Political Ecology of Land Degradation and Social Impacts from Urban Expansion

(Karawang Urban Area, Jakarta Metropolitan Area, Indonesia)

by

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Through the rainy storm, sunburn, and icy blizzard, I dedicate this to my parents, who convinced me I could go this far and complete the final degree possible on earth. And to my wife and my children, to savor the fruits you deserve after your hard work.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

ABSTRACT

The thesis of this dissertation tells "two sides" of the planning story in Indonesia: an official story and an on-the-ground account to reflect the case of political ecology where future planning needs to bring the thought and the reality closer together. The case study is Karawang, which has been rendered invisible in the official and unofficial accounts of the uncontrollable development of Jakarta. The dissertation is structured into five chapters. The first and last chapters serve as introductions and concluding narratives, respectively, providing an overview of the research and its implications. The second chapter delves into the planning culture of urban trends and developments, employing a political ecology perspective to explore the history, politics, and utilization of natural resources and knowledge (Robbins, 2012; Turner, 2009; Goldman, Nadasdy, & Turner, 2011). It sheds light on the marginalization of Karawang in the face of rapid urbanization and expansion within the Jakarta Metropolitan Area (Firman, 1997; Winarso and Firman, 2002). In the third chapter, the focus shifts to prioritizing the voices of the people and translating their perspectives into constructive suggestions for the governing system. The intergenerational knowledge held by the community is emphasized as a valuable resource for fostering a more sustainable future (Beatley, 2012; Lehmann, 2011; Douglas & James, 2015). Building upon the knowledge and analysis from the previous chapters, the fourth chapter conducts a geospatial analysis to depict the socio-environmental conditions of Karawang. By questioning the existing planning culture and policies, the analysis highlights the land patterns, environmental degradation, and the need for a more holistic approach to planning. The chapter also integrates the social value emphasized in the third chapter into the geospatial analysis, recognizing the importance of involving the local community in shaping future urban

agendas. By improving the essence of maps to incorporate both biophysical information and the experiences of the people, a more comprehensive and valuable understanding of the region can be achieved (Casas, Sadat, & Urtasun, 2021; Beaulieu, 2002). Finally, the concluding chapter brings together the analyses and findings from the previous chapters to generate a forward-looking planning perspective grounded in political ecology. It aims to integrate the insights gained into future planning approaches, emphasizing the need for sustainable and inclusive development practices. Overall, this dissertation provides a critical examination of the planning culture in Indonesia, drawing on political ecology and local perspectives to inform more robust and effective planning strategies for the future.

Keywords: Political Ecology, Karawang, Marginalized Community

CHAPTER 1. INTRODUCTION

Understanding history is crucial for effective future planning. Sustainability, as defined by the Brundtland Report (1987), encompasses development efforts that meet present needs without compromising the ability of future generations to meet their own needs. The thesis of this dissertation tells two sides of the planning story in Indonesia: an official story and an on-the-ground account. These two sides reflect the case of political ecology where future planning needs are realized by bringing thought and reality closer together. The case study focuses on the town of Karawang, which has been rendered invisible in the official and unofficial accounts of the uncontrollable development of Jakarta.

This dissertation argues that the lack of reflection on past experiences and locals' perspectives contributes to the unsustainability of urban planning in Indonesia. Planners often overlook meaningful historical, cultural, and social contexts that can inform sustainable development practices. There has so far been a failure to consider and learn from past lessons.

Furthermore, inconsistent urban planning policies, which are influenced by private companies, exacerbate the problem. When policies are subject to changes driven by personal interests or when private companies have significant control over urban development, it can lead to a prioritization of short-term gains over long-term sustainability. This results in implementing pragmatic solutions that neglect environmental and social considerations. The dominance of private companies in urban development also plays a significant role. When private companies have a strong influence over the planning process, their profit-oriented objectives may overshadow broader sustainability goals. This imbalance undermines efforts to create

environmentally friendly and socially inclusive urban environments.

Overall, this dissertation argues that to achieve sustainable urban planning in Indonesia, it is essential to reflect on past experiences, incorporate the locals' perspectives, ensure policy consistency, and promote a more balanced and inclusive decision-making process that prioritizes long-term sustainability over short-term gains. To aid in this analysis, the opening chapter of this dissertation presents three themes:

- An approach to Political Ecology
- An outline of environmentally sustainable urbanization
- The research methodology of this dissertation

A. Introduction to Political Ecology in Urban Development with history, origin, and developing cases worldwide

Urban planning is an inherently political process shaped by the interests and aspirations of various stakeholders involved in decision-making for future development (Daniels, 2009). The United States has witnessed the influence of politics on urban development and the efforts to preserve the environment since the 19th century. Over time, the US has experienced different phases where scientific knowledge, government initiatives, and social advocacy have driven environmental planning (Daniels, 2009, p. 179). While progress has been made in achieving environmental balance, particularly in many European cities (Beatley, 2012), cities in the Global South face more significant challenges in advancing sustainability.

In the Global South, the influence of politics on urban development is often intensified when

governments prioritize economic interests over social equality and the well-being of the environment. This has led to uncontrolled development in many cities, even though it is widely recognized that such practices are detrimental (Lehmann, 2011). The Jakarta Metropolitan Area (JMA) case study in Indonesia exemplifies the consequences of uncontrolled development and the contentious debates between environmental and economic interests in the decision-making processes (Firman, 1997; Winarso and Firman, 2002).

To foster sustainable urban development in Indonesia, it is crucial to incorporate perspectives from the field of Political Ecology into environmental planning. Political Ecology (PE), which originated from cultural ecology and agrarian political economy, delves into the political dimensions of environmental decision-making and sheds light on why specific plans succeed in some areas but fail in others (Watts, 1983; Blaikie, 1985). PE, initially developed in the context of the Global South, is highly relevant for Indonesia's conventional planning approaches, as it enables a broader consideration of the historical, political, and economic factors that shape human-environment interactions (Blaikie, 1985; Robbins, 2012).

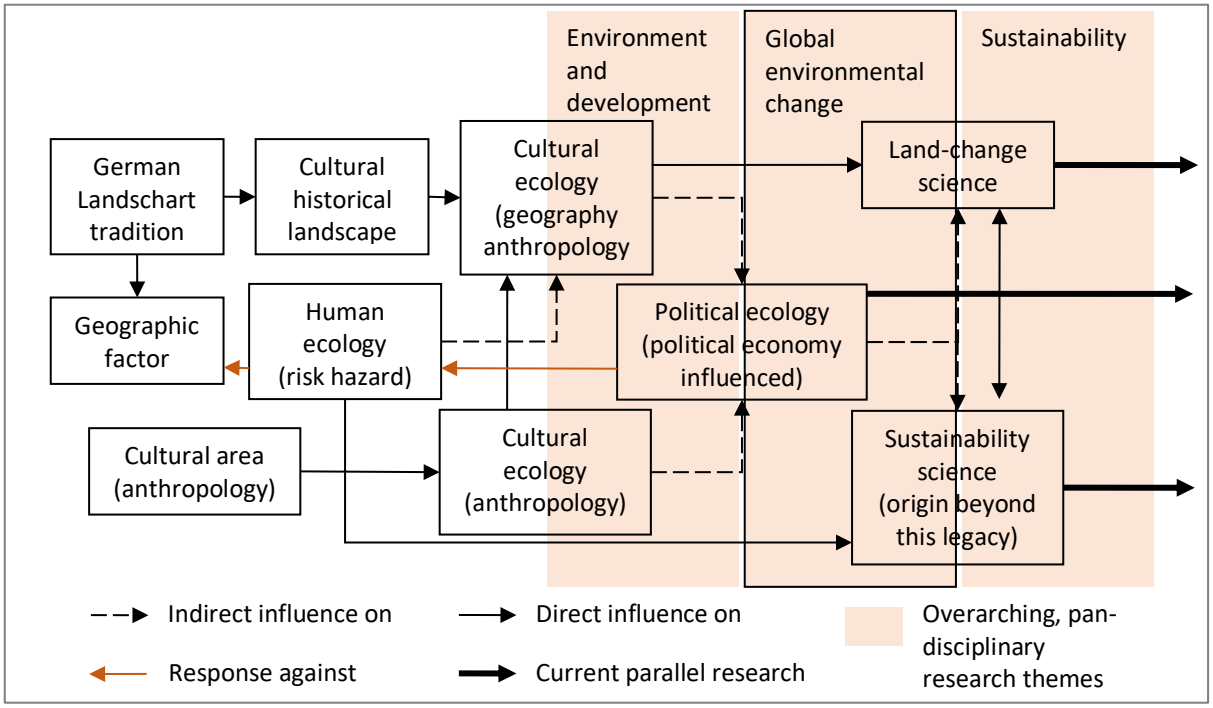
Integrating PE into planning practices can lead to a more comprehensive understanding of the complex interplay between politics, history, power dynamics, and the environment. This approach goes beyond a narrow focus on physical infrastructure and incorporates social and ecological considerations into the decision-making processes. Ultimately, by embracing political ecology, Indonesia can advance toward more sustainable planning methods that prioritize social equity and environmental well-being.

PE is an interdisciplinary field that explores the political dynamics surrounding resource use, environmental change, and their social representations (Goldman, Nadasdy, & Turner, 2011, p.

6). According to Turner (2009), PE involves a critical examination of history and place, offering a framework that integrates historical and contemporary patterns of resource use into environmental assessments, particularly in the developing world (Turner, 2015, p. 3).

The development of PE can be traced back through decades of scholarly inquiry into the relationships between people, culture, and the environment. Turner and Robbins (2008) present a conceptual framework that illustrates the intellectual connections underlying PE as seen below in Figure 1.1. The diagram showcases various perspectives that came before PE, including ideas about harmonious coexistence with nature, the importance of environmental aesthetics, considerations of risks and natural disasters, and the integration of culture and the environment. PE builds upon and critiques these perspectives, connecting them to global environmental change and sustainability to foster a more holistic understanding of the human-environment relationship. This framework aligns with the central themes of this dissertation, which applies PE's coherence to Indonesia's planning cultures. By encompassing diverse factors and drawing on historical insights, PE provides a wide lens to analyze the complexities of human-environment interactions.

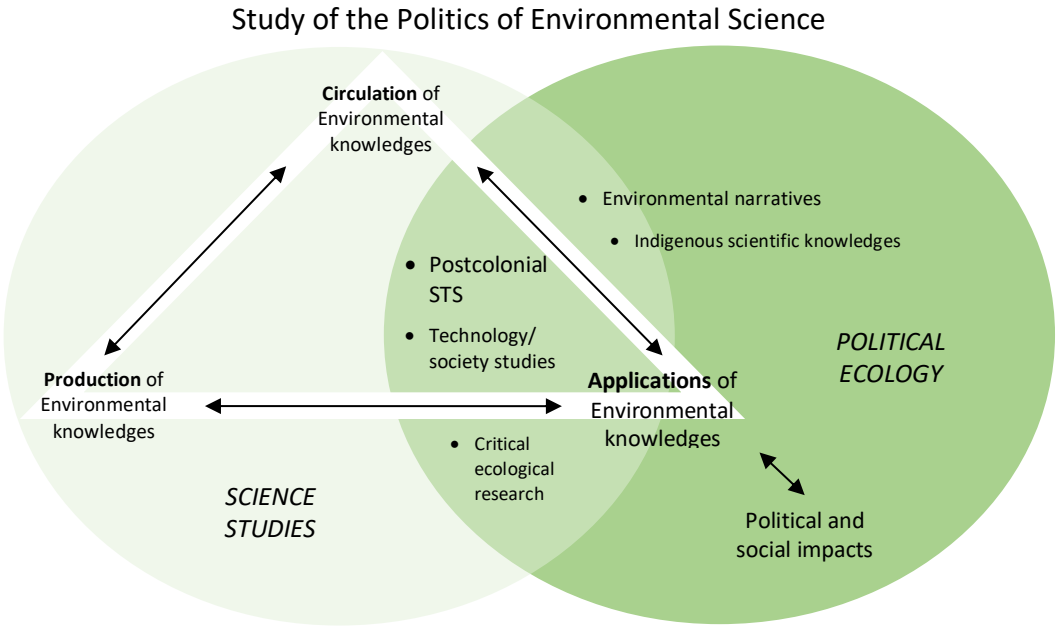
Figure 1.1 The Conceptual Origin of Political Ecology



Source: Turner and Robbins (2008, p. 297)

This dissertation recognizes the interconnectedness between PE and environmental science as they contribute to understanding environmental issues. PE expands the scope of environmental science by incorporating the political and social dimensions of environmental impacts, as illustrated in Figure 1.2 below. Environmental science encompasses producing and utilizing environmental knowledge, which intersects with PE, environmental history, technological applications, critical discourse development, and incorporating local narratives and Indigenous knowledge. Goldman, Nadasdy and Turner (2011) depict PE as sharing foundational principles with environmental science but placing greater emphasis on the application of environmental knowledge and its political and social implications. This diagram underscores the incorporation of environmental science principles in this dissertation's PE framework, highlighting the importance of integrating PE into planning and environmental science studies.

Figure 1.2 Nexus between PE and Environmental Science Studies



Source: Goldman, Nadasdy and Turner (2011, p. 5)

As depicted in the figure above, PE highlights the social and political impacts on the human subsystem within environmental science studies. PE emphasizes the significance of the environment for marginalized groups who face disproportionate environmental challenges, as well as those embedded within disadvantaged social, cultural, and economic power structures. PE aligns with other theories focused on social and environmental justice, and while it encompasses ecosystem research, its central focus remains on the human dimension. PE examines how human actions contribute to the outcomes of interactions within systems. By promoting coadaptation between humans and the environment and fostering the participation, engagement, and investment of diverse stakeholders, PE advances sustainability (Turner & Robbins, 2008).

One significant aspect of PE revolves around discussing conflicts over resources and

environmental politics. Environmental politics influence environmental change and ecological dynamics and depend on the scale of natural resources. The more crucial the resources, the greater the potential for conflicts between communities, competing interests, governance structures, and power differentials. The scale and magnitude of PE can vary when examining resources at regional or national levels. Environmental governance, on the other hand, pertains to how communities and societies organize themselves to extract or utilize ecological resources, control development, and distribute power and wealth (Robbins, 2012, pp. 75-76).

It is essential to acknowledge that all human activities impact the ecological system, regardless of the perceived distinction between humans and the environment (Turner, 2009). Choices must be made regarding the scope of analysis in PE research. While comprehensive, it is not feasible for PE research to encompass every aspect of the biophysical environment when investigating social-ecological change. Thus, it is crucial to set ecological and social parameters in PE research and be mindful of the limitations inherent in studying PE (Turner, 2009).

