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Historic Institutionalism and Urban Morphology in Jakarta: Drawing the link between flood policy and impacts on urban form and social sustainability

David Wallace Mathewson

A thesis submitted in partial fulfilment of the requirements of University of Westminster, for the award of Doctor of Philosophy in Urban Studies

January 2024



Declaration

I hereby declare that the work presented in this thesis has not been submitted for any other degree or professional qualification, and that it is the result of my own independent work.

David Wallace Mathewson

31 January 2024

Date

Abstract

This research examines the link between flooding, planning policies and the physical and spatial impacts of those decisions on the urban form of the city. Jakarta has a long history of flooding, beginning with the Dutch colonial occupation of the city in 17th century, and examines the development of the urban form and the impacts of decisions around flooding over the past 400 years. The study examines the development of the European morphological typologies in the context of Jakarta. It continues with the post-independence eras as well, linking planning policies as responses to flooding throughout the city to both improved existing and new flood infrastructure, where those improvements or interventions have resulted in physical and spatial change.

Informal settlements are examined, where houses have been demolished to make way for infrastructure, or where they have been separated from water bodies by such flood mitigation measures. This helps to understand the physical and spatial changes brought about by decisions around flooding, as well as to clarify the human and social costs to the city's most vulnerable residents as well. Furthermore, the Jakarta Coastal Defence Strategy and the evolving National Capital Integrated Coastal Development master plans are analysed to understand how these new infrastructure projects are impacting communities and the urban form of North Jakarta in real time. Historical institutionalism is utilised as an analytical approach to understand the characteristics of planning decisions and the culture of institutions and decision-making, how certain approaches have come to be relied on, and the manner in which it has become trapped in the same system which, despite more than four centuries of flooding, has enacted little material change to flooding or improvements in the lives of people living in close proximity to water.

Methodologically this study utilises a multi-method or mixed method approach, where a variety of research methods are utilised, including mapping, use of satellite imagery and GIS-based open sources; literature review to understand much of the background and history of planning policies, infrastructure, flooding and environmental challenges; document review to clarify the context and relevance of planning policy and its implications; unstructured interviews with local experts were held to understand gaps in information; and workshops with flood specialists, which were facilitated to understand more precisely what the government and developers should be doing to improve the current situation and to make policy proposals for the future of the city. Taken together, these elements paint a clear image of the way flooding has shaped the physical, spatial and social dynamics of the city, and proposes responses to improve the sustainability, flood resilience and quality of life of a wide range of city inhabitants, not just the wealthy and powerful.

Note on the use of Indonesian and Dutch terminology and references

Considering the location of this research and the history of Jakarta, a number of Indonesian and Dutch terms are utilised throughout this dissertation. As a general rule, terms in Indonesian and Dutch are italicised except where used in proper names, for example of particular communities, neighbourhoods, districts or government departments, which often have acronyms, such as 'Bappenas' or 'Bappeda'. However, one exception to this rule is the word *kampung*, which is used so frequently throughout this document that italicising each and every usage would become cumbersome.

Most terms in Indonesian have no difference in singular and plural form. For example, 'one kampung' or 'three kampung'. This Indonesian convention is used in this dissertation.

Additionally, some references are referred to in simplified form, both for ease of understanding and because the documents or institutions are commonly referred to as such (very few people know the formal names). For example, 'NCICD (2022)' which refers to Menteri Pekerjaan Umum Perumahan Rakyat Republic Indonesia [Minister of Public Works and Housing of the Republic of Indonesia] (NCICD). (2022). *Kepmen NCICD 112 Tahun* [Ministerial Decree on the NCICD 112 Years], Ministry of Public Works: Jakarta. , because it is an official letter detailing the revision of the NCICD Master Plan in 2022, and for ease of understanding. Other examples include 'Rujak (YEAR)' as opposed to Rujak Centre for Urban Studies, as again this is common terminology in Indonesia.

Publications associated with this research

Chapter II was published separately as:

Mathewson, D.W. (2018). Historic Institutionalism and Urban Morphology in Jakarta: Moving Towards Building Flood Resiliency into the Formal Planning and Development System. *Journal of Regional and City Planning*, 29 (3), 188-209. DOI: 10.5614/jrcp.2018.29.3.2

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Many thanks are also due to my Second Supervisor Tony Lloyd-Jones who championed my development as an academic and brought me into the Max Lock Centre fold through international development work in Nigeria, Rwanda and Indonesia. Tony was one of the first individuals who piqued my interest in urban morphology and introduced me to the possibilities and rewards of working in the developing world and taught me when I studied on the MA International Planning and Sustainable Development course from 2009-2011. Tony has been a friend, colleague and mentor for many years.

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List of abbreviations and acronyms

Ahok: Basuki Tjahaja Purnama, Governor of Jakarta 2014-2017.

Anies: Anies Baswedan, Governor of Jakarta 2017-2022.

Bappeda: Regional Planning Board (in this study, this relates to Jakarta's Regional Planning Board.

Bappenas: Ministry of National Development Planning.

Jabodetabek: The metropolitan region of Jakarta DKI and its neighbouring cities of Bogor, Depok, Tangerang and Bekasi.

Jakarta DKI: Daerah Khusus Ibukota Jakarta or Special Capital Region of Jakarta.

DKI: Shortened version of 'Jakarta DKI'. See above definition.

GIS: Geographical Information System.

JCDS: Jakarta Coastal Defence Strategy.

Jokowi: Joko Widodo, President of Indonesia 2014-2024, Governor of Jakarta 2012-2014, Mayor of Surakarta 2005-2012.

KIP: Kampung Improvement Programme.

NCICD: National Capital Integrated Coastal Defence master plan.

PIK: *Pantai Indah Kupuk*, the first and only land reclamation island development completed to date in Jakarta Bay.

PBJR: *Proyek Pengendalian Banjir Jakarta*, or PBJR or Jakarta Flood Management Project, a body established in the 1970s to manage flooding in Jakarta.

RUTR: The Master Plan for the Special Capital Region of Jakarta 1985-2005.

RT: Rukum Tetangga or Neighbourhood Association.

RW: Rukun Warga or Citizens' Association.

VOC: Vereeinigde Oostindische Compagnie, the Dutch East India Company.

Timeline of political leaders in Jakarta

President of the Republic of Indonesia (presidenri.go.id, 2024)

Post 1998 Democratic Era

- Prabowo Subianto: 2024-Present
- Joko Widodo (Jokowi): 2014-2024
- Susilo Bambang Yudhono: 2004-2014
- Megawati Sukarnoputri: 2001-2004 (Daughter of Sukarno)
- Adurrahman Wahid: 1999-2001
- Bacharuddin Jusuf Habibie: 1998-1999 (Vice President March-May 1998 under Suharto)

New Order Era

• Suharto: 1968-1998

Early Post-Independence Era

• Sukarno: 1945-1967

Governor of Jakarta (jakarta.go.id, 2024)

Post 1998 Democratic Era (elected)

- Teguh Setiabudi: 2024-Present (Acting until 2025 election; appointed by President Joko Widodo)
- Heru Budi Hartono: 2022-2024 (Acting after Anies Baswedan resigned to run in the 2024 Presidential Election)
- Anies Baswedan (Anies): 2017-2022
- Djarot Saiful Hidayat: May-June 2017 (Acting, following Basuki Tjahaja Purnama's loss in the 2017 election, conviction and imprisonment for blasphemy in 2016).
- Basuki Tjahaja Purnama (Ahok): 2014-2017
- Joko Widodo (Joko): 2012-2014
- Fauzi Bowo: 2013-2018
- Sutiyoso (Bang Yos): 1997-2007

Chapter I:

Introduction and Background Literature



Introduction

My interest in Jakarta began when I was studying in the MA International Planning and Sustainable Development course at the University of Westminster from 2009-2011. As part of the programme, we analysed several case studies based in the city and worked on a virtual slum-upgrading project for a kampung¹ called Karet Tengsin in Central Jakarta. Later, while working as an urban designer at Skidmore Owings and Merrill LLP in London, I delivered a portfolio of master planning projects across Southeast Asia, including several in Jakarta. One of these, Pluit City, was to be built on two islands in the Java Sea immediately north of the city's coastline to house a population of 140,000. The project, if implemented would be an early phase of a vast new archipelago of island developments constructed from land reclamation, including several seawalls to protect the city from flooding due to land subsidence (see the JCDS and NCIDC below). This project experience led to my recruitment on a later bus improvement project for the Indonesia Infrastructure Initiative funded by the Australian Government's Department of Foreign Affairs and Trade from 2015-2018. Along with the Pluit City project, this work enabled me to understand first hand many of the city's development challenges, solidified by several visits to the city. I was impressed with the people I met in Jakarta: local consultants and academics at Bandung Institute of Technology (ITB) and Tarumanagara University (UNTAR) in Jakarta. I took part in a conference at ITB in 2018 and later that year ran a joint urban design workshop with a Westminster colleague teaching at UNTAR with students from the University of Westminster. The workshop focused on slum upgrading projects in three kampung communities in North Jakarta and an urban regeneration scheme for Glodok, a historic Chinese neighbourhood near the city's historic colonial centre, Kota Tua. These various projects and first-hand experience in Jakarta, along with local people developed a long-lasting interest in the country. It led me to realise the importance of the city to its region, as well as its potential for understanding urban challenges related to flooding that could continue throughout my academic and professional work moving forward.

¹ Kampung is the Indonesian word meaning village and is typically used to describe informal settlements (Ford, 1993; Dovey and King, 2011).

This research for this dissertation has been undertaken primarily in order to understand the nature of planning policy and its effect on the urban form of the city in a context of severe flooding and multiple other urban development challenges faced by Jakarta, a mega city of the global south and largest city in southeast Asia (Elias et al., 2018; Priatmodjo, 2016; Cybriwsky and Ford, 2001). Jakarta, being one of the planet's largest urban conurbations, presents an informative case of flooding coupled with vast areas of land covered by informal development set within the context of a rising world city in a large, rapidly developing nation. Jakarta's case is unique, however this research approach could potentially inform studies into how other cities in the Southeast Asian region, such as Bangkok, Ho Chi Minh City, Hanoi, Yangon or Manila respond to similar development and environmental challenges. In detail, the research seeks to reveal the link between planning policy around flooding and the physical influences of those policies on the changing urban fabric of the city, while focusing on how these spatial alterations to the city's urban form have impacted on the inhabitants of affected areas of Jakarta.

While each mega city is unique to its context, these large urban conurbations can act as urban laboratories for other cities to learn from, as the problems and challenges they face are often at their most visible in these highly populated metropolises where disasters are quickly covered by the international media and felt by international markets. Indonesia is a multi-cultural, multi-ethnic and multi-religious nation that shares parallels with other mixed, large societies elsewhere in the world. The success of these projects and resulting societal ramifications can be informative from a research perspective, not only in Southeast Asia, but cities throughout the global south and developing world; cities that potentially face threats of rising sea levels and flooding, coupled with high populations and economic concentrations could potentially utilise the methodological approach utilised here, modified for their own context.

The research considers the following questions:

• How have planning decisions in reaction to flooding shaped the urban form of Jakarta over time?

- How have these changes in urban form in response to flood-related planning policies taken place historically?
- How have these physical changes in urban form impacted on the lives and wellbeing of people living in areas affected by food policies?
- What policies, development strategies and best practices should the Jakarta DKI and central government be utilising to improve the flood situation in a more sustainable and resilient manner, i.e. ones that does not negatively impact on the residents of flood-prone informal settlements, such as by creating barriers to accessing the sea and fishing vessels for local fishermen or by demolishing houses to accommodate new sea walls and dykes, but those that result in an improvement to the quality of life of a wide cross section of city inhabitants?
- Can a new research method that brings together historical institutionalism and urban morphology reveal new things about Jakarta's relationship to flooding?

This dissertation has been organised according to the various outcomes of the research, be those historic, strategic, or local. Several chapters have been written as stand-alone, papers for peer-reviewed publication. For example, Chapter II outlines the strategic history of spatial development patterns with respect to policy decision-making around flooding going back to the first colonial interventions by the Dutch in the early 17th century. This chapter draws on historic mapping and links morphological periods historically to strategic institutionalist characteristics over time. This chapter so far is the only one published as a separate, peer-reviewed article in 2018, entitled *Historic Institutionalism and Urban Morphology in Jakarta: Moving Towards Building Flood Resiliency into the Formal Planning and Development* System in the *Journal of Regional and City Planning*. This chapter (which is identical to the published article apart from minor revisions) is important because it establishes at the strategic level of the city, the historic link between planning policy in response to flooding and the impact on the city's urban form. In fact, it establishes the story of a city historically spatially shaped by flooding.

Chapter III examines the nature of the link between planning policies in response to flooding and the physical effects of these decisions on the urban form of the city at the local scale, as well as the effects of these policies on local residents of the affected areas in North and East Jakarta. Chapter IV utilises the city's flood and drainage infrastructure network to understand the impact of policy decisions with respect to flooding across the city as a whole, and crucially, what types of urban form are affected, as well as the social, environmental and financial impacts upon the wider community of urban poor and vulnerable in Jakarta. Importantly, this chapter reviews the Jakarta Coastal Defence Strategy (JCDS) and subsequent National Capital Integrated Coastal Development Master Plan (NCICD), currently under construction along the city's northern coastline, with significant impacts on communities of North Jakarta, including several informal settlements and fishing communities impacted by these new flood works. This chapter also utilises mapping and satellite imagery while drawing upon interviews with relevant stakeholders to fill-in gaps where past decisions and current political strategies are not always clear, nor the reasons behind them. Finally, Chapter V reflects on a series of workshop events with local academic experts, considering and proposing policies, strategies and development best practices the government of Jakarta and Indonesia should be implementing to deliver long-term, positive change to a wide range of communities and demographic groups within the city while also concluding on the overall findings of this research.

This study utilises Jakarta as a case study because of the significant challenges it faces from flooding, together with the demands of a rapid and growing mega city, set across a historical record going back over 400 years to the beginning of Dutch colonial administration in the early 17th century. The research examines the nature of government responses to flooding which have both shaped and reacted to the city's spatial and urban form, in the shape of policies, strategies or mitigation measures, for example where previous responses to such environmental challenges failed to take into consideration existing local ecology, flood patterns, natural drainage systems, as well as existing communities affected both by flooding and plans for mitigation measures which are poorly planned or negatively impact local communities, e.g. where informal settlements are demolished to make way for flood infrastructure improvements. Crucially, the research also aims to recognise how the government of Jakarta and the Indonesian Republic have fallen into a pattern of making the same decisions time and again, despite ample evidence to their negative impacts or lack of positive outcomes, over a period of four centuries. Importantly this research proposes potential solutions in terms of planning policies, development

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strategies and best practices for infrastructure and community planning which could better suit Jakarta's unique environmental context and social challenges, potentially leading to an improved quality of life for the wider inhabitants of the city across socio-economic boundaries.

This dissertation both draws and builds on the research of key international academics and Indonesian sources covering various topics including the planning system, historical institutionalism in the context of Indonesia, urban morphology in Jakarta, flooding in Jakarta, informal development in Indonesia and the challenges vulnerable communities face trying to survive, as well as the infrastructural projects undertaken both historically and those being implemented as this dissertation was written. The literature utilised comes from a variety of sources: peer-reviewed journal articles, academic conference papers, books as well as planning documents, the latter in English or translated from Indonesian.

Research design (aims and questions)

Much has been written about the issue of flooding in cities around the world, and in particular urban regions of the global south, such as Garschagen et al. (2018) Priatmodjo (2016) and Texeir (2008). A great deal of research has been undertaken covering the challenges of mega cities and rapidly urbanising regions of the developing world, including Cybriwsky and Ford (2001), Dahiya (2012) and Priatmodjo (2016). However, the literature on the two theoretical approaches to the research employed in this study - historical institutionalism and the changing urban form or urban morphology of the city, generally are undertaken separately. This is because they occupy different theoretical contexts, sociological and political science in the case of historical institutionalism and architecture and urbanism in the case of urban morphology. What is unique about this study is the marrying of a sociological approach typically utilised by planners: historical institutionalism, with an architectural and urban design-focused one: urban morphology. This link between different theoretical approaches also brings together different ways of considering and understanding the issues facing Jakarta. Rather than viewing these issues from a single perspective, these two approaches - utilised together in a complimentary fashion, enable the research to uncover the nature of planning policy in response to flooding and the way

those decisions impact on the urban form in Jakarta and perhaps most importantly, the people who inhabit it. This in turn better reflects the multidisciplinary nature and complexity of challenges facing a complex city in the developing world.

The research utilises historical institutionalism together with urban morphology through the use of satellite imagery and mapping, to link planning policies in response to flooding or flood-related issues to physical and spatial changes in the city's urban form. While mapping and satellite imagery have been used by others to illustrate particular urban morphological conditions and historical institutionalism utilised in order to understand the culture and nature of decision-making at various levels of government in Indonesia, this is the first-time research has linked the two approaches into one study. Historical institutionalism comes from a sociological background which has proven useful for discussions on governance, policy and particularly for research in the built environment by planners. Urban morphology, typically the arena for architects and urban designers, is utilised to explain the nature of historical or current patterns of development in Indonesia, even in Jakarta. This engenders a type of multidisciplinary theory and analysis to what could otherwise be purely a planning or urban design study. This research, while linking both theoretical approaches, also does so by examining and analysing the historic changes that have taken place and indeed, are currently taking place in Jakarta. This research provides an understanding both of historical change - in other words, how it took place and under what conditions, and how it continues to change, and in what manner, as well as crucially, who is impacted, how and why. This study can therefore create a historic as well as real-time picture of the changing nature of urban form in Jakarta in response to particular government planning policies around flooding. This information can serve to help understand how and why the city came to be in its current state while helping to identify particular pathways out of the city's historic trap of infrastructure maintenance and improvement, to a certain extent the proliferation of informal settlements and flooding, among other related urban challenges.

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Research context and methodology: Multi-Method Approach with Dual Primary Theoretical Framework

This research project follows a mixed-methods approach as described by Shorten and Smith (2017), where qualitative and quantitative data are both collected and analysed as part of the same study. This is also referred to as a multi-method approach similar to that employed by McKendrick (1999), Ghauri, et al. (2020), Kulig, et al. (2008), Graham (2020), Ahram (2011) and Hesse-Biber, et al. (2015) where several methods are employed, each appropriate to individual outputs or other elements of the study. Shorten and Smith (2017) explain that a mixed methods approach is not accidental, but requires a mixture of methods in data collection, analysis and interpretation of the evidence, due in large part to the nature of the research project. A key element of this mixing of methods is the linkage between various forms of data and their integration into a single study with different elements (ibid). In particular, as part of this study, qualitative and quantitative data has been collected and analysed concurrently, in parallel, as set out in Shorten and Smith (2017), (see Table 1: Types of mixed methods designs, p74). Shorten and Smith (2017) note that a mixed methods approach "is appropriate for answering research questions that neither quantitative nor qualitative methods could answer alone" (p75), and that this approach could be utilised to gain a better understanding of the links or contradictions between various sources of data. Additionally, mixed methods can facilitate various avenues of exploration that can enrich the evidence while enabling questions to be answered at greater depth (Shorten and Smith, 2017).

In addition to the mixed-methods or multi method technique, two theoretical approaches are utilised as part of the conceptual framework: historic institutionalism as discussed by Steinmo (2008), Thelen (1999) and Skopkol (1992), and explained in the Indonesian context by Holzhacker, et al. (2016), Hudalah et al. (2007), Silver (2008), Silver et al. (2001), Salim and Firman (2011), as well as Octavianti and Charles (2019a), along with urban morphology as described by Oliveira (2016) and Kropf (2017), set within the context of Indonesia, in particular the post-colonial city models such as Surabaya and more specifically Jakarta, is argued in depth historically by Ford (1993), Cybriwsky and Ford (2001), Kusno (2011) and Priatmodjo, 2016). Urban morphology more recently in Indonesia and Jakarta is detailed in depth by Dovey and King (2011), Raharjo (2010), Jones (2017; 2019), Supriatna and Van der Molen (2014) and Cuadra (2015).

An important underpinning of this linkage between two seemingly disparate and disconnected approaches to theoretical analysis is the benefit of multi-disciplinary and cross-disciplinary thinking. Historical intuitionalism traditionally focuses on the pattern, culture and history of institutional decision-making, as well as the relevant political contexts, but does not typically address physical or spatial factors in its application. At the same time urban morphology, apart from associated market or economic or cultural influences does not generally consider non-spatial factors such as the nature of institutions (such as local governments shaping planning and infrastructure-related policies), how they arrive a decisions or political structures in its utilisation as a tool for analysis. By utilising both approaches together, this research recognises that spatial outcomes and institutional culture and political structures can influence one another in surprising ways. By utilising this structure of theoretical analysis, this research addresses gaps in both historical institutionalist and urban morphological literature and thus occupies a space in both fields with potential for a more nuanced understanding of both discourses.

In the context of this dissertation, each chapter incorporates data or analysis (e.g. Chapters II-V) which were initially written as individual articles covering different areas of the overall research project, each necessitating different research methods, though there is continuity to the overarching methodology through the focus on historical institutionalist analysis and mapping (satellite-based imagery, open-source GIS-based mapping and the use of historic maps where relevant and available), and the utilisation of kampung communities as case studies throughout the dissertation. There is also some unavoidable overlap of research methods covering various aspects of the overall study due to the necessity of separating different components of the research into the stand-alone papers mentioned above. These individual methods include document analysis, review of the overarching literature and literature reviews of specific chapter-related documents, articles and books as described by O'Leary (2004), interviews with relevant officials, academics and professionals engaged

with the work, as well as spatial and contextual analysis utilising historic satellite imagery², GIS-based mapping and historic maps of the city, and workshops to test the research findings, as well as to assess and propose potential policy or strategy changes, as well as infrastructural and development best practices to enable long-term change and a visible improvement to living standard of the city's urban poor and vulnerable. These methods are described in detail in each chapter.

Qualitative methods

Document analysis was undertaken to understand in-depth, the plans underway and historic development from local government sources and central government ministries (e.g. Ministry of National development Planning, 'Bappenas' or the Regional Planning Authority for Jakarta, 'Bappeda'), who publish planning documents and post informational videos online. Some additional documents were made available by local NGOs (such as Rujak Centre for Urban Studies, Rame-Rame Jakarta and Climate Hub Indonesia) or academic colleagues at Tarumanagara University (UNTAR) and Bandung Institute of Technology (ITB) and comprised background information on infrastructure interventions including their histories, project data related to case study sites or other useful information. These documents were utilised in part due to their relevance to the research and in particular, to the mapped case study sites set out in Chapters III and IV. Videos produced by Bappeda, showing future locations of yet-to-be constructed sections and the wider extent of the developing NCICD flood wall along the city's northern coastline, in particular, were useful to help map the locations of these infrastructure interventions to understand the impact of physical and spatial changes still to come.

These documents included:

- The JCDS (2011)
- The NCICD (2014) and Revised NCICD (2022)
- Local Millenium Ecosystem Assessment: Condition and Trend of the Greater Jakarta Bay Ecosystem (2004)
- The Jakarta Spatial Development Plan (2012)

² High resolution satellite imagery from google Earth Pro is generally available from the late 1990s-today, with some exceptions, e.g. aerial photography from the 1930s, 40s and 50s in cities such as London and Berlin (Google Earth, 2023).

- Six videos produced by Bappeda
- Three presentations produced by Bappeda
- Background presentations by Rujak (2018) on Kampung Akuarium, Kampung Gedung Pompa
- Two student projects I oversaw studying Kampung Akuarium and Kampung Gedung Pompa (De Albuquerque Reis et al., 2018 and Jason et al., 2018)

Unstructured interviews with stakeholders, including government officials (such as Bappenas and Bappeda in 2019 and 2022), as well as NGOs with experience working with kampung communities impacted by flooding and infrastructure developments examined in Chapters III and IV (such as Rujak Centre for Urban Studies and Rame-Rame Jakarta in 2022 and 2023). Seven semi-structured interviews, part of the workshops outlined in Chapter V, involved specialist consultants, academics engaged in relevant research and other professionals engaged on the design and development plans themselves, or other relevant parties which took place in Jakarta in June 2023. In total, twelve participants attended the workshops. These experts and specialists were chosen in part because of their expertise on flooding (e.g. a professor of flood management and planning at a local university) or their experience designing flood works in Jakarta or involvement in the conception, design or advice on the JCDS and NCICD (e.g. a flood engineer engaged on the NCICD or an NGO with history of working with communities situated along the city's northern coastline). The workshops were undertaken with single or multiple respondents utilising the same questionnaire, as semi-structured interviews in-person with the author taking notes and respondents returning written responses afterwards this was done separately due to the difficulty in finding a single date and location where all participants could take part. One workshop was conducted online using Microsoft Teams, as the respondent could not come to Jakarta and did not have time for the author to visit them at their university. This workshop was recorded and transcribed. The workshops were undertaken with one municipal planning department, two Indonesian universities and one Dutch university, three Jakarta-based, Indonesian NGOs. Further details can be found in the appendices.

These methods solidify understandings of local bureaucratic and political processes and public discourse. Spatial and contextual analysis are important to critique the development plans from a design and planning perspective, and best practice methodologies and development modes, for example Transit Orientated Development (TOD), have been utilised to set a standard of spatial sustainability and gauge the overall effectiveness of the planned developments.

Literature on historic institutionalism is employed in order to understand government responses over time in relation to urban development and flooding, or in absence of such decisions, failings of governance. This method was also utilised for the individual case study sites in chapters II, III and IV.

Quantitative methodology

Historic maps (Chapter II) and satellite imagery (Chapters II, III and IV), as well as GISbased mapping were used in order to understand spatial development patterns and urban morphology in relation to literature review and on the issues by a number of authors including Ford (1993) and Kusno (2011), as well as other literature on urban morphology. GIS-based open source maps were downloaded from OpenStreetMap as layered PDFs, then adapted as morphological diagrams in Adobe Illustrator. These methods were backed up by measurements undertaken in AutoCAD where raster images of satellite images and completed GIS-based maps were overlaid to ensure accuracy at scale. To be clear, some inconsistencies inevitably emerge between satellite images and open-source data, which is dependent on individual users populating the database. These were rectified in AutoCAD and transferred as PDFs into layers in the Illustrator files. Two pilot projects for blue-green solutions were reviewed using document research (Priatmodjo, 2016) in order to understand what recommendations could be made at the strategic and policy level for implementation across the wider city, in Chapter II. Case studies: Kampung communities

A number of kampung communities are used as case studies in Chapters II, III and IV. The are utilised to illustrate physical and spatial changes to Jakarta's urban form as a result of infrastructure interventions by local authorities and central government in response to flooding. In particular, these communities, utilising the satellite imagery and open-source GIS-based mapping techniques described above, illustrate the manner in which policy decisions are resulting in change on the ground. These communities illustrate how local residents and workers are being impacted by the implementation of upgraded or improved existing flood infrastructure, as in Chapters II and III, or, as in Chapter IV, new flood defences under construction along the city's northern coastline.

The case studies were chosen following three principles: Firstly, they needed to be locations where morphological change could be mapped historically, so historic satellite imagery was key, and needed to be available for each kampung; secondly literature written in English – preferably in peer-reviewed journals, conference papers or books needed to be located for each site that could cross-reference the satellite imagery; thirdly each kampung needed to illustrate changes in urban form as a result of an infrastructure intervention related to flooding. This therefore limited which kampung communities were studied, and resulted in others being left out which could either not be sufficiently identified or had a lack of literature associated with them in English. In a few cases newspaper articles were used to supplement gaps in information.

Outline of research methods by chapter:

- Chapter I: Overview of the generalist literature to set the context of research methods and theoretical framework.
- Chapter II: Literature review and document analysis to explain the historical institutionalist context and urban morphological history of the city over the past four centuries, analysis of historic mapping to explain the strategic, historical growth of the city's urban morphology in relation to flood responses historically;

and satellite imagery to understand recent spatial interventions in Jakarta (case studies).

- Chapter III: Literature review to review flooding in the city historically and as a
 perennial challenge, to review the urban morphology of kampung communities in
 Jakarta and current infrastructure improvements related to flooding, to understand
 the context of kampung communities in Jakarta and to explain each case study,
 historic satellite imagery and GIS-based mapping to illustrate morphological
 changes to kampung communities in relation to flood-related policy responses (case
 studies).
- Chapter IV: Literature review to understand the context of historical institutionalist background of infrastructure investment and implementation decisions over the past 400 years, document analysis to review the importance of infrastructure developments along the city's northern coastline, including the National Capital Integrated Coastal Development master plan and the Jakarta Coastal Defence Strategy; literature review to explain each case study; historical satellite imagery and GIS-based mapping to illustrate morphological changes to fishing communities on Jakarta's northern coastline in response to current infrastructure works under construction there (case studies).
- Chapter V: Workshops with key flooding, community, planning and sustainable development experts to ascertain the direction of planning policy in response to flooding in the future of Jakarta (undertaken as semi-structure interviews).

One of the primary assertions of this study maintains that the history of governmental responses in Jakarta is linked to urban morphology and spatial development of the city over time. The imposition of a European urban model on an alien landscape was initially manifested in spatial segregation where the Dutch controlled the cities inhabited by Europeans and Chinese immigrants, the latter of which dominated the commercial activities of urban centres, while the former dominated administration and the military. In this model the Javanese were considered hostile and thus too dangerous and unskilled to be allowed to inhabit European cities, and they therefore were relegated to their traditional urban centres elsewhere or kampung and *desa* around Batavia and other burgeoning colonial settlements (Ford, 1993). However, as seen in Chapter 3, this trend has continued from the Post-Independence era of the 1950s right up to the present day, personified by the evictions by then-Governor Ahok in 2016 (Rujak, 2018; Betteridge and Webber, 2019;

Wijaya, 2018a, 2018b). Thus, it appears from an early era in colonial rule, segregation was a spatial tool utilised by the city and central government authorities. Those on the lowest economic or social rung of the ladder who inhabited kampung and *desa* historically suffered from significant problems while the rich and well-off moved away from flooding, waterways, usually to higher ground. This pattern is apparent today with the large areas of kampung and similar informal settlements clustered around canals and rivers in Jakarta.

Thesis Structure

The structure of the study is outlined below in the following six chapters:

<u>Chapter I: Introduction and Background Literature</u>

This chapter delineates the background of the issue, along with the research aims, objectives, research questions, methodology and theoretical framework utilised. It also sets out a review of the background literature on the issues dealt with in more detail in each of the findings and analysis chapters.

- <u>Chapter II: Overview of Historic Institutionalism and Urban Morphology</u> This chapter sets out the overarching history of urban form in Jakarta, going back to the beginning of the colonial Era when the Dutch captured the city in 1617, as well as their initial urban design and town planning efforts, through later colonial eras, the post-Independence dictatorships up to the present era. In parallel this chapter also exhibits the historic institutionalist eras and links them with urban morphological eras, again from the inception of the Colonial Era up to the present day.
- <u>Chapter III: Understanding the Local Level Impacts of Planning Policies Around</u> <u>Flood Infrastructure on the Urban Morphology and Residents of Kampung</u> This chapter examines and analyses in detail the link between planning policy in response to flooding, in this case primarily around the improvement and maintenance of existing flood infrastructure and the manner in which these policies

have impacted the physical urban fabric of the city. Several kampung³ (informal settlements) were used as case studies to illustrate these impacts utilising satellite imagery and GIS-based mapping to illustrate the physical and spatial changes to urban form discussed.

 <u>Chapter IV: A Strategic View – Flood Infrastructure and the Effects on Urban</u> <u>Form Across Jakarta</u>

This chapter also utilises satellite imagery and GIS-based mapping to illustrate changes to the city's urban form at a strategic scale, using the city's flood infrastructure as a framework for study. In this chapter, various examples from across the city were examined and analysed in order to understand how widespread the link is between planning policy in response to flooding and impacts on the city's urban fabric. Types of instances across the city were also catalogued. Particulars and trends were backed-up by interviews with city planning professionals and academics engaged in related research.

<u>Chapter V: The Future of Food Planning in Jakarta</u>

A series of workshops with academics, engineers, NGOs and planners were held to understand which policies and practices should be utilised for the city in the future, with specific focus on how to improve the quality of life of city residents, in particular those most vulnerable to flooding.

<u>Chapter VI: Conclusions</u>

This chapter concludes the study, reflecting on the contribution to knowledge, the findings and their implications for the future of planning in response to flooding in Jakarta. Future research developing from this dissertation is also discussed.

³ In Indonesian the word kampung is the same in singular and plural forms.

Review of the Background Literature

This dissertation is structured where most chapters were conceived as separate articles published in peer-reviewed academic journals covering various areas of the research study. This means that most chapters have a highly specific literature review incorporated within them which corresponds to the element of research covered in that chapter. However, in order to set the context for the entirety of the study, an introduction to the generalist literature is included. This is set out in this chapter.

The Context of Jakarta

Jakarta is an emerging global city, one of the world's largest urban agglomerations, with a metropolitan population of more than 28 million people inhabiting a highly dense⁴ built-up area (Priatmodjo, 2016; Cybriwsky & Ford, 2001). The largest urban region in Indonesia and Southeast Asia, it is the capital, business and economic centre of the world's fourth largest nation by population, set within an island archipelago of more than 16,000 islands, part of the planet's largest island system (Cybriwsky & Ford, 2001; Hidayatno et al., 2017). The city is located on the north coast of Java, an island with a population of over 141 million people and 57 percent of the country's 268 million people (World Population Review, 2019; Cybriwsky & Ford, 2001). It is a city that continues to rapidly urbanise while facing significant challenges to sustainable development, including flooding, drainage, water and solid waste management, air pollution, secawater intrusion, land subsidence, natural hazards and disasters, traffic and congestion, access to affordable housing, as well as effective urban management and governance (Steinberg, 2008 and Kops, 2012).

Jakarta sits within the context of the rapid urbanisation and growth of mega cities across the developing world (Dahiya, 2012), the challenges of climate change (Baker, 2012), as well as over development and resource depletion (Delinom, 2008). Many large cities in the

⁴ Within this urban conurbation is Jakarta DKI, the Special Capital Region, an area of 664 km² inhabited by 12.7 million people by day and 10 million at night and a metropolitan area of 6,400 km² (Priatmodjo, 2016).

global south have been urbanising at unprecedented rates over recent decades, in particular between 1990 and 2010 (Dahiya, 2012). This presents local governments with significant challenges, such as the lack of affordable housing, population increases, inadequate infrastructure and insufficient public transport (Douglass, 2005). Some mega cities also suffer from the effects of climate change and disasters, both natural and man-made (Delinom, 2008). According to the World Bank (2010, p1), "Jakarta's rapid growth and urbanisation have given rise to large-scale infrastructure problems that are acknowledged and analysed by the DKI government and experienced regularly and directly by the public." These challenges include urban sprawl, some of the world's worst traffic congestion, the proliferation of informal settlements (irregular development, shanties or slums), extensive flooding, lack of potable water and solid waste management systems, as well as some of the most rapid land subsidence in the world (The World Bank, 2010, Carroll, 2009).

Jakarta presents an informative case not only because of the threats it faces from flooding and land subsidence, population growth, rapid urbanisation, over development, but importantly how the city has planned the Jakarta Coastal Defence Strategy (JCDS) and subsequent National Capital Integrated Coastal Defence (NCICD) Master Plan, among other flood and water infrastructure interventions which respond to some of these key challenges (Kops, 2012). Successive local and national governments in the city have long been grappling with these problems, though little progress has been made until relatively recently, when the city began dredging canals and rivers, embarking on the JCDS (Kops, 2012), which will be crucial over the next decades as the city continues to grow, both in population and economically.

Jakarta like other mega cities, forms an important socio-economic region in Indonesia and Southeast Asia. If the city does not address the development problems and disaster risks facing it, significant portions of the city could end up under water permanently in the near future (Ward et al., 2011).

Planning and governance in Indonesia

A review of literature on the planning system is Indonesia is helpful to understand the context of decision-making in Jakarta with respect to flooding. This is particularly relevant because the majority of flood works and improvements to flood -related infrastructure have taken place over the past two decades, a period corresponding to Indonesia's democratisation since and decentralisation of governance process since Suharto period, as outlined in the following sections.

Decentralisation of Governance

Holzhacker et al. (2016) argue that Indonesia has been undergoing a process of decentralisation, part of a wider democratisation process, over the past twenty years. This followed an earlier era of highly centralised governance across the far-flung islands of the country, leading back to independence in the 1940s. During this early post-colonial era, the government struggled with attempts to pursue strategies of both centralisation and decentralisation. The impetus for a strong central authority was partly a result of attempts to exert central control and national unity over such a vast archipelago, with huge variances of religious, cultural and ethnic diversity situated across a large national population (Holzhacker et al., 2016). The resulting fixation on a strong, centralised state was partly also a response to secessionist tendencies in various regions such as Aceh, North Sumatra, North Sulawesi, Riau and the South Moluccas (Brown, 2005; Henley, 2007; McCall, 2003; Wittek, 2007). Despite this, Holzhacker et al. (2016) and Ranis and Stewart (1994) argue that the diversity of cultures, religions and languages across the Indonesian archipelago would naturally suggest a policy of decentralisation.

This was initiated during the New Order era of Suharto, where Basic Law No. 5 of 1974 was promulgated to initiate constitutional change to provide more responsibility at the levels of government below the national, at provincial, district subdistrict and village levels (Holzhacker et al., 2016). More recent rounds of decentralisation have occurred during the post-Suharto era of democratisation, where they were spurred on, partly due to the political

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and economic crisis of 1997, and partly due to external international pressures, and importantly have had more impact. The first of these decentralisation efforts took place in 1999 with the introduction of Law No. 22/1999, which granted the central government and local governments two years to prepare for the implementation of decentralisation itself. The second movement towards decentralisation began in 2004 with Law No. 32/2004, which was passed to replace the previous law from 1999 (ibid). this built on feelings of unfairness that the government had prioritised Java over other regions in the country during the New Order regime. After Suharto stood down, the new president Habibie responded to these pressures (Suwondo, 2002 Holzhacker et al., 2016).

This process of decentralisation involves new political, fiscal and financial relationships, policy- and decision-making processes, the involvement of civil society and citizen groups, as well as accountability and transparency (Holzhacker et al., 2016). It has been argued that in some policy areas, particular regions or municipalities, this process has led to increased policy performance through the process of shifting power to local authorities to tailor national goals to local circumstances while utilising local knowledge, expertise and stakeholder input increase responsiveness. However, elsewhere decentralisation has been less successful where it has resulted in a loss of expertise from the central government, as well as diminished oversight and accountability to the national level, with little gain in citizen input or local democratic control (ibid). This has taken place within the context of so-called 'good governance' initiatives promoted by intergovernmental bodies such as the International monetary fund or the World Bank, where principles such as political stability, government effectiveness, the rule of law, regulatory quality, anti-corruption efforts, as well as the involvement of citizens and other stakeholders in governmental decision-making are advanced and seen as necessary for middle-income, developing country such as Indonesia (ibid). Holzhacker et al. (2016) argue that this middle-income status with its diverse economy requires foreign capital and expertise, as well as a desire to improve education and raise social standards to confront growing disparities across the archipelago demands an effective decentralisation strategy.

The decentralisation of governance in Indonesia would appear logical from the perspective of far-flung regions across such a large geographic region of the country's archipelago. It

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would also seem advantageous from the perspective of regions and local authorities, who might gain greater control over development in their areas, where they could logically be expected to be better informed of local challenges and needs. However, one area of potential problems initiated by decentralisation is cooperation across regions and local authority boundaries, with particular relevance for flooding and drainage of watershed areas, which inevitably cross boundaries. Indeed, in Chapter V, the evidence indicates that this remains a particular challenge for the various levels of Indonesian government to overcome.

The Indonesian Planning System

The current planning system in Indonesia has its origins in the Dutch colonial period, where, during the first 25 years of the 20th century, the first zoning and building permit regulations were introduced and developed. The first of these regulations was the Nuisance Ordinance of 1926, which regulated industrial facilities in particular zones (Niessen, 1999; Hudalah & Woltjer, 2007). Later in the century, the first planning regulatory framework was initiated through the implementation of the *Staadvormings Ordonatie⁵* (SVO) in 1948 and the subsequent *Staadsvormings Verordening⁶* (SVV) in 1949, which formed the first formal town planning ordinances which were focused on the improvement of urban housing conditions, and was designed for urban municipalities like Jakarta where the urban challenges of a large city had already become apparent (Dirdjosisworo, 1978; Winarso and Firman, 2002; Hudalah et al., 2007). This system continued to be applied across the country following independence in 1949 (Hudalah et al., 2007).

A new legal framework for planning, the Act 24/1992 was passed in response to colonial and biases and Java-based pre-eminence in the centralist administration that had existed from independence in the 1940s until the 1990s (Niessen, 1999; Hudalah et al., 2007). Despite this new legislation, a fundamental multidimensional change in governance in relation to decentralisation triggered by a series of economic crises from 1997-1998,

⁵ Staadvorming Ordonatie: City Formation Ordinance (Google Translate, 2021).

⁶ Staadsvormings Verordening: Urbanisation Ordinance (Google Translate, 2021).

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ensured that this law became quickly redundant, as it no longer reflected the rapidly changing nature of governance in Indonesia (Hudalah et al., 2007). The enactment of Laws No. 22/1999 and 25/1999, later amended by Laws No. 32/2004 and 33/2004, concerning regional administration and regional fiscal balancing, Indonesia's central government embarked on an ambitious policy of decentralisation (Hudalah et al., 2014). This implementation has demanded fundamental reform of the existing highly centralised and hierarchical administrative system and its associated governance practices, resulting in a framework which is significantly more decentralised and more democratic in nature (ibid).

It has been argued that the common aim of decentralisation in Indonesia was functionalist in nature, primarily to promote improved public services and make them more responsive to local needs, yet this new framework was drafted amid what was seen to be a risk of national disintegration following the fall of President Suharto's dictatorship, the New Order in 1997, the formation of the new system was highly political (Hudalah et al., 2014). Hudalah et al. (2014) argue that the most sweeping effect of the policy has been the transfer of power to the local level of government, essentially without any intermediary role at the regional level of the provinces (ibid).

According to Hudalah et al. (2007) in December 2005 a new draft Spatial Planning Act was released, which along with the 1992 law stipulates a full adoption of the integrated-comprehensive approach by the Indonesian planning system. In this approach, planning is conducted through a systematic and formal hierarchy of plans at various levels, from the national to the local, coordinating public sector activities across various sectors, while prioritising spatial coordination over economic development. Despite this apparently clear organisation, in Indonesia public investment in the implementation of planning frameworks (based on the Spatial Planning Act of 1992) retains an unclear role in the planning system. Related sectoral policy systems such as housing and water management effectively prioritise private over public involvement in planning by promoting privatisation rather than government participation (based on the Housing and Settlement Act of 1992), according to Winarso and Firman (2002), Siregar (2005) and Hudalah et al. (2007).
Today the planning system, through the Spatial Planning Act of 2005, adopts a North American style system of land use management where growth and development through rigid development controls are applied. These are collectively the responsibility of local, provincial and the central governments (Hudalah et al., 2007). As a result, it becomes clear that the planning system in Jakarta is a mixture of Dutch and American style planning regimes. Though in practical terms, whether this hybrid approach has benefitted Jakarta remains doubtful. Widespread proliferation of informal settlements across the city would appear to belie that control and raise the question of the appropriateness of a system where huge areas of the city exist despite regulations making them illegal forms of urban development. Additionally, the lack of suitable provision for affordable housing within the DKI also appears to be a major failure of the planning system, as it does not meet the most basic needs of its most vulnerable residents. These issues are examined in detail in Chapters III and IV.

The challenge of flooding in Jakarta

According to the United Nations Environment Programme (UNEP) (2007), the planet is steadily urbanising. The UNEP argues, based on the UN Report on world Urbanisation Prospects, that greater than half of the world's population will be living in cities and urban areas and nearly all the growth in population will be absorbed by cities in less developed regions between 2000-2030 (UNEP, 2007). De Sherbinin et al. (2007) contend cities, global centres of innovation and engines of economic growth, are highly vulnerable to climate change and natural disasters, as they are often located in low-lying coastal areas or near the mouths of great rivers or river systems. These locations, which place large cities at increased risk from climate hazards such as cyclones, high winds, flooding, coastal erosion and deposition, as well as sea-level rise (De Sherbinin et al., 2007). Climate change, while not a major underlying cause of flooding in Jakarta, is expected to result in an increase the frequency and intensity of flood events (Djalante, 2013). Indonesia is one of the planet's countries most vulnerable to natural disasters, due in large part to its location along the Pacific Ring of Fire, where major incidents such as volcanic eruptions, earthquakes and resulting tsunamis are common (ibid).

"Jakarta is now highly vulnerable to the impacts of climate change. The greatest climate and disaster-related risk facing Jakarta is flooding, which imposes very high human and economic costs on the city" (The World Bank, 2010, p1). Up to 40 percent of the city's land area, primarily areas located along the north coast, already lies below sea level and is therefore highly vulnerable to tidal flooding, storm surges and future rises in sea levels. Within this context, total rainfall levels and the intensity of precipitation has increased, while rising global temperatures, the urban heat island effect have resulted in higher average temperatures in the DKI area (The World Bank, 2010).

Not uncommon for large cities in Southeast Asia, flooding is potentially Jakarta's primary environmental threat, which has a number of causes. The city is situated in a lowland delta area, crisscrossed by 13 rivers and canals, with close to 50 percent of its land below the regional water level, and is vulnerable to both coastal and river flooding from monsoons and rising sea levels (C40 Cities, 2019). Another issue is the rapid rate of land subsidence, up to 40 mm per year, in some places as high as 200 mm annually, while up to 90 percent of North Jakarta is estimated to lie below sea level (C40 Cities, 2019). The city also lacks effective flood control, a historical problem for successive colonial and post-independence administrations, in part caused by upstream deforestation, which has resulted in flash floods downstream in the city (Steinberg, 2008). The city's waterways have for decades been losing their capacity to carry flood waters as a result of the ongoing historic development of informal settlements along their riverbanks and canal sides, which has caused them to narrow. On top of this is the dumping of refuse into waterways, causing an additional reductions in capacity and the uncontrolled growth of water hyacinth on existing water basins, which clogs the flow of water and allows silt to gather, further reducing capacity (Priatmodjo, 2016 and Steinberg, 2007). If these problems were not enough, the ability for the ground in Jakarta to absorb water has also been reduced due to widespread urbanisation and deforestation, made worse by a lack of greenspace in the city⁷ and uncontrolled development on the urban periphery (Steinberg, 2007 and Priatmodio, 2016). Within this context there has been a marked failure by the city administration, central government and earlier colonial administrations to adequately invest in infrastructure over

⁷ Currently only 10%, though the Spatial Planning Act of 2007 requires 20% of total land area in Indonesian cities to be green open space (Priatmodjo, 2016).

time, manifested by an unfinished canal project left over from the time of the Dutch era, only completed in the 2000s (Steinberg, 2007 and Priatmodjo, 2016). However, what is clear is the problems of flooding are historic to Jakarta and have been plaguing the city for centuries.

While this marked failure of investment in infrastructure goes back centuries, more recently the DKI administration and central government have embarked on major infrastructure expansions such as the JCDS and NCICD, as well as improvements to existing infrastructure, such as dredging waterways, which began under the tenure of Joko Widodo (Jokowi) as Governor of Jakarta (Octavianti and Charles, 2018; Priatmodjo, 2016). As outlined in Chapters III and IV, these infrastructure interventions have significant impacts on the city's urban form and the lives of its residents, often to the detriment of vulnerable communities inhabiting the waters' edge.

Historic Institutionalism

It is necessary to give an introduction to the issue of historic institutionalism broadly in order to understand the specifics of the Indonesian case and where governmental responses to flooding were found to have shaped the spatial layout of the city over time. How this applies to Jakarta is reviewed in detail in Chapters II, III and IV.

In Jakarta, the administrative region is designated in the Indonesian constitution as *Daerah Khusus Ibukota Jakara* or the Special Capital Region of Jakarta, or simply 'Jakarta DKI', which is equivalent to province and headed by a governor elected by popular vote of citizens resident within the special region (Martinez and Masron, 2020). This special region is comprised of five *Kota Administratif* or administrative cities (Munjirin et al., 2024), each with its own mayor, who are also popularly elected. In addition, there is one *Kapubaten Administratif* or Administrative regency which covers the *Kepulauan Seribu* or Thousand Islands situated in the Java Sea to the north. Each administrative city is also divided into 44 *Kecamatan* or districts (Martinez and Masron, 2020; Munjirin et al., 2024).

In terms of historical institutionalism, the levels of government concerned with this research are the central or national government and that of the special region outlined above. At the national level the President of the Republic, the Parliament, *Bappenas*: the Ministry of National Development Planning, the Ministry of Public Works and Housing, the Ministry of Infrastructure and the Environment, as well as the Coordinating Ministry for Economic Affairs are involved in infrastructure development. The level of the special province the primary departments are *Bappeda*: the Regional Planning authority for the Special Capital Region, as well as the Governor and *Dewan Perwikan Rakyat Daerah Provinsi Daerah Khusus Ibukota Jakarta* or the Jakarta Regional People's Representative Council. While local mayors also play a role in urban development, as far as this research uncovered, they do not figure as major influencers in infrastructure development. This was true also of the local district heads..

Starting with historical institutionalism's sociological basis, three types of historical analysis are present in social science literature today and are described as rational choice, sociological institutionalism and historical institutionalism (Sorensen, 2015; Steinmo, 2008; Thelen, 1999). Historic institutionalism is seen to stand between rational choice and sociological institutionalism, where human beings tend to be norm-abiding rule followers while also self-interested rational actors, with behaviour being dependent upon individuals, context or rules (Steinmo, 2008). In essence, historic institutionalists are concerned with why a specific choice was made and why a definitive outcome occurred. History is discussed as important in this context for three reasons: political events take place within a historical context with direct consequences for decisions made and the events surrounding them, actors or agents are seen to learn from experience within a particular social, political, cultural and economic context, and expectations are moulded by past occurrences, for example past wars or terrorist attacks (Steinmo, 2008).

Hall and Taylor (1996, p937) argue that "historical institutionalism developed in response to the group theories of politics and structural-functionalism prominent in political science during the 1960s and 1970s". It borrowed from both approaches yet attempted to develop beyond them. Hall and Taylor (1996) contend that from group theory, historical institutionalist proponents acknowledge the argument that conflict between rival groups for scarce resources is at the centre of politics, however they explored better explanations for the distinctiveness of national political outcomes and for the inequalities that characterised them. Historical institutionalists were influenced by the manner in which structural functionalists saw polities as overall systems with interacting parts (Hall and Taylor, 1996). Rather, they understand institutional organisation of polities or political economy as the primary factor structuring collective behaviour generating various distinct outcomes (ibid). Historical institutionalists emphasise the structuralism implicit in institutions of polities rather than the functionalism of earlier approaches which viewed political outcomes as a response to the needs of the system (ibid). during the period of the 1970s, Hall and Taylor (1996) argue, many historical institutionalists were closely examining the role of the state which was no longer as a neutral intermediary among competing interests but as a network of institutions capable of structuring the character and outcomes of group conflicts.

According to Steinmo (2008), historical institutionalism forms neither a theory nor method, but should be seen as an approach to understanding governance, politics and social change. He notes that historical institutionalism was born out of the disappointment with grand theories, the boredom or disinterest in technical approaches to behaviourism, arguing that historic institutionalism was developed as a theory out of the interest of political scientists in real world outcomes (Steinmo, 2008). Skopkol (1979a, 1979b), another theorist on the subject, was interested in understanding sources and patterns of political upheavals and revolutions, so she examined these political shifts, placing them within comparative and historical contexts. Skopkol (1979a, 1979b) realised that the structure of governmental institutions in pre-revolutionary periods was highly consequential in determining outcomes following upheavals.

Steinmo (2008) views historical institutionalism from a social sciences view, rather than from a political science perspective. He argues historic institutionalism is distinguished from other social sciences through its attention to real-world empirical questions, historical orientation and attention to the manner in which institutions structure and shape behaviour, as well as how it forms outcomes (Steinmo, 2008). Sorensen (2015) also defines historical institutionalism as a research method within social science, however stating it is one that focuses on the creation, persistence and change of institutions over time. This is relevant, argues Peters et al. (2005), because historical institutional theory has generated important insights that have taken our understanding of public policy to a new level, in particular the core argument of historic institutional theory that policy development can be conceptualised not as a continuous but discrete process. Sorensen (2015) contends that historic institutionalist approaches to the analysis of institutional change offer a robust theoretical framework and valuable set of analytical tools for the analysis of continuity and change in public policy, developed and deployed effectively in several areas of study, particularly in political science (Sorensen, 2015). Indeed, historical institutionalism has emerged over the past several decades as a leading approach to institutional analysis and a prominent approach more generally within political science (Peters et al., 2005).

It is important to set out the meaning of institution within the context of historical institutionalism. For example, Hall and Taylor (1996, p938) define institutions "as the formal or informal procedures, routines, norms and conventions embedded in the organisational structure of the polity or political economy". Steinmo (2008), defines institutions as rules that influence social or political behaviour, noting however that informal rules and norms also influence. This is important, he explains, because these rules, whether formal or informal shape who participates in decision-making, as well as the strategic behaviour of decision-makers (Steinmo, 2008). Sorensen (2015) similarly defines institutions in terms of "collectively enforced expectations with respect to the behaviour of specific categories of actors or to the performance of certain activities" (citing Streek and Thelen, 2005; p20), going on to describe planning institutions "as collectively enforced expectations with respect to the creation, management and use of urban space" (2015, p20). Sorensen (2015) notes that collective enforcement refers principally to the utilisation of coercion by the state in order to enforce laws and regulations, with the recourse of private actors to courts to enforce contracts. This more narrow definition focuses attention chiefly on formal legal and political institutions that structure urban space via the utilisation of plans, laws and regulations enforceable by the state or through recourse to a third party. Steinmo (2008) notes that the structure of each country's political or regulatory institutions tends to offer various interest groups powers of veto over new rules and regulations which need to be negotiated between various parties. In this context, institutions provide not only

obstacles to specific policy choices, but ultimately structured the menu of choices available in different regimes.

Hall and Taylor (1996) explain the four features of historical institutionalist theory. First, they argue that historical institutionalists have a tendency to conceptualise the relationship between institutions and individual behaviour in comparatively broad terms. Secondly, they place an emphasis on the asymmetry of power associated with the operation and development of institutions. Thirdly, they have a tendency to view institutional development which emphasises path dependency (see below) and unintended consequences. Finally, they are especially concerned with the integration of institutional analysis with contributions of other elements, such as ideas, can influence political outcomes (Hall and Taylor, 1996).

In this dissertation, institutions primarily relate to government ministries, departments or other bodies at the national level, and to local authorities in Jakarta, specifically the provincial and city levels, though some interventions take place at district and neighbourhood levels, and are explained in detail in Chapters II, III and IV.

Historical institutionalism: Path dependency

Path dependency is an important concept in historic institutionalist theory, in that it helps to explain why some institutions continue to make the same or similar types of decisions over long periods despite evidence of their inappropriateness or ineffectiveness. This is particularly relevant to government policies in response to flooding in Jakarta, where inundation has a long history, going back to colonial times.

Path dependency as utilised in historical institutionalist literature, is defined as selfreinforcing persistence of institutional structures (Schwartz, 2004; Mahoney, 2000; 2001). Alternatively, Green (2005) argues that choices made when institutions are in their formative stages of inception or development, or when policies are being formulated, have a constraining effect far into the future. Peters et al. (2005) explain that deeply embedded within historical institutionalist literature is an assumption that policy-making entities tend towards conservatism and thus inevitably find ways to defend existing patterns of policymaking, as well as the institutions that initiate and deliver those policies. Pierson (2004, cited in Peter et al., 2005, p1276) contends that self-reinforcing processes within institutions that design institutional configurations have policies which are difficult to change once a particular policy-making pattern has been established. Peter et al. (2005, p1276) argue that historical institutionalism "conceives of public policy-making and political change as a discrete process, characterised by extended time periods of considerable stability-referred to as path dependency, interrupted by turbulent, formative moments". During these formative periods public policy generally assigns new objectives, while new priorities are initiated and new political and administrative coalitions develop to sustain those new policies (North, 1990; Steinmo et al., 1992; cited in Peter et al., 2005, p1276). Historical institutionalist theory has generated important insights which have furthered understanding of public policy to a new level, particularly the central argument of historical institutionalist theory which states that policy development can be conceptualised as a discrete vet continuous process (Peter et al., 2005).

Sorensen (2015) describes the core concept of path dependence as one that some institutions, once established, will tend to become increasingly adverse to change as time passes, so that small choices early on can have long-term impacts. Peters et al. (2005) argue that deeply embedded within the historical institutionalist literature lies an assumption that policymaking systems tend to be conservative and look for ways to defend existing patterns of policy. Pierson (2004, cited in Peters et al., 2005, p 1276) describes self-reinforcing processes within institutions that make institutional configurations, and therefore their policies, difficult to change once a pattern has been established. Peters et al. (2005) contend that historical institutionalism conceives of public policymaking and political change as a discrete process that is characterised by extended periods of considerable stability, which the authors refer to as path dependency, which are interrupted by periods of turbulence, or formative moments, which Sorensen (2015) describes as well known to historical institutionalism.

Institutional lock-ins

Similar to the concept of path dependence, and also from the perspective of political science is the idea of institutional lock-in. This concept views history not as a constraint but rather as generating a series of specified moments of choice, each of which can create various potential pathways to different trajectories or outcomes (Suddaby et al., 2014). Thelen (2000, cited in Stensaker and Benner, 2013 p401) describes this institutional lockins as "a reproduction of templates" from decisions and ways or reaching policy decisions seen to be useful, efficient, agreeable, or simply possible. Foxton (2002) contends that increasing returns due to positive feedback leads to lock-ins of both technologies, technological systems and decision-making, thus preventing the take up of alternative and potentially superior alternatives. Foxton (2002, p3) further explains that "because formal institutions and public policies place extensive, legally binding constraints on behaviour, they are subject to learning, co-ordination and expectation effects, and so become difficult to change, once implemented". Furthermore, there are, according to Thelen (1999, p385) explains that the most widely invoked model of path dependency is one which has been derived from the work of economists seeking to understand technological development. She argues that once an institutional path is taken, it can become "locked-in", since all the relevant actors adjust their strategies to accommodate the prevailing pattern of decisionmaking.

The concepts of path dependency and institutional lock-ins therefore form a key tool for understanding policy inertia in Jakarta where top-down, technocratic led flood infrastructure interventions which have failed to arrest inundation resulting from multiple causes over several decades since independence in the late 1940s. this adds to problems experienced during the colonial period as well, where flooding was a long-term problem. This builds on the wider approach of historical institutionalism as a way of analysing government departments and decisions taken at certain levels, and the way these influence the changes in the city's physical urban form over time, particularly in Chapters II and IV.

Urban Morphology

A discussion of generalist urban morphological theory is useful for this study to set the background for how it is applied as a research approach in Jakarta. Urban morphology can be utilised in a variety of ways to gain an understanding of urban context. In this research, it is utilised to appreciate the changing nature of urban form over time in Jakarta through a process of mapping and diagramming.

Regarding urban morphology, in general terms, there are several definitions, including "the study of urban form" (Cowan, 2005, p424); "the science of form, of various factors that govern and influence urban form" (Lozano, 1990, cited in Oliveira, 2016, p3); the study of the physical (or built) fabric of urban form, and the people and processes shaping it" (Urban Morphology Research Group, 1990, cited in Oliveira, 2016, p3); and "Morphology (that) literally means form-lore, or knowledge of the form. What is the essence of that form; does certain logic in spatial composition apply, certain structuring principles?" (Meyer, 2005, cited in Oliveira, 2016, p3). Kropf (2017, p9) defines urban morphology as "the study of human settlements, their structure and the process of their formation and transformation." Kropf (2017) explains further that urban morphology relates to the form and structure of cities, towns and villages, the manner in which they develop and change and their characteristics that comprise much of our urban habitat.

Of particular relevance to this research is urban morphology's key applications, as defined by Kropf (2017, p10) to include the following elements:

- "General description and explanation
 - Identifying the distinct parts of settlements and their historical origins to explain the settlements' character, diversity and complexity
 - Identifying the generative processes and developmental regularities of human settlements
- Development and evolution of human settlements
 - o Telling the story of historical development of individual settlements

- Investigating the evolution of ideas and diversification of urban form
- Investigating the built environment as a complex adaptive system underpinned by quasi-natural generative and evolutionary processes."

Oliveira (2016, p3) further describes urban morphology as a "focus on the object of study (urban form)" through Larkham's (2005, cited p3) approach which conceptualises the complexity of urban form by understanding the physical and spatial complexities at various scales, from individual buildings, plots (or individual landholdings), urban blocks and the street patterns which comprise the structure of urban settlements helps to elucidate the manner in which urban settlements have grown and developed. Smailes (1955, cited in Oliveira, 2016, p3) notes that urban morphology is not limited to two dimensions, but is in three dimensions where it "assumes in the urban scene that much of its distinctiveness and variety arise."

Oliveira (2016, p3) further discusses urban morphology in a third sense, as a "focus on the manner and purpose of study" through a review of several theorists, including Gabauer and Samuels (1981) as a method of analysis which is essential to the discovery of principles or rules of urban design; or in the case of Moudon (1997), "the study of the city as a human habitat", that urban morphologists analyse a city's spatial evolution from its inception through to subsequent transformations, identifying and dissecting its various urban components (cited in Oliveira, 2016, p3).

Core Principles

Kropf (2017, p14) in his review of core principals discusses the concept of "pattern" as being central to urban morphology, for examples through "patterns of relationship", which are repeated arrangements or configurations of various elements such as networks of movement (primarily streets), layout of plots and combinations of rooms within buildings. "These repeating patterns are generally recognised as types of form. If the repeating patterns represent one of the principle ways in which the built environment is organised, one of the principle ways in which it is complex is that the types themselves are connected in a pattern: streets surround collections of individual plots upon which buildings are built. Kropf (2017) discusses hierarchy of elements in urban form with distinct levels of complexity, which are linked in a relationship of part-to-whole at various levels. This hierarchy includes: "streets", "plots" and "buildings" (Kropf, 2017, p15).

Both Oliveira (2016) and Kropf (2017) discuss the various elements of urban form, including "urban tissue", defined by Kropf (2017, p15) as "the combination of streets, plots and buildings seen as a composite, multi-level form. Kropf (2017) describes urban tissue as the principal component of urban growth and transformation. He argues that it is the element which combines to form the larger-scale structure of entire settlements and is comprised of smaller-scale elements which create places and form local identity (ibid). Oliveira, referencing Kropf (1996, cited in Oliveira, 2016, p8), defines urban tissue as the organic whole which can be seen according to different levels of resolution. In other words, urban tissue is a particular type of urban form or urban fabric associated with a neighbourhood, district, or quarter, or in some cases entire urban settlements, which is distinct from other places and incorporates similar street types, open space networks and building typologies which are more similar than they are different.

In addition to urban tissue, Oliveira (2016, p11) discusses the natural context, in particular surrounding topography, which he refers to as "land relief", as being important for the development of urban form. Local topographical conditions, including the slope of land, the quality and suitability of soil for construction, local climate, solar and wind exposure, as well as the presence of water, all influence the manner in which land is occupied and settled, from inception to the initial pathways and streets, as well as land divisions (Oliveira, 2016).

The "streets system", the movement network through which pedestrians and vehicles travel through the city, is also an important core principle (Oliveira, 2016, p15). It is streets which generally define the perimeter of urban blocks which comprise particular types of urban form, i.e. urban tissue. They distinguish public from private spaces, they constitute the public realm and by extension all spaces available to the public (Oliveira, 2016). In simple terms, "streets are, in broad terms, the public and democratic space of the city, the

place where we all meet, with all our differences, and where we all interact in social terms (Oliveira, 2016, p15).

The "plots system" is "one of the most important elements of urban form" which separates the public domain from the private (Oliveira, 2016, p23). Oliveira (2016, p15) notes that "the definition of the plots system in a given territory is an essential element of the urbanisation process and has considerable stability over time." The decisions which govern what system of private land ownership in a particular urban settlement usually involves the subdivision of large plots, for example plots of former rural uses, or the proposal for a new land division (Oliveira, 2016). The following stage of this process of urbanisation typically involves more precise definition of plots, including the relationship to the street (the dimension of street frontage), the orientation of the plot in relation to the street (the long or narrow dimension), the position of the plot within the system, in other words is it a corner plot or in the middle of the block? (Oliveira, 2016). Plots therefore can vary in size and proportion: are they long and narrow or more box like? The shape will determine the layout of rooms inside the resulting buildings.

The division of landholdings into plots has implications for the type of buildings constructed. This is related to land tenure and is of particular relevance in Jakarta, where communities adopt a virtual plot system, not necessarily recognised by the local authorities or central government. It is important to note that plots van be highly complex and do not always follow building footprints, for example as in the case of Barcelona's Cerdà Grid of the 1850s (Busquets and Pérez-Ramos, 2017; Busquets, 2005). In Jakarta's kampung, these plot divisions are not always visible or mapped, and typically when they are it is the result of slum-upgrading programmes, land tenure initiatives or other similar programmes.

