or development projects?
10. When the program was designed, how the program consider local governance and institutional context in each country and how this affect the program implementation and selection of methodology?
11. What kind of capacities need to be develop at individual, community and institutional level in the face of climate change? How this capacity should be developed or achieved? What kind of capacity that has already been developed through the intervention of ACCCRN program at secondary cities in Asia?
12. Why the intervention projects has so much focus at individual and community level? Has the ACCCRN program touch down the relation between state and citizens in a different ways? Citizens as an active actor rather than passive or reactive individuals?
13. When designing the ACCCRN program, what is the final goal or what it is want to be achieved of resilience building at the end of the (urban climate experiments) program?

Appendix 5. List of local regulations on climate change

No	Year	Regulations
Bandar Lampung City		
1	2009	Mayor of Semarang Decision on Urban Climate Change Resilience Team
2	2013	Mayor of Bandar Lampung Instruction for Rainwater Utilisation
3	2014	Mayor of Bandar Lampung Decision on Urban Climate Change Resilience Team Revised
4	2014	Mayor of Bandar Lampung Regulation on Climate Change Integrated Materials for Elementary and Secondary Schools
5	2015	Mayor of Bandar Lampung Decision on Green Teacher Community
6	2016	Mayor of Bandar Lampung Decision on Urban Climate Change Resilience Team
Semarang City		
1	2009	Mayor of Semarang Decision on Urban Climate Change Resilience Team
2	2014	Mayor of Semarang Decision on Urban Climate Change Resilience Team Revised
3	2015	City Development Planning Agency (BAPPEDA) Decision on Urban Resilience Working Group
4	2015	Mayor of Semarang Decision on City Resilience Officer

Appendix 6. Data coding or transcript analysis with Nvivo



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