The term "ecology" in PE necessitates establishing data levels and parameters, as will be done in this dissertation. Ecology involves understanding the nonhuman world, including soil, climate, water chemistry, geomorphology, and other physical features (Turner, 2015). Turner (2015) highlights that ecology develops relationships with human culture, resulting in a mutual accommodation between nature and human institutions, practices, and cultures. Ecology generates patterns of resources and hazards that contribute to the social distribution of populations (Bassett & Fogelman, 2013). Chapter 4 of this dissertation will incorporate the concept of ecology to deconstruct it into geospatial analysis.

In the field of Political Ecology, Robbins (2012) identified five essential theses that serve as a

guiding framework for understanding the intricate dynamics between society, politics, and the environment as illustrated in Table 1.1. They provide valuable insights into analyzing environmental issues, resource conflicts, and conservation efforts, emphasizing the social, political, and discursive dimensions that shape our relationship with nature. These theses offer a critical lens through which environmental challenges can be examined, enabling a deeper understanding of how social, political, and cultural factors influence our utilization and management of natural resources.

Furthermore, in conjunction with the ecological-social parameters highlighted by Turner (2009), these theses form a solid foundation for the methodology employed in this dissertation. They establish the boundaries and parameters for investigating the case study and guide the analysis of the intricate interplay between humans and their surrounding ecosystems. By embracing the parameters, boundaries, and theses of Political Ecology, this dissertation seeks to unravel the multifaceted connections between society, politics, and the environment.

Additionally, PE encompasses a range of critical sustainability issues, including land degradation, desertification, deforestation, conservation, institutional governance, and the ecological impacts of urban development (Turner & Robbins, 2008). It also recognizes the importance of integrating Indigenous knowledge and studying social movements in order to address the challenges of urban planning in a sustainable manner. This inclusive approach promotes a holistic understanding of urban systems and supports the development of sustainable solutions in the face of rapid urbanization and environmental degradation.

Table 1.1 Five Theses of Political Ecology

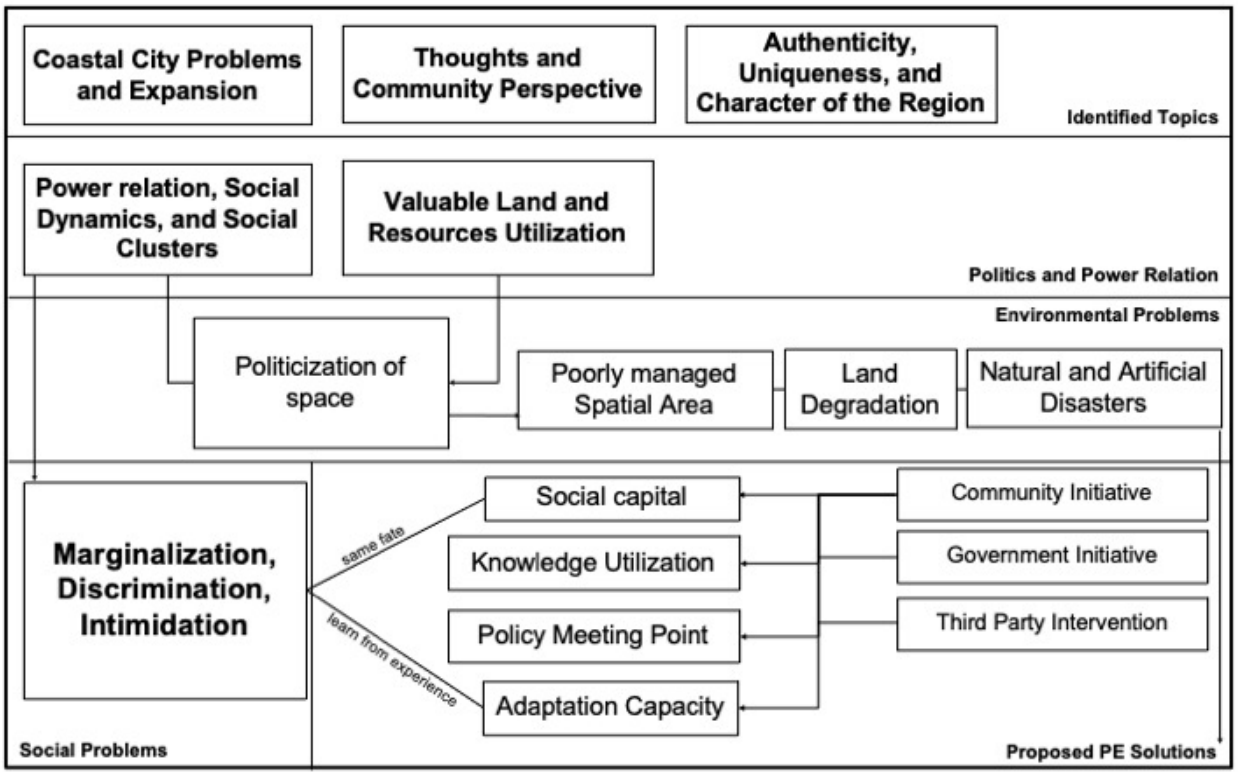
Thesis	*What is explained?*	*Relevance*
Degradation and marginalization	Environmental condition (especially degradation) and the reasons for their change	Environmental degradation, long blamed on marginal people, is shown in its larger political and economic context.
Conservation and control	Conservation outcomes (especially failures)	Usually viewed as benign, efforts at environmental conservation are shown to have pernicious effects, and sometimes fail as a result.
Environmental conflict and exclusion	Access to the environmental and conflict over exclusion from it (especially natural resources)	Environmental conflicts are shown to be part of larger gendered, classed, and raced struggles and vice versa.
Environmental subjects and identity	Identities of people and social groups (especially new or emerging ones)	Political identities and social struggles are shown to be linked to basic issues of livelihood and environmental activity.
Political object and actors	Socio-political conditions (especially deeply structures ones)	Political and economic systems are shown to be underpinned and affected by the non-human actors with which they are intertwined.

Source: Robbins (2012, p. 22)

B. Political Ecology perspectives from cases around the world

The relationship between planning and Political Ecology is relatively unfamiliar in Indonesia. Therefore, this subsection highlights relevant recent cases from different parts of the world, viewed through the lens of PE. This is to suggest how incorporating PE perspectives in planning for the Jakarta Metropolitan Area (JMA) can lead to more comprehensive and collaborative approaches to shaping future schemes and sustainable solutions. By examining these cases, planners can gain insight into how similar situations have been addressed abroad and how PE can contribute to resolving environmental challenges in JMA.

Figure 1.3 Analytical Framework from the PE Articles



In this section, I will introduce a selection of literature on PE cases that address various aspects relevant to JMA. These cases highlight three essential topics that could greatly benefit JMA: Coastal City Problems and Expansion, Thoughts and Community Perspective, and Authenticity, Uniqueness, and Character of the Region. By examining these topics through a PE lens, planners and policymakers in JMA can gain valuable insight into sustainable planning practices and address the specific challenges faced by the region.

- ***Coastal city problems and expansion***

As JMA is a coastal megacity, valuable lessons learned can be taken from Mangaluru and Ghaziabad cities of India as well as Lagos and Eco Atlantic Cities of Nigeria (Kadfak & Oskarsson, 2020; Karpouzouglou, Marshall, & Mehta, 2018; Ajibade & McBean, 2014; and

Ajibade, 2017). These four cities have similar situations. The local governments in these cities neglected the fishery communities and continued the massive expansion toward a modern city. These expansions created many environmental problems, primarily erosion and flooding. Because of this one-sided perspective, the government expected the communities to find alternative occupations, which did not happen. The sole consideration of the future of the city was a form of maladaptation that disrupted the balance of the ecosystem and biodiversity. The foundation of infrastructures, particularly in Lagos, was initiated in the English colonial era to build massive roads, harbors, housing, and business areas. However, the city was not designed to accommodate all social groups. Infrastructure was only built in the luxurious and exclusive parts of the city in favor of the colonials. These cities prevented local erosion, but in turn the lower area just outside these cities were at higher risk of erosion. The leading cause of the land degradation problems in these cities was poor urban management. These cities formed in an unstructured and inclement distribution of built area and expansion, followed by wretched drainage systems and a lack of infrastructure to overcome flooding events (Kadfak & Oskarsson, 2020; Karpouzouglou, Marshall, & Mehta, 2018; Ajibade & McBean, 2014; and Ajibade, 2017).

The power relations and politics that took place in these satellite cities segregated the poor and the middle class. The wealthier communities live in gated residences with access to filtered water. At the same time, the poor relied on highly contaminated water that threatened their food supplies and put their well-being in enormous hazard. These phenomena are treated as natural occurrences in urban expansion and development. Communities in the slum area are at the edge of survival and exposed to many health problems. They also were forced to deal with the damage and casualties of flooding events. Under the non-integrated systems, the backlash disadvantages the non-exclusive areas that were not only left alone without infrastructure and supporting

systems, but also had to withstand the negative externalities from the exclusive areas. More than half of the middle to lower-income groups lived together in an area and created slums. They do not live decently and adequately. It was an extreme situation between the futuristic city of the wealthy contrasted with a living hell next to it for the poor (Kadfak & Oskarsson, 2020; Karpouzouglou, Marshall, & Mehta, 2018; Ajibade & McBean, 2014; and Ajibade, 2017).

PE studies from these four literatures investigated different angles and found that effective planning moving forward accommodates small communities better and involves them as part of the city planning process. There, they found a meeting point. Without anyone looking at the larger context, the problem will snowball into a greater disaster. PE sees not only the phenomenon but also the power relations and politics surrounding the establishment of the cities, giving more explicit pictures and actors to explain the situation. These studies indicate the importance of looking at history to build the future, as noted in the PE principles. JMA also had a similar story from the Dutch colonial era, and the main structures are still standing and influence the current and future infrastructure developments. Looking at the history, PE also reminds us that a city contains different groups from different backgrounds that construct it. This perspective must be emphasized when speaking more about JMA. Planning practices did not see this thoroughly, but PE perspectives are able to put together a complete picture. A great lesson for JMA is to consider every group of residents when planning for the future.

- ***Thoughts and community perspective***

The cases of Sarno, Italy (D'Alisa & Kallis, 2016) and Christchurch, New Zealand (Cadiex, 2008) stress the urgency needed to seek a meeting point between the government and communities, as planning in these cases tends to fall almost always on the side of the

government without much consideration to the needs of the community. The city of Sarno is an excellent example of the government's forceful and one-sided decision to sacrifice an entire community. Because Sarno had long had the problem of erosion from the above-normal annual heavy rainfall, the city has undergone immense physical infrastructure developments with large channels, which later proved to be a maladaptation. It began with an ambitious, unsustainable, enormous, and expensive plan that was unsuitable for the geographic location; most projects were halted at the end due to the limited budget. From these interventions, communities were used to surviving with the prior warning system and relied upon the channels to prevent erosion. When projects were halted, they were confused and unable to sustain themselves. On the other hand, communities that resisted moving took the initiative to rebuild their homes from scratch after being devastated by the floods (D'Alisa & Kallis, 2016). Similarly, when most of the community decided to move to the suburbs in Christchurch, the government insisted that suburbs become green spaces, which later created an immense conflict (Cadiex, 2008).

The conclusions drawn from the two articles highlight the limitations of implementing purely physical solutions in interventions without listening to the perspectives of the community. Understanding the communities' perspectives before jumping to conclusions is essential. It also potentially saves a considerable amount of money where the capital can return to the community. These PE studies advise residents and governments to link land users' affairs and their practices on the ground. The connection between the two can result in an opportunity to improve cohesion and land value in the urban landscape. However, there needs to be a clear boundary between the use of land for urban activities and the green spaces that remain included in the development of cities.

- ***Authenticity, uniqueness, and the character of the region***

This chapter's final literature examples are case studies of Chao Phraya of Thailand and the outskirts of Phnom Penh, Cambodia (Morita & Jensen, 2017; Simone, 2008). Chao Phraya is a region in a delta area in Thailand, at the river's end before it reaches the ocean. A PE study tells the Chao Phraya story about a region that loses its identity after a century of Western urban planning. Since 1903, Thailand has appointed Dutch engineers to reform the land management of the delta, water, river, and irrigation system. Although the technology was advanced and similar to what was applied in the Netherlands, it was adequate for only about a century.

Chao Phraya was well-versed in the concepts of terrestrial and amphibious environments. In the context of Chao Phraya's familiarity with the terms, "terrestrial" refers to the land-based or land-dwelling aspects of the environment. On the other hand, "amphibious" pertains to the interplay between land and water. It encompasses the transitional zones between terrestrial and aquatic environments, such as wetlands, riverbanks, and estuaries. Chao Phraya's understanding of the amphibious nature of certain areas allowed him to navigate water bodies and their surrounding terrestrial habitats effectively. By the twentieth century, Chao Phraya went almost fully terrestrial. The 2000s flood devastated the region and became a great shock to their forgotten amphibious infrastructures. In 2006, the government requested residents to spare their land for water retention, repentance for neglecting the history (Morita & Jensen, 2017).