The" building system": Oliveira (2016, p26) notes that although the buildings do not have the same stability in time as the street system and plot system, they remain a most important element of urban form and certainly the most visible. In general, cities are comprised of two types of buildings: "ordinary" and "exceptional" (ibid). He describes the primary characteristics that distinguish the two types are related to building form and land

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use, for example residential, commercial, religious, etc. Ordinary buildings are typically those which have great similarities than differences, and are typically residential, commercial, or industrial in use. The second type are those buildings which by their shape and function are clearly distinguishable in the urban context (Oliveira, 2016), such as churches, courthouses, market buildings, stadiums, town halls or other similar buildings. These buildings often occupy central or nodal locations within the urban forms of cities, sometimes are focal points or stand astride a major axis, for example.

Urban form is utilised in this study as a means of understanding the relationship of flooding, the resulting planning decisions and infrastructure interventions, and their impact on the city's physical and spatial urban form. Urban morphological analysis helps to illustrate the nature of these physical and spatial impacts. In general terms this study also builds on the work of Oliveira (2016), Cowan (2005), Whitehand (2001) and Kropf (2017) by mapping the urban form, particularly in Chapters III and IV of kampung, to understand the characteristics and layout of this highly specific typology in relation to flooding and infrastructure. This is outlined in further detail in Chapters III and IV, specifically the manner in which this study builds on the research of mapping by Dovey and King (2011), Dovey, et al. (2019), Raharjo (2010), Octifanny and Norvanyi (2021), Kamalipour (2016), Kusno (2019), Winayanti and Lang (2004) and Priatmodjo (2016) through the utilisation of satellite imagery, photography and GIS-based mapping to understand morphological characteristics and the nature of changing urban form in relation to new flood works forming part of the Jakarta Coastal Defence Strategy and the National Capital Integrated Coastal Development Master Plan, as well as other water and flood infrastructure improvements across Jakarta, such as the recent construction of the Eastern Canal.

Understanding the streets, plots and buildings systems is fundamental to the manner in which urban morphology is utilised as a tool for understanding physical and spatial change in Jakarta. The buildings system helps to illustrate where buildings have been demolished to make way for flood infrastructure improvements and new infrastructure interventions, while the streets system illustrates where easements along roadways have been utilised as a tool for demolition through the erection of high flood walls. These are seen in detail in Chapters III and IV. This is also discussed at the strategic level in Chapter II. The plot

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system, while not always apparent visually, due to the complexity of land ownership challenges, as well as the highly complex land tenure system in Indonesia, does influence urban form in the city. This is readily apparent in the community cooperation whereby typical building typologies of similar dimensions were constructed over long periods of time, as discussed in Chapters III and IV.

Chapter II:

Overview of Historic Institutionalism and Urban Morphology



Introduction

This study seeks to examine a gap in current ideas between the west and global south considering discourses around flooding and rapid urban development. An historic analysis of Jakarta was used to illustrate potential consequences for other cities in Southeast Asia facing similar challenges. This research examines the role of government responses to flooding, which have both shaped and reacted to the city's spatial and urban form over time in the form of policies, strategies or mitigation measures, for example where previous approaches failed to take into consideration existing local ecology, flood patterns and natural drainage systems. It also investigates the potential of urban morphological tools as a methodology to appreciate the changing form of the city and the relationship of spatial development to institutional decision making on flooding historically.

This dual approach, the combination of historical institutionalism and urban morphology is useful because it could potentially link spatial outcomes and their implications for flooding to planning policy over time. It may also highlight changes in the city over time, while providing an understanding of the influence of institutional decision-making on the physical urban fabric of the city. These findings are preliminary, though they have the potential to develop in complexity if the research were to be developed further.

Jakarta is an emerging world city with a metropolitan population of between than 28 and 30 million people inhabiting a highly dense built-up area (Priatmodjo, 2016; Jakarta Open Data, 2017). It is a city that has undergone rapid urbanisation while being faced with significant challenges to sustainable development, including flooding, drainage, water and solid waste management, air pollution, seawater intrusion, land subsidence, natural hazards and disasters, traffic and congestion, access to affordable housing, as well as effective urban management and governance (Steinberg, 2007; Kops, 2012).

Methodology

A qualitative methodology utilising historic institutionalism and document analysis is employed to understand government responses over time in relation to urban development and flooding or, in absence of such decisions, failings of governance. The historic institutionalist analysis implies a description of formal and informal rules and norms (in this case specifically embedded in policy documents on flooding) over a period of time. It stands for an approach to understanding governance, politics and social change, for example as outlined by Steinmo (2008). In view of the purposes of this study, historic institutionalism helps to understand the specifics of the Indonesian case and where governmental responses to flooding were found to have shaped the spatial layout of the city over time.

In addition, historic maps and satellite imagery are used together with an urban morphological analysis, initially based on those of M.R.G. Conzen (2004), which remains relevant today because it can shed light on spatial development patterns historically in relation to document study on the issue, as noted by a number of authors, including Whitehand (2007, 2001a and 2001b), Ford (1993), Whitehand et al (2016), Cybriwsky and Ford (2001), Kusno (2011), as well as Sanders and Baker (2016). This is partly because of the mixture of European, indigenous Javanese (*desa* and kampung), post war linear development and international high-rise and mega-project typologies that comprise the overall urban form of Jakarta (Cybriwsky and Ford, 2001). Conzen's analytical methodologies have been widely employed in Western urban design practice since at least since the 1970s, as described by Marzot (2002), cited in Sanders and Baker (2016, p. 213) and have become the industry standard for spatial mapping and analysis of development at the urban scale.

Utilising research methods based in different disciplines, sociology and political science in the case of historical institutionalism and architecture and urbanism with respect to urban morphology, inevitably results in divergences between theories, as well as potential limitations. In the case of this research, historical institutionalism tends to focus on the longer, more strategic history of Jakarta over the past 400 years, while urban morphology tends to be more time- or period-specific. In the case of urban morphology, while it is possible to trace the history of the development and changes to urban form over the past four centuries through the use of historic maps, and indeed this is achieved in this research, these sources are limited in number and availability, meaning it is challenging to obtain a fully comprehensive understanding of changes in more recent decades without the assistance of other mapping sources and technology. Fortunately, satellite imagery has been widely available for some years, as has open-source GIS-based data, such as OpenStreetMap. Therefore, mapping methodology differs due to the limitations of data. For example, GIS-based open-source data is a relatively recent development, having been founded in 2004 (OpenStreetMap, 2024), as is satellite imagery, the latter element is only widely available at sufficiently detailed resolution over the past two decades, to around the year 2000 (Google Earth, 2024), meaning they cannot be readily useful for periods before the mid-to-late 1990s, depending on location and data platform. While all of these differing sources and methods can be utilised harmoniously and in a complimentary fashion, as it is used throughout this dissertation, it is important to understand the limitations of each, and therefore the wider limitations of this research.

In addition, two pilot projects for blue-green solutions in Jakarta, Waduk Pluit and Waduk Ria Rio, are reviewed using document research (Priatmodjo, 2016) in order to understand what efforts are currently being realised in the city with respect to flood resiliency and which recommendations could potentially be made at the strategic and policy level for implementation across the wider city. The difficulties associated with implementing such flood mitigation methods within a mega city in the developing world also become clear, in particular the necessity of responding to the proliferation of informal developments that often occupy waterfront land in Jakarta due to a lack of affordable housing and land tenure options in the city. This area of the research is also further developed to include additional current best-practice thinking both from the region and beyond, as the wider study moves forward.

The Problem of Flooding in Jakarta

Flooding in Jakarta results from a number of factors. The absence of effective flood control a long-term challenge for the city administration – is partly caused by deforestation of Java's interior, leading to flash floods in Jakarta, as well as rising sea levels and saltwater intrusion caused by depletion of ground water (Steinberg, 2008). In addition, the water capacity of the thirteen rivers and canals that crisscross the city, flowing northwards into the Java Sea (Priatmodjo, 2016), has been reduced for decades as a result of the ongoing historic development of informal settlements along the city's waterways, which has caused them to narrow. The dumping of refuse into the city's canals and rivers has caused further reduction in capacity and the uncontrolled growth of water hyacinth on existing water basins, which clogs water flow and allows silt to gather, reduces capacity even further (Priatmodjo, 2016; Steinberg, 2007; Steinberg, 2008). As if these problems were not enough, ground water absorption has been reduced in Jakarta due to widespread urbanisation and deforestation, made worse by a lack of green space in the city (currently only ten percent of total land area, though the Spatial Planning Act of 2007 requires thirty percent of total land area in Indonesian cities to be green open space) and uncontrolled development on the urban periphery (Steinberg, 2007; Priatmodjo, 2016). Fisabilillah and Maulana (2016) also indicate that between 80,000 and 100,000 hectares of agricultural land and wetlands are lost each year in Indonesia due to urban development and expansion. Within this context there has been a marked failure by the city administration to invest in infrastructure over several decades, manifested by an unfinished canal project left over from the time of the Dutch colonisation (Steinberg, 2007; Priatmodjo, 2016). However, the problems of flooding are not new to Jakarta and have been plaguing the city for centuries.

Indonesian Morphology: Jakarta

This section provides an initial urban morphological analysis of urban Jakarta, thereby pointing out physical aspects such as land use and building form. Though Jakarta's urban history dates back to the 5th century, when it was called Sunda Kelapa, a port city of the Tarumanagara kingdom, it was the Dutch who were responsible for the current layout of the historic centre, Batavia, capital of the Dutch East Indies, dating from the 17th century

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(Priatmodjo, 2016). Batavia was laid out (see Figures 1-4) by the Dutch in 1617-19 using their *waterstad* (water city) typology, loosely based on Amsterdam (Priatmodjo, 2016). This represents the first imposition of a European typology into the Javanese context and resulted in the total destruction of the previous indigenous city by Dutch Governor Jan Pieterszoon Coen. It also constitutes a reordering of the Javanese urban model, which had previously been based on Hindu-Buddhist cosmic orientations around a traditional open space (*alun-alun*) or palace (*keraton*) of the local ruler (Ford, 1993).



Figure 2.1: Batavia, 1681

Figure 2.2: Batavia and surroundings, 17th or 18th century

The primary search for a model of Indonesian urban morphology has been suggested by Ford, who describes Jakarta as the prototype Indonesian city, where the initial basic layout and plans developed there formed a model for cities elsewhere in Indonesia (Ford, 1993). Large Indonesian cities, including Jakarta, it has been explained, were henceforth developed around central areas (no longer centred on the traditional *alun-alun* or *keraton*⁸), but modelled on idealised Dutch port cities with features such as canals, churches, row houses and city walls by the 1700s, which were also common in the Netherlands (Ford, 1993). This typology would be repeated elsewhere in Indonesia during the colonial period as cities were remade or established by the Dutch (Ford, 1993) and would form the standard for the layout of cities throughout the Dutch East Indies (Figures 2.1 and 2.2).

⁸ *Alun-alun* refers to the main square in front of the ruler's palace, which is also the location, typically on the western side, of the Friday Mosque in traditional Javanese cities such as Yogyakarta and Surakarta, Central Java. The *keraton* or *kraton* is the palace complex of the ruler, typically located directly to the south of the *alun-alun* (Ford, 1993).



Figure 2.3: Batavia, 18th century

Figure 2.4: Batavia 18h century

However, evidence suggests that this idealised European urban model was alien to the Javanese landscape. The canals that were intended to draw water away from the city and into the sea became slow-moving, even stagnant and malaria infested as a result of lack of maintenance. This model of urban form was not limited to canals and rivers; indeed, these waterways were fronted by tall, narrow houses in the style of Amsterdam, ill-suited for the tropical climate (Ford, 1993) (Figures 2.3, 2.4, 2.8 and 2.9). Despite the city's nickname as the 'Jewel of Asia', 'Pearl of the Orient' or 'Queen of the East', the city's beauty gradually disappeared after the early 19th century when the Dutch colonial government decided to relocate their administrative centre 4 km to the south to a new garden district called Weltevreden, today's Medan Merdeka (Priatmodjo, 2016). This shift southward had consequences for old Batavia, for it was virtually abandoned by the European community and given over to the Chinese and other Asian merchants and traders who were now allowed to occupy the colonial centre in its entirety. This northern area of Jakarta remains a predominantly Chinese district today.

The European elite neglected old Batavia as they sought the greener open spaces of Weltevreden, away from the compact and poorly drained old colonial centre. The new district was situated at some distance from old Batavia because swampy ground around the old centre and a dense network of indigenous villages in surrounding areas precluded the development of suburbs built close to the old centre (Ford, 1993). Weltevreden was developed around two large, open green spaces, the Koningsplein and Waterlooplein, both of which were beyond the smells of the canals in the old centre. In addition, the water wells

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in Weltevreden did not suffer from saltwater intrusion, allowing for more easily sourced drinking water (Ford, 1993). This area with its large open, green spaces emulated the then current Romantic design trends in Europe, with low, neoclassical buildings erected in parklike settings. These early developments were later to be supplemented by Javanese-Dutch hybrid bungalows and public buildings that took account of the local climate (Ford, 1993). At this time the old city was fully abandoned, and 17th century Dutch style port cities fell out of fashion. By now the European elite had started to move inland to newly pacified areas that had been unsafe in earlier centuries (Ford, 1993), further isolating Europeans from the Chinese and Javanese. As a result of this development, the Koningsplein and the viceregal palace with the classical villas of Weltevreden became the contemporary equivalent of the Javanese *alun-alun* and *keraton* (Ford, 1993), serving as a pattern for other Indonesian cities of the period (see Figures 2.5a, 2.5b and 2.6).



Figure 2.5a: Kota Tua (formerly Batavia) today. Figure 2.5b: Medan Merdeka (Koningsplein and Weltvreden) today.

The migration of the colonial elite and associated administrative development to the south of the old colonial centre led to the development of what initially became a linear city, where built-up area flanked the main north-south trunk road (today's Jl. Gajah Mada) connecting Batavia in the north to Weltevreden in the south. By the mid-19th century, this strip of developed land had grown into what Ford refers to as a 'dumbbell' shape with the old and new centres at either end (Ford, 1993) and lower-density development fanning out from the north-south trunk road towards the countryside. Later in the 19th century the land flanking the trunk road gradually filled-in with kampung (informal settlement) or *desa*

(collections of rural villages) in what Ford calls a 'new dumbbell-infill pattern', which came to dominate the morphology of Indonesian cities and continues to do so to this day (1993, p. 377).



Figure 2.6: Diagram showing the spine link between old Batavia (Kota Tua) and Weltvreden (Medan Merdeka)

Following independence from the Netherlands in 1949, the new regime under President Soekarno promoted the concentration of power in central government hands, increasing Jakarta's importance as the national capital (Ford, 1993). The government began to fund urban development projects in the city as Soekarno, who associated the regime with the Non-Aligned Movement, sought to rebuild Jakarta as a capital the developing world could be proud of, as conditions during the Japanese occupation during World War II had caused the deterioration of much of the city centre, while Weltevreden remained incomplete (Ford, 1993). This money was used to build monumental projects, such as the 161 m tall Monas (National Monument) on the newly rechristened Medan Merdeka (Independence Square), formerly the Koningsplein, in 1961, In addition, the National Stadium was built for the Asian Games of 1962, a series of wide boulevards and roundabouts with fountains and heroic statues were laid out, lined with important buildings, including the new Hotel Indonesia, the city's first international standard luxury hotel, as well as a 'Brasília-style' complex of government office buildings erected (Ford, 1993, p. 378). Also, during this period, a new residential district 6 km to the south of Medan Merdeka was built. Kebayoran Baru was to epitomise modernity and would be filled in with low-rise buildings laid out in spacious landscaped surroundings, with Western-style suburban housing (Ford, 1993). This repeat of a retreat to the south for elites was easily appropriated by the new regime and continued the development of monumental spine trunk roads, connecting Kebayoran Baru with Medan Merdeka to the north with more linear development. Much of this effort was to modernise the city and place it at the level of other emerging capitals that fulfilled Sukarno's vision of a modern metropolis, such as Brasília in Brazil (Ford, 1993), developed during the late 1950s. This effort also served to separate the city from uncomfortable associations with its colonial past (see Figure 2.7).

Sukarno was ousted in 1967, only to be followed by another authoritarian regime, the New Order of Suharto, which pursued free market economics and was supported by the United States. This pro-capitalist, pro-Western, pro-development and pro-foreign-investment government facilitated the infiltration of the city by foreign corporations who built Western food chains like McDonald's, KFC and Pizza Hut, symbolically replacing the socially oriented, state sponsored projects of the past (Ford, 1993). During this period, which was prosperous for the country due to a boom in tourism and oil revenues, the city's skyline began to rise as the first high-rises were built along its monumental roadways. Corporate banking headquarters in glass towers and high-rise apartments were built, along with air-conditioned shopping malls. For example, along Jl. Jenderal Sudirman, the city's main traffic spine, more than fifty mid- and high-rise towers were constructed between 1970 and 1990 (Ford, 1993). This wholesale redevelopment constituted a re-imaging of the post-colonial, modernist city into one with a more international appearance, something Ford refers to as "a dazzling veneer of Westernisation" (1993, p. 381).

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Figure 2.7: Diagram (by author) showing the key morphological areas of Jakarta, as well as the historic progression further to the South, starting in the late 18th and early 19th century with the administrative move from Old Bataviatoday's Kota Tua) to Weltevreden, later in the early 20th century to Menteng and finally in the 1950s and 60s to Senayan Sports City and Kebayoran Baru)Ford, 1993; Cybriwsky and Ford, 2001; Kusno, 2011). Note also the more recent return to the north coast with developments at Pantai Mutiara in the mid-90s and Pantai Indah Kapuk (PIK) since the 2010s (Priatmodjo, 2022a and 2022b), as well as the linear high-rise and shopping mall typological development first introduced in the 1970s under Suharto and continuing today (Ford, 1993).

Since the late 1960s, kampung located near Jl. Jenderal Sudirman have received attention and funding for slum upgrading projects. These kampung improvement projects, some of which were financed by intergovernmental organisations such as the World Bank, have provided potable water, electricity, paved roadways, schools and limited urban services to many areas formerly neglected. Housing has also been improved, with shanties and bamboo structures replaced by permanent structures, reaching nearly 3 million kampung inhabitants by the early 1990s (Ford, 1993). Despite this, urban poverty remains a major challenge in Jakarta, with up to 30 percent of the city's inhabitants continuing to live in kampung or on illegally occupied land along riverbanks, on empty or abandoned plots, or on floodplains (McCarthy, 2003). From the 1950s, new satellite industrial and residential areas were developed around Jakarta in towns like Bogor, Bekasi and Tangerang. This extended the urban territory into an extended urban region including Depok, Tangerang and Bekasi, referred to as Jabodetabek (Rustiadi, et al., 2015). Ford argues that despite large acquisitions of territory since the 1950s, Jakarta was under bounded, with Jabodetabek containing 11.4 million inhabitants and the city itself 8.2 million by 1990 (Ford, 1993).



Figure 2.8: Traditional Dutch houses, Kota Tua

Figure 2.9: The former Stadhuis (city hall), Kota Tua

The city has maintained its preeminent position economically and politically, despite processes of decentralisation since Suharto's ouster and the implementation of democracy in 1998. Indeed, Ford writes that "most of the new urban development was confined to metropolitan Jakarta until the late 1980s," (1993, p. 383) and this continued until the 1990s when other regions of the country such as Sumatera and Kalimantan as well as other Javanese cities like Surabaya, Semarang and Medan began to demand more of a share in the country's economic development (see Figures 2.10 - 2.11).



Figure 2.10: Linear development along Jl. Jenderal Sudirman. Figure 2.11: Linear development along Jl. R.S. Fatmawati.

Historic Institutional Responses: Jakarta

One of the primary assertions of this study is that the history of governmental responses in Jakarta is linked to the urban morphology and spatial development of the city over time. The efforts by the Dutch to lay out a new settlement along European lines resulted in the imposition of an alien urban model on the Javanese landscape. This typology was manifested in spatial segregation where the Dutch controlled the cities inhabited by Europeans and Chinese immigrants, the latter of which dominated the commercial activities of urban centres, while the former controlled the colonial administration and the military (Ford, 1993). In this model, the Javanese were considered hostile and thus too dangerous and unskilled to be allowed to inhabit European cities and were therefore relegated to their traditional urban centres inland or to kampung and *desa* around Batavia and other burgeoning colonial settlements (Ford, 1993). Thus, it appears that from an early era in colonial rule segregation was a spatial tool utilised by the Dutch. Those on the lowest economic or social rung of the ladder who inhabited kampung and desa historically suffered from significant environmental problems such as flooding, while the rich and well-off moved away from these problems around low-lying areas and waterways to higher ground (Ford, 1993). This pattern is apparent today with the large areas of kampung and similar informal settlements clustered around canals and rivers in Jakarta.

In the first planning effort in Jakarta, directed by the Dutch Governor Jan Pieterszoon Coen in 1617-19, the original Javanese settlement of Jayakarta (City of Victory) was demolished (Silver, 2008) to be replaced with what was essentially a replica of Amsterdam on the Java Sea. In what Steinberg (2007) refers to as the first case of technocratic planning, this wholly European city was established complete with a rectilinear set of urban blocks and streets as well as canals named for Dutch cities and provinces, along with the straightening of the Ciliwung River into a large canal. Thus, the new city of Batavia was born. Chandramidi (2013) argues that this evidence indicates a government-driven, topdown approach to planning, with a focus on technical flood mitigation and water drainage measures. Despite these efforts at planning a formal city, informal development nevertheless occurred, as already noted by Ford (1993), in the kampung and *desa* that surrounded the new city outside of its walls. These areas developed spontaneously, without formal plans (Cybriwsky and Ford, 2001), much in the same way as rural villages develop organically. These informal areas were the first examples of unplanned development expanding inland from the coast. Chandramidi (2013) notes that this displays a lack of stakeholder or community engagement on the part of the government, i.e. the colonial administration at the time, a pattern which was apparently to be repeated. Further government-driven initiatives can be seen in the out-migration of Europeans south from old Batavia to Weltevreden (Chandramidi, 2013) and even as far as Bogor in the early 19th century. The colonial government moved its administration to Weltevreden at this time, while the viceroy built a summer palace at Bogor, where Dutch and other Europeans escaped from the heat (Cybriwsky and Ford, 2001). These planning efforts appear aimed at providing for the elite while ignoring the majority of the public at the time (Chandramidi, 2013).

During the colonial era already, as noted by Ford (1993), the canals built by the Dutch failed to drain properly and caused flooding. Calijouw et al. (2005) notes the stench of the canals at low tide that was already well-known during this period. The canals were also utilised as a dumping ground for waste, as noted by Steinberg (2007), Ford (1993) and Cybriwsky and Ford (2001), which was the cause of dysentery, typhoid and malaria outbreaks. This indicates a lack of understanding of basic health and hygiene by the government at the time, as well as the need to build in a manner that takes account of the existing climate and environment, in other words, building resiliency into the urban development process (Chandramidi, 2013). Despite these problems, planners had already been considering the perennial causes of flooding at least as far back as the early twentieth century. In 1922, De Haan published a document listing the causes of flooding in Batavia, including low land levels, minimal tidal changes, the eradication of forests upstream, erosion of canal and riverbanks as well as the use of these water bodies as destinations for solid waste dumping (Caljouw et al., 2005).

Calijouw (2005) notes that during the 19th century, government officials and local inhabitants appeared fatalistic in their acceptance and inevitability of flooding, noting a

publication by Abeyasekere (1989, cited in Caljouw et al., 2005, p. 467), which indicates that despite a high and regular frequency of inundation during the 19th century, the government failed to take action, only responding after extreme events caused widespread damage. Gunawan (2010) argues that no public or stakeholder engagement was undertaken, except following major flood events, indicating a lack of appreciation for the need to involve local people and organisations necessary to understand the issues and how to respond to them collectively. In 1910, a major flood event forced all normal activities to cease, while severely disrupting mobility and damaging transport infrastructure (Gunawan, 2010). It was only following this major inundation that water pumps were installed in highrisk areas and the construction of new canals commenced, according to Chandramidi (2013), who argues this illustrates a deficiency of learning from experience. Gunawan (2010) puts the lack of sufficient flood management during the colonial era down to a lack of adequate funding, which resulted in numerous unimplemented plans, where the cost of such projects would have been equal to that of the entire city budget at the time. The canals that were built served areas inhabited by the colonial elite, who were also the primary beneficiaries of protective measures implemented following a major flood in 1918 (Gunawan, 2010). Chandramidi (2013) notes that this prioritisation of elite areas hampered efforts to build relationships between the government and local stakeholders, leading to a distrust of the colonial government.

Formal flood planning began in 1910, with the development of a comprehensive plan (Salim & Firman, 2011), followed by another in 1930, which followed the earlier 1910 framework, though Steinberg (2008) regards both plans as ineffective because Batavia did not have wealthy sponsors to fund those efforts. Chadramidi (2013) explains that the individuals concerned were architects rather than business elite, indicating an exclusion of relevant actors required for implementing such plans. The final plan developed by the colonial regime was one drawn up in 1948 for Kebayoran Baru by Professor Ir. V.R. van Romondt at the Institute of Technology in Bandung, which designated high ground between two rivers. The rivers and adjacent lands were planned as green spaces to act as flood zones. However, these areas were developed informally, which resulted in regular flooding during the rainy season (Chandramidi, 2013). This indicates that while expert advice was sourced to advise on planning, it went unheeded by the planning authorities who failed to stop the unregulated development.

Post-independence planning during the 1950s was politically driven, characterised by government-driven initiatives under a strong central state, led by the first president, Soekarno (Salim and Firman, 2011; Hudalah et al., 2007). Soekarno's efforts to rebuild Jakarta on a grand scale were intended to physically represent the struggle against imperialist regimes [18]. In the building of his new, monumental national monuments and facilities, Soekarno symbolically homogenised the various areas of Jakarta, utilising unifying symbolic layers, enormous statues and buildings to further his nation-building effort (Salim and Kombaitan, 2009). During this era, the Concept Plan of 1952 was developed, which redesigned the city to be surrounded by rings of highways and a green belt to act as a separation between the surrounding towns of Bogor, Tangerang and Bekasi (Chandramidi, 2013). The Outline Plan of 1957 designated these cities for further future development outside the city (Silver, 2008), which indicated an understanding by the planning authorities of the need to use planning as a tool for protecting vulnerable open spaces, a form of resiliency planning according to Chandramidi (2013).

The Master Plan of Jakarta for 1965-1985 was set out in 1966 by the Special Capital Region (DKI) of Jakarta government, which designated a metropolitan region with Tangerang, Serpong, Depok and Bekasi functioning as satellite cities (Steinberg, 2007). The plan set out strategies for responding to flooding, one of five important challenges at the time. It included measures for comprehensive flood control at the regional level, which included infrastructure investment, drainage regulations for new settlements and set the outer limits of the region at the Cikarang River to the east, at the Cisadane River to the west and the Puncak mountain range to the south of Bogor as the southern boundary, which as a comprehensive approach indicates the application of expert knowledge applied in a complex manner (Chandramidi, 2013). Chandramidi further notes that since the masterplan's flood mitigation measures were not based on administrative boundaries but utilised a river basin approach incorporating Jakarta as well as areas outside of the city, it is an approach that illustrates the need to include cross-border cooperation between governments at the municipal and provincial level to achieve resilient planning in the metropolitan region (2013). The spatial plan of Jakarta also mapped areas with potential for flooding in order for planning authorities to understand where to limit development (Gunawan, 2010).

The government's awareness of flood management and its importance to planning began in 1965 with Presidential Degree 183/1965, which proscribed as vital all works related to flood mitigation, demonstrating the seriousness with which the authorities regarded flooding. This meant that any subsequent flood management not carried out properly could be punished with legal action (Gunawan, 2010). This is supported by Hudalah et al. (2007), who argue that the constitution requires the government to effectively manage all land, water, spaces and natural resources to the greatest benefit of the country's citizens. The Basic Agrarian Law of 1960 regulated the authority to utilise and develop land while also regulating the relationship between people and land, indicating a top-down approach from government, where it exercised control over the public and stakeholders (Chandramidi, 2013).

Technocratic planning has been utilised in Indonesia since independence in 1949, through Presidential Decree 3/1947 on the committee for scientific strategy, which signifies a strong emphasis on expert knowledge, which led to the technocratic planning tradition still in place today (Chandramidi, 2013). These strong, state-driven initiatives continued into the regime of Suharto's New Order (which ousted Soekarno in 1967), where large-scale, prestigious projects were continued. However, planning during the New Order, while also technocratic, was focused on economic development utilizing neo-liberal policies and freemarket mechanisms, based on an economy with a high degree of external foreign financing (Chandramidi, 2013). Suharto moved the economy away from state-directed approaches to economic liberalisation (Cowherd, 2005). The neo-liberal ideologies promoting free markets as the sole effective economic system led to the removal of government roles from numerous policy areas under Suharto, where the government would be seen to guide investment and promote development rather than direct or influence the realisation of plans (Hudalah et al., 2007). The development of new industrial zones at Tanjung Priok and Pulo Gadung, aimed at attracting foreign investment to the new international airport at Soekarno-Hatta are examples of this (Cybriwsky and Ford, 2001). This demonstrates a move away from government-driven initiatives of the previous regime and the inclusion of new actors - in particular the private sector - in the development of the city (Chandramidi, 2013).

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A body was established in the 1970s to manage flooding in city, the Proyek Pengendalian Banjir Jakarta, or PBJR (Jakarta Flood Management Project), which succeeded in developing the Master Plan of 1973 in cooperation with a Dutch flood consultant, NEDECO (Chandramidi, 2013). This flood plan utilised a horse-shoe system where upstream water would be captured by a half-circle canal placed outside of the city (Gunawan, 2010). This was the first time since independence where the government took the opportunity to engage with international specialist consultants, showing a high degree of expert knowledge engaged in the planning and flood management system. However, plans took time to be realised, as evidenced by the construction of the East Flood Canal, originally planned in 1973 but only initiated in 2006 (Chandramidi, 2013).

During the 1970s and 1980s, flooding increased significantly, linked to encroachment of informal developments on water bodies, which is a positive development, as it indicates an increased awareness of flood causes. Additionally, the expansion of informal settlements illustrates the rural-to-urban migration where new developments under construction and economic activity attract people seeking improved living conditions (Chandramidi, 2013). In 1983, another major flood event occurred, causing inundation of Kebon Nanas, a location of important government facilities in Central Jakarta (Gunawan, 2010). This prompted the government to implement more flood management projects, this time funded with aid money from the Japanese government. The projects included flood management, river clean-up and dredging, land acquisition and improvement of the drainage system, which indicates an effort to access international research best placed to implement the necessary infrastructure to respond to flooding (Chandramidi, 2013).

Also adding to the build-up of flood events was the increase in development in Jakarta, specifically of new towns built by private developers on the periphery of the city and aimed primarily at the middle- and upper-income groups of society. Pondok Indah, the first project of this typology, was constructed in 1970 in South Jakarta, despite the fact that this area was earmarked by the Spatial Development Plan as a green buffer for satellite cities and for water catchment areas (Chandramidi, 2013). Many new housing developments followed, often built along toll roads leading out to Bogor, Tangerang or Bekasi. These communities, initially planned as self-sufficient developments, ended up merely as

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dormitory communities that created an ever-growing stream of commuters in and out of the city (Cybriwsky and Ford, 2001). These communities serve as an example of the conflict of interest between the government and private developers, where new development was built on unsuitable land or in the wrong locations, which ultimately compromised the resilience of the city to flooding (Chandramidi, 2013). Moreover, visual research utilising historic satellite imagery clearly indicates water retention ponds that have disappeared due to development over the past decade (preliminary visual mapping research undertaken by the author, 2016).

Cybriwsky and Ford (2001) note another policy shift that has impacted the spatial development of the city: the DKI government has prioritised increased specialisation in finance and service industries while manufacturing and industrial functions have been transferred to surrounding towns and cities. Since the 1980s, large areas of kampung in the city have been demolished and replaced with high-rise developments and shopping malls, where former residents were forced into relocation to apartments built by the government. This is a clear indication of how the physical development of Jakarta is driven by market forces (Chandramidi, 2013), where the needs of local residents are not protected or prioritised by the government.

Chandramidi (2013) argues that the most important development plan for Jakarta during Suharto's tenure was the Master Plan for the Special Capital Region (DKI) of Jakarta (RUTR 1985-2005), which aimed to integrate regional and city strategies while addressing the imbalance between economic and physical solutions, aiming at stronger community participation in the implementation of the Kampung Improvement Programme (KIP), itself designed to reduce the chaotic development of informal settlements at the city's periphery. This illustrates what could be a first attempt to include local communities in the planning of their neighbourhoods. However, in practice, as Steinberg (2007) notes, market forces have overtaken the aims of the document.

Rahmawati (2015) suggests that while spatial plans for Jakarta are aimed at primary guidance for managing land-use change, in practice these documents are not implemented

or enforced well by local governments due to power dispersal at the decentralised level of governance, which suggests a failure of decentralisation practices undertaken in recent years. Additionally, another problem with the spatial plans is that the land allocated to water catchment was reduced from 37 percent to less than 26 percent and this land was further reduced in the subsequent Spatial Plan 2000-2010 to less than 14 percent (Tempo, 2007).

The post-Suharto era in Jakarta is characterised as institutionally decentralised with a focus on metropolitan coordination or cross-boundary cooperation at the local level. This increasing localisation of urban and regional development involves the central cities (*kota*) and their surrounding districts (*kabupaten*) of DKI. The urgency around flooding has also intensified the need for governance arrangements at the regional level due to the need for coordination of efforts along rivers and canals, both upstream (where causes of flooding often emerge) and downstream (where consequences of flooding are readily apparent). Therefore, the implication is that decentralised authority can be supplemented by provincial coordination and control.

Summary of Initial Findings

Table 2.1 summarises the key preliminary findings of urban morphology in Jakarta in conjunction with historical institutional periods. Though preliminary, this table helps to understand what correlation there is between historic institutional forms and related policy decisions and the spatial development of the city, in particular with regard to specific urban morphological patterns or typologies. This already indicates a clear influence of policy on the development of urban form in Jakarta.

Historical institutional era	Characteristics	Specific or related policies	Time frame	Urban morphological era, typology or	Characteristics
Sunda Kelapa	Indigenous Javanese kingdom		5 th century CE -1617	description Pre-European costal city (Ford, 1993)	Javanese pre-colonial coastal city; Hindu- Buddhist cosmological cities or palace cities (largely retained by Islamic states post 16 th
Early Colonial Period	Segregation of ethnic groups (Ford, 1993) and (Chandramidi, 2013); first technocratic planning through demolition of Sunda Kelapa by Dutch Governor in 1619 (Steinberg, 2007), (Cybriwsky and Ford, 2001); no stakeholder Engagement (Chandramidi, 2013); lack of acknowledgement of flooding problems and severe flood problems already at this early stage (Steinberg, 2007), (Cybriwsky and Ford, 2001)	Governor Jan Pieterszoon Coen plan for Batavia (1617-19)	1617/1619 - 1808	Batavia (Dutch port city), (Ford, 1993) and (Chandramidi, 2013)	century), (Ford, 1993) Cities with a Dutch style port or European style core adjacent to a Chinatown for Chinese and other Asian merchants or traders (both segregated) with indigenous Javanese desa beyond the city fortifications in kampung and desa, which developed spontaneously without formal planning (Ford, 1993) and (Chandramidi, 2013); Dutch-style canals and rivers were sluggish and malaria- infested and flood-prone with tall, narrow Dutch houses and dense, tightly packed Chinese shophouses (Ford, 1993)
Middle Colonial Period	Further segregation of Europeans who moved six kilometres south of Old Batavia (Kota Tua) to Weltevreden; Chinese allowed to fully occupy old Batavia (Kota Tua) (Ford, 1993)	Plan for Koningsplein and surrounding Weltvreden (1808-11)	1808/1811 – Mid 19 th century	Weltevreden (European monumental city with linear pattern) (Ford, 1993) and (Chandramidi, 2013)	Spacious, airy, classical-style, monumental cityscapes set within open parklands and gardens, set upon higher ground less susceptible to flooding with linear development along trunk road connecting Weltevreden with Old Batavia (Ford, 1993); abandonment of coastal city identity (Kusno, 2011)
Late Colonial / Pre- Independence Period	Fatalist approach to flood problems by government and inhabitants (Caljouw, et al., 2005);	Publication by De Haan on causes of flooding in Batavia (Caljouw, et al., 2005)	Mid 19 th century – mid 20 th century	Linear Dumbbell Pattern (19 th century expansion era) (Ford, 1993)	Linear Dumbbell Pattern where a main trunk road (today's Jl. Gajah Madah) flanked by linear development linked Kota Tua (Old Batavia) with Weltevreden to the south (Ford, 1993)
Post- Independence Sukarno Era	Highly centralised state apparatus, government- driven initiatives at the behest of political leaders; prestigious projects to promote the power of the regime and distance itself from the colonial era (Ford, 1993); first awareness or acknowledgement of flooding as a problem and the need for experts to advise the government on planning and mitigation measures (Chandramidi, 2013)	Concept Plan of 1952 which laid out the first highways and a green belt, the Outline Plan of 1957, which set out the development of satellite cities, 1965-85 Master Plan of Jakarta established in 1966, Presidential Decree 183/1965, the first flood	1949 – 1967	Fill-out of the Linear Dumbbell Pattern (Post-war International and Modernist style planning), (Ford, 1993)	New layers of ideology added to the city in the form of monumental developments like the Monas (at Medan Merdeka) and National Stadium (for the Asian Games of 1962), as well as new town (suburban) style developments such as Kebayoran Baru, six kilometres south of Medan Merdeka (Ford, 1993)
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Suharto Era	Suharto moved the economy away from state-directed system in favour of free market liberalisation (Cowherd, 2005); planning during this period was more technocratic in nature (Chandramidi, 2013); governing bodies largely seen as rubber stamp decision- takers with almost total power vested in the presidency (Holzhacker et al., 2016)	mapping and land allocation for water retention (Chandramidi, 2013) Master Plan for the Special Capital Region (DKI) of Jakarta (RUTR 1985-2005)	1967 – 1997	Expansion beyond the filled-out Dumbbell Pattern (International Postmodernism) (Ford, 1993)	Development of the city with large mega developments continued during this period, including luxurious hotels, industrial estates, large malls, high-rise towers lining major roads in the 1970s and 1980s, Western-style corporate architecture, wide avenues electric railways linking the city with far-flung areas of the metropolitan region; South Jakarta designated for flood retention – however, subsequently the location of significant new suburban residential development (Chandramidi, 2013) and (Ford, 1993)
Post-Suharto / Decentralisatio n / Neoliberal Era	Characterised by so-called good governance: political transparency, the rule of law, governmental effectiveness, transparency and civil society promoted by intergovernmental bodies such as the World Bank and IMF (Holzhacker, et al., 2016); decentralisation efforts from central/national government to more localised power and responsibility: e.g. at the provincial, city, district, sub-district and village levels achieved through constitutional change (Holzhacker et al., 2016); fiscal arrangements between national and local levels of government reformed with implementation of single block grant system (Silver, et al., 2001)	Law No. 22/1999, Law No. 32/2004, Dana Alokasi Umum or DAU (General Purpose Fund), Spatial Plan of Jakarta 2000- 2010	1998 – Present	Mega city with linear, high-rise and mega developments (Dahiya, 2012)	Kampung replaced by malls and high-rise residential and office developments, further development of large highways and associated linear development along their length (Chandramidi, 2013) and (Ford, 1993)





Recent Responses to Flooding: Interim Solutions

Residents of kampung and informal settlements have historically occupied riverbanks and other undesirable, flood-prone land in Jakarta (due to a lack of affordable housing in the city). These spaces often filled the role of informal rubbish dumps for the city. These factors have resulted in the narrowing and silting of waterways, culminating in flooding during the rainy season on top of silting and clogging of water basins by water hyacinth (Priatmodjo, 2016). Added to these factors is the long history of flooding in Jakarta, coupled with a lack of investment in flood defence (Abeyasekere, 1989) and a fatalistic acceptance to flooding and its inevitability (Caljouw et al., 2005), which has only exacerbated the challenges to the city's flood and drainage systems (see Figures 2.12 – 2.15).



Figure 2.13a: Waduk Pluit before works.

Figure 2.13b: Waduk Pluit after works carried out.

In 2012, this long-term historic trend of institutional non-interference appeared to change when the government decided to tackle the flood issue by focussing efforts on cleaning up parts of the city's river and canal networks. The governor of Jakarta chose two water retention basins *(waduk)* in the city for redevelopment: one at Waduk Pluit in the north of Jakarta, the other in the east, at Waduk Ria Rio, to serve as water restoration and green open space pilot projects (see Figures 14- 15). Each *waduk* was chosen in part due to the narrowing of their banks, silting, infestation by water hyacinth, excessive annual flooding, as well as their strategic locations in the city (Priatmodjo, 2016). These projects were undertaken within the current context of metropolitan cooperation at the local level as well as national decentralisation of planning and development powers at the national level (Holzhacker et al., 2016) and (Silver et al., 2001).

Waduk Pluit is the largest reservoir in Jakarta and was built from 1960-1980. Not long after this, it began to be occupied by informal settlements due to the unoccupied and undeveloped land surrounding the water basin. Originally 80 hectares, by 2012, the capacity of the water basin had been reduced by 25 percent, while its original depth of 10 metres had been reduced by 70 percent (Priatmodjo, 2016). The project for restoring the *waduk* necessitated a phased removal of surrounding informal settlement residents to alternative

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housing elsewhere. Due to a lack of available accommodation in the vicinity, 2,000 families who had occupied the wet section were decanted to a site 20 km distant and their houses demolished to preclude their return (Priatmodjo, 2016). Not long after the land on the west bank was unoccupied, a 6 hectares park was built on the site, called Taman Kota Waduk Pluit, and opened in August 2013. It includes jogging and cycle paths, as well as recreation facilities. Machinery was brought in to dredge and restore the reservoir, work which still continues, along with the decanting of 5,000 further residents on the east bank to nearby social housing estates (Priatmodjo, 2016).



Figure 2.14: Waduk Ria Rio before transformation.

Figure 2.15: Waduk Ria Rio after works carried out.

The other water basin, at Waduk Ria Rio, covers 26 hectares and was constructed from 1960-1967 and was similarly occupied with informal settlements. 230 families were decanted to a site 8 km away, while a park situated on the western side of the water basin was built (Priatmodjo, 2016). The new 1.6 hectares park, called Taman Kota Ria Rio, was not equipped with the same type of recreational facilities as the park at Waduk Pluit, however, free WIFI was provided as well as attractive and rare foliage (Priatmodjo, 2016) to attract visitors and create a local amenity space. Restoration of the water basin is ongoing.

Conclusions

This chapter focusses on a gap in contemporary concepts between the west and global south around flooding and urban development with implications for other cities in the region facing rapid development and environmental challenges. It sets out to describe the

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role of government responses to flooding historically, which has influenced the spatial development of Jakarta over time in terms of policies, strategies and flood mitigation responses. This research illustrates the long history of top-down, centralised approaches to these issues, highlighting alien urban morphological, water drainage and flood protection systems imposed onto the Javanese context and the failures of those approaches to mitigate flooding. It also highlights more recent trends of decentralisation and power sharing at the local level of governance, which has resulted in some initial project examples indicating an integral movement towards flood resiliency.

A dual approach of historical institutional and urban morphological analysis has been utilised as a new methodology to understand the link between decisions of government with respect to flooding and the subsequent pattern of development in Jakarta over time. This paper demonstrates that applying a combination of historic institutionalism and urban morphological analysis can reveal dependencies between the dynamics of political decisionmaking and the development and evolution of urban form.

The research details, firstly, the distinct eras of institutional policy and secondly the resulting spatial typological periods that can be distinguished in Jakarta over four successive centuries. These preliminary findings indicate a link between institutional era and spatial development typology, though this is somewhat blurred from the era of Suharto's New Order to the one that followed, which appears to be a continuation in terms of high-rise developments and mega shopping malls. However, the shift of manufacturing and services to satellite cities and the replacement of kampung by more formalised development was particularly evident in the post-Suharto era, as was the increase in these new development typologies, which owed less to Western typologies than those already prolific in other Southeast Asian countries or in the wider East Asian region, for example in cities such as Kuala Lumpur, Bangkok, Ho Chi Minh City, Hanoi and even Hong Kong, where high-rise, mega mall and linear development abound. These preliminary findings are further developed in subsequent chapters.

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Chapter III:

Understanding the Local Level –

Impacts of Planning Policies Around Flood Infrastructure on the Urban Morphology and Residents of Kampung



Introduction

This chapter explores the impact of planning policies in response to flooding and their effects on both the physical urban form and kampung communities at the local level in Jakarta. This reflects on broader implications for cities facing similar challenges in the region and the wider global south. Research work on urban flood risk tends to be oriented to understanding water systems and possible management strategies (e.g. flood mitigation technologies or solutions) with only limited attention to aspects of urban morphology and changing human-settlement forms. This chapter builds on research undertaken at the strategic level in Jakarta in Chapter II utilising a dual historical institutionalist and urban morphological methodology. This is undertaken to understand the link between the two elements and how this affects the inhabitants of the city at the local scale, which is primarily one which prioritises infrastructure improvements over the livelihoods and housing needs of local people, leading to the demolition of kampung housing where the most vulnerable inhabitants live. In terms of urban morphology, this work builds on that of others including Dovey and King (2011) and Raharjo (2010), Octifanny and Norvyani (2021), Kamalipour (2016), Dovey, et al. (2019), Kusno (2011), Winayanti and Lang (2004) and Priatmodjo (2016) who utilise various combinations of satellite imagery, photos and plans to describe urban morphological characteristics in Jakarta.

Where this study differs is the application of recent historic satellite imagery taken on various dates alongside morphological diagrams based on GIS-based mapping platform OpenStreetMap (2021) to illustrate not only current conditions but historical changes in urban form. Google Earth Pro allows for the user to download high resolution JPEG satellite images going back to the early 2000s, or in some cases further. This allows for a comprehensive understanding of the changes in urban form over recent years. OpenStreetMap only indicates the current situation, however the two can be overlaid to understand where buildings have changes, for example where structures have previously existed have been demolished. Changes in waterbodies, coastlines, waterfront structures

including esplanades, docks, quaysides, and numerous other forms can clearly be documented.

This chapter also utilises literature covering historical intuitionalist perspectives of kampung and flood infrastructure in North Jakarta by Octavianti and Charles (2019a and 2019b), Supriatna and Van der Molen (2018), Octifanny and Norvyani (2021), among others, and on the nature of kampung in Indonesia and Jakarta by authors such as Dovey, et al (2019), Dovey and King (2011), Jones (2017 and 2019), Ford (1993), Conzen (2004), Oliveira (2016), Birkhamshaw & Whitehand (2012). These insights help to illustrate the characteristics, effects and implications of policies, in particular those relevant to the communities effected by demolition and eviction.

This dual approach marks a change from previous work utilising a historical institutionalist approach, which did not link policy decisions or institutional culture and characteristics to outcomes in the spatial development or physical urban form of cities. An important benefit of this theoretical framework is that one can observe physical and spatial changes in urban development as a direct and clear result of decision-making at the institutional level, in turn examining the resulting societal impacts on the people affected. This is important in order to understand the wider urban development of Jakarta in the context of policies in response to flooding historically. This study uses satellite imagery and GIS-based maps and diagrams in order to understand the changing urban morphology of the city at the local scale in recent years.

This chapter seeks to understand this relationship between flooding, policy, the impact on urban form, and at the local level through an analysis of several historic kampung in North, East and South Jakarta which have been demolished as a result of the construction of new flood barriers and the renovation of existing flood drainage systems. These cases represent the current state of flood mitigation policies and implementation efforts, which the government of Jakarta is undertaking to respond to major environmental challenges, as well as the physical and human cost of such decisions on local residents and livelihoods. Additionally, a primary reason for examining the North Jakarta context is the large number of flood infrastructure projects currently being implemented along the north coast, the associated improvements to existing flood and water drainage infrastructure, and the completion of long planned flood infrastructure initiatives, such as the recently completed East Flood Canal (Octavianti and Charles, 2019a, 2019b). Additionally, the proliferation of informal settlements along urban waterways, many of which form part of the city's flood infrastructure, is of major concern due to the potential detrimental effects on local communities of any large-scale changes in the urban form resulting from any infrastructure works. This research investigates the role of government responses to flooding undertaken in Chapter II at the local scale, which historically – prior to 2012 as noted by Priatmodjo (2016) failed to incorporate a thorough understanding of local ecology, flood patterns and natural drainage systems. This chapter also examines urban morphological tools as a means of understanding the changing nature of the physical urban fabric of the city and its relationship to flood-related planning policies and the inhabitants of affected neighbourhoods.

It is important to understand the term kampung as it is utilised in this dissertation. 'Kampung' is an Indonesia word (similar to the Malaysian word 'Kampong') which denotes a village. However, the term is typically used in literature on Indonesia and Malaysia to refer specifically to informal settlements and their particular context, set of challenges, culture, socio-economics and other related issues. This is similar to the manner in which the term 'favela' is utilised to describe informal settlements in Brazil. In Indonesia, kampung are communities which have developed in an informal manner and generally with a distinct urban morphology and a lack of development planning consent, or even legal occupational title that sets them apart from more formally developed areas of cities. This does not assume however that all kampung are the same, nor that all their inhabitants are poor or vulnerable. Rather, it is often the case that kampung communities include a variety of land tenures and socio-economic demographics, including different income levels. As such, it is common to see more formalised housing adjacent to less formal or even precarious housing, some constructed from basic materials including plastic, plywood, corrugated aluminium and similar low-cost elements. Indeed, the mixture of land tenure types can also be striking, where some residents have formal ownership while others have only occupational tenure, some a tenants or some may even be squatters.

In the case of the kampung communities studied in this dissertation, many of the inhabitants are among the most vulnerable residents in Jakarta, many with precarious land tenure, if at all, and many with quite basic housing structures. The reason for focusing on these communities is due to their location along waterways where there is an intersection between flooding, housing, vulnerability and flood infrastructure, in order to illustrate the locations where flood infrastructure is impacting vulnerable communities spatially and physically, in response to government decisions around flooding. However, this does not mean that all residents of kampung are vulnerable or poor, simply that some kampung communities are more physically and spatially vulnerable than others, and in some cases acutely so.

A central argument of this chapter is that planning decisions made (or not made as the case may have been) around flood mitigation have influenced the spatial and physical development of the city's urban form over time. These policy responses from municipal and national government importantly prioritise urban development and infrastructure over the needs of existing local communities located on or adjacent to waterways, *wuduk*⁹, rivers, canals or other water infrastructure. In other words, strategic, city-wide needs are seen as more important than local problems. Yet it is at the local level where the clearest examples of the impacts of flooding are apparent, and where the impacts are the most dire. In this example, looking at the local level *penggusuran*¹⁰ (eviction or removal of residents) from three kampung in North Jakarta have resulted in demonstrable physical change: the demolition of housing in order to improve existing flood works or to build new flood mitigation infrastructure. This chapter examines this premise at the local level already studied at the strategic, city-wide scale in Chapter 2, where the history of institutional decision-making around flooding and the urban morphological development of Jakarta have already been linked.

⁹ Waduk is the Indonesian term for polder or water retention pond (Priatmodjo, 2016).

¹⁰ Penggusuran is the Indonesian term for eviction (Colven and Irawaty, 2019).

Background

Jakarta is grouped with other coastal megacities with the highest flood risk in the world, suffering from extreme events with fluvial, pluvial and tidal flooding (Garschagen, et al., 2018). The city is traversed by thirteen rivers that flow into the Java Sea (Priatmodjo, 2016). Flooding, Priatmodjo argues, is caused in part by uncontrolled development in upstream areas, which cause rivers to overflow downstream in the city. This situation is worsened by the fact that the existing waterways: the rivers and canals that make up the city's drainage network, are narrowing, a result of the occupancy of riverbanks by low-income squatters who live in the urban kampung built along the waterways, as well as by silting (2016). Water basins designed to control flood waters are suffering from a similar fate. According to Priatmodjo (2016), the *waduk* in some parts of the city are also narrowing and silting up and are covered by water hyacinth. Over the past two decades, this silting, narrowing, and clogging with plants has resulted in annual flooding (ibid).

Added to these infrastructural issues, the city also lacks open land that could aid in water absorption. The Spatial Planning Act of 2007 requires a minimum of 20 percent of total land area be public green open space and an additional 10 percent private green space, for a total of 30 percent of total land area to be green open space in the city. However, as Priatmodjo (2016) notes, the city currently has only 10 percent of public green open space, 50 percent of the required land allocation, meaning the city lacks sufficient ground cover for water absorption both upstream and downstream. However, in a sign that the government is finally taking action to begin to tackle this problem after decades of inaction, in 2012 then governor of the DKI, Jokowi, currently the president), achieved improvement at two urban polders: Waduk Pluit and Waduk Ria Rio (Priatmodjo, 2016). The basin edges of these two polders, which had been occupied by squatters for decades were transformed into green open spaces, while the resident squatters were relocated to social housing on the urban periphery provided by the DKI government (ibid). Following on from Jokowi's efforts in North Jakarta, in 2016 his successor as governor, Basuki Tjahaja Prunama (Ahok), cleared a third informal settlement, Kampung Akuarium in north Jakarta, to make way for a flood defence wall (Rujak, 2016; Wijaya, 2018a).

Vast areas of the city's urban fabric are comprised of informal or semi-informal neighbourhoods referred to locally as *kampung*¹¹ (Indonesian for villages), often self-built dwellings constructed from a variety of cheap, locally and readily available materials, that house large sections of the city's population, including the urban poor (Elias, et al., 2018). Sometimes referred to by various terms, including informal settlements, slums, irregular settlements or shanties, kampung in Jakarta often include buildings constructed to a relatively high standard, as well as local shops, services, markets, *mushollas* (prayer halls), mosques and other community facilities, as well as public open space (Dovey & King, 2011; Elias et al., 2018). Many of the residents of these urban kampung have resided on the same land for generations, have paid land and property taxes and hold documentation attesting to their right of ownership, habitation or other form of land tenure or status as a resident citizen of Jakarta (ibid). These communities make up a significant portion of both the urban form of the city and its inhabitants. They are also the locations where the city's poorest and most vulnerable citizens live, placing them at the forefront of the contest between flooding, infrastructure, and the rights of local residents.

Methodology

This chapter employs a qualitative methodology, which makes use of the historicinstitutionalist approach outlined in Chapters I and II, to understand the nature of government decisions and rules around planning in response to flooding, as well as the mitigation policies themselves. It also suggests an empirical description of formal and informal practices and rules (in this case specifically relating to flood mitigation measures being implemented within the last decade, or even earlier). Historic institutionalism can be useful to understand how recent government policies and decisions around flooding have impacted the physical and spatial form of North and East Jakarta, policy documents, academic literature, and other documentation (including data from a local NGO involved in an ongoing community consultation with one of the affected kampung communities) have been utilised to illustrate this approach.

¹¹ Kampung is both singular and plural.

Academic literature that focussed specifically on kampung in Jakarta both impacted by flooding, and which have undergone physical and spatial change in recent years – directly as a result of government intervention, form a key element to understand the historic institutionalist approach in this context. In addition, this study utilises satellite imagery together with an GIS-based mapping data, specifically OpenStreetMap (e.g., see Table 1), to appreciate the changing nature of the city's urban form as discussed by Kamalipour (2016), Dovey et al. (2019), and Dovey and Ristic (2017) which utilise satellite imagery as in the case of Priatmodjo (2016), GIS-based mapping data, or a combination of the two. These are supplemented with the findings of Dovey and King (2011) and Raharjo (2010), who characterise the specific urban morphological typology of informal settlements in Southeast Asia. Further, the historic development of spatial patterns of Jakarta are analysed to appreciate the changing physical urban form of the city, as noted by a number of authors, including Whitehand (2007) and Sanders and Baker (2016), as well as Ford (1993), Cybriwsky and Ford (2001), and Kusno (2011) who write in relation to the Indonesian or Jakarta contexts at the wider scale of the Jakarta DKI.

In terms of the use of satellite imagery, a few authors have utilised this for analysis in one form or another with respect to flooding and urban morphology in Jakarta, most notably by Dovey, et al., (2019) and Priatmodio (2016). Further afield, Dovey and Ristic (2015); Taubenböck, et al. (2006); Monkkonen (2008); Kuffer and Barros (2011); as well as Yang and Liu (2005a, 2005b) have all utilised satellite imagery in order to classify complex urban morphological conditions, in some cases utilising Google Earth or GIS and other software to incorporate spatial or topographical metrics to incorporate additional levels of complexity to their analyses. This study utilises high-resolution satellite imagery accessed through Google Earth Pro, both current and historic (going back to the late 1990s or early 2000s) in order to understand how the urban form of the city has been impacted on by planning policies related to flooding, building on the work of Priatmodjo (2016), as well as Dovey, et al. (2019). For example, this chapter links specific governmental decisions related to flood and water drainage infrastructure to the changing urban morphology of the city by illustrating where policies have resulted in physical and spatial changes, for example the erection of new flood barriers or the demolition of existing structures to upgrade or improve existing rivers and canal systems.

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A number of case studies were reviewed to illustrate the link between institutional decisionmaking (as shown through the use of historical institutionalism), and that of historic spatial development (as demonstrated through urban morphological analysis). These case studies include two Waduk restoration projects and a kampung in North and East Jakarta, utilising document research (Priatmodjo, 2016; Rujak, 2018; Darwis et al., 2018 and Bappenas, 2019); Kampung Buki Durit, Kampung Pulo and Kampung Penas Tanggul in East Jakarta with data from (Dovey, et al., 2019; Winayanti and Lang, 2004); as well as five small kampung in North Jakarta called Kampung Kerapu, Kongol, Tongol Lodan and Kunir documented by Dovey et al. (2019). This is undertaken in order to understand the manner in which recent historic efforts made by the DKI and national governments to restore flood works and drainage infrastructure have had an impact on the urban form of the city and negative effects on local communities.

Flooding in Jakarta: The perennial challenge

Flooding is a longstanding historical challenge in Jakarta from its earliest days in the 5th century as a port city of the Hindu Tarumanagara kingdom, when it was called Sunda Kelapa and later during the era of Dutch colonial rule from the early 17th century when the city was known as Batavia (Garschagen et al., 2018; Priatmodjo, 2016). These perennial inundations appear to result from a number of causes, including an absence of effective flood control, deforestation of Java's interior and saltwater intrusion, as noted by Steinberg (2008). Added to this, Priatmodjo (2016) suggests rising sea levels and saltwater intrusion caused by the depletion of ground water play a role, as well as the intensive rainfall during the wet season, ordinarily between October and April annually, typical of the region's Monsoon climate (Texier, 2008). Garschagen et al. (2018) characterise Jakarta's floods as pluvial, fluvial, and tidal, with flood risks resulting from multiple causes, the primary factor being the city's existing topography. The city historically developed on a deltaic plain facing the Bay of Jakarta because of favourable agricultural conditions and proximity to trade routes, an area traversed by the Ciliwung River and thirteen other, smaller rivers, crisscrossing today's urban area (Texier, 2008; Garschagen et al., 2018; Priatmodjo, 2016). The city's northern areas in particular are affected by flooding due to the very low-lying topography that characterises the area along the coast (Garschagen et al., 2018), and there

have been major flood events in 1996, 2002, 2007 and 2013 (Texier, 2008; Goh, 2019). The 2007 flood event was a particularly harsh, where more than 60 percent of Jakarta was inundated; between 58-74 mortalities and a total of over 400,000 residents affected (Texeir, 2008). In Kampung Malayu in East Jakarta, waters from the nearby Ciliwung River reached levels as high as 11.20m from the thalweg¹², and floodwaters destroyed 100 houses in area kampung (ibid).

According to Garschagen et al. (2018) and Texier (2008), the problem of flooding has been intensifying rapidly over recent decades, primarily due to human causes, including massive population growth in the city, economic and industrial intensification over the course of the 20th and 21st centuries, as well as extensive outward spatial expansion, despite a greenbelt clearly designated by a series of development master plans adopted since 1965. The population of the Jakarta DKI¹³ has grown from 3 to 10 million over the past five decades, with the coastal area comprising more than 20 million inhabitants on its own. Urban land use within the DKI boundary has increased by over 276 percent over essentially the same period, absorbing 565 km² of the available 674 km², or over 83 percent of available undeveloped land (Garschagen et al., 2018; Texier, 2008). During the 1972-2014 period the city's urban sprawl grew beyond the DKI administrative boundaries causing significant changes to run-off and flood hydrology (ibid). according to Garschagen et al. (2018), this urban sprawl has been forming an increasingly continuous megametropolitan region with formerly separated sub-centres in Jakarta's adjacent kabubaten (regencies). This mega-metropolitan region, commonly referred to as Jabotetabek¹⁴ is an emerging world city hosting between 27 and 30 million people (Garschagen et al., 2018; Priatmodjo, 2016; Jakarta Open Data, 2017). In addition to massive urban development expansion and population growth, Garschagen et al. also note significant land use conversion, up to a factor of 31, during the 1972 – 2012 period (2018). In addition to largescale land conversion activities, a large number of rivers, canals, wetlands and other

¹² Thalweg: Defined as the line connecting the lowest points along multiple cross-sections along the course of a river or valley (Oxford Dictionary, 2021).

¹³ Jakarta DKI stands for *Daerah Khusus Ibukota Jakarta* or Special Capital Region of Jakarta (Steinberg, 2008).

¹⁴ Jabodetabek refers to the metropolitan region of the Jakarta DKI and its neighbours Bogor, Depok, Tangerang and Bekasi (Garschagen et al., 2018).

waterbodies have been built over, further reducing the water absorption abilities, flood retention and discharge capacities of the entire region of Jabodetabek (Garschagen et al., 2018).

Texier (2008) and Steinberg (2008) note that urban development promoted by successive governments starting with Soekarno in 1945 have led to the construction of tall buildings which has reduced downstream water absorption significantly. In recent decades, the development of large shopping malls and luxury high-rise residential complexes have progressively replaced traditional low-rise neighbourhoods, including kampung, and reduced green open spaces and woodlands, further diminishing the ability for water absorption in the city (Texier, 2008). Another factor, according to Goh (2019, p250), "is the state of infrastructure in the city continually provisional and in progress", where flood canals, sluice gates, catchment ponds and other water infrastructure have been in various stages of development from planning to inception and completion since the Dutch colonial era. Goh (2019) also notes the long running contestation between the DKI government and the city's poorest residents, where officials unfairly blame kampung residents of actually causing flooding, or as Texier (2008) describes, exacerbating existing flooding because they are throwing waste into the waterways and building structures to close to them, or in some cases on stilts over the top of them (Priatmodio, 2016)¹⁵. This is particularly relevant in light of the significant infrastructural works under construction along the city's northern coastline, where a number of kampung have experienced eviction and demolition in order to improve existing infrastructure or build new flood defences. These residents nevertheless unfairly and inaccurately shoulder the blame for flooding.

Garschagen et al. suggest the second most important cause of flooding in Jakarta is due to the city's significant land subsidence problem, where some areas have experienced up to 25cm per year in extreme periods, and up to 4m between 1974 and 2010, where the most affected areas are along the city's northern coastline, the area with the lowest natural topography and some of the most intensive industrial activities (2018). According to Garschagen et al. (2018), land subsidence in Jakarta is caused by three factors: massive

¹⁵ Residents of kampung have little choice, as no municipal, city-wide waste removal services operate.

uncontrolled groundwater extraction for industrial and private uses, natural sediment compaction and substantial compaction loads from infrastructure and buildings, where most studies agree groundwater extraction is the most significant of these factors. Indeed, according to Octavianti and Charles (2019a) and Abidin et al., (2011), areas of North Jakarta have been subsiding at a rate of up to 15 centimetres per year, some of the highest rates of urban sinking in the world (Octavianti and Charles, 2019a; Sherwell, 2016).

It is clear that flooding is not a new problem for Jakarta but is a historic legacy going back to the early Dutch colonial period, yet it is an issue yet to be solved with long term solutions. The problem stems from a number of natural and manmade causes, with ongoing urban expansion and development continues to hamper the city's natural water absorption capability. Floods continue to plague the city, while the issue of land subsidence presents a major challenge.

Flood Infrastructure Works in North and East Jakarta

Due to the adjacency of the case studies utilised in this research to the North Coast (in North Jakarta and East Jakarta), and the associated infrastructure works currently taking place there, as well as their impacts on low-income communities scattered along the coastline, a brief review of the larger infrastructure development is important to understand the flood mitigation context the kampung communities described later in this chapter.

In 2007 an extreme flood event which inundated more than 60 percent of the city and resulted in 79 deaths with 500,000 evacuees, intensified long running debates around flood risk reduction in Jakarta and elsewhere in Indonesia and shifted the emphasis of flood mitigation drastically (Garschagen et al., 2018; Octavianti and Charles, 2019a). This severe flood was caused by heavy precipitation and discharge concurrent with an unusually powerful spring tide, where water was pushed into the city by rivers from the south, but also from the sea to the north, a situation which the city had not typically faced (ibid). The focus had previously been around diverting discharge from the upstream Ciliwung River catchment zone around the city and into the sea to the north, however the focus now

moved to incorporate coastal protection alongside attempts to improve and expand water retention capacities within the city's water and drainage network (ibid). The result of these pressures and shift in focus was the Jakarta Coastal Defence Strategy (JCDS), which was conceived by a consortium of Indonesian and Dutch specialists under the direction of the DKI government lead by Fauzi Bowo (ibid).

Flood risk since 2007 had focused on three primary mitigation measures (Garschagen, et al., 2018; Octavianti and Charles, 2019a):

- A strong emphasis on river and canal regulation and maintenance; the widening of waterways, clearance of riverbanks, both typically the subject of encroachment by squatters;
- Refurbishment, improvement, and expansion of flood reservoirs, especially in North Jakarta; and
- A new coastal flood protection wall currently under construction.

Garschagen, et al. (2018) note that these mitigation measures all require a significant amount of space, and considerable resettlement of existing residents in areas of encroachment has been necessary in recent years. The majority of dwellings affected belong to low-income and poor households residing in kampung which had been built atop or adjacent to the banks of rivers, canals and *waduk*, due to the scarcity of affordable housing elsewhere in the city (Garschagen, et al., 2018). 15,000 residents had to be relocated for the Ciliwung River alone over the 2013 – 2018 period (ibid). Added to these mitigation measures along the North Coast is a canalisation project covering a 19km stretch of the Ciliwung River, the city's main waterway, controversial due to the forced eviction of 70,000 riverbank residents but also because some experts have questioned the project's sustainability (Octavianti and Charles, 2019; Van Voorst, 2016; Monalisa, 2015).

Responding to these recent challenges, the DKI government has issued a series of policies to tackle flooding through implementation of mitigation and associated urban planning (Hidayatno, et al., 2017; Betteridge and Webber, 2019). The Jakarta Coastal Defence

Strategy (JCDS) is one of these policies, intended to respond to many of these challenges, will be set along the entirety of Jakarta's northern coastline, and constitutes a mega development is both size and scale. (Kops, 2012; Hidayatno, et al., 2017). The JCDS is essentially a security system for the city, being realised as a series of physical and spatial interventions, most notably a giant seawall which will run along the entirety of the city's north coast, as well as related regulations concerning new water transmission and distribution infrastructure, as well as large scale land reclamation in the coastal area (Hidayatno, et al., 2017). Ground-breaking for the JCDS project occurred in October 2014 and (ibid) is currently well under construction.

The JCDS has been revised and expanded a number of times since 2011, which has led to a related policy, the National Capital Integrated Coastal Development Master Plan (NCICD), also developed by a Dutch-Indonesian consortium, which was implemented in 2014, led by the Coordinating Ministry for Economic Affairs of Indonesia, with a strong partnership with the DKI government, the National Development Planning Agency and the Ministry of Public Works (Garschagen, et al., 2018). It was enacted largely in response to the 2007 and 2013 floods, in particular the latter, when the city's central business district was submerged (Octavianti and Charles, 2018). This plan builds on the idea of blocking the Bay of Jakarta off from the sea envisaged in the JCDS, through the implementation of a giant seawall known as the Great Garuda¹⁶ Project (due to the shape of the land reclamation involved), to be 25km long, behind which the bay will be converted into a sealed reservoir regulated to remain below sea level, allowing for controlled drainage of the city (ibid). It is within the context of the JCDS and the NCICD and associated flood infrastructure projects that the case studies undertaken in this article are set. The influences and direct effects of these plans and their associated policies have directly influenced the spatial development of North Jakarta.

¹⁶ Referring to the mythological bird of Hindu culture which is also the national symbol of Indonesia.

Historic Institutional Context in North Jakarta: Flood mitigation and kampung evictions

This section sets kampung communities in relation to the power of the Indonesian state and local governments in the context of Jakarta, where large communities of urban poor reside in such flood-prone neighbourhoods. Kampung are illustrative of the power dynamic between the government and local residents where flood mitigation policies are prioritised over the needs of the poor.

The concept of illegality in Jakarta is complex. Many informal settlements are not populated by squatters, but long-term residents with right of tenure. Though many kampung have been consolidated with secured tenure, many remain officially illegal or have unregistered land titles Winayanti and Lang, 2004). Winayanti and Lang (2004) estimate that up to 60 percent of the land allocated for housing is unregistered. These properties may have various designations, including *girik*¹⁷ or *garapan*¹⁸, neither of which is formally registered with the Ministry of Land. Therefore, kampung residents are often vulnerable and marginalised groups and forced onto land deemed undesirable or ill-suited for formal development which had been informally subdivided into individual plots for residential or employment uses (Winayanti and Lang, 2004). Nationally, across Indonesia, the Ministry of Housing defined informal settlements as *kampung kumuh* (slums), irregular settlements with substandard infrastructure, small plots of land for each housing unit, low-quality structures and building materials, and illegal construction (ibid).

It is important to understand the nature of the kampung in relation to the planning system in Indonesia. The word 'kampung', which originally meant 'village' under Dutch colonial rule, in part because of these communities' relative isolation and spatial segregation from the colonial European city (Ford, 1993), together with a traditional land tenure system, had

¹⁷ Dating back to the Dutch Colonial era, *girik* was a land tax on indigenous farmland. Today, if *girik* is registered with the National Ministry of Land, it includes *hak milik*, or ownership rights (Winayanti and Lang, 2004).

¹⁸ Garapan is a term derived from Javanese originally used to describe land that could be exploited or worked agriculturally, and farmers must typically obtain permission to utilise the land for these purposes from the village head (Winayanti and Lang, 2004). In more urban areas *garapan*-designated land has often been developed for housing, and where it is registered with the National Ministry of Land, it usually includes *bak* guna bangunan or building utilisation rights. Despite this many government entities consider the residents of garapan-designated land as squatters and therefore illegal occupiers (ibid).

a high level of autonomy (Reerink, 2015). As the colonial city of Batavia (today Kota Tua) developed to the south of the old port at Sunda Kelapa during the 17th century and from there to Weltevreden and the Koningsplein (today Medan Merdeka), kampung surrounding these areas to the west, south and east were absorbed by the expanding urban form of the growing city. These informal communities transformed themselves by densifying and expanding to accommodate new rural migrants seeking affordable housing who formed much of the urban labour force (Dovey et al., 2019). This form of spatial and economic segregation remains to this day in Jakarta. Reerink (2015) argues the relative autonomy of kampung communities limited control by the state as they also allowed for the emergence of sub-standard housing conditions which over time served to facilitate the association of the word kampung with informality and slums. This itself symbolised a failure of the state to modernise and develop the city. Thus, the kampung came to be seen as the antithesis of *kemajuan* (progress) which is the goal of *pembangunan* (development), a central agenda of Indonesia's government during the postcolonial era (Heryanto and Lutz, 1988; Dovey et al., 2019).

Additionally, the urban housing policy of the DKI government historically prioritised private land development for new housing with little government oversight in recent decades (Texier, 2008; Firman, 2004). Texier (2008) argues that as a result, residents evicted from kampung and migrants from rural provinces were forced to dwell in the remaining marginal or vacant landholdings, e.g. riverbanks and along waterways, in railway sidings, on the northern coastline or underneath motorway overpasses. This is relevant, as Texier (2008) and Colven and Irawaty (2019) argue, because kampung are viewed as illegal settlements by the DKI government, and inaccurately, as a primary cause of flooding, particularly so in light of the increase in magnitude of flood events in recent years. This is emphasised due to the presence of informal housing encroaching along riverbanks and waterways.

Under the New Order regime of Suharto, kampung were upgraded through the second Kampung Improvement Programme (KIP), funded by the World Bank from 1968 onwards, and while basic services such as potable water, sewerage and electricity were improved, land tenure issues were not addressed, while other kampung continued to be demolished with the residents evicted to make way for contemporary developments built to

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an international standard (Kusno, 2011, 2013, 2023; Marulanda and Steinberg, 1991; Winayanti and Lang, 2004). Many of the river and canal bank kampung have customary rights of ownership over waterway lands while others have evidence of longstanding occupation, essentially de facto land tenure (Dovey, et al., 2019). Simone (2014) argues that the typical condition in Jakarta is ambiguity, because Jakarta has a highly complex land tenure classification system, including freehold ownership (HM), long-term lease (HGB), certificate of use, development rights on state-owned land (Girik, HPL), and *Adat* (customary ownership) (Dovey, et al., 2019). Dovey et al. (2019) argue that it is precisely this ambiguity of land title that creates the scope for politicians to use discretion in relation to land development. Governor Ahok passed a law in 2014 declaring all riverbank kampung in Jakarta as illegal, calling for all structures within 15m of the river or canal banks to be demolished (Dovey et al., 2019). This presented an immediate problem for many communities living along riverbanks, as most were within this 15m easement.

Kampung demolitions and evictions are unfortunately not new. In fact, they can be traced back at least as far as 1958 when then President Sukarno planned to construct sport facilities at Senayan in Central Jakarta, needed for Indonesia to host the 1962 Asian Games. As a result, 60,000 residents of four kampung across the area were evicted to make way for the subsequent Gelora Bung Karno Sport Complex, which covered over 166 hectares (Andapita, 2019). Kampung became ever more crowded during the 1970s and 80s due to increases in the cost of living, as well as rural to urban migration, which left the urban poor with little alternatives. During the 1980s in particular, the sole providers of housing were private developers, whose profits-based decisions were not based on the needs of the wider city. As kampung became ever more crowded, with a lack of basic services and infrastructure (prior to the second KIP), "evictions were used by those in power to marginalise those with less power" (Andapita, 2019). Additionally, Colven and Irawaty (2019) argue that state-led evictions have increasingly been viewed as compatible with environmentalist agendas, for example as researched by Doshi (2013 and 2019; Anguelovski et al., 2019).

The trend of evictions has unfortunately continued as a number of other informal settlements have been demolished or threatened with demolition in recent years. Kampung

Pulo and Bukit Duri (see Table 3.2) and Luar Batang were the focus of evictions and demolition in 2015, carried out under the auspices of flood management (Colven and Irawaty, 2019). Winayanti and Lang (2004) contend that official maps such as the *Peta Tematik Daerah Kumuh* (Map of Slums) issued by the Jakarta Map Agency, evaluation reports on physical conditions such as the *Kelurahan* (ward) and *Rukun Warga* (RW, citizens' association) document the locations of informal settlements without identifying them. For example, majority of kampung located along waterways, waste disposal sites or railway and motorway infrastructure are not documented (ibid). Winayanti and Lang (2004, p43-44) argue that government institutions are not inclined to document informal settlements several reasons:

- Kampung may lack the administrative status of *Rukum Tetangga* (RT, or Neighbourhood Association), calling into question the legitimacy of the community.
- Kampung which are considered illegal due to land status or zoning, even where the community has RT status, because they are considered to be occupying stateowned land required for a particular public utilisation, or land which is zoned for non-residential uses.
- There is an assumption that the kampung will at some point in the future be demolished and the residents evicted.

In addition, Dovey et al. (2019) argue that flood control in Jakarta is being utilised as a pretext to justify forced eviction. This could be understood merely as a negative but necessary consequence of flood mitigation, however Dovey et al. (2019) and Kusno (2013) contend that it is actually a form of neoliberal urbanism or political opportunism where Jakarta is effectively being cleansed of undesirable neighbourhoods in order for the city to develop into something more internationally significant, such as Hong Kong, Singapore or Kuala Lumpur. This continues a long tradition of colonial practices that involve 'cleaning up' the city, in which the urban poor are synonymous with grime. Dovey et al. (2019) explain, is essentially a "discourse of normalisation" (p265) along the waterways of Jakarta, where recent forced evictions have been carried out in recent years in a number of kampung communities across the city with the aim of cleansing the city of 'undesirable' or

'unsightly' informal development. This is backed up by Winayanti and Lang (2004, p44) who contend, based on United Nations Development Programme (UNDP, 1997), 68 instances of displacement involving 194,582 residents in Jakarta between 1990-1997. Winayanti and Lang (2004, p44) further evidence 265 evictions displacing 108,873 households between 1996-1997 based on research by Buyamin and Kartini (1998).

The Indonesian government refers to squatters officially as *penduduk liar* (wild residents), which suggests an unfavourable or pejorative connotation of residents living in informal settlements (Winyanti and Lang, 2004). This negative association further disadvantages the urban poor and vulnerable who already contend with flooding, affordable housing and security of tenure challenges. Indeed, so-called 'wild residents' are the worst affected victims of forced evictions and often receive little to no compensation to rent or construct replacement homes. These individuals often have no place to go as a result of their evictions and become homeless or become squatters of other undesirable or unsuitable land illegally, sometimes within other existing kampung of the inner city, on hidden or neglected sites along or underneath infrastructure such as railways or motorways, river- or canal banks, cemeteries and pavements of Jakarta¹⁹ (Winayanti and Lang, 2004; Dovey and King, 2011).

The physical changes part of what Dovey et al. (2019) call the discourse of normalisation are taking place within the context of major infrastructural developments in response to land subsidence, flooding and climate change taking place along Jakarta's North Coast. This area is comprised of a mixture of industrial uses, maritime industries, marginalised and informal settlements, traditional fishing communities (many on stilts) and pockets of affluent Chinese-Indonesian neighbourhoods (Betteridge and Webber, 2019). Leitner et al (2017, p198) argue that forced "eviction from kampung is an integral component of these infrastructure projects", in order to reclaim potential profitable sites, but also to clear out so-called 'illegal' residents, relocating them to more formalised housing where they can engage in formal employment, thus removing another obstacle to higher quality development and the creation of an improved city image. Indeed Colven (2017) contends

¹⁹ See Morphology of Kampung section below.

that these projects form part of enduring desires by political elites to redevelop Jakarta as a more competitive, word-class city. However, for the residents of kampung these environmental governance interventions, including flood mitigation and land reclamation, can contribute to vulnerability as significantly as natural disasters, (Betteridge and Webber, 2019).

Since the governorship of Jokowi in 2012-14, forced eviction has become increasingly tied to resettlement programmes, however these often involve significant displacement to alternative housing located far away from the residents' original settlement and often result in loss of livelihood as economic and social networks are severed. This has led many residents to return to the site of their former dwellings (Dovey et al., 2019), as borne out by the example of Kampung Akuarium more recently where residents saw this as the only way they could earn a living. This continues a long trend of path dependency and institutional lock-ins²⁰ by the Indonesian state since at least the 1960s, where the government undertakes poorly managed or designed stakeholder engagement, or even totally fails to incorporate the views or needs of residents when planning infrastructural changes, often without adequate compensation (Colven and Irawaty, 2019). These often lead to eviction and demolition. Indeed, as Andapita (2019, para. 17) notes, "evictions were used by those in power to marginalise those with less power". These mistakes continue to be repeated over and over again, where the poor and marginalised are moved far away from social and livelihood networks, limiting their ability to earn a living in their new locations.

In 2015 and 2016, wide-scale evictions occurred under then Jakarta Governor Basuki Tjahaja Purnama, 'Ahok', Jokowi's successor. He evicted people from residential and business areas in order to create more green spaces or to develop infrastructure as part of the city's wider flood mitigation programme (Andapita, 2019). The Legal Aid Institute (LBH) of Jakarta recorded that these evictions affected more than 25,000 residents, and that in 2015 alone 48 of the city's 113 evictions had a significant detrimental impact on kampung communities located adjacent to riverbanks, *waduk* or the city's northern coastline (Colven and Irawaty, 2019). During the same period, the DKI government

²⁰ For explanations of path dependency and institutional lock-ins, see Chapter I.

developed a number of affordable housing complexes for evictees, typically located far away, on the urban periphery (ibid). Despite high hopes for the Governor Anies Baswedan, since he was sworn in in 2016, evictions continued under his tenure, despite a campaign pledge not to do so. In his first year in office, 79 evictions affecting 277 families and 864 neighbourhoods where residents operated businesses (ibid). Anies introduced the Community Action Plan (CAP) programme, launched in May 2018 via a gubernatorial decree targeting kampung management, including 21 neighbourhoods utilising the regional budget. The programme provides residents with the opportunity to work in the administration to find solutions to housing challenges and was implemented in kampung affected by evictions such as Kampung Akuarium, where evictees are provided with temporary shelter, which has more recently been replaced with a permanent apartment block (ibid. However to date the case of Kampung Akuarium appears to be an unusual case not at all typical of Anies' modus operandi, and was undertaken purely for his own political benefit (see description later in this chapter).

The correlation between environmental improvements and evictions, particularly around flooding, is not limited to Jakarta or indeed Indonesia. Coelho (2016) describes three decades of failure of state interventions in Chennai. There informal settlements, termed as "slums", "tenements" or even "ghettos" continue to be seen as "evesores," problems in need of "renewal" so that cities can be more aesthetically pleasing and "renewed" to ensure their "competitiveness and bankability" following the repositioning of Indian cities in the 1990s, when the economy was opened up to international investment (Coelho, 2016, p112). This perspective is shared by Ghertner (2011) who describes the Delhi Development Corporation's efforts to rid the inner city of pollution and the accompanying dirt, filth, and poor sanitary conditions of informal settlements, particularly ones situated in close proximity to industrial facilities, by evicting the residents and demolishing their homes. Nyametso (2011, p25) concurs, describing the eviction of squatters from informal settlements in Accra for the construction of so-called "acceptable housing" and associated undefined "environmental improvements". Unfortunately for the residents of kampung communities in Jakarta, their government appears to continue to pursue similar strategies of prioritising infrastructure over local needs.

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Neighbourhood Associations and the Government of Jakarta

In this research, some neighbourhood organisations are mentioned in the case study section, as they relate to efforts of local communities to improve their living conditions, or where such associations factor in disputes between local residents and local government, for example in cases of demolition and eviction, as well as land tenure rights.

The Republic of Indonesia is a unitary state, though power has since the late 1990s been significantly decentralised to regional and municipal levels (Evans, 2020). The government hierarchy is led by the president of the republic, elected at the national level, alongside a bicameral elected parliament. Following the decentralisation process initiated after 1998, the national (or central) government retains exclusive powers in four key areas: foreign policy, national defence, monetary and fiscal policy and religious affairs (ibid). Examples include education, where the national government is responsible for tertiary education, while provinces are responsible for secondary education and recencies for primary education. Road transport is another relevant example, though here each level of government is responsible for some roads, and there are road categories corresponding to this division of duties: National, provincial, local and village roads (Evans, 2020).

Indonesia is comprised of 34 provinces which form the second tier of government after the national level. Each province, including the special administrative region, is led by an elected governor. The 2014 amendments to the Law of Regional Administration retained key powers to coordinate authority on matters located within their boundaries which also have implications for *kota* and *kabupaten* administrations, the third level of government. The fifth level of administration is that of the village. Of this level there are two types, *desa* or rural villages, and *kelurahan* in urban areas. Desa are semi-autonomous from the *kecamatan* where they are located, and their *kepala desa* (village head), is elected by residents (Evans, 2020).

As noted elsewhere in this dissertation, Jakarta, as the capital of Indonesia, is designated as a special administrative region, treated as a province and headed by a governor. Below the

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governor are the *wali kota* (mayors) who are elected and serve as the heads of each of the special region's five *kotamadya* (city regions): *Jakarta Pusat* (Central Jakarta), *Jakarta Utara* (North Jakarta), *Jakarta Barat* (West Jakarta), *Jakarta Selatan* (South Jakarta) and *Jakarta Timur* (East Jakarta). Each *kota* is then divided into *kecamatan* (districts), headed by a *camat*, a career civil servant appointed by, and accountable to their *wali kota* or, in the case of Jakarta's one *kapubaten*, the *bupati* (regent). Below the *camat* is the *kelurahan* (sub-district), headed by a *lurah*, also a career civil servant (Dwianto, 2003; Evans, 2020).

Specific organisation structures at the local level can vary, however located within provincial administrative offices sit a number of departments or bureaus, including those responsible for staffing, finances, planning and development control, protocol, legal affairs, public affairs, communications to name a few. Within provincial and local administrations are *Bappeda*, the regional planning boards. They play a central role in drafting the annual budget in conjunction with the Regional Budget Financial Management Agency. Once drafted, these budgets must be passed by the *Dewan Perwikilan Rakyat Daerah*, or DPRD (the respective provincial or local representative councils) who also have responsibility for passing local authority regulations that fall within their respective territories (Evans, 2020).

Official neighbourhood associations, typically referred to as 'RT/RW' constitute the representative form of local residents in Indonesia (Dwianto, 2003). *Rukun Tetangga* means (Neighbourhood Unit), while *Rukun Warga* (Community Unit), Yuliastuti et al (2015). In theory all households in a given community are members of their RT/RW, and these neighbourhood associations manage various community matters, including maintaining a hygienic environment, crime prevention, neighbourhood events, marriage ceremonies and funerals, as well as the collection of membership fees and other dues from local residents (ibid). It is effectively the smallest rung of local representative governance (Sullivan, 1992 and Suwarno, 1995, cited in Dwianto, 2003, p41).

RT/RW were established during the Japanese occupation during the Second World War and are recognised as people-focused organisations under the protection of government, but not units of the government itself, based on the Decree of the Governor of Jakarta, December 23rd, 1966. They are tasked with promoting integration between citizens and government, accepting and implementing the government's proposals and plans for the development of society, preserving *musyawarah mufakat* (the spirit of mutual consultation), as well as *gotong royong* (mutual assistance), collecting dues and making use of any means available for the improvement of local living conditions (ibid). the heads of each RT also act as civil registrants tasked with verifying the identity of their local residents needing various permits from higher levels of administration (Evans, 2020) (see Figure 3.0a).

Figure 3.0a: The five levels of government in Indonesia (from Evans, 2020).



According to Speirs (2024), RT is the smallest unit, consisting of 10-20 households. At neighbourhood meetings, members of the RT can debate various issues and elect a chair, who is assisted by RT officers, also elected. Their responsibilities include "maintaining communal harmony between members", ensuring community services are carried-out, mediating community disputes and coordinating community action. RW is the level above RT, and is usually comprised of several RTs, typically between 5-10. The RW chair is selected by the chairs of the RTs, as are the RW officers. Their responsibilities are similar to those of RTs, including supervising RTs in their RW, aiding the territorial administrator in carrying out their responsibilities, and bridging the gap between community and local government (Speirs, 2024). Because *kelurahan* are the smallest units of the official administrative system, RT/RW are not considered official bodies that are part of the local government administration (Dwianto, 2003; Evans, 2020).

The Urban Morphology of the Kampung

Approximately 54 percent of the planet's population currently resides in cities, while 70 percent is expected to live in urban areas by the middle of the century (Jones, 2017). In addition to this, in excess of one billion people worldwide reside in informal settlements, also frequently referred to as 'squatter settlements', 'irregular settlements' or 'slums', a population that is expected to rise to 1.4 billion by 2020 (UN-HABITAT, 2006; Raharjo, 2010). This sits within a context of rapid economic change and population increases with associated activities more and more concentrated within urban areas as resident populations seek urban lifestyles with corresponding levels of services, infrastructure, amenities and associated levels of liveability (Jones, 2017). One of the consequences of rapid urbanisation in recent decades is a relentless acceleration of the development of informal settlements, including slums (ibid). For example, in Jakarta, estimates of the number of poor living in informal settlements is suggested at between 5 to 50 percent of the city's inhabitants Baker (2012), Firman (2011); Badan Pusat Statistik (2016) and *The Jakarta Post* (2014).

UN-HABITAT (2006) suggests such informal settlements have emerged as a result of poverty together with a lack of affordable housing, while poverty itself results from a combination of income inequality, lack of economic growth and rural to urban migration (2003). These settlement types appear to be part of a wider process of urbanisation which facilitates and allows their residents access to housing, land, infrastructure, services, and economic activity through extra-legal processes that would otherwise be impossible for them (Jones, 2017).

Perlman (1976) classically argued that any notion these populations are insignificant to the cities they occupy has long since been disproven, while most cities in the developing world would cease to function economically without them. Indeed, "their permanency and scale of growth in the urban landscape of developing countries reflects their emergence as a universal city phenomenon which may be tolerated, accepted or their residents designated for eviction by government" Jones (2017, p2). Therefore, policies addressing such communities are diverse and can include in situ upgrading, demolition, resettlement or redevelopment (Jones, 2017; Rujak, 2018). Reinforcing Elias, et al. (2018), Dovey and King (2011) explain that such informal settlements have developed in the same locations over long periods of time into well-serviced neighbourhoods, no longer slums in the sense of merely housing the poor of the city, but with varying levels of income, tenure, and formality.

In Jakarta, the majority of the urban poor reside in such informal settlements, typically referred to as *kampung*, many self-built and spontaneous in nature, often without formal land titles. Land plots and buildings in kampung are often acquired initially without authorisation from local authorities. This illegal land occupation has effectively stripped the residents of these informal settlements of citizenship rights and access to basic infrastructure and municipal services (Winayanti and Lang, 2004). Winayanti and Lang (2004) argue that the concept of illegality depends in large part on the context of local laws. This is important to understand because any informal settlements are not squatter settlements, or only so in part, incorporating varying degrees of illegality. Jakarta, these kampung have evolved historically under changing social, political and economic conditions going back to the Dutch colonial period in the early 17th century (Winayanti and Lang, 2004; Ford, 1993).

Dovey and King (2011, p13) have identified three processes of development in informal settlements, including 'settling', where squatters occupy unclaimed, unwanted, unoccupied, or unbounded land; 'inserting' into uninhabited, abandoned or leftover fragments of urban land, or 'attaching', where informal settlements grow out of or attach onto formal structures of the city. These processes are also reflected in Kamalipoor's (2016) research on similarly situated Khlongs (informal settlements) in Bangkok, Thailand. These development

processes take place in a variety of contexts, including on unused land, on, under or around urban infrastructure, at the edges of formal settlements and in rustbelt districts. Houses within informal settlements often expand and develop horizontally or vertically (or both) in "room-by-room accretion", that can extend up to five or six storeys in height and is a process of gradual accumulation of resources and materials (Dovey and King, 2011, p13).

Dovey and King (2011) and Raharjo (2010), among others, suggest a series of informal settlement types. The following characterisations (Dovey and King, 2011, p14-18) are related to the Indonesian context:

- "Districts" Informal settlements developed to such a state that they are large, mixed-use districts in their own right, with significant retail and industrial land uses, which can no longer be described as infiltrations or encroachments. Examples include Kampung Manggarai and Kampung Karet Tengsin in Jakarta.
- "Waterfronts" Settlements on marginal landholdings situated between formal elements of the city and water bodies such as rivers, canals, lakes or harbours, and often on land considered or designated as unsafe, or prone to flooding. Examples include kampung built on the edges of harbours or along rivers or canals in Indonesia, such as Kampung Akuarium and Kampung Pluit and Ria Rio in Jakarta. This typology of is particularly relevant to this study, as all three case studies are located on or adjacent to waterways. Raharjo (2010) notes that informal settlements commonly locate along urban waterfronts prone to hazardous dumping, flooding, landslides and other natural disasters, common in South and Southeast Asia. Despite these challenges, the necessity of employment in city centres and proximity to water sources overrules these concerns (ibid).
- "Easements or Infrastructure Margins" Settlements situated along, above, adjacent to or underneath urban infrastructure, including railways, motorways, road overpasses, large power or sewer lines, or railway sidings which function as pedestrian routes in between passing trains. This includes Sidewalk Encroachments, which are linked to informal trade and associated activities and is manifested in built structures occupying part or the entirety of the sidewalk or footpath.

- "Backstages" A type of informal settlement formed largely through its attachment to or insertion between existing buildings and in situations where it remains largely hidden from public view, often behind formal development, deep within urban blocks and accessed by narrow alleyways.
- "Enclosures" A type of informal settlement physically constrained within the formal shell of a large building or inner areas of urban blocks, vacant plots or institutional compounds, where the formal boundary sets the limit of any extensions to and visibility of informal settlements. Enclosures are typical of Jakarta and other Southeast and South Asian cities.

Jones (2019) argues that at the strategic, citywide scale, informal settlements typically develop in similar locations or conditions throughout urban areas, for example along the edges of waterbodies, adjacent to waste disposal sites, on vacant, abandoned, or customary landholdings, as well as landlocked sites such as urban villages. He explains the inherent order in informal settlements at the local level as reflected in a series of outcomes, including (ibid):

- Fluid public and private space boundaries transgressed, contested or negotiated on a regular basis by local residents in the absence of clearer or higher levels of state enforcement;
- Patterns of spatial occupation whereby the introduction of structures, buildings and the demarcation of boundaries is initiated first, followed by a range of services such as potable water, sanitation, power, roads and the acquisition of rights to land tenure;
- Strong dependence on localised socio-cultural values, traditions and their associated protocols;
- Communities which display resilience in conditions of low availability of financial capital and high environmental or natural hazards;
- A robust and vibrant market in traditional or state land dealings and house or room rentals which provides financial security for landowners; and

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 The utilisation of governance solutions established with include mixtures of social groupings such as community leaders, informal local representatives or other persons of importance, committees, religious establishments, and other groups.

Jones (2019) also describes informal settlements in the Indonesian context in detail, noting common features derived from a combination of natural features such as rivers and topography, "past major development decisions driven by in-migration and settlement growth" (p51), as well as gradual changes to land uses, e.g. from agricultural to housing or commercial uses. This is certainly the case with kampung in Jakarta, for example where development is driven in part by natural waterways, and manmade infrastructures including sluice gates, canals, and flood walls, but also the availability of land accessible to squatters.

Supriatna and Van der Molen (2014, p382), categorise kampung into three typologies: 'inner city', 'woodland' and 'peripheral'. In the case of the kampung studied in this article, all three are of the inner-city variety as described by Supriatna and Van de Molen (2014). Octifanny and Norvyani (2021) describe kampung as having cramped houses, narrow roads and irregular structures and geometries. These village-like neighbourhoods were historically located close to city centres, or as in the case of Jakarta, settled around the periphery of the colonial city of Batavia (Octifanny and Norvyani (2021), Ford (1993).

Cuadra (2015), notes that informal settlements often pre-date the formal elements of the city, such as when an existing village is swallowed by urban development, a situation common to Jakarta. Such settlements can, over time, become virtually indistinguishable from more recent encroachments because traditional morphological patterns become redeveloped over and over again as settlements are continuously rebuilt to higher and higher densities (Dovey and King, 2011).

Political parties can be known to form alliances or agreements with squatter communities who guarantee protection from eviction in return for votes (Dovey and King, 2011), as was the case of Jakarta's recent governor Anies Baswedan, who allied himself with the evicted residents of Kampung Akuarium where shelters were subsequently erected with local government assistance for residents whose homes were demolished by his predecessor Ahok. Anies has promised to build new housing on the site (Rujak, 2018; Kimmelman, 2017).

While state responses to the challenges of informal settlements vary, they include slum upgrading, on-site resettlement, offsite resettlement, outright eviction and demolition of homes (Cuadra, 2015). Forced resettlement generally takes place with demolition of existing housing and does not necessarily guarantee compensation, while resettlement often means residents being moved far away to cheaper land on the urban periphery where social networks are severed and access to livelihoods is severely impaired (ibid). Dovey and King (2011) note that such relocations have the effect of stimulating local real estate, creating the conditions where formal development can take place as wealthier residents move back into the city to be closer to local employment, in the West often referred to as 'gentrification'. This pattern of eviction has been increasingly replaced by coercive displacement, where residents are either enticed to sell or intimidated into moving under unfavourable conditions (Dovey and King, 2011; Cuadra, 2015).

Summary of Findings

The findings in this paper are categorised in order to link each case study with the relevant historical institutionalist characteristics in relation to recent infrastructure works or improvements undertaken by the government. These include those policies or regulations utilised in order to carry out the spatial interventions, as well as the impacts on the built urban form of the city in the locations studied (see Figure 3.0b). These can be found in Tables 3.1-3.7. These characteristics are then set within a spatial context by utilising satellite imagery together with diagrams by the author utilising an OpenStreetMap, GIS-base, highlighting, in various contrasting colours, where structures have been demolished, as well as where waterways have widened following the associated infrastructure upgrades or improvements. These spatial impacts of policy decisions are illustrated by the satellite imagery and urban form diagrams in Figures 3.1-3.8. Together the findings clearly demonstrate the spatial impacts of policy decisions made by the national and DKI governments on the physical urban form of the city. The GIS-based diagrams have utilised
Open Street Map open-source data for the base cartography, then assessed against historic satellite imagery available from Google Earth (2000-2024). In this way any detectable discrepancies in the Open Street Map data is reconciled with high resolution satellite images. Additionally, this makes possible to delineate clearly where buildings and other structures have been demolished.

Several kampung affected by flooding and related infrastructure changes are utilised as case studies in this section: the large kampung on the eastern side of Waduk Pluit, the kampung on the north side of Waduk Ria Rio, Kampung Akuarium in North Jakarta and Kampung Bukit Duri and Kampung Pulo in East Jakarta, as well as the collective kampung of Kolongol, Tongol, Lodan and Kerapu in Sunda Kelapa and Kampung Kunir in Kota Tua in North Jakarta. These sites were chosen because of their adjacency community infrastructure subject to government pilot projects or other improvements in the context of new sea walls and other works being constructed as part of the JCDS and National Capital Integrated Coastal Development Master (NCIDC) along the city's northern coastline. This area is at the heart of sea level rises, land subsidence and flooding, and as such clearly illustrates the challenges of implementing flood resilience into the physical urban fabric of the existing city, as well as the impact of these decisions on the lives of local residents living in the affected communities along the North Coast.

In 2012 the then new governor of Jakarta, Jokowi, began a process of infrastructure improvements which he would become known for both during his tenure as head of the national capital and during his later presidency. Two examples of this initiative to improve the water infrastructure of the city were initially realised in pilot projects at Waduk Pluit and Waduk Ria Rio in North Jakarta (see Chapter II), chosen primarily because of their strategic locations, silting problems, narrowing of waterways, large numbers of squatters present in both sites, as well as a high prevalence of water hyacinth infestation and importantly, recurring flooding problems (Priatmodjo, 2016).



Figure 3.0b: Map of the kampung communities analysed in this chapter.

A change in policy between the tenures of Governor Jokowi (2012-2014) and Busuki Tjahaj Purnama, 'Ahok' (2014-2017), was realised in the demolition of three kampung: Kampung Akuarium in North Jakarta and Kampung Bukit Duri and Pulo in East Jakarta. Kampung Akuarium, which was a long established kampung comprised of two and three storey houses surrounding the Paasar Ikan, the local fish market and adjacent to the Maritime Museum²¹. The neighbourhood was built on land running to the north of the market, where a sea wall protected it from the waters of Sunda Kelapa, the historic harbour of old Jakarta, pre-dating the establishment of the Dutch colonial city at Batavia (today Kota Tua) nearby to the south. What was once a vibrant community filled with houses and the occasional shop, integral to the city's economy, has since been demolished (Tilley, et al, 2017; Darwis et al, 2018; Rujak, 2018).

²¹ The present Maritime Museum is located on the site of the former Dutch fort.

Kampung Penas Tanggul

Kampung Penas Tanggul is located along the Cipinang River in East Jakarta (see Table 3.1 and Figure 3.1), with an estimated population of 388 in 2000 (Winayanti and Lang, 2004). Comprised primarily of migrants from West Java, Central Java and East Java Provinces, most lived in informal settlements in the area surrounding Penas Tanggul before moving to the kampung, which dates back to the early 1970s when several migrant farmers constructed temporary shelter on dry land along the Cipinang River. These squatters considered the land to have *tanah communt*²² (land used for agriculture) status (ibid). On the river's eastern bank, a smaller group of squatters living in overcrowded housing units has a stronger claim to land tenure based on the principle of *girik*²³. These residents managed to resist at least two attempts of forced eviction starting in 1975. By the 1980s both settlements had grown larger, however the Jakarta DKI government designated the western side as an area for dumping rubbish, resulting in the presence of scavengers who built *lapak*²⁴ (ibid).

In 1991 the Mayor of East Jakarta issued a *Surat Perintah Bongkar* (Letter of Eviction) which stated that the residents must remove themselves from the riverbanks within seven days (Winayanti and Lang, 2004). Following major protests at the local mayor's office by residents, they government relented and allowed the community to remain, though some land located along the river in the southern area of the current settlement could not survive forced eviction and residents were relocated, with the land remaining vacant today. Other evictions took place in 1992 and 1993, as well as a fourth in 1997 which resulted in 38 households and 109 residents, the majority of residents in the eastern area of the settlement, being evicted and their houses demolished (Winayanti and Lang, 2004). Minimal compensation of Rp 150,000 (US\$62.73)²⁵ per household was issued at the time, though some did not receive any compensation, though there was a solidarity fund of IDR100,000 (US\$41.82) per household (ibid). However, it is important to note that no

 ²² Land ustilised for agriculture, e.g. rice paddies, vegetable or fruit production (Winayanti and Lang, 2004).
 ²³ See earlier footnote.

²⁴ Places where rubbish is sorted for reselling or recycling, awhich often serves a residential function as well (Winayanti and Lang, 2004).

 $^{^{25}}$ Based on the US\$1.00 = IDR2371.00 official exchange rate set out in the US Treasury (1997).

indication of offers by the government of alternative housing, whether at a distance or in the local areas being made available has been found.

Table 3.1: Kampung Penas Tanggul key findings from satellite & GIS-based mapping

analysis

Kampung Penas	s Tanggul, East Ja	akarta					
Area of wider kampung: 212,679.40m ² Area demolished: 24,652.27m ² Percentage of built form demolished: 11.6%							
Existing characteristics	Related policies/ Institutional characteristics/ era	Urban morphological characteristics	Actions taken	Related policies/ Institutional characteristics	Effects of actions taken on urban morphology		
A kampung straddling both sides of the Cipinang River (Winayanti and Lang, 2004).	1991 Serat Perintah Bongkar (Letter of Eviction) (Winayanti and Lang, 2004); Decentralisation Era: 2014 Law Declaring all informal settlements constructed along or over riverbanks, canalsides and water infrastructure illegal, under the governorship of Ahok (Dovey, et al., 2019).	Extensive kampung housing structures along the west and east banks of the river, in some cases houses extending out over the water and in close proximity to flood infrastructure (Google Earth, 2019). Kampung type: Waterfronts and Easements (Dovey and King, 2011).	Demolition of existing housing within a 15m easement offset from the riverbank, creation of a 10m wide maintenance and access road (Dovey, et al., 2019; Google Earth, 2019).	Negotiated stakeholder engagement process to upgrade the two kampung, with support of Governor Jokowi pre- 2014 (Dovey, et al., 2019). Change in policy under Governor Ahok in 2015 resulting in declaration of kampung illegality, removal of residents within the 15m easement and demolition of houses (ibid).	Removal (demolition) of a number of kampung houses in areas atop or along the water's edge and within the 15m easement. (Dovey et al., 2019; Google Earth, 2019).		

Despite no further evictions so far evidenced for the 1997-2004 period, according to satellite imagery (Google Earth Pro, 2021), by at least 2009, a significant portion of the eastern area of the site, including more than 70 residential structures have been demolished to make way for the construction of the long-awaited Eastern Canal, which now occupies the site. During following the 1997 eviction up to the canal's construction, the community requested RT (neighbourhood association) status, without which residents could not obtain identity cards, a necessary prerequisite to legal citizenship and accessing local services, including public schools for their children. Despite being denied twice due to their illegal status, formal land tenure was finally achieved in 2000 following a visit by the Minister of Human Settlements to the community. This was the result of the intercession of the

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Institute Sosial Jakarta (ISJ), a local NGO who had been working with the community since 1986 and who lobbied the government on the community's behalf during the Period of Reforms following Suharto's ousting as dictator that took place from 1998-1999 (Winayanti and Lang, 2004). This case clearly illustrates a local kampung which had encroached upon a river the government deemed in need of improvement. The contested history of flood-prone land in Jakarta is illustrated well here where mayoral officials issue dictats to local communities who push back, demanding consideration of their rights.

This back-and-forth did not result in the elimination of the threat of eviction for the entirety of the community, as there were evictions in subsequent years in order to make way for new infrastructure, formal land tenure was finally achieved for a smaller remnant of the community (Google Earth, 2021). This demonstrates a government predisposition to prioritise infrastructure over the needs of local residents, a continuation of institutional lock-ins and path-dependency. In other words, this action by the government upholds long held historic institutional bias against the urban poor of Jakarta. By doing away with some of the kampung, the problem of unsightliness and the appearance of chaos in the capital is improved, if not fully remediated. It is questionable whether this was the plan of local officials from the beginning, realising they could not do away with the entire community, but with the aim of realising surgical interventions fulfilled.

The satellite imagery and diagrams illustrate the extent to which demolition has occurred over time, representing nearly 12 percent of the urban fabric having been removed. Houses and other structures have been pulled back from the riverbanks and the area around the new East Jakarta Canal. While new infrastructure ostensibly provides improved water circulation and drainage, particularly in flood conditions, a number of physical linkages have been severed by these changes. What was previously one large community has now been separated into two, and the remaining kampung have been further physically isolated. This spatial segregation no doubt mirrors an increased social segregation where the unwanted community is further hidden from the 'formal' city. Additionally, the increased capacity of the river, as well as the new canal are clear from the diagram.





Kampung Bukit Duri and Kampung Pulo

Kampung Bukit Duri and Kampung Pulo are located on both sides of the Ciliwung River in East Jakarta, along one of its most flood-prone sections (Dovey et al., 2019). Under Jokowi's tenure as governor, the government of the DKI engaged in a process of collaborative community consultation to negotiate an outcome that would allow needed infrastructure improvements along to length of the river to be carried out while minimising demolition and relocation (ibid). Most residents were open to a redevelopment of their neighbourhood, provided a sufficiently sensitive design could be implemented. With this in mind, a sympathetic local Jakarta architecture office – Studio Akanmoma – was engaged (ibid). The design realised consisted of new housing at heights of 4-10 storeys raised over an open ground level space which could accommodate flooding. This would allow for the retention of the local community while establishing new pedestrian access to the river. However, the project was deemed too costly by the Ministry of Public Works, which resisted it, despite support of the then-Governor Jokowi (Dovey et al., 2019).

Table 3.2: Kampung Bukit Duri and Kampung Pulo key findings from satellite & GIS

 based mapping analysis

Kampung Bukit Duri and Kampung Pulo, East Jakarta							
Area of wider kampung: 551,842.19m ² Area demolished: 46,488.10m ² Percentage of built form demolished: 8.4%							
Existing characteristics	Related policies/ Institutional characteristics/e ra	Urban morphological characteristics	Actions taken	Related policies/ Institutional characteristics	Effects of actions taken on urban morphology		
Two large kampung straddling both sides of the Ciliwung River. Presence of squatters around the edges of the water reduced drainage capacity severely (Dovey, et. Al., 2019).	Decentralisation Era: 2014 Law Declaring all informal settlements constructed along or over riverbanks, canalsides and water infrastructure illegal, under the governorship of Ahok (Dovey, et al., 2019).	Extensive kampung housing structures along the west and east banks of the river, in some cases houses extending out over the water and in close proximity to flood infrastructure (Google Earth, 2019, OpenStreetMap, 2021). Kampung type: Waterfronts and Easements (Dovey and King, 2011).	Demolition of existing housing within a 15m easement offset from the riverbank, creation of a 10m wide maintenance and access road (Dovey, et al., 2019; Google Earth, 2019;).	Negotiated stakeholder engagement process to upgrade the two kampung, with support of Governor Jokowi pre- 2014 (Dovey, et al., 2019). Change in policy under Governor Ahok in 2015 resulting in declaration of kampung illegality, removal of residents within the 15m easement and demolition of houses (ibid).	Removal (demolition) of a number of kampung houses in areas atop or along the water's edge and within the 15m easement. (Dovey et al., 2019; Google Earth, 2019).		

Following the election to the governorship of Ahok in 2014, a new policy was initiated which declared the kampung illegal and resulted in the demolition and forced evictions of housing located over and alongside the river (ibid; Google Earth, 2021). In 2015 houses on both sides of the river within a 15m easement from the river were demolished to create a

10m wide maintenance road, which doubles as a flood retention wall, creating a wider water channel of approximately 25m and an overall easement of 50m between houses on both sides of the river (ibid; Google Earth, 2021).

In this example, the community was consulted early on in the process. Despite this, the Ministry of Works, a central government department, resisted the cost implications, effectively deeming this poor community unworthy of a more costly solution which could have improved the image of the capital, another long-held government ambition. This illustrates how even when a progressive, community-focused governor is in power, the central government can still override gubernatorial considerations. Ahok's administration proved to be significantly more pro-infrastructure in its approach than did his predecessor Jokowi. This represents a return to a more historic tendency for governments to prioritise infrastructure concerns over that of kampung dwellers.

The satellite imagery and GIS-based diagrams illustrate primarily the extent to which both kampung have retreated away from the riverbanks to allow for the new maintenance road. While it may appear innocuous, more than 8 percent of the urban fabric of both kampung have been removed. The community's physical and spatial relationship to the river has been severed, and houses which once abutted other dwellings are now exposed to the river. While ostensibly better protected from flooding, this means these structures will bear the brunt of any flooding, increasing the risk of those inhabitants dwelling there. What can also be observed is the vastly increased capacity of the river as it passes through these two communities (see Figure 3.2 and Table 3.2)).

Figure 3.2: Kampung Bukit Duri and Kampung Pulo satellite imagery & OpenStreetMapbased diagrams.



Waduk Pluit

Waduk Pluit, located near the Java Sea and thus the northern coastline of the city to the north of the old colonial centre at Kota Tua, is the largest reservoir in the city at 80 hectares in area. It was initially constructed in 1960, though only completed two decades

later (Priatmodjo, 2016). By the 1990s the proliferation of informal housing erected by squatters had reduced the area of the *waduk*²⁶ by nearly 25 percent, while its depth, initially up to 10m, had been reduced to only 2-3m (ibid). Indonesia's National Commission of Human Rights reported 12,000 families residing on the banks of the *waduk* at Pluit, though the DKI Government put this figure at just over half that number, at 7,000. 2,000 families resided on the west bank, what Priatmodjo (2016) refers to as the 'wet section' because their domiciles were built on land that formed part of the water body. On the east bank, another 5,000 families were located, 2,000 of which were situated in the wet section (Priatmodjo, 2016). This *waduk* is located adjacent to where an important new seawall is being built along the city's northern coastline (Bappenas, 2019; Google Earth, 2021), Which is clearly visible in satellite imagery and is currently under construction.

In the case of Waduk Pluit, the kampung community resides primarily along the water basin's eastern side, though previously a small kampung community existed on the western side, where the current Taman Kota Waduk Pluit (Pluit Reservoir City Park) now stands. This residential area was entirely demolished to make way for the new park, whereas the area along the eastern side of the water basin was partially demolished, with only the houses built out over the water on stilts destroyed to enable dredging of the basin and the removal of water hyacinth to enable proper drainage and water retention at the designed capacities (Priatmodjo, 2016) (see Table 3.3).

Following a major flood lasting 10 days in 2013 with areas of the city inundated up to 2m, and 20 fatalities, there was a political momentum to remove residents from the banks of the *waduk*. Residents were relocated to a housing complex in Marunda an area of Jakarta 20 km distant, while the abandoned houses were then demolished. Replacing these residential areas on the west side of the *waduk* was the new park, which opened in 2013 (Priatmodjo, 2016). After Jokowi became president in 2014, the Vice Governor Ahok took his place as governor and continued the relocation of residents and demolition of houses from the east

²⁶ *Waduk* means water basin (Priatmodjo, 2016) or polder, after the Dutch fashion of water retention and detention ponds.

bank of the *waduk*, where up to 5,000 families still remain to be removed and their houses demolished (ibid).

Waduk Pluit, North Jakarta							
Area of wider kampung: 353,127.37m ² Area demolished: 51,075.34m ² Percentage of built form demolished: 14%							
Existing	Related	Urban	Actions taken	Related	Effects of		
characteristics	policies/	morphological		policies/	actions taken		
	Institutional	characteristics		Institutional	on urban		
	characteristics/e			characteristics	morphology		
	ra						
80 ha polder built from 1960-1980. Presence of squatters around the edges of the water basin reduced area to 60 ha. Acute sedimentation reduced depth of 10m down to 2-3m (Priatmodjo, 2016).	Sukarno era: Presidential Decree 3/1947 which established a technocratic manner of planning and established a committee for scientific strategies. (Chandramidi, 2013); Presidential Decree 183/1965 which prioritised flood mitigation (Chandramidi, 2013). The Jakarta Master Plan of 1965-85 (Chandramidi, 2013); Suharto era: The Jakarta Flood Management Project [Proyek Pengendalian Banjir Jakarta, PBJR] (Chandramidi, 2013).	Extensive kampung housing structures along the north, west, east and southwest edges of the waduk, in some cases houses extending out over the water and in close proximity to flood infrastructure (Google Earth, 2019) Kampung type: Waterfronts and Easements (Dovey and King, 2011).	Renovation of the water basin; removal of water hyacinth & silt accumulation (Priatmodjo, 2016; Google Earth, 2019)	Pilot project (one of two) of Governor Jokowi in response to the major flood of 2013 (Priatmodjo, 2016). Removal of squatters from the west bank to Marunda and other areas, far removed from the waduk. Later squatters from the east bank removed to public housing nearby. Sukarno era: Master Plan for the Special capital Region (DKI) of Jakarta [RUTR] 1985-2005 (Chandramidi, 2000-2010, which called for 13.94% of green open spaces to be allocated for water retention, detention and absorption (Chandramidi, 2011);	Removal (demolition) of a number of kampung houses in areas atop or along the water's edge, flood infrastructure, canals, etc. (Priatmodjo, 2016; Google Earth, 2019).		

Table 3.3: Waduk Pluit key findings from satellite & GIS-based mapping analysis

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Figure 3.3: Waduk Pluit satellite imagery & Open Street Map-based diagrams. North is at the top of the satellite images and map.



narrowed water body (darker shades of blue) now widened (light blue) water body.

While the administration of Jokowi did make an effort to rehouse the residents of demolished houses, these were located at a huge distance where all meaningful social and economic networks would likely be severed, and it is not clear if all residents were included in this effort (no evidence has so far been found). How these people would then be able to afford their now housing is questionable, as their livelihoods would have been primarily based in their old neighbourhood. Additionally, there is potential for some community members to return closer to their old neighbourhood, or to areas nearby, further adding to housing pressures in the area, and potentially creating more likely the occupation of unsafe land. Given Ahok's clear prioritisation of infrastructure needs over that of kampung communities, it appears unlikely that local residents would want to move far away given the long distances involved, as is evident in the case of Kampung Akuarium (see below). Additionally, the demolition of housing to provide for new open space is debatable, considering the huge number of urban developments in the form of shopping malls and gated residential communities across the city which do not contribute to public open space, and do not appear to be demolished to make way for parks and gardens.

The satellite imagery and diagram illustrate the huge loss of houses demolished to make way for the *waduk* improvements, with 14 percent of the built form having been removed. Large areas of housing on the west side have been demolished to make way for the new park, while on the eastern side, houses have been removed which previously covered the *waduk* itself. The capacity of the *waduk* itself has also improved, and the canals, locks and gates are no longer surrounded by development. The clear prioritisation of green, open space here is evident on the *waduk*'s western side where the majority of land is now parkland (see Figure 3.3 and Table 3.3).

Waduk Ria Rio

Covering an area of 26 hectares in East Jakarta, Waduk Ria Rio was built from 1960-67, where housing built by squatters covered 7 hectares (Priatmodjo, 2016). The local community was more resistant in this location than had been the case at Waduk Pluit, so the city government was forced to provide better compensation, which caused a public backlash by relocated residents from Waduk Pluit (ibid). Residents here were relocated in

two phases, 230 families in total, to Pinus Elok Housing, 8km distant, in 2013. Their houses were demolished and partially replaced with a park, Taman Kota Ria Rio (Ria Rio City Park), which was followed by a master plan published by the Governor indicating the removal of the 600 remaining families on the east bank of the *waduk*, and the demolition of their houses in several phases (see Table 3.4). Currently, a small remnant of the community remains on the site, though it is understood that Jokowi's masterplan, if fully realised, will result in its removal and replacement with urban forest, parkland, two amphitheatres and associated facilities (ibid).

Priatmodjo (2016) argues that while this replacement of kampung with urban parkland is detrimental to the communities at both Waduk Pluit and Waduk Ria Rio, in terms of their proximity to livelihoods and social networks, the presence of two green parks has no doubt enhanced the liveability of the city, particularly in view of Jakarta's poor public open space and natural landscape provision. Crowhurst et al. (1995) and Priatmodjo (2016) contend that the creation of these new landscaped public open spaces are essential to improving the quality of life of Jakarta's citizens, enabling a more sustainable city. However, the question arises as to who benefits from these open spaces? It seems debatable that the local kampung residents view them as a necessity, and the question remains whether these types of urban spaces could have been realised without the eviction of so many local residents, perhaps on redundant, brownfield land as has been the case in many other cities around the world. This case, as at Waduk Pluit represents not only the prioritisation of infrastructure over affordable housing, but also that of public open space over the needs of local communities.

Table 3.4: Wadul	k Ria Rio key	findings fr	rom satellite &	GIS-based	mapping	analysis
	1	()				1

Waduk Ria Rio,	Waduk Ria Rio, East Jakarta						
Area of wider kampung: 172,621.49m ² Area demolished: 30,839.81m ² Percentage of built form demolished: 18%							
Existing	Related policies/	Urban	Actions taken	Related policies/	Effects of actions		
characteristics	Institutional characteristics/e	morphological characteristics		Institutional characteristics	taken on urban morphology		
	ra				- F - 8)		
26 ha polder built from 1960-67. Presence of squatters around the edges of the water basin though to a lesser extent than at Waduk Pluit as squatters only occupied 7 ha (Priatmodjo, 2016).	Sukarno era: Presidential Decree 3/1947 which established a technocratic manner of planning and established a committee for scientific strategies. (Chandramidi, 2013); Presidential Decree 183/1965 which prioritised flood mitigation (Chandramidi, 2013). The Jakarta Master Plan of 1965-85 (Chandramidi, 2013); Suharto era: The Jakarta Flood management Project [Proyek Pengendalian Banjir Jakarta, PBJR] (Chandramidi, 2013).	Extensive kampung housing structures along the north and northeast edges of the waduk, in some cases houses extending out over the water (Google Earth, 2019; Priatmodjo, 2016). Kampung type: Waterfronts and Easements (Dovey and King, 2011).	Renovation of the water basin; removal of water hyacinth & silt accumulation. Park built on the southern edge of the waduk (Priatmodjo, 2016; Google Earth, 2019).	Pilot project (one of two) of Governor Jokowi (Priatmodjo, 2016). Compensation was offered due to the increased resistance from the kampung community to displacement (Priatmodjo, 2016). Sukarno era: Master Plan for the Special capital Region (DKI) of Jakarta [RUTR] 1985-2005 (Chandramidi, 2013); The Spatial Plan of Jakarta 2000-2010, which called for 13.94% of green open spaces to be allocated for water retention, detention and absorption (Chandramidi, 2013).	Removal of a number of kampung houses in areas atop or along the water's edge, flood infrastructure, canals, etc. (Priatmodjo, 2016; Google Earth, 2019).		

Reminiscent of the communities forcibly evicted from New York's Central Park in the 19th century, these communities are faced with extremely tough choices: move far away where local livelihoods are non-existent and where social connections are lacking or find another piece of land on which to squat. The DKI government continues to ignore the needs of vulnerable communities while utilising flood and water infrastructure, along with the city's need for open space, it would seem, as an excuse to rid themselves of yet another undesirable, aesthetically unpleasing kampung to improve the appearance of the city and prevent flooding.

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Figure 3.4: Waduk Ria Rio satellite imagery & Open Street Map-based diagrams. North is at the top of the satellite images and map.



(blue: by 2009, orange and pink: by 2019).

The satellite images and diagram illustrate the extent of urban form removed, initially 18 percent of the kampung in 2009, and significantly more by 2011 and 2019. The various colours indicate the different demolition phases. The new park is visible in the southwest region of the *waduk*, while in the northern reaches, woodland appears to have been planted. The clear prioritisation of green, open space here is evident: the majority of land is now covered in greenery or park (see Figure 3.4 and Table 3.4).

Kampung Akuarium

Located in the subdistrict Penjaringan on the southern side of the historic port of Sunda Kelapa, north of the historic Dutch colonial city centre of old Batavia (now Kota Tua), is Kampung Akuarium. It is considered an illegal settlement by the DKI government (Betteridge and Webber, 2019), in part due to the site's ownership by the government and past use as a marine laboratory. A community of squatters took over following the site's abandonment in the 1970s and 1980s, eventually developing into a densely developed informal settlement (Rujak, 2018a; 2018b; Sutanudjaja, 2022). This was the situation in 2016 when then Governor Ahok cited the need for flood infrastructure and economic revitalisation of the area as justification for evictions and demolition of the kampung (Betteridge and Webber, 2019; Wijaya, 2018a, 2018b).

Ahok ordered the forced eviction of hundreds of residents of the kampung on 11 April 2016, which was quickly undertaken, and the houses demolished. An astonishing 69% of the pre-existing kampung was destroyed. The DKI government had prepared a number of apartments in affordable housing complexes located in Marunda, North Jakarta, 17km to the east, and Rawa Bebek, East Jakarta, 19km to the southeast, for the 596 families who were evicted. Despite these preparations, approximately 160 families refused to move to the apartments citing the long distances from their existing places of employment or small businesses (Betteridge and Webber, 2019). Instead, this group of residents erected four large tents and built 132 dormitories on top of the debris from their demolished homes on the site of the former kampung. They were reportedly assisted in this temporary construction by politically affiliated organisations (Jakarta Post, 2017; Rujak, 2019), potentially with links to the next governor Anies Baswedan, 'Anies' who opposed Ahok in

the subsequent gubernatorial election and adopted contrary policies towards Kampung Akuarium following his election (Rujak, 2018a; 2018b; Sutanudjaja, 2022).

Table 3.5: Kampung	Akuarium key	y findings from	n satellite & GIS-based	l mapping analysis
		0		

Kampung Akuarium at Sunda Kelapa Port, North Jakarta							
Area of wider kampung: 154,415.59m ² Area demolished: 46,893.79m ² Percentage of built form demolished: 69%							
Existing characteristics	Related policies/ Institutional characteristics/e	Urban morphological characteristics	Actions taken	Related policies/ Institutional characteristics	Effects of actions taken on urban morphology		
15.44 ha existing kampung (including areas along the canal to the west and water retention pond to the southwest) (Google, 2019).	Sukarno era: Presidential Decree 3/1947 which established a technocratic manner of planning and a committee for scientific strategies. (Chandramidi, 2013); Presidential Decree 183/1965 which prioritised flood mitigation (Chandramidi, 2013). The Jakarta Master Plan of 1965-85 (Chandramidi, 2013); Suharto era: The Jakarta Flood management Project [Proyek Pengendalian Banjir Jakarta, PBJR] (Chandramidi, 2013).	Kampung with tightly packed housing extending over waterways and surrounding a recently constructed market building and the former Dutch East India Company warehouses (currently the Museum Bahari [Maritime Museum], (Google Earth, 2019; Indonesia Tourism, 2019). Kampung type: Waterfronts, Easements and Backstage (Dovey and King, 2011).	Residents were evicted and houses demolished. Temporary housing was erected by the residents, then replaced by more substantial structures with the help of Anies' administration. These were demolished a third time and replaced with the 'vertical kampung' housing in 2021 (Rujak, 2018a, 2018b; Sutunujaja, 2022).	Jakarta DKI Governor Basuki Tjaha Purnama (Ahok) ordered eviction in order to clean the port water basin, river and canals (Rujak, 2018; Kimmelman, 2017); the Spatial Plan of Jakarta 2000-2010 (Chandramidi, 2013), as well as the government ownership of the land which was cited by Ahok's administration (Kimmelman, 2017)	Remaining 10.75 ha kampung site following demolition in 2016 (Google Earth, 2019).		

In due course Anies agreed to rebuild Kampung Akuarium, committing his administration to collaboration with the remaining residents on a new plan for the community, and to initiate plans to construct shelters for up to 180 families during the interim. He also announced that the kampung site would form part of the city's heritage tourism programme to be integrated with other locations of interest in the old city centre, such as the adjacent historic Sunda Kelapa port and nearby Luar Batang, the location of one of the city's oldest and most historic mosques (Jakarta Post, 2018; Rujak, 2018a; 2018b; Sutanudjaja, 2022). In addition to building temporary shelters while the kampung reconstruction, the DKI government issued 166 Jakarta identification cards and 79 family cards to evicted residents of the area. This would allow them to prove residency in the neighbourhood and to avail themselves of local services such as public school places for their children (Jakarta Post, 2017; Rujak, 2018a; 2018b; Sutanudjaja, 2022). Despite these initiatives, the land tenure issue reportedly remains unresolved, though Anies has committed "the relevant agencies" to collaborate in the replanning of the community, which would include "dealing with the legal aspects of the land," according to Kompas.com (2010).

There are currently plans to redevelop Kampung Akuarium as a *kampung susun* (vertical village) for the remaining residents, while also moving forward with the existing plan to transform the area into a tourist destination to boost the local economy (Sutrisno, 2019; Rujak, 2018a, 2018b; Sutanudjaja, 2022). This was completed in mid-August 2021 when residents were allowed to move-in (ibid). Despite this, the DKI government has finally recently constructed new apartments on the site for the residents who returned, following a full community consultation process, where residents had input into the design of the new housing, and they were able to move-in by mid-August 2021 (Assegaff, 2021; Kumparan, 2021). The remaining residents have found employment at a nearby toy factory; however, they have cited the need for small businesses to develop in the kampung to ensure a more sustained livelihood for local residents after the kampung is rebuilt, and especially if the long term tourism plan is to be realised (ibid).

The redevelopment as of 2021 was to cover 10,000m² of land while providing housing for 700 residents to be accommodated in ten blocks, nine for residential use, one for a mosque and early childhood education centre (PAUD). Additionally, the area along the sea wall was to be redeveloped as a public open space for visitors to enjoy views out over the historic Sunda Kelapa port to the immediate north, however it is not known whether these provisions have been since implemented in full. The plans for the new community were prepared in consultation with the community forum with assistance from the Rujak Centre for Urban Studies, a local NGO and urban think tank that works with communities to develop sustainably, in consultation with the Jakarta Urban Poor Network (JRMK), which initially assisted the residents following their eviction back in 2016 (Sutrisno, 2019; Rujak, 2018a; 2018a, Sutanudjaja, 2022).

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Figure 3.5: Kampung Akuarium satellite imagery & Open Street Map-based diagrams.

North is at the top of the satellite images and map.





Open Street Map-based diagram by the author indicating changes to the urban form: Demolished and rebuilt structures in the later stages (orange initially as rebuilt by 2017 and later demolished rebuilt again by 2018).

This example illustrates a rare example of government responding to the need of kampung communities and completing community engagement, rather than simply starting the process, only to abandon it later when conditions or political considerations no longer made those options attractive. However, this only came after a change in local government administration. Governor Ahok still evicted the community and demolished their houses, though a small remnant of the community returned. Additionally, the new governor used this community as a tool to achieve his electoral goals (Assegaff, 2021), however it could be argued that this was, in the long run, a positive outcome for a small remaining group of the original community, despite the apparent political opportunism.

The satellite images and diagrams illustrate the sheer scale of demolition on the site: 30 percent of the area's built form has been removed. The various stages of demolition, reoccupation and temporary housing structures erected by Governor Anies' administration are clearly evident, as it the manner in which houses have pulled back from the edges of the canal to the west and the water retention pond to the south. The old market has emerged from its development by kampung houses, and the waterways are apparently operating with their intended capacities, which previously had been significantly reduced. Flood infrastructure is more evident and improved flood protection is clearly visible. The large area set aside for new housing is evident to the north of the market (see Figure 3.5 and Table 3.5).

Kampung Kerapu, Kongol, Tongol, Lodan and Kunir

Five small kampung in North Jakarta located close to Fatahillah Square in Kota Tua (the old colonial centre of Batavia) known as Kampung Tongkol, Kerapu, Lodan, Kolongol and Kunir, often locally collectively referred to as 'Tongol', have also recently been impacted by Jakarta's infrastructure improvements policies. These communities occupy narrow stretches of land along riverbanks of the Ciliwung River as it nears the old port of Sunda Kelapa near the city's north coast (Dovey, et al., 2019; Google Earth, 2021). The reason these four informal settlements are worthy of mention is because they further support the link between flood policy and resultant changes in urban form. Residents of these kampung trace their settlements back to the 1960s when they allege the land was purchased from the

traditional owner. Following this they built houses and a mosque along the river (Dovey et al., 2019).

In 1992 the then Governor of Jakarta initiated a plan to widen the river which would require the rebuilding of riverbanks and the construction of an access and maintenance road alongside the water course, which would necessitate the demolition of all structures within 5m of the river: this constitutes the first eviction threat faced by the kampung communities (ibid). Dovey et al. (2019) contend that residents who lost their houses were compensated and the kampung re-established themselves on the land back to the riverbank as the community's population increased. However, in 2014, so-called "normalisation" plans by then Governor Ahok meant the threat of eviction returned, though without any compensation offered (Dovey, et al., 2019, p273). Residents with Jakarta ID cards were offered rental apartments on the city's urban periphery because they had formal claim to land tenure - as evidenced by Winayanti and Lang (2004) in the case of Kampung Penas Tanggul in East Jakarta. However, this resulted in the severance of livelihoods and social networks. The response to this was the establishment of a community association called the Ciliwung River Community, in 2015, which included approximately 1,000 families, in order to avoid the threat of eviction (Dovey, et al., 2019). The community association used the 1992 precedent as a basis for claiming rights, successfully campaigning for the proposed 15m easement to be reduced back to 5m, as the larger setback would have effectively demolished the entirety of the collective settlements. They also proposed a voluntary demolition back to the 1992 5m line, and to undertake cleaning and maintenance of the river (ibid). Despite these efforts, later that year Ahok ordered the forcible demolition of one of the communities, nearby Kampung Kunir. In this case, only community leaders were offered housing, and that at a distance of 16km, while the rest of the community was offered nothing (ibid).