On the other hand, Dey Krahom was a suburb of Phnom Penh and the destination for many marginalized poor and low-income groups. These groups were fleeing due to the significant and rapid changes of the city after being remade following the end of Khmer Rouge Regime in 1975

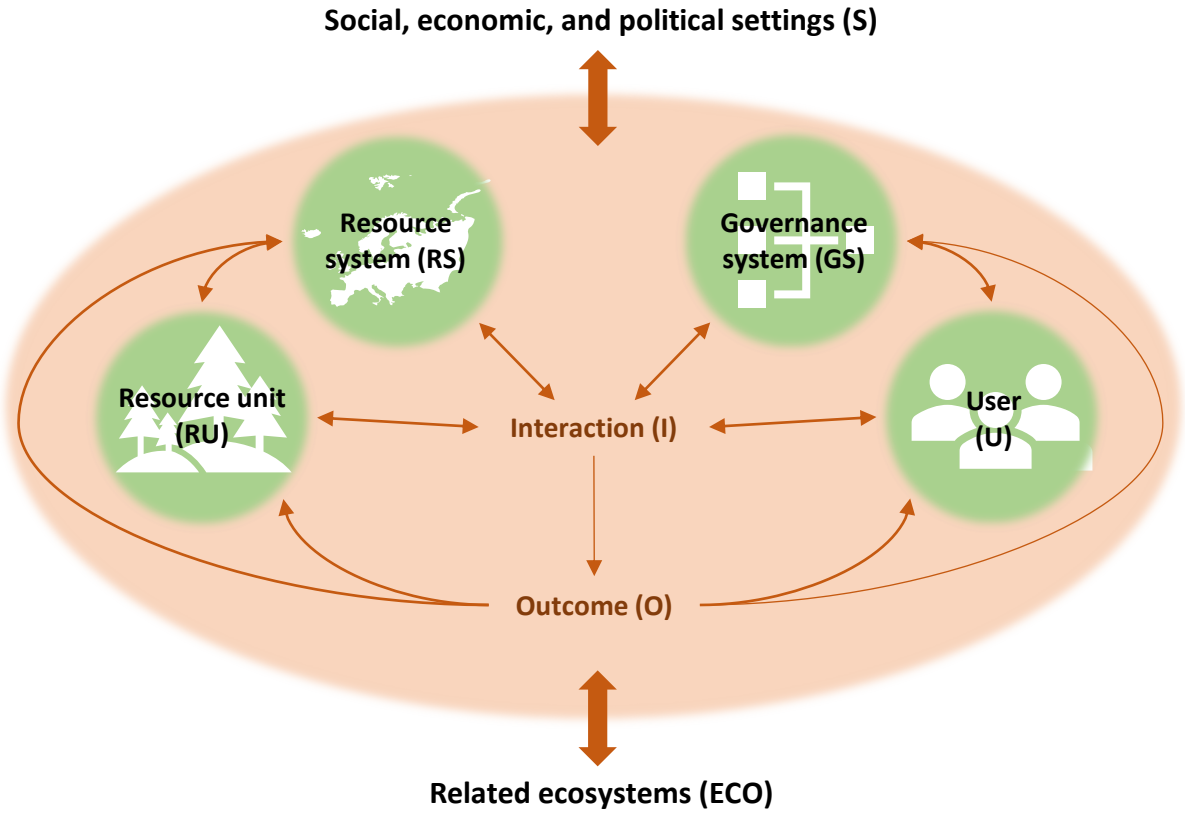
– 79 with foreign loans. This area has diverse communities. Each social cluster has its self-maintenance practices, obligations, and reciprocities with complex social relations. The ability of many individuals to make a livelihood depends upon networks and negotiations amongst others. People rely on shifting between different jobs to survive with better wealth, as staying in the same job does not guarantee a better living (Simone, 2008).

In the end, the article about Chao Phraya suggests reconciling terrestrial and amphibious infrastructures from their early stage of the history of their initial character and identity. Then, it indicates finding ways to make new delta worlds in which water, people, and other beings can find ways of living together. Similarly, without the matters PE calls attention to, the Dey Krahom will only be seen as neglected, poor, and the center of crime and poverty. Nevertheless, PE helps to see things differently based on their nature and character. Without a more comprehensive view of a problem, it is impossible for planners to see a bright light from inside. These two cases become a reflection of applying a more contextual approach to a city's future development and elaborating on the history and the region's character. Urban residency is valued for its potential for putting together collaborations where individuals can hedge their bets, pursue disparate, even contradictory, aspirations, and different ways both to recognize themselves and support these multiple recognitions. The city is a way of keeping things open and materializing ways of becoming something that has not existed before but has been possible all along.

C. Ostrom's socio-ecological system (SES)

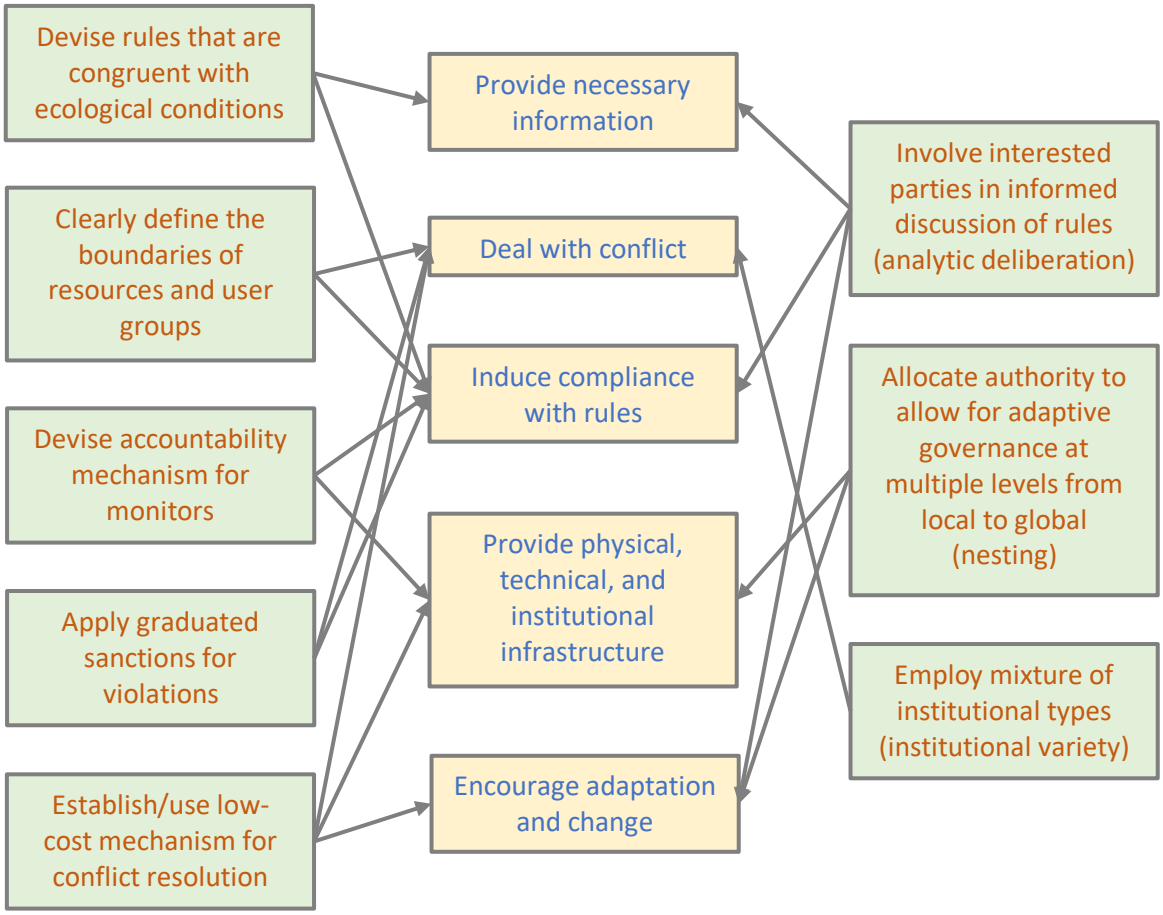
Another essential idea of the human-environmental relationship related to institutional and resource organization comes from Elinor Ostrom's concept of a Complex Social-Ecological System (SES) (Anderies, Janes, & Ostrom, 2004; Dietz, Ostrom, & Sterm, 2003; Ostrom, 2007; and Ostrom, 2009). Ostrom defines SES as "an ecological system intricately linked with and affected by one or more social systems; an interdependent system of organisms or biological units while Social simply means tending to form cooperative and interdependent relationships with others and both social and ecological systems contain units that interact interdependently, and each may contain interactive subsystems as well" (Anderies, Janssen, & Ostrom, 2004, p. 4). Within the context of SES, Ostrom also explains the struggle of governing the commons (individual desires to exploit the natural resources) and that the universal solution, or what she called a panacea, in most cases does not work to resolve the complex human-environment problems to be sustainable over time (Dietz, Ostrom, & Sterm, 2003; Ostrom, 2007). Ostrom emphasizes in many of her articles the urgency of developing the framework and set of variables for the different case studies associated with the social and ecological system of the resources (Ostrom, 2009). Another article of hers also describes the complexity of the socio-ecological system itself (Liu, et al., 2007).

Figure 1.4 Ostrom's Core Subsystems in a Framework for analyzing SES



Source: Ostrom (2009), p. 420

Figure 1.5 Ostrom's General Principles for Good Governances in SES



Source: Dietz, Ostrom, Stern, 2003, p. 420

Although Ostrom does not mention PE as it is described in this dissertation, her perspective relates to my thoughts from several standpoints: (1) the human and environmental relationship is a complex system; (2) there is a need to break down the environmental issues into frameworks and the factors and variables associated with different cases; (3) the universal solution (panacea) is not sustainable. The figures above illustrate Ostrom's views about her idea of the subsystems within SES and the principles governing the SES, which will be beneficial to be reviewed further for this dissertation as benchmarks to evaluate my case study.

D. What role can PE play in urban development and planning policies in Indonesia?

The initial context from which the field of Political Ecology emerged was the increasing trends of land degradation caused by deforestation in countries in the Global South. A similar situation was happening in Indonesia during the 60s. The establishment of Act No. 1 in 1967 about foreign investment, accompanied by Act No. 6 in 1968 about domestic investments, triggered the massive exploitation of Indonesian natural resources (Ministry of State Secretariat, 1967, 1968). The New Order era, when Suharto was president, applied a more modernistic ideology where developments were marked by the transition from a traditional community into a modern lifestyle. Thus, the vision of development at that time was to pursue solely economic growth (Muthmainnah, Mustansyir, & Tjahyadi, 2020).

The legislation to maintain the environment in Indonesia first began in 1982 with the establishment of Act No. 4, about the Basic Provisions for Environmental Management (Ministry of State Secretariat, 1982), which was later updated in Act No. 23 in 1997 regarding Environmental Management (Ministry of State Secretariat, 1997). However, it was difficult to prioritize the environment in practice as there were many overlaying policies and conflicts with other regulations. After the overthrow of the New Order in 1998, the national government updated the approach in the 2009 Act of 32 about the Protection and Management of the Environment. It was said to be more balanced and supportive of equity. Unfortunately, a similar situation occurred when this policy went against many conflicting regulations. Accordingly, the urban developments that focused on urban expansion and economic growth ignored environmental concerns and left the act meaningless. Ignorance of the environment at the time resulted in ecological issues and conflicts within society. At this time, the top five causes of the

disputes in cities and urban area were pollution, extensive mining, deforestation, a decline in fisheries, and issues related to plantations (Walhi, 2018).

Despite several attempts since 1960, Indonesia not had an increasing pattern of better environmental management overall. Efforts toward the protection of ecological resources have mainly halted. As a result, environmental problems and land degradation have occurred in many regions of Indonesia. Indonesia's national disaster management agency reported that the recorded disasters from 2008 to 2017 were dominated by hydrometeorology-related disasters (about 95%), and the remaining 5% were geologically related (National Agency for Disaster Countermeasure, 2018). These phenomena illustrate Indonesia's ecology crisis, which might escalate further if no mitigation is taken. It is therefore essential to reflect on the idea of shifting modern lifestyles to aim and provide sustainability.

Although the academic idea of PE is not yet widespread in Indonesia, the approach of PE is nevertheless similar to existing concepts and practices of participatory community development. The strengthening of the community as an actor in the governance of natural resources through its local knowledge (*kearifan lokal)* has been noted in the history of Indonesia insofar as society has adaptive value with nature thanks to *kearifan lokal* (Suhartini, 2009). In some Indonesian regions, *kearifan lokal* becomes a guide in managing natural resources. For example, the Balinese apply the *subak* system in agricultural water governance (Jati, 2012). In addition to *subak*, there is also the concept of *tirta*, which means water as a source of life, so the people of Bali are reluctant to pollute the water (Jati, 2012). In Papua, there is a ban on indiscriminate logging because forests are considered *mama* that provide food sources for the community. In the marine community in North Maluku, *sasi* law applies, namely banning fish hunting during

certain months because continuous hunting will eliminate fish (Jati, 2012). The incredible usefulness of local wisdom should be affirmed as a paradigm of public policy on natural resource governance and as a participatory step of the community calling for its environmental conservation aspirations.

Indonesia's top-down approach and national-centered development has involved detailed, mechanistic confining regulations that typically do not leave much room for the local government and regions to improve. Decentralization functions a shadow step to create more dependencies on the national government, leading to a re-centralization. The lens of PE may provide a direction for moving planning policies forward in Indonesia in order to prevent further conditions as seen in the past decades. PE in the urban development and planning policies of Indonesia and other critical, constructive thinking are overlooked due to the financial dependencies on the national government. From a different point of view, the national government urgently requires a more holistic, comprehensive, multi-perspective approach to set a trajectory for a transformative future in which science and planning are no longer separated.

E. The idea of Green Urbanism and Sustainable Planning: origins, history, and application

This sub-section presents some planning ideas that aim to advance beyond the conventional notion of urban design toward understanding how humans may achieve sustainability goals. Campbell's Green City, Beatley's Green Urbanism, Spirn's Ecological Urbanism, Steiner's Landscape Ecological Urbanism, and Liu's Integrated Studies of Coupled Human and Natural

Systems below share similar views toward Sustainable Development in planning. They value the more profound connections in human-environmental systems. They require a more holistic approach to get to the meeting point of economic stability and environmental preservation. Most of all, they point out authentic characteristics and identities in each case. I perceive that all these ideas are consistent with analytical perspectives of PE. However, the elaboration between Planning and PE has not yet explored to its fullest potential yet, especially in Indonesia. Each of these ideas will be briefly described below.

The idea of sustainable development has been embedded in the field of urban and regional planning since its inception. Accordingly, scholars, academics, and students affiliated with this discipline strive to incorporate the idea of sustainable planning into their work. The United Nations also applied this concept to their program, Sustainable Development Goals, as a follow-up to the Millennium Development Goals.

Scott et al. (2016) and Campbell (Fainstein & DeFilippis, 2016) present a triangular model (economic, environment, and the meeting point of social justice, economic opportunity, and income equality) to explain the divergent priorities in planning to attain the Green City of Sustainable Development (see Figure 1.6). They argue that translating environmental, economic, and political thought across disciplines is not enough. They explore the socially constructed view of nature to overcome the dilemma of 'humans vs. nature' or 'job vs. environment'. They assess that the triangle is the pillar in planning, which requires incorporating attempts toward sustainability.

Figure 1.6 Three Pillars of Planning for Sustainability

Source: Scott Campbell in Fainstein & DeFilippis (2016, p. 218)

Beatley et al. (2015) argue that a sustainable lifestyle has already been achieved in many European cities. Their intent is to disseminate this success story to other cities and countries in the world. They promote the idea of Green Urbanism and Sustainable Mobility with practical examples from Europe. Some of these examples are integrated public transportation systems with the land use plan, strong disincentives for private vehicles, a great encouragement to non-motor cars, energy efficiency, and zero waste policies.