Dovey et al. (2019) argue that the demolition of Kampung Kunir served as a catalyst for the remaining kampung communities who managed to negotiate an agreement to the 5m line with the visiting deputy governor by blocking his vehicle from departing. The communities then engaged in self-demolition within the agreed 5m easement, as well as initiating a public campaign for stewardship of the river, known as *pencitraan* or reimagining the river area, which included cleaning and greening it (Dovey, et al., 2019).

Coinciding with these efforts, a group of volunteer architects and urban designers worked on a new housing prototype built of bamboo which could be built to higher densities than the existing houses, in-situ and within the 5m easement, while local media got involved, enabling the story to be widely disseminated (Dovey et al., 2019). This regeneration of the kampung was so successful that the community even advertises for tourist homestays, and it illustrates the potential alternatives to demolition and eviction (ibid).

Table 3.6: Kampung Kolongol, Tongol, Lodan and Kerapu key findings from satellite &GIS-based mapping analysis

Area of the four kampung: 45,889.06m ² Area demolished: 4,647.19m ² Percentage of built form demolished: 10.13%							
Existing characteristics	Related policies/ Institutional characteristics/e ra	Urban morphological characteristics	Actions taken	Related policies/ Institutional characteristics	Effects of actions taken on urban morphology		
4.89 ha existing kampung (including areas along the both sides of the canal to the west and water retention pond to the southwest) (Google, 2019).	Sukarno era: Presidential Decree 3/1947 which established a technocratic manner of planning and a committee for scientific strategies. (Chandramidi, 2013); Presidential Decree 183/1965 which prioritised flood mitigation (Chandramidi, 2013). The Jakarta Master Plan of 1965-85 (Chandramidi, 2013); Suharto era: The Jakarta Flood management Project [Proyek Pengendalian Banjir Jakarta, PBJR] (Chandramidi, 2013).	Kampung with tightly packed housing extending over the canalised portion of the Ciliwung River as it passes through Sunda Kelapa immediately to the north of Kota Tua (Google Earth, 2023; Open Street Map, 2024). Kampung type: Waterfronts, Easements and Backstage (Dovey and King, 2011).	Residents were evicted and houses demolished within the 5m 1992 setback.	Jakarta DKI Governor Wiyogo Atmodarminto (1987-92) or Governor Soerjadi Soedirja (1992-97) ordered eviction in 1992 in order to widen the canal, requiring reconstruction of the canal banks (Dovey et al., 2019;; Kimmelman, 2017); the Spatial Plan of Jakarta 2000-2010 (Chandramidi, 2013), as well as Ahok's "normalisation" plan requiring all residents residing in kampung to have Jakarta-issued IDs (Dovey et al., 2019, p273; Winayanti and Lang, 2004).	Remaining 4.12 ha kampung site following demolition in 2016 (Google Earth, 2019).		

Kampung Kolongol, Tongol, Lodan and Kerapu, Sunda Kelapa, North Jakarta

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Figure 3.6: Kampung Kolongol, Tongol, Lodan and Kerapu satellite imagery & Open Street Map-based diagrams. North is at the top of the satellite images and map.

Kampung Kolongol, Tongol, Lodan and Kerapu, Sunda Kelapa, North Jakarta (Google Earth, 2021).



Kampung Kolongol, Tongol and Lodan GIS-based diagram illustrating buildings demolished between 2010-2016.

While this example constitutes another positive example of the benefits to community empowerment and grassroots involvement, it still came at the cost of the demolition of

nearby Kampung Kunir. The government continues to pursue demolition whenever and wherever it suits them, without a fair or even-handed standard; some communities are saved, while others demolished, some communities are compensated while others are not. Much of this apparently depends on the ability of local community activists to organise effectively, while being able to access local media in order to publicise their story so that the wider community of the city become interested, and in some way invested.

Table 3.7: Kampung Kunir key findings from satellite & GIS-based mapping analysis

Area of wider kampung: 25,625.60m ² Area demolished: 10,679.17m ² Percentage of built form demolished: 41.67%							
Existing characteristics	Related policies/ Institutional characteristics/e ra	Urban morphological characteristics	Actions taken	Related policies/ Institutional characteristics	Effects of actions taken on urban morphology		
2.56 ha existing kampung (including areas along the both sides of the canal to the west and water retention pond to the southwest) (Google, 2019).	Sukarno era: Presidential Decree 3/1947 which established a technocratic manner of planning and a committee for scientific strategies. (Chandramidi, 2013); Presidential Decree 183/1965 which prioritised flood mitigation (Chandramidi, 2013). The Jakarta Master Plan of 1965-85 (Chandramidi, 2013); Suharto era: The Jakarta Flood Management Project [Proyek Pengendalian Banjir Jakarta, PBJR] (Chandramidi, 2013).	Kampung with tightly packed housing extending over the canalised portion of the Ciliwung River as it passes through Kota Tu to the north of Jakarta Kota Railway Terminus (Google Earth, 2023; Open Street Map, 2024). Kampung type: Waterfronts, Easements and Backstage (Dovey and King, 2011).	Residents were evicted and houses demolished within the 5m 1992 setback.	Jakarta DKI Governor Wiyogo Atmodarminto (1987-92) or Governor Soerjadi Soedirja (1992-97) ordered eviction in 1992 in order to widen the canal, requiring reconstruction of the canal banks (Dovey et al., 2019;; Kimmelman, 2017); the Spatial Plan of Jakarta 2000-2010 (Chandramidi, 2013), as well as Ahok's "normalisation" plan requiring all residents residing in kampung to have Jakarta-issued IDs (Dovey et al., 2019, p273; Winayanti and Lang, 2004).	Remaining 1.49 ha kampung site following demolition in 2016 (Google Earth, 2019).		

Kampung Kunir, Kota Tua, North Jakarta

Figure 3.7: Kampung Kunir satellite imagery & Open Street Map-based diagrams. North is at the top of the satellite images and map.



Kampung Kunir GIS-based diagram illustrating buildings demolished between 2010-2016.

The satellite images here illustrate clearly where the kampung communities have selfdemolished houses along the waterfront. The rather thin nature of much of the kampung is also clearly visible: in most cases the communities are only a few structures wide adjacent to the river, while in some places it is only one dwelling wide. It is clear from these images why the 15m setback would have essentially removed the entire communities and constituted a major challenge to the communities' continued existence (see Figures 3.6 and 3.7, as well as Tables 3.6 and 3.7).

Conclusions

This chapter utilised a dual approach of urban morphological analysis and a historic institutionalist perspective, by utilising historic satellite imagery and GIS-based mapping tools to appreciate the changing physical urban form of the city in response to policy decisions and reflecting on the nature of kampung, their morphology, origins, growth communities and challenges, as well as their relationship to governmental institutions, and legal status. It examines the issues of flooding in Jakarta in the context of these informal settlements affected by flooding and plans for renewed infrastructure. Understanding the changing physical form of the city through its urban morphology illustrates the direct consequences of institutional policy around flood risk. A historic intuitionalist perspective builds on this by analysing the nature of decisions and the associated institutions, in this case the DKI government, over time, and crucially the characteristics of the decisions, where they deviate from the norm, and how those decisions continue, though with notable exceptions, to overwhelmingly work against the interests of the urban poor.

The research explores the relationship between planning policy decisions in relation to flood infrastructure in Jakarta and the impacts of the decisions on both the physical urban form of the city, as well as the people living in the communities affected by them. It examines the context of decision-making by the DKI government where local residents were evicted from kampung built on or adjacent to water basins and waterways forming part of the city's existing flood mitigation and drainage infrastructure. This preference for infrastructure-driven solutions to Jakarta's flood problems is not new, and the government's response falls into a pattern of institutional lock-ins and path dependency

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which goes back not just decades, but in fact centuries to the Dutch Colonial period. Added to these issues is the fact that eviction negatively impacts on the most vulnerable inhabitants of the city, while their removal to housing complexes far distances from their former homes severs social networks and local livelihoods, further impoverishing them.

The examples utilise satellite imagery (Google Earth, 2021) and GIS-based urban morphological diagrams to clearly illustrate the central government and the government of the DKI which continues to prioritise technocratic considerations through policies and actions to improve or upgrade existing flood infrastructure at the expense of local communities. While these policies are not new, they go back many decades to the early Independence era under Sukarno, and even reflect a longer history of colonial segregation of indigenous Javanese from secure places of habitation. What is clear here, based on the evidence, is the continuation of the prioritisation of infrastructure and projects that promote an improved image for the city over that of local communities who suffer the consequences of flooding, forced evictions and relocations, severances of social and economic networks, and many other degrading impacts. In some cases, it appears the government will attempt the most extreme demolition and eviction programme if they think it will be successful, only to back down once communities fight back. This suggests an active strategy where those who cannot push back against the government are unable to remain in their communities, to be evicted far to the urban periphery, or refused compensation, only to end up squatting elsewhere on equally unsuitable land (or worse), which could mean them reliving the experience repeatedly.

The central government and the DKI need to better address the needs of local kampung residents: these are the poorest and most vulnerable citizens of the city. While it is certainly possible to pursue infrastructure improvement, these cases evidence the fact that compromises can better balance the needs of communities with the wider infrastructural considerations of the city without the need for wholesale demolition and eviction. It is possible to incorporate new flood infrastructure, improve existing infrastructure while improving the lives of people who live adjacent to these waterbodies in the long term.

Chapter IV:

A Strategic View –

Flood Infrastructure and the Effects on Urban Form Across Jakarta



Chapter IV: A Strategic View – Flood Infrastructure and the Effects on Urban Form Across Jakarta

Introduction

This chapter continues the investigation of the relationship between planning policies in response to flooding and their impact on the physical urban fabric of Jakarta. Whereas the previous chapter focused on the local level, this chapter examines the link between planning policy and its effects on urban form utilising the flood and water drainage infrastructure network of the city, primarily across the city's northern coastline, that are undergoing the most rapid land subsidence and the location of significant new flood mitigation infrastructure.

Areas along Jakarta's northern coastline are subsiding at an average rate of 15cm per year and as much as 25cm in places, making the city one of the most rapidly sinking cities in the world, further impacted by eustatic rises in sea levels amounting to approximately 3cm per annum (Abedin et al., 2011; Sherwell, 2016; Octavianti and Charles, 2019b; Garschagen, et al., 2018). The city is naturally vulnerable, situated as it is on a marshy, deltaic plain, causing the city to be highly vulnerable to flooding (Dudal, 2005; Octavianti and Charles, 2019a; Texeir, 2008). 40 percent of the city lies below sea level (Firman, et al., 2011; Octavianti and Charles; 2019a). The city has suffered from a number of severe flood events in recent years, including those of 1996, 2002, 2007 and 2013 (Texier, 2008; Goh, 2019), the flood event of 2007 inundated more than 60 percent of Jakarta's land and resulted in 79 deaths, 400,000-500,000 people evacuated and approximately \$680 million in property damages (Bappenas, 2019; Octavianti and Charles, 2019a; Texier, 2008).

The government is investing in infrastructure improvements to mitigate both land subsidence and flooding in the city, largely in response to major flood events in 1996, 2002, 2007 and 2013 (Octavianti and Charles, 2019; Goh, 2019; Texier, 2008). As part of these efforts the DKI government embarked on the Jakarta Coastal Defence Strategy (JCDS), as well as the subsequent National Capital Integrated Coastal Development Master Plan (NCICD) series of flood infrastructure and land reclamation developments along the city's norther coastline, including a large offshore seawall to close off Jakarta Bay from the Java Sea, reducing the sea level in an artificial coastal lagoon (Octavianti and Charles, 2019a; Kops, 2012; Hidayatno, et al., 2017). These projects have proven to be controversial, sparking a number of debates in the public realm (Octavianti and Charles, 2019a).

Water security in Jakarta

It is important to understand the issues around water driving infrastructure changes in Jakarta, which is well known to face a number of water security challenges, including regular inundations, major flood events on average every five years, one of the lowest rates of water supply at 60 percent (of residential structures in Jakarta) and sewerage services at 4 percent (of residential structures in Jakarta), in urbanised Asia (Octavianti and Charles, 2020). Piped water services, where they do exist are often supply poor quality water with issues around quantity, which has historically led to an over reliance on groundwater extraction, which in turn, has led to the problems with land subsidence in the city (ibid). indeed, over-extraction of groundwater is thought to be the primary contributor to the land subsidence problem where areas of the north coast have been noted to be as high as 15cm to 25cm per annum (Octavianti and Charles, 2020; Sherwel, 2016; Garschagen et al., 2018) in places.

Methodology

This chapter utilises primarily qualitative data in the form of satellite imagery and opensource, GIS-based mapping to diagram the physical changes brought about through planning policy implementation in response to flooding. These spatial elements are supported through literature review of the history of flood infrastructure and associated policies implemented from the 17th century at the beginning of the Dutch colonial period, through the later colonial periods, the early post-Independence era under President Sukarno, followed by the New Order Regime of President Suharto and lasting until the present day, democratic, neo-liberal-influenced era of governmental decentralisation across the country, and the spatial imp^{ac}ts of new, upgraded or otherwise improved flood

infrastructure in Jakarta. With regard to the literature review, a historic institutionalist approach is utilised in order to elucidate the nature of policies and their impacts on local communities, primarily in North Jakarta, where much infrastructure is being implemented or improved, necessitating changes to the urban form of the surrounding neighbourhoods. Additionally, the JCDS and NCICD plans, along with their historic policy development, are analysed alongside satellite imagery and GIS-based mapping to understand the most recent and current impacts of policy decisions on the urban form of the city's northern coastline. These are supplemented by interviews undertaken in June 2019, August 2022 and June and July 2023 with specialists with in-depth knowledge of the project, including locally-based academics who have undertaken research on the subject, members of the DKI planning team, and professional members of a local NGOs working with flood-prone communities along the city's north coast. Interviews were unstructured and tailored to fill specific gaps in knowledge, including where literature was not readily available. These interviews are often supported by research or project- and policy-related documents, including unpublished presentations (or not circulated widely in the public realm) or recently revised planning documents.

The mapping exercise of this study utilises satellite imagery together with an GIS-based mapping data, specifically OpenStreetMap (see Figure 1.0), to appreciate the changing nature of the city's urban form as argued by Kamalipour (2016), Dovey et al. (2019), and Dovey and Ristic (2017) which utilise satellite imagery as in the case of Priatmodjo (2016), GIS-based mapping data, or a combination of the two methods. These are supplemented with the findings from the series of interviews undertaken by the author in 2019, 2022 and 2023 with national (Bappenas) and local government institutions (Bappeda), local academics (from Universitas Tarumanagara, Instut Teknologi Bandung and IHE Delft Institute for Water Education), planning and infrastructure experts (from engineering consultancy Witteveen+Bos and the Indonesian Land Reclamation and Water Management Institute) as well as local NGOs working with local communities affected by the

infrastructure improvements along the North Coast (Climate Hub Indonesia, Rujak Centre for Urban Studies and Rame-Rame Jakarta).

Historical institutionalist context of flood infrastructure in Jakarta

This chapter reviews the historic institutionalist perspective from literature on the subject in order to understand the manner in which current planning policies sit in the context of a long history of policy decisions and characteristics going back at least to the inception of the colonial period in the early 17th century with the occupation of Jakarta by the Dutch and continuing to influence decision-making to the present day. Historical institutionalism is useful because it can illuminate the structures and mechanisms of social order, the consideration of how various actors, in this case institutions, operate and behave according to a set of characteristics or rules (Octavianti and Charles, 2018). Historical institutionalism enables the understanding of variations in policy outcomes across different eras and political regimes by describing and analysing the manner in which national and local level governmental organisations are structured and the means by which institutional reforms were impeded through established processes (both formal and informal) at given times (Marshall and Alexandra, 2016; North, 1990; Octavianti and Charles, 2018). Liebcapp (2010), Van Buuren et al. (2016), Meacham, (2009) and Octavianti and Charles (2018) have used historical institutionalism in flood management and related water infrastructure, and they argue that both the canalisation and sea wall projects of the Jakarta Coastal Defence Strategy (JCDS) and National Capital Integrated Coastal Development Master Plan (NCICD) "represent infrastructural solutions to control water" (2019a, p1103). This is highly relevant to the case of Jakarta because of the large amount of flood infrastructure built during the Dutch colonial period which forms a significant part of the city's current water drainage system.

Much of the literature on flood infrastructure in the context of historical institutionalism in English in recent years has been undertaken by Octavianti and Charles (2018; 2019a; 2019b; 2020) and is therefore limited. A good deal of existing older research on the subject in Jakarta is no longer available through online sources and is often necessarily cited through their publications. However, Octavianti's and Charles's writings form an important foundation for an understanding of historical institutionalism and its relationship to flood infrastructure of over time, and therefore constitute a significant set of source material. This supplements earlier historic studies around flooding and flood-related infrastructure discussed by Priatmodjo (2016; 2022a; 2022b; 2023), Ford (1993), Cybriwsky and Ford (2001) and Kusno (2011).

Octavianti and Charles (2018) note the role of colonialism in shaping existing flood infrastructure systems in postcolonial nation states. This technocratic, scientific approach utilised by colonial administrations was undertaken partly to justify the rule of European imperial powers in Asia and Africa (Octavianti and Charles, 2018; Adas, 1989, cited in Octavianti and Charles, 2018, p1103; Buckley, 1893, cited in Octavianti and Charles, 2018, p1103). A variety of flood mitigation measures were incorporated into the city's water infrastructure, including dams, canals, sluice gates and pumping stations in order to control the flow of water from southern areas of the city to the north where waterways would empty into the Java Sea. This approach was claimed to be more rational and efficient than indigenous systems previously employed prior to European colonial occupation, though the effectiveness of these systems has been debated (Octavianti and Charles, 2018; Murphy, 2009; Beinart and Hughes, 2007). This characteristic of technocratic colonial infrastructure implementation has been referred to as "imperial science" by Gilmartin (1994, cited in Octavianti and Charles, 2018, p1103), which played a significant role in the manner in which postcolonial governments administered their countries. Octavianti and Charles (2018) argue that Jakarta fits within this description in the way it has been shaped by to large flood channels, the East and West Canals, 23.6km and 14.5km in length respectively, both of which were planned during the Dutch colonial period, though the East Canal was only completed recently (Gunawan, 2010; Octavianti and Charles, 2018).

Early Colonial Period: Batavia (1617-1808)

During this long era of Dutch colonial rule, from the perspective of historical institutionalism in the context of flood infrastructure, a number of characteristics could be said to have become embedded into the planning and water infrastructure system of the Jakarta. Of these, inequality of access to safe drinking water and land free from flooding are

particularly pertinent (Octavianti and Charles, 2018; Argo, 1999; Kooy and Bakker, 2008; Putri, 2014 and Gunawan, 2010). Indeed, the involvement of the Dutch in Jakarta's flood infrastructure development continues to this day with the Dutch government playing "a significant role in promoting the NCICD, through a consortium of Dutch engineering consultants and a grant for the feasibility study" (Octavianti and Charles, 2019a, p1104; Tyas, 2016, Bappenas, 2019; Priatmodjo, 2019; Bappeda, 2023, Climate Hub, 2023).

The period of early Independence, (1949-1966), analogous to the rule of Sukarno, few investments were made, however this changed under Suharto's New Order Regime which took over in 1967. During this later period several important infrastructure investments were made, including several *waduk*²⁷ and canalisation projects following major flood events in 1976 and 1979 (Octavianti and Charles, 2018). Flood events continually worsened, largely due to land subsidence, the Jakarta DKI and central government increasingly relied on technocratic infrastructure-driven flood mitigation measures leading up to the present day, such as the Eastern Canal initiated in 2003 and the new offshore seawall, by implementing old policies initially derived from the Dutch colonial era (Steinberg, 2007; Kops, 2012; Octavianti and Charles, 2019a; Google Earth Pro, 2021).

Canals were an integral feature of the Dutch *Waterstad*²⁸ urban typology implemented in Batavia²⁹ to combat flooding and required regular dredging essentially from their inception (Heuken, 1983; Priatmodjo, 2016). According to Gunawan (2010), the *Waterstad* urban typology with its system of urban blocks, canals and bridges, based on Dutch cities like Amsterdam and Rotterdam, was the earliest attempt by local government to respond to flood challenges. Indeed, the first recorded major flood event took place in 1621, soon after the Dutch East India Company occupied the city (ibid). Canals became an integral feature of Dutch era Batavia, acting not only as drainage channels, but transportation routes. This resulted in large numbers of Europeans occupying plots along waterways in the colonial city (Abeyasekere, 1989, cited in Octavianti and Charles, p1108; Ford 1993),

²⁷ Waduk is the Indonesian term for polder or water retention pond (Priatmodjo, 2016).

²⁸ Waterstad, literally 'water city' in Dutch (Priatmodjo, 2016).

²⁹ Batavia was the name for Jakarta during the Dutch colonial period (Octifanny and Norvyani, 2021; Ford, 1993).
placing large numbers of inhabitants directly within flood range. As a result, according to Abeyasekere (1989, cited in Octavianti and Charles, 2018, p1108;) as well as Putri and Rahmanti (2010), soil excavated from the canals was used to raise the ground level within the walled city and within the first three decades of Dutch occupation of Batavia, more than five canals had been built within the city's relatively small area of 1.3km².

One of the earliest problems to emerge from the Waterstad typology was the slowing down of river current due to the dissipation of water across wider and deeper canals. This caused silting along waterways, made worse by the eruption in 1654 of Mount Salak which brought large amounts of silt downriver and into the deltaic plan where Batavia stood (De Haan, 1993, cited in Octavianti and Charles, 2018, p1108; Kanumoyoso, 2011; Texier, 2008; Garschagen et al., 2018; Priatmodjo, 2016, Priatmodjo, 2022b). Further problems emerged in 1699 when a large earthquake resulted in the Ciliwung River, Batavia's main waterway, to change its course, bringing even larger amounts of soil into the area of the city, clogging canals (Heuken, 1983 cited in Octavianti and Charles, 2018, p1108), which was exacerbated by intensive land clearance for agriculture on the plain around Batavia and in the uplands to the southwest, south and southeast of the city, which resulted in sand infiltration and the closing up of the river's mouth (Kanumoyoso, 2011; Octavianti and Charles, 2018).

As the city began to grow, both in population and land area, the canals and rivers became the repository of rubbish and sewage, including pressed sugarcane from plantations upriver, leading quickly to clogging and even slower currents (Abeyasekere, 1989, cited in Octavianti and Charles, 2018, p1108; Ford, 1993). Because this wate ended up in the canals fronting Europeans' houses in Batavia, drainage worsened with running streams together creating a nuisance, which worsened, neglected by colonial authorities until the VOC³⁰ employed 100 slaves to remove mud from the canals in 1718, though it was halted with authorities realised the task would be endless (Jayapal, 1993; Vlekke, 1943 and Blussé, 1986, cited in Octavianti and Charles, 2018, p1108;). Despite the fact that the imported *Waterstad* system was clearly ill-suited to Batavia's tropical climate, canals continued to be seen as the

³⁰ Vereeinigde Oostindische Compagnie, the Dutch East India Company, or VOC (Octavianti and Charles, 2018).

best solution for flooding. As a result, a series of new flood canals were constructed on the western side of the city in 1725 (Gunawan, 2010; Octavianti and Charles, 2018).

In 1732 the *Mookervaart* (mainstream), a new long canal, was dug in *Ommelanden* (the area outside of the city walls) to provide a cleaner source of water for city inhabitants. This resulted in greater levels of water circulation, however during the dry season stagnant pools would remain, causing malaria (Blussé, 1986, and Brug, 1997, cited in Octavianti and Charles, 2018, p1108;). Octavianti and Charles (2018) and Kanumoyoso (2011) argue that by the early 18th century the exploration and exploitation for agriculture of *Ommelanden*, had a significant role in the acceleration of already existing flood problems. Once the area had been sufficiently secured from attack by the Banten Sultanate to the west of Batavia, private investors began initiating new industries in the area. This coincided with the construction in 1648 of a canal for floating timber downstream to the city's harbour and the emergence, from 1721 the rise of sugar plantations and rice cultivation, massive deforestation driven by profit from agriculture, all of which contributed to the increase in runoff and pollution, further degrading the natural environment (Octavianti and Charles, 2018).

During this early colonial period policy responses were slow or inadequate, as the sole authority was that of the VOC, rather than a colonial administration. This meant it operated as a company entity, with the associated profit incentives, rather than acting with a government agenda. As such only individuals employed by the company were included in social affairs, and the population was segregated (Vlekke, 1943, cited in Octavianti and Charles, 2018, p1109; Ford, 1993). This policy of segregating the population thus did not address the needs of the majority of inhabitants in the city and surrounding countryside, including so-called 'private citizens' (Europeans not employed by the company), the Chinese and indigenous Javanese (Octavianti and Charles, 2018; Ford, 1993). Additionally, the VOC required approval from the Dutch government for certain strategic policies, which generated a substantial delay between incidents taking place and policy responses.

Middle Colonial Period: Weltevreden (1808-mid 19th century)

Major reforms in colonial administration were required following the collapse of the VOC in the late 18th century. These were realised under the leadership of Governor General Herman W. Daendels (1808-11), when the administrative centre of Batavia was moved 6km to the south of the existing colonial city centre to a new area called *Weltevreden*, situated on higher ground (Sutherland, 1979, cited in Octavianti and Charles, 2018, p1109; Ford, 1993). The Governor General ordered the demolition of the city walls, partly seen as the cause of the unhealthy and poor living conditions in the old centre (Abeyasekere, 1989, cited in Octavianti and Charles, 2018, p1108). This led to an exodus of wealthy Europeans to the south while the urban poor who depended on seasonal labour for their livelihoods remained in the now-deserted port city, which was largely turned over to the Chinese, many of whom continue to inhabit the area to this day (Jayapal, 1993, cited in Octavianti and Charles, 2018, p1108; Ford, 1993). It was thus that living in the south of the city became synonymous with a healthier and socially elevated lifestyle, while signalling a new Dutch era in Batavia, which had been transformed from a port outpost of the colonial capital of the Dutch West Indies (Abeyasekere, 1989, cited in Octavianti and Charles, 2018, p1108; Ford, 1993).

Late Colonial Period: Weltevreden (Mid 19th century-1949)

With the dawn of the 20th century, the 'ethical policy', which aimed to improve the welfare of the colony, was introduced by the colonial government after various unsuccessful experiments with flood related policies in the latter 19th century (Abeyasekere, 1989, cited in Octavianti and Charles, 2018, p1109). Money for the development and improvement of education and infrastructure was funded by the Royal Government in the Netherlands which enabled local political initiatives, though this caused a decentralisation of power, essentially a desire by the colonial government to shirk its urban responsibilities at a time when the colony was becoming an ever greater financial and administrative burden to the state (Vlekke, 1943, cited in Octavianti and Charles, 2018, p1110; Abeyasekere, 1989, cited in Octavianti and Charles, 2018, p1110). Octavianti and Charles (2018, p1110) argue the "combination of laissez-faire and ethical policies had a particular impact on water policies," indeed this was the first time in 300 years of colonial rule where water, in particular potable and for sanitation, had been prominent in the colonial government's agenda, where they could create a "hierarchy of decent colonies" (Octavianti and Charles, 2018, p1110) while maintaining their hegemony (Kooy and Baker, 2008 and Milone, 1987, cited in Octavianti and Charles, 2018, p1110). The result was that certain investments were made in the water and sanitation sector, for example transferring the now unwanted wells from Europeans who had access to better spring water sources, as well as the first of the Kampung Improvement Projects (KIP), initially starting in 1928 (Sadikin and Hadimadja, 2012 and Van der Heiden, 1990, cited in Octavianti and Charles, 2018, p1110) which were to figure so prominently across the political landscape of the 20th century in Jakarta, particularly from the 1960s-1990s (Kusno, 2011, 2013, 2023; Marulanda and Steinberg, 1991; Winayanti and Lang, 2004).

According to Octavianti and Charles (2018), compared with other water issues, flood policy differed from potable and sanitary water, as it was historically, since the founding of Old Batavia in the 17th century, primarily the concern of the VoC, however little was done to implement flood infrastructure comprehensively across the city through the flood control plan until sufficient capital was available to do so (Argo, 1999). The flood control plan was the consequence of advantageous political conditions resulting from a major flood event in 1918. As the population had grown in Weltevreden over the previous century, flooding had become increasingly problematic. At least two other major flood events had already taken place in 1854 and 1878, before the colonial government took action by excavating canals upstream in order to divert water away from the colonial centre, though this action was comparatively minor to those policy responses taken after 1918 (Gunawan, 2010; Sedlar, 2016).

Since more financial capital was available from the liberal and ethical policies, the colonial government was able to undertake large infrastructure projects to alleviate flooding. These policy responses were particularly important in Batavia because they allowed for greater certainty of private investment in the city (Octavianti and Charles, 2018). The central feature of the flood control plan was the construction of the *bandjirkanal*, the West Flood

Canal, which carried overflow from the Ciliwung River west of the city and north to the Java Sea (ibid). The canal, an engineering achievement in its own right, represented colonial modernisation in Batavia while also providing water in abundance to far-flung areas of the wider city (Argo, 1999).

Post-Independence Era: Sukarno Regime (1949-1967)

During the early period of Indonesian independence, from the late 1940s to the late 1960s, President Sukarno was a central figure in the planning and development of Jakarta, in particular for strategic decision-making. Planning during this period was politically driven, characterised by government-led initiatives under the guidance of a strong centralised state (Salim and Firman, 2011; Hudalah et al., 2007). This was especially true because Sukarno had been trained as an architect and believed architecture and urban planning could facilitate the creation of an ideal society (Leclerc, 1993). The president's vision was to transform the then colonial city into a world city by building new, monumental facilities and infrastructure on a grand scale (Salim and Kombaitan, 2009; Crouch, 1980; Ford, 1993). This vision, which Octavianti and Charles (2018) argue, was not linked to economic reality, and his approach was criticised as being strong on political rhetoric and symbolism but weak on revolutionary reality (Abeyasekere, 1989, cited in Octavianti and Charles, 2018, p1111). Diverting resources towards these large scale and expensive building projects meant that limited funds were available for basic services (Octavianti and Charles, 2018).

Jakarta's first attempt at creating a strategic development for future growth was the Master Plan for 1965-1985, initiated by the DKI government and aided by international experts and included an extension of the water supply system, drainage infrastructure, solid waste collection, as well as the preservation of green open spaces in the south-eastern area of the city. Importantly it also mapped areas with potential for flooding (Steinberg, 2007; Chandramidi, 2013; Abeyasekere, 1989, cited in Octavianti and Charles, 2018, p1111). Sukarno himself was involved with certain aspects of the master plan, imposing his own priorities on the consultant team, though implementation was inhibited by staff shortages and political considerations (Tambunan, 1996, cited in Octavianti and Charles, 2018, p1111). At the time, "it was impossible even to have it (the plan) discussed, much less approved", however this was viewed by some experts as a positive outcome due to the unrealistic expectations set by the plan (Abeyasekere, 1989, cited in Octavianti and Charles, 2018, p1111).

Jakarta's early development as an independent city affected the severity of flood problems affecting the city. One example was the predilection for the government to evict poor residents from informal settlements which stood in the way of infrastructure. One such example was Senayan City, a 300-hectare sports complex built in the Senayan area of then South Jakarta in 1962 in preparation for the Asian Games later that year (Ford, 1993). The construction of the complex required the demolition of existing kampung³¹ and the eviction of residents to other areas of the city, for example Kemang or Tebet Gunawan, 2010). This pattern of demolition followed by eviction of residents of informal settlements in order to construct new or improve existing infrastructure would become a key historic institutionalist characteristic pervading planning and infrastructure development in the present day. Added to this problem is the fact that the area of Senayan City had been designated since the colonial era as green space for stormwater absorption, with a requirement that only a maximum of 5% of land in the area could be set aside for construction (Octavianti and Charles, 2018).

The development of new towns to the south of old *Weltevreden* (now Medan Merdeka) such as Kebayoran Baru and Grogol in the 1950s as a response to a housing crisis at the time exacerbated flooding problems as the two areas were built on drained swamps (Gunawan, 2010; Octavianti and Charles, 2018). As a sign of their lack of sustainable planning, these areas have continued to flood to the present day (Rudi, 2015; Silver, 2008; Octavianti and Charles, 2018).

Sukarno established the Komando Proyek Penanggulangan Banjir Jakarta (The Jakarta Flood Mitigation Project Command, 'Kopro Banjir') in 1965, which was comprised in large part

³¹ Kampung is the Indonesian word for village, but is typically used to refer to informal settlements in Indonesian cities. The Malaysian term kampong is essentially the same meaning, and the term is the same for singular and plural forms (Singapora stories, 2021).

from a flood control plan initiated by the colonial government (Caljouw et al., 2005; Gunawan, 2010; Octavianti and Charles, 2018). A long-term project implemented by the Department of Public Works, which included the construction of up to 89km of canals, the dredging of 750,000m3 of mud in rivers and estuaries, and the construction of pumping stations, bridges and flood control gates followed, which required the relocation of local residents from 478 hectares of land (Sethuraman, 1976; Octavianti and Charles, 2018).

New Order Regime: Suharto Era (1967-1997)

Under President Suharto (1966-98), Indonesia's second dictator and initiator of the rightwing New Order, Ali Sadikin (1966-77) governed Jakarta. His primary concern was how to deal with large population increases resulting in significant informal development resulting from squatters occupying undeveloped land, in some cases under dangerous conditions, e.g. underneath bridges and motorway overpasses, on top of dykes and levees, as well as alongside canals and rivers (Sadikin and Hadimadja, 2012; cited in Octavianti and Charles, 2018, p1111), where approximately 70,000 squatters were reported in the city at the time (Abeyasekere, 1989, cited in Octavianti and Charles, 2018, p1111). Clearing of kampung for new development, infrastructure improvements such as road widening and "river normalisation" was expensive and time-consuming, however illegal occupation of empty urban landholdings partly resulted from a policy by the DKI government not disclosing urban planning projects to the general public in order to avoid land speculation (Octavianti and Charles, 2018, p1110). Sadikin attempted to reduce rural to urban migration through the implementation of the 'closed Jakarta' policy, which proved to be unsuccessful (Sadikin and Hadimadja, 2012 cited in Octavianti and Charles, 2018, p1112) and is described by Mulyana (2012) and Octavianti and Charles (2018) as a policy failure.

Flooding continued to be a significant challenge for the government during this period and a variety of responses emerged. Kopro Banjir established in 1965 was transformed into *Proyek Pengendalian Banjir Jakarta Raya* (Jakarta Flood Control Project) in 1972 (Gunawan, 2010). The Jakarta Flood Control Project covered the city and surrounding areas, which contributed to runoff in the catchment zone (Octavianti and Charles, 2019a). According to Sadikin and Hadimadja (2012), in response, large infrastructure projects were implemented

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during the 1960s including the Pluit Dam, Setiabudi Dam, Melati Dam and Tomang Dam. In 1973, *Kementerian Pekerjaan Umum dan Perumahan Rakyat* (the Ministry of Public Works and Housing, Kemen PUPR) together with NEDECO, a Dutch Engineering Consultancy, undertook an infrastructure study which proposed the continuation of the West Flood Canal originally constructed in 1918. The recommendation called for the canal to be extended all the way to the sea, as well as to construct the East Flood Canal which would divert flood waters from the Ciliwung River to the eastern side of the city (NEDECO, 1973, cited in Octavianti and Charles, 2018, p1111).

Gunawan (2010) and Octavianti and Charles (2018) note that two major flood events took place in 1976 and 1979. Two flood drains were constructed in response to these inundations, however due to financial constraints, the Cengkarang and Cakung drains were built smaller than initially planned and were implemented to replace the East and West Flood Canals respectively (Gunawan, 2010; Octavianti and Charles, 2018), though their effectiveness appears questionable given the fact that both canals continue to form integral parts of Jakarta's flood defence system (Bappenas, 2019; Bappeda, 2022). Despite Governor Sadikin's insistence that full flood planning must be implemented to avoid future problems, the funding was never sufficient and the improvements to Jakarta's flood mitigation. Systems were not implemented and remain fragmented to this day (Octavianti and Charles, 2018; Priatmodjo, 2022a). Unfortunately, the problems associated with flooding continued to get worse as the city's population increased, with neoliberal policies implemented where only those who could afford to pay received services (Kooy and Bakker, 2008; Octavianti and Charles, 2018). Indeed, according to Abeyasekere (1989, cited in Octavianti and Charles, 2018, p1115), waterways implemented under colonial rule continued to serve as the city's primary bathing and laundry facility for the city's urban poor, despite the poor hygiene, dirty quality of the water (Argo, 1999; Octavianti and Charles, 2018). Despite these problems, some limited public services were implemented, justified by the government as a way of limiting excessive urbanisation (ibid).

Governor Sadikin, inspired by the first Kampung Improvement Programme of the 1920s, and under the Suharto Regime, facilitated a similar programme funded by the World Bank from 1968 which focused on the provision or improvement of basic services such as potable water, sewerage and electricity (Kusno, 2011, 2013, 2023; Marulanda and Steinberg, 1993; Winayanti and Lang, 2004) or lining drains, providing water hydrants and toilet blocks without otherwise disrupting the social fabric of kampung. The programme was highly successful in Jakarta and was implemented with elsewhere in Indonesia (Sadikin and Hadimadja, 2012, cited in Octavianti and Charles, 2018, p1112). City Planning was strictly adhered to during this period, partly due to Governor Sadikin's military background, who saw Jakarta's Master Plan of 1965-85 as essential to controlling urban development in the city (Gunawan, 2010; Octavianti and Charles, 2018). This plan however did not suit the needs of a rapidly growing city, and while regulations were in place for potable water, sewerage and public transport, there was a marked lack of coordination at the implementation stage which has continued, Octavianti and Charles argue, down to the present DKI administration (2018). Octavianti and Charles (2018) contend that one of the planning successes of the period was the regional planning framework known as Jabotabek (a portmanteau of Jakarta plus the surrounding suburbs of Bogor, Tangerang, and Bekasi), which was established with the aim of limiting the growth of Jakarta in favour of other cities while incorporating regional solutions to flooding (Caljouw et al., 2005).

In the era following Governor Sadikin's departure from public office, flood control in the city continued to adhere to Jakarta's Master Plan of 1985-2005, where technical solutions to flooding and drainage were prioritised. During this period several projects were implemented, including the Depok Dam, coordination between different government ministries, agencies and departments was improved and the regulation of urban development in the city's southern areas was also improved (Pemda Jakarta, 1991, cited in Octavianti and Charles, 2018, p1112). Despite the city master plan, Jakarta experienced rapid, uncontrolled growth of new satellite towns and superblocks under Suharto (Pratiwo and Nas, 2005, cited in Octavianti and Charles, 2018, p1112).

Post-Suharto Decentralisation and Neoliberal Era (1998-present)

A tense political situation emerged partly as a result of the Asian Financial Crisis of 1997-98 which resulted in then President Suharto resigning from office after ruling as dictator for 32 years, ending his New Order regime in the process. This led to the emergence of a

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new political administration in Indonesia and ushered in democracy. This political change brought about a decentralisation process in governance and fiscal power from the level of the central government to that of local, municipal government, allowing for greater levels of local autonomy and financial control, a process which continues to develop to this day (Bunte and Ufen, 2009; Holzhacker et al., 2016; Silver et al., 2001).

Octavianti and Charles (2018) note that between 1998 and 2016, major flood events occurred more frequently and were of greater intensity than in past years. For example, floods were recorded in 1996, 2002, 2007 and 2013. While the 1996 flood was a major event, it was not treated with sufficient urgency by the government. This changed in 2002, which triggered the implementation of new flood mitigation measures such as the East Flood Canal that had been planned for more than three decades (Octavianti and Charles, 2018). Since by the early 2000s, Jakarta had mostly recovered from the Asian Financial crisis of 1997-98, and money was finally available in the government's budget for infrastructure projects. Despite this, the East Flood Canal took eight years to complete largely due to land acquisition problems and financing. This is illustrated by the case of Kampung Penas Tanggul in East Jakarta where 109 residents were evicted due to property demolition to make way for the new canal (Winayanti and Lang, 2004)³². According to Octavianti and Charles (2018, 2020), the 2007 flood was one of the worst in the history of Jakarta. The government's response was to begin conducting river and canal dredging joint initiative with the World Bank in 2008 while undertaking flood control research in collaboration with the Government of the Netherlands (Ministry of Public Works, 2011; Netherlands Agency, 2012). In 2013 yet another major flood event caused the inundation of the Golden Triangle (the city's central business district). In response, the governmentinitiated efforts to undertake river canalisation along a 19km stretch of the Ciliwung River (PU, 2016; Octavianti and Charles, 2018).

Octavianti and Charles (2018) describe a new discourse concerning land subsidence in Jakarta, one which, despite the issue having been discovered as far back as the 1920s, only recently appears to have been recognised for its urgency. As a response to this situation of

³² See Chapter 3 for further details.

a sinking city in the context of already severe flooding, the National Capital Integrated Coastal Development Master Plan (NCIDC) was initiated by the Central Government in partnership with the Government of the Netherlands (NCIDC, 2014). A number of stakeholders primarily concerned academics and experts working in planning and urban development, as well local NGOs working with communities affected by the planned flood mitigation measures, primarily in North Jakarta, have expressed scepticism as to the potential effectiveness of the plan (Priatmodjo, 2022b; Sutanudjaja, 2018 and 2022; Octavianti and Charles, 2018).

Aside from physical flood infrastructure, the DKI Government has long been pursuing policies in order to arrest, or at least minimise the flooding problems, all the way back to the colonial period. More recently *megapolitan* was a tern brainstormed by Governor Sutiyoso (1997-2007) to describe areas of Jakarta and its surrounding region where urban rapid development and resulting deforestation in the Puncak area (the hills and mountains surrounding the city) were seen as the cause of the 2002 flood. The Central Government therefore passed Law No. 5, 2008, for Jabodetabekpunjur (Octavianti and Charles, 2018). Governor Jokowi (2012-14) in 2014 signed an agreement with other regional political leaders aimed at reducing the risk of flooding to Jakarta (Agustina, 2014). Octavianti and Charles (2018, p1113) argue "that these non-structural measures are only secondary and complimentary to the main infrastructure measures".

Octavianti and Charles (2018) note that the waterfront development in the form of land reclamation north of the city's coastline accompanying the JCDS and the NCIDC that began taking place since 2011 (Google Earth, 2022) was initially set out under Suharto through the signing of Presidential Decree No. 52, 1995. Since the city is constrained spatially to the west, south and east, the only direction it could reasonably develop was north, therefore Government recognised that the creation of new land would be a potential solution to provide significant new space for development which would otherwise not be possible given the shortage of available real estate (Kusno, 2011; Pemda Jakarta, 2012, cited in Octavianti and Charles, 2018, p1112). Despite this seemingly advantageous opportunity, building land reclamation for new urban development in the city's most flood prone area "exposes people and assets to environmental hazards such as land subsidence, sea level rise

and coastal flooding" (Octavianti and Charles, 2018, p1113), a long-term risk in North Jakarta.

Institutional lock-ins: Flood mitigation measures

Considering a historical institutionalist analysis of flood infrastructure over the past 400 years in Jakarta, Octavianti and Charles (2018) argue that policy responses to flooding were repeated over and over again with only nominal adjustments to primary infrastructure concepts. They note that some major flood events served as critical junctures for related policies, e.g. the inundations of 1621, 1918, 2003 and 2013, which were comparably brief periods of considerably increased probability where decisions made by agents of change could affect the outcome of interest (Capoccia and Kelemen, 2007 cited in Octavianti and Charles, 2018, p1113-1114). The primary outcome of these flood crises was the instigation of the implementation of old policies (going back to the colonial era), while the focus on infrastructural approach remained unchanged. Conducive political and economic conditions were necessary in order for individual flood events to be sufficiently influential (Octavianti and Charles, 2018). An example of this is the East Flood Canal, originally planned during the colonial period and only finally built in response to the 2002 inundation (ibid). There was an attempt to shift preferences to non-structural measures, for example more controlled urban development in the region in order to combat loss of water absorption and deforestation, development of agricultural land, etc. which was initiated on several occasions, starting in the 1970s with the introduction of the Jabotebek concept. In 2002 the *megapolitan* model followed, while in 2013 the then ruling governor signed an agreement with other local leaders in order to take concrete action, however these attempts were ultimately unable to change the long held beliefs of policymakers in favour of technical infrastructure solutions (ibid).

An analysis of policy responses to significant flood events suggests infrastructural approaches dating back to the colonial era, in particular canalisation, has made a recent resurgence in Jakarta (ibid). No significant infrastructure was constructed in Jakarta between 1945 in the Early Independence Era and 1998 at the end of the New Order regime. Since that time, under the Flood Control Plan of 1972, which was dominated by technocratic, infrastructure-led mitigation measures, ironically, very little outlined in policy documents was actually realised (Octavianti and Charles, 2018). Evidence suggests this was due primarily to the instability of economic conditions in Indonesia preceding the Asian Financial Crisis of 1997-98, though some indications point to corruption endemic during the New Order regime, along with the nepotism and cronyism of Suharto in the city's urban development sector which was partly responsible for the plan's poor implementation (Pratiwo and Nas, 2005, cited in Octavianti and Charles, 2018, p1112).

Octavianti and Charles (2018) argue that policy responses to recent major flood events in 2002, 2007 and 2013 serve to maintain institutional lock-ins, the inability to change policy course, with regard to infrastructural policy responses. These have in turn led to institutional stability through positive feedback loops. This cycle of positive feedback is the primary characteristic of an institution following a path-dependency (Octavianti and Charles, 2018), where institutions continue to implement policies or strategies because of previous perceived successes (see Figure 4.0). Indeed, the link between a particular policy and its impact can serve to strengthen a preference for a particular policy response over long periods of time. One example of this in terms of flood mitigation is the canalisation project along the Ciliwung River (ibid). The canalisation as a process is technically uncomplicated and the benefit is that such projects can provide rapid alleviation of inundations within certain design limitations. More significant is the fact of their being relatively easy to implement which suits the short timeframes of political election cycles, a challenge Indonesia shares with other large, well-established democracies (ibid).

The parliamentary system modelled on the West which was implemented in Indonesia following independence in the late 1940s has led to politicians favouring short-term objectives in order to acquire political support at the expense of long-term ambitions (Jayapal, 1993, cited in Octavianti and Charles, 2018, p1114). Politicians therefore employ aggressive rhetoric and disproportionate utilisation of power (Argo, 1999). An example of this was when Governor Anies publicly promoted the interests of poor residents in Kampung Akuarium where the previous ousted Governor Ahok had pursued a ruthless programme of eviction and demolition of what the DKI government claimed was public

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land. Canalisation therefore has fulfilled the objective of securing political support (Octavianti and Charles, 2018). One of the major problems with canalisation is that it treats flooding as downstream problem, ignoring the nature of flooding as a problem of the watershed. This fails to address the root cause of flooding, which is locally understood to result from a combination of lack of ground absorption and increased rainfall intensity (Maharani, 2013; Octavianti and Charles, 2018). Often these local causal factors are ignored: particularly overdevelopment and deforestation in the uplands surrounding Jakarta, which lead to the decreased ability for land and vegetation to absorb water mentioned by Octavianti and Charles.

Octavianti and Charles (2018) argue that canalisation requires continuous investment for maintenance, which the current government has failed to match. In fact, in a four-month period of 2016, a minimum of five dike failures were recorded at Pantai Mutiara, Muara Angke, Pondok Labu, Pesanggrahan and Kemang. Octavianti and Charles (2018) contend that this continues a long-held practice dating back to colonial times where flood problems were transferred to poorer areas of the city, while providing protection to commercial and wealthier districts. This in fact, represents what Ford (1993) and Kusno (2011) described as spatial segregation during colonial times, which has continued to the present day. Where formerly this focused primarily on ethnicities: Europeans, the Chinese and indigenous Javanese, segregation is now manifested through flood protection and infrastructure: the poor are relegated to flood-prone, unprotected land, while the wealthy and middle classes can afford to protect themselves in their restricted enclaves.



Figure 4.0: Octavianti's and Charles's (2018) description of positive feedback of Jakarta's flood policy where major flood events are nearly always responded to by infrastructural mitigation measures providing rapid but unsustainable relief.

Octavianti and Charles (2018) note three primary reasons for the retention of infrastructural approaches to flooding in Jakarta: Firstly, decades of government investment in flood mitigation infrastructure has resulted in costs too difficult to recover, and consequently, in what would effectively otherwise be lost capital. This policy has its roots in the long history of flood mitigation in Jakarta going back to the colonial period. Secondly, policymakers are impeded by cultural pressures, where they must follow a script or behavioural pattern established by Indonesian society over a long period of time in order for their decisions to be recognised as legitimate (Octavianti and Charles, 2018). This is supported by Hudalah et al. (2014) where they observed similar behaviours are manifested in group decision-making by consensus led by a patriarchal, hierarchical system. This essentially means policymakers are not at liberty to modify or transform strategic direction to bring about lasting change. Thirdly, the recent canalisation project could be seen to be a reflection of unconscious bias to continue the same approaches initiated by the old colonial government (Octavianti and Charles, 2018). Indeed, Sukarno, in an attempt to depart from colonial imperialism, attempted to recreate Jakarta in the image of a thenmodern and internationalist city (Octavianti and Charles, 2018; Ford, 1993; Kusno, 2011), though he was also criticised for prioritising resources to create large roads, expansive urban squares, expensive monuments and grandiose buildings amidst under-resourced urban services which itself was a holdover from the previous colonial government which openly prioritised European settlements over indigenous ones (Ford, 1993; Kusno, 2011; Abeyasekere, 1989, cited in Octavianti and Charles, 2018, p1115). This further represents a continuation of colonial spatial segregation through the utilisation of financial resources for

flood mitigation: the rich and powerful are protected while the poor and vulnerable are left to fend for themselves.

Octavianti and Charles (2018, p1115) argue that unconscious bias is also reflected in the colonial government's regular utilisation of what they refer to as "imperial science" which essentially acted to justify their dominance over their colony of the East Indies (Adas, 1989, cited in Octavianti and Charles, 2018, p1115). They contend that Dutch colonial expertise was entrenched in the city's canal system encouraged the current Jakarta DKI administration to unconsciously follow a similar approach to that of the colonial administration during pre-independence era (Kusno, 2013; Octavianti and Charles, 2018). Indeed, such an inherited policy was essentially so entrenched that post-independence administrations have yet to successfully move beyond this characteristic policy (Argo, 1999; Octavianti and Charles, 2018). In addition, Abeyasekere, 1989 (cited in Octavianti and Charles, 2018). In addition, Abeyasekere, 1989 (cited in Octavianti and Charles, 2018), the Western-driven character of policies remains embedded in decision-making around flood mitigation, water and drainage systems and general urban planning in Indonesia, illustrated clearly by the ongoing river and waterway canalisation project in Jakarta and also the JCDS and NCICD, delivered with Dutch expertise.

Population growth has undoubtedly contributed significantly to the severity and impacts of major flood events in recent decades, as well as annual flooding that currently plague the city. "Independence ignited the hope that motivated people to search for a better life in the capital, but uncontrolled urbanisation influx encroached (on) the city's water ecology to cope with the surplus of water" (Octavianti and Charles, 2018, p1116). This point is important considering the problems of water-clogged waterways exacerbated by the presence of informal development along the banks of rivers and canals (Priatmodjo, 2016), and the manner in which the DKI government has acted in recent years to demolish and evict residents from such areas in order to improve water capacity, as seen in Chapter III. In fact, this pattern of path dependence is not new, but goes back to the beginning of the colonial period, as argued by Octavianti and Charles (2018), as well as Kusno (2011) and Ford (1993). Indeed, Octavianti and Charles (2018) argue that policy decisions made in response to flooding during the colonial era continue to play a role in flood policy today in

Jakarta. During the colonial period, technocratic, engineering-led flood mitigation solutions such as canal-building were pursued because they were seen as necessary infrastructure. This constitutes further evidence supporting the argument that current policies have merely continued this trend, with the current canalisation project, the recent construction of the East Flood Canal, as well as the JCDS and NCIDC projects attest.

Octavianti and Charles' analysis of flood infrastructure over the past 400 years illustrates a government – be it that of the colonial period or those of the post-independence or post-Suharto eras – have struggled to remain ahead of flooding consistently over the centuries. Their persistence in promoting technocratic, engineered solutions for flood infrastructure to control inundations and drainage, while by no means a constant, has also remained characteristic of the manner in which they have viewed the challenge of flooding. Top-down solutions have also factored as a way of reaching decisions around what types and forms such infrastructure interventions would take, illustrative of institutional lock-ins, which show the inability of government bodies to consider viable alternatives. What remains remarkably coherent across colonial, post-independence and post Suharto era governments is the persistence of the system initially established by the Dutch in the early 17th century. Indeed, in some cases, colonial-era planned works were only realised in the 21st century, emblematic of this path dependency.

However, what Octavianti and Charles's analysis does not show is the spatial impact and changes to urban morphology illustrated by this chapter, as well as Chapters II and III, where infrastructure interventions can and certainly do result in physical, spatial changes on the ground, with important implications for the communities impacted by them. This is illustrated later in this chapter, building on the case studies of Chapter III, which illustrated kampung communities affected by flood infrastructure improvements, specifically to *waduk* (polders), canals and rivers.

Evolution of the Jakarta Coastal Defence Strategy and National Capital Integrated Coastal Development Master Plan (2007-2020)

A review of the larger infrastructure development being undertaken in Jakarta is important to understand the flood mitigation context across the city described in this chapter. In particular, the northern area of the city, where land subsidence and flooding are at the highest levels in the city, it is essential to recognise how new flood infrastructure being built as part of the JCDS and NCIDC is being undertaken and what effects these works are having on the city's urban form and local communities.

The government of the Jakarta DKI³³, its *kota*³⁴ and *kecamatan*³⁵ and its predecessors, as well as the national government, have long been grappling with the challenges of flooding, land subsidence, population growth, rapid urbanisation, over development in the city, particularly in the areas along the northern coast (Kops, 2012). Garschagen et al. (2018) note that the quest by city authorities to provide flood risk reduction responses is not new, going back to colonial times, when in 1619 the Dutch implemented their *Waterstad* typology, a structured canal system, based on networks of water and flood drainage from cities of the 17th century Netherlands. The Western Canal, first built in 1725, was and essential component of this system imported to Jakarta by the Dutch. It was constructed in order to divert some of the Ciliwung River's discharge around the city. This was followed by further infrastructure-based diversions, in effort to gain additional control over Jakarta's hydrology (Garschagen, et al., 2018).

More recent policies related to flood mitigation along the city's north coast undertaken at the national and DKI-levels date back to at least since 1995 (Priatmodjo, 2022a, 2022b). Presidential Decree No. 52/1995, on the Reclamation of the North Coast of Jakarta was

 ³³ Jakarta DKI stands for *Daerah Khusus Ibukota Jakarta* or Special Capital Region of Jakarta (Steinberg, 2008).
³⁴ Kota or Kota Administrasi refers to a city level municipality, literally a 'city' or 'administrative city' (JDIH BPK RI Database Peraturan, 2022).

³⁵ *Kecamatan* refers to administrative districts. Kota are typically divided into several kecamatan (Moehadi, et. Al., 1989).

promulgated on the 13th of July that year by then President Suharto (ibid). At that time, the project was called the Jakarta Waterfront City, with an idealised associated theme of "the Rebirth of Jayakarta" (Priatmodjo, 2022a, p2), the Victory City destroyed back in 1617 by the Dutch. The plan consisted of 2,700 hectares of land reclamation along with 2,300 hectares of redeveloped coastal land, for a total of 5,000 hectares of new urban development (see Figs. 4.1-4.5). Priatmodjo (2022, p2) refers to this as a "fait accompli" by the president, since the *Recana Umum Tata Ruang* (the Jakarta City Master Plan) for 1985-2005 did not include any land reclamation along the city's northern coastline and was the DKI government's official development plan during that period.

1995

Presidential Decree No. 52/1995, 13 July 1995 on "Reclamation of the North Coast of Jakarta"



Attachment no. 1 – Boundaries of reclamation plan

Figure 4.1: Boundaries of the reclamation plan in 1995. Source: Priatmodjo, 2022a).

A local regulation by the DKI government, No. 8/1995, initiated on the 6th of October that year, concerned the Execution of Land Reclamation and a Spatial Plan for the North Coast of Jakarta (Priatmodjo, 2022a). This piece of legislation was a response to Suharto's Decree from July that year. The decree only covered the zoning and associated land use boundaries, while the DKI law formulated for the first time the actual shape of the islands (see Fig. 1.1) (ibid).

1995

Local Regulation of DKI Jakarta No. 8/1995, 6 October 1995 on "Execution of Reclamation and Spatial Plan for the North Coast of Jakarta"



Attachment no. 5 - Map of infrastructure plan

Figure 4.2: Map of the infrastructure plan of 1995. Source: Priatmodjo, 2022a).

According to Priatmodjo (2022a), the Jakarta Waterfront City project ceased operations temporarily during the 1997-98 Asian Financial Crisis when Indonesia underwent a severe economic recession. By 2003 a number of institutions and NGOs had studied the reclamation plan, conducting environmental impact studies. The results called into question the effectiveness of the plan, stating that it would damage coastal ecosystems while interfering with the operation of the adjacent Muara Karang power generation plant. In response to this, the Ministry of the Environment issued Decree No. 14/2003, called the Infeasibility of the Reclamation Plan and Revitalisation of the North Coast of Jakarta, on the 19th of February, 2003 (Priatmodjo, 2022a).

Despite the decree of the Ministry of the Environment, the Master Plan of the DKI to 2030 still includes the reclamation plan for the north coast, though revised, as it provides more clarified island shapes and functions (see Fig. 1.2) (ibid; Pemerintah Provinsi DKI Jakarta, 2012). Also, in 2012 the DKI Governor initiated Regulation No. 121/2012, the Spatial Plan of the Reclamation Area on the North Coast of Jakarta, in September.



Figure 4.3: Map of the reclamation islands and their land use zones. Source: Priatmodjo, 2022a).



Figure 4.4: Map of the land reclamation with alphabetical designations. Source: Priatmodjo, 2022a).

This legislation gave each island an alphabetic designation (A-Q) and covered an area of 5,153 hectares (see Fig. 4.4 and Table 4.1), increased from 2,700 hectares, which would be built to accommodate a population of 728,500 inhabitants (Priatmodjo, 2022a). The same year, Presidential Regulation No. 122/2012, the Reclamation of Coastal Areas, and Small Islands, was promulgated in December of 2012, which acted as a kind of endorsement of reclamation projects along the city's norther coastline, according to Priatmodjo (2022a).

Sub-Kawasan	Nama Pulau	Luas Pulau [Island	Persebaran Penduduk (jiwa)
[Sub-Region]	[Island Name]	Area] (Ha) (+-)	[Population Distribution (people)] (+-)
Sub-Kasawan Barat	А	79	10,500
[Sub-Region West]	В	380	57,000
	С	276	37,000
	D	312	47,000
	Е	284	43,000
	F	190	25,500
	G	161	21,500
	Н	63	8,500
Sub-Kawasan Tengah	Ι	405	95,500
[Sub-Region Middle]	J	316	74,500
	К	32	7,500
	L	481	113,500
	М	587	109,000
Sub-Kawasan Timur	Ν	411	24,000
[sub-Region East]	0	344	22,000
	Р	463	30,000
	Q	369	24,000
Total		5,153	750,000

Table 4.1: Above, Nama Pulau, Luas Pulau dan Persebaran Penduduk [Island Name, Island Area, and Population Distribution], after "Table 1", (Priatmodjo, 2022, p5).

Following the decrees and regulations of 2012, Priatmodjo (2022a) notes that an unknown regulation or decree was issued with an unknown legal basis, but which indicates that private developers have obtained official concessions for developing specific islands, with only Islands O, P and Q being developed directly by the DKI government (see Fig. 4.5). under this provision the total reclamation area decreased from 5,153 hectares to 4,996 hectares, the Jakarta Waterfront City project name was missing from associated documents,

including the updated plan (see Table. 1.4), and the plan for redeveloping the 2,300 hectares of land on the existing north coast was also missing (Priatmodjo, 2022a).

Priatmodjo (2022a) also notes that the absence of a detailed master plan and zoning regulation plan for the reclamation islands resulted in illegal buildings being built on several sites. In fact, in 2015, 2016 and 2018 various Jakarta DKI governors ordered the halting of construction work on the reclamation islands, though it appears that construction eventually continued and is still underway to this day (Priatmodjo, 2022a).

? Unknown regulation/decree



Source: metrotvnews.com

Figure 4.5: Map of the artificial islands illustrating the developers allocated to each island. Source: Priatmodjo, 2022a).

In 2007 an extreme flood event which inundated more than 60 percent of the city and resulted in 79 deaths with 500,000 evacuees, intensified long running debates around flood risk reduction in Jakarta and elsewhere in Indonesia and shifted the emphasis of flood mitigation drastically (Garschagen et al., 2018; Octavianti and Charles, 2019a; Priatmodjo, 2022a, Priatmodjo, 2022b; Bappeda, 2023; Respondent 4, 2023). This severe flood was caused by heavy precipitation and discharge concurrent with an unusually powerful spring tide, where water was pushed into the city by rivers from the south, but also from the sea

to the north, a situation which the city had not typically faced (ibid). The focus had previously been around diverting discharge from the upstream Ciliwung River catchment zone around the city and into the sea to the north, however the focus now moved to incorporate coastal protection alongside attempts to improve and expand water retention capacities within the city's water and drainage network (ibid). The result of these pressures and shift in focus was the JCDS, which was conceived by a consortium of Indonesian and Dutch specialists under the direction of the DKI government lead by Fauzi Bowo (ibid; Priatmodjo, 2022a).

Flood risk since 2007 had focused on three primary mitigation measures (Garschagen, et al., 2018; Octavianti and Charles, 2019b):

- A strong emphasis on river and canal regulation and maintenance; the widening of waterways, clearance of riverbanks, both typically the subject of encroachment by squatters;
- Refurbishment, improvement, and expansion of flood reservoirs, especially in North Jakarta; and
- A new coastal flood protection wall currently under construction.

Garschagen, et al. (2018) note that these mitigation measures all require a significant amount of space, and considerable resettlement of existing residents in areas of encroachment has been necessary in recent years. The majority of dwellings affected belong to low-income and poor households residing in kampung which had been built atop or adjacent to the banks of rivers, canals and *waduk*, due to the scarcity of affordable housing elsewhere in the city (Garschagen, et al., 2018). 15,000 residents had to be relocated for the Ciliwung River alone over the 2013 – 2018 period (ibid).



Figure 4.6: Early version of the NCICD illustrating the inner reclamation islands in relation to existing mangrove forests and the outer seawall (Suprayogi et al., 2018).

Added to these mitigation measures along the North Coast is a canalisation project covering a 19km stretch of the Ciliwung River, the city's main waterway, controversial due to the forced eviction of 70,000 riverbank residents but also because some experts have questioned the project's sustainability (Octavianti and Charles, 2019; Van Voorst, 2016; Monalisa, 2015).

Responding to these recent challenges, the DKI government has issued a series of policies to tackle flooding through implementation of mitigation and associated urban planning (Hidayatno, et al., 2017; Betteridge and Webber, 2019; Priatmodjo, 2022a). The JCDS is one of these policies, it aims to transform the city's waterfront from its current mixture of industrial backwater, harbour functions and gated communities into an international waterfront akin to cities like Singapore and Hong Kong (Kops, 2012). The city currently lacks a publicly accessible waterfront and, due to the mixture of private land and industrial uses, turns its back towards the sea (Kusno, 2011), not unlike pre-Olympic Barcelona of the 1980s.

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Figures 4.7-4.15; Top three images: Aerial photos of Island G by PT Agung Podomoro still only partially complete in 2019. Middle and bottom images: Aerial and ground level photos of Islands C & D, including with recently constructed buildings. All images those of the author apart from the bottom row. Source: Figures 4.7-4.13: Author, 4.14-4.17: Priatmodjo (2022a).

The JCDS is essentially a security system for the city, being realised as a series of physical and spatial interventions, most notably a giant seawall which will run along the entirety of the city's north coast, as well as related regulations concerning new water transmission and distribution infrastructure, as well as large scale land reclamation in the coastal area (Hidayatno, et al., 2017). Ground-breaking for the JCDS project occurred in October 2014 and (ibid) is currently well under construction.

The JCDS has been revised and expanded a number of times since 2011, which has led to a related policy, the National Capital Integrated Coastal Development Master Plan (NCICD), also developed by a Dutch-Indonesian consortium, which was implemented in 2014, led by the Coordinating Ministry for Economic Affairs of Indonesia (2014), with a strong partnership with the DKI government, the National Development Planning Agency and the Ministry of Public Works (see Figures 4.6 -4.23) (Garschagen, et al., 2018; Priatmodjo,

2022a). It was enacted largely in response to the 2007 and 2013 floods, in particular the latter, when the city's central business district was submerged (Octavianti and Charles, 2018). This plan builds on the idea of blocking the Bay of Jakarta off from the sea envisaged in. The JCDS, through the implementation of a giant seawall known as the Great Garuda Project (due to the shape of the land reclamation involved), to be 25km long, behind which the bay will be converted into a sealed reservoir regulated to remain below sea level, allowing for controlled drainage of the city (ibid). for this to be possible, the world's largest pumping station, with a planned capacity of 730m³ per second, is planned to pump water out of the reservoir and into the sea (ibid). A series of associated improvements, upgrades and expansions of the existing flood infrastructure and drainage system in the city, including the retention of *waduk* and other reservoirs, drainage canals, flood protection walls along main waterways and the coastal dam are included (ibid).

Within the sealed reservoir, vast land reclamation projects, are planned to provide a new central business district (CBD), residential areas, a new harbour and airport, which will house an additional 650,000 inhabitants, 350,000 new jobs at an estimated cost of US\$40 billion, with significant commercial and residential real estate opportunities for a total population of between 1.5 and 2 million inhabitants (Garschagen, et al., 2018; Priatmodjo, 2022a; Octavianti and Charles, 2019b). Implementation is planned to be undertaken in three phases with completion of the sea dike set for 2022 (ibid). The city government argues the high cost of the Great Garuda Project will be offset by the considerable increased land values and other economic benefits (ibid). despite these benefits and the large number of government agencies involved in the project, civil society groups and residents affected by these plans have raised strong objections, specifically that the plan lacks public consultation and opportunities for citizen involvement in the planning process (ibid).



Figure 4.16: Plan of the Floor Area Ratio (FAR) density calculations for the Great Garuda. Source: Priatmodjo, 2022a).

Priatmodjo (2022a, p11; 2022b) refers to the "Crazy FAR" for the Great Garuda artificial island. Nearly one-third of the reclamation in this phase is designated for Floor Area Ratios (FAR) of 6, 7 and 8 (see Figure 4.16). If this is compared with elsewhere in Jakarta, along the Jelan Thamrin-Sudirman corridor in the Golden Triangle (the central business district where the tallest buildings in the city are located, up to 389m), the average FAR there is 3-4. Only certain plots are allowed special FARs, such as the corner plots in Semanggi (an interchange in the Thamrin-Sudirman corridor) that have FARs of 8-9 (Priatmodjo, 2022a). The master plan for the Great Garuda and states that the land reclamation here will provide 23.7 million m² of development. With a total area of 696 hectares on the main island, the average FAR for this area is 3.4 (ibid). this means the average density of the city could be as high as 680 people per hectare, compared with the Jakarta average of 159 people per hectare (ibid). These figures represent a significant departure from the average

densities across the DKI, and indeed apart from the Golden Triangle and a few high-rise developments scattered across the city, such as Pluit City in the north. It would appear that the DKI, Central Government and the developers concerned were attempting to create a new face or façade of the city, almost a stage set to hide the real Jakarta behind it, with its myriad problems including flooding, lack of infrastructure, informal settlements, and poverty.





Figure 4.17a & 4.17b; Left image: The NCICD Master Plan with the Jakarta Giant Sea Wall and the Great Garuda land reclamation development. Right image: The NCICD Master Plan detailed view with associated development districts. Source: Priatmodjo, 2022a).



Figure 4.18: The NCICD Master Plan with the Great Garuda and the new offshore container port. Source: Priatmodjo, 2022a).

The NCICD, along with a canalisation project along 19km of the Ciliwung River and recent infrastructure projects such as the East Canal of 2003, was launched amid renewed

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efforts by the National and DKI governments to tackle the city's ongoing flood problems (Octavianti and Charles, 2018). The NCICD project has proven to be highly controversial, with a number of stakeholders, including NGO activists and concerned academics, casting doubt on the ability of the mega structure to deal with flooding threats (ibid).



Copy of Dubai's Palm Jumeirah and Palm Jebel Ali



Figures 4.19 – 4.23: The NCICD Master Plan three-dimensional visualisations which Priatmodjo (2022a, p10) calls a "copy of Dubai's Palm Jumeirah and Palm Jebel Ali".

When the author undertook a site visit to the North Coast infrastructure works at Waduk Pluit in June 2019, hosted and led by Bappenas, the Ministry of National Development and Strategy, serious doubts were raised by accompanying flood experts as to whether the proposed pumping stations needed to ensure the NCICD would function effectively could actually be sufficient to pump the necessary amounts of water to the level of the Java Sea on an ongoing basis. This element is important, because Bappenas claims the pumping stations will be the largest in the world, and it is within the context of ongoing severe land subsidence that this infrastructure will be required to function, not only during dry periods, but also at times of major flood events. It is within the context of the JCDS and the NCICD, that the three case studies utilised in this article are set. The influences and direct effects of these plans and their associated policies have directly influenced the spatial development of North Jakarta.

Octavianti and Charles (2019a) argue that the seawall plan, takes place amidst a recently completed canalisation project along a 19km stretch of the Ciliwung river, the city's largest waterway. This project, like the JCDS and NCIDC, is also controversial because up to 70,000 riverbank squatters were evicted, and because local experts have claimed it is an unsustainable solution for flooding problems (Octavianti and Charles, 2019b; Van Voorst, 2016; Monalisa, 2015). The seawall and canalisation projects constitute infrastructural responses to flooding and illustrate government responses out of tune with international best practices. Indeed, evidence suggests more ecological responses to environmental challenges are gaining consensus internationally, including the 'Room for the River' project in the Netherlands and incorporation of ecology within flood management in Hungary (Octavianti and Charles, 2019b; Rijke, et al., 2021; Werners, et al., 2010).

Historic Institutionalist Analysis (up to 2020)

"The NCICD plan is influenced by infrastructural values embedded in the city's canalisation system" (Octavianti and Charles, 2019, p1116), which appears to follow a similar logic to existing structural approaches or what Campbell referred to as "institutional bricolage" whereas part of an innovative process, new institutions are established and utilised which resemble earlier ones (1997, cited in Octavianti and Charles, 2019, p 1116).

Octavianti and Charles (2018) see the NCIDC as an attempt to maintain the status-quo of Jakarta's North coast in terms of structural mitigation measures, possibly due to limitations within the government which then act as constraints to later policymakers. When attempts are made by to deviate from established path dependencies, Octavianti and Charles (2018; Thelen and Conran, 2016) note that institutions attempting change can be locked-into the same form and character as existing ones, unable to activate meaningful change. The reason this is important is that the NCIDC, according to Octavianti and Charles (2018) incorporates a considerable amount of policy inheritance from previous flood infrastructure plans, built on previous knowledge and expertise of policymakers and their supporting institutions.

Octavianti and Charles (2019, p1116) also note that "policy preference to the NCIDC demonstrates that curative over preventative (flood) preventative measures tend to be chosen to cope with water-related disasters. The role of groundwater extraction has not been addressed, but rather the response to the crisis was the proposal to build a massive sea wall." Despite the massive scale of the NCIDC plan, it continues to represent the old structural approaches (Octavianti and Charles, 2018), signalling that little in terms of policy rejuvenation has taken place, only the scale of infrastructural solutions has changed, only now it is coupled with significant new urban development in the form of commercial facilities and housing accommodation.

In another set of articles by Octavianti and Charles, they discuss the hydro social cycle, defined as the "process of making and remaking the social construction and production of water" (Linton and Budds, 2014; citied in 2020, p1). The hydro social cycle is closely related to water security and developed within literature discourses on political ecology, having emerged from the concept of the hydrological cycle as insufficient to describe the social impacts around water security (Octavianti and Charles, 2020; Octavianti and Charles, 2019b). In Jakarta, the portrayal of water insecurity as solely a technical matter does not address the primary problem of land subsidence, nor inland flooding from the upland watershed. In other words, the seawall may reduce vulnerability to sea rises and tidal flooding, however it responds only to a symptom and not the cause of the problem (Octavianti and Charles, 2020; 2019b; Respondent 5, 2023; Respondent 4, 2023;

Priatmodjo 2022b; Respondent 6, 2023). The NCICD does not incorporate any policies aimed specifically at land subsidence, nor upstream flooding (ibid). Octavianti and Charles (2020), argue that the focus on technical issues could cause an over reliance on an already vulnerable system of water drainage across the city. For example, they mention the pumping system which will be required in order to maintain the reduced water levels in Jakarta Bay, anticipated to me at least 730m³/s, however they note that pump failures have occurred numerous times in the past and have led to localised flooding in surrounding areas. In fact, a number of pumps were said to have failed in the most recent 2020 flood event (Octavianti and Charles, 2020).

Octavianti and Charles (2020, p2) also contend that "major infrastructure can dehumanise the anthropocentric nature of water security by abstracting the social element from the water security conception". This has implications for the communities living along the north coast. Closing off Jakarta Bay with an offshore seawall will almost certainly restrict the local fishing industry by literally erecting barriers to fishermen's' freedom of navigation and ease of entering and exiting through the seawall (Octavianti and Charles, 2020; Google Earth, 2023). The blue-collar jobs and affordable housing offered to fishermen appear far from secure and this situation is very likely to increase already significant inequality in Jakarta (Octavianti and Charles, 2020). Octavianti and Charles (2020) note that decisionmakers typically fail to address the externalities³⁶ of large infrastructure projects, intentionally neglecting them or through failure to detect or understand them. They note that most externalities associated with the NCICD master plan will likely arise from the poor coastal environment largely caused by wastewater discharge from residential and industrial uses (Octavianti and Charles, 2020). Because of this long-term, ongoing challenge of water contamination, it is likely that the retention lake within the bounds of the offshore seawall will trap polluted water and pose health risks to people living in the area, possibly greater than the levels already taking place currently (Octavianti and Charles, 2020; Respondent 4, 2023; Respondent 1, 2023; Priatmodjo, 2022a; Respondent 6, 2023).

³⁶ From economics, an externality or external cost or benefit to an uninvolved third party which arises as an effect of another party or parties' activity, such as air pollution resulting form the use of diesel-powered engines (Pigou, 2017).

Flooding remains a perennial challenge for Jakarta's government, usually occupying a space at the forefront of policy decisions, however in practice only major floods have been able to push decisions around infrastructure onto decision-making agendas (Octavianti and Charles, 2018), where there exists potential for real change. Looking back over the past 400 years of flood policies, the issue of flood mitigation has typically formed a top priority for government, yet flooding as a challenge for large megacities like Jakarta is not isolated, from the problems of poor sanitation, inadequate water supply, the proliferation of informal settlements, a lack of sufficient green open space and increasing urban development reducing water absorption, along with excessive groundwater extraction and the resultant land subsidence mean that it must be considered as a system, which impacts on a multitude of issues that challenge the city administration (ibid; Abedin et al., 2011).

The resulting development as part of the JCDS and NCICD projects will form a major change in coastal development in a crucial catalyst for future growth, with linkages to regional and international economies (Van Marrewijk, 2013), addressing the historic lack of waterfront development noted by Kusno (2011), which has seen the city face away from the Java Sea. The ambitious strategy of these efforts at flood mitigation and new development seek to provide comprehensive flood and sea defences along the entirety of the city's northern coastline, while providing new development in the form of islands constructed from land reclamation. The development will effectively create a new 'face' for the city, re-imaging it as a waterfront city, delivering significant development with significant flood and coastal protection elements, sustainable drainage systems and other climate change effect mitigation measures (Kops, 2012).

These new island developments will need to protect Jakarta from flooding while delivering significant new housing to benefit a wide swath of urban society and at the same time delivering vibrant, inclusive communities. They will form a new image and character that the city currently lacks to encourage visitors and international investment, potentially forming a model of development for cities facing similar challenges. However, the current trajectory of planning policy around flooding, as demonstrated by Octavianti and Charles (2018), Kops (2012), Kusno (2011) and others, appears to be merely a continuation of the technocratic-led infrastructural solutions which seek to push the water away, downstream

from the city, rather than decision-makers attempting to find ways of living with the presence of water. This is hugely problematic, for the massive bathtub-harbour proposed by the JCDS and NCIDC will mean that massive pumping stations will be needed to maintain the lower-then-sea level water surrounding the new islands. Will these new pumping stations be sufficient to move such a huge quantity of water constantly upwards during normal times, to say nothing of how they will cope during flood events. This would appear highly unlikely. Furthermore, the central government's attempts to shift the national capital to East Kalimantan Province on Borneo, more than 1,000km to the northeast, cynically appears to be an attempt by policymakers to avoid the future problems of Jakarta which surely they must be aware are coming. Political leaders will be far away in a few years, but as the decades roll by, it will be the people of Jakarta, especially the urban poor and vulnerable, who pay the price for the failure of more than 400 years of inappropriate flood policies.

Recent Evolution of the NCICD under Anies

Since the 2014 NCICD plan was adopted, the Central Government and the DKI have radically changed the plan (see Figures 4.24 – 4.26). The first was down to the removal of the to the new site in Nusantara in East Kalimantan Province, on the island of Borneo, more than 1,000km to the northeast of Jakarta (Respondent 4, 2023, Bappeda, 2022; Bappeda, 2023; Google Earth, 2023). According to Respondent 4 (2023), the initial reason for the changes was that Governor Anies ordered a halt to the reclamation. This was following a series of court battles over corruption around the construction of islands and buildings on top of them (Priatmodjo, 2022a, 2022b). However, during my interview with Climate Hub Indonesia (Respondent 4, 2023), they informed me that the real reason behind the cessation of land reclamation was the detection of natural gas in Jakarta Bay in 1994, and that Anies was reluctant to build in that location due to the possibility of a manmade disaster occurring. This discovery from the mid-1990s had been noted in environmental studies but was consistently ignored by the Central Government and the DKI prior to Anies' administration (Respondent 4, 2023).

Furthermore, Climate Hub Indonesia allege that this further empowered the President of the Republic, Jokowi, to push further with his plans for the new relocated capital on Borneo, therefore tacitly (or deliberately) empowering Anies to demand changes to the NCICD to make it more safe. In Figures 4.23-4.25 it is clear how radically the plan has changed. Gone is the Great Garuda and its attendant second layer of islands, while only islands C, D and E remain. The islands which have been retained are only those where construction has already commenced and it is believed risk from a natural gas explosion is limited (Respondent 4, 2023).



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Figure 4.24: The Revised NCICD Master Plan as of 2022 (NCICD, 2022).



Figures 4.25 & 4.26: The Revised NCICD Master Plan as of 2022 (NCICD, 2022).
Also interesting to note about this new plan is the reduced area of the offshore seawall and the dis-inclusion of the new container port facility to the outside of the new retention lake. This has several advantages: Firstly, is the supposedly safer construction with respect to the natural gas deposits located in Jakarta Bay. Second is the smaller amount of water to maintain lower water levels inside of the seawall. This means the pumping system will not have to constantly move the same volume of water as alleged in the previous master plan. This was something queried to Bappenas in our tour and interview at the north coast in 2019. Their response at the time was that they were certain the pumping stations could cope with the vast amount of water, responding that the then planned (and now partially implemented) pumping stations would have the world's largest pumps (2019). However, it was pointed out at the time that such a quantity of water has never before been pumped out of such a large area: 35km from east to west (Google Earth, 2019).

Regardless, it appears that these concerns were eventually acted upon by Anies, and in turn supported by the Central Government. What remains unclear, however, is whether the current plan is suitable for Jakarta. As noted by Priatmodjo (2022b, 2023), who are these island developments for? Even in their reduced form, they do not appear (if the mostly complete developments on island D evidence) to cater to any but a small upper-middle and wealthy class in North Jakarta.

Spatial Findings for Areas impacted by the NCICD in North Jakarta

The Current North Coast Interventions

This section examines the mapping element of this chapter, utilising Google Earth Pro satellite images together with Open Street Map GIS-based data diagrams to understand the physical and spatial implications of the ongoing NCICD master plan currently being implemented. The first phase is the landward seawall which is currently under construction (NCICD, 2014; NCICD, 2022; Bappenas, 2019; Bappeda, 2022; Bappeda, 2023; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015). To illustrate these impacts, several sites have been

chosen where the seawall will impact or already has affected local communities in a significant manner. Together, these four sites provide insight into the scale of the changes being brought about by the NCICD infrastructure developments. These can be seen at the strategic and local scales in Figures 4.32 and 4.33. Figures 4.27 - 4.31 illustrate how these changes are taking place at the local level, at Pantai Mutiara.



Figure 4.27: Seawall construction at Pantai Mutiara, July, 2017 (Suprayogi et al., 2018).

Red solid lines indicate where flood walls have already been constructed, while red dotted lines indicate where construction is already underway or is planned. Light blue indicates land reclamation whether from the new islands currently under construction or those called for in the latest NCICD plan, while blue buildings indicate new buildings on the artificial islands. The purple dotted line represents the border between North Jakarta as part of the DKI to the east and Tangerang to the west.



Figures 4.28-4.31: Seawall construction at Pantai Mutiara, May through July, 2017, and the redevelopment planned for the existing docklands, warehouse and kampung district (Suprayogi et al., 2018).

Each site includes a satellite image to detail the current situation where the seawall or floodwall is yet to be built, or where construction has already commenced. The GIS-based diagrams indicated the degree of change, including the minimal setback easement of 5m (Dovey et al., 2019) and the buildings already demolished to accommodate the planned floodwalls and required statutory setbacks of up to 5-15m in certain places (ibid). All are informed partly through Google Earth Pro (2023, 2024) satellite imagery, as well as information explained verbally by Bappenas in June 2019 and Bappeda (2023), including a series of videos outlining the NCICD seawall progress and future locations (AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015).

Figures 4.32 and 4.33 also illustrate the sheer scale of the physical interventions taking place along the north coast over the past decade (Google Earth, 2024), with the large artificial islands and new container port as the most visible expression of these changes. In the GIS-based diagrams here it is readily apparent the extent of flood defences already

implemented along the north coast across a distance of at least 27.5km (Google Earth, 2024)³⁷.

Figure 4.32: Satellite & GIS-based diagram analysis of Jakarta's northern coastline, Western Section.



³⁷ Based on Google Earth measurements in a straight line, not a measurement of the coastline itself which is undoubtedly much longer.

Figure 4.33: Satellite & GIS-based diagram analysis of Jakarta's northern coastline, Eastern Section.

Jakarta's northern coastline (eastern section) illustrated by Google Earth Pro satellite imagery (Google Earth, 2023). 2012 Pre-infrastructure improvements and prior to 2021 Post-infrastructure improvements with land land reclamation programme at the port reclamation of the port underway Open Street Map-based diagram by the author indicating large-scale changes to the urban form: The newly

completed seawall (solid red line) and the portion under construction (dotted red line), anong with the land reclamation created by the seawall separating the fishing communities from their boats and the land planned for further land reclamation in the form of artificial islands and land extensions, the outer seawall topped by a toll road, and the new offshore container port.

For the various local areas analysed, the maps and satellite images of each community affected is set out, alongside the area and percentage of change to the built urban form resulting from the planned or already constructed infrastructure interventions in tables. See Figure 4.34 for locations of the various sites analysed in detail.



Figure 4.34: Location Plans of the Study Sites within Jakarta.

Kali Baru

Kali Baru is one of several smaller kampung that form part of a large, sprawling informal district known as Cilincing in East Jakarta, situated along the city's northern coastline (Padawangi, 2012; Bappenas, 2019). It is bounded on the south by the Jakarta Outer Ring Road (a toll road), the major east-west motorway in Northern Jakarta, the city's primary container port to the west, and the Kali Rawa Malang waterway to the east (Bappenas, 2019). To its north in Jakarta Bay, is the recently constructed offshore seaport, an extension to the container port on the mainland. Separating this site from the bay is the recently built seawall, which is still under construction (ibid; Google Earth, 2021).



Figures 4.35 & 4.43: The condition of the new sea dike at Kali Baru in June 2019 (Photos by the author, 2019).

This neighbourhood is the location of a fishing community which has traditionally accessed its boats directly from piers jutting out over the water from their houses nearby. This can be clearly seen in Figures 4.35-4.49. After the seawall was constructed, fishermen could no longer access their boats directly, though initially this only affected the piers to the east of the small harbour. In the future when the seawall is extended there, the number of fishing vessels cut-off from the kampung will likely be significantly greater in number, forcing local residents to construct ad-hoc access points up and over the dyke and down to the water level, a significant barrier to cross (see also Table 4.2).



Figure 4.44 & 4.45 Aerial views of the new sea dike at Kali Baru in May 2017, showing the sheer height above the then-current water level (Suprayogi et al., 2018).



Figure 4.46: Planned landscaped areas of the new seawall at Kali Baru in May 2017 (Suprayogi et al., 2018), though this has yet to be implemented.

This is because, according to Suprayogi et al. (2018), the height of the seawall can be as much as 3m above the water level and 22.86m across, with an incline of 1:3. This also means the current (in some cases former) ease of access will be severely impaired, limiting not only access to fishing boats but also limiting the size of catches that can be loaded and unloaded.





Images 4.47 & 4.48: Oblique image from 2016 showing the location of then future seawall at Kali Baru with plan and cross-section of the seawall at Kali Baru, which has a depth of 24m and height of 6.2m above ground level, presenting a significant obstacle for fishermen (Suprayogi et al., 2018).

It is not known whether the DKI government has fully considered the implications of this, though in their documentation for other sites, Bappeda (2023; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015) has indicated some staircases which allow for access over the seawall, though not in this location. Images 4.28-4.35 indicate that some ad-hoc docks have been built at Kali Baru by the local fishing community. However, these structures are flimsy and do not

appear sufficient to be able to sustain heavy loads from large catches, nor are the boats seen in any of the photos, nor when we visited the site, indicative of the typical larger fishing vessels used by fishermen.



Figure 4.49: Kali Baru satellite & GIS-based diagram analysis of the kampung.

Additionally, the green space alleged by Surprayogi et al. (2018) appears to have been only partially implemented at Kali Baru, where a few spindly trees and palms have been planted

but no other greenery was in evidence when the author visited the site in June 2019. The esplanade atop the dyke was completed, as were large staircases leading up to the top of the seawall, along with some incomplete brick paving and spaces for shrubbery and plantings, though left unfinished. According to satellite imagery, this situation as of 2022-23 has not changed (Google Earth, 2023).

Table 4.2. Kali Baru key findings from satellite & GIS-based mapping analysis

Kampung at Kali Baru Fast Jakarta						
Area of wider kampung: 637,330.24m² Area at risk: 0m² Area of land added: 84,195.28m² Percentage of built form demolished: 0.0% (Negligible) Percentage of land added: 13.2%						
Existing characteristics	Related policies/ Institutional characteristics/ era	Urban morphological characteristics	Actions taken	Related policies/ Institutional characteristics	Effects of actions taken on urban morphology	
A kampung straddling both sides of the Kali Baru fishing harbour in Cilincing, North Jakarta (Padawangi, 2012; Bappenas, 2019; Bappeda, 2023a and 2023b; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015, Google Earth, 2023).	1991 Serat Perintah Bongkar (Letter of Eviction) (Winayanti and Lang, 2004); Decentralisation Era: 2014 Law Declaring all informal settlements constructed along or over riverbanks, canalsides and water infrastructure illegal, under the governorship of Ahok (Dovey, et al., 2019).	Extensive kampung housing structures along the west and east banks of the river, in some cases houses extending out over the water and in close proximity to flood infrastructure (Google Earth, 2019, OpenStreetMap, 2021). Kampung type: Waterfronts and Districts (Dovey and King, 2011).	Demolition of existing housing within a 15m easement offset from the riverbank, creation of a 10m wide maintenance and access road (Dovey, et al., 2019; Google Earth, 2019; OpenStreetMap, 2021).	Negotiated stakeholder engagement process to upgrade the two kampung, with support of Governor Jokowi pre- 2014 (Dovey, et al., 2019). Change in policy under Governor Ahok in 2015 resulting in declaration of kampung illegality, removal of residents within the 15m easement and demolition of houses (ibid).	Removal (demolition) of a number of kampung houses in areas atop or along the water's edge and within the 15m easement. (Dovey et al., 2019; Google Earth, 2019; OpenStreetMap, 2021).	

Muara Angke

Muara Angke is situated in North Jakarta along Jakara Bay to the west of the District called Pluit, northwest of Sunda Kelapa and Kota Tua (Bappeda, 2023; Anita 2013a; Anita, 2013b; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015). The immediate surroundings include the Muara Angke Wetlands, part of the wider river delta, to the west and the ferry terminal

to the east. It is bounded on the west by the River Adem and to the east by the River Asin (Anita, 2013a; Anita, 2013b). The kampung at Muara Angke was occupied and constructed from 1977, accommodating the local fishing community, as the site was originally designated as housing for a number of fishing communities across the North Coast of Jakarta in 1990 (ibid). According to Anita (2013a, 2013b) Muara Angke originally comprised an area of 62 hectares, however through land reclamation undertaken by the DKI government in 2006, an addition 9.7 hectares was added, so the neighbourhood today comprises approximately 71.7 hectares (ibid)

Like much of the north coast of Jakarta, the area has experienced sea level rise, between 2005-2011 this was on average 1.45cm per annum (Suk-Jae et al., 2012, cited in Anita 2013b, p6), while land subsidence has exacerbated this problem. Depending on the area along the north coast, land subsidence can range anywhere from 3.6cm to 6cm per year though Octavianti and Charles (2019), as well as Sherwell (2016) argue this could be as high as 15cm per year, and Garschagen et al. (2018) claims up to 25cm in places.

According to Bappeda (2023; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015), the entire western riverbank and the northern coastline soon be protected by a new seawall. Fig 4.50 illustrates the proposed changes, with the impact from the wall on the physical and spatial urban form (see also Table 4.3). The red dotted line indicated where the seawall is likely to stand, according to Bappeda (2023; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015) documentation, while the light red and blue lines indicate the easement setback of a minimum of 5m required by the Jakarta Spatial Development Plan (Dovey, et al., 2019). However, as noted previously, it is important to note that the 5m minimum can be as much as 15m (ibid), and elsewhere features such as existing roads can be utilised as setbacks, so the easement can vary considerably deposing on the location where it has been implemented. The red indicates potential future changes to urban form in order to accommodate the new floodwall and easement. Figure 4.50: Satellite & GIS-based diagram analysis of Muara Angke sub-district.



Open Street Map-based diagram by the author indicating planned and potential future changes to the urban form: The newly completed seawall (solid red line) and the portion under construction (dotted red line), anong with the land reclamation created by the seawall separating the fishing communities from their boats, and red indicating potential future morphological change as a result of the minimum 5m setback , in some cases as wide as 15m (Dovey, et al., 2019) imposed by the DKI government and Bappenas.

Table 4.3. Muara Ar	ngke key	findings fro	m satellite 8	c GIS-based	mapping	analysis
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Muara Angke, East Jakarta						
Area of wider kampung: 441,752.45m ² Area demolished: 37,641.21m ² Percentage of built form demolished 8.5% Existing characteristics Related policies/ Institutional Urban morphological Actions taken Institutional Related policies/ taken on urban Effects of action taken on urban						
	ra	characteristics		characteristics	morphology	
A kampung situated along the River Adem and the Muara Angke Westlands on the western side of the Muara Angke sub- district, an island separated from the mainland by the River Adem and River Asin in North Jakarta (Winayanti and Lang, 2004).	1991 Serat Perintab Bongkar (Letter of Eviction) (Winayanti and Lang, 2004); Decentralisation Era: 2014 Law Declaring all informal settlements constructed along or over riverbanks, canal sides and water infrastructure illegal, under the governorship of Ahok (Dovey, et al., 2019).	Extensive kampung housing structures along the west and east banks of the river, in some cases houses extending out over the water and in close proximity to flood infrastructure (Google Earth, 2019, OpenStreetMap, 2021). Kampung type: Waterfronts and Districts (Dovey and King, 2011).	Demolition of existing housing within a 15m easement offset from the riverbank, creation of a 10m wide maintenance and access road (Dovey, et al., 2019; Google Earth, 2019).	Negotiated stakeholder engagement process to upgrade the two kampung, with support of Governor Jokowi pre- 2014 (Dovey, et al., 2019). Change in policy under Governor Ahok in 2015 resulting in declaration of kampung illegality, removal of residents within the 15m easement and demolition of houses (ibid).	Removal (demolition) of a number of kampung houses in areas atop or along the water's edge and within the 15m easement. (Dovey et al., 2019; Google Earth, 2019).	

Kamal Muara

Kamal Muara is a sub-district of the Penjaringan District in North Jakarta, and a centre for the fishing industry in the city (Lola et al., 2023), though secondary to Muara Angke further east (Anita 2013a; Anita 2013b). Kamal Muara is an area located in the western part of Jakarta Bay adjacent to the Java Sea (Lola et al., 2023, Bappeda, 2023; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015). Lola et al. (2023) suggest that the majority are engaged in the fishing industry and that some form of residential neighbourhood has existed since 1953, when the area was still primarily mangrove forest. The residential neighbourhoods in the sub-district have a population of 69,915 inhabitants with approximately 800 families engaged in the fishing industry, who utilise traditional fishing vessels and cultural practices (Lola et al., 2023). Fishing incomes remain low in Indonesia and therefore many live in poverty, which is reflected in the poor quality of housing and environmental conditions in Kamal Muara (Nurbaya, 2019, cited by Lola et al., 2019, p426). According to Bappeda (2023; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015) and visible in Google Earth image (2023), a seawall is under construction on the eastern side of the peninsula. While not detailed, it is likely that this will be continued around the western side of the peninsula, as indicated by the NCICD (2022). In Fig 4.51, the existing seawall (solid red line) and the possible future extensions (red dotted lines), are indicated. Also illustrated is the minimum 5m setback in light red and with the blue dotted line, representing the 1992 5m setback line, though noting it can be extended up to 15m (Dovey et al., 2019). In blue are the buildings already demolished for the construction of the current seawall, while red indicates potential future changes to the urban form due to the setback easement (see also Table 4.4).

Like the kampung at Kali Baru, this community has been separated from direct access to Jakarta Bay and their fishing boats. Previously this was not the case. How this barrier to access their livelihoods will be rectified does not yet appear to have been addressed. While some access points have been created, it is not clear whether they are able to fully mitigate the effects of the lack of direct access to the water. How fishermen are to load and unload their vessels across such a large barrier, with large catches remains questionable. Additionally, it seems likely, given the nature of this solution, that the fishermen were not consulted on this particular point. If true, this would further evidence the poor track record of community consultation by the DKI government, long an issue with kampung communities going back to Sukarno's regime in the 1950s. Figure 4.51: Satellite & GIS-based diagram analysis of the Kamal Muara peninsula.



Open Street Map-based diagram by the author indicating changes to the urban form: The newly completed seawall (solid red line) and the portion under construction (dotted red line), anong with the land reclamation created by the seawall separating the fishing communities from their boats.

King, 2011).

Table 4.4. Kamal Muara peninsula key findings from satellite & GIS-based mapping

analysis

Kampung at Kamal Muara, North Jakarta						
Manipung at Manua Maara, Moran Jakara						
Area of west kampung: 160,828.68m ² Area at risk: 29,815.61m ² Percentage of built form at risk: 18.5%						
148,914.41m ² Area o	demolished: 17,172.73m ²	Percentage of built	form demolished: 11.5%			
mpung: 309,743.09m ²	Area demolished: 46,98	8.34m ² Percentage o	f built form demolished:	15.1%		
Related policies/	Urban	Actions taken	Related policies/	Effects of actions		
Institutional	morphological		Institutional	taken on urban		
characteristics/e	characteristics		characteristics	morphology		
ra						
1991 Serat Perintah Bongkar (Letter of Eviction) (Winayanti and Lang, 2004); Decentralisation Era: 2014 Law Declaring all informal settlements constructed along or over riverbanks, canal sides and water infrastructure illegal, under the governorship of Ahok (Dovey, et al.,	Extensive kampung housing structures along the west and east banks of the river, in some cases houses extending out over the water and in close proximity to flood infrastructure (Google Earth, 2019, OpenStreetMap, 2021). Kampung type: Waterfronts and	Demolition of existing housing within a 15m easement offset from the riverbank, creation of a 10m wide maintenance and access road (Dovey, et al., 2019; Google Earth, 2019).	Negotiated stakeholder engagement process to upgrade the two kampung, with support of Governor Jokowi pre- 2014 (Dovey, et al., 2019). Change in policy under Governor Ahok in 2015 resulting in declaration of kampung illegality, removal of residents	Removal (demolition) of a number of kampung houses in areas atop or along the water's edge and within the 15m easement. (Dovey et al., 2019; Google Earth, 2019).		
	al Muara, North J 160,828.68m² Area 148,914.41m² Area a mpung: 309,743.09m² Related policies/ Institutional characteristics/e ra 1991 Serat Perintah Bongkar (Letter of Eviction) (Winayanti and Lang, 2004); Decentralisation Era: 2014 Law Declaring all informal settlements constructed along or over riverbanks, canal sides and water infrastructure illegal, under the governorship of Ahok (Dovey, et al.,	North Jakarta 160,828.68m2Area at risk: 29,815.61m2148,914.41m2Area demolished: 17,172.73m2148,914.41m2Area demolished: 17,172.73m2mpung: 309,743.09m2Area demolished: 46,98 Related policies/ Institutional characteristics/e ra1991 Serat Perintah Bongkar (Letter of Eviction) (Winayanti and Lang, 2004); Decentralisation Era: 2014 Law Declaring all informal settlements constructed along or over riverbanks, canal sides and water infrastructure illegal, under the governorship of Ahok (Dovey, et al.,Urban morphological characteristics0Urban morphological characteristics1001 Serat Perintah Bongkar (Letter of Eviction) (Winayanti and Lang, 2004); Decentralisation Era: 2014 Law Declaring all informal settlements constructed along or over riverbanks, canal sides and water infrastructure illegal, under the governorship of Ahok (Dovey, et al.,Kampung type: Waterfronts and The settlements constructure illegal, Waterfronts and	Area Muara, North Jakarta 160,828.68m2Area at risk: 29,815.61m2Percentage of built form148,914.41m2Area demolished: 17,172.73m2Percentage of built148,914.41m2Area demolished: 17,172.73m2Percentage of builtmpung: 309,743.09m2Area demolished: 46,988.34m2Percentage o Related policies/ Urban morphological characteristics/eActions takenInstitutional characteristics/eUrban morphological characteristicsActions taken1991 Serat Perintah Bongkar (Letter of Eviction) (Winayanti and Lang, 2004); Decentralisation Era: 2014 Law Declaring all informal settlements constructed along or over riverbanks, canal sides and water infrastructure illegal, under the governorship of Ahok (Dovey, et al., Constructed along of Constructure illegal, constructure illegal, under the governorship of Ahok (Dovey, et al., Constructed along of Constructure illegal, under the governorship of Ahok (Dovey, et al., Constructed along of Constructure illegal, under the governorship of Ahok (Dovey, et al., Constructed along of Constructed	al Muara, North Jakarta 160,828.68m²Area at risk: 29,815.61m²Percentage of built form at risk: 18.5%148,914.41m²Area demolished: 17,172.73m²Percentage of built form demolished: 11.5%mpung: 309,743.09m²Area demolished: 46,988.34m²Percentage of built form demolished: 11.5% Related policies/ Institutional characteristics/eUrban morphological characteristics Actions takenRelated policies/ Institutional characteristics1991 Serat Perintab Borgkar (Letter of Eviction) (Winayanti all informal settlements constructed along or over riverbanks, canal sides and water infrastructure illegal, under the governorship of Ahok (Dovey, et al., 2014 Law Docy, et al., 2014 Law Declaring all informal settlementsExtensive kampung houses extending out openStreetMap, 2011.Demolition of existing housing within a 15m easement offset from the riverbank, creation of a 10m wide maintenance and access road (Dovey, et al., 2019).Negotiated stakeholder engagement process to upgrade the two kampung ilegality, removal of residents		

within the 15m

easement and demolition of houses

(ibid).

Kali Blencong

2019).

This kampung, is situated on the Kali Blencong, a river which empties north into the Bay of Jakarta, in Cilincing, East Jakarta. The area surrounding it was known as Omnelanden, unplanned settlement for indigenous Javanese outside the city walls of the then Dutch colonial capital, Batavia, from the 17th-19th centuries (Ellisa and Naibaho, 2019; Bappeda, 2023; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015). According to Ellisa and Naibaho (2019) the area remained undocumented until mentioned by John Joseph Stockdale the early 19th century, as being situated 25km east of the walled colonial city, in an area of indigenous Javanese desa spread around a small bay and estuary called Tjelenking (Cilincing), fed by the Kali Blencong and navigated by small boats and canoes. Ellisa and

Naibaho (2019) explain that the predominant ethic group residing in this part of Cilincing is Betawi³⁸, and that many still engage in fishing using traditional boats while other members of the community run food stalls, often overlooking the sea in places where they can serve fishermen.

The area appears to have potential for redevelopment as a tourist development (Ellisa and Naibaho, 2019), meaning the physical spatial and urban form could radically change in the near future. In parallel to these potential urban developments, the area is one of the sites set out for protection by the new landward seawall which will be constructed at least part way down the length of the Kali Blencong (Bappeda, 2023; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015; Google Earth, 2023). While much of the landholdings in the area are confined to industrial and institutional uses, a large kampung is located in the bend of the river as it turns east and then east again, towards the south-eastern part of the area.

If the seawall is constructed in this location, it would potentially result in changes to the urban form to allow for the 5m 1992 easement which has been implemented elsewhere in similar kampung across Jakarta where flood improvements or new defences have been implemented, though this could be as wide as 15m (Dovey, et al., 2019). The diagram in Fig 4.52 illustrates the possible future location of the floodwall (red dotted line) and the setback zone (light red with blue dotted line), along with areas of potential morphological change (red). So far only information regarding the right (north) bank of the river has been sourced from Bappeda (2023; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015; Google Earth, 2023) illustrating construction of the new floodwall, however it is likely that the government would similarly wish to protect the left (southern) bank of the river, given the residential and industrial landholdings situated there, and this appears to be the case given

³⁸ The Betawi are a Javanese indigenous group native to the city of Jakarta and its surroundings, often historically described as the city's original inhabitants by historians. Their name comes from the Dutch colonial name for the city, Batavia (Indrasafitri, 2012).

the entirety of the North Coast is to be protected according to the NCICD (2022) (see also Table 4.5).

Figure 4.52: Satellite & GIS-based diagram analysis of the kampung at Kali Blencong.



reclamation created by the seawall separating the fishing communities from their boats.

Table 4.5. Kampung at Kali Blencong key findings from satellite & GIS-based mapping

analysis

Kampung at Kali Blencong, East Jakarta						
Area of wider kampung: 52,609.91m ² Area demolished: 7,652.66m ² Percentage of built form demolished 14.5%						
Existing	Related policies/	Urban	Actions taken	Related policies/	Effects of actions	
characteristics	Institutional	morphological		Institutional	taken on urban	
	characteristics/e	characteristics		characteristics	morphology	
A kampung situated along the north and easter banks of the Kali Blencong River in Cilincing, East Jakarta (Bappenas, 2019; Google Earth, 2023).	ra 1991 Serat Perintah Bongkar (Letter of Eviction) (Winayanti and Lang, 2004); Decentralisation Era: 2014 Law Declaring all informal settlements constructed along or over riverbanks, canal sides and water infrastructure illegal, under the governorship of	Extensive kampung housing structures along the west and east banks of the river, in some cases houses extending out over the water and in close proximity to flood infrastructure (Google Earth, 2019, OpenStreetMap, 2021). Kampung type:	Demolition of existing housing within a 15m easement offset from the riverbank, creation of a 10m wide maintenance and access road (Dovey, et al., 2019; Google Earth, 2019).	Negotiated stakeholder engagement process to upgrade the two kampung, with support of Governor Jokowi pre- 2014 (Dovey, et al., 2019). Change in policy under Governor Ahok in 2015 resulting in declaration of kampung illegality,	Removal (demolition) of a number of kampung houses in areas atop or along the water's edge and within the 15m easement. (Dovey et al., 2019; Google Earth, 2019).	
	Ahok (Dovey, et al., 2019).	Waterfronts and Districts (Dovey and King, 2011).		removal of residents within the 15m easement and demolition of houses (ibid).		

Kampung Gedung Pompa, Kampung Nelayan and Kampung Bonpis

This group of small kampung forms part of the wider kampung community surrounding the Waduk Pluit (Pluit Reservoir) discussed in Chapters II and III (see Figures 4.53 – 4.68). As a smaller community, distinct in being constructed at the northern end of the reservoir, situated adjacent to a local pumping station, hence the name, Gedung Pompa (Lie and Purnama, 2020). The community largely derives its livelihood from fishing and other maritime-associated occupations (ibid). Based on satellite imagery and a tour organised by Bappenas in 2019, what is clear is the impact of the construction of the new seawall to the north. It should be noted that this is a separate impact from that of the demolition of the wider kampung around Waduk Pluit described in Chapters II and III and is therefore a separate analysis.



Figures 4.53–- 4.67: The condition of the new seawall, pumping station, polder and kampung at Gedung Pompa in North Pluit (Photos by the author, June 2019).



Figure 4.68: The condition of the new seawall and polder at Gedung Pompa in North Pluit (Photos by the author, June 2019).

Due to the kampung's unique location, it is difficult to fully discern the impact of the construction of the new seawall from the ground-level photographs. Notably, the Bappenas-led tour in 2019 only visited the top of the seawall at Kampung Kali Baru, to the east and Waduk Pluit itself, not the kampung. However, when viewing the satellite images, it becomes clear that the seawall has had a major impact on the community at Gedung Pompa, by acting as a barrier between the kampung and the fishing vessels docked in the harbour to the immediate north. Like the other kampung communities along the north coast where the seawall has already been constructed, or is planned, this imposition of a flood defence in the form of such a large dike has implications for how fishermen are able to access their vessels, with implications for their livelihoods. As elsewhere, the dike at Gedung Pompa does not appear to be designed for transporting large catches of fish over it – as there do not presently appear to be any crossing points to do so – and even where such staircases have been implemented, they appear only able to accommodate pedestrian traffic, not large transport of ship cargos such as daily catches of fishermen.

Figure 4.69: Satellite & GIS-based diagram analysis of Kampung Gedung Pompa,

Kampung Nelayan and Kampung Bonpis.



Open Street Map-based diagram by the author indicating changes to the urban form: The newly completed seawall (solid red line) and the planned extension (dotted red line), anong with the land reclamation created by the seawall separating the fishing communities from their boats (dark blue), possible areas of morphological change to accommodate the necessary setback easement (red), with the easement (blue dotted), as well as the likely structures to be inundated (in blue).

Visible in the Open Street Map-base diagram (Figure 4.40), is the likely impact of the extension of the seawall further south alongside Waduk Pluit, based on open-source GIS evidence in Open Street Map (2024), along with the information sources shared by Bappeda (2023; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2023; NCICD Videos, 2015). If it is to be constructed as appears highly likely, the southern extension will require the usual setback easement for the roadway along the existing canal for maintenance access, with potential impact on adjacent structures.

Additionally, the new seawall has captured a large amount of land behind it, the site of former docks for fishing vessels. This will presumably be redeveloped for new housing projects as elsewhere along the north coast, e.g. as at Pantai Mutiara (Figure 4.69). this has resulted in the completed demolition of Kampung Nelayan, which previously stood at the southeast corner of the docks, behind where the new seawall curves. The area demolished is visible in red, Along with the dark blue area which is the area lost to the sea and presumably to be redeveloped as land reclamation. It is unfortunate that potential for retaining Kampung Nelayan in some form (e.g. as a rebuilt community) was apparently not considered by the government, since that land is to be reclaimed. Also, while not confirmed, one potential reason for not protecting Waduk Pluit entirely could be the sheer size of the polder, or the need for higher levels of water once the outer seawall is constructed.

Table 4.6. Kampung Gedung Pompa, Kampung Nelayan and Kampung Bonpis key

findings from satellite & GIS-based mapping analysis

Kampung Gedung Pompa, Kampung Nelayan and Kampung Bonpis, North JakartaArea of wider kampung: 52,609.91m²Area demolished: 7,652.66m²Percentage of built form demolished: 14.5%						
Existing characteristics	Related policies/ Institutional characteristics/e ra	Urban morphological characteristics	Actions taken	Related policies/ Institutional characteristics	Effects of actions taken on urban morphology	
A kampung situated along the north and easter banks of the Kali Blencong River in Cilincing, East Jakarta (Bappenas, 2019; Bappeda 2023; AFA99 Channel, 2023; DKI Provincial Water Resources Service, 2020, 2022a and 2022b; WPS Channel, 2022; NCICD Videos, 2015; Google Earth, 2023).	1991 Serat Perintah Bongkar (Letter of Eviction) (Winayanti and Lang, 2004); Decentralisation Era: 2014 Law Declaring all informal settlements constructed along or over riverbanks, canal sides and water infrastructure illegal, under the governorship of Ahok (Dovey, et al., 2019).	Extensive kampung housing structures along the west and east banks of the river, in some cases houses extending out over the water and in close proximity to flood infrastructure (Google Earth, 2019, OpenStreetMap, 2021). Kampung type: Waterfronts and Districts (Dovey and King, 2011).	Demolition of existing housing within a 15m easement offset from the riverbank, creation of a 10m wide maintenance and access road (Dovey, et al., 2019; Google Earth, 2019; Open Street Map, 2023).	Negotiated stakeholder engagement process to upgrade the two kampung, with support of Governor Jokowi pre- 2014 (Dovey, et al., 2019). Change in policy under Governor Ahok in 2015 resulting in declaration of kampung illegality, removal of residents within the 15m easement and demolition of houses (ibid).	Removal (demolition) of a number of kampung houses in areas atop or along the water's edge and within the 15m easement. (Dovey et al., 2019; Google Earth, 2019).	

Conclusion

This chapter set out to understand the current state of the city's urban morphology within the context of the changing north coast of Jakarta by utilising the city's infrastructure network. The northern coastline of the city is changing as a result of the implementation of these infrastructure plans, namely the JCDS and NCICD master plan. As part of this understanding, a review of the historical institutionalist literature of flood infrastructure was undertaken in order to understand the particulars of the link between infrastructure investment, floods, and changes to the city's urban form over the past four centuries, leading up to the city's current infrastructure plans. The NCICD in particular has been much criticised, not the least due to its likely negative environmental impacts, as well as the monocentric and monocultural nature of the upscale and gated development typologies pursued by developers on the first land reclamation island to be so far completed, Pondok Indah Kapuk (PIK). In addition, the overall unsuitability of the island reclamation plan has

been discussed and illustrated through government action. Firstly, this was through the recognition by Governor Anies of the long known and understood danger from the presence of natural gas underneath Jakarta Bay which eventually led to the revision of the NCICD plan in 2022. This resulted in the removal of all but three of the originally 47 planned artificial islands (which would have housed government ministries now destined for the new capital city)³⁹, and a redesign of the location of the outer sea wall in order to avoid natural gas locations.

The JCDS and the more recent NCICD master plan were reviewed with particular focus on how the latter master plan has recently been implemented and the local level. This historic institutionalist analysis has illustrated the historic and more recent culture of decision-making, the nature and effectiveness of policies (namely flood mitigation measures) implemented. The impact on Jakarta's physical built form has been undertaken spatially with satellite imagery and GIS-based mapping, similar to Chapter III, however with an emphasis on the manner in which JCDS and NCICD-related infrastructure is or will be implemented along Jakarta's northern coastline, rather than on general flood infrastructure interventions across the city, (as was the case in Chapter III). The element of urban form most appreciably impact has, as in Chapter III, been seen to be the city's most vulnerable: the urban poor who inhabit kampung situated along the city's northern coastline. These communities primarily rely on fishing for their livelihoods, as has been the case for centuries. However, the imposition of new barriers to accessing the sea, and therefore their fishing vessels – the primary tools for accessing and undertaking their livelihoods – has been shown to constitute a major impediment to engaging in fishing for these communities. In some cases, the authorities have added staircases to allow pedestrians to traverse the seawalls, however it appears that these pathways are insufficient to allow for the transport of cargo such as fishing catches up, over and down again to traverse these new physical barriers.

³⁹ The central government began construction of the new capital city of Nusantara in 2022, after the idea being endorsed by President Jokowi in 2019. The location of the city is in East Kalimantan Province on the island of Borneo (Astuti, 2019; Suryowati, 2022).

To date no ramps or other large access points over the top of dikes and seawalls which form part of the new JCDS and NCICD flood mitigation measures have been located. This indicates clearly how the technocratic, engineered flood mitigation solutions are currently being favoured and implemented through top-down decision-making, rather than through the inclusion of local communities to find more balanced solutions. The result of this topdown process is clear: the poorest, most vulnerable communities continue to be the most heavily impacted. In this case it is not simply by flooding, but through the implementation of new flood infrastructure. From a historical institutionalist perspective, these actions by the government indicate institutional lock-in and path dependency, i.e. an inability to change course politically, culturally or in terms of policy around flood infrastructure.

Chapter V:

The Future of Flood Resilient Planning in Jakarta



Chapter V: The Future of Flood Resilient Planning in Jakarta

This element of the research was undertaken in order to understand the future of planning policy in response to flooding in Jakarta and constitutes the final element of the findings in this research study. It explores best practices and examples of sustainable, flood resilient planning in Southeast Asia and globally, while proposing practical policy solutions for responses to flooding in Jakarta. The research was based on a series of seven workshops attended by a total of twelve participants where specific questions were posed to participants (as a semi-structured interview) on the nature of the appropriateness of current infrastructure solutions, where gaps exist in the planning system and what planning policies the government should be pursuing for the future. (see Appendix A for questionnaire, notes and transcripts) The workshops were undertaken in small groups due the difficulty of getting all participants in the same room on one date during the time the author was in Jakarta in the summer of 2022. Participants were all asked exactly the same questions in the same manner, and once set by the author, the questionnaires did not change. Participants were infrastructure planning officers working in the DKI government, flood engineers (some of who were engaged in the design of the JCDS and NCICD), local Indonesian academics, an Indonesian researcher at a Dutch university, all with expertise in flooding. Additionally, some participants were NGOs working with local communities impacted by flooding and flood-related infrastructure in North Jakarta. All the participants have been anonymised for ethical reasons and are referred to as 'Respondents 1-7'.

Workshop Findings

Based on workshops held in person with participants in June and July of 2023 in Jakarta, the following key themes emerged with regard to potential flood policies and related infrastructure mitigation measures for the future of Jakarta (full transcripts of the workshops and participants and their organisations can be found in Appendix A):

 Technocratic solutions continue to be the preferred response for academics, government officers and technical specialists: These technocratic solutions were advocated and encouraged by the administration of the Governor of Jakarta, by Bappeda at the level of the Jakarta DKI (Regional Level), as well as the level of the central government, for example Bappenas and the Ministry of Public Works and Housing. In addition, the engineering consultancy that designed the NCIDC and JCD, Wittveen & Bos, also promoted technocratic solutions in their infrastructure plans, according to Respondents 1 and 2.

The continued preference for such technocratic (engineered) flood infrastructure solutions represent institutional lock-in, as historically, these initiatives have proved to be insufficient for delivering flood protections for Jakarta, despite their widespread use. This goes all the way back to the Dutch colonial period, was repeated in the early Post-Independence and New Order eras and continues to this day. The inability to change from this course represents a path dependency. These technocratic solutions should be considered with nature-based solutions to deliver lasting, positive change.

 Despite the preference for technical solutions, nature-based solutions should be utilised wherever possible and integrated with technical responses:

At the level of the Jakarta DKI (the Regional Level) the Jakarta DKI government has endorsed certain nature based solutions in limited circumstances, particularly for the new land reclamation projects situated along the north coast of Jakarta.

According to Respondent 3, these solutions are being implemented in a number of locations across Jakarta, particularly in North Jakarta where the greatest vulnerabilities to flooding and land subsidence are located. A local government agency indicated in their workshop that the naturalisation and normalisation of rivers and reservoirs in five locations, the construction of 13 new polders, and up to 76 in the near future, development of infiltration wells and bio pores (vertical drainage), the application of the new Blue Space Index as well as the implementation of a minimum performance-based green-glue index, the latter with

a 30% green open space requirement, both advised by Respondent 3 are all currently being implemented or are in the planning stages with government commitment to their incorporation.

However, both Respondents 1 and 2 are somewhat in disagreement. They indicated that while all this sounds quite progressive, the 30% green open space 'requirement' for the blue-green index, advocated by Respondent 3 is only an aspiration, not a regulation. Additionally, these interventions are yet to be fully implemented, and due to the history of such regulations, such as the 30% green open space requirement set out in the Jakarta Spatial Development Plan (2012), which actually resulted in only effectively 5% open space, they appear quite sceptical that it will ever be realised.

Respondents 1 and 2 also suggest mangrove forests as a nature-based solution to flooding are being implemented or restored in a number of locations along the northern coastline and on some of the reclamation islands. However, due to limitations in land area for natural solutions, they note these areas and instances are quite limited. Respondent 7 noted that nature-based solutions can still be technocratic, explaining that so-called 'greenwashing' was still prevalent as a wellestablished response to flooding in Jakarta. This raises questions as to whether the Jakarta DKI government is pursing such greenwashing policies. However, they also noted that flood mitigation solutions "need to acknowledge the unique hydrology of Jakarta as being a mega city stretching from mountains with high tropical rainfall to a floodplain and estuarine delta," nature-based solutions therefore should focus on identifying and mapping existing nature prior to embarking on designing or implementing new solutions. Other solutions for combined technical and naturebased solutions could be realised in dual-function spaces, for example parks which would host sustainable drainage systems and water retention ponds.

In spite of these efforts to pursue nature-based solutions, technocratic, infrastructure-based mitigation measures were widely believed to be necessary for Jakarta. Virtually all workshop participants argued for the utilisation of technocratic infrastructure solutions. Respondent 3 argued that the Jakarta DKI for example has been implementing policies aimed at the development of beach and river embankments of up to 37km (13.4km completed so far) by 2030. Other technocratic infrastructure currently being developed includes the Ciawi Sukamahi Reservoir, the Ciliwung-KBT waterway diversion, the installation of pumps, as well as the construction of up to 44 polders. These certainly represent positive developments, though there is some doubt as to whether these regulations, as with others mentioned by the DKI government, will be fully implemented and enforced.

While infrastructure solutions in of themselves are not necessarily problematic as a solution, in Jakarta with its long history of preference for engineered solutions as a typology and failure to promote any real alternatives at sufficient scale appear to have failed to change the flooding situation appreciably. This would seem to further exemplify a path dependency and institutional lock-in, where typically solutions do not change, and institutions continue to make the same decisions over long periods of time. This also illustrates that nature-based solutions do not seem to be utilised to their full potential, nor are alternative typologies sufficiently explored for implementation across wide areas of Jakarta Bay. This indicates silo thinking, where experts and policy-makers are unable to think beyond already widely-accepted solutions, such as technical engineered typologies.

 Flooding needs to be understood as a challenge involving the entire watershed of the Ciliwung River, not merely as a local problem:

This remains a challenge for both the Jakarta DKI and central governments, and this workshop, along with the wider research in this dissertation, did not identify significant evidence of cross-boundary cooperation or any such projects in the Ciliwung River watershed, which would enable such programmes to be undertaken. The only exception to this was a pilot project undertaken in the *Daerah Istimewa Yogyakarta* (Yogyakarta Special Region, like the Jakarta DKI, a regional government equivalent to a Province) noted in Hudalah et al. (2016).

The need to view flooding from the perspective of the entire watershed, i.e. as a system or network of water bodies, rather than responding to flooding within municipal or provincial boundaries is vital, advocated by Respondent 5. The historic lack of cross-boundary coordination and collaboration represents an institutional lock-in. The inability to change from this course represents a path dependency.

 Top-down, flood infrastructure planning remains the preferred way of responding to flood challenges through the planning and regulatory system:

As with technocratic solutions, top-down initiatives were favoured and promoted by the administration of the Governor of Jakarta and Bappeda at the level of the Jakarta DKI (Regional Level), as well as the level of the central government, for example Bappenas and the Ministry of Public Works and Housing. In addition, the engineering consultancy that designed the NCIDC, Wittveen & Bos, also advocated top-down solutions.

The majority of workshop participants (Respondents 1, 2, 3, 5 and 6) argued for top-down flood infrastructure planning, rather than grass-roots organisation. Most participants felt that experts should explore and discuss potential solutions amongst themselves, then consult local residents who lack sufficient expertise or knowledge to propose sustainable flood solutions. This was disputed by both Respondents 4 and 7. This top-down form of infrastructure planning represents institutional lockin, as historically, these initiatives have failed to deliver lasting, positive change with regard to flood planning in Jakarta. The inability to change from this course represents a path dependency.

Respondent 2 advocated for a novel solution where rural areas are the focus of infrastructure development and job creation to reduce migration to Jakarta of rural workers that then go on top live in kampung, many of which are located on or

around water bodies, further exacerbating flooding problems. Therefore, inside of Jakarta, this participant argues for the elimination of illegal housing and occupation of land adjacent to waterways. This would require the relocation of residents and would need to be accompanied by employment measures to ensure livelihoods remain sustainable and so that any new rents would be affordable for low-income families. This is a tall order for a country lacking such safeguards historically, and where there has been community or stakeholder consultation, such processes have frequently broken down with numerous complaints of broken promises, according to Respondents 4, 5 and 7. Another criticism of this idea is the long history of forced relocations and the strong likelihood that livelihoods would be severed without adequate alternatives in place, the story of Kampung Akuarium in Chapter III being a case in point.

Despite evidence of successful community mobilisation one a case-by-case basis at Kampung Kerapu, Kongol, Tongol, Lodan and Kunir in North Jakarta (Dovey et al. , 2019), Kampung Akuarium also in North Jakarta (Rujak, 2018a and 2018b: Sutanudjaja, 2022); as well as Kampung Penas Tunggul in East Jakarta (Winayanti and Lang, 2004) reviewed in Chapter III, this does not appear to be a movement which has had lasting impact at scale across the city. Community initiatives do not appear to have developed into a larger social, cultural or political force in Jakarta. The government does not seem to have sufficient public or political pressure to cease its long term programme of demolition, eviction and severance of livelihoods. Whether this could develop in the near term seems unlikely.

 New developments on the reclamation islands catering only for a narrow demographic, rather than for a wider cross section of society, due to exclusive, luxury style developments already realised:

This appears to be the favoured development typology by both the DKI and central governments, based on historic evidence and a number of site visits by the author in 2012, 2018, 2019 and 2022, for example to the Pantai Mutiara, Regatta and Green Bay Jakarta developments situated along the north coast of Jakarta and

built in the 1990s, the mid-2000s and since 2015 respectively (Google Earth, 2024). While land reclamations have been relatively rare in Jakarta's history, the lack of alternative solutions represents a form of institutional lock-in, as no other options are presented or advocated by government bodies.

For example, the developments at Pantai Indah Kapuk (PIK)⁴⁰ do not appear to include any affordable housing and housing typologies include luxury, gated communities. This is related to other responses around the need for public-private partnership funding models as noted by Respondent 1 but criticised by Respondent 4 and Respondent 6. Therefore, what model would be utilised remains unclear.

• The initial environmental studies undertaken for the reclamation islands indicated that they did not meet minimum environmental standards:

This indicates internal conflict within the central government, and between it and the DKI government (e.g. vertical and internal misalignment), both bodies which historically favoured land reclamation in Jakarta Bay, prior to the administration of Governor Anies. This is one of the few examples (based on this research) where a particular government executive interrupted institutional lock-in and path dependencies, though in the case of Anies, whether this was undertaken for political gain rather than for the wider benefit of Jakarta residents was not clarified by these workshops, nor the wider research in this dissertation. However, the absence of a wider programme under his administration is telling.

According to Respondent 4, the Environment Agency rejected the initial environmental impact assessment for the land reclamation islands master plan submitted to it, so the document was resubmitted at a lower, provincial level (the Jakarta DKI) with the islands cut into smaller land reclamation parcels, which though revised a number of times, was eventually accepted. Furthermore, the DKI and Central governments appear to now be in agreement regarding the land

⁴⁰ Pantai Indah Kapuk (PIK) is so far the only completed island constructed from land reclamation in Jakarta Bay.

reclamation islands, the majority of which have been erased in the latest plan (NCICD, 2022). This was due to two factors, the discovery of natural gas deposits in Jakarta Bay, which followed that the large-scale construction of new island developments was deemed to be unsafe by Governor Anies. Additionally, given the President's desire to move the capital to East Kalimantan Province on Borneo, more than 1000km to the northeast, there was no longer a need for the Great Garuda and its large number of attendant islands to house a large number of government offices, workers and associated residents (ArchDaily, 2023).

Jakarta has a history of controversy around the construction of the islands from land reclamation. Though several of the islands started construction in 2013, this was halted only three years later when a moratorium was declared on all reclamation projects in Jakarta Bay, and all building ceased (Sherwell, 2016). This was because of a corruption case involving an executives of one of the island developers who was accused of bribing a local parliamentarian in order to relax local zoning laws. The investigations exposed the nebulous links between developers and government officials. No construction on the islands has continued since that time, apart from KIP (Island D and part of C) (ibid). This does not bode well for future land reclamation projects, even on the reduced scale called for in the revised NCICD of 2022.

 Finally, according to Respondents 4 and 7, bottom-up solutions currently do not have a viable pathway to implementation in Jakarta and there is an urgent need for mechanisms, institutions, and processes to facilitate these kinds of processes to be implemented.

This continues the trend of institutional lock-ins and path dependencies evidenced by the central and Jakarta DKI governments (also demonstrated by the engineering profession and academia) with respect to the preference for technical flood infrastructure and top-down solutions. However, this ignores international best practices where community empowerment has actually improved outcomes for large scale urban development projects in local communities. This therefore should be taken up as a priority by both the central and DKI governments to ensure more
equitable planning and infrastructure development in Jakarta that meets the needs and aspirations of a significantly wider cross section of the city's society, not simply the ultra-rich or upper middle classes who can afford to live in segregated, gated communities. This could then serve to avoid potential institutional lock-ins and path dependencies by forging a new trajectory for Jakarta's flood infrastructure planning by integrating local communities with long-term, vital knowledge of flooding and experience in combating and living with it. .

Conclusions

What the series of workshops illustrates is the general historical trend of top-down, technocratic, infrastructure-driven responses to flooding in Jakarta remains remarkably consistent with the historic institutional trends outlined by Ford (1993), Silver et al. (2001), Steinberg (2007), Priatmodjo (2016), Octavianti and Charles (2019a) and others. Natural solutions were initially ignored by the Dutch in the early 17th century in favour of the Waterstad typology they imported from European Holland, as were any indigenous solutions which would have existed in Jakarta prior to its destruction by the Dutch in 1619. Therefore, it is clear that institutional lock-ins and path dependencies remain, continuing to influence policymakers, planning officers, engineers and even academics to the present day. The opportunity for bottom-up, community-based, and locally empowered solutions has not been taken up by the DKI or central governments to an extent that would change the existing mindset towards and status-quo of flood infrastructure interventions in Jakarta. This is significant because of the overarching influence Jakarta has on other large and regional cities in Java and elsewhere across the Indonesian archipelago, in the establishment of planning and infrastructure policies and practices. In other words, what works for Jakarta can and is likely to be copied or replicated by planning authorities elsewhere in Indonesia, for better or worse.

It is unfortunate that more is not being done to incorporate nature-based solutions for flooding. This is because, according to the UN (2023) and American University (2023), Nature-Based Solutions (NBS) can be more cost-effective than traditional infrastructurebased mitigation measures, they are sustainable and effective. In particular, the restoration or preservation of coastal wetlands reduces CO₂ by removing it from the air and sequestering it in plants, soils, and sediments (American University, 2023). NBS also protect biodiversity from climate change and habitat loss (Wisconsin, 2023). Furthermore, technocratic flood solutions tend to push water away from land where it could otherwise be absorbed naturally or stored against other uses, to be disperses in seas and oceans. In contrast, NBS and Ecosystem-based management (EBM) measures are designed to retain water at or near the site of flooding, protect from tidal inundation and storm surge (Vuik et al., 2016; Van der Nat et al., 2016). This would effectively constitute the city learning to live with water rather than attempting to push the water further away, or potentially, as bluegreen solutions. Furthermore, technocratic, engineered solutions such as dikes and sea walls also prevent sediment transport to low-lying hinterlands, resulting in increases in elevational differences between land and water (Van den Hoven et al., 2022).

The argument by planners, engineers and academics perpetuates the notion that there is insufficient land available for such mitigation measures, for example for large scale mangrove forests, yet the government was previously considering the implementation of up to 47 new island islands in the form of land reclamation. Could these not be reconsidered, if unsafe for human habitation and urban development, as nature preserves where green-blue water systems, mangroves and other nature-based solutions could be incorporated at a previously unprecedented scale? Surely this crisis presents Jakarta's and the national government an opportunity to be truly innovative. In such a scenario, Jakarta could truly function as a world-leading urban example.

Achieving this would require a significant turnaround in thinking both at the level of government and local experts, as mentioned earlier. Policies would need to be amended while experts would need to consider the historic yet largely ineffective history of manmade approaches to flooding which have not been successful over four centuries of flood management in Jakarta. This series of workshops has illustrated the difficulties in changing not only policies, but the socio-cultural practices and thinking that underpins them. Most of the respondents favoured top-down, technocratic solutions. In order to overcome these obstacles, the benefits of NBS and EMB would need to be more widely disseminated in Indonesia and significant resources would need to be allocated to implement them. This would not only involve local and national levels of government, but likely international cooperation as well, perhaps through intergovernmental organisations such as ASEAN, the World Bank, and the UN. In addition, significant amounts of land would need to be created to serve as NBS, for example mangrove forests and similar wetlands suitable for Jakarta.