Spirn (2011) promotes the idea of ecological urbanism to design resilient cities. She defines ecological urbanism as the relationships between living organisms and their environment and the processes that shape both. She embraces and promotes the idea that the future of humanities lies in how to adapt to environmental challenges. She proposes that ecological urbanists have a significant role in producing safer and healthier urban environments and creating a feasible, tangible, and legible system to support life and change perceptions. She suggests implementing ecological urbanism into urban design, as the interaction between organisms and the natural

environment is crucial. Steiner (2011) adds to this idea with landscape ecological urbanism to promote three key points. First is to advance the concept of aesthetic understanding, not only to design a beautiful view but also to appreciate and preserve the environment. The second is to explore in-depth understanding of human agency in ecology, and third, to acquire reflective learning through continuous practices.

Lastly, many scholars, including Marina Alberti and Eleanor Ostrom, introduced the integrated studies of coupled human and natural systems (Liu, et al., 2007) to the planning field. They present that the social and natural system shows different characteristics between space, time, and organizational units. Moreover, the study also shows nonlinear dynamics with thresholds, reciprocal feedback loops, time lags, resilience, heterogeneity, and surprises. They conclude their research with four significant features: complex interactions and feedback between human and natural systems; interdisciplinary involvement of ecologists and social scientists in simultaneous dialogue; generation of tools from different disciplines; and "simultaneously context-specific and longitudinal over periods long enough to elucidate temporal dynamics" (Liu et al, 2007, p. 1513). In other words, their study depicts the voluminous benefits of profoundly exploring both human and natural systems through the complex systems within urban planning.

PE resonates with the studies above to build a powerful exploration of human-environmental relationships. PE emerges from social and environmental justice ideas about utilizing natural resources where it values cultures, history, and authenticity (Turner & Robbins, 2008; Robbins, 2012; Peet & Watts, 2004). I can relate the principles of sustainable development planning and all the above studies' findings under the umbrella of PE to note that there are political powers and domains that influence future planning decisions.

Political Ecology (PE) is meaningful to sustainable urban and regional planning. PE recognizes humans and acknowledges ecology. In PE, humans and the environment are equal and mutual. In the urban context, Urban Political Ecology (UPE) encourages an integrated and relational approach to discovering urban landscapes' interconnected economic, political, social, and ecological processes (Heynen, 2014). For example, scholars of UPE continue to involve and associate the "binaries, boundaries, margins, and limits between urban and natural environments and within urban socio-natural processes and politics" (Heynen, 2014, p. 600). PE also addresses environmental politics and environmental governance (Robbins, 2012). In my study to follow, PE accompanies urban planning to make clear the complex connections between humans and environments in urban spaces. PE provides a complete framing for urban planning to prepare a better system where nature, modern life, and culture coexist.

The most significant challenges toward Sustainable Development are the general and unrealistic models that undermine each area's authenticities, unique characteristics, and identities. In addition, there needs to be political will to attain environmental goals. Moreover, in many cities in the Global South, pursuing economic interests often takes precedence over finding viable solutions to environmental issues. Planning culture in Indonesia, in particular, is not integrated with the infrastructures and natural resources. On top of that, there is an eminent sense of competition between municipalities (Firman, 1997).

F. Methodology and outline of the dissertation

The thesis of this dissertation tells the two sides of the planning story in Indonesia: an official story and an on-the-ground account. This reflects the approach of PE, showing that future

planning needs are addressed by bringing thought and reality closer together. The case study is Karawang, which has been rendered invisible in the official and unofficial accounts of the uncontrollable development of Jakarta. This is also a story of land degradation. The region has been integral to Jakarta's successful agriculture and food provision. Fieldwork data also show that the residents of Karawang have been affected by planning policies such as they are, and they respond in unanticipated ways. This analysis brings together the official and on-the-ground perspectives to allow Karawang to be considered in sustainable planning.

This research depicts the current environmental problems and the practices of planning and development policies in the Global South, especially in Indonesia, to see whether the policies have effectively provided solutions. Observing JMA's intended directions for different groups of people is also essential. Under the perspective of PE, the territory of decision-making is political, not only at the level of national government but also from the community's grassroots. Social dynamics and power relations influence decision-making at all levels. Politics influence how people act toward the environment and natural resources. Therefore, it is vital to have a robust exploration of the different structures in the community.

This research goes beyond the governing documents and the Jakarta Metropolitan Area's latest research, focusing on Karawang as a region that has been environmentally and politically impacted by the JMA. The approaches to solving developmental problems show that Indonesia's typical planning approaches are not interdisciplinary. Thus, the multidisciplinary research proposed here intertwines Political Ecology, Sustainable Urbanism, and the consideration of the relationship between people and the environment to contribute to the current research on the urban development of Indonesia. It is expected to provide a new perspective to solve Indonesia's

problems comprehensively and attenuate the mainstream of Indonesia's policies that tend to be segmented, sectoral, and disintegrated.

The main research question described in this dissertation is: "**How can future urban development understand social and environmental changes?"** Then, the main arguments following the research question are as follows:

A. *Karawang has never been in the picture since the beginning of the JMA expansion due to the emerging planning culture in Indonesia (Chapter 2)*
B. *Planning culture is shaped by different views among planners, governments, and community (Chapter 2)*
C. *There is a need to translate the thoughts and perspective of the community for future urban development (Chapter 3)*
D. *Maps and spatial analysis can better elaborate the impact of the development and expansion as well as the livelihood of the community (Chapter 4)*

The research methodology of this study consists of three robust stages, which are outlined below:

1. **Thousand years of JMA's environmental history**

The research commenced in 2018 with a review of relevant literature focusing on Indonesia's environmental history and planning culture, specifically the JMA, and then this exploration subsequently narrowed down to the case study of Karawang. The data collection phase traversed from 2020 to 2022. In 2020, the initial data collection primarily involved gathering secondary data from previous projects, governmental sources, and colleagues with expertise and direct

involvement in JMA and Karawang.

As part of the research process, archives were consulted, covering different historical periods from the early stages of civilization around Jakarta to the post-modern era. Chapter 2 of the dissertation provides a concise yet significant history crucial to understanding the research context. An extensive summary of Jakarta's history is compiled in the appendix for reference and further exploration. These historical insights serve as a foundation for the subsequent analysis and examination of the planning practices and environmental issues in JMA and Karawang.

2. Deep exploratory interviews

The second stage of this research involved a comprehensive exploration of the community of the Karawang urban area, in line with the principles of PE. To achieve this, interviews were conducted to capture the experiences and perspectives of the community members. The interview questions were carefully designed to encourage open expression and facilitate sharing of residents' thoughts and experiences. These questions were open-ended, allowing for a more organic and unrestricted flow of information. The snowballing method was also employed, whereby interviewees were encouraged to recommend or refer others who could provide valuable insights.

In addition to community representatives, interviews were conducted with individuals from diverse backgrounds, including academia, planning practitioners, journalists, and representatives from the national and local governments of Jakarta and Karawang. This approach ensured a comprehensive and multi-perspective understanding of the intergenerational experiences and lessons learned regarding urban development and land degradation in the Karawang urban area,

particularly with the ongoing expansion of the JMA. The outcomes of these interviews yielded a rich and diverse collection of narratives, providing valuable insights into the complex dynamics at play.

Field interviews were conducted over five months in 2021 (August to December) and three months in 2022 (July to September), comprising Phase 1 and Phase 2 of the research. To ensure the integrity and security of the data, all interviews were recorded and stored within a secure cloud computing system provided by the university. Strict measures were taken to protect the privacy and rights of the interviewees. To maintain confidentiality, no personal identifiers or photographs were included in the documentation of the interviews. This approach was guided by the research ethics boards of UW Madison according to standards of protocols of the United States, ensuring that the research adhered to the highest ethical standards and respected the privacy and confidentiality of the participants. Following these ethical guidelines, the study aimed to create a safe and respectful environment for participants to share their experiences and perspectives.

Due to the unprecedented circumstances of the COVID-19 pandemic, the research faced significant challenges during the initial phase. Due to the restrictions imposed to curb the spread of the virus, health precautions and many casualties prevented direct access to the community, and the fact that the country was under a strict lockdown, resulting in limited mobility. Despite these constraints, the research adapted by conducting most interviews online using Zoom and other virtual platforms. This approach allowed for continued engagement with participants while prioritizing their safety and well-being. By the end of Phase 1 (August to October 2021), 19 interviews were successfully conducted. The specific details and demographics of the diverse

pool of interviewees are provided below, demonstrating the breadth and depth of the collected data:

- 8 community representatives, including news reporters,
- 4 government employees (2 from the national government, 1 from the Jakarta government, and 1 from the Karawang government),
- 1 urban planning practitioner (consultant).
- 6 planning lecturers.

The second phase of the field survey occurred from July to September 2022, during a relatively stable period of the COVID-19 pandemic when social distancing measures had been relaxed. Taking advantage of this improved situation, I resided within the Karawang urban area, which served as the case study location, allowing for a more immersive research experience. During this phase, 27 families living in and around the Karawang urban area were interviewed. The interviews were designed to be approximately 90 minutes on average, providing ample time to delve into the interviewees' thoughts and perspectives. The interviews were conducted naturally and unobtrusively, ensuring no interference or influence toward desired outcomes. This approach fostered open and honest discussions with the interviewees, allowing their perspectives to emerge authentically.

The selection of interviewees aimed to capture a diverse range of participants from different socioeconomic backgrounds and occupations. This approach ensured that the research encompassed various perspectives representing middle- and low-income households. By including a broad range of backgrounds, the study gains comprehensive insights into the experiences and viewpoints of different population segments within the Karawang urban area.

Overall, the second phase of the field survey provided an in-depth exploration of the community's perspectives, allowing for a nuanced understanding of the issues related to urban development and its impacts on the local population.

3. Geospatial Analysis and Methodology

In this dissertation, geospatial modeling and analysis were employed to assess the biophysical characteristics and land degradation of the Karawang urban area. Chapter 4 of the dissertation comprehensively describes the modeling process and presents research findings integrating spatial context with socio-cultural analysis. The geospatial analysis in this study draws upon the examination of 14 different GIS land analysis models implemented in cities worldwide. Through synthesizing the insights from these multiple works and considering the specific contextual conditions of urban development and data availability in Indonesia, a suitable method was developed specifically for the Karawang urban area. The aim was to ensure the model was practical and applicable to the local context.

The developed model incorporates weighting analyses and utilizes each indicator's Analytical Hierarchy Process (AHP) methodology. A total of 31 indicators were synthesized into ten parameters and three components, enabling a comprehensive and holistic assessment of the land analysis. The results of the land analysis, including the outcomes for each indicator, parameter, and component, are detailed in Chapter 4. Visual illustrations of these results can be found in the appendix section, providing further clarity and supporting the research findings.

By employing geospatial modeling and analysis, this dissertation enhances our understanding of the biophysical characteristics and land degradation in the Karawang urban area. Integrating

spatial analysis with socio-cultural factors contributes to a comprehensive assessment and provides valuable insights for sustainable urban development planning.

Accordingly, this dissertation consists of four substantive chapters following the introduction as the first chapter, as follows:

Chapter 2. Planning Culture and History of JMA to Karawang

The second chapter discusses the relationship between government and planners, historically and through Indonesia's decentralization era, focusing on how the planning discipline began and developed over time. It focuses on the different stages of history: colonialism, the New Order, and the period which reflects the vision and accomplishment of planning in Indonesia. The latter sections of the chapter will shift to the growing influence of Jakarta's authorities and decision-makers in the development of policies, which has created the planning culture in Indonesia up to this point as a national government that influences all the local policies.

This chapter claims that Jakarta's development process has resulted in land degradation that affects the locals. Despite some efforts, there has been no control over the development of Jakarta. This has also suggested that Karawang emerged as an area of manufacturing and food supply for the city but was not included in the vision of JMA, of which it was not officially a part. Most importantly, I will elevate the history of Karawang, which has always been a supporting system toward all the recurring phases and developments of Jakarta. Karawang bears significant environmental, growth, and expansion externalities while Jakarta continues to be a megapolitan city.

Chapter 3. Socio-Environment Planning Analysis of Karawang Urban Area

The third chapter narrows the perspective to the community's point of view. I aim to understand the impact and effects of decades of planning and development policies on humans and about the place from their perspectives. This represents a contrasting view to that of government and planning practitioners. I have engaged with the marginalized community of the Karawang urban area to get their perspective. This chapter is where the people reveal and share their intergenerational stories. Also, this chapter aims to explore and translate their thoughts and views into future constructive suggestions that work better for their well-being as an essential factor and element of the city. This chapter also focuses on one area of the Karawang urban area, Karangligar, to present a unique case for applying PE to illuminate the livelihoods of people living in an undesired and neglected environment. Continuities in their life confirms the PE idea of environmental governance (Robbins, 2012) and alternative governance structures (Ostrom, 2007).

Chapter 4. Environmental History and Multi-Criteria Comprehensive Land Analysis of Karawang Urban Area

The fourth chapter of this dissertation begins with the brief history, land characteristics, and the ecological degradation of the Karawang urban area in association with Karawang's one-sided relationship with Jakarta and the megacity's expansion. The second section continues with the identification and boundaries of the Karawang urban area, as they are defined conceptually in this dissertation. The final section of this chapter concentrates on the application of geospatial analysis to develop the land analysis of Karawang Urban Area for planning purposes, incorporating findings from similar GIS analyses. It will present a better picture of the latest geo-environmental conditions, and compare these to those of the past decade.

Chapter 5. Conclusion and Moving Forward

The dissertation's last chapter returns to the overall underlying question and synthesizes the arguments discussed in the previous chapters. This dissertation attempts to contextualize the situation from different points of view in order to recommend future strategies for the constellation of the center and peripheries for sustainable megapolitan development. This chapter also recommends moving forward from the current state of Karawang urban area, applying the lens of Political Ecology and Sustainable Urbanism into the picture to combined with the expressed message and ideas from the community.

CHAPTER 2. PLANNING CULTURE AND HISTORY FROM JMA TO KARAWANG

This chapter delves into the historical background of spatial planning and the formulation of government policies that have shaped the planning culture in Indonesia. Exploring this history results in a more precise understanding of how Karawang has evolved into its current state, tracing its growth and expansion within the broader context of the Jakarta Metropolitan Area (JMA). Furthermore, the chapter asserts that Jakarta's development process has resulted in land degradation that has significantly impacted its residents. Despite attempts to manage development, there has been a lack of effective control over Jakarta's growth. Karawang, on the other hand, has emerged as a manufacturing and food supply hub for the city, although it was not officially included in the planning vision of the JMA. While this dissertation focuses on Karawang, it is essential to recognize the significance of Jakarta's history to Karawang's current situation. Examining the history of Jakarta enables a better understanding of how to plan for its future development, and provides valuable insights into the context within which Karawang exists.

Historical context and government policies have influenced spatial planning in Indonesia since the country gained independence in 1945. However, the relationship between planning and government policies has not been constructive, often driven by political interests and private businesses rather than science and innovation. Private enterprises play a significant role in triggering new urban developments, with planning disciplines subsequently accommodating these projects' infrastructure and diplomatic aspects. For example, in May 1996, of the 15

companies engaged in property development listed in the Jakarta Stock Exchange, Lippo Land was the company with the most considerable assets of about US$ 507.88 million, and out of the 60 identified developers in JMA, more than half were controlled by only a few companies (Winarso and Firman, 2002, p. 495 – 496).

The discussion surrounding the profession of urban and regional planning in Indonesia began in the 1950s, marked by the establishment of the first planning program at the Institute of Technology of Bandung (ITB) in 1959. ITB, previously known as *Technische Hoge Schoof,* introduced Urban and Regional Planning as a master's level program to teach regional organization and management. Numerous universities across Indonesia adopted this planning education model, establishing planning departments in about 60 universities (Indonesian Planning School Association, 2021).

Urban and regional planning legislation in Indonesia can be traced back to the Dutch colonial period, with the Act of Agrarian Affairs in 1870. After independence, the Act of Agrarian Fundamentals was introduced in 1960, followed by the Act of Spatial Planning in 1992 (renewed in 2007) and the recent Job Creation Act in 2020, which aimed to address the challenges posed by the pandemic. The Job Creation Act encompassed the Act of Spatial Planning and numerous other regulations governing urban and regional territories and professions (Ministry of State Secretariat, 2021).

The evolution of planning legislation in Indonesia reflects a shift from focusing on land development to a more comprehensive approach that includes spatial planning and the consideration of local interests. Earlier acts primarily addressed land development on private and public land, with little discussion of the design and maintenance of an area or municipality.

These acts outlined the authority of national and local governments in deciding land development and addressed taxation and land ownership responsibilities. In contrast, acts introduced after the 1990s established a hierarchy of planning policies, with national spatial plans guiding local spatial city plans. Spatial planning was distinguished from non-spatial planning, with spatial planning focusing on an area's physical and structural patterns. Non-spatial planning dealt with the interests and programs of local government leaders. However, the importance of the cohesion between these two planning aspects was not explicitly addressed.

The 2007 act brought further changes by emphasizing punishments for planning or land use violations and adding zoning regulations for urban areas within regencies (Ministry of Public Works, 2008). However, as I concluded from many interviews with planning lecturers and urban development onlookers, penalties and sanctions remain limited. The planning regulation within the Act of Job Creation in 2020 prioritized economic recovery and investment, with less focus on regulating land for environmental sustainability.

Regarding planning culture, Indonesia has attempted to improve decentralization, but the national government still maintains significant control over local development (Winarni, 2022). The rapid introduction of national policies within a relatively short period has posed challenges for local governments to adapt to. Policies from different national government institutions often conflict, leading to a lack of cohesion, integration, and collaboration beyond the national level. Local governments are expected to comply with generalized policies despite regional differences, and the strictness of the law can hinder innovation due to the fear of non-compliance with national guidelines (Winarni, 2022).

An example of this challenge, in many years of experience as a planner I observed how efforts in

Karawang to adopt the terms "Local Innovations System" and "Integrated Local Development" were ignored in 2018, despite years of studies and projects undertaken by the local government. This discontinuity in policy implementation rendered previous efforts by the Karawang government ineffective. This highlights local governments' difficulties navigating national policies and maintaining continuity in planning initiatives.

The uncontrolled urban developments in Indonesia have been characterized by the freedom granted to business-oriented private developers to expand, often leading to disarray in urban areas and significant land degradation. This has resulted in pollution of the land, soil, and air in urban areas, impacting the well-being of disadvantaged groups (Susanti & Richwanudin, 2020). The Job Creation Act in 2020 exacerbated the situation by prioritizing investments with little regard for environmental concerns or land protection (Ministry of Law, 2020). Despite the conceptual ideals of planning and sustainability held by academics and the government, the practical implementation of these concepts often does not reach the intended goals (Winarni, 2022; Susanti & Richwanudin, 2020).

The focus of development in Indonesia has traditionally revolved around Jakarta, with other regions nearby being affected. A significant portion of the national budget has been allocated to the JMA, despite Indonesia having thousands of islands. Jakarta, often called the fastest-sinking city in the world, has experienced extensive land and environmental degradation. Efforts to address these problems have been short-term and sometimes unrealistic, considering the magnitude of the damage already incurred (CNBC Indonesia, 2022; Simon, 2019).

The rapid urban expansion and environmental degradation of the JMA can be traced back to the dictatorship era of President Suharto, who aimed to develop Jakarta into a global city. This led to

massive development in the manufacturing, finance, and property sectors between 1970 and 1995, disregarding the environmental carrying capacity of Jakarta (Firman, 1998). During the same period, a significant amount of agricultural land was converted into residential areas in Jakarta and its surrounding regions (Winarso & Firman, 2002). Many of the property developers working on these projects were connected to the Suharto family (Firman, 1998; Winarso, 1999, 2001).

As Jakarta expanded, it exerted trickle-down effects on the surrounding cities, transforming Karawang into an industrial area and Jakarta's satellite city. Karawang now hosts numerous industrial zones and serves as a residence for higher-income urban commuters from Jakarta (Open Data Karawang, 2021). This rapid development has resulted in significant environmental problems, with violations of land use plans by local governments and private sectors driven by political interests and economic activities (Firman & Dharmapatni, 1994).

In summary, the uncontrolled urban developments in Indonesia, particularly in the JMA and its surrounding regions, have had detrimental effects on the environment and the well-being of disadvantaged groups. The prioritization of business interests and the lack of comprehensive planning and environmental regulations have contributed to land degradation and pollution. Addressing these issues requires a more sustainable and integrated approach to planning and development, and considering the long-term well-being of communities and the preservation of natural resources (Ministry of Law, 2020; Winarni, 2022; Susanti & Richwanudin, 2020). The history of spatial planning in Indonesia reflects the dynamic relationship between government policies, private interests, and the evolving discipline of planning. Understanding this history is crucial for contextualizing the current planning state and provides insights into the challenges

and opportunities for future planning initiatives. Correspondingly, the evolution of Indonesian planning legislation and the planning culture reveal the need for greater collaboration between national and local levels of governance to effectively address the diverse needs of different regions while ensuring compliance with national policies.

Hence, the following section analyzes the role of planning disciplines in the planning policies before the independence of Indonesia in the 1940s until 2021, after the 2020 Act of Job Creation during the pandemic.

A. Affiliation and association of planning discipline and policies in Indonesia throughout history

The idea of developing planning as an official university program came before Indonesian independence, between 1940 and 1950. In most other countries, spatial planning is common at the post-graduate level to complement initial skills from various other disciplines. However, because Indonesia needed more experts with an undergraduate education and interest in continuing post-graduate education was still minimal, Harvard University finally agreed to open an undergraduate spatial planning program in 1955. The formation of educational programs should be tailored to the needs of each country; at that time Indonesia was focused on regional planning, while developed countries at that time focused on solving problems in the development of urban life. By the end of the 1950s, Indonesia admitted that there were still very few expert planners. Planners mainly came from Civil Engineering backgrounds and lacked a sense of urban aesthetics and comprehensiveness, despite being trained (Soefaat, 2003, pp. 45-46).

In 1954, preparation to develop the Urban and Regional Planning program in Indonesia was

initiated with the support of a representative from the United Nations. They also assisted in developing the Master Plan of Jakarta. In 1959, the first program was pitched in Bandung under the Division of City and Regional Development Planning, limited to understanding the procedures and steps of building a city plan and infrastructures (Poerwo, 2003, p. 50). Eventually, there was also a necessity to expand into economic analysis and the awareness of the quality of life. In 1979, the second planning program was established at the Bandung Islamic University (Poerwo, 2003, p. 51). The trend also continued to in the development of the master's degree in planning at the National Technology Institute of Malang and regional planning at Bogor Agricultural Institute under the agriculture faculty (Poerwo, 2003, p. 51). Between 1980 and 1990, numerous universities continued developing undergraduate and master's planning programs. These degrees became popular among government employees (Poerwo, 2003, p. 50).

At the time, they did not have a formal curriculum, so that each program built its own courses. After a series of discussions in 2000, the Association of Indonesian Planning Schools (ASPI) established a program to develop lecturers, researchers, and planning students. It also had the purpose of influencing the system development and as a medium to solve development and planning issues (Poerwo, 2003, p. 53).

In addition to formal education, the government of Indonesia relied on workshops and training to teach spatial planning. The training focused on physical infrastructure and technical guidance to support local governments in spatial planning (Budisantoso, 2003, pp. 61-62) They were primarily designed for government employees from all backgrounds to get a sense of spatial planning. Briefly, from 1950 to 1965, the government developed the first technical guidance for new urban settlement planning. From 1966 to 1978, the training was limited to staff in the local

government. The material for the workshop focused on the making of an urban spatial plan for local governments. From 1979 to 1984, the training expanded to affiliate with international institutions, and geospatial mapping was introduced. From 1985 onward, the activity included zoning regulations, and for the first time, spatial planning was a reference for physical development (Budisantoso, 2003, p. 64).

Still heavily influenced by the Dutch, Indonesia could not fully develop institutions at the capacity needed to organize planning and development until a couple of years after independence (see Appendix 2 for details). There was a debate between improving the institution from the Dutch era, developing a new one with a similar domain, or maintaining both (Soefaat, 2003, p. 44). The former position of the Dutch period was led by engineers, and the latter was led by graduates from the new planning discipline.

The planning programs continue to expand along with the number of universities in Indonesia. The planning domain, which mostly goes to the governmental sector, also involved many national and local government institutions. Most of the national ministries also have a planning division. (See Table 2.1 in Appendix 2 for the details of some ministries with the planning division). Accordingly, local governments also have planning divisions distributed through some departments. Planning graduates working in governmental sectors on consultancy is also popular. Due to the flexibility in Indonesian occupational systems, lecturers can also work as consultants.

The number of consultants grew after 1965 (Puradimadja, 2003, p. 105), Previously, spatial planning work was considered a government task and was carried out by government officials. The idea of appointing consultants began with a self-management system in government

agencies working toward spatial planning. Initially, Public Works assisted the local government in urban spatial planning by sending a team of planners who prepared plans which were conveyed to the local government. At the start of the 1970s, the budget of government agencies increased, and there was a desire to expand aid to the region through private services. Finally, consultants began to assist the area in preparing spatial plans. Using foreign assistance for various regional and urban development jobs, the number of consultants increased, as it was the most desirable position for people with planning experience.

This was not only the case for planners but also people from other backgrounds such as architecture, industrial engineering, social studies, and politics. There are no limitations in the employment of assistant planners. Therefore, some parties or institutions who receive many projects can control the flow of money in their own interest, leaving assistant planners to accept much lower compensations. This forces them to work on multiple projects at a time at different companies. These patterns are prominent in the planning domain.

In the planning domain, competition is intense. The sectoral and top-down approaches from the national government created conflicted yet competitive policies and regulations among different ministries. Accordingly, several national institutions' intensive annual policies challenge the local governments. For example, the Act of Spatial Planning of year 2007 requires the municipalities to provide at least 30% of green space in the proportion of their total area. Still, there is a different definition and calculation of green space between the Ministry of Internal Affairs, the Ministry of Public Works, and the Ministry of Environment (Ministry of State Secretariat, 2021). Reacting to this, local consultants at the local levels strive to justify moving local policies forward by mixing and matching the national policies so the local policies may

proceed.

Consultants may also attempt to translate these new national policies to local policies by conducting more workshops and training. These seminars and trainings are most beneficial for local governments due to the nature of the local governments that routinely rotate their employees despite their backgrounds. The idea is to avoid corruption, but on the downside, the people in charge do not have expertise associated with their positions. Spatial planning relied on the 1960 Agrarian act but was left without any meaningful content (Ministry of State Secretariat, 1960). The first draft of the Act about Urban Advisory, which was supposed to be the first to regulate spatial planning, encountered a dead end. It was initially proposed in 1972. When the bill was not progressing, the Minister of Internal Affairs stood in to develop guidelines for drafting city plans. Yet, this created a controversy over the authority between the Ministries of Internal Affairs and Public Works, as was revealed in the 2021 to 2022 field interviews.

The function of cities in Indonesia tends to shift from the center of manufacturing industry activities to service and business activities that intensively utilize the land. In contrast, industrial activities move to the suburbs. The need for land in the city encourages the government to cooperate with the private sector carry out coastal reclamation, which will likely disrupt coastal and marine ecosystems. Granting flexibility to the region through the autonomy system can increase city competitiveness, thus affecting the city's economy and foreign exchange income (Soegijoko, 2000).

Despite the existence of regulations mentioning sustainability, they were not acted upon because the New Order was more focused on economic growth. Although the policies have evolved over time (Act No. 24 the year 1992 was adjusted to Act No. 26 the year 2007 about spatial planning

and Act. No. 32 the year 2004 about Regional Autonomy), development was still oriented toward the economy, disregarding the environment. Just as the digital lifestyle began to bring awareness to the future and sustainability, the COVID-19 pandemic hit hard in 2020. In the same year, Indonesia released the Omnibus Law. Act No. 1 of Year 2020. This law addressed job creation, and pushed the idea of sustainability backwards by focusing on recovery and maximizing investment into the economy, as indicated in the field interviews between 2021 and 2022. Further, the 2020 Job Creation Law stresses investments to accelerate economic growth after the pandemic, especially in the industrial sector.

After discussing the decades of the interaction between planning and development policies, the following section elaborates on the history of Jakarta and the megacity's expansion until it reaches Karawang. The exploration of the past also reveals how Karawang has always been associated with Jakarta, even if their connection was never planned.

B. The history of Jakarta and how Karawang was associated with the JMA

This section explains the history of the JMA and shares the centralized planning management heavily inclined toward business interest. Continuous land and environmental degradation follow the same timeline. In the one-sided relationship between Jakarta and Karawang, three environmental issues representing land degradation are the focus of this section: rapid land use changes, poor water management and sanitation, and flooding.