The effectiveness of these solutions would need to be tested, though if the land were to remain undeveloped as a form of protected landscape, the danger from natural gas might be reduced enough to warrant the implementation of such a mitigation measure. However, were this form of NBS to be successful, it could potentially herald a new era of international cooperation in combating climate change utilising sustainable mitigation measures.

As it stands, Jakarta certainly presents a learning experience for other cities, both in the region of Southeast Asia and closer to home in Java. It this sense it presents a cautionary tale of the failure of long-term planning and infrastructure policies, the history of unsuccessful community consultation and the resulting broken promises made to communities who would subsequently face the demolition of their homes and forced eviction from their neighbourhoods. The root causes of flooding have not been addressed by the JCDS and NCICD, namely the causes of land subsidence and upstream flooding, therefore these mega infrastructure projects serve primarily to treat the symptoms rather than solve the root causes of flooding. Flooding is not understood by policymakers as a cross-border problem, and the need for policies that respond to the challenges of the entire watershed have yet to be implemented.

Affordable housing remains a significant challenge in Jakarta, as the continued proliferation of kampung communities on precarious, unsafe, or flood-prone sites demonstrates. The sheer quantity of this type of urban form indicates the unsuitability of the formal planning system in Indonesia, where huge portions of its population live in communities and housing which is deemed illegal by the planning and regulatory system at worse, or at best ignored by it. The islands which have been constructed so far, such as KIP, do not appear

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to include affordable housing of any apparent typology, further illustrating the image of a government that favours the interests of private developers over the needs of the majority of its citizens. In order for this to change, serious consideration of affordable housing provision for the city's most vulnerable citizens needs to be considered by policymakers. In addition, the planning system need to be reformed to better reflect the realities of a megacity where two thirds of its inhabitants live in some form of informal settlement. Kampung will need to be fully acknowledged as a reality in Jakarta and properly integrated into the formal regulatory system. Migrants will need to be provided with Jakarta residency to ensure they benefit from local services.

Finally, the DKI government needs a plan which responds sufficiently and seriously to all the issues around flooding, not simply reacting to the symptoms of the problem (merely through technical, engineered solutions), but tacking the root causes: land subsidence, overdevelopment, deforestation, lack of land for natural water absorption, overpopulation and the rest. This also requires a dedicated focus from the central government to look at generating sufficient economic development outside of Jakarta to develop new industries and sufficient jobs in order to enable more people to remain in their local communities across the archipelago and thereby reduce the pressure on Jakarta and Java's other large cities.

Chapter VI:

Conclusions



Chapter VI: Conclusions

From the outset, this research has aimed to uncover the link between flooding, planning decisions in response to flooding and the resulting impact on the urban form in Jakarta. In essence, this dissertation relates the history of how flooding has shaped the physical and spatial fabric of Indonesia's capital and largest city over a period of four centuries. This relationship between governmental responses to flooding and the resulting physical and spatial impact on the city's built urban form has been illustrated strategically, at the scale of the city, across four centuries of flooding and urban development, as well as through the analysis of kampung communities where improved or new flood infrastructure interventions have necessitated the demolition of houses and eviction of local residents. Related to this is the new flood walls and land reclamation currently under construction along the city's northern coastline, part of the JCDS and NCICD Master Plan. In these areas, again fishing communities living in kampung appear to be the most affected, with demolition of houses, eviction, and new barriers in the form of seawalls, often exceeding 6m in height (Suprayogi et al., 2018).

Methodology

Individual research methods utilised in each findings chapter varied since these elements of the dissertation were envisaged as independent, peer-reviewed articles, for example Chapter II which has already been published. Specific methods include satellite imagery and GISbased mapping used in Chapters II, III and IV, document analysis and literature review utilised in Chapters II, III and IV, as well as open structured interviews where information or data was lacking as in Chapters III and IV, as well as workshops on future planning and infrastructure policy in this chapter.

The research considered several questions:

 Can a new research method that brings together historical institutionalism and urban morphology reveal new things about Jakarta's relationship to flooding? This is answered in Chapters III and IV.

- How have planning decisions in reaction to flooding shaped the urban form of Jakarta over time? This is answered primarily in Chapter II, but on a more site by site basis in Chapters III and IV.
- How have these changes in urban form in response to flood-related planning policies taken place historically? This is answered in Chapters II, III and IV.
- How have these physical changes in urban form impacted the lives and wellbeing of people living in areas affected by flood policies? This is primarily answered by Chapters III and IV, though Chapter II offers historic insight.
- What policies, development strategies and best practices should the Jakarta DKI and central government be utilising to improve the flood situation in a more sustainable and resilient manner, i.e. one that does not negatively impact on the poor and vulnerable of flood-prone informal settlements but improves the quality of life of a wide cross section of city inhabitants? This is explored in Chapter V.

Each of these questions have been answered or responded to by the research. The manner in which planning decisions as a response to flooding have shaped the urban form of Jakarta over time is now abundantly clear. Starting in Chapter II, which looks at the long history of flooding and the strategic decision-making and urban form of the city over the past 400 years. The relationship of flooding and planning decisions around flooding is clear. From a strategic and historical perspective, the Dutch colonial government in the 17th and 18th centuries implemented a *Waterstad* typology of urban form, complete with canals, rectilinear blocks surrounded by fortifications to protect Europeans and Chinese workers imported from elsewhere in Asia, from indigenous hostile Javanese inhabitants of the *desa* and *kampung* surrounding the new city of Batavia.

The manner in which planning decisions as a response to flooding have shaped the urban form of Jakarta over time is now abundantly clear, from a strategic and historical perspective, the Dutch colonial government in the 17th and 18th centuries implemented a

Waterstad typology of urban form, complete with canals, rectilinear blocks surrounded by fortifications to protect Europeans and Chinese workers imported from elsewhere in Asia, from indigenous hostile Javanese inhabitants of the desa and kampung surrounding the new city of Batavia. The manner in which planning decisions have taken place historically are borne out by these actions, including the imposition of an alien European typology of urban form and water infrastructure began a technocratic, top-down pattern of decisionmaking and policies which prioritised a small cadre of elites while ignoring the needs of rest of the population, while implementing engineered solutions which aimed to disperse water as far away from the city as possible, to the sea. This disregarded any existing indigenous water systems or existing, traditional ways of dealing with water, in favour of imposed foreign systems brought from the Netherlands. In turn, the European elites subsequently decamped from Old Batavia along the North Coast of Jakarta and migrated south to Weltevreden (today's Medan Merdeka and the Monas), where they built a new administrative centre and residential enclave on higher ground in the early 19th century. This allowed them to escape the worse impacts of flooding and its side effects including malaria and cholera. These colonial periods would go-on to influence subsequent planning of infrastructure works, as well as wider urban planning in Jakarta, which for several decades continued to prioritise urban development through southward migration until by the late 1990s this was no longer viable due to natural topography in the south.

In Chapter III, more recent flood interventions and infrastructure improvements, along with their physical and spatial impact on urban form, and the resulting effects on local communities were examined. A number of kampung communities were used in this chapter to illustrate this and to answer how the physical changes in urban form have impacted on the lives and wellbeing of people living in the areas affected. The most visible result of government policies to prioritise infrastructure needs of the wider city over those of local communities are clarified by the satellite imagery and GIS-based mapping which illustrate the change in urban form and the quantifiable elements of these impacts which typically result in the demolition of local residents' houses and the eviction of large numbers of kampung inhabitants to areas far from their sources of local livelihoods. In Chapter IV satellite imagery and GIS-based mapping are utilised again to demonstrate the changes in urban form, however specifically in the context of the construction of the JCDS and NCICD Master Plan seawalls, pumping stations and other associated infrastructure

works on coastal kampung communities. This is illustrated through the recent and potential impact on kampung houses (based on existing policies and previous infrastructure implementation), the associated eviction of residents and the creation of new barriers to access of the water, namely the difficulty in moving between the kampung and fishing vessels used by the community for their livelihoods.

The question of whether a new research method, i.e. the bringing together of historical institutionalism and urban morphology can reveal new things about Jakarta's relationship to flooding, the answer is that it can and has done so successfully. What this new method does is to illustrate the physical and spatial ramifications of policy decisions in real time. It accomplishes this by linking recent changes in the physical form of the city, its morphology, to flood mitigation measures as they are being constructed, or as they have recently been implemented. Without regularly updated satellite imagery available through platforms or software applications such as Google Earth Pro or other forms of digital mapping, such as OpenStreetMap⁴¹ or even Google Street View⁴². This method, while based on research unique to Jakarta, could be adapted and employed elsewhere to similarly understand the nature of changes to the urban form in recent decades⁴³. In detail, the method works by linking literature review and interviews on historical institutionalist factors, such as planning regulations, the culture of decision-making or the types and forms of infrastructure implemented, with mapping of the resultant changes to urban form using historic satellite imagery and GIS-open source data based diagrams to show before and after policy and infrastructure implementation. Therefore, this approach could potentially be adapted for other cities where the link between planning policy and changing urban form is necessary, or desirable to capture.

This research method's usefulness is borne out by the now clarified link between the historic nature of government decision-making and associated technocratic, top-down policies which prioritise flooding over the lives and needs of the city's vulnerable

⁴¹ An open-source GIS-based cartographic information system regularly updated by users of the platform (OpenStreetMap, 2024).

⁴² Like Google Earth Pro, Google Street View utilizes historic street-level imagery in limited locations worldwide, allowing for the tracking of a changing built environment (Google Earth Street View, 2024).
⁴³ Google Earth Pro allows viewing and downloading of high-resolution satellite imagery covering approximately the past two decades, and in some limited cities such as London and Berlin, older aerial photography is available, for example as far back as the 1930s-1950s (Google Earth, 2024).

communities who live along the waterways and northern coastline of the city, areas subject to historic and frequent flooding. The prioritisation of flood infrastructure over local communities is clear through the repeated, evidenced examples demolition and subsequent eviction of residents, as well as the implementation of new floodwalls separating fishing communities from their fishing vessels and their livelihoods in the Java Sea, and the strategic manner in which flooding has shaped the city's urban form from the early colonial period to the present day, in favour of technocratic, engineered solutions. What is different in this research to similar studies on flooding and kampung communities in Jakarta is the manner in which institutional decision-making is directly linked to physical and spatial outcomes, i.e. changes in the urban form of the city as a result of policies implemented by the central and local government through the use of policy examples in specific affected neighbourhoods where infrastructure interventions have been realised, illustrated with satellite imagery and mapping. As such this element constitutes an additional primary contribution to knowledge.

This research has provided a window into understanding the complex case of one of the world's mega cities, facing a complicated array of challenges, including flooding. More than 400 years of flooding and infrastructure responses to these challenges have been reviewed, alongside the impacts on the city's urban form. The application of this research, its particular methods and theoretical approach, as well as its findings, have significantly furthered the understanding of how decisions around flood infrastructure are made and the manner in which they impact the physical built environment of this city. As Ford (1993) argued, Jakarta can be argued to be the prototype of the Indonesian city in terms of its urban form, for many large and regional cities across Java, and further across the archipelago, look to the capital for patterns to emulate, be they economic, political, cultural or in the realm of planning, infrastructure, and flood prevention. Indonesia's capital is in the early stages of its relocation to East Kalimantan Province on the Island of Borneo to the northeast across the Java Sea, and while that shift will inevitably result in a decrease in Jakarta's political importance, it is unlikely to lose its preeminent role as the economic engine and financial centre of the country. As such it will continue to exert and outsized influence on the way other cities nationwide respond to similar challenges. Therefore, the appreciation of the link between policy, infrastructure intervention and the impact on urban form in the city remains paramount to the fundamental understanding of the

processes of urban development and physical change in Indonesian cities, which are likely to continue to be highly influential for years to come.

Finally, the policies, development strategies and best practices the Jakarta DKI and central government should be utilising to improve the flood situation for the future in a more sustainable and resilient manner, indeed one that does not negatively impact on the poor and vulnerable of flood-prone informal settlements but improves the quality of life of a wide cross section of city inhabitants is an important consideration of this dissertation. In Jakarta and more widely across Indonesia, there are academics engaged in associated research, as well as consultants, including water experts and engineers and planning officials, engaged in the realisation of flood prevention, while community planning specialists are working with local communities to empower the city's poor and vulnerable to respond to these changes, both as a result of climate change and worsening flooding, as well to manage the impacts of new flood infrastructure being developed along the city's northern coastline. To understand the views of these experts with respect to the future of Jakarta in terms of planning, flood infrastructure and flood resilience, a series of workshops were undertaken, which are discussed in the following section.

Limitations

There were limitations to the research methods employed throughout this dissertation. Analysis of historical maps was limited to those available through online sources, specifically the British Library and Wikimedia. Additionally, most historic maps available focused on Old Batavia and Weltevreden, not more recently constructed areas of the city such as Kebayoran Baru or Senayan. This meant that historic maps were limited to Chapter II. Open source GIS data was obtained from OpenStreetMap, however open source GIS data is reliant on the users mapping specific areas of the planet's surface. Some gaps were readily apparent when comparing with satellite imagery, and the data needed to be revised in some limited cases. In terms of high resolution satellite data, Google Earth Pro was used, and this source of imagery generally includes images from the present year back to the early 2000s or late 1990s in sufficient resolution, depending on the global location. This meant that real time analysis was limited to the last 20-25 years, and therefore why Chapters II and III focus on this method. In these two chapters, the kampung communities studied were limited to those with identifiable morphological changes visible in satellite imagery as well as communities where English literature was available for crossreferencing, to ensure proper analysis could be undertaken. Finally, there were limitations generally to literature available in English on Jakarta and Indonesia. This limited the scope of the literature review, as well as the mapped sites in Chapters II, III and IV.

There were of course other limitations. The research was conducted part time over an 8year period, from 2016-2024. A significant period of the data gathering – three years in total – fell during the period of the 2020-21 Covid-19 global pandemic. Indonesia closed its borders from 2020-2022 to all outsiders. This effectively meant I was unable to access the country for field work during that period. This meant that the original research plan requiring more interviews had to be adapted to allow for more remote data gathering. This shifted the research further in the direction of mapping. While initially a challenge, this ended up being an advantage, as a new method of investigation was developed utilising literature review, interviews and mapping together to form a more coherent understanding of a complex relationship between governmental bodies (institutions), their decisions (policies) and decision-making culture and procedures (historical institutionalism) with a result of influencing the changing urban form (morphology) of Jakarta over time. Additionally, coming from Western Europe, and before that North America, it became painfully obvious that government officials in particular do not necessarily communicate in the same manner. For example, gaining a planning officer's email is not usually sufficient, as government officials are loathe to put anything in writing, lest it be used against them. I therefore had to spend long periods of time finding secondary or tertiary contacts who would share WhatsApp numbers so I could text the individuals involved. While this was especially true for government employees, it was also true to a lesser degree for the other experts and specialists I interviewed. In Indonesia, WhatsApp is an absolute necessity for communication. Email is for official confirmation and for formal invitations, rather than day-to-day communication.

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Summary of the findings:

Chapter II examined the broad history of flooding and urban morphology in Jakarta, starting from the Dutch colonial reconstruction of Jayakarta into Batavia in 1619. It explained the imposition of the Waterstad typology of rectilinear urban blocks and grid of streets with the system of canals and associated flood and water drainage infrastructure borrowed directly from cities in the Netherlands. It analysed the historical institutionalist context of flood infrastructure and linked it with policy responses and the development and changes to the city's urban form as it migrated from the northern coastline to the south in order to understand how planning and flood related infrastructure policies impact the physical and spatial development of the city over time. This migration took place initially to Weltevreden from Old Batavia in the early 19th century and then further south to Kebayoran Baru in the 1950s, still further south until there was renewed interest in the city's northern coastline with land reclamation projects at Pantai Mutiara in the 1990s, Green Bay Jakarta and the new islands developed beginning in the 2010s, such as Pantai Indah Kapuk (PIK). Methods in the chapter included literature review, mapping analysis using historic cartography and satellite imagery. Policies examined were promoted by the Dutch colonial administration until 1949, afterwards by the DKI and central governments in the post-independence period.

Chapter III focused on specific instances of changes to urban form as a direct result of infrastructure improvements in response to flooding and related policies implemented at the level of the Jakarta DKI and central government levels. GIS-based open source mapping, together with historic high resolution satellite imagery were utilised to map changes to kampung communities in different areas of Jakarta. All were located along canals, riverbanks, *waduk* (polders) or other water bodies. The timeframe examined in this chapter was limited to approximately the last two decades, from around 2003 until the time of writing the chapter, due to the availability of high resolution imagery after the late 1990s.

Chapter IV investigated the in-situ ongoing implementation of the NCICD flood infrastructure and its physical and spatial impact on the city's urban form, and the implications for local residents, for kampung communities situated along Jakarta's northern coastline. In these fishing communities, new flood walls are being build which not only result in the demolition of houses and presumed eviction of local residents, but also the erection of a significant barrier to movement. Specifically, this represents not only morphological change but also a significant obstacle for fishermen in accessing both the water and their fishing vessels, as well as the removal of catches so they can be sold at market. This revealed not only top-down policy planning, but additionally a lack of foresight in planning and empathy for the difficulties caused to local livelihoods.

Chapter V reviewed a series of workshops with flood experts, including planners and government officers, infrastructure engineers and hydrologists, climate specialists, academics and NGOs working with local communities impacted both by flooding and improvements to flood infrastructure, as well as those affected by the implementation of new flood defences. The workshops were revealing, as they indicated continuing institutional lock-in and path dependencies, specifically with regard to the preference for technocratic over nature-based systems for flood mitigation, and top-down policy initiatives in response to flooding. Additionally, conflicts in ideologies between administrations and different levels of government was apparent, based on findings regarding the administration of Government Anies which preferred bottom-up solutions, but only for specific kampung communities (Kampung Akuarium), while continuing bottom-down policies for elsewhere in Jakarta. Additionally, the NCICD and JCDS with all their technocratic engineering fail to solve the problem up upstream flooding as well as land subsidence. This chapter also revealed that governance arrangements need to be changed to allow for cross-border cooperation and collaboration in order to manage flooding adequately across entire watersheds, such as that of the Ciliwung River, in order to bring about lasting positive change. As a result, significant change is still needed in terms of governance, regulations and stakeholder engagement, in order to change the long term institutional trajectory around flood and infrastructure planning.

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Contribution to knowledge

This dissertation employs a unique strategy in academic literature, the linking of two theoretical approaches from separate disciplines: historical institutionalism and urban morphology. The first approach, historical institutionalism, is utilised as described by Steinmo (2008), Thelen (1999), Skopkol (1992), Silver (2008), Holzhacker et al. (2016), Hudalah et al. (2007) and others, typically utilised in political science and sociology. The second approach, urban morphology, is employed as discussed by Oliveira (2016) and Kropf (2017), Ford (1993), Cybriwsky and Ford (2001), Dovey and King (2011), Raharjo (2010) along with others, commonly utilised in architecture and urban design, in order to consider the complex relationship between decision-making and policy with that of physical and spatial development, as well as the impacts on people living and working in the areas affected. This combination of a dual theoretical approach enables the research to reveal the nature of planning policies in response to flooding and the way those decisions have impacted the city's urban form, and in particular, on the people who inhabit Jakarta not simply in a static, historical fashion, but as it is taking place. This allows for an understanding of a changing context and therefore a city undergoing physical and spatial change in real time, in response to government decisions.

What this new method reveals is a context of institutions (in this case primarily the government, but also the engineering profession and to a certain extent, academia in Indonesia) which remain locked-into an apparently unbreakable path dependency initiated during the Dutch colonial era, continued through the early Post-Independence and New Order periods, and ongoing to this day which remains obsessed with technocratic, engineering-driven solutions based along the city's northern coastline through the implementation of the JCDS and NCICD, and which views kampung residents as expendable and not worth inclusion as partners in change. Nature-based solutions are only considered as an after-thought, not as integrated solutions alongside technical ones, despite international and local evidence pointing to the contrary. Also, despite the argument that there is insufficient land in Jakarta to accommodate nature-based solutions, the previous version of the NCICD specifically called for multiple islands to be constructed from land reclamation. Could not a similar solution be utilised but for mangroves or other nature-

based solutions? This would not appear to impact significantly on the livelihoods of fishermen and would potentially go some way to improving the local ecology of Jakarta Bay. Mangrove islands would not be as heavy as land reclamation and perhaps would not pose the same danger from natural gas explosions as was outlined in the workshops that could be the case from large scale urban developments in the Bay.

While it does appear that technical solutions are needed to combat flooding from the sea, but these do not address the land subsidence issue or upstream flooding. Solving the flood challenge would require examining flooding both upstream and downstream, across the entire Ciliwung watershed, requiring cross-border cooperation between local municipalities and various levels of government (i.e. the national, provincial and kota levels vertically, as well as horizontally between various kota and provinces across their boundaries). This vertical cooperation could include both national level ministries such as Bappenas and the Ministry of Works and Housing, as well as regional ones such as Bappeda. However, at present the elected officials in charge appear to remain uninterested in improving on this dire history of failure in regard to flood planning.

What this research also reveals is the challenge not only of policy-makers and government officials, but also of academics and professionals in Indonesia who still believe top-down flood planning initiatives are the best solution. Despite the evidence that consulting with local communities (who often know the nature of flooding far better than planning officials), community stakeholder engagement is not treated with the weight it requires. Instead of maintaining vigorous, diverse communities in-situ who could help to monitor local flood conditions to make them part of the solution, politicians continually evict them to neighbourhoods far away. They demolish their homes to make way for infrastructure maintenance easements and local livelihoods are severed. Also, knowledge is lost when communities are evicted and dismantled. The lessons on how to live with flooding is lost. Understanding the potential of this knowledge for implementation across Jakarta is also important, for in the future it may become likely that a much wider cross section of Jakartans need to understand how to deal with flooding and live with water.

Finally, this methodological approach reveals the nature of the changing physical and spatial urban form of the city in response to policy decisions in real time. This approach, when studied in tandem with certain planning regulations, can act as a limited predictive model. Due to the 5m setback easement regulation dating at least from the 1990s, it is possible to predict to a limited degree, where buildings will be demolished in order to accommodate new flood infrastructure, in this case the NCICD flood wall along the city's northern coastline. This link between a sociological-political science based theoretical approach with a spatial and physical one of urban morphology has not been utilised before in academic research. This is a significant gap in the understanding of how policy decisions impact on the physical and spatial urban form of cities. This revelation constitutes an original contribution to knowledge and an approach with potential utilisation elsewhere.

Jakarta is a city living on borrowed time. It has not faced up to the realities of its situation, nor the inadequacies of its planning and decision-making culture. The only individuals who understand how to live with flooding are the members of kampung communities who have dealt with flooding for decades and adapted, within their limited capacities. What the Central and DKI Jakarta governments should be doing, is working with these communities to understand what works and how this local knowledge and expertise could be incorporated alongside more technical, engineered interventions, nature-based solutions, in parallel with a comprehensive flood plan for the watershed as well as tidal inundation, as well as a plan for how to combat land subsidence. This latter element is the most pernicious, because currently, according to the information available for this research, no solutions appear to be proposed for Jakarta.

Future research

My background as an urban designer working in international development in the global south greatly influenced my understanding of the issues examined in this research. My initial master planning work in Jakarta sparked an interest in the city with its unique history and context, and this was furthered by development work for the Australian government on a transport planning project from 2015-18. I became familiar with the city's urban

morphology, many of its planning regulations, flood challenges and landholdings. This was a great benefit to the research, as I had already developed a number of professional, governmental and academic contacts which I subsequently built on over the course of the research.

This dissertation has developed a methodological approach to understanding the relationship between flooding, government policy and urban morphological change. While the context is highly specific to Jakarta, this approach could be modified for different contexts in other cities facing similar flood, regulatory and morphological challenges, potentially based on regions. For example, several cities elsewhere along Java's northern coastline could be studied, as well as mega cities further afield in Southeast and South Asia in the near term. Longer term, this approach could potentially be adapted for other developing world cities or even cities in the developed world, where flooding and regulatory challenges, as well as affordable housing remain a distinct problem for policymakers. In addition, it would explore potential solutions to land subsidence globally to understand how this knowledge could be applied elsewhere.

Moving beyond this, my future research would endeavour to further elucidate on the link between planning policy decisions and the urban form of cities, to potentially include manifestations of institutional lock-in, path dependency and other challenges that have shaped cities over time and prevented them from reaching their full developmental potential. This could focus on flooding but also expand to other challenges in the planning system, for example to examine other large-scale infrastructure challenges such as housing development or public transport. This research could also be applicable to both developed and developing world contexts, specifically focusing on the challenges of mega cities globally.

References

Abeyasekere, S. (1989). *Jakarta: A History*, Revised Edition. Singapore: Oxford University Press.

Abidin, H.Z., Andreas, H., Gumilar, I., et al. (2011). Land subsidence of Jakarta (Indonesia) and its relation with urban development. *Natural Hazards*, 59(3): 1753–1771.

Adas, M. (1989). Machines as the Measure of Men: Science, Technology and Ideologies of Western Dominance. Ithaca, NY: Cornell University Press.

AFA99 Channel (2023). Wow Super Panjang, Besar dan Tahan Lama Tanggul Laut NCICD di Kalibaru Celencing Jakarta Utara [Wow Super Long, Big and Durable NCICD Sea Wall in Kalibaru, Celincing, North Jakarta]. *YouTube*. Available from: https://www.youtube.com/watch?v=znyj72n2GQo&t=431s&ab_channel=AFA99Channe 1 [Accessed July 13, 2023].

Ahram, A.I., 2011. The theory and method of comparative area studies. *Qualitative Research*, *11*(1), pp.69-90.

Agustina, W. (2014). Jokowi Rembuk Banjir di Katulampa, Ini Hasilnya [Jokowi discusses the floods in Katulampa, these are the results]. Tempo, 20 January. Available at: https://metro.tempo.co/read/546656/jokowi-rembuk-banjir-di-katulampa-ini-hasilnya [Accessed 13 July, 2023].

American University (2023). Fact Sheet: Nature-Based Solutions to Climate Change. Available at: https://www.american.edu/sis/centers/carbon-removal/fact-sheet-nature-based-solutions-to-climate-

change.cfm#:~:text=Protecting%20biodiversity%3A%20because%20they%20conserve,cli mate%20change%20and%20habitat%20loss. [Accessed 20 December 2023].

Andapita, V. (2019). In Jakarta, kampung coexist with skyscrapers. *The Jakarta Post*, 19 March. Available from https://www.thejakartapost.com/news/2019/03/19/injakartakampung-coexist-with-skyscrapers.html [Accessed 29 January 2021].

Anguelovski, L. Irazábal-Zurita, C. and Connolly, J.J. (2019). Grabbed urban landscapes: Socio-spatial tensions in green infrastructure planning in Medellín. *International Journal of Urban and Regional Research*, 43 (1), 133-156.

Anita, J., (2013), November. Structural and non-structural approaches as flood protection strategy in Muara Angke settlement, North Jakarta. In *Proc., 2nd Int. Conf. on Sustainable Infrastructure and Built Environment (SIBE)* (pp. 1-9).

ArchDaily (2023). *ArchDaily: The world's most visited architecture platform*. Available at: https://www.archdaily.com/?ad_name=small-logo [Accessed August 15 2023].

Argo, T.A. (1999). *Thirsty Downstream: The Provision of Clean Water in Jakarta, Indonesia.* Doctoral Thesis, University of British Columbia.

Assegaff, S.B. (2021). The journey of Kampung Akuarium. *The Straits Times*, 17 September. Available from: <u>https://www.nst.com.my/opinion/columnists/2021/09/728227/journey-kampung-akuarium</u>[Accessed 1 February 2022].

Astuti, N.A.R. (2019). Surat Jokowi soal Ibu Kota Dibacakan di Paripurna DPR [Jokowi's letter regarding the new capital city was read at the DPR Plenary. *detikNews*, 27 August. Available from: https://news.detik.com/berita/d-4682438/surat-jokowi-soal-ibu-kota-baru-dibacakan-di-paripurna-dpr [Accessed 29 December 2023].

Badan Pusat Statistik (2016). Statistik Indonesia 2016. *Badan Pusat Statistik*. Available from: <u>https://bps.go.id</u> [Accessed 16 August 2021].

Baker, J. L., (2012). *Climate Change, disaster Risk and the Urban Poor: Cities Building Resilience for a Changing World* [online] Washington: World Bank. Available from: www.worldbank.org [Accessed 29 December 2014].

Bappeda (2022). Interviewed by David Mathewson. 29 August 2022, Bali (via MS Teams).

Bappeda (2023). Interviewed by David Mathewson. 20 June 2023, Jakarta.

Bappenas (2019). Interviewed by David Mathewson. 17 June 2019, Jakarta.

Beinart, W. and Hughes, L. (2007) *Environment and Empire*. Oxford: Oxford University Press.

Betteridge, B. and Webber, S. (2019). Everyday resilience, reworking, and resistance in North Jakarta's kampung. *ENE: Nature and Space*, 2 (4), 944-966.

Birkhamshaw, A.J., J.W.R. Whitehand (2012). Conzenian urban morphology and the character areas of planners and residents. *Urban Design International*, 17(1), 4-17.

Blusse' L (1986) Strange Company: Chinese Settlers, Mestizo Women and the Dutch in VOC Batavia. Dordrecht; Riverton, NJ: Foris Publications.

Britannica (2024). Polder: Land reclamation. *Britannica*. Available from: https://www.britannica.com/science/polder [Accessed 21 January 2024].

Brown, R.A. (2006). Indonesian corporations, cronyism, and corruption. *Modern Asian Studies*, 4: 953–992.

Buckley, R.B. (1893). Irrigation Works in India and Egypt. London; New York: Spon & Chamberlain.

Bunte, M. and Ufen, A. (eds) (2009). *Democratization in Post-Suharto Indonesia*. London; New York: Routledge.

Busquets, J. (2005). Barcelona: the urban evolution of a compact city. Rovereto, Italy: Nicolodi.

Busquets, J. and Pérez-Ramos, P. (2017). *Barcelona: Manifold Grids and the Cerdà Plan*. Cambridge, Massachusetts: Applied Research and Design Publishing.

Caljouw, M., P.J.M. Nas, and Pratiwo (2005) Flooding in Jakarta: Towards a blue city with improved water management. *Bijdragen tot de Taal-, Land- en Volkenkunde* [Contributions to Language, Land and Ethnology], 161-4, 454-484.

Campbell, J. (1997). Mechanisms of evolutionary change in economic governance: Interaction, interpretation and bricolage. In: Magnusson L and Ottosson J (eds) *Evolutionary Economics and Path Dependence*. Cheltenham: Elgar, pp.10–32.

Capoccia, G. (2016). Critical junctures. In: Fioretos, O., Falleti, T.G. and Sheingate, A. (eds), *The Oxford Handbook of Historical Institutionalism*. Oxford: Oxford University Press, pp.89–112.

Capoccia, G. and Kelemen, R.D. (2007). The study of critical junctures: Theory, narrative and counterfactuals in historical institutionalism. *World Politics* 59 (3), 341–369.

Carroll, T. (2009). Social development as neoliberal Trojan horse: The World Bank and the Kecamatan development program in Indonesia. *Development and Change*, 40 (3), 447-466.

Chandramidi, A.N. (2013) Urban Flood Resilience in Jakarta: an Historic Analysis of Institutions. Unpublished Masters Thesis. University of Groningen.

Climate Hub Indonesia (2023). Interview by David Mathewson, June 20, Jakarta.

Coelho, K. (2016). Tenements, Ghettos, or Neighbourhoods? Outcomes of Slum-Clearance Interventions in Chennai. Review of Development & Change, 21 (1), 111-136.

Colven, E., 2017. Understanding the Allure of Big Infrastructure: Jakarta's Great Garuda Sea Wall Project. *Water Alternatives*, 10(2).

Colven, E. and Irawaty, D.T. (2019). Critical spatial Practice and Urban Poor Politics: (Re)Imagining Housing in a Flood-Prone Jakarta. *Society and Space*. Available from https://www.societyandspace.org/articles/critical-spatial-practice-and-urban-poor-politicsre-imagining-housing-in-a-flood-prone-jakarta [Accessed 10 June 2021].

Conzen, M.R.G. (2004). *Thinking about urban form: papers on urban morphology, 1932-1998*. Oxford: Peter Lang.

Coordinating Ministry for Economic Affairs (NCICD) (2014). *Master Plan: National Capital Integrated Coastal Development*. Jakarta: The Coordinating Ministry of Economic Affairs of the Republic of Indonesia.

Cowan, R. (2005). The Dictionary of Urbanism. London: Streetwise Press.

Cowherd, R. (2005) Does Planning Culture Matter? Dutch and American Models in Indonesian urban transformations. In B. Sanyal, (Ed.). *Comparative Planning Cultures*. London: Routledge.

Crouch, H. (1980). The trends to authoritarianism: The post-1945 period. In: Aveling, H. (ed), *The Development of Indonesia's Society: From the Coming of Islam to the Present Day*. New York: St Martin's Press, pp.166–120.

Crowhurst, Lennard, S.H. and Lennard, H.L. (1995). Livable Cities Observed: A Source Book of Images and Ideas for City Officials, Community Leaders, Architects, Planners and All Others Concerned. Carmel, CA: Gondolier Press.

Cuadra, L.K. (2015). *This Grieveable Life: Precarity, Land Tenancy and Flooding in the* Kampung *of Jakarta*. Unpublished Masters Thesis. University of Washington.

Cybriwsky, R. and L.R. Ford (2001) City profile: Jakarta. Cities 18(3), 199-210.

C40 Cities (2019). *C40 Cities*. Available from: https://www.c40.org [Accessed: 15 July 2019].

Dahiya, B. (2012). Cities in Asia 2012: Demographics, Economics, Poverty, Environment and Governance. *Cities* 29, S44-S61. Accessed from: https://doi.org/10.1016/j.cities.2012.06.013 on 30 December 2014.

Darwis, I., Gregorius, J., Hill, C., Nelwan, M., Sequeira Sousa, I. and Tekbali, F. (2018). *Kampung Akuarium*. Jakarta: University of Westminster & Universitas Tarumanagara. De Albuquerque Reis, A., Huynh Nguyen, M., Jeremy, Rivan, Alcorn, T. (2018). *Kampung Gedung Pompa* [Unpublished masters project]. London: University of Westminster.

De Haan, F. (1935). Oud Batavia [Old Batavia]. Bandung: A. C. Nix.

De Sherbinin, A., Schiller, A. and Pulsipher, A. (2007). The vulnerability of global cities to climate hazards. *Environment & Urbanisation*. 19 (1), 34-64.

Delinom, R.M. (2008). Groundwater management issues in the Greater Jakarta area, Indonesia. In: *Proceedings of International Workshop on Integrated Watershed Management for Sustainable Water Use in a Humid Tropical Region, JSPS-DGHE Joint Research Project*, University of Tsukuba, October 2007. Available from: file:///Users/davidmathewson/Downloads/BTERC_8sv2_40.pdf [Accessed 28 February 2018].

Di Balik Banjir Jakarta. Tempo, 12-18 February 2007.

Dirdjosisworo, S., 1978. Legal Aspects Regarding Urban Planning in Indonesia.

Djalante, R. (2013). Identifying Drivers, Barriers, and Opportunities for Integrating Disaster Risk Reduction and Climate Change Adaptation in Indonesia: An Analysis Based on the Earth System Governance Framework. In: Leal Filho, W. (ed.) *Climate Change and Disaster Risk Management*. Berlin: Springer-Verlag.

Dinas Sumber Daya Air Provinsi DKI Jakarta [DKI Jakarta Provincial Water resources Service] (2020). Pantai Muara Angke [Muara Angke Waterfront]. *YouTube*. Available from: https://www.youtube.com/watch?v=KE_Gv887C1U&ab_channel=DinasSumberDayaAir ProvinsiDKIJakarta [Accessed: July 13, 2023].

Dinas Sumber Daya Air Provinsi DKI Jakarta [DKI Jakarta Provincial Water resources Service] (2022a). Tanggul Belum Terbangun: 4.997 m – Kterangan: Tahun 2022-2028 [Unbuilt Embankment: 4,997m – Information: Years 2022-2028]. *YouTube*. Available from: https://www.youtube.com/watch?v=a2eUYUh2FYg&t=14s&ab_channel=DinasSumber DayaAirProvinsiDKIJakarta [Accessed: July 13, 2023].

Dinas Sumber Daya Air Provinsi DKI Jakarta [DKI Jakarta Provincial Water resources Service] (2022b). Update 100% 942 Project Maret 2023 [Update 100% 942 Project March 2023]. *YouTube*. Available from:

https://www.youtube.com/watch?v=QgaFb6C_b74&ab_channel=DinasSumberDayaAirP rovinsiDKIJakarta [Accessed 13 July, 2023].

Doshi, S. (2013). The politics of the evicted: Redevelopment, subjectivity, and difference in Mumbai's slum frontier. *Antipode* 45 (4), 844-865.

Doshi, S. (2019). Greening displacements, displacing green: Environmental subjectivity, slum clearance and the embodied political ecologies of dispossession in Mumbai. *International Journal of Urban and Regional Research*, 43 (1), 112-132.

Douglass, M., Le, T.Q., Lowry, C.K., Nguyen, H.T., Pham, A.N., Thai, N.D. and Yulinwati, H. (2004). The Livability of Mega-Urban Regions in Southeast Asia – Bangkok, Ho Chi Minh City, Jakarta and Manila Compared. In: *International conference on the Growth of Mega-Urban Regions in East and Southeast Asia*, Singapore, 24-25 June 2004.

Douglass, M., (2005). Mega-projects and the Environment: Urban Form and Water in Jakarta. In: *International Conference on Global Cities: Water, Infrastructure and Environment*. 16-19 May 2005. Honolulu: University of Hawaii, 2005, pp. 1-12. Dovey, K., Cook, B. and Achmadi, A. (2019). Contested riverscapes in Jakarta: flooding, forced eviction and urban image. *Space and Polity*, 23 (3), 265-282.

Dovey, K. and King, R. (2011). Forms of Informality: Morphology and Visibility of Informal Settlements. *Built Environment*, 37 (1), 11-129.

Dovey, K. and Ristic, M. (2017). Mapping urban assemblages: the production of spatial knowledge. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 10 (1), 15-28.

Dudal, R. (2005). Soils of Southeast Asia. In: Gupta, A. (ed), *The Physical Geography of Southeast Asia*. Oxford: Oxford University Press, p.103.

Dwianto, R.D. (2003). The existing form of urban locality groups in Jakarta: Re-examining the RT/RW in the post-new order era. *Osaka City University*, *41*, pp.41-60.

Elias, J., Ma'riyah, C., Rethel, L., Suwarso, R. and Tilley, L. (2018). *The Gendered Everyday Political Economy of Kampung Eviction and Resettlement in Jakarta: Final Project Report.* Coventry: The University of Warwick.

Evans, G., 2020. Measure for measure: Evaluating the evidence of culture's contribution to regeneration. *Culture-led urban regeneration*, pp.116-140.

Fiisabiilillah, D.F. and A. Maulana (2016) Feeding the Megacity: Challenges to Achieve Food Security in Jakarta. *Journal Perencanaan Wilayah dan* Kota [Journal of Regional and City Planning] 27(3), 208-218. Firman, T., 2004. New town development in Jakarta Metropolitan Region: a perspective of spatial segregation. *Habitat international*, *28*(3), pp.349-368.

Firman, T. (2011). Post-suburban elements in Asian extended metropolitan region: the case of Jabodetabek (Jakarta Metropolitan Area). In: Phelps, N.A. and Wu, F. (eds) *International perspectives on suburbanisation: A post-suburban world*? Palgrave McMillan: London.

Firman, T., Surbakti, I.M., Idroes, I.C. and Simarmata, H.A. (2011). Potential climatechange related vulnerabilities in Jakarta: Challenges and current status. *Habitat International*, 35 (2), 372-378.

Ford, L. (1993). A Model of Indonesian City Structure. Geographical Review, 83 (4), 374-396.

Foxton, T.J. (2002). Technological and institutional 'lock-in' as a barrier to sustainable innovation. *Imperial College Centre for Policy and Technology Working Paper*, p1-9.

Gagalnya System Kanal: Pengendalian Banjir dari Masa ke Masa [Failure of the Canal System: Flood Control from Time to Time]. Kompas, 2010.

Garschagen, M., Surtiari, G. A. K. and Harb, M. (2018). Is Jakarta's New Flood Risk Reduction Strategy Transformational? *Sustainability*, 10 (8), 2394. Available from: https://doi.org/10.3390/su10082934

Ghauri, P., Grønhaug, K. and Strange, R., 2020. Research methods in business studies. Cambridge University Press.

Ghertner, D.A. (2011). Green evictions: environmental discourses of a "slum-free" Delhi. In: Peet, R., Robbins, P., and Watts, M.J. (eds). *Global Political Ecology*. Routledge: Abingdon, England.

Gilmartin, D. (1994). Scientific empire and imperial science: Colonialism and irrigation technology in the Indus Basin. *The Journal of Asian Studies*, 53(4): 1127–1149.

Goh, K. (2019). Urban Waterscapes: The Hydro-Politics of Flooding in a Sinking City. *International Journal of Urban and Regional Research*, 43 (2), 250-272. Available from: https://doi.org/10.1111/1468-2427.12756

Graham, S., 2020. The sciences of reading and writing must become more fully integrated. *Reading research quarterly*, *55*, pp.S35-S44.

Greener, I. (2005). The Potential of Path Dependence in Political Studies. *Politics*, 25 (1), 62-72.

Gunawan R (2010) *Gagalnya Sistem Kanal: Pengendalian Banjir Jakarta Dari Masa ke Masa* [The Failure of the Canal System: Jakarta's Flood Control from Time to Time]. Jakarta: Kompas.

Hairudin, Kriyanto, R. and Wisadirana, D. (2017). Process of development Planning consensus [Musrenbang] As A Means of Communication in Decision-Making in Siniu Subdistrict Parigi Moutong Regency. *Wacana* [Discourse], 20 (3), 153-161.

Hall, P.A., and Taylor, R.C.R. (1996). Political Science and the Three New Institutionalisms. *Political Studies*, XLIV, 936-957.

Herlambang, S., Leitner, H., Tjung, L.J., Sheppard, E. and Anguelov, D. (2019). Jakarta's great land transformation: Hybrid neo-liberalisation and informality. *Urban Studies*, 56 (4), 627-648.

Heryanto, A. and Lutz, N., 1988. The development of 'Development'. Indonesia, (46), 1-24.

Heuken, A. (1983). Historical Sites of Jakarta. Jakarta: Cipta Loka Karya.

Hidayatno, A., Dinianyadharani, A.K. and Sutrisno, A. (2017). Scenario analysis of the Jakarta Coastal Defence Strategy: Sustainable Indicators Impact Assessment. *International Journal of Innovation and Sustainable Development*, 11 (1), 37-52.

Holzhacker, R.L., R. Wittek, and J. Woltjer (2016) Decentralisation and Governance for Sustainable Society in Indonesia. In Holzhacker, R.L., R. Wittek, and J. Woltjer (Eds.) *Decentralisation and Governance in Indonesia* (pp. 3-29). London: Springer.

Hudalah, D. and Woltjer, J. (2007) Spatial Planning System in Transitional Indonesia. *International Planning Studies* 12(3), 291-303.

Hudalah, D., Firman, T. and Woltjer, J. (2014). Cultural Cooperation, Institution Building and Metropolitan Governance in Decentralising Indonesia. *International Journal of Urban and Regional Research*. 38 (6), 2217-234. Available from: DOI:10.1111/1468-2427.12096 [Accessed 10 March 2016].

Indonesia Tourism (2019). Jakarta: Maritime Museum. Indonesia-Tourism.com. Available from: http://www.indonesia-tourism.com/jakarta/maritime-museum.html [Accessed 8 August 2019].

Indrasafitri, D. (2012). Betawi: Between tradition and modernity. *The Jakarta Post*, 26 April. Available from: https://www.thejakartapost.com/news/2012/04/26/betawi-between-tradition-and-modernity.html [Accessed 29 January 2024].

JDIH BPK RI Database Peraturan [Legal Database] (2022). Udang-undang Nomor 22 tahun 1999 tentang Pemerintahan Daerah [Law No. 22 of 1999]. Available from: https://peraturan.bpk.go.id/Home/Details/45329/uu-no-22-tahun-1999 [Accessed 14 June 2022].

Jakarta Globe (2016). Edhi Sunarso, Scuptor of Selamat Datang and 'Dirgantara' Landmarks, Dies at 83, Jakarta Globe. Available at: https://web.archive.org/web/20160110162311/http://jakartaglobe.beritasatu.com/news/ edhi-sunarso-sculptor-selamat-datang-dirgantara-landmarks-dies-83/ [Accessed 28 January 2024].

Jason, Tekbali, F., Siqueira Sousa, I., Marisha, Hill, C. and Ibrahim (2018). *Kampung Akuarium* [Unpublished masters project]. London: University of Westminster.

Jayapal, M. (1993). Old Jakarta. Kuala Lumpur: Oxford University Press.

Jones, P. (2017). Formalizing the Informal: Understanding the Position of Informal Settlements and Slums in Sustainable Urbanization Policies and Strategies in Bandung, Indonesia. *Sustainability*, 9 (1436), 1-27.

Jones, P. (2019). The Shaping of Form and Structure in Informal Settlements: A Case Study of Order and Rules in Lebak Siliwangi, Bandung, Indonesia. *Journal of Regional and City Planning*, 30 (1), 43-61.

Kamalipour, H. (2016). Forms of informality and adaptations in informal settlements. International Journal of Architectural Research, 10 (3), 60-75.

Kanumoyoso B (2011) Beyond the City Wall: Society and Economic Development in the Ommelanden of Batavia, 1684–1740. Leiden, The Netherlands: Leiden University.

Kimmelman, M. (2017). Jakarta is Sinking So Fast, It Could End Up Underwater. *The New York Times*, 21 December. Available from: https://www.nytimes.com/interactive/2017/12/21/world/asia/jakarta-sinking-climate.html [Accessed 30 July 2019].

Kooy, M. and Bakker, K. (2008) Splintered networks: The colonial and contemporary waters of Jakarta. *Geoforum*, 39(6, 1843–1858.

Kops, A., (2012). Quickscan of Masterplans executive summary: Jakarta Coastal Defence Strategy Bridging Phase (JCDS-BP) [online] The Hague: Netherlands Enterprise Agency. Available from: http://www.partnersvoorwater.nl [Accessed 29 December 2014].

Kropf, K. (2017). The Handbook of Urban Morphology. Wiley: Chichester, West Sussex.

Kuffer, M. and Barros, J. (2011). Urban morphology of unplanned settlements: The use of spatial metrics in VHR remotely sensed images. *Procedia Environmental Sciences*, 7 (2011), 152-157.

Kumparan (2021). Wjah Baru Kampung Akuarium [The New Face of Kampung Akuarium]. *YouTube*. Available from: https://www.youtube.com/watch?v=RDvY6qAaZN0&t=31s&ab_channel=kumparan

[Accessed 15 September 2021].

Kusno, A. (2011) Runaway city: Jakarta Bay, the Pioneer and the Last Frontier. *Inter-Asia Cultural Studies* 12(4): 513-531. Accessed from: http://www.tandfonline.com on 9 January 2014.

Kusno, A., 2013. After the new order: Space, politics, and Jakarta. University of Hawaii Press.

Kusno, A. (2023). Middling urbanism: the megacity and the kampung. *Urban Geography*, 41 (7), 954-970. Available from: https://doi.org/10.1080/02723638.2019.1688535

Larkham, P.J. (2005). Understanding urban form? Urban Design, 93, 22-24.

Leclerc, J. (1993). Mirrors and the lighthouse. A search for meaning in the monuments and great works of Sukarno's Jakarta, 1960–1966. In: Nas, P.J.M. (ed), *Urban Symbolism*. Leiden: E.J. Brill, pp.38–58.

Leitner, H., Colven, E. and Sheppard, E. (2017). Ecological security for whom? The politics of flood alleviation and urban environmental justice in Jakarta, Indonesia. In: Heise, U., Niemann, M. and Christensen, J. (eds) *The Routledge Companion to the Environmental Humanities*. London: Routledge, pp.194–205.

Libecap, G.D. (2010). Institutional Path Dependence in Climate Adaptation: Coman's 'Some Unsettled Problems of Irrigation'. Santa Barbara, CA: National Bureau of Economic Research.

Lie, F.C. and Purnama, L. (2020). A Center for Activities and Coastal Communities in Muara Baru. *Jurnal Stup: Sains, Teknologi, Urban, Perancangan, Arsitektur* [STUP Journal: Science, Technology, Urban Design, Architecture], 2 (1), 155-164.

Linton, J. and Budds, J. 2014. The hydrosocial cycle: Defining and mobilizing a relationaldialectical approach to water. *Geoforum* 57: 170-180.

Lola, D., Saparuddin and Iranto, D. (2023). Analysis of factors affecting fisherman's income in Kamal Muara, North Jakarta City, *Journal of Humanities, Social Sciences and Business (JHSSB)*, 2 (2), 424-441.

Lozano, E.E., 1990. *Community design and the culture of cities: the crossroad and the wall.* Cambridge University Press.

Maharani, D. (2013). Ini 4 Penyebab Banjir Jakarta [These are the 4 Causes of Flooding in Jakarta]. *Kompass.* 22 January. Available from: https://megapolitan.kompas.com/read/2013/01/22/1053289/Ini.4.Penyebab.Banjir.Jakar ta#google_vignette [Accessed 30 January 2022].

Mahoney, J. (2001). Legacies of Liberalism: Path Dependence and Political Regimes in Central America. Baltimore: Johns Hopkins University Press.

Mahoney, J. (2000). Path Dependence in Historical Sociology. *Theory and Society*, 29 (4), 507-548.

Mahoney, J. and Schensul, D. (2006). Historical Context and Path Dependence. In: Goodin, R. and Tilly, C. (eds), *The Oxford Handbook of Contextual Political Analysis*. Oxford: Oxford University Press.

Marshall, G.R. and Alexandra, J. (2016). Institutional path dependence and environmental water recovery in Australia's Murray-Darling Basin. *Water Alternatives*, 9(3): 679–703.

Martinez, R. and Masron, I.N., 2020. Jakarta: A city of cities. Cities, 106, p.102868.

Marulanda, L. and Steinberg, F., 1993. Country profile: Indonesia—Land Management issues in Jakarta. *Sustainable Development*, 1(2), pp.10-14.

Marulanda, L. and Steinberg, F., 1991. Land management and guided land development in Jakarta (No. IHS Working Papers, No 1/1991). Available from: https://repub.eur.nl/pub/32208/IHS%20WP_001%20Land%20Management%20and%20 Guided%20Land%20Development%20in%20Jakarta%201991.pdf [Accessed 30 July 2022.

Marzot, N. (2002) The Study of Urban Form in Italy. Urban Morphology 6(2), 59-73.

McCall, M.K., 2003. Seeking good governance in participatory-GIS: a review of processes and governance dimensions in applying GIS to participatory spatial planning. *Habitat international*, 27(4), pp.549-573.

McCarthy, P. (2003) Part IV: Summary of City Case Studies. In UN-Habitat. *Global Report* on Human Settlements 2003: The Challenge of Slums. London: Earthscan.

McKendrick, J.H. (1999). Multi-Method Research: An Introduction to its Application in Population Geography. *Professional Geographer*, 51 (1), 40-50.

Meacham, M. (2009). Path Dependency of Infrastructure: Implications for the Sanitation System of Phnom Penh. Stockholm, Sweden: Stockholm University.

Menteri Pekerjaan Umum Perumahan Rakyat Republic Indonesia [Minister of Public Works and Housing of the Republic of Indonesia] (NCICD). (2022). *Kepmen NCICD 112 Tahun* [Ministerial Decree on the NCICD 112 Years], Ministry of Public Works: Jakarta.

Meyer, H. (2005). Plan analysis. In: Jong, T., Van der Voordt, D. (eds), *Ways to study and research: urban, architectural and technical design.* IOS Press, Amsterdam, 125-135.

Milone, P.D. (1987). Indische culture, and its relationship to urban life. *Comparative Studies in Society and History*, 9: 407–426.

Ministry of Public Works (2011) ATLAS Pengamanan Pantai Jakarta [ATLAS Securing Jakarta's Coastal Area]. Jakarta: The Ministry of Public Works, Indonesia.

Ministry of Public Works and Public Housing (2022). Decree of the Minister of Public works and Public Housing Number 112/KPTS/M/2022 Concerning integrated flood control concept and predesign of sea embankment Phase B integrated development of the National Capital coast (PTPIN)/National Capital Integrated Coastal Development (NCICD) on the Coast of Jakarta Bay. Jakarta: Ministry of Public works and Public Housing.

Moehadi, Pratis, T., Mulyono and Priyanto, S. (1989). *Dampak Modernisasi Terhadap Hubungan Kekerabatan Di Daerah Jawa Tengah* [The Impact of Modernisation on Kinship Relations in the Central Java Region], Semarang: Depertemen Pendidikan dan Kebudayaan

Monalisa. (2015). Normalisasi Cilinung dengan beton justru tambah masalah [Ciliwung normalisation with concrete is a new problem]. Antara News. Available at: http://www.antaranews.com/berita/522723/normalisasi-ciliwung-dengan-beton-justru-tambah-masalah (accessed 1 February 2017).

Monkkonen, P. (2008). Using online satellite imagery as a research tool: Mapping changing patterns of urbanization in Mexico. *Journal of Planning education and research*, 28(2), 225-236.
Moudon, A.V. (1997). Urban morphology as an emerging interdisciplinary field. *Urban Morphology*, v. 1, n. 1, p. 3-10, 1997. Available from: https://journal.urbanform.org/index.php/jum/article/view/4047 [Accessed on: 24 June 2022].

Mulyana, W., 2012. *Decent work in Jakarta: an integrated approach*. International Labour Organisation (ILO). Available from: http://oit.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms_174991.pdf [Accessed 13 July 2023].

Munjirin, M. (2024). Redesigning The Organization Of The Jakarta City Government: Adaptation And Innovation Towards A Sustainable City. *Eduvest-Journal of Universal Studies*, 4(3), pp.1021-1032.

Murphy, J. (2009). Environment and imperialism: why colonialism still matters. *Sustainability Research Institute*, 20, 1-27.

NCICD Videos (2015). Rationale behind NCICD: Why, What and How? YouTube. Available from: https://www.youtube.com/watch?v=N9uxswz4nyI&ab_channel=ncicdvideos [Accessed: July 13, 2023].

NEDECO. (1973). Master Plan for Flood Control and Drainage System of Jakarta. Jakarta: NEDECO.

Niessen, N. (1999) Municipal government in Indonesia: policy, law, and practice of decentralization and urban spatial planning. Ph.D. Thesis, Universiteit Leiden, 1999.

NL Agency (2012) Jakarta Coastal Development Strategy, End-of-Project Review Final Mission Report. The Netherlands: NL Agency, Ministry of Infrastructure and the Environment.

North, D.C. (1990) *Institutions, Institutional Change and Economic Performance*, Cambridge: Cambridge University Press.

Nurbaya. (2019). Pengaruh Pendapatan Nelayan Terhadap Peningkatan Ekonomi Di Desa Wewangriu Kecamatan Malili Kabupaten Luwu Timur Sulawesi Selatan [The Influence of Fishermen's Income on Economic Growth in Wewangriu Village, Malili District, East Luwu Regency, South Sulawesi]. *Αγαη*, 8(5), 55.

Nyametso, J.K. (2011). Improvement of squatter settlements: the link between future tenure security, access to housing, and improved living and environmental conditions. (Doctoral dissertation, University of Otago).

Octavianti, T. and Charles, K. (2018). Disaster Capitalism? Examining the Politicisation of Land Subsidence Crisis in Pushing Jakarta's Seawall Megaproject. *Water Alternatives*, 11 (2), 394-420.

Octavianti, T. and Charles, K. (2019a). The evolution of Jakarta's flood policy over the past 400 years: The lock-in of infrastructural solutions. *Politics and Space*, 37 (6), 1102-1125.

Octavianti, T. and Charles, K. (2019b). De- and Re-politicisation of Water Security as Examined Through the Lens of the Hydrosocial Cycle: The Case of Jakarta's Sea Wall Plan. *Water Alternatives*, 12 (3), 1017-1037.

Octavianti, T. and Charles, K. (2020). The increasing pursuit of large infrastructure for a water secure city: Insights from Jakarta's sea wall plan in Indonesia. *Global Water Forum*.

Available from https://globalwaterforum.org/2020/05/06/the-increasing-pursuit-of-largeinfrastructure-for-a-water-secure-city-insights-from-jakartas-sea-wall-plan-in-indonesia/ [Accessed 16 June 2022].

Octifanny, Y. and Norvyani, D.A. (2021). A review of urban kampung development: The perspective of livelihoods and space in two kampung in Pontianak, Indonesia. *Habitat International,* 107 (2021), 1-13.

O'Leary, R.S., 2004. A construct validity comparison of alternative structured interview scoring methodologies. Auburn University.

Oliveira, V. (2016). Urban morphology: an introduction to the study of the physical form of cities. London: Springer.

Oxford Dictionary (2021). Oxford English Dictionary. Available at: https://www.oed.com/?tl=true [Accessed 15 September 2021].

Padawangi, R. (2012). Climate change and the north coast of Jakarta: Environmental justice and the social construction of space in urban poor communities. In *Urban areas and global climate change* (Vol. 12, pp. 321-339). Emerald Group Publishing Limited.

Pemda Jakarta (2012) *Perda No. 1 Year 2012 Rencana Tata Ruang Wilayah 2030* [Regional Regulation No. 1 of 2012 Spatial Planning 2030]. Jakarta, Indonesia. Available at: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://pelayanan.jakarta.go.id/download /regulasi/peraturan-daerah-nomor-1-tahun-2012-tentang-rencana-tata-ruang-wilayah-2030.pdf [Accessed 01December 2021].

Pemda Jakarta (1991). *Jakarta 2005*, 2nd ed. Jakarta: Pemerintah Daerah Khusus Ibukota Jakarta [Government of the Special Capital Region of Jakarta].

Pemerintah Provinsi DKI Jakarta [DKI Provincial Government]. (2012). Rencana Tata Ruang Wilayah Jakarta 2030 [Jakarta Spatial Plan 2030]. Jakarta: DKI Provincial Government.

Perlman, J (1976). The Myth of Marginality. Berkeley: University of California Press.

Peters, B.G., Pierre, J. and King, D.S. (2005). The Politics of Path Dependency: Political Conflict in Historical Institutionalism. *The Journal of Politics*. 67 (4), 1275-1300.

Pierson, P. (2004). Politics in Time: History, Institutions and Social Analysis. Princeton: Princeton University Press.

Pigou, A.C. (2002). *The Economics of Welfare* (1st ed.). London: Routledge. https://doi.org/10.4324/9781351304368

Pratiwo and Nas, P.J.M. (2005). Jakarta: Conflicting directions. In: Nas, P.J.M. (ed), *Directors of Urban Change in Asia*. London; New York: Routledge, pp.68–82.

Presiden Republik Indonesia (2024). *Presiden Republik Indonesia* [President of the Republic of Indonesia]. Available at: https://www.presidenri.go.id/ [Accessed 24 May 2024].

Priatmodjo, D. (2016). Winning Back City's Blue-Green Elements: Cases of Waduk Pluit and Waduk Ria Rio, Jakarta. In: *53rd International Making Cities Liveable Conference*, Vatican City, June 13-17, 2016. Vatican City: Pontifical University, 1-13. Priatmodjo, D. (2019). Interview by David Mathewson. 24 June 2019, Jakarta.

Priatmodjo, D. (2022a). *Chronology of Policies and plans for the North Coast of Jakarta*. Unpublished Research Presentation. Universitas Tarumanagara.

Priatmodjo, D. (2022b). Interview by David Mathewson. 25 August 2022, Jakarta.

Priatmodjo, D. (2023). Interview by David Mathewson. 26 August 2023, Jakarta.

PU (2016) Normalisasi Kali Cilimung Sudah Capai 47 Persen Rampung Akhir 2016 [Ciliwung River Normalisation Has Reached 47 Percent Completion by the End of 2016]. Available at: http://pu.go.id/main/view_pdf/10820 (accessed 1 February 2017).

Putri P. W. and Rahmanti A. S. (2010) Jakarta waterscape: From structuring water to 21st century hybrid in Nature? *Nakhara*, 6: 59–74.

Raharjo, W. (2010). Speculative Settlements: Built Form/Tenure Ambiguity in Kampung Development. Melbourne: University of Melbourne.

Rahmawati, Y.D. (2015) Self-Organisation, Urban Transformation, and Spatial Planning in Greater Jakarta, Indonesia. *Journal Perencanaan Wilayah dan Kota* [Journal of Regional and City Planning] 26(30), 147-165.

Ranis, G. and Stewart, F., 1994. Decentralisation in Indonesia. *Bulletin of Indonesian Economic Studies*, 30 (3), 41-72.

Respondent 1. (2023). Workshop 1. Interview by David Mathewson, 19 June, 2023, Jakarta.

Respondent 2. (2023). Workshop 2. Interview by David Mathewson, 19 June, 2023, Jakarta.

Respondent 3. (2023). Workshop 3. Interview by David Mathewson, 20 June, 2023, Jakarta.

Respondent 4. (2023). *Workshop 4*. Interview with David Mathewson, 20 June, 2023, Jakarta (via Teams).

Respondent 5. (2023). *Workshop 5*. Interview with David Mathewson, 22 June, 2023, Jakarta (via Teams).

Respondent 6. (2023). Workshop 6. Interview by David Mathewson. 22 June 2023, Jakarta.

Respondent 7. (2023). *Workshop 7*. Interview by David Wallace Mathewson, 25 June, Jakarta.

Rudi, A. (2015) 'Ketika Daerah Resapan Air Dijadikan Perumahan Elite...'. ['When Water Catchment Areas are Turned into Elite Housing']. Kompas, 12 February. Available at: http://megapolitan.kompas.com/read/2015/02/12/08521131/Ketika.Daerah.Resapan. Air.Dijadikan.Perumahan.Elite [Accessed 23 June 2022].

Rujak Centre for Urban Studies (Rujak). (2018a). *Kampung Akuarium*, Jakarta: Rujak Centre for Urban Studies.

Rujak Centre for Urban Studies (Rujak). (2018b). Kampung Akuarium: Kacamatan Penjaringan, Kelurahan Penjaringan, Jakarta Utara [Kampung Akuarium: Penjaringan district, Penjaringan Ward, North Jakarta], Jakarta: Rujak Centre for Urban Studies. Rujak Centre for Urban Studies (Rujak). (2018c). Kampung Akuarium, Kampung Nelayan and Kampung Bonpis, Jakarta: Rujak Centre for Urban Studies.

Rujak Centre for Urban Studies (Rujak). (2018d). PRE-CAP Kampung Gedung Pompa, Muara Baru: Kelurahan Penjaringan RT20/RW17 [Pre-Cap Kampung Gedung Pompa, Muara Angke, Penjaringan Subdistrict RT20/RW17], Jakarta: Rujak Centre for Urban Studies.

Rustiadi, E., D.O. Pribadi, A.E. Pravitasari, G.S. Indraprahasta, and L.S. Iman (2015) Jabodetabek Megacity: From City Development Toward Urban Complex Management System. In Singh, R. (Eds.) *Urban Development Challenges, Risk and Resilience in Asian Mega Cities.* Tokyo: Springer.

Sadikin, A. and Hadimadja, R.K., 2012. *Ali Sadikin, membenahi Jakarta menjadi kota yang manusiawi* [Ali Sadikin, fixing Jakarta into a humane city]. Istanbul: Ufuk Publishing House.

Salim, W. and T. Firman (2011). Governing the Jakarta City-Region: History, Challenges, Risks and Strategies. In Hamnett, S. and D. Forbes (Eds.). *Planning Asian Cities: Risks and Resilience*. Abingdon: Routledge.

Salim, W. and B. Kombaitan (2009). Jakarta. City 13(1), 120-128.

Sanders, P. and D. Baker (2016). Applying Urban Morphology Theory to Design Practice. *Journal of Urban Design*, 21(2), 213-233. Accessed from https://doi.org/10.1080/13574809.2015.1133228 on 27 December 2017.

Schwartz, H. (2004). Down the Wrong Path: Path Dependence, Increasing Returns and Historical Institutionalism. Unpublished Manuscript, University of Virginia.

Sedlar, F. (2016). Inundated infrastructure: Jakarta's failing hydraulic infrastructure. *Michigan Journal of Sustainability*, 4: 33–45.

Sethuraman, S.V. (1976). Jakarta: Urban Development and Employment. Geneva: International Labour Office.

Sherwell, P. (2016). \$40bn to save Jakarta: the story of the Great Garuda. *The Guardian*, 22 November. Available from: https://www.theguardian.com/cities/2016/nov/22/jakarta-great-garuda-seawall-sinking [Accessed 28 October 2024].

Shorten, A. and Smith, J., 2017. Mixed methods research: expanding the evidence base. *Evidence-based nursing*, *20*(3), pp.74-75.

Silver, C., J. Iwan, A. Schroeder, and L. Schroeder (2001) Intergovernmental Transfers and Decentralisation in Indonesia. *Bulletin of Indonesian Economic Studies* 37(3), 345-362.

Silver, C., (2008) Planning the Megacity: Jakarta in The Twentieth Century. London, Routledge.

Simone, A., 2016. Sociability and endurance in Jakarta. Deleuze and the City, pp.224-240.

Siregar, R. (2005) Government Regulation Concerning Drinking Water Supports Privatisation. *Koran Tempo*, July 15, 2005.

Skidmore, Owings and Merrill (SOM), (2013). *Green Bay Pluit City*. London: Skidmore, Owings and Merrill.

Skopkol, T. (1992). Protecting Soldiers and Mothers: The Political Origins of Social Policy in the United States. Cambridge: Cambridge University Press.

Skopkol, T., 1979a. States and social revolutions: A comparative analysis of France, Russia and China. Cambridge University Press.

Skopkol, T., 1979b. State and revolution: Old regimes and revolutionary crises in France, Russia, and China. *Theory and Society*, 7, pp.7-95.

Smailes, A. (1955). Some reflections on the geographical description of townscapes. *Inst Br Geogr Trans Pap*, 21, 99-115.

Sorensen, A. (2015). Taking path dependence seriously: an historical institutionalist research agenda in planning history. *Planning Perspectives*, 30 (1), 17-38. Available from http://dx.doi.org/10.1080/02665433.2013874299 [Accessed 27 April 2017].

Steinberg, F., (2008) Revitalisation of Historic Inner-City Areas in Asia: Potential for Urban Renewal in Ha Noi, Jakarta and Manila. Mandaluyong City: Asian Development Bank.

Steinberg, F. (2007a). Jakarta: environmental problems and sustainability. *Habitat International*, 31 (3-4), 34-365.

Steinberg, F. (2007b). Housing reconstruction and rehabilitation in Aceh and Nias, Indonesia—Rebuilding lives. *Habitat international*, 31 (1), 150-166.

Steinmo, S., (2008) Historical Institutionalism. In: Della Porta, D. and Keating, M. (Eds.) Approaches and Methodologies in the Social Sciences. Cambridge: Cambridge University Press. Streeck, W., and Thelen, K. (2005). Introduction: Institutional Change in Advanced Political Economies. In *Beyond Continuity: Institutional Change in Advanced Political Economies*, edited by Streeck, W. and Thelen, K., 1–39. Oxford: Oxford University Press.

Suddaby, R., Foster, W.M. and Mills, A.J. (2014). Historical Institutionalism. Organisations in time: History, theory, methods, 100, p123.

Suk-Jae, S., Han San, P., Won-Tae, S., Chungkyun, J., Hadi, S., Latie, H., Sofian, I. and Fitriyanto. (2012). Study on Establishment of Integrated Coastal Management Programme in Jakarta Bay Area, Indonesia: A Precise 3-D Coastal Topographic Mapping of a Vulnerable Area in Jakarta Bay, *Seongnam: Korea International Cooperation Agency*, 4 (xi), 112-113. Available from: https://lib.koica.go.kr/search/detail/CATKCA000000037367 [Accessed 30 July, 2024].

Suprayogi, H., Rudyanto, A., Bachtiar, H. and Limantara, L.M. (2018). Critical-phase sea dike construction of NCICD program in Jakarta as national capital city, *IOP Conference Series: Earth and Environmental Science*, 162 (1), 012020. DOI: 10.1088/1755-1315/162/1/012020

Supriatna, A. and Van der Molen, P. (2014). Land Readjustment for Upgrading Indonesian Kampung: A Proposal. *Southeast Asia Research*, 22 (3), 379-397.

Suryowati. E. (2022). Pembangunan IKN Nusantara Tahap 1 Dimulai, Nilainya Rp 5,3 Triliun [Development of IKN Nusantara Phase 1 Begins, Value IDR 5.3 Trillion]. *JawaPos.com* [JavaPost.com], 30 August. Available from: https://www.jawapos.com/ibukota-baru/01404873/pembangunan-ikn-nusantara-tahap-1-dimulai-nilainya-rp-53-triliun [Accessed 29 December 2023].

Sutrisno, B. (2019). Kampung Akuarium residents see brighter future in redevelopment plans. *The Jakarta Post*, 5 October. Available from

https://www.thejakartapost.com/news/2019/10/04/kampung-akuarium-residents-seebrighter-future-in-redevelopment-plans.html [Accessed 29 January 2021.

Sutanudjaja, E. (2018) Introduction to North Jakarta. In: Joint Urban Design Workshop, University of Westminster, Universitas Tarumanagara & Rujak Centre for Urban Studies. Jakarta, Indonesia 14-29 April, 2018.

Sutanudjaja, E. (2022). Interview by David Mathewson. 30 August, Bali.

Sutherland, H. (1979). *The Making of a Bureaucratic Elite: The Colonial Transformation of the Javanese Priyayi*. Singapore: Published for the Asian Studies Association of Australia by Heinemann Educational Books (Asia).

Suwarno, PJ. 1995. Dari Azazyookai dan Tonarigumi ke Rukun Kampung and Rukun Tetangga di Yogyakarta (1942-1989) [From Azazyookai and Tonarigumi to Rukun Kampung and Rukun Tetangga in Yogyakarta (1942-1989)]. Yogyakarta: Penerbitan Universitas Sanata Dharma.

Suwondo, K. (2002). *Decentralization in Indonesia*. International Non-Government Organization Forum on Indonesian Development (INFID).

Taubenböck, H., Esch, T. and Roth, A. (2006). An urban classification approach based on an object-oriented analysis of high resolution satellite imagery for a spatial structuring within urban areas. *Proceedings on CD-ROM*.

Tambunan, R. (1996) Master plan 65-85 [Master plan 1965-1985]. Media Jaya 19(4): 48-57.

Texier, P. (2008). Floods in Jakarta: when the extreme reveals daily structural constraints and mismanagement. *Disaster Prevention and Management*, 17 (3), 358-372.

Thelen, K., 2000. Timing and temporality in the analysis of institutional evolution and change. *Studies in American political development*, 14(1), pp.101-108.

Thelen, K. (1999). Historical Institutionalism in Comparative Politics. *Annual Review of Political Science*, 2, 369-404. Available from http://www.annualreviews.org [Accessed 10 December 2016].

Thelen, K. and Conran, J. (2016). Institutional change. In: Fioretos, O., Falleti, T. G. and Sheingate, A. (eds), *The Oxford Handbook of Historical Institutionalism*. Available from: https://doi.org/10.1093/oxfordhb/9780199662814.013.3 [Accessed 30 June 2022].

Tilley, L., Elias, J. and Rethel, L. (2017). Undoing ruination in Jakarta: the gendered remaking of life on a wasted landscape. *International Feminist Journal of Politics*, 14 (4), 522-529.

Tyas, H.H. (2016). Proyek pembangunan NCICD Indonesia-Belanda [NCICD Construction Project Indonesia-the Netherlands]. *Semarak News*, 24.

UN-HABITAT (2006). The State of the World's Cities. London: Earthscan.

United Nations Department of Economic and Social Affairs (2023). Implementation of Nature-Based Solutions for Climate-Resilient and Flood Risk Management in Pakistan. Available from: https://sdgs.un.org/partnerships/implementation-nature-based-solutionsclimate-resilient-and-flood-risk-

management#:~:text=Cost%2Deffective%3A%20NBS%20can%20be,biodiversity%20con servation%2C%20and%20livelihood%20improvement. [Accessed 20 December 2023].

United Nations Environment Programme (2007). *Cities and Vulnerability in the context of Urban Environmental Management: A Concept Paper*. Geneva: United Nations Office for Disaster Risk Reduction. Available from: https://www.unisdr.org [Accessed 30 January 2021].

Urban Morphology Research Group (1990). Glossary. Available from: http://www.urbanform.org/ [Accessed 3 November 2019.

Van Buuren, A., Ellen, G.J. and Warner, J.F. (2016). Path-dependency and policy learning in the Dutch delta: Toward more resilient flood risk management in the Netherlands? *Ecology and Society*, 21(4): 43.

Van den Hoven, K., Kroeze, C. and van Loon-Steensma, J.M. (2022). Characteristics of realigned dikes in Coastal Europe: Overview and opportunities for nature-based flood protection. *Ocean and Coastal Management*, 222 (2022), 106-116.

Van der Brug, P.H. (1997). Malaria in Batavia in the 18th century. Tropical Medicine and International Health 2(9): 892–902.

Van der Heiden, C.N. (1990) Town planning in the Dutch Indies. *Planning Perspectives* 5 (1): 63–84.

Van der Nat, A., Vellinga, P. Leemas, R. and van Slobbe, E. (2016). Ranking coastal flood protection designs from engineered to nature-based. *Ecological Engineering*, 87 (2016), 80-90.

Van Marrewijk, A., (2013). Organising Mega-projects: Understanding their cultural practices. In: *Mega-projects: Theory meets practice*. [online] London. 12-13 September 2013. Manchester: Manchester Business School. Available from: < *https://research.mbs.ac.uk/infrastructure/Newsevents/Megaprojectsschedule.aspx* > [Accessed 10] [anuary 2015]

Van Voorst, R. (2016) Formal and informal flood governance in Jakarta, Indonesia. *Habitat International*, 52: 5–10.

Vlekke, B.H.M. (1943) Nusantara: A History of the East Indian Archipelago. Cambridge, MA: Harvard University Press.

Vuik, V., Jonkman, S.N., Borsje, B.W. and Suzuki, T. (2016). Nature-based flood protection: The efficiency of vegetated foreshores for reducing wave loads on coastal dikes. *Coastal Engineering*, 116 (2016), 42-56.

Ward, P.J., Marfai, M.A., Yulianto, F., Hizbaron, D.R. and Aerts, J.C.J.H. (2011). Coastal inundation and damage exposure estimation: a case study for Jakarta. *Natural Hazards*, 56, 899-916.

Werners, S.E., Matczak, P. and Flachner, Z. (2010) Individuals matter: Exploring strategies of individuals to change the water policy for the Tisza River in Hungary. *Ecology and Society* 15 (2): 24.

Whitehand, J. W. R., (2001a). British urban morphology: the Conzenian tradition. Urban Morphology, 5 (2), 103-109.

Whitehand, J. W. R., (2001b). Building Interpretation and ISUF. In: Cannigia, G. and Maffei, G. L., (2001). *Architectural Composition and Building Typology: Interpreting Basic Building*. Florence: Alinea, 13-16.

Whitehand, J.W.R. (2007) Conzenian Urban Morphology and Urban Landscapes. Paper presented at the *Proceedings, 6th International Space Syntax Symposium, Istanbul*, Istanbul Technical University, 12-15 June 2007.

Whitehand, J.W.R., Conzen, M.P. and Gu, K. (2016). Plan analysis of historical cities: a Sino-European comparison. *Urban Morphology*, 20 (2), 139-158.

Wijaya, C.A. (2018a). Anies attends second anniversary of Kampung Akuarium eviction. *The Jakarta Post*, 14 April. Available from: https://www.thejakartapost.com/news/2018/04/14/anies-attends-second-anniversary-ofkampung-akuarium-eviction.html [Accessed 29 July 2019].

Wijaya, C.A. (2018b). Akuarium residents hopeful for better housing. *The Jakarta Post*, 16 April. Available from: https://www.thejakartapost.com/news/2018/04/16/akuarium-residents-hopeful-better-housing.html [Accessed 30 July 2019].

Williams, K. (2014). Urban form and infrastructure: a morphological review – Future of cities: working paper. Government Office for Science. Available from: https://assets.publishing.service.gov.uk/media/5a7e0dd4ed915d74e33efc1f/14-808-urban-form-and-infrastructure-1.pdf [Accessed 21 January 2024].

Winarso, H. and Firman, T. (2002). Residential land development in Jabotabek, Indonesia: triggering economic crisis?. *Habitat International*, 26 (4), 487-506.

Winayanti, L. and Lang, H.C. (2004). Provision of urban services in an informal settlement: a case study of Kampung Penas Tanggul, Jakarta. *Habitat international*, 28(1), 41-65.

Wisconsin Department of Natural Resources (Wisconsin) (2023). Flood Prevention: Steps that can save your life and property. Available from: https://dnr.wisconsin.gov/emergency/flood.html [accessed 20 December 2023].

Wittek, R. (2007). Governance from a sociological perspective. In Jansen, D. (ed.) *New forms of governance in research organizations. Disciplinary approaches, interfaces, and integration*, 73–99. Dordrecht: Springer.

The World Bank (2010). Jakarta - Urban Challenges in a changing Climate: Mayors' Task Force on climate Change, Disaster Risk & The Urban Poor. The World Bank. Available at: chromeextension://efaidnbmnnnibpcajpcglclefindmkaj/https://documents1.worldbank.org/curat ed/ar/132781468039870805/pdf/650180WP0Box360ange0Jakarta0English.pdf [Accessed on June 23 2022].

World Population Review, (2014). *Indonesia Population 2014*. World Population Review. Available from: http://worldpopulationreview.com/countries/indonesia-population/ [Accessed 10 January 2015].

WPS Channel (2023). SEGERA DIBANGUN!! Giant Sea Wall di Utara Jakarta [Immediately Built!! Sea Wall in North Jakarta]. *YouTube*. Available from: https://www.youtube.com/watch?v=Rk7eCf6yBII&ab_channel=WPSChannel [Accessed: July 13, 2023].

Yang, X. and Liu, Z. (2005a). Use of satellite-derived landscape imperviousness index to characterize urban spatial growth. *Computers, Environment and Urban Systems*, 29 (5), 524-540.

Yang, X. and Liu, Z. (2005b). Using satellite imagery and GIS for land-use and land-cover change mapping in an estuarine watershed. *International Journal of Remote Sensing*, 26(23), 5275-5296.

Yuliastuti, N., Syahbana, J.A. and Soetomo, S., 2015. The role of community institutions "Rukun Tetangga" in social housing, Indonesia. *International Journal of Humanities and Social Science*, 5 (10), 44-52.

Zhu, K., Kraemer, K.L., Gurbaxani, V. and Xu, S.X. (2006). Migration to open-standard Interorganisational Systems: Network Effects, Switching Costs and Path Dependency. *MIS Quarterly*, 30, 515-539. Cover, chapter headings, Appendix A heading and end cover. Source: Author (2012-2024)

Appendix B heading. Source: Google Earth (2024).

2.1 Batavia, 1681. Source: British Museum (2017).

2.2 Batavia and surroundings, 17th or 18th century. Source: Eduwe van Jacob van Meurs (2018).

2.3 Batavia, 18th century. Source: Vrije Universiteit (2018).

2.4 Batavia, 18th century. Source: British Museum (2017).

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3.1 Kampung Penas Tanngul satellite imagery and OpenStreetMap-based diagrams

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3.3 Waduk Pluit satellite imagery and OpenStreetMap-based diagrams. Satellite image source: Google Earth (2021). Diagrams source: Open Street Map (2021) for the base and otherwise by the author.

3.4 Waduk Ria Rio satellite imagery and Open Street Map-based diagrams. Satellite image source: Google Earth (2021). Diagrams source: Open Street Map (2021) for the base and otherwise by the author.

3.5 Kampung Akuarium satellite imagery and Open Street Map-based diagrams. Satellite image source: Google Earth (2021). Diagrams source: Open Street Map (2021) for the base and otherwise by the author.

3.6 Kampung Kolongol, Tongol and Lodan satellite imagery and Open Street Mapbased diagrams. Satellite image source: Google Earth (2024). Diagrams source: Open Street Map (2021) for the base and otherwise by the author.

3.7 Kampung Kerapu satellite imagery and Open Street Map-based diagrams. Satellite image source: Google Earth (2021). Diagrams source: Open Street Map (2024) for the base and otherwise by the author.

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4.7-4.15 Photographs of the existing artificial islands in 2019. Source: the author and Priatmodjo, 2022b).

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4.25 & 4.26 The revised NCICD Master Plan as of 2022. Source: NCICD (2022).

4.27 Seawall construction in Pantai Mutiara, July 2017. Source: Suprayogi et al., 2018).

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4.32 Satellite and GIS-based diagram analysis of Jakarta's northern coastline,Western Section. Satellite image source: Google Earth (2023). Diagrams source: OpenStreet Map (2023) for the base and otherwise by the author.

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4.44 & 4.45 Areal views of the new sea dike at Kali Baru, May 2017. Source: Suprayogi et al. (2018).

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4.50 Satellite and GIS-based diagrams analysis of Muara Angke. Satellite image source: Google Earth (2023). Diagrams source: Open Street Map (2023) for the base and otherwise by the author.

4.51 Satellite and GIS-based diagrams analysis of Kamal Muara. Satellite image source: Google Earth (2023). Diagrams source: Open Street Map (2023) for the base and otherwise by the author.

4.52 Satellite and GIS-based diagram analysis of Kali Blencong. Satellite image source: Google Earth (2023). Diagrams source: Open Street Map (2023) for the base and otherwise by the author.

4.53-4.67 Photographs of the seawall, pumping station, polder and kampung at Gedung Pompa in North Pluit, June 2019. Satellite image source: Google Earth (2023).Diagrams source: Open Street Map (2023) for the base and otherwise by the author.

4.68 Panoramic photograph of the new seawall and polder at Gedung Pompa,North Pluit, June 2019. Satellite image source: Google Earth (2023). Diagrams source:Open Street Map (2023) for the base and otherwise by the author.

4.69 Satellite and GIS-based diagram analysis of Kampung Gedung Pompa. Satellite image source: Google Earth (2023). Diagrams source: Open Street Map (2024) for the base and otherwise by the author.

Bibliography

Abeyasekere, S. (1989). *Jakarta: A History*, Revised Edition. Singapore: Oxford University Press.

Abidin, H.Z., Andreas, H., Gumilar, I., et al. (2011). Land subsidence of Jakarta (Indonesia) and its relation with urban development. *Natural Hazards*, 59(3): 1753–1771.

Adas, M. (1989). Machines as the Measure of Men: Science, Technology and Ideologies of Western Dominance. Ithaca, NY: Cornell University Press.

AFA99 Channel (2023). Wow Super Panjang, Besar dan Tahan Lama Tanggul Laut NCICD di Kalibaru Celencing Jakarta Utara [Wow Super Long, Big and Durable NCICD Sea Wall in Kalibaru, Celincing, North Jakarta]. *YouTube*. Available from: https://www.youtube.com/watch?v=znyj72n2GQo&t=431s&ab_channel=AFA99Channe 1 [Accessed July 13, 2023].

Ahram, A.I., 2011. The theory and method of comparative area studies. *Qualitative Research*, *11*(1), pp.69-90.

Agustina, W. (2014). Jokowi Rembuk Banjir di Katulampa, Ini Hasilnya [Jokowi discusses the floods in Katulampa, these are the results]. Tempo, 20 January. Available at: https://metro.tempo.co/read/546656/jokowi-rembuk-banjir-di-katulampa-ini-hasilnya [Accessed 13 July, 2023].

Ahram, A.I. (2011). Concepts and Measurement in Multimethod Research. *Political Research quarterly*, 66 (2), 280-291. DOI: 10.1177/1065912911427453

Akmalah, E. and Grigg, N.S. (2011). Jakarta flooding: systems study of socio-technical forces. *Water International*, 36 (6), 733-747. DOI: 10.1080/02508060.2011.610729

American University (2023). Fact Sheet: Nature-Based Solutions to Climate Change. Available at: https://www.american.edu/sis/centers/carbon-removal/fact-sheet-nature-based-solutions-to-climate-

change.cfm#:~:text=Protecting%20biodiversity%3A%20because%20they%20conserve,cli mate%20change%20and%20habitat%20loss. [Accessed 20 December 2023].

Andapita, V. (2019). In Jakarta, kampung coexist with skyscrapers. *The Jakarta Post*, 19 March. Available from https://www.thejakartapost.com/news/2019/03/19/injakartakampung-coexist-with-skyscrapers.html [Accessed 29 January 2021].

Anguelovski, L. Irazábal-Zurita, C. and Connolly, J.J. (2019). Grabbed urban landscapes: Socio-spatial tensions in green infrastructure planning in Medellín. *International Journal of Urban and Regional Research*, 43 (1), 133-156.

Anita, J., (2013a), November. Structural and non-structural approaches as flood protection strategy in Muara Angke settlement, North Jakarta. In *Proc., 2nd Int. Conf. on Sustainable Infrastructure and Built Environment (SIBE)* (pp. 1-9).

Anita, J. and Latief, H. (2013b), October. Coastal Flooding Adaptation by Housing Adjustment in Coastal Settlements Case Studies: Muara Angke, North Jakarta and Tambak Lorok, Semarang. In *The Second Planocosmo Conference* (Vol. 3, pp. 339-354).

ArchDaily (2023). *ArchDaily: The world's most visited architecture platform*. Available at: https://www.archdaily.com/?ad_name=small-logo [Accessed August 15 2023].

Argo, T.A. (1999). *Thirsty Downstream: The Provision of Clean Water in Jakarta, Indonesia.* Doctoral Thesis, University of British Columbia.

Arifin, Z. (2004). Local Millennium Ecosystem Management: Condition and Trend of the Greater Jakarta Bay Ecosystem. Report. Research Centre for Oceanography – LIPI: Jakarta.

Arliana, R. (2018). *Mitigating value conflicts in large infrastructure projects in Indonesia: The case of the National Capital Integrated Coastal Development (NCICD) Plan.* Masters Thesis. Delft University of Technology.

Assegaff, S.B. (2021). The journey of Kampung Akuarium. *The Straits Times*, 17 September. Available from: <u>https://www.nst.com.my/opinion/columnists/2021/09/728227/journey-kampung-akuarium[Accessed 1 February 2022]</u>.

Astuti, N.A.R. (2019). Surat Jokowi soal Ibu Kota Dibacakan di Paripurna DPR [Jokowi's letter regarding the new capital city was read at the DPR Plenary. *detikNews*, 27 August. Available from: https://news.detik.com/berita/d-4682438/surat-jokowi-soal-ibu-kota-baru-dibacakan-di-paripurna-dpr [Accessed 29 December 2023].

Badan Pusat Statistik (2016). Statistik Indonesia 2016. *Badan Pusat Statistik*. Available from: <u>https://bps.go.id</u> [Accessed 16 August 2021].

Baker, J. L., (2012). *Climate Change, disaster Risk and the Urban Poor: Cities Building Resilience for a Changing World* [online] Washington: World Bank. Available from: www.worldbank.org [Accessed 29 December 2014].

Bappeda (2022). Interviewed by David Mathewson. 29 August 2022, Bali (via MS Teams).

Bappeda (2023). Interviewed by David Mathewson. 20 June 2023, Jakarta.

Bappenas (2019). Interviewed by David Mathewson. 17 June 2019, Jakarta.

Batubara, B., Kooy, M. and Zwarteveen, M. (2018). Uneven Urbanisation: Connecting Flows of Water to Flows of Labour and Capital Through Jakarta's Flood Infrastructure. Antipode, 50 (5), 1186-1205.

Beinart, W. and Hughes, L. (2007) *Environment and Empire*. Oxford: Oxford University Press.

Betteridge, B. and Webber, S. (2019). Everyday resilience, reworking, and resistance in North Jakarta's kampung. *ENE: Nature and Space*, 2 (4), 944-966.

Birkhamshaw, A.J., J.W.R. Whitehand (2012). Conzenian urban morphology and the character areas of planners and residents. *Urban Design International*, 17(1), 4-17.

Blussé, L. (1986) Strange Company: Chinese Settlers, Mestizo Women and the Dutch in VOC Batavia. Dordrecht; Riverton, NJ: Foris Publications.

Breckwoldt, A., Dsikowitky, L., Baum, G., Ferse, S.C.A., Van der Wulp, S., Kusumanti, I., Ramadhan, A. and Adiranto, L. (2016). A review of stressors, uses and management perspectives for the larger Jakarta Bay Area, Indonesia. Marine Pollution Bulletin. Available from: http://dx.doi.org/10.1016/j.marpolbul.2016.08.040 [Accessed 15 August 2023].

Britannica (2024). Polder: Land reclamation. *Britannica*. Available from: https://www.britannica.com/science/polder [Accessed 21 January 2024].

Brookings Institute, (2012). *Global Metro Monitor 2011: Volatility, Growth and Recovery* [online] Washington: Brookings Institute. Available from:

http://www.brookings.edu/~/media/research/files/reports/2012/1/18%20global%20me tro%20monitor/0118_global_metro_monitor.pdf [Accessed 9 January 2014].

Broschek, J. (2013). Between path dependence and gradual change: Historical institutionalism and the study of federal dynamics. In: Benz, A. and Broschek, J.(eds.) *Federal Dynamics: Continuity, Change and the Varieties of Federalism.* Oxford: Oxford University Press, 93-116.

Brown, R.A. (2006). Indonesian Corporations, Cronyism and Corruption. *Modern Asian Studies*, 40 (4), 953-992.

Buckley, R.B. (1893). *Irrigation Works in India and Egypt*. London; New York: Spon & Chamberlain.

Bunte, M. and Ufen, A. (eds) (2009). *Democratization in Post-Subarto Indonesia*. London; New York: Routledge.

Busquets, J. (2005). Barcelona: the urban evolution of a compact city. Rovereto, Italy: Nicolodi.

Busquets, J. and Pérez-Ramos, P. (2017). *Barcelona: Manifold Grids and the Cerdà Plan*. Cambridge, Massachusetts: Applied Research and Design Publishing.

Caljouw, M., P.J.M. Nas, and Pratiwo (2005) Flooding in Jakarta: Towards a blue city with improved water management. *Bijdragen tot de Taal-, Land- en Volkenkunde* [Contributions to Language, Land and Ethnology], 161-4, 454-484.

Campbell, J. (1997). Mechanisms of evolutionary change in economic governance: Interaction, interpretation and bricolage. In: Magnusson L and Ottosson J (eds) *Evolutionary Economics and Path Dependence*. Cheltenham: Elgar, pp.10–32.

Caniggia, G. and Maffei, G. L. (2001). *Architectural Composition and Building Typology: Interpreting Basic Building*. Florence: Alinea.

Capoccia, G. (2016). Critical junctures. In: Fioretos, O., Falleti, T.G. and Sheingate, A. (eds), *The Oxford Handbook of Historical Institutionalism*. Oxford: Oxford University Press, pp.89–112.

Capoccia, G. and Kelemen, R.D. (2007). The study of critical junctures: Theory, narrative and counterfactuals in historical institutionalism. *World Politics* 59 (3), 341–369.

Carroll, T. (2009). Social development as neoliberal Trojan horse: The World Bank and the Kecamatan development program in Indonesia. *Development and Change*, 40 (3), 447-466.

Causevic, A., LoCastro, M., David, D., Selvakkumaran, S. and Gren, A. (2021). Financing resilience efforts to confront future urban and sea-level rise flooding: Are coastal megacities in Association of Southeast Asian Nations doing enough? *Urban Analytics and City Science*, 48 (5), 989-1010.

Chandramidi, A.N. (2013) Urban Flood Resilience in Jakarta: an Historic Analysis of Institutions. Unpublished Masters Thesis. University of Groningen.

Climate Hub Indonesia (2023). Interview by David Mathewson, June 20, Jakarta.

Coelho, K. (2016). Tenements, Ghettos, or Neighbourhoods? Outcomes of Slum-Clearance Interventions in Chennai. Review of Development & Change, 21 (1), 111-136.

Colven, E. (2017). Understanding the Allure of Big Infrastructure: Jakarta's Great Garuda Sea Wall Project. *Water Alternatives,* 10 (2), 250-264.

Colven, E. and Irawaty, D.T. (2019). Critical spatial Practice and Urban Poor Politics: (Re)Imagining Housing in a Flood-Prone Jakarta. *Society and Space*. Available from https://www.societyandspace.org/articles/critical-spatial-practice-and-urban-poor-politicsre-imagining-housing-in-a-flood-prone-jakarta [Accessed 10 June 2021].

Conzen, M.R.G. (2004). *Thinking about urban form: papers on urban morphology, 1932-1998*. Oxford: Peter Lang.

Coordinating Ministry for Economic Affairs (2014). *Master Plan: National Capital Integrated Coastal Development*. Jakarta: The Coordinating Ministry of Economic Affairs of the Republic of Indonesia.

Costa, D., Gurusamy, S., Burlando, P. and Liong, S. (2014). Modelling the impact of urban floods in heavily polluted rivers: The case of Kampung Melayu in Jakarta. In: 3rd LAHR *Europe Congress Book of Proceedings*, 2014, Porto, Portugal.

Cowan, R. (2005). The Dictionary of Urbanism. London: Streetwise Press.

Cowherd, R. (2005) Does Planning Culture Matter? Dutch and American Models in Indonesian urban transformations. In B. Sanyal, (Ed.). *Comparative Planning Cultures*. London: Routledge.

Crouch, H. (1980). The trends to authoritarianism: The post-1945 period. In: Aveling, H. (ed), *The Development of Indonesia's Society: From the Coming of Islam to the Present Day*. New York: St Martin's Press, pp.166–120.

Crowhurst, Lennard, S.H. and Lennard, H.L. (1995). Livable Cities Observed: A Source Book of Images and Ideas for City Officials, Community Leaders, Architects, Planners and All Others Concerned. Carmel, CA: Gondolier Press.

Cuadra, L.K. (2015). *This Grieveable Life: Precarity, Land Tenancy and Flooding in the* Kampung *of Jakarta*. Unpublished Masters Thesis. University of Washington.

Cybriwsky, R. and L.R. Ford (2001) City profile: Jakarta. Cities 18(3), 199-210.

C40 Cities (2019). *C40 Cities*. Available from: https://www.c40.org [Accessed: 15 July 2019].

Dahiya, B. (2012). Cities in Asia 2012: Demographics, Economics, Poverty, Environment and Governance. *Cities* 29, S44-S61. Accessed from: https://doi.org/10.1016/j.cities.2012.06.013 on 30 December 2014.

Darwis, I., Gregorius, J., Hill, C., Nelwan, M., Sequeira Sousa, I. and Tekbali, F. (2018). *Kampung Akuarium*. Jakarta: University of Westminster & Universitas Tarumanagara.

De Albuquerque Reis, A., Huynh Nguyen, M., Jeremy, Rivan, Alcorn, T. (2018). *Kampung Gedung Pompa* [Unpublished masters project]. London: University of Westminster.

De Haan, F. (1935). Oud Batavia [Old Batavia]. Bandung: A. C. Nix.

De Sherbinin, A., Schiller, A. and Pulsipher, A. (2007). The vulnerability of global cities to climate hazards. *Environment & Urbanisation*. 19 (1), 34-64.

Delinom, R.M. (2008). Groundwater management issues in the Greater Jakarta area, Indonesia. In: *Proceedings of International Workshop on Integrated Watershed Management for Sustainable Water Use in a Humid Tropical Region, JSPS-DGHE Joint Research Project*, University of Tsukuba, October 2007. Available from: file:///Users/davidmathewson/Downloads/BTERC_8sv2_40.pdf [Accessed 28 February 2018].

Di Balik Banjir Jakarta. Tempo, 12-18 February 2007.

Diaz, Orueta, F., and Fainstain, S.S., (2009). The New Mega-Projects: Genesis and Impacts. *International Journal of Urban and Regional Research*. 32 (4), 759-767. Available from: http://cuimpb.cat/politiquesurbanes/docs/Num_31_ijur_829.pdf [Accessed 30 December 2014].

Dirdjosisworo, S., 1978. Legal Aspects Regarding Urban Planning in Indonesia.

Djalante, R. (2013). Identifying Drivers, Barriers, and Opportunities for Integrating Disaster Risk Reduction and Climate Change Adaptation in Indonesia: An Analysis Based on the Earth System Governance Framework. In: Leal Filho, W. (ed.) *Climate Change and Disaster Risk Management*. Berlin: Springer-Verlag.

Dinas Sumber Daya Air Provinsi DKI Jakarta [DKI Jakarta Provincial Water resources Service] (2020). Pantai Muara Angke [Muara Angke Waterfront]. *YouTube*. Available from: https://www.youtube.com/watch?v=KE_Gv887C1U&ab_channel=DinasSumberDayaAir ProvinsiDKIJakarta [Accessed: July 13, 2023].

Dinas Sumber Daya Air Provinsi DKI Jakarta [DKI Jakarta Provincial Water resources Service] (2022a). Tanggul Belum Terbangun: 4.997 m – Kterangan: Tahun 2022-2028 [Unbuilt Embankment: 4,997m – Information: Years 2022-2028]. *YouTube*. Available from: https://www.youtube.com/watch?v=a2eUYUh2FYg&t=14s&ab_channel=DinasSumber DayaAirProvinsiDKIJakarta [Accessed: July 13, 2023].

Dinas Sumber Daya Air Provinsi DKI Jakarta [DKI Jakarta Provincial Water resources Service] (2022b). Update 100% 942 Project Maret 2023 [Update 100% 942 Project March 2023]. *YouTube*. Available from:

https://www.youtube.com/watch?v=QgaFb6C_b74&ab_channel=DinasSumberDayaAirP rovinsiDKIJakarta [Accessed 13 July, 2023].

Doshi, S. (2013). The politics of the evicted: Redevelopment, subjectivity, and difference in Mumbai's slum frontier. *Antipode* 45 (4), 844-865.

Doshi, S. (2019). Greening displacements, displacing green: Environmental subjectivity, slum clearance and the embodied political ecologies of dispossession in Mumbai. *International Journal of Urban and Regional Research*, 43 (1), 112-132.

Douglass, M. (2016). Resilient Urbanism in the Anthropocene – The Rise of Progressive City Regions in Asia's Urban Transition. In: *Workshop on resilience in Asian Urbanism*, University of Washington Centre for Asian Urbanisms, College of Built Environment, Jackson School of International Studies, 28-30 March 2016.

Douglass, M. (2010). Globalisation, Mega-projects and the Environment: Urban Form and Water in Jakarta. *Environment and Urbanisation ASIA*, 1 (1), 45-66.

Douglass, M., (2005). Mega-projects and the Environment: Urban Form and Water in Jakarta. In: *International Conference on Global Cities: Water, Infrastructure and Environment.* 16-19 May 2005. Honolulu: University of Hawaii, 2005, pp. 1-12.

Douglass, M., (2002). From global intercity competition to cooperation for liveable cities and economic resilience in Pacific Asia. *Environment & Urbanization*. 14 (1), 53-68. Available from http://www.bvsde.paho.org/bvsacd/cd26/enurb/v14n1/53.pdf [Accessed 30 December 2014].

Douglass, M., Le, T.Q., Lowry, C.K., Nguyen, H.T., Pham, A.N., Thai, N.D. and Yulinwati, H. (2004). The Livability of Mega-Urban Regions in Southeast Asia – Bangkok, Ho Chi Minh City, Jakarta and Manila Compared. In: *International conference on the Growth of Mega-Urban Regions in East and Southeast Asia*, Singapore, 24-25 June 2004.

Dovey, K., Cook, B. and Achmadi, A. (2019). Contested riverscapes in Jakarta: flooding, forced eviction and urban image. *Space and Polity*, 23 (3), 265-282.

Dovey, K. and King, R. (2011). Forms of Informality: Morphology and Visibility of Informal Settlements. *Built Environment*, 37 (1), 11-129.

Dovey, K. and Ristic, M. (2017). Mapping urban assemblages: the production of spatial knowledge. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 10 (1), 15-28.

Dudal, R. (2005). Soils of Southeast Asia. In: Gupta, A. (ed), *The Physical Geography of Southeast Asia*. Oxford: Oxford University Press, p.103.

Dwianto, R.D. (2003). The existing form of urban locality groups in Jakarta: Re-examining the RT/RW in the post-new order era. *Osaka City University*, *41*, pp.41-60.

Elias, J., Ma'riyah, C., Rethel, L., Suwarso, R. and Tilley, L. (2018). *The Gendered Everyday Political Economy of Kampung Eviction and Resettlement in Jakarta: Final Project Report.* Coventry: The University of Warwick.

Ellisa, E. and Naibaho, J. (2019). Urban Design Concept to Enhance Tourism in Cilincing Coastal Area. In: International Seminar on Architecture in Urbanized Maritime Culture: Chances and Challenges in Design and Planning for Sustainable Future, and the 3rd CONVEEESH,

Department of Architecture, Faculty of Engineering, Hasanuddin University, Makassar, September 6-7, 2013. Available from: chrome-

extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.researchgate.net/profile/Ev awaniEllisa/publication/308357905_Urban_Design_Concept_to_Enhance_Tourism_in_C ilincing_Coastal_Area_Jepri_Naibaho_Evawani_Ellisa/links/5c4730e5a6fdccd6b5c04114/ Urban-Design-Concept-to-Enhance-Tourism-in-Cilincing-Coastal-Area-Jepri-Naibaho-Evawani-Ellisa.pdf [Accessed 24 August 2023].

Erickson, B. and Lloyd-Jones, T. (1997). Experiments with Settlement Aggregation Models. *Environment and Planning B: Urban Analytics and City Science*, 24 (6), 903-928.

Evans, G., 2020. Measure for measure: Evaluating the evidence of culture's contribution to regeneration. *Culture-led urban regeneration*, pp.116-140.

Fainstain, S.S., (2009). Mega-projects in New York, London and Amsterdam. *International Journal of Urban and Regional Research.* 32 (4), 768-785. Available from:
http://www.gsd.harvard.edu/images/content/5/4/540407/fac-pub-fainstain-Megaprojects-IJURR-final.pdf [Accessed 30 December 2014].

Fiisabiilillah, D.F. and A. Maulana (2016) Feeding the Megacity: Challenges to Achieve Food Security in Jakarta. *Journal Perencanaan Wilayah dan* Kota [Journal of Regional and City Planning] 27(3), 208-218.

Firman, T. (2004). New town development in Jakarta Metropolitan Region: perspective spatial segregation. *Habitat International*, 28, 349-68.

Firman, T. (2011). Post-suburban elements in Asian extended metropolitan region: the case of Jabodetabek (Jakarta Metropolitan Area). In: Phelps, N.A. and Wu, F. (eds) *International perspectives on suburbanisation: A post-suburban world*? Palgrave McMillan: London.

Firman, T., Surbakti, I.M., Idroes, I.C. and Simarmata, H.A. (2011). Potential climatechange related vulnerabilities in Jakarta: Challenges and current status. *Habitat International*, 35 (2), 372-378.

Florian, M.C. (2023). Indonesia Plans to Build Its New Capital from the Ground Up to Replace the Sinking City of Jakarta. *ArchDaily*. Available from: https://www.archdaily.com/1003506/indonesia-plans-to-build-its-new-capital-from-theground-up-to-replace-the-sinking-city-ofjakarta#:~:text=The%20Indonesian%20parliament%20has%20approved,kilometers%20fr om%20the%20current%20capital. [Accessed 29 September 2023].

Ford, L. (1993). A Model of Indonesian City Structure. Geographical Review, 83 (4), 374-396.

Foxton, T.J. (2002). Technological and institutional 'lock-in' as a barrier to sustainable innovation. *Imperial College Centre for Policy and Technology Working Paper*, p1-9.

Gagalnya System Kanal: Pengendalian Banjir dari Masa ke Masa [Failure of the Canal System: Flood Control from Time to Time]. Kompas, 2010.

David Wallace Mathewson

Garschagen, M., Surtiari, G. A. K. and Harb, M. (2018). Is Jakarta's New Flood Risk Reduction Strategy Transformational? *Sustainability*, 10 (8), 2394. Available from: https://doi.org/10.3390/su10082934

Ghauri, P., Grønhaug, K. and Strange, R., 2020. Research methods in business studies. Cambridge University Press.

Ghertner, D.A. (2011). Green evictions: environmental discourses of a "slum-free" Delhi. In: Peet, R., Robbins, P. and Watts, M.J. (eds). *Global Political Ecology*. Routledge: Abingdon, England.

Gil-Garcia, J.R. and Pardo, T.A. (2006). *Multi-Method Approaches to Understanding the Complexity of E-government*. International Journal of Computers, Systems and Signals, 7 (2).

Gilmartin, D. (1994). Scientific empire and imperial science: Colonialism and irrigation technology in the Indus Basin. *The Journal of Asian Studies*, 53(4): 1127–1149.

Ginsburg, N. (1991). Extended Metropolitan Regions in Asia: A New Spatial Paradigm. In: In: Ginsburg, N., Koppel, B. and McGee, T.G. (eds.) *The Extended Metropolis: Settlement Transition in Asia*. Honolulu: University of Hawaii Press.

Globalisation and World Cities Research Network, (2015). *The World according to GaWC 2008*. Loughborough University. Available from: http://www.lboro.ac.uk/gawc/world2008t.html [Accessed 30 November 2015].

Goh, K. (2019). Urban Waterscapes: The Hydro-Politics of Flooding in a Sinking City. *International Journal of Urban and Regional Research*, 43 (2), 250-272. Available from: https://doi.org/10.1111/1468-2427.12756

Graham, E. (1999). Breaking Out: The Opportunities and Challenges of Multi-Method Research in Population Geography. *The Professional Geographer*, 51 (1), 76-89. DOI: 10.1111/033-0124.00147

Greener, I. (2005). The Potential of Path Dependence in Political Studies. *Politics*, 25 (1), 62-72.

Grimm, N.B., Faeth, S.H., Golubiewsky, N.E., Redman, C.L., Wu, J., Bai, X. and Briggs, J.M. (2008). Global Change and the Ecology of Cities. *Science*, 319 (5864), 756-760.

Gunawan R (2010) *Gagalnya Sistem Kanal: Pengendalian Banjir Jakarta Dari Masa ke Masa* [The Failure of the Canal System: Jakarta's Flood Control from Time to Time]. Jakarta: Kompas.

Hairudin, Kriyanto, R. and Wisadirana, D. (2017). Process of development Planning consensus [Musrenbang] As A Means of Communication in Decision-Making in Siniu Subdistrict Parigi Moutong Regency. *Wacana* [Discourse], 20 (3), 153-161.

Hall, P.A. and Taylor, R.C.R. (1996). Political Science and the Three New Institutionalisms. *Political Studies*, XLIV, 936-957.

Herbeck, J. and Flitner, M. (2019). Infrastructuring coastal futures: Key trajectories in Southeast Asian megacities. *Die Erde: Journal of the Geographical Society of Berlin*, 150 (3), 119-130.
Herlambang, S., Leitner, H., Tjung, L.J., Sheppard, E. and Anguelov, D. (2019). Jakarta's great land transformation: Hybrid neolibralisation and informality. *Urban Studies*, 56 (4), 627-648.

Heryanto, A. and Lutz, N., 1988. The development of 'Development'. Indonesia, (46), 1-24.

Hesse-Biber, C., Rodriquez, D. and Frost, N. (2015). In: Hesse-Biber, C., Nagy, S. and Burke, J.R. (eds) *The Oxford Handbook of Multimethod and Mixed Methods Research Inquiry*. Oxford University Press: Oxford.

Heuken, A. (1983). Historical Sites of Jakarta. Jakarta: Cipta Loka Karya.

Hidayatno, A., Dinianydharani, A.K., and Sutrisno, A. (2016). Scenario analysis of the Jakarta Coastal Defence Strategy: Sustainable Indicators Impact Assessment. *International Journal of Innovation and Sustainable Development*, 11 (1), 37-52. Available from: https://doi.org/10.1504/IJISD.2017.080626 [Accessed 22 July 2022].

Holzhacker, R.L., R. Wittek, and J. Woltjer (2016) Decentralisation and Governance for Sustainable Society in Indonesia. In Holzhacker, R.L., R. Wittek, and J. Woltjer (Eds.) *Decentralisation and Governance in Indonesia* (pp. 3-29). London: Springer.

House of Commons Library. (2021). *Global net zero commitments*. Available from https://commonslibrary.parliament.uk/global-net-zero-commitments/ [Accessed 14 September 2023].

Hudalah, D. and Woltjer, J. (2007) Spatial Planning System in Transitional Indonesia. *International Planning Studies* 12(3), 291-303.

Hudalah, D., Firman, T. and Woltjer, J. (2014). Cultural Cooperation, Institution Building and Metropolitan Governance in Decentralising Indonesia. *International Journal of Urban and Regional Research.* 38 (6), 2217-234. Available from: DOI:10.1111/1468-2427.12096 [Accessed 10 March 2016].

Hudalah, D., Winarso, H. and Woltjer, J., 2016. Gentrifying the peri-urban: Land use conflicts and institutional dynamics at the frontier of an Indonesian metropolis. *Urban studies*, *53*(3), pp.593-608.

Human Rights Watch (2006). *Condemned Communities: Forced Evictions in Jakarta*. New York: Human Rights Watch.

Indonesia Tourism (2019). Jakarta: Maritime Museum. Indonesia-Tourism.com. Available from: http://www.indonesia-tourism.com/jakarta/maritime-museum.html [Accessed 8 August 2019].

Indrasafitri, D. (2012). Betawi: Between tradition and modernity. *The Jakarta Post*, 26 April. Available from: https://www.thejakartapost.com/news/2012/04/26/betawi-between-tradition-and-modernity.html [Accessed 29 January 2024].

JDIH BPK RI Database Peraturan [Legal Database] (2022). Udang-undang Nomor 22 tahun 1999 tentang Pemerintahan Daerah [Law No. 22 of 1999]. Available from: https://peraturan.bpk.go.id/Home/Details/45329/uu-no-22-tahun-1999 [Accessed 14 June 2022].

Jakarta Flood Team (2011). *Jakarta Coastal Defence Strategy*. Jakarta: Ministry of Public Works of the Republic of Indonesia.

Jakarta Globe (2016). Edhi Sunarso, Scuptor of Selamat Datang and 'Dirgantara' Landmarks, Dies at 83, Jakarta Globe. Available at: https://web.archive.org/web/20160110162311/http://jakartaglobe.beritasatu.com/news/ edhi-sunarso-sculptor-selamat-datang-dirgantara-landmarks-dies-83/ [Accessed 28 January 2024].

Jason, Tekbali, F., Siqueira Sousa, I., Marisha, Hill, C. and Ibrahim (2018). *Kampung Akuarium* [Unpublished masters project]. London: University of Westminster.

Jayapal, M. (1993). Old Jakarta. Kuala Lumpur: Oxford University Press.

Jones, P. (2017). Formalizing the Informal: Understanding the Position of Informal Settlements and Slums in Sustainable Urbanization Policies and Strategies in Bandung, Indonesia. *Sustainability*, 9 (1436), 1-27.

Jones, P. (2019). The Shaping of Form and Structure in Informal Settlements: A Case Study of Order and Rules in Lebak Siliwangi, Bandung, Indonesia. *Journal of Regional and City Planning*, 30 (1), 43-61.

Kamalipour, H. (2016). Forms of informality and adaptations in informal settlements. International Journal of Architectural Research, 10 (3), 60-75.

Kanumoyoso B (2011) Beyond the City Wall: Society and Economic Development in the Ommelanden of Batavia, 1684–1740. Leiden, The Netherlands: Leiden University.

Karg, H., Hologa, R., Schlesinger, J., Drescher, A., Kranja-Bresavljevic, G. and Glaser, R. (2019). Classifying and Mapping Periurban Areas of Rapidly Growing Medium-Sized Sub-

Saharan African Cities: A Multi-Method Approach Applied to Tamale, Ghana. *Land*, 8 (40). DOI: 10.3390/land8030040

Kebudayaan Daerah Tahun 1988/1989 [Directorate of History and Traditional Values, Project Inventory and Documentation of Regional Culture 1988-1989].

Kimmelman, M. (2017). Jakarta is Sinking So Fast, It Could End Up Underwater. *The New York Times*, 21 December. Available from: https://www.nytimes.com/interactive/2017/12/21/world/asia/jakarta-sinking-climate.html [Accessed 30 July 2019].

Kooy, M. and Bakker, K. (2008) Splintered networks: The colonial and contemporary waters of Jakarta. *Geoforum*, 39(6, 1843–1858.

Kops, A., (2012). Quickscan of Masterplans executive summary: Jakarta Coastal Defence Strategy Bridging Phase (JCDS-BP) [online] The Hague: Netherlands Enterprise Agency. Available from: http://www.partnersvoorwater.nl [Accessed 29 December 2014].

Kropf, K. (2017). The Handbook of Urban Morphology. Wiley: Chichester, West Sussex.

Kristanti, E. (2018). Eviction fails to quash Kampung Akuarium's fighting spirit. *The Jakarta Post*, 9 January. Available from:

https://www.thejakartapost.com/news/2018/01/09/eviction-fails-quash-kampung-akuarium-s-fighting-spirit.html [Accessed 30 July 2019].

Kuffer, M. and Barros, J. (2011). Urban morphology of unplanned settlements: The use of spatial metrics in VHR remotely sensed images, *Procedia Environmental Sciences*, 7 (2011), 152-157.

Kulig, J.C., Edge, D.S. and Joyce, B. (2008). Understanding Community Resiliency in Rural Communities Through Multimethod Research. *Journal of Rural and Community Development*, 3 (3), 77-94.

Kumparan (2021). Wjah Baru Kampung Akuarium [The New Face of Kampung Akuarium]. *YouTube*. Available from: https://www.youtube.com/watch?v=RDvY6qAaZN0&t=31s&ab_channel=kumparan [Accessed 15 September 2021].

Kusno, A. (2011) Runaway city: Jakarta Bay, the Pioneer and the Last Frontier. *Inter-Asia Cultural Studies* 12(4): 513-531. Accessed from: http://www.tandfonline.com on 9 January 2014.

Kusno, A., 2013. After the new order: Space, politics, and Jakarta. University of Hawaii Press.

Kusno, A. (2023). Middling urbanism: the megacity and the kampung. *Urban Geography*, 41 (7), 954-970. Available from: https://doi.org/10.1080/02723638.2019.1688535

Larkham, P.J. (2005). Understanding urban form? Urban Design, 93, 22-24.

Latief, H., Putri, M.R., Hanifah, F., Afifah, I.N., Fadli, M. and Ismoyo, D.O. (2018). Coastal Hazard Assessment in Northern part of Jakarta. *Procedia Engineering*, 212 (2018), 1279-1286. Lehrer, U., and Laidley, J., (2009). Old Mega-Projects Newly Repackaged? Waterfront Development in Toronto. *International Journal of Urban and Regional Research.* **32** (4), 786-803. Available from: < www.onlinelibrary.wiley.com [Accessed 30 December 2014].

Libecap, G.D. (2010). Institutional Path Dependence in Climate Adaptation: Coman's 'Some Unsettled Problems of Irrigation'. Santa Barbara, CA: National Bureau of Economic Research.

Lie, F.C. and Purnama, L. (2020). A Center for Activities and Coastal Communities in Muara Baru. *Jurnal Stup: Sains, Teknologi, Urban, Perancangan, Arsitektur* [STUP Journal: Science, Technology, Urban Design, Architecture], 2 (1), 155-164.

Li, L. and Bergen, J.M. (2018). Green infrastructure for sustainable urban water management: Practices of five forerunner cities. Cities, 74, 126-133.

Linton, J. and Budds, J. 2014. The hydrosocial cycle: Defining and mobilizing a relationaldialectical approach to water. *Geoforum* 57: 170-180.

Lola, D., Saparuddin and Iranto, D. (2023). Analysis of factors affecting fisherman's income in Kamal Muara, North Jakarta City, *Journal of Humanities, Social Sciences and Business (JHSSB)*, 2 (2), 424-441.

Lorenzo, T.E. and Kinzig, A.P. (2019). Double Exposures: Future Water Security across Urban Southeast Asia. *Water*, 12, 116.

Lozano, E.E., 1990. *Community design and the culture of cities: the crossroad and the wall.* Cambridge University Press.

Magalhaes, L., (2013). O'Neill, Man Who Coined 'BRICs,' Still Likes BRICs, but Likes MINTs, Too [online] Wall Street Journal. Available from: http://blogs.wsj.com/moneybeat/2013/12/09/oneill-man-who-coined-brics-still-likesbrics-but-likes-mints-too/ [Accessed 7 January 2015].

Maharani, D. (2013). Ini 4 Penyebab Banjir Jakarta [These are the 4 Causes of Flooding in Jakarta]. *Kompass.* 22 January. Available from: https://megapolitan.kompas.com/read/2013/01/22/1053289/Ini.4.Penyebab.Banjir.Jakar ta#google_vignette [Accessed 30 January 2022].

Mahoney, J. (2001). Legacies of Liberalism: Path Dependence and Political Regimes in Central America. Baltimore: Johns Hopkins University Press.

Mahoney, J. (2000). Path Dependence in Historical Sociology. *Theory and Society*, 29 (4), 507-548.

Mahoney, J. and Schensul, D. (2006). Historical Context and Path Dependence. In: Goodin, R. and Tilly, C. (eds), *The Oxford Hanbook of Contextual Political Analysis*. Oxford: Oxford University Press.

Marcotullio, P.J., (2001). The compact city, environmental transition theory and Asia-Pacific urban sustainable development. In: *New Approaches to Land Management for Sustainable Urban Regions*. University of Tokyo. 29-31 October 2001. Tokyo: University of Tokyo. 2001, pp. 1-20.

Marcotullio, P.J., (2005). Urban Sustainability and the Regional City System in the Asia Pacific. *Human Settlement Development*. 1, 91-99.

Marshall, G.R. and Alexandra, J. (2016). Institutional path dependence and environmental water recovery in Australia's Murray-Darling Basin. *Water Alternatives*, 9(3): 679–703.

Martinez, R. and Masron, I.N., 2020. Jakarta: A city of cities. Cities, 106, p.102868.

Marulanda, L. and Steinberg, F., 1991. Land management and guided land development in Jakarta (No. IHS Working Papers, No 1/1991). Available from: https://repub.eur.nl/pub/32208/IHS%20WP_001%20Land%20Management%20and%20 Guided%20Land%20Development%20in%20Jakarta%201991.pdf [Accessed 30 July 2022.

Marzot, N. (2002) The Study of Urban Form in Italy. Urban Morphology 6(2), 59-73.

Max Lock Centre (2016). Urban Change in a Northern Nigerian City: Kaduna 1965-2015. London: University of Westminster.

Mathieu, R., Freeman, C. and Aryal, J. (2007). Mapping private gardens in urban areas using object-oriented techniques and very high-resolution satellite imagery. *Landscape and Urban Planning*, 81, 179-192.

McCall, M.K., 2003. Seeking good governance in participatory-GIS: a review of processes and governance dimensions in applying GIS to participatory spatial planning. *Habitat international*, 27(4), pp.549-573.

McCarthy, P. (2003) Part IV: Summary of City Case Studies. In UN-Habitat. *Global Report* on Human Settlements 2003: The Challenge of Slums. London: Earthscan.

McGee, T.G. (1991). The Emergence of Desakota Regions in Asia: Expanding a Hypothesis. In: Ginsburg, N., Koppel, B. and McGee, T.G. (eds.) *The Extended Metropolis: Settlement Transition in Asia*. Honolulu: University of Hawaii Press.

McKendrick, J.H. (1999). Multi-Method Research: An Introduction to its Application in Population Geography. *Professional Geographer*, 51 (1), 40-50.

Meacham, M. (2009). Path Dependency of Infrastructure: Implications for the Sanitation System of Phnom Penh. Stockholm, Sweden: Stockholm University.

Ministry of Infrastructure and the Environment, (2012). Jakarta Coastal Development Strategy End-Of-Project Review [online] The Hague: Netherlands Ministry of Infrastructure and the Environment. Available from: < www.partnersvoorwater.nl > [Accessed 29 December 2014].

Menteri Pekerjaan Umum Perumahan Rakyat Republic Indonesia [Minister of Public Works and Housing of the Republic of Indonesia] (NCICD). (2022). *Kepmen NCICD 112 Tahun* [Ministerial Decree on the NCICD 112 Years], Ministry of Public Works: Jakarta.

Meyer, H. (2005). Plan analysis. In: Jong, T., Van der Voordt, D. (eds), *Ways to study and research: urban, architectural and technical design*. IOS Press, Amsterdam, 125-135.

Milone, P.D. (1987). Indische culture, and its relationship to urban life. *Comparative Studies in Society and History*, 9: 407–426.

Ministry of Public Works (2011) ATLAS *Pengamanan Pantai Jakarta* [ATLAS Securing Jakarta's Coastal Area]. Jakarta: The Ministry of Public Works, Indonesia.

Ministry of Public Works and Public Housing (2022). Decree of the Minister of Public works and Public Housing Number 112/KPTS/M/2022 Concerning integrated flood control concept and predesign of sea embankment Phase B integrated development of the National Capital coast (PTPIN)/National Capital Integrated Coastal Development (NCICD) on the Coast of Jakarta Bay. Jakarta: Ministry of Public works and Public Housing.

Moehadi, Pratis, T., Mulyono and Priyanto, S. (1989). *Dampak Modernisasi Terhadap Hubungan Kekerabatan Di Daerah Jawa Tengah* [The Impact of Modernisation on Kinship Relations in the Central Java Region], Semarang: Depertemen Pendidikan dan Kebudayaan

Monalisa. (2015). Normalisasi Ciliwung dengan beton justru tambah masalah [Ciliwung normalisation with concrete is a new problem]. Antara News. Available at: http://www.antaranews.com/berita/522723/normalisasi-ciliwung-dengan-beton-justru-tambah-masalah (accessed 1 February 2017).

Monkkonen, P. (2008). Using online satellite imagery as a research tool: Mapping changing patterns of urbanization in Mexico. *Journal of Planning education and research*, 28(2), 225-236.

Moudon, A. V. (2001). Introduction. In: Cannigia, G. and Maffei, G. L., (2001). Architectural Composition and Building Typology: Interpreting Basic Building. Florence: Alinea, 13-16.

Mulyana, W., 2012. *Decent work in Jakarta: an integrated approach*. International Labour Organisation (ILO). Available from: http://oit.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms_174991.pdf [Accessed 13 July 2023].

Munjirin, M. (2024). Redesigning The Organization Of The Jakarta City Government: Adaptation And Innovation Towards A Sustainable City. *Eduvest-Journal of Universal Studies*, 4(3), pp.1021-1032. Murphy, J. (2009). Environment and imperialism: why colonialism still matters. *Sustainability Research Institute*, 20, 1-27.

NCICD Videos (2015). Rationale behind NCICD: Why, What and How? *YouTube*. Available from: https://www.youtube.com/watch?v=N9uxswz4nyI&ab_channel=ncicdvideos [Accessed: July 13, 2023].

NEDECO. (1973). Master Plan for Flood Control and Drainage System of Jakarta. Jakarta: NEDECO.

Nessa, Monica, Hadadi, Z., Taha, H., Destephen Lavaire, G. (2018). *Kampung Rawa Barat, Jakarta* [Unpublished masters project]. London: University of Westminster.

Newman, P. and Thornley, A., (2004). *Planning world Cities: Globalization and Urban Politics*. Basingstoke: Palgrave Macmillan.

Niessen, N. (1999) Municipal government in Indonesia: policy, law, and practice of decentralization and urban spatial planning. Ph.D. Thesis, Universiteit Leiden, 1999.

NL Agency (2012) Jakarta Coastal Development Strategy, End-of-Project Review Final Mission Report. The Netherlands: NL Agency, Ministry of Infrastructure and the Environment.

North, D.C. (1990) *Institutions, Institutional Change and Economic Performance*, Cambridge: Cambridge University Press.

Nurbaya. (2019). Pengaruh Pendapatan Nelayan Terhadap Peningkatan Ekonomi Di Desa Wewangriu Kecamatan Malili Kabupaten Luwu Timur Sulawesi Selatan [The Influence of Fishermen's Income on Economic Growth in Wewangriu Village, Malili District, East Luwu Regency, South Sulawesi]. *Ayaŋ*, 8(5), 55.

Nyametso, J.K. (2011). Improvement of squatter settlements: the link between future tenure security, access to housing, and improved living and environmental conditions. (Doctoral dissertation, University of Otago).

Octavianti, T. and Charles, K. (2018). Disaster Capitalism? Examining the Politicisation of Land Subsidence Crisis in Pushing Jakarta's Seawall Megaproject. *Water Alternatives*, 11 (2), 394-420.

Octavianti, T. and Charles, K. (2019a). The evolution of Jakarta's flood policy over the past 400 years: The lock-in of infrastructural solutions. *Politics and Space*, 37 (6), 1102-1125.

Octavianti, T. and Charles, K. (2019b). De- and Re-politicisation of Water Security as Examined Through the Lens of the Hyrosocial Cycle: The Case of Jakarta's Sea Wall Plan. *Water Alternatives*, 12 (3), 1017-1037.

Octavianti, T. and Charles, K. (2020). The increasing pursuit of large infrastructure for a water secure city: Insights from Jakarta's sea wall plan in Indonesia. *Global Water Forum*. Available from https://globalwaterforum.org/2020/05/06/the-increasing-pursuit-of-large-infrastructure-for-a-water-secure-city-insights-from-jakartas-sea-wall-plan-in-indonesia/ [Accessed 16 June 2022].

Octifanny, Y. and Norvyani, D.A. (2021). A review of urban kampung development: The perspective of livelihoods and space in two kampung in Pontianak, Indonesia. *Habitat International,* 107 (2021), 1-13.

O'Leary, R.S., 2004. A construct validity comparison of alternative structured interview scoring methodologies. Auburn University.

Oliveira, V. (2016). Urban morphology: an introduction to the study of the physical form of cities. Springer.

O'Neill, J., (2001). Building Better Global Economic BRICs. *Global Economics Paper*. 66. London: Goldman Sachs. Available from: http://www.gs.com [Accessed 7 January 2015].

Oxford Dictionary (2021). Oxford English Dictionary. Available at: https://www.oed.com/?tl=true [Accessed 15 September 2021].

Padawangi, R. (2012). Climate change and the north coast of Jakarta: Environmental justice and the social construction of space in urban poor communities. In *Urban areas and global climate change* (Vol. 12, pp. 321-339). Emerald Group Publishing Limited.

Padawangi, R. (2014). *Humanistic Planning and Urban Flood Disaster Governance in Southeast Asia: Metro Manila and Jakarta.* Asia Research Institute Working Paper Series No. 228, National University of Singapore.

Pemda Jakarta (2012) *Perda No. 1 Year 2012 Rencana Tata Ruang Wilayah 2030* [Regional Regulation No. 1 of 2012 Spatial Planning 2030]. Jakarta, Indonesia. Available at: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://pelayanan.jakarta.go.id/download /regulasi/peraturan-daerah-nomor-1-tahun-2012-tentang-rencana-tata-ruang-wilayah-2030.pdf [Accessed 01December 2021].

Pemda Jakarta (1991). *Jakarta 2005*, 2nd ed. Jakarta: Pemerintah Daerah Khusus Ibukota Jakarta [Government of the Special Capital Region of Jakarta].

Pemerintah Provinsi DKI Jakarta [DKI Provincial Government]. (2012). Rencana Tata Ruang Wilayah Jakarta 2030 [Jakarta Spatial Plan 2030]. Jakarta: DKI Provincial Government.

Perlman, J (1976). The Myth of Marginality. Berkeley: University of California Press.

Peters, B.G., Pierre, J. and King, D.S. (2005). The Politics of Path Dependency: Political Conflict in Historical Institutionalism. *The Journal of Politics*. 67 (4), 1275-1300.

Peters, B.G. (2001). Institutional Theory in Political Science. London: Continuum.

Pierson, P. (2004). *Politics in Time: History, Institutions and Social Analysis*. Princeton: Princeton University Press.

Pigou, A.C. (2002). *The Economics of Welfare* (1st ed.). London: Routledge. https://doi.org/10.4324/9781351304368

Prasad, N., Ranghieri, F., Shah, F., Trohanis, Z., Kessler, E. and Sinha, R., (2009). *Climate Resilient Cities: A Primer on Reducing Vulnerabilities to Disasters.* Washington: International Bank for Reconstruction and Development. Available from: http://www.worldbank.org [Accessed 29 December 2014].

Pratiwo and Nas, P.J.M. (2005). Jakarta: Conflicting directions. In: Nas, P.J.M. (ed), *Directors of Urban Change in Asia*. London; New York: Routledge, pp.68–82.

Pratt, A.C., (2011). The cultural economy and the global city. In: Taylor, P., Derudder, B., Hoyler, M. and Witlox, F., (eds), *International Handbook of Globalization and World Cities*. Edward Elgar, Cheltenham, pp. 265-274.

Presiden Republik Indonesia (2024). *Presiden Republik Indonesia* [President of the Republic of Indonesia]. Available at: https://www.presidenri.go.id/ [Accessed 24 May 2024].

Priatmodjo, D. (2016). Winning Back City's Blue-Green Elements: Cases of Waduk Pluit and Waduk Ria Rio, Jakarta. In: *53rd International Making Cities Liveable Conference*, Vatican City, June 13-17, 2016. Vatican City: Pontifical University, 1-13.

Priatmodjo, D. (2022a). Chronology of Policies and plans for the North Coast of Jakarta. Unpublished Research Presentation. Universitas Tarumanagara.

Priatmodjo, D. (2022b). Interview by David Mathewson. 25 August 2022, Jakarta.

Priatmodjo, D. (2023). Interview by David Mathewson. 26 August 2023, Jakarta.

PU (2016) Normalisasi Kali Cilinung Sudah Capai 47 Persen Rampung Akhir 2016 [Ciliwung River Normalisation Has Reached 47 Percent Completion by the End of 2016]. Available at: http://pu.go.id/main/view_pdf/10820 (accessed 1 February 2017).

Puffert, D. (2022). *Path Dependence*. Economic History Association. Available from: https://eh.net/encyclopedia/path-dependence/ [Accessed 21 January 2024].