People resided in Jakarta from 3000 to 1000 B.C. for agricultural purposes (Djafar, 1987). The alluvial land was the main soil structure in the area. A rural lifestyle has been identified from

prehistoric sites. Not only was the land fertile, but water resources were also abundant**.** During the beginning of the agricultural era, the community began to form a social structure and neighborhood system based on their location. These early village systems formed a sort of bonding within the community that enhanced the agricultural system faster. Later, the community utilized metal materials to help in farming (Djafar, 1987). Eventually, more and more areas were occupied. This civilization continued for centuries, and as it expanded physically, the population also grew. The first kingdom of Tarumanegara, an early Sundanese Indianized kingdom, was established between 400 B.C. to 100 C.E. The 5th-century leader, King Purnawarman, created some of the earliest inscriptions in Java (Bintang, 2007). Archaeologists have shown that during the Tarumanagara era, a term called city or state (*negara*) showed an area with a discrete boundary and a functional role (Djalal, 1977). There was a term similar to a village that, from the economic standpoint, had a role in supporting the state's primary needs. The larger social structure focused on the power relation between the organizer of the city and all other residents. Then, a more structured system began where the ability to restructure the river flow was established (Sedyawati, 1987).

Tarumanegara ceased after the 5th century, marking the rise of the Sunda kingdom that thrived for almost a millennium from 669 to 1579 (Bintang, 2007). Pakuan Pajajaran was the capital of the Sunda kingdom in the west. It was to the south of what is now Jakarta. The Sunda kingdom recognized the importance of the port on the north side, where history has already shown that many foreigners had arrived for trading. Soon this port became Java island's door to the world (Poesponegoro & Notosusanto, 1984, p. 126). They named the port Sunda Kalapa. Sunda Kalapa was under constant watch by Pakuan Pajajaran from the south, upstream of the Ciliwung river, where it flowed toward the sea. The center of the road networks was in Pajajaran, and the goods

from the trading were also collected and showcased there. The road networks were extensive toward the west, south, east, and northeast (Karawang). In 1527, Sunda Kalapa was taken by the Demak Sultanate led by Fatahillah, which at the same time ended the alliance between the Sunda kingdom and the Portuguese. Soon, Fatahillah changed the name of Sunda Kalapa to Jayakarta and opened the door to the first Dutch group to enter and collaborate with the sultanate (Surjomihardjo, 1977; ten Dam, 1951; Poesponegoro & Notosusanto, 1984).

In 1602, the Dutch nobles instigated a trade union under the VOC (*Vereenigde Oost-Indische Compagnie,* or the Dutch United East India Company). Although it began with peaceful communication, VOC had intentions to monopolize the spices of Indonesia. For this purpose, VOC established a base camp in Jayakarta and changed the name to Batavia in 1619 (Surjomihardjo, 1977; Poesponegoro & Notosusanto, 1984). VOC was initially located in Banten before an intense conflict occurred, and they needed to occupy a more strategic location**.** Since its establishment, Batavia became the center of power for the Dutch in Indonesia and this marked the beginning of the three centuries of Dutch colonization in Indonesia. The VOC immediately expanded its territory in Batavia with water channels and ditches to expedite transportation and built a city in the style of the Netherlands. Soon after, Batavia was also equipped with other infrastructure such as a tram, railway, forts, offices, and settlement areas (Surjomihardjo, 1977). JP Coen (the two-terms Governor-General of VOC and the one who renamed Jayakarta to Batavia) further constructed Batavia to mimic Amsterdam, with the city center as a stronghold surrounded by fortresses, walls, and ditches. The two rivers of Citarum and Ciliwung divided the city centers into two sections. Indonesians were prevented from building anything within the designated city center. The expansion of Batavia followed the Ciliwung River's flow to the west. The road networks were aligned with the river as a commercial area. From 1811 to 1816,

Daendels, the 36th General of VOC, famous for using forced labor to build roads from the west side corner of Java to the east side corner, again moved the center of the city to the south (Sedyawati, Rahardjo, Johan, & Ohorella, 1987, p. 94). It was designed to be the government's center, while most offices and trade centers were planned to stay in the old location. This new city center followed the designs of other Indonesian cities, with the city square in the middle and wide roads surrounding it to access every corner. However, the city's rapid expansion outpaced the initial planning, leading to significant disorder and disarray (Johan, 1987). This resulted in negative consequences, such as the rapid explosion of population growth and the lack of infrastructure to support the current residents. The colony was advanced in technology and building expertise, but they had no vision for sustainability.

The Dutch colony was challenged in the Second World War (1939 to 1945), especially under Japanese occupation, and was pressured to declare Indonesian independence in 1945 (Sedyawati, Rahardjo, Johan, & Ohorella, 1987, p. 137). A few years before, squatters were proliferating in Jakarta during the Japanese colonial era from 1942 to 1945. Japan forced people from Jakarta and the surrounding area to plant vegetables and castor (for weapon and vehicle lubricants) on empty lands without considering land ownership (Sedyawati, Rahardjo, Johan, & Ohorella, 1987, p. 99). People were permitted to build huts, which later developed into tiny houses and buildings. Later, this contributed to many land ownership disputes where in most parts, the area expanded into small neighborhoods and squatters. Further, from 1960 to 1970, waste management became a huge issue (Sedyawati, Rahardjo, Johan, & Ohorella, 1987). Many efforts to resolve this were made but had hardly any impact because the waste had already contaminated rivers, and water storage in Jakarta had increased the number of floods, which were already complicated due to the inconsistency of the urban design since the beginning of the colonial era.

These have remained critical issue because of the rapid and extensive urbanization all across Indonesia (Sedyawati, Rahardjo, Johan, & Ohorella, 1987).

The first twenty years of independence after 1945 marked Jakarta's highest urbanization. People migrated to the area because the Dutch had partially left the country. Soon, Jakarta became a magnet for people from all over Indonesia, embracing these with migrant lifestyles. A person who successfully established themselves in Jakarta would invite more and more of their relatives. The highest-paying jobs in Indonesia in the consulting, business, and governmental sectors were located only in Jakarta (Ohorella, 1987).

In parallel to what I have gathered from numerous sources above, Indraprastha and Derudder (2019) examined the history of the JMA and presented a summary of what they called a historical framing, or what I call developing images, of the JMA from the pre-colonial era through post-1998 (Indraprahasta & Derudder, 2019). Complementing the discussion presented previously, the table below shows more specific information following the different timelines, including the Japanese colonies and the era of the two first presidencies of Indonesia. Table 2.1 covers the events of each era according to Indraprahasta and Derudder (2019).

Table 2.1 The Developing Images of JMA

		Pre-colonial era	Colonial era			Proto-democratic state		Reformasi
			VOC (pseudo-colonialization)	Dutch colonialization	Japanese colonialization	Soekarno presidency	Soeharto presidency	
Factor	Global Landscape	Trade expansion (Eurasia and parts of Africa)	European (trade and military) expansion to Asia, Africa, and America	Nineteenth century globalization	World War II	Cold war: capitalism vs. communism	Global shift and the genesis of the NIDL	Intensified global integration and competition
	National Landscape	Indonesian archipelago consisted of different kingdom/ sultanates	Indonesian archipelago consisted of different kingdom/ sultanates Occupation of several port towns and production areas (agriculture)	Gradual efforts to formally colonialize the Indonesian archipelago: starting from Java and Sumatra to the eastern parts of the archipelago The inception of Indonesian modern nationalism in the early 20th century	Supporting the Japanese interest in the Pacific war	Post-colonial spirit of nationalism: socialism Non-aligned 'third world' global project	Gradual economic liberalization Authoritarian government	Gradual economic liberalization Democratization and decentralization: greater opportunities for other cities and regions to tap into global capital flows
Implications	Character and function of the JMA	Small port town named Sunda Kelapa (later Jayakarta)	Headquarters of VOC named Batavia	Capital city of the colony named Batavia Gradual spatial expansion from port area to its surrounding areas Adding economic and administrative functions	Capital city of the colony named Jakarta Economic and administrative functions	Capital city of a new independent nation named Jakarta Symbol of power and unity of Indonesia	Capital city of an emerging economy Economy heartbeat of Indonesia Spatial expansion from Jakarta to its surrounding areas: the formation of the JMA or Jabodetabek	Capital city of a decentralizing nation Economic heartbeat of Indonesia
	JMA within the national (urban) system	Urban system consisting of coastal cities and sacred cities (governmental and religious centers)	Gradual prominence of coastal cities (including Batavia) as economic centers	Establishing the development of Batavia as a primate city	Continuing the development of Jakarta as a primate city	Reinforcing the development of Jakarta as a primate city	JMA or Jabodetabek Reinforcing the development of Jakarta (and its surrounding areas or Bodetabek) as a primate city	Spatially privileging the JMA as center for (hi-tech) manufacturing and services industries
	JMA within the global (urban) system	Commercial node within maritime networks	Entrepôt	Colonial outpost	Colonial outpost	Post-colonial node within the 'third world' global alliance	Key gateway to the global economy Industrial node within the NIDI.	Key gateway to the global economy Industrial node within the NIDI.

Source: Indraprahasta and Derudder, 2019, p. 8

- **Rapid land use changes**

Jakarta experienced immense land-use change during the ambitious Suharto presidential era, transforming it into a global city. Jakarta has always been a highly attractive region in Indonesia for foreign and domestic investments (Firman, 1998). A massive land expansion occurred between 1970 and 1995 in the manufacturing, finance, and property sectors. In this period, Jakarta and the surrounding areas experienced the conversion of 16.6 thousand hectares of agricultural fields into residential land (Winarso, 1999, 2001). The government also eased up policies to allow the private sector to get involved in property development. Unsurprisingly, many of the realtors were affiliated with Suharto's family. In a country where corruption and the centralized power of authority were eminent, Suharto's family influenced decision-making in the planning process, especially if the proposed development was not recommended in the statutory spatial plan (Winarso & Firman, 2002).

This phenomenon was triggered by the national government's efforts to stimulate economic growth, especially in the real estate and financial sectors. Tremendous expansions of property were built in Jakarta, including hotels, shopping centers, office spaces, and high-rise apartments. Elsewhere on the periphery of Jakarta, new town development, industrial estates, and tourist resorts were developed to accommodate the global capitalist system (Firman, 1998). The government also urgently expanded Jakarta to the north through a reclamation project despite many arguments questioning its harm to the environment. This project added about 2800 hectares of land to the city (Firman, 1997).

This cycle continued in the JMA for decades, even after Suharto's fall in 1997. The authorities controlling Jakarta and its surroundings have created economic crises, in part due to the collapse

of Indonesia's housing market (Winarso & Firman, Habitat International, 2002). The excessive development also targeted the rich minority, cementing Jakarta and the JMA as the region with the highest wealth gap in Indonesia, with millions more people living in poverty with a low standard of living. Over time, as Jakarta has advanced uncontrollably, the JMA has also been burdened with manufacturing and industrial developments. By 1997, the industry area in the JMA reached over 6000 hectares, and out of the 42 sectors, half were located in the JMA (Firman, 1997; Winarso & Firman, 2002). Another negative effect was the act of land speculation by these developers. They deliberately kept their land idle for a long time to gain more profit when it was sold.

Overall, land use management has been lacking since the 1970s, and it continues to be imbalanced. The massive development and expansion originated from economic stimulus, and economic growth has been the prominent driver. The desire for land-use expansion comes with severe consequences. The environmental damages are accumulating, and Jakarta is currently vulnerable. The violation of the 1999 spatial plan found that up to 80% of the city’s considerable air pollution was emitted from vehicles under conditions of overpopulation (Winarso, 2000).

Without any boundaries and limitations, Jakarta's land-use conversion and expansion have been damaging to the environment (Firman, 1997, pp. 1043-1044). The spatial plan is ineffective against the developers who have had political immunity. In other words, there is no limit to their actions. Agricultural and forest conversion causes substantial adverse impacts. The agricultural land's productivity is lost; the built environment destroys the landscape and threatens water reserves. The loss of farming areas also contributes to the influx of people in the city who are losing jobs in the rural areas. It also disrupts the food chain supply. The idle land is also

problematic. The landscape has already been damaged but cannot be developed into green spaces. Land conversion occurs in many places designated as conservation areas due to their function for water recharge (Firman, 1997).

- **Poor water management and sanitation**

Several analyses (Bakker, Kooy, Shofiani, & Martijn, 2008; Furlong & Kooy, 2017) characterize Jakarta as a city with a very weak water and sanitation system. Through their study, they indicate that only 25% of the population has access to centralized water services. Another 15% can access secondary water services. On the other hand, approximately 60% or six million Jakarta residents rely heavily on shallow, contaminated groundwater. Groundwater pumping can lead to land subsidence, saltwater intrusion, shallow groundwater salinization, and flooding in the northern areas near the ocean (Bakker, Kooy, Shofiani, & Martijn, 2008). Recent tests have also indicated that the water is contaminated with heavy metals, nitrate, and E. coli. Jakarta's low-income residents are marginalized, suffer higher exposure to flooding, and low water quality, and have less ability to invest in household water treatment technologies (Furlong & Kooy, 2017).

In the colonial era, Jakarta's original water networks were developed in the 1870s as the first artesian centralized water supply. The systems were then extended in the 1920s to support the standard of the European urban population. Although they comprised only 7% of the people, European residents extracted 78% of the city's water supply. They left the native residents to pay double for the mobile vendors (Heetjans, 1923). In the following decades, the water networks' development still resembled the colonial patterns as the government utilized the original structure. The colonial era also saw the development of water treatment plans in the 1950s and 1960s. Despite the massive expansion of the city, these networks have mostly remained. The

network expansion was deliberately limited to upper-class residential areas. Moreover, the government intentionally limited access to lower-income neighborhoods to discourage urbanization. Therefore, the most impoverished community continued to be excluded.

In other words, the water supply was already fragmented from establishing Jakarta as a city. This differentiation of access has deep historical roots throughout the legacy of the colonial era. It continues to be applied under the policy to discourage urbanization and low-income housing but takes sides heavily with the higher-income group (Bakker, Kooy, Shofiani, & Martijn, 2008). In the end, water access in Jakarta depends on socio-economic status. Ironically, the government's act to differentiate services for people experiencing poverty resembles the Dutch in the 1920s. The uncontrolled development and poor planning contribute to various complex water issues in Jakarta. Efforts to fix the problem become more challenging as rampant growth continues. Water quality is the clear indicator of the immediate impact of the land degradation of Jakarta, and the surrounding areas.