Putra, T. H., Woltjer, J. and Tan, W. G. Z. (2016). Metropolitan Governance and Institutional Design: Transportation in the Jakarta Metropolitan Region. In: Holzhacker, R.L., R. Wittek, and J. Woltjer (2016) *Decentralisation and Governance for Sustainable Society in Indonesia.* In Holzhacker, R.L., R. Wittek, and J. Woltjer (Eds.). Springer: London.

Putri P. W. (2014). Black Water – Grey Settlements. Domestic Wastewater Management and the Socio-Ecological Dynamics of Jakarta's Kampungs. Leuven, Belgium: KU Leuven.

Putri P. W. and Rahmanti A. S. (2010) Jakarta waterscape: From structuring water to 21st century hybrid in Nature? *Nakhara*, 6: 59–74.

Quickscan of Masterplans executive summary: Jakarta Coastal Defence Strategy Bridging Phase (JCDS-BP). The Hague: Netherlands Enterprise Agency, 2012. Accessed from: http://www.partnersvoorwater.nl on 29 December 2014.

Quintsir, S., Peregrina, B. and Octavianti, T. (2021). Mobilisation of bias: learning from drought and flood crises in Sao Paulo, Rio de Janeiro and Jakarta. *Water International*, 46 (6), 861-862.

Raharjo, W. (2010). Speculative Settlements: Built Form/Tenure Ambiguity in Kampung Development. Melbourne: University of Melbourne.

Rahmawati, Y.D. (2015) Self-Organisation, Urban Transformation, and Spatial Planning in Greater Jakarta, Indonesia. *Journal Perencanaan Wilayah dan Kota* [Journal of Regional and City Planning] 26(30), 147-165.

Ranis, G. and Stewart, F., 1994. Decentralisation in Indonesia. *Bulletin of Indonesian Economic Studies*, 30(3), pp.41-72.

Reerink, G., 2015. From autonomous village to 'Informal Slum': Kampong development and state control in Bandung (1930–1960). In *Cars, conduits, and Kampongs* (pp. 193-212). Brill.

Respondent 1. (2023). Workshop 1. Interview by David Mathewson, 19 June, 2023, Jakarta.

Respondent 2. (2023). Workshop 2. Interview by David Mathewson, 19 June, 2023, Jakarta.

Respondent 3. (2023). Workshop 3. Interview by David Mathewson, 20 June, 2023, Jakarta.

Respondent 4. (2023). *Workshop 4*. Interview with David Mathewson, 20 June, 2023, Jakarta (via Teams).

Respondent 5. (2023). *Workshop 5*. Interview with David Mathewson, 22 June, 2023, Jakarta (via Teams).

Respondent 6. (2023). Workshop 6. Interview by David Mathewson. 22 June 2023, Jakarta.

Respondent 7. (2023). *Workshop 7*. Interview by David Wallace Mathewson, 25 June, Jakarta.

Rijke, J., Herk, S., Van Zevenbergen, C. and Ashley, R. (2012). Room for the river: Delivering integrated river basin management in the Netherlands. *International Journal of River Basin Management*, 10(4): 369–382.

Rudi A (2015) 'Ketika Daerah Resapan Air Dijadikan Perumahan Elite. . .'. [When Water Catchment Areas Are Turned into Elite Housing...], *Kompas*, 12 February. Available at:

http://megapolitan.kompas.com/read/2015/02/12/08521131/Ketika.Daerah.Resapan.Air .Dijadikan.Perumahan.Elite (accessed 30 June 2024).

Rudolf, S.C., Gradinaru, S.R. and Hersperger, A.M. (2017). Impact of planning mandates on local plans: a multi-method assessment. *European Planning Studies*, 25 (12), 2192-2211. DOI: 10.1080/09654313.2017.1353592

Rujak Centre for Urban Studies (Rujak). (2018a). Kampung Akuarium, Jakarta: Rujak Centre for Urban Studies.

Rujak Centre for Urban Studies (Rujak). (2018b). *Kampung Akuarium: Kacamatan Penjaringan, Kelurahan Penjaringan, Jakarta Utara* [Kampung Akuarium: Penjaringan district, Penjaringan Ward, North Jakarta], Jakarta: Rujak Centre for Urban Studies.

Rujak Centre for Urban Studies (Rujak). (2018c). Kampung Akuarium, Kampung Nelayan and Kampung Bonpis, Jakarta: Rujak Centre for Urban Studies.

Rujak Centre for Urban Studies (Rujak). (2018d). PRE-CAP Kampung Gedung Pompa, Muara Baru: Kelurahan Penjaringan RT20/RW17 [Pre-Cap Kampung Gedung Pompa, Muara Angke, Penjaringan Subdistrict RT20/RW17], Jakarta: Rujak Centre for Urban Studies.

Rustiadi, E., D.O. Pribadi, A.E. Pravitasari, G.S. Indraprahasta, and L.S. Iman (2015) Jabodetabek Megacity: From City Development Toward Urban Complex Management System. In Singh, R. (Eds.) *Urban Development Challenges, Risk and Resilience in Asian Mega Cities.* Tokyo: Springer.

Sadikin, A. and Hadimadja, R.K., 2012. *Ali Sadikin, membenahi Jakarta menjadi kota yang manusiawi* [Ali Sadikin, fixing Jakarta into a humane city]. Istanbul: Ufuk Publishing House.

Salim, W. and B. Kombaitan (2009). Jakarta. City 13(1), 120-128.

Salim, W. and T. Firman (2011) Governing the Jakarta City-Region: History, Challenges, Risks and Strategies. In Hamnett, S. and D. Forbes (Eds.). *Planning Asian Cities: Risks and Resilience*. Abingdon: Routledge.

Salim, W. and B. Kombaitan (2009). Jakarta. City 13(1), 120-128.

Sanders, P. and D. Baker (2016). Applying Urban Morphology Theory to Design Practice. Journal of Urban Design, 21(2), 213-233. Accessed from https://doi.org/10.1080/13574809.2015.1133228 on 27 December 2017.

Schwartz, H. (2004). Down the Wrong Path: Path Dependence, Increasing Returns and Historical Institutionalism. Unpublished Manuscript, University of Virginia.

Scott, J.C., (1998). Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed. London: Yale University Press.

Schiller, A., de Scherbinin, A., Hsieh, W. and Pulsipher, A., (2007). The vulnerability of global cities to climate hazards. *Environment and Urbanization*. 19 (1) 39-64. Available from: http://www.sagepub.com [Accessed 29 December 2014].

Sedlar, F. (2016). Inundated infrastructure: Jakarta's failing hydraulic infrastructure. *Michigan Journal of Sustainability*, 4: 33–45.

Sethuraman, S.V. (1976). *Jakarta: Urban Development and Employment*. Geneva: International Labour Office.

Setiadi, R., Baumeister, J., Burton, P. and Nalau, J. (2020). Extending urban development on water: Jakarta case study. *Environment and Urbanisation ASLA*, 11 (2), 247-265.

Setiawan, A., Fukuda, Y., Nishijima, J and Kazama, T. (2015). Detecting Land Subsidence Using Gravity Method in Jakarta and Bandung Area, Indonesia. *Procedia Environmental Sciences*, 23, 17-26. Available from: https://doi.org/10.1016/j.proenv.2015.01.004

Sherwell, P. (2016). \$40bn to save Jakarta: the story of the Great Garuda. *The Guardian*, 22 November. Available from: https://www.theguardian.com/cities/2016/nov/22/jakarta-great-garuda-seawall-sinking [Accessed 28 October 2024].

Shirleyana, Hawken, S. and Sunindijo, R.Y. (2020). City of Kampung: risk and resilience in the urban communities of Surabaya, Indonesia. *International Journal of Building Pathology and Adaptation*, 36 (5), 543-568.

Sherwell, P. (2016). \$40bn to save Jakarta: the story of the Great Garuda. *The Guardian*, 22 November. Available from: https://www.theguardian.com/cities/2016/nov/22/jakarta-great-garuda-seawall-sinking [Accessed 28 October 2024].

Shorten, A. and Smith, J. (2017). Mixed methods of research: expanding the evidence base. *Evidence-Based Nursing*, 20 (3), 74-75.

Silver, C., J. Iwan, A. Schroeder, and L. Schroeder (2001) Intergovernmental Transfers and Decentralisation in Indonesia. *Bulletin of Indonesian Economic Studies* 37(3), 345-362.

Silver, C., (2008) Planning the Megacity: Jakarta in The Twentieth Century. London, Routledge.

Silver, C. (2014). Spatial Planning for Sustainable Development: An Action Planning Approach for Jakarta. *Journal of regional and Urban Planning*, 25 (2), 115-125.

Silver, C. (2015). Planning Asian Cities: Risks and Resilience. *Journal of Urban History*, 41 (1), 165-170.

Simone, A., 2016. Sociability and endurance in Jakarta. Deleuze and the City, pp.224-240.

Singapura stories (2021). From 'Kampong' to 'Compound': Retracing the forgotten connections. *Our stories, Singapura stories*. Available from http://singapurastories.com/kampungcompound-houses/kampungcampongcompound/ [Accessed 7 July 2022].

Skidmore, Owings and Merrill (SOM), (2013). *Green Bay Pluit City*. London: Skidmore, Owings and Merrill.

Skopkol, T. (1992). Protecting Soldiers and Mothers: The Political Origins of Social Policy in the United States. Cambridge: Cambridge University Press.

Skopkol, T., 1979a. States and social revolutions: A comparative analysis of France, Russia and China. Cambridge University Press.

Skopkol, T., 1979b. State and revolution: Old regimes and revolutionary crises in France, Russia, and China. *Theory and Society*, 7, pp.7-95.

Smailes, A. (1955). Some reflections on the geographical description of townscapes. *Inst Br Geogr Trans Pap*, 21, 99-115.

Sorensen, A. (2015). Taking path dependence seriously: an historical institutionalist research agenda in planning history. *Planning Perspectives*, 30 (1), 17-38. Available from http://dx.doi.org/10.1080/02665433.2013874299 [Accessed 27 April 2017].

Srinivas, H., (2007). *Cities and Urban Vulnerability in the context of Urban Environmental Management*. Nairobi: United Nations Environment Programme. Available from: http://www.preventionweb.net [Accessed 29 December 2014].

Steinberg, F., (2008) Revitalisation of Historic Inner-City Areas in Asia: Potential for Urban Renewal in Ha Noi, Jakarta and Manila. Mandaluyong City: Asian Development Bank.

Steinberg, F. (2007a). Jakarta: environmental problems and sustainability. *Habitat International*, 31 (3-4), 34-365.

Steinberg, F. (2007b). Housing reconstruction and rehabilitation in Aceh and Nias, Indonesia—Rebuilding lives. *Habitat international*, 31 (1), 150-166.

Steinmo, S., (2008) Historical Institutionalism. In: Della Porta, D. and Keating, M. (Eds.) Approaches and Methodologies in the Social Sciences. Cambridge: Cambridge University Press.

Stenstaker, B. and Benner, M. (2013). Doomed to be entrepreneurial: intuitional transformation or institutional lock-ins of 'new' universities? *Minerva*, 51, 399-416.

Streeck, W., and Thelen, K. (2005). Introduction: Institutional Change in Advanced Political Economies. In *Beyond Continuity: Institutional Change in Advanced Political Economies*, edited by Streeck, W. and Thelen, K., 1–39. Oxford: Oxford University Press. Suddaby, R., Foster, W.M. and Mills, A.J. (2014). Historical Institutionalism. Organisations in time: History, theory, methods, 100, p123.

Sugiantoro (2008). Appendix 2: Jakarta Case Study. In: Steinberg, F. (de.) Revitalisation of Historic Inner-City Areas in Asia. Mindaluyong City: Asian Development Bank.

Suk-Jae, S., Han San, P., Won-Tae, S., Chungkyun, J., Hadi, S., Latie, H., Sofian, I. and Fitriyanto. (2012). Study on Establishment of Integrated Coastal Management Programme in Jakarta Bay Area, Indonesia: A Precise 3-D Coastal Topographic Mapping of a Vulnerable Area in Jakarta Bay, *Seongnam: Korea International Cooperation Agency*, 4 (xi), 112-113. Available from: https://lib.koica.go.kr/search/detail/CATKCA000000037367 [Accessed 30 July, 2024].

Suprayogi, H., Rudyanto, A., Bachtiar, H. and Limantara, L.M. (2018). Critical-phase sea dike construction of NCICD program in Jakarta as national capital city, *IOP Conference Series: Earth and Environmental Science*, 162 (1), 012020. DOI: 10.1088/1755-1315/162/1/012020

Surnarharum, T.M., Sloan, M. and Susilwati, C. (2013). Re-framing Infrastructure Investment Decision-Making Processes: A Preliminary Scoping Study for Urban Flood Risk Management in Jakarta, Indonesia. In: *Proceedings of the 9th International Conference on the International Institute for Infrastructure Renewal and Reconstruction*, QUT Science & Engineering Centre, Queensland University of Technology, Brisbane, pp1-9.

Supriatna, A. and Van der Molen, P. (2014). Land Readjustment for Upgrading Indonesian Kampung: A Proposal. *Southeast Asia Research*, 22 (3), 379-397.

Surya, M.Y., He, Z. Xia, Y. and Li, L. (2019). Impacts of Sea Level Rise and River Discharge on the Hydrodynamic Characteristics of Jakarta Bay (Indonesia). *Water*, 11 (1384).

Suryowati. E. (2022). Pembangunan IKN Nusantara Tahap 1 Dimulai, Nilainya Rp 5,3 Triliun [Development of IKN Nusantara Phase 1 Begins, Value IDR 5.3 Trillion]. *JawaPos.com* [JavaPost.com], 30 August. Available from: https://www.jawapos.com/ibukota-baru/01404873/pembangunan-ikn-nusantara-tahap-1-dimulai-nilainya-rp-53-triliun [Accessed 29 December 2023].

Sutrisno, B. (2019). Kampung Akuarium residents see brighter future in redevelopment plans. *The Jakarta Post*, 5 October. Available from https://www.thejakartapost.com/news/2019/10/04/kampung-akuarium-residents-seebrighter-future-in-redevelopment-plans.html [Accessed 29 January 2021.

Sutanudjaja, E. (2018) Introduction to North Jakarta. In: Joint Urban Design Workshop, University of Westminster, Universitas Tarumanagara & Rujak Centre for Urban Studies. Jakarta, Indonesia 14-29 April, 2018.

Sutanudjaja, E. (2022). Interview by David Mathewson. 30 August, Bali.

Sutherland, H. (1979). *The Making of a Bureaucratic Elite: The Colonial Transformation of the Javanese Priyayi*. Singapore: Published for the Asian Studies Association of Australia by Heinemann Educational Books (Asia).

Suwarno, PJ. 1995. Dari Azazyookai dan Tonarigumi ke Rukun Kampung and Rukun Tetangga di Yogyakarta (1942-1989) [From Azazyookai and Tonarigumi to Rukun Kampung and Rukun Tetangga in Yogyakarta (1942-1989)]. Yogyakarta: Penerbitan Universitas Sanata Dharma. Suwondo, K. (2002). *Decentralization in Indonesia*. International Non-Government Organization Forum on Indonesian Development (INFID).

Tambunan, R. (1996) Master plan 65-85 [Master plan 1965-1985]. Media Jaya 19(4): 48-57.

Tan, P.Y. and Jim, C.Y. (eds) (2017). *Greening Cities - Forms and Functions: Advances in 21st Century Human Settlements*. Springer: Singapore.

Taubenböck, H., Esch, T. and Roth, A. (2006). An urban classification approach based on an object-oriented analysis of high resolution satellite imagery for a spatial structuring within urban areas. *Proceedings on CD*-ROM.

Taylor, J.R. and Lovell, S.T. (2012). Mapping public and private spaces of urban agriculture in Chicago through the analysis of high-resolution aerial images in Google Earth. *Landscape and Urban Planning*, 108, 57-70.

Temukan Data Seluruh Unit Kerja Pemerintah Provinsi DKI Jakarta. Jakarta Open Data – Berbagi Data untuk Transparansi. *Jakarta Open Data*, 2017. Accessed from http://data.jakarta.go.id/ user/login?came_from=http://data.jakarta.go.id/dataset/datajumlah-penduduk-dki-jakarta on 27 December 2017.

Texier, P. (2008). Floods in Jakarta: when the extreme reveals daily structural constraints and mismanagement. *Disaster Prevention and Management*, 17 (3), 358-372.

Thelen, K., 2000. Timing and temporality in the analysis of institutional evolution and change. *Studies in American political development*, 14(1), pp.101-108.

Thelen, K. (1999). Historical Institutionalism in Comparative Politics. *Annual Review of Political Science*, 2, 369-404. Available from http://www.annualreviews.org [Accessed 10 December 2016].

Thelen, K. and Conran, J., 2016. Institutional change. In: Fioretos, O., Falleti, T. G. and Sheingate, A. (eds), *The Oxford Handbook of Historical Institutionalism*. Available from: https://doi.org/10.1093/oxfordhb/9780199662814.013.3 [Accessed 30 June 2022].

Tierolf, L., de Moel, H. and van Vliet, J. (2021). Modelling urban development and its exposure to river flood risk in southeast Asia. Computers, Environment and Urban Systems, 87, 1016-20.

Tilley, L., Elias, J. and Rethel, L. (2017). Undoing ruination in Jakarta: the gendered remaking of life on a wasted landscape. *International Feminist Journal of Politics*, 14 (4), 522-529.

Tully, A., Tafuro, E., Kissi, Natalishvili, M., Matthew, Dutta, N. (2018). *Kampong Petak Sembilan* [Unpublished masters project]. London: University of Westminster.

Tyas, H.H. (2016). Proyek pembangunan NCICD Indonesia-Belanda [NCICD Construction Project Indonesia-the Netherlands]. *Semarak News*, 24.

UN-HABITAT (2006). The State of the World's Cities. London: Earthscan.

United Nations Department of Economic and Social Affairs (2023). Implementation of Nature-Based Solutions for Climate-Resilient and Flood Risk Management in Pakistan. Available from: https://sdgs.un.org/partnerships/implementation-nature-based-solutionsclimate-resilient-and-flood-riskmanagement#:~:text=Cost%2Deffective%3A%20NBS%20can%20be,biodiversity%20con servation%2C%20and%20livelihood%20improvement. [Accessed 20 December 2023].

United Nations Environment Programme (2007). *Cities and Vulnerability in the context of Urban Environmental Management: A Concept Paper*. Geneva: United Nations Office for Disaster Risk Reduction. Available from: https://www.unisdr.org [Accessed 30 January 2021].

United States Treasury (1997). *Treasury Reporting Rates of Exchange as of March 31, 1997*. Washington: Department of the Treasury Financial Management Service.

Urban Morphology Research Group (1990). Glossary. Available from: http://www.urbanform.org/ [Accessed 3 November 2019.

Van Buuren, A., Ellen, G.J. and Warner, J.F. (2016). Path-dependency and policy learning in the Dutch delta: Toward more resilient flood risk management in the Netherlands? *Ecology and Society*, 21(4): 43.

Van den Hoven, K., Kroeze, C. and van Loon-Steensma, J.M. (2022). Characteristics of realigned dikes in Coastal Europe: Overview and opportunities for nature-based flood protection. *Ocean and Coastal Management*, 222 (2022), 106-116.

Van der Brug, P.H. (1997). Malaria in Batavia in the 18th century. Tropical Medicine and International Health 2(9): 892–902.

Van der Heiden, C.N. (1990) Town planning in the Dutch Indies. *Planning Perspectives* 5 (1): 63–84.

Van der Nat, A., Vellinga, P. Leemas, R. and van Slobbe, E. (2016). Ranking coastal flood protection designs from engineered to nature-based. *Ecological Engineering*, 87 (2016), 80-90.

Van Dijk, M.P. (2016). Financing the National Capital Integrated Coastal Development (NCICD) Project in Jakarta (Indonesia) with the Private Sector. *Journal of Coastal Zone Management*, 19 (5). DOI: 10.4172/2473-3350.1000435

Van Marrewijk, A., (2013). Organising Mega-projects: Understanding their cultural practices. In: *Mega-projects: Theory meets practice*. [online] London. 12-13 September 2013. Manchester: Manchester Business School. Available from: < *https://research.mbs.ac.uk/infrastructure/Newsevents/Megaprojectsschedule.aspx* > [Accessed 10] *January 2015*]

Van Voorst, R. (2016) Formal and informal flood governance in Jakarta, Indonesia. *Habitat International*, 52: 5–10.

Vlekke, B.H.M. (1943) Nusantara: A History of the East Indian Archipelago. Cambridge, MA: Harvard University Press.

Vuik, V., Jonkman, S.N., Borsje, B.W. and Suzuki, T. (2016). Nature-based flood protection: The efficiency of vegetated foreshores for reducing wave loads on coastal dikes. *Coastal Engineering*, 116 (2016), 42-56.

Wang, M. Zhang, D.Q., Adhityan, A., Ng, W.J., Dong, J.W. and Tan, S.K. (2016).
Conventional and holistic urban stormwater management in coastal cities: a case study of the practice in Hong Kong and Singapore. *International Journal of Water Resources Development*, 34, 2, 192-212.

Ward, P.J., Marfai, M.A., Yulianto, F., Hizbaron, D.R. and Aerts, J.C.J.H. (2011). Coastal inundation and damage exposure estimation: a case study for Jakarta. *Natural Hazards*, 56, 899-916.

Whitehand, J. W. R., (2001a). British urban morphology: the Conzenian tradition. Urban Morphology, 5 (2), 103-109.

Whitehand, J. W. R., (2001b). Building Interpretation and ISUF. In: Cannigia, G. and Maffei, G. L., (2001). *Architectural Composition and Building Typology: Interpreting Basic Building*. Florence: Alinea, 13-16.

Whitehand, J.W.R. (2007) Conzenian Urban Morphology and Urban Landscapes. Paper presented at the *Proceedings, 6th International Space Syntax Symposium, Istanbul*, Istanbul Technical University, 12-15 June 2007.

Whitehand, J.W.R., Conzen, M.P. and Gu, K. (2016). Plan analysis of historical cities: a Sino-European comparison. *Urban Morphology*, 20 (2), 139-158.

Wijaya, C.A. (2018a). Anies attends second anniversary of Kampung Akuarium eviction. *The Jakarta Post*, 14 April. Available from: https://www.thejakartapost.com/news/2018/04/14/anies-attends-second-anniversary-of-kampung-akuarium-eviction.html [Accessed 29 July 2019].

Wijaya, C.A. (2018b). Akuarium residents hopeful for better housing. *The Jakarta Post*, 16 April. Available from: https://www.thejakartapost.com/news/2018/04/16/akuarium-residents-hopeful-better-housing.html [Accessed 30 July 2019].

Williams, K. (2014). Urban form and infrastructure: a morphological review – Future of cities: working paper. Government Office for Science. Available from:
https://assets.publishing.service.gov.uk/media/5a7e0dd4ed915d74e33efc1f/14-808-urban-form-and-infrastructure-1.pdf [Accessed 21 January 2024].

Winaktoe, W., Schultz, B. and Suryadi, F.X. (2019). Measuring urban polder resilience of DKI Jakarta Province. In: *The 12th Conference of the International Forum on Urbanism: Beyond Resilience.* Jakarta, Indonesia, 24-26 June, 2019. Universitas Tarumanagara: Jakarta, 404-423.

Winarso, H. and Firman, T. (2002). Residential land development in Jabotabek, Indonesia: triggering economic crisis?. *Habitat International*, 26 (4), 487-506.

Winayanti, L. and Lang, H.C. (2004). Provision of urban services in an informal settlement: a case study of Kampung Penas Tanggul, Jakarta. *Habitat international*, 28(1), 41-65.

Wisconsin Department of Natural Resources (Wisconsin) (2023). Flood Prevention: Steps that can save your life and property. Available from: https://dnr.wisconsin.gov/emergency/flood.html [accessed 20 December 2023].

Wittek, R. (2007). Governance from a sociological perspective. In Jansen, D. (ed.) *New forms of governance in research organizations. Disciplinary approaches, interfaces, and integration*, 73–99. Dordrecht: Springer.

The World Bank (2010). Jakarta - Urban Challenges in a changing Climate: Mayors' Task Force on climate Change, Disaster Risk & The Urban Poor. The World Bank. Available at: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://documents1.worldbank.org/curat ed/ar/132781468039870805/pdf/650180WP0Box360ange0Jakarta0English.pdf [Accessed on June 23 2022].

World Population Review, (2014). *Indonesia Population 2014*. World Population Review. Available from: http://worldpopulationreview.com/countries/indonesia-population/ [Accessed 10 January 2015].

WPS Channel (2023). SEGERA DIBANGUN!! Giant Sea Wall di Utara Jakarta [Immediately Built!! Sea Wall in North Jakarta]. *YouTube*. Available from: https://www.youtube.com/watch?v=Rk7eCf6yBII&ab_channel=WPSChannel [Accessed: July 13, 2023].

Yang, X. and Liu, Z. (2005a). Use of satellite-derived landscape imperviousness index to characterize urban spatial growth. *Computers, Environment and Urban Systems*, 29 (5), 524-540.

Yang, X. and Liu, Z. (2005b). Using satellite imagery and GIS for land-use and land-cover change mapping in an estuarine watershed. *International Journal of Remote Sensing*, 26(23), 5275-5296.

Yuliastuti, N., Syahbana, J.A. and Soetomo, S., 2015. The role of community institutions "Rukun Tetangga" in social housing, Indonesia. *International Journal of Humanities and Social Science*, 5 (10), 44-52.

Zaide, P. (2020). Floodscape Urbanism: Architectural Design Strategies for Manila at Risk. Doctoral Thesis, Royal College of Art.

Zhu, K., Kraemer, K.L., Gurbaxani, V. and Xu, S.X. (2006). Migration to open-standard Interorganisational Systems: Network Effects, Switching Costs and Path Dependency. *MIS Quarterly*, 30, 515-539.

Definition of Terms

Bappeda: Badan Perecanaan Pembangunan Daerah Ibukota Jakarta, or the Regional Planning Authority for Jakarta, abbreviated as 'Bappeda' (Bappeda, 2024).

Bappenas: Kementerian Perecanaan Pembangunan Nasional, or the Ministry of National development Planning, abbreviated as Bappenas' (Bappenas, 2024).

DKI or DKI Jakarta: Jakarta DKI stands for *Daerah Khusus Ibukota Jakarta* or Special Capital Region of Jakarta (Steinberg, 2007). Jakarta is a special administrative region at the provincial level, headed by a governor, comprised of five kota or cities, each with a mayor.

Desa: One of two words in Indonesian meaning village, the other being *kampung*. They are typically considered a form of informal development and can exist in city centres or the urban periphery (Ford, 1993).

Historical institutionalism: Is a new institutionalist approach to research developed in the social sciences emphasising the timing, sequence and path dependence which affect institutions while shaping political, social and economic behaviour and their resulting changes (Steinmo, 2008).

Institutional lock-in: Thelen (2000, cited in Stensaker and Benner, 2013 p401) describes this as "a reproduction of templates.." from decisions and ways of doing or reaching policy decisions which have historically been seen to be useful, efficient, agreeable or simply possible and therefore useful.

Kampung: One of two words in Indonesian meaning village, the other being *desa. Kampung* are typically considered a form of informal development and can exist in city centres or the urban periphery (Ford, 1993; Dovey and King, (2011). Shireleyana et al. (2020) describe it as Indonesia's main settlement type, typically high density and often with pejorative connotations, such as typically being referred to slums or squatter settlements, though in reality they are often the home of communities which exhibit a high degree of resiliency to shocks such as environmental hazards (Dovey and King, 2011).

Kecamatan: *Kecamatan* refers to administrative districts. *Kota* (see below) are typically divided into several kecamatan (Moehadi, et. Al., 1989).

Kota: *Kota* or *Kota Administrasi* refers to a city level municipality, literally a 'city' or 'administrative city' (JDIH BPK RI Database Peraturan, 2022).

Morphology or urban morphology: Is the study of the formation, growth, and composition of human settlements, as well as the processes of their formation, development, growth, and transformation (Kropf, 2017).

Path dependence: Is a social science concept which refers to various processes where historic events or decisions act to constrain later events or decisions (Mahoney and Schensul, 2006; Douglass et al., 2004). Path dependence can also be used to refer to outcomes at a single point in time or to long term processes (Zhu et al., 2006).

Polder: Typically, a tract of lowland reclaimed from a body of water through the construction of dikes, seawalls or other flood retention infrastructure, usually parallel to the shoreline and which allows for drainage through sluice gates or other openings out to sea (Britannica, 2024).

Urban form: The physical and spatial characteristics that comprise built-up areas in urban settlements, including their shape, size, density and configuration or layout (Williams, 2014).

Waduk: This is the Indonesian word for water retention ponds or reservoirs, also known as polders (Priatmodjo, 2016; Bappeda, 2022 and 2023).

Appendicies



Appendix A

Research Workshops:

Jakarta, June 2023



Introduction

This research has been in order to understand the nature of planning policy and its effect on the city in a context of severe flooding and multiple other urban development challenges associated with mega cities of the global south. Jakarta, being one of the planet's largest urban conurbations, presents an informative case of flooding coupled with vast areas of land covered by informal development set within the context of a rising world city in a large, rapidly developing nation. Outcomes from this research could potentially inform how other cities in the Southeast Asian region, such as Bangkok, Ho Chi Minh City, Hanoi, Yangon or Manila respond to similar development and environmental challenges. In detail, the research seeks to reveal the link between planning policy around flooding and the physical influences of those policies on the changing urban fabric of the city, while focusing on how these spatial alterations to the city's urban form have impacted on the inhabitants of affected areas of Jakarta.

This study utilises Jakarta as a case study because of the significant challenges it faces from flooding, together with the demands of a rapid and growing mega city, set across a historical record going back at least four centuries. The research examines the nature of government responses to flooding which have both shaped and reacted to the city's spatial and urban form, in the shape of policies, strategies or mitigation measures, for example where previous responses to such environmental challenges failed to take into consideration existing local ecology, flood patterns, natural drainage systems, as well as existing communities affected both by flooding and plans for mitigation measures. Importantly this research proposes potential solutions in terms of planning policies, development strategies and best practices for infrastructure and community planning which could better suit Jakarta's unique environmental context and social challenges, potentially leading to an improved quality of life for the wider inhabitants of the city across socio-economic boundaries.
Workshop Brief

The research workshop specifically aims to propose potential planning policies, development best practices and strategies in light of the past four centuries of municipal, colonial and national government planning policies in respect to flooding, and how these have impacted the spatial and physical urban form of the city, in turn affecting local communities, for example through demolition and eviction. The objective is for participants, who are experts in flood infrastructure, planning policy and urban design, from academic, practitioner or public sector roles, to propose new solutions which will take the city into the future, not repeating past mistakes, considering community consultation and improving the quality of life of city residents.

This was undertaken in half day workshop with a list of questions, aims and objectives for participants.

Specific questions addressed by the workshop:

- Considering the history of planning policy around flooding, and its technocratic nature (canalisation, infrastructure-driven approaches) which have had mixed results in terms of flood mitigation and the associated negative impacts on local communities, e.g. kampung residents through demolition and eviction, how should the government at the national, DKI and local government be intervening?
- How should the various levels of government be consulting with local residents, communities at large and businesses to fully incorporate their views and ensure their needs are met?
- Which policies should the national, DKI and (where appropriate) local government be implementing for a more flood resilient future for Jakarta generally?
- Should policies continue to be technocratic (i.e. infrastructure-driven) in nature, or utilise more nature-based solutions, e.g. mangroves or more naturalistic riverbanks, or even solutions from the West such as Sustainable Urban Drainage Systems, 'S.U.D.S.', (i.e. forms which are more water-absorptive)?

 Should the DKI and national government reconsider the NCIDC infrastructure and land reclamation projects in favour of other solutions? If so what would those solutions look like?

The workshops were held with the following organisations and participants:

- An Indonesian land reclamation and water management NGO
 - A flood infrastructure engineer who previously worked on the JCDS and NCICD
 - A hydrologist and researcher at a Dutch institute for hydrology
- A Dutch institute for hydrology
 - o An Indonesian hydrologist and researcher
- A regional government ministry of the Jakarta DKI
 - Head of the water resources subdivision and environmental expert
 - o A second water infrastructure and planning expert
 - An environmental expert with planning expertise
- Local University I
 - Professor of planning and policy development
- Local University II
 - o Professor of Urban Planning and Design
- Climate-focused NGO
 - The NGO director and former climate advisor to the government of Jakarta
 - o Additional staff member
 - o Additional staff member
- Community-based NGO in Jakarta
 - o Director
 - o Senior staff member

Workshop Transcripts

Workshop 1: Respondent 1 - An Indonesian NGO focusing on land reclamation and water management

Participants

- One flood infrastructure engineer
- One hydrologist

19 June 2023 15:00

Anonymous Consultancy Offices Jakarta Selatan DKI Jakarta, Indonesia

1. Considering the history of planning policy around flooding, and its technocratic nature (canalisation, infrastructure-driven approaches) which have had mixed results in terms of flood mitigation and the associated negative impacts on local communities, e.g. kampung residents through demolition and eviction, how should the government at the national, DKI and local government be intervening?

Current solutions are short term due to the electoral cycle. This is insufficient to
meet the longer-term needs of the city. An incremental approach could potentially
respond to this challenge by phasing long term solutions into shorter ones
achievable within an electoral cycle such as a five-year gubernatorial term.

2. How should the various levels of government be consulting with local residents, communities at large and businesses to fully incorporate their views and ensure their needs are met?

- Experts should discuss potential solutions first, then consult with local residents who do not have sufficient expertise or knowledge.

3. Which policies should the national, DKI and (where appropriate) local government be implementing for a more flood resilient future for Jakarta generally?

- Government responses not sufficient, PPP needed.
- Potentially a developer levy could help fund the necessary infrastructure.
- Natural embankments and riverbanks along waterways such as canals, rivers and polders.

4. Should policies continue to be technocratic (i.e. infrastructure-driven) in nature, or utilise more nature-based solutions, e.g. mangroves or more naturalistic riverbanks, or even solutions from the West such as Sustainable Urban Drainage Systems, 'S.U.D.S.', (i.e forms which are more water-absorptive)?

- Mangrove forests are being implemented in limited areas.

5. Should the DKI and national government reconsider the NCIDC infrastructure and land reclamation projects in favour of other solutions? If so what would those solutions look like?

- Effective local consultation should be ensured in practice as it is on paper.
- Open and transparent public-private partnerships should be pursued.
- A developer's levy should be implemented.
- An incremental approach to planning and infrastructure to meet long term goals should be pursued.

Workshop 2: Respondent 2 - Workshop 1 with the an Indonesian researcher at a Dutch hydrology institute at a university in the Netherlands

Participant:

One hydrologist

19 June 2023 18:00

Stasiun Gambir Café Jl Medan Merdeka Timur No. 1 Gambir, Kecamatan Gambir Kota Jakarta Pusat 10110 DKI Jakarta, Indonesia

- Considering the history of planning policy around flooding, and its technocratic nature (canalisation, infrastructure-driven approaches) which have had mixed results in terms of flood mitigation and the associated negative impacts on local communities, e.g. kampung residents through demolition and eviction, how should the government at the national, DKI and local government be intervening?
 - If we examine period of 1990-2010 or/and 2010-2023 then we may read the Jakarta flood protection strategy as follows⁴⁴: 1) upper part ,water shall be contained in lakes/situ, 2) middle part before entering Jakarta, water shall be diverted by Flood Canal (eastern/BKT and western/BKB), 3) lower part = low land = below MSL (Mean Sea Level) shall use polder.
 - Following that information, you need to select whether you want to examine all parts or only 1 part.⁴⁵

⁴⁴ It is to put Jakarta within larger system of Ciliwung River. So the 'upper part' also means upper part of Ciliwung River, and so on.

⁴⁵ In upper part, lakes and situ(s) vanished due to encroachment by real estates. It against your assumption about negative effect of demolition and eviction. In the middle part, demolition and eviction occurred during land provision for BKT or BKB development. It agrees with your assumption but a check about floodplain violation is required. In the lower part, demolition and eviction occurred for normalizing the

- Jakarta Flood protection infrastructures have been i) invaded by illegal housing and ii) trying to reconcile with the legal existing structures (housing, waste collection, drinking water system⁴⁶, bridges, land uses, etc).
- For question number 1 (illegal housing), the intervention needs to be implemented in i) rural area/agriculture dominant village through job provisions⁴⁷ hence preventing urban migration as a supply for squatters and ii) in the Jakarta administrative area, relocation is an option and needs to be accompanied by job provisions. To support job provision hence public transportation needs to be affordable for such migrants or low-income people.
- For problem number 1, National has provided regulations (SDGs Desa) and budget (Dana Desa) hence those are more than sufficient to prevent urban migration. Local Government (Provincial-municipality/regency-district-village) are less initiative, unless in some provinces like West Java with program of 1 village 1 product.
- 2. How should the government at the national be intervening?
 - For the problem number 2, there is no other way than build/rehabilitate the necessary infrastructures. During the process it may be a conflict with existing

volume of ciliwung river and retention ponds of polders (Pluit, Pulo Mas). It agrees with your assumption but a check about floodplain violation is required. Further, the evicted households were relocated to descent vertical housing with job provisions. I heard that those people have difficulties to pay Monthly rents (there is specific thesis/report about this). Jakarta Government tries to help by training them to generate income. <u>I think it is the main problem need to be addressed</u>.

⁴⁶ Drinking water by PDAM will reduce ground water extraction hence reduce the rate of land subsidence. Continuing land subsidence shall create land depressions which prone to the extended area of inundation and floods.

⁴⁷ In 2015 the Dana Desa programme was launched so every village gets Rp.1-2 million which enables to develop village economics. In 2020 village became more financially stronger and focused to improve the economics as mandated by SDGs Desa diimplementasikan mulai 2021 sesuai dengan Permendesa PDTT No 13/2020 tentang prioritas penggunaan dana desa 2021

⁽https://www.kominfo.go.id/content/detail/30529/kontribusi-sdgs-desa-74-persen-atas-pencapaian-nasional/0/berita#:~:text=SDGs%20Desa%20diimplementasikan%20mulai%202021,dana%20desa%2020 21%2C%22%20katanya.)

https://rancaekekwetan.desa.id/artikel/2022/8/26/sdgs-desa-dan-penerapannya-dalam-rkp-desa-dan-rpjn-desa

legal housing, but the regulation is clear: Government has to replace the evicted houses due to Government projects⁴⁸.

- I would suggest that DKI Jakarta Government may start to design a program which enable relocation while also secure job provisions or income.
- Regarding polder development, particularly for public polders, hence polder board needs to be established of which its tasks are i) to build and manage the infrastructures and ii) to provide and manage financial aspect.
- There are several cases which can follow different ways as long as the flood hazard can be mitigated while create other opportunities for community income/revenue through architectural/landscape design or tourism. So, both National and Local Government can start to adopt comprehensive review related to the future of certain "unique" areas which means relocations and conventional infrastructures may not be suitable to them.

⁴⁸ This is a Standard Pelayanan Minimum or Minimum Service Standard for sector of housing.

Workshop 3: Respondent 3 - Regional government ministry for Jakarta DKI

Participants:

Government official, team lead (infrastructure and planning expert) Two team members, subordinate (infrastructure and planning experts)

20 June 09:00

Relevant DKI Jakarta Ministry Offices Kota Jakarta Pusat DKI Jakarta, Indonesia

1. Considering the history of planning policy around flooding, and its technocratic nature (canalisation, infrastructure-driven approaches) which have had mixed results in terms of flood mitigation and the associated negative impacts on local communities, e.g. kampung residents through demolition and eviction, how should the government at the national, DKI and local government be intervening?

- Collaborative climate disaster mitigation and adaptation
 - o Rise of mean sea level caused by global warming and carbon emissions
 - Targeted to decrease 30% in emissions by 2030 and net-zero by 2050 (Central government)
- Control land subsidence
 - Land subsidence rate reduction of 3-10cm per year using Geodetic GPS by 2022 (Target: 6cm per year by 2026)
- Integrated tidal and flood management
 - Land acquisition support for increasing river capacity
 - o Continuation of coastal and river embankment construction
 - o Preparing the sea wall concept with the Central government
- Adequate provision of potable drinking water
 - Percentage of service access (of residential structures) to pipeline of safe drinking water sources of 65% (Target: 89.02% by 2026)

Reduction of NRW (non-revenue water) by 40% in 2022 (Target: 26% by 2030)

2. How should the various levels of government be consulting with local residents,

communities at large and businesses to fully incorporate their views and ensure their

needs are met?

- Participation of local communities and residents starts with Development and Planning (*Musrenbang*) at the Neighbourhood Level, this then moves to *Musrenbang* at the Sub-District Level at the city or Regency Level and then the Provincial Level.
- Simultaneously there is preparation of the Preliminary Regional Government Work Plan document (RKPD) through public consultation to completion of the preliminary RKPD, which then goes to the Regional Agency Forum.
- From *Musrenbang* Development and Planning migrates from:
 - Sub-District to The Regional Agency Forum
 - o City/Regional to Preparation of the RKPD Draft
 - o Provincial Levels to Preparation of the RKPD Final Draft
- The Final RKPD Draft then moves up to for submission to the Ministry of Internal Affairs where the Regulation Draft RKPD and the Final Draft RKPD are finalised.
- This is followed by the Enhancement of the Government Regulations of the RKPD and finally to the Establishment of the Regulations.

3. Which policies should the national, DKI and (where appropriate) local government be implementing for a more flood resilient future for Jakarta generally?

- Normalisation and naturalisation of rivers and reservoirs
 - Development and revitalisation of reservoirs in 7 locations
 - Naturalisation of rivers and reservoirs in 5 locations
- Development of beach embankments and downstream rivers
 - Length of critical embankments: 37km
 - 0 13.4km so far constructed (PUPR & DKI)
 - Planned for up to 2030: 23.7km (11km PUPR, 12km DKI)
- Polder system development and revitalisation

- o Plans for 76 polders
- Realised so far: 13 polders
- 0 Need to increase pump capacity: 44 polders
- Not yet constructed: 19 polders
- Development of infiltration wells and so-called 'bio pores' (vertical drainage)
 - o Development of vertical infiltration/drainage wells throughout DKI Jakarta
- Central-regional cooperation in spatial planning and Jabodetabekpunjur (All Jakarta) Flood Control
 - o Construction of the Ciawi Sukamahi Reservoir
 - Formulation of PR incentive/disincentive mechanisms for conservation of 13 upstream watersheds
 - o Development of the Ciliwung-KBT waterway diversion
- Jakarta Spatial Plan 2024/2030 (2012) (draft documents under revision)
 - o Environmental quality improvement
 - Water resources, infrastructure planning and development
 - River normalisation
 - Polder development and revitalisation
 - In-situ development and revitalisation, *embung* (pond) and reservoir
 - Coastal embankment development
 - Construction of the sea wall, etc.
 - Green open space quality and quantity improvements
 - Application of Indonesia Blue Space Index
 - Opening of green space on land that has not been developed and utilised
 - Providing incentives for the provision of green space
 - Implementation of a minimum performance green-blue index equivalent to 30% green open space from the area of service (plus 5% blue space? Not adopted yet)
 - Development of drinking water supply system infrastructure
 - Restrictions on the utilisation of groundwater
 - Development of a clean water pipeline network

- Development of water treatment plants
- Development of facilities and infrastructure for water resource conservation and water recycling in each or a group of several buildings
- Policy directions in Jakarta mid-term plan 2023-26 (See details on Slides 8, etc.)

4. Should policies continue to be technocratic (i.e. infrastructure-driven) in nature, or utilise more nature-based solutions, e.g. mangroves or more naturalistic riverbanks, or even solutions from the West such as Sustainable Urban Drainage Systems, 'S.U.D.S.', (i.e forms which are more water-absorptive)?

Policies and mitigation measures should be integrated, i.e. nature-based where possible and technocratic

5. Should the DKI and national government reconsider the NCIDC infrastructure and land reclamation projects in favour of other solutions? If so what would those solutions look like?

 The plan is already adapting, for example the Great Garuda is no longer happening due to the high costs associated with the plan and because the capital is moving to East Kalimantan Province in Borneo.

Workshop 4: Respondent 4 - Climate focused NGO

NGO director, plus two colleagues

Tuesday 20 June 2023 15:00

NGO Offices Kota Jakarta Selatan DKI Jakarta, Indonesia

1. Considering the history of planning policy around flooding, and its technocratic nature (canalisation, infrastructure-driven approaches) which have had mixed results in terms of flood mitigation and the associated negative impacts on local communities, e.g. kampung residents through demolition and eviction, how should the government at the national, DKI and local government be intervening?

- The perspective needs to change to see issues more comprehensively, both from the perspective of the government and the public, through the media
- Not just infrastructure How to adapt capacity of people on the forefront
 - Kampung Improvement Programme (KIP) 36 kampung established a political contract through engagement with the government
 - Gubernatorial decree, which established the Community Action Plans (CAPs)
- The approach to planning and engagement needs to be transformed to put people at the heart of the development process

2. How should the various levels of government be consulting with local residents, communities at large and businesses to fully incorporate their views and ensure their needs are met?

- Use of social media and apps such as WhatsApp are a practical way to gather input quickly
- Rockefeller 100 Resilient Cities event with the community was held as the Grand Hyatt, but no one attended, likely intimidated by the grand surroundings. Similar

challenge when events are held at government offices or police stations – Local residents who are already fearful of the authorities, are intimidated and stay away

- The WhatsApp tool has been more successful in engaging local residents and has resulted in clear feedback
 - Potential tool for the future for public participation

3. Which policies should the national, DKI and (where appropriate) local government be implementing for a more flood resilient future for Jakarta generally?

- Facilitating pumping services to all areas where needed
- Enforcing the 2007 Drinking Water Subsidy will increase the motivation for local people to connect with the municipal system.
- Businesses are pumping huge amounts of water since independence residences typically have 1 pump whereas businesses can have as many as 8 – Businesses need to comply with sustainable water use

4. Should policies continue to be technocratic (i.e. infrastructure-driven) in nature, or utilise more nature-based solutions, e.g. mangroves or more naturalistic riverbanks, or even solutions from the West such as Sustainable Urban Drainage Systems,

'S.U.D.S.', (i.e forms which are more water-absorptive)?

- Infrastructure needs to have built-in redundancies, multi-purposes, including learning from history
- Combined technical and nature-based approaches
 - Dual functionality spaces, e.g. parks which host sustainable drainage systems and water retention ponds

5. Should the DKI and national government reconsider the NCIDC infrastructure and land reclamation projects in favour of other solutions? If so what would those solutions look like?

- The government needs to reconsider the NCICD and JCDS.
 - They have erased the land reclamation islands

- There is currently consensus between the national and DKI governments Anies wrote a formal letter asking for the central government to reconsider the Great Garuda due to the natural gas fears
- This changes the perspective on how the coast is managed
- o Focus on livelihoods of local residents is needed
- Plans should be designed for and deliver demonstrable benefit to local people, not simply be about managing the water
- The Environment Agency rejected the initial EIA submitted directly to it, so it was resubmitted it at the provincial level with islands cut into smaller land reclamation parcels and later revised a number of times before being accepted.

Workshop 5: Respondent 5 – Local Indonesian University I

Participant:

Professor of Urban Planning and Infrastructure

Thursday 22 June 14:00

Online via MS Teams (Bandung & Jakarta)

1. Considering the history of planning policy around flooding, and its technocratic nature (canalisation, infrastructure-driven approaches) which have had mixed results in terms of flood mitigation and the associated negative impacts on local communities, e.g. kampung residents through demolition and eviction, how should the government at the national, DKI and local government be intervening?

- In my opinion, the technique technocratic approach is. It's a needed. Yeah, participate is OK, but not this is having to be an integrated approach. Yeah. And then for the integrated approach I think we need the technocratic. Network solution like a canalization and then infrastructure driven approach, but of course.
- I agree that it should be an integrated approach, not only in the EU but also in the national level and also in the because the theatre water set is also located in the area it's in West Japan, also in Jakarta, so it's near.
 The coordination between the region, but it's not mean that a Community participation, it's not needed yet to overcome the problem.
 But a community participation is also needed, but this is I think it's not the main yeah, the main solution. So, the 1st 1:00 we have to have a in an integrated technocratic network approach and then it's enriched by Community participation.

2. How should the various levels of government be consulting with local residents, communities at large and businesses to fully incorporate their views and ensure their needs are met?

- The most important thing is the great roads. But I mean technocratic. Yeah, like a top down. Yeah, top down the top-down approach from the government. But of course, community have to be included and consulted.
- You have to prepare the committee to prepare their resiliency.
- Let's say 50% of the people use their roof yet to get the at the water into their, let's say reservoir in their house. Yeah, not on from the roof. But if they utilise this concept, it also can help. Yeah, to reduce the runoff. So, we can see this is there are 2 approaches where from the community from the government this is like what you call as a technocratic network.
- Maybe I can use the term as a top-down approach from government. It should be combined with bottom-up approaches. With the bottom-up approach will explore or will deal with the demand. Yeah, the demand for the infrastructure, I mean, if the community can reduce water run-off through measures that capture excess water. This can reduce the demand for the infrastructure.
- For the second question community involvement is very important.

3. Which policies should the national, DKI and (where appropriate) local government be implementing for a more flood resilient future for Jakarta generally?

Flooding occurs in, different administrative regions: The problem is with a coordination yeah between these administrative regions. The ideal condition that we have to have the integrated planning for the entire watershed which includes Jakarta but other cities as well, and the agricultural areas around them.

4. Should policies continue to be technocratic (i.e. infrastructure-driven) in nature, or utilise more nature-based solutions, e.g. mangroves or more naturalistic riverbanks, or even solutions from the West such as Sustainable Urban Drainage Systems,

'S.U.D.S.', (i.e forms which are more water-absorptive)?

- Uh, yeah, I think it's a yes. Uh, like a mangrove. It's OK. Especially in the riverside.
- Yeah, but the most important thing. Like I already mentioned, like a community contribution to provide their reservoir in their home. Yeah, to get the rainwater. This is this is very important. Yeah. Because why? Because Jakarta has a very

limited land for water absorption and retention. Other forms of rainwater harvesting would also be preferrable.

 Other nature-based solutions such as green infrastructure, including green roofs could also be implemented, depending on the technical constraints and local context.

5. Should the DKI and national government reconsider the NCIDC infrastructure and land reclamation projects in favour of other solutions? If so, what would those

solutions look like?

- The problem with the NCICD and the JCDS is that it is reactionary to the problem of tidal inundations and land subsidence. It does not deal with flooding upstream, in the wider watershed.
- The financial and environmental impacts are considerable, and a detailed costbenefit analysis needs to be undertaken which would be available to the public and fully transparent.
- It is questionable whether the NCICD and JCDS will significantly reduce flooding.
- Regardless, an integrated nature-based and technocratic solution is needed which deals with both tidal flooding, land subsidence and upstream flooding, i.e. a solution for the entire watershed.

Workshop 6: Respondent 6 – Local University II

Participant:

Professor of Urban Design and Planning

Thursday 22 June 2023 16:00

Mercure Jakarta Jl H Augus Salim No 11 Gambir, Kota Jakarta Pusat, 10110 Jakarta, Indonesia

1. Considering the history of planning policy around flooding, and its technocratic nature (canalisation, infrastructure-driven approaches) which have had mixed results in terms of flood mitigation and the associated negative impacts on local communities, e.g. kampung residents through demolition and eviction, how should the government at the national, DKI and local government be intervening?

- There is a lack of coordination between the central and local levels of government

 A serious challenge to overcome with respect to flooding.
- Greater cooperation is needed between various levels of government, as well as across administrative boundaries.
- Better rationalisation of flood responses and lack of political scapegoating

2. How should the various levels of government be consulting with local residents, communities at large and businesses to fully incorporate their views and ensure their needs are met?

Kampung residents live adjacent to waterways

- Will we allow houses to remain next to the water or will we impose an easement as has been the case previously?
- o The link with informal livelihoods cannot be ignored
- Many proposals for 2-4 storey houses which keep the ground level free of flooding

3. Which policies should the national, DKI and (where appropriate) local government be implementing for a more flood resilient future for Jakarta generally?

- Waduk and polders are needed to control flooding in local areas
 - Local flooding is a big problem across Jakarta; flood typically last 3-5 hours
 - Water basins utilising SUDS and multi-uses (e.g. parks and water retention for part of the year)
- Water absorption wells on the street
 - How will these operate? Bio pores? Permeable paving?

4. Should policies continue to be technocratic (i.e. infrastructure-driven) in nature, or utilise more nature-based solutions, e.g. mangroves or more naturalistic riverbanks, or even solutions from the West such as Sustainable Urban Drainage Systems,

'S.U.D.S.', (i.e forms which are more water-absorptive)?

 An integrated, technocratic infrastructure-driven and nature-based solution for flood mitigation and drainage is needed

5. Should the DKI and national government reconsider the NCIDC infrastructure and land reclamation projects in favour of other solutions? If so what would those solutions look like?

- Overall, the plan is relatively good from a technocratic standpoint, however, there
 appears to be a hidden agenda for a new development of a new city or new
 communities catering to certain demographics and socio-economic groups.
- Separate the protective measures for the city from the development plans

- The current plans are okay for the city but the question of 'who are these developments for?' must be considered.
 - They appear to be for the wealthy and upper middle-class inhabitants of the city
 - As such they have little to do with flood protection
 - Not something that should be repeated.

Workshop 7: Respondent 7 – Jakarta community-based NGO

Participants:

- NGO director
- Senior team member

Sunday 25 June, 2023 18:30

Ya Udah Bistro Jl Johar No. 15 5 RT.5/RW.3 Gondangdia Kecamatan Menteng Kota Jakarta Pusat 10350 DKI Jakarta, Indonesia

1. Considering the history of planning policy around flooding, and its technocratic nature (canalisation, infrastructure-driven approaches) which have had mixed results in terms of flood mitigation and the associated negative impacts on local communities, e.g. kampung residents through demolition and eviction, how should the government at the national, DKI and local government be intervening?

- Regional-level coordination (especially with upstream cities/administrations) should be strengthened, perhaps developing a watershed-level agency or policy centre)
- New approach to flood-based zoning 15m from riverbank should be revised or integrated within a needs-assessment and context-specific framework. (Communities have suggested 5m as a more appropriate distance)
- Permeable surface development/flood management infrastructure as a part of project development regulations - for example artificial wetlands, green roofs targeted for water storage or at least impact assessment of how a building/complex will impact the hydrology of an area
- Focus on innovation to reduce the 'disaster' of flood events rather than just to manage the presence of water (community empowerment at the local/micro scale).

2. How should the various levels of government be consulting with local residents,

communities at large and businesses to fully incorporate their views and ensure their

needs are met?

- FGD model struggles to facilitate meaningful dialogue, tends towards one way 'notifying' about pre-determined policies
- Anonymous portal to submit concerns/ideas?
- Research regarding the impact of flooding on communities, not just the location and depth of water, to develop solutions to actual problems associated with flooding (which may be more urgent than the water itself)
- There is a need to develop/disseminate a flood vocabulary so that citizens can meaningfully participate in discussions
- Decouple high-risk flooding areas from high eviction risk

3. Which policies should the national, DKI and (where appropriate) local government be implementing for a more flood resilient future for Jakarta generally?

- Resilience needs to be established as a distinct priority, perhaps with a 'community resilience body' or 'community resilience framework' which allows local communities to identify their own vulnerabilities and suggest/request assistance to resolve them
- Budget should be available to develop laboratories/policy trials for innovation focused on resilience itself, adjusted for the needs and capabilities of specific locations & groups (at a minimum, there should be distinct approaches to each of the 3 flood types identified by DKI itself; tidal, local and downstream)

4. Should policies continue to be technocratic (i.e. infrastructure-driven) in nature, or utilise more nature-based solutions, e.g. mangroves or more naturalistic riverbanks, or even solutions from the West such as Sustainable Urban Drainage Systems,

'S.U.D.S.', (i.e forms which are more water-absorptive)?

- Nature-based solutions can still be technocratic, greenwashing is a very wellestablished response to flooding in Jakarta

- Solutions need to acknowledge the unique hydrology of Jakarta as being a megacity stretching from mountains with high tropical rainfall to a floodplain and estuarine delta. Nature-based solutions should focus on identifying and mapping the 'nature' before developing solutions
- Bottom-up solutions have no viable path to implementation at present there is an urgent need for mechanisms/institutions to facilitate this process

5. Should the DKI and national government reconsider the NCIDC infrastructure and

land reclamation projects in favour of other solutions? If so what would those

solutions look like?

- Land reclamations with both worsen flooding and displace the effects onto lower income communities while reinforcing the class-based inequality of floods
- Spearheading alternative urbanisms built with water in mind could present a longterm agenda for Jakarta, but will struggle to be sold to decision-makers
- It seems as if the only future for Jakarta is to learn to live with water.

Appendix **B**

Selected Larger Reproductions of figures and images from Chapters II, III, and IV



Appendix B: Selected larger reproductions of figures and images from Chapters II, III and IV

Figure 2.1: Batavia, 1681. NOTE: Image is rotated 90 degrees; north is to the righthand side.



Figure 2.2: Batavia and surroundings, 17th or 18th century. *NOTE: Image is rotated 90 degrees; north is to the righthand side.*





Figure 2.3: Batavia perspective etching, 18th century

Figure 2.4: Batavia in the 18th century, etching of a riot



Figure 2.5a: Kota Tua (formerly Batavia) today.





Figure 2.5b: Medan Merdeka (formerly the Koningsplein and Weltevreden) today.



Figure 2.6: Diagram illustrating the spine link between old Batavia (today Kota Tua) to the north (left) and Weltevreden (today Medan Merdeka) to the south (right).



Image 2.7: Diagram showing the key morphological areas of Jakarta, as well as the historic progression further to the South, starting in the late 18th and early 19th century with the administrative move from Old Batavia (today's Kota Tua) to Weltevreden, later in the early 20th century to Menteng and finally in the 1950s and 60s to Senayan Sports City and Kebayoran Baru (Ford, 1993; Cybriwsky and Ford, 2001; Kusno, 2011). Note also the more recent return to the north coast with developments at Pantai Mutiara in the mid-90s and Pantai Indah Kapuk (PIK) since the 2010s (Priatmodjo, 2022a and 2022b), as well as the linear high-rise and shopping mall typological development first introduced in the 1970s under Suharto and continuing today (Ford, 1993).











Figure 2.11: Linear development along Jl. R.S. Fatmawati





Figure 2.13a: Waduk Pluit before works





Figure 2.13b: Waduk Pluit after works carried out











Figure 2.15: Waduk Ria Rio after works carried out





Figure 3.1 Kampung Penas Tanggul satellite imagery and GIS-based diagram

3.1.1 2011 Pre-infrastructure improvements



3.1.2 2011 Post-infrastructure improvements



3.1.3 Open Street Map-based diagram by the author indicating changes to the urban form: Demolished structures (red) and the previous narrowed waterway (dark blue) now widened (light blue). *NOTE: Image is rotated 90 degrees; north is to the righthand side.*



Figure 3.2: Kampung Bukit Duri and Kampung Pulo satellite imagery & OpenStreetMapbased diagrams

3.2.1 2003 Pre-infrastructure improvements





3.2.2 2020 Post-infrastructure improvements




3.2.3 Open Street Map-based diagram by the author indicating changes to the urban form: Demolished structures (red) and the previous narrowed waterway (dark blue) now widened (light blue). *NOTE: Image is rotated 90 degrees; north is to the righthand side*.





Figure 3.3: Waduk Pluit satellite imagery & Open Street Map-based diagrams

3.3.1 Waduk Pluit, October 2013





3.3.2 Waduk Pluit, July 2015





3.3.3 Open Street Map-based diagram by the author indicating changes to the urban form: Demolished structures (red) and the previous narrowed water body (darker shades of blue) now widened (light blue) water body.



Figure 3.4: Waduk Ria Rio satellite imagery & Open Street Map-based diagrams

3.4.1 Waduk Ria Rio, February 2006





3.4.2 Waduk Ria Rio, August 2009





3.4.3 Waduk Ria Rio, July 2011





3.4.4 Waduk Ria Rio, May 2019





3.4.5 Open Street Map-based diagram by the author indicating changes to the urban form: Demolished structures in various stages (blue: by 2009, orange and pink: by 2019). *NOTE: Image is rotated 90 degrees; north is to the righthand side.*





Figure 3.5: Kampung Akuarium satellite imagery & Open Street Map-based diagrams

3.5.1 Kampung Akuarium and port, July 2011





3.5.2 Kampung Akuarium detail, 3 September 2017





3.5.3 Kampung Akuarium: Detail, May 2018





3.5.4 Open Street Map-based diagram by the author indicating changes to the urban form: Demolished structures in the initial stage (red: by 2015).



3.5.5 Open Street Map-based diagram by the author indicating changes to the urban form: Demolished and rebuilt structures in the later stages (orange initially as rebuilt by 2017).



3.5.6 Open Street Map-based diagram by the author indicating changes to the urban form: Demolished and rebuilt structures in the later stages (orange initially as later rebuilt a second time by 2018).



Figure 3.6 Kampung Kolongol, Tongol, Lodan and Kerapu in Sunda Kelapa, North Jakarta

3.6.1 The four kampung in 2009



3.6.2 The four kampung in 2023



3.6.3 GIS-based diagram illustrating buildings demolished in the four kampung between 2010-216. NOTE: Image is rotated 90 degrees; north is to the righthand side.





Figure 3.7: Kampung Kunir in Kota Tua satellite imagery

3.7.1 Kampung Kunir: February 2009





3.7.2 Kampung Kunir, January 2023





3.7.3 Kampung Kerapu GIS-based diagram illustrating buildings demolished between 2010-2016.





Figure 4.32: Satellite & GIS-based diagram analysis of Jakarta's northern coastline,

Western Section.

4.32.1 2010 Pre-infrastructure improvements and prior to land reclamation programme





4.32.2 2021 Post-infrastructure improvements with land reclamation well under way





4.32.3 Open Street Map-based diagram by the author indicating large-scale changes to the urban form: The newly completed seawall (solid red line) and the portion under construction (dotted red line), anong with the land reclamation created by the seawall separating the fishing communities from their boats. *NOTE: Image is rotated 90 degrees; north is to the righthand side.*



Figure 4.33: Satellite & GIS-based diagram analysis of Jakarta's northern coastline, Eastern Section.

4.33.1 2012 Pre-infrastructure improvements and prior to land reclamation programme at the port





4.33.2 2021 Post-infrastructure improvements with land reclamation of the port underway





4.33.3 Open Street Map-based diagram by the author indicating changes to the urban form: The newly completed seawall (solid red line) and the portion under construction (dotted red line), anong with the land reclamation created by the seawall separating the fishing communities from their boats. *NOTE: Image is rotated 90 degrees; north is to the righthand side.*





Figure 4.49: Satellite & GIS-based diagram analysis of the kampung at Kali Baru.

4.49.1 2014 Pre-infrastructure improvements





4.49.2 2019 Post-infrastructure improvements (with construction continuing)





4.49.3 Open Street Map-based diagram by the author indicating changes to the urban form: The newly completed seawall (solid red line) and the portion under construction (dotted red line), anong with the land reclamation created by the seawall separating the fishing communities from their boats. *NOTE: Image is rotated 90 degrees; north is to the righthand side.*



Figure 4.50: Satellite & GIS-based diagram analysis of Muara Angke sub-district.

4.50.1 2022 Pre-infrastructure improvements. NOTE: Image is rotated 90 degrees; north is to the righthand side.



4.50.2 Open Street Map-based diagram by the author indicating planned future changes to the urban form: The newly completed seawall (solid red line) and the portion under construction (dotted red line), anong with the land reclamation created by the seawall separating the fishing communities from their boats, and red buildings suggesting urban morphological change (Dovey, et al., 2019) typically imposed by the DKI government and Bappenas. *NOTE: Image is rotated 90 degrees; north is to the righthand side.*



Figure 4.51: Satellite & GIS-based diagram analysis of the Kamal Muara peninsula.

4.51.1 2021 Pre-infrastructure improvements





4.51.2 2023 Infrastructure improvements in-progress





4.51.3 Open Street Map-based diagram by the author indicating changes to the urban form: The newly completed seawall (solid red line) and the portion under construction (dotted red line), anong with the land reclamation created by the seawall separating the fishing communities from their boats. *NOTE: Image is rotated 90 degrees; north is to the righthand side.*





David Wallace Mathewson

Figure 4.52: Satellite & GIS-based diagram analysis of the kampung at Kali Blencong.

4.52.1 2014 Pre-infrastructure improvements





4.52.2 2019 Post-infrastructure improvements





4.52.3 Open Street Map-based diagram by the author indicating changes to the urban form: The newly completed seawall (solid red line) and the portion under construction (dotted red line), anong with the land reclamation created by the seawall separating the fishing communities from their boats. *NOTE: Image is rotated 90 degrees; north is to the righthand side.*





Figure 4.69: Satellite & GIS-based diagram analysis of Kampung Gedung Pompa, Kampung Nelayan and Kampung Bonpis

4.69.1 2021 Pre-infrastructure improvements



4.69.2 2023 Infrastructure improvements in-progress



4.69.3 Open Street Map-based diagram by the author indicating changes to the urban form: The newly completed seawall (solid red line) and the planned extension (dotted red line), anong with the land reclamation created by the seawall separating the fishing communities from their boats (dark blue), the area of potential morphological change (red), with the easement (blue dotted), as well as areas likely to be inundated (in blue).