- **Flooding events**

Flood events have struck Jakarta almost yearly since before the Dutch colonial era. According to Zaenuddin (2013), floods have occurred since the Kingdom of Tarumanegara in the 5th century. The cause of these floods was unknown at the time, but efforts to deal with the flooding had been made by excavating around 24 km of the Chandrabhaga river in Bekasi and Gomati river in Tangerang. Starting with the Dutch Colonial era, the city's development in Jakarta and its surroundings further increased the frequency and severity of floods. This was coupled with the ambition of the Dutch government at that time to organize the city of Jakarta in the same manner as cities in the Netherlands through a canal system. This was a problem, as a canal system is

unsuitable for Jakarta because the land surface is lower than the sea, and it is more difficult for the water to flow into the ocean. The canal system was also implemented to deal with floods, and instead created brown puddles due to mud carried from new rice fields in Jakarta and surrounding areas (Zaenuddin, 2013). Table 2.2 below describes the causes and management of Jakarta's floods in every era, from pre-colonial to reformation.

Table 2.2 aligns with the previous explanation about the flooding events in Jakarta throughout history. As seen, the immediate mitigations are around community development and capacity building to be more alert during severe weather and overflow. The construction of canals during the pre-colonial era and reformation were incapable of providing solutions. The floods still occur annually or several times a year during the rainy season. On top of that, due to climate change, the seasons are difficult to predict, and the rainy season lasts longer than usual. Due to the failure to plan for long-term solutions or sustainability, flooding problems will continue unless some transformative, interdisciplinary, and integrated approaches are taken. This dissertation suggests the inclusion of PE into applied planning methods in Indonesia. The following section focuses on Karawang as a region affected by the continuous expansion of the JMA.

Table 2.2 Flood Events Timetable of Jakarta

Flood Events Timetable of Jakarta					
	Pre-colonial	**During Dutch Colonial**	**Old Order**	**New Order**	**Reformation - 2013**
Cause		Intense Rainfall			
		Inaccordance City Plan	Expansion of Settlement	Land Use Change	Decline in Water Absorption
		Inclement Drainage System			
		Upstream Flow → River Overflow			
		Unsavory flooding management			
				Ground Water Exploitation →	Compaction and Liquefaction
				High Tide	
Immediate Mitigation	Canal Construction				Canal Construction
		Maintenance			
		Water Course Construction			
		Warning System			
		Individual Rescue			
			Establishing Volunteers	Building Flood Posts	
			Infrastructure Planning	Spatial Plan and Flood Control	
				Intra Regions Coordination	
					Emerging Response System

Source: Adapted from Zaenuddin, 2013

- **The marginalized Karawang**

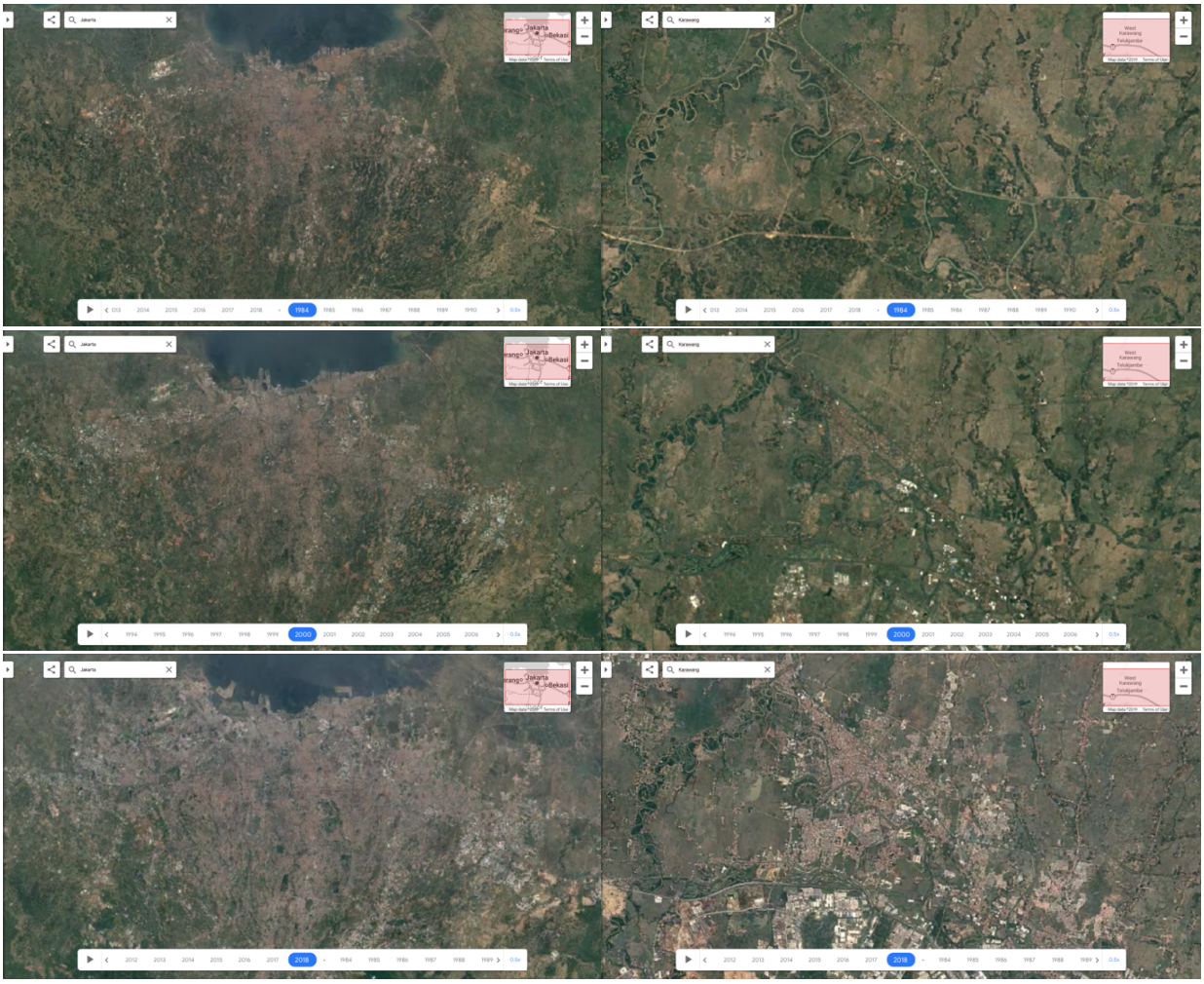
Karawang has historically played a crucial role as Jakarta's primary granary and rice supplier and later became a center for manufacturing and industries in the 1990s. However, the development of Jakarta has consistently burdened Karawang without proper consideration in the planning process. Despite being intertwined with the growth and expansion of Jakarta, Karawang was never included in comprehensive planning efforts.

For centuries, Karawang has faced a complex and challenging situation, serving as both an agricultural center and an industrial hub while also being expected to develop as a satellite city for Jakarta. However, there has been a lack of integration and support from Jakarta in addressing the issues faced by Karawang. The region struggles with an identity crisis and challenging circumstances, where locals often find it difficult to secure employment in the manufacturing and industrial centers due to competition from workers from neighboring areas with more disciplined work ethics. Additionally, many engineers and professionals working in Karawang come from major cities across Indonesia.

There is still no legal recognition that Karawang is a part of the JMA. This lack of formal acknowledgment further hinders the region's ability to receive support and resources from Jakarta. As a result, Karawang has been left to navigate its development and address its challenges with limited assistance from the capital.

Figure 2.1 below illustrates the expansion of Jakarta's land area and the corresponding growth of Karawang's urban areas in 1984, 2000, and 2018. These visual representations highlight how Karawang has been affected proportionally by the continuous expansion of Jakarta.

Figure 2.1 The Expansion of Jakarta (left) and Karawang (right) of the year 1984, 2000, and 2018



Source: Google Earth Engine, Accessed in 2019

Figure 2.2 Map of Karawang Regency and Surroundings in West Java Province

Source: West Java in Numbers. West Java Statistical Agency, 2008.

Since 1952, The Master Plan of the JMA did not include Karawang as an interconnected region, despite its historical role in supporting Jakarta. The plan was designed with Jakarta as the central city and the other surrounding areas as supporting cities (Indraprahasta & Derudder, 2019). This oversight is significant considering Karawang's longstanding contribution to Jakarta's food supply and its subsequent transformation into an industrial center.

The extensive development of agricultural and industrial areas in Karawang has resulted in the depletion of groundwater resources and a decline in soil quality (Karawang Planning

Development Agency, 2016). Groundwater extraction in many parts of Karawang has exceeded sustainable limits, lowering groundwater levels in certain regions. Over the past decade, there has also been a substantial expansion in residential settlements, adding to the strain on natural resources (Karawang Planning and Development Agency, 2016).

Karawang's industrial and manufacturing sector, which encompasses various industries ranging from textiles to automobiles, further exacerbates the groundwater extraction issue. The uncontrolled groundwater extraction by these businesses has caused significant depressions in groundwater levels, with some areas experiencing a decline of up to 4 meters over the past decade, as concluded from the interviews from both planning practitioners and the Karawang government in 2022.

It is apparent that the absence of Karawang in the JMA's master plan, coupled with the extensive development and industrialization in the region, has led to significant environmental issues. Groundwater depletion, declining soil quality, and vulnerability assessments all point to the urgent need for comprehensive planning and sustainable development strategies in Karawang.

C. Conflict of interest: idealistic science and reality

The implementation of city plans in the JMA, including Karawang, has faced significant challenges, with more than 80% of the plans not coming to fruition, as indicated by the interviews with the planning lecturers in 2021. This disparity between the idealism, expectations, theories, and spatial plans for urban development and their actual implementation is a significant issue in Indonesian urban spatial planning. City development managers often desire to create

visually appealing cities with advanced technologies, but they may overlook the importance of community ownership and participation (Budihardjo, 1998). It is crucial to build cities that foster democracy, humanity, and an awareness of the surrounding environment. Cities are dynamic entities comprised of diverse cultures and characters, so understanding the influence of different cultural groups on urban life is essential.

The development of cities is complex and ever-evolving, and adopting overly rigid and inflexible patterns of urban spatial planning can hinder adaptability. Instead, it is vital to embrace planning approaches open to diverse options and actively involve the community in expressing their needs and aspirations. This inclusive and participatory planning process is believed to offer creative solutions to overcome the challenges faced in urban development (Budihardjo, 1998).

> A planner from the field interview in 2021 said that "There is no guideline for the planning documents from the national government and ministries to include the community. We needed to follow the self-explanatory guidelines and the template, which are primarily physical. As for the community, we developed a set of questionnaires with a driven conclusion so that it seemed as we have accommodated the people's voice".

The allocation of funds in Indonesia has changed from a sectoral to a regional approach to reduce regional disparities and promote balanced development. However, this has created competition among regions to secure more funding allocations. Local governments often focus solely on obtaining funds without prioritizing improving public services, promoting regional economic growth, or ensuring their independence (Firman, 1999).

The decentralized system in Indonesia still has room for improvement. The national government

continues to exert dominance and control over local governments. National policies often fail to accommodate different regions' unique needs and characteristics, relying on a generalized model instead. Despite lacking holders of prestigious alums and consultants, local governments should recognize and embrace their territorial identities and characteristics. A more distinct boundary should be established between the national and local governments within the decentralized system. While policies aim to achieve specific outcomes, they often lack adequate supervision and evaluation. Consequently, as obtained in the field interviews between 2021 and 2022, many policies remain only on paper without being implemented in practice.

For example, the Act of Spatial Planning, now part of the Act of Job Creation, mandates a minimum of 30% green space in any municipality. However, only a few municipalities have been able to meet this requirement (Dwihatmojo, 2016), especially in larger cities where achieving 30% green space is challenging.

Currently, the system of control in Indonesia relies on society and the media to raise awareness about issues and trigger actions from the government. The government tends to respond to phenomena such as the sinking of Jakarta or embrace sustainable development principles after global discussions, even though experts within Indonesia may have previously raised these concerns, as concluded in the 2021 to 2022 field interviews. The lack of evident control systems leads to a tendency for people in Indonesian society, including the government, to seek shortcuts or workarounds.

The interviews from 2021 to 2022 indicated that informal-under-the-table systems, such as scalpers and bribes, are prevalent in public services. Additionally, the bureaucratic processes are rigid and challenging to navigate. These issues also extend to the planning system, where

shortcuts and under-the-table options are often used to expedite proposals and bypass procedures. On the one hand, the processes can be overly burdensome, leading to problems in implementing policies effectively. This creates a perception that actions and implementations are superficial, serving more as branding or lip service.

A significant portion of the Indonesian economy, more than 50% or 80.24 million people, relies on the informal sector (Mustajab, 2022). However, these jobs are often not taxed appropriately. Due to slow system improvements, the community continues to depend on the informal sector. For example, scavengers work in landfills because the recycling system is lacking. If waste management improves through the implementation of recycling policies, ideally these scavengers could be integrated into formal companies and receive better treatment.

The government cannot intervene or replace the private sector's role in urban expansion. While many private developers have successfully developed new towns and facilities that provide jobs and create urban compactness, others focus solely on residential areas in suburban locations without supporting infrastructure. Consequently, long-distance commuting to business centers has become common, leading to uncontrolled and disorganized urban infrastructures due to haphazard settlement expansion. Continuous urban growth has severe environmental consequences, including degradation in various aspects. Groundwater overexploitation, similar to the situation in Jakarta, results in the scarcity of clean water and land subsidence (Bakker, Kooy, Shofiani, & Martijn, 2008). Pollution increases due to the extensive use of private long-distance vehicles, while public transportation integration remains incomplete.

Another example of poor planning and policy interaction is the Jakarta-Bandung high-speed train project, which has received significant attention from the national government. However, many

people view this project as ineffective because the distance between Jakarta and Bandung is relatively short for a high-speed train function. The project's funding has also been subject to conflicts, raising doubts about the motivations behind the idea (Ulfa, 2022).

From the interviews with the representative of the Jakarta government in 2021, I found that Jakarta has made efforts to promote sustainable development through initiatives such as green building. However, implementing green building practices is difficult, as they tend to be more costly than conventional buildings. While green buildings offer long-term benefits regarding reduced energy consumption, building owners are often reluctant to invest in them. In Indonesia, the understanding of green urbanism is primarily limited to providing green open spaces, which remains a significant challenge in many cities. The national government addresses basic infrastructure needs before fully embracing sustainable development. One major obstacle to achieving sustainability goals is Indonesia's heavy reliance on coal, significantly as the industrial sector expands, leading to increased emissions in urban areas.

There is still a lack of consideration for the environmental carrying capacity and no apparent limits on urban expansion in Indonesia. In recent years, there has been criticism from planning and environmental experts regarding the government's emphasis on economic growth during President Jokowi's administration (Lako, 2016). The understanding that today's disasters result from human actions and the need to change littering habits is still challenging for many Indonesians to grasp. Nevertheless, periodic flooding in Jakarta has served as a wake-up call for some residents, highlighting the consequences of land degradation and increasing awareness of environmental issues.

In response, specific segments of Jakarta's diverse population, mainly middle to higher-income

residents, have become more open-minded and started movements to reduce plastic usage. Plastic waste in rivers and squatter settlements along riverbanks exacerbates the risk of flooding. Interestingly, despite the ongoing flood hazards, people living in densely populated and flood-prone areas are often reluctant to relocate due to the high cost of rent in alternative locations. In contrast, higher-income communities with more stable financial means can consider various options. Different social classes employ different strategies to cope with the situation, and communities become involved in regulating their settlements and environments. Consequently, individuals on the ground take actions into their own hands rather than solely relying on government intervention, as documented in the 2022 interviews.

D. The complex history and the crisis of Karawang: the two sides of the coin

Despite its technological advancements, Jakarta remains the fastest-sinking city in the world. The city grapples with water scarcity and accessibility issues, along with environmental challenges like flooding and sea-level rise. Saving a city that has already passed its prime is a daunting task. Although new policies in Spatial Planning aim to prevent future violations of the spatial plan, transforming the already developed environment into green spaces seems nearly impossible without a strong government commitment to change. The new planning policies still struggle to rectify the mistakes of the past.

Karawang, on the other hand, primarily supports the JMA and has struggled to develop its own identity apart from Jakarta. The local government is heavily influenced by the benefits Jakarta and the national government reap from the presence of heavy industries in the area. This

continuous pressure on Karawang for agricultural fields, industrial activities, or residential areas for Jakarta's population has disrupted regional stability and compromised environmental sustainability, as found in the 2021-2022 field interviews. The ecological degradation in Karawang is evident from groundwater depletion, extensive pollution, soil quality decline due to relentless land expansion, and the overall depression of the landscape and social mobility in the region remains limited (Karawang Planning Development Agency, 2020).

The direction of Karawang's development remains unclear, as indicated by the Karawang regional government documents (Karawang Planning Development Agency, 2017). The development of the Karawang Spatial Plan has been protracted since its initiation in 2017, with no definitive outcome yet which of three potential development options to pursue is still undecided. These are:

- Focusing solely on the industrial sector
- Maintaining an emphasis on agriculture
- Pursuing a combination of both

If both sectors are maintained, the industrial sector will continue to expand under the existing conditions and technology, while agriculture will continue to degrade and suffer from pollution. Additionally, the interviews showcased that due to the continuous expansion of the JMA, Karawang's urban area has transformed into a new world-class city and a residential hub for commuters working in Jakarta.

The government has shown no apparent intention to ensure a well-functioning agricultural supply chain in Karawang. Thus, as argued here, the community needs to be involved in the

planning process to allow residents to express their opinions, especially regarding the direction of Karawang's development. The local government has not adequately addressed the potential for rapid and disorganized investments in the housing sector. As a result, rampant land-use changes have occurred near the Karawang exit on the Jakarta toll road, a location where agricultural land has been converted into industrial and housing complexes without proper guidance and coordination, as revealed in the observations and field interviews from 2021 and 2022. Field interviews presented that the housing complexes in the Karawang urban area are primarily occupied by residents who have businesses in Karawang or commute to work in Jakarta. At the same time, only a tiny portion is designated for industrial workers.

The Karawang urban area is situated on clay land, which cannot support extensive buildings on the surface. Housing complexes developed by large developers are generally more expensive due to the advanced technology required such as planted poles to stabilize structures in the earthquake-prone region. However, this is not the case with cluster housing developed by smaller developers. The unstable land poses a significant risk for disasters, with specific areas in Karawang prone to flooding during the rainy season and experiencing drought in the dry season. While Karawang has mountainous regions that serve as water catchments, there are also water-related challenges, as the lack of clean water. This leads to lower-income groups paying four times more than urban communities to access clean water (Karawang Planning and Development Agency, 2016).

The local population in Karawang is not adequately prepared for the rapid development occurring in the area. Only a few locals are involved in the industrial sector, as they cannot compete with most migrants, despite government policies aiming for 60% of industrial

employees to be residents (Karawang Regional Secretariat, 2011). However, bridging this gap, both socially and economically, is challenging.

As a buffer for Jakarta, Karawang still lacks an official regional affiliation with the capital city. The absence of official collaboration between Jakarta and Karawang affects infrastructure development, as the JMA does not prioritize or consider Karawang as an affected area. There is also no concept of compensation from Jakarta towards Karawang for such externalities. Consequently, Karawang bears the brunt of negative impacts without receiving due consideration from Jakarta.

In the following chapters, the physical and social aspects of the Karawang urban area will be further discussed, including its environmental history and the perspectives of Karawang residents. Ostrom (2007) emphasizes that a universal solution tends to fail in smaller regions, and it will become apparent that PE is critical for future planning in Karawang. Limited government action and the complexity of informal sectors taking control of land use highlight the importance of community resilience and their ability to survive independently amidst the pressures and burdens of the JMA's expansion into Karawang. The case studies of PE from around the world illustrate the significant role of communities in shaping urban areas. Neglecting their input can lead to chaos in the future urban form (D'Alisa & Kallis, 2016; Cadiex, 2008). The field interviews suggest that the Karawang government has made little effort to understand the community and instead focuses on transforming Karawang into a modern city. This approach is likely to backfire, as neglecting the region's geological realities will not only hinder development but also contribute to the stress, depression, and discomfort experienced by the residents (Morita & Jensen, 2017; Simone, 2008).

CHAPTER 3. SOCIO-ENVIRONMENT PLANNING ANALYSIS OF KARAWANG'S URBAN AREA

In this chapter, I focus on the community's point of view to understand the impacts of decades of planning and development policies on Karawang residents and their surroundings. It provides an alternative viewpoint to that of government and planning practitioners by exploring the experiences of marginalized communities within the Karawang urban area. The chapter delves into the intergenerational stories and perspectives of migrants, locals, and dominant local organizations (LSMs). Furthermore, this chapter will uncover constructive suggestions from the community that would contribute to their well-being, recognizing them as essential elements of the city. One particular area of focus is the village of Karangligar, presenting a unique case study for applying PE, considering the livelihood of people living in an undesired and neglected environment. This chapter highlights how the community takes action without relying solely on the government to address their needs.

This chapter links with the previous discussion in Chapter 2 that Karawang has never been in the picture under the dialogue of the regional governments of JMA, Jakarta, or the national government despite its significant historical and economic contributions. Interviews with Karawang government officials in 2021 and 2022 revealed that although manufacturing industries are located in Karawang, their main offices and tax payments are directed toward Jakarta. This financial arrangement puts the Karawang government in a weaker position to provide adequate infrastructure and services for its residents. The absence of planning and the prevalence of business-driven developments in Karawang are direct consequences of these dynamics.

Karawang has experienced organic growth due to the externalities associated with the expansion of Jakarta. This includes an influx of migrants seeking better opportunities and increased demand for luxurious settlements to accommodate Jakarta's commuting workers. The Karawang government has limited control over these phenomena. It faces the dilemma of deciding the future direction of Karawang, whether it should prioritize agriculture, industrial development, or transition into a growing metropolitan area. The findings from the interviews conducted with the Karawang government officials further corroborate these realities of the challenges the Karawang government faces in navigating the complexities of urban expansion and the demands of external forces. The chapter provides a deeper understanding of the contextual factors that have shaped the current situation in Karawang.

The rapid development in Karawang has brought challenges, including increased poverty levels. Despite its branding as an industrial area, Karawang has been identified as one of Indonesia's impoverished areas (Pratama, Hidayat, & Azizah, 2022, p. 127). This is contrary to the expectations for its development (Pratama, Hidayat, & Azizah, 2022). The COVID-19 pandemic has further exacerbated the situation, leading to a rise in poverty rates (Pratama, Hidayat, & Azizah, 2022, p. 126).The cost of living in Karawang has also increased significantly due to the rapid development. In 2022, Karawang's minimum wage was the second highest in West Java at the national level, following Bekasi (West Java and Human Rights, 2022). While an increased minimum wage may initially seem beneficial, it has led to declining job opportunities for residents as businesses face higher labor costs. This has further contributed to the challenges the local community faces in Karawang (Pratama, Hidayat, & Azizah, 2022). The convergence of these factors, including rapid development, the impact of the Covid-19 pandemic, and the rising cost of living, has resulted in a complex situation for the residents of Karawang.

The increased cost of living in Karawang has compelled residents to make significant adjustments to their lives. One of the strategies some individuals employ is choosing to give birth outside of Karawang, where health facilities or services may be more affordable. This decision allows them to mitigate the financial burden associated with childbirth expenses. Furthermore, to cope with rising costs, some locals have begun to raise livestock such as chickens, ducks, or sheep at home. These animals can be sold or consumed as a source of food, providing a more affordable option for sustenance. However, it is essential to note that migrant workers, who often have better and more stable incomes, have greater flexibility in choosing where to live. They can afford to rent or purchase houses in locations that are strategically advantageous and potentially offer better environmental conditions. As indicated during the field interviews in 2022, this has resulted in a pattern where locals are pushed toward a geographical periphery, in most cases, toward the river, possibly due to economic constraints and limited access to more desirable residential areas. These adjustments made by the residents reflect their resourcefulness and resilience in the face of financial challenges.

The low literacy rate and limited average education level in Karawang have significantly impacted the residents' productivity and ability to adapt to the changing economic landscape. However, it is crucial to recognize that this situation results from historical priorities and the predominant agricultural focus in Karawang. For generations, the local community has primarily engaged in farming, with little emphasis on diversifying their skills or exploring alternative industries. The national and local governments, until recently, further emphasized the agricultural role of the region. As a result, the intergenerational knowledge and skills of the locals have been centered around farming, making it challenging for them to transition to factory work or become traders/sellers in the emerging urban environment.

In contrast, migrant workers often possess the education and skills necessary to fit into the industrial sector and take advantage of the expanding job market. It was reported to me that the stark contrast in education, skills, and opportunities between locals and migrants has created social tensions and feelings of jealousy within the community. The rapid transformation of Karawang from an agricultural area into a metropolitan region has been extensive and swift, leaving many locals struggling to adapt to the metropolitan lifestyle. As a result, they have experienced marginalization and a sense of displacement. As one older interviewee, a retired farmer, said, "the identity of Karawang follows Chameleon, imitating Jakarta, but the community cannot adjust to the metropolitan lifestyle, resulting in the marginalization of the locals."

There are many job seekers in Karawang, including locals, terminated transient contract factory workers, and migrants coming to Karawang who cannot work in factories (Istiqomah, 2020). At the same time, depending on the job market, demands are far greater than the number of open positions. Karawang is still a magnet for job seekers considering the high minimum wage, but the number of open jobs is unable to keep up (Silitonga, 2022).

I found from the field surveys that questionable practices involving advance fees in the job acceptance process create significant challenges for locals in Karawang. Many individuals lacking skills and education have limited options and pay informal fees to secure job opportunities. However, there is no guarantee that they will be hired, resulting in the loss of their money without any evidence or record of the transaction. This situation further exacerbates the financial vulnerability of the locals, as they often lack savings and are forced to borrow money from banks or engage in predatory lending practices to cover these fees.

In contrast, migrant workers can enter companies through official procedures without needing to

pay initial entrance fees. They typically go through online recruitment processes or connections outside of Karawang, which disadvantages the local community members with limited background and education. Local job seekers must compete with a large pool of applicants from various provinces for positions within Karawang, and they often lack access to information about job vacancies, including the ones distributed on the Internet and social media. Connections, such as relatives working within a company, become a significant advantage for securing employment. This inequality within the job market further deepens the challenges locals face in Karawang. It perpetuates a system where connections and existing networks play a crucial role in accessing job opportunities, leaving those without such bonds at a significant disadvantage.

The observation from 2021-2022 highlights the different values placed on money by the locals in Karawang. The farming culture and mentality still prevail among the residents, whose focus is not solely on earning money but on ensuring they have enough food for their households. Traditionally, farmers in Indonesia rely on their agricultural produce for sustenance and often trade their crops for daily meals. The support system within extended families plays a crucial role in their survival, and many of their activities are not monetized.

As a result, some jobs with lower incomes are taken by migrant workers because locals do not prioritize them. Migrant workers, on the other hand, are diligent and driven as they are far from their homes and have specific targets to achieve. In their comfort zone, the locals may display inconsistency due to the perception that Karawang is their home. This mindset, influenced by the farmer's mentality, has been associated with a perception by employers that locals are lazy.

It has become challenging for those who continue to farm. Farmers must manage their farms and take responsibility for increasing crop yields. Although there has been limited support from the

local government, some policies are in place to maintain irrigation channels and agricultural infrastructure as indicated from an interview with a Karawang government official in 2021. The interview also added that, in recent years, a significant decline in productivity has been attributed to several factors. The growth of the industrial sector has led to a shortage of workers in the agricultural industry. Additionally, farmers have faced difficulties due to the high cost of fertilizers and a lack of capital to start growing crops. Moreover, the agricultural sector is always vulnerable to the impact of weather conditions, and unprecedented flooding and extreme rains in recent years have further hindered agricultural activities. Combined with high fertilizer prices and limited marketability due to intermediaries, the farm sector in Karawang is facing significant challenges.

During the interviews conducted in 2022 with farmers in Karawang, a common practice emerged, highlighting the dominance of intermediaries in the market chains. Farmers often find themselves with limited options and are compelled to sell their products to intermediaries at significantly lower prices. Meanwhile, these intermediaries are able to sell the same products at much higher prices in the market. This disparity in prices was confirmed by all the farmers interviewed, indicating a systemic issue within the agricultural sector.

The presence of loan sharks, particularly the notorious "Bank Emok," has become a significant issue in Karawang. Farmers, who often struggle with limited financial resources, need quick loans to cope with the continuously increasing prices of goods and services. Bank Emok originated from gatherings of spouses involved in a traditional savings clubs called *arisan,* where members contribute money weekly and take turns withdrawing the accumulated sum monthly. Bank Emok, however, deviates from this concept by becoming a group-based loan system that targets low-income individuals in urgent need of funds. The responsibility falls on the entire

group when a borrower cannot repay the loan.

Bank Emok primarily enrolls those with limited access to formal banking services, including farmers and low-income individuals. Additionally, other loan sharks are operating in Karawang, with one common tactic being targeting permanent employees. These loan sharks entice individuals with large sums of cash, persuading them to hand over debit cards linked to accounts which receive payroll from their primary jobs. By doing so, the creditors gain direct access to the money. Obtaining loans from sources other than traditional banks has become accessible in Karawang, often without a formal application process. Some lenders even approach potential borrowers directly. However, individuals who fall into the trap of these loan sharks risk losing their assets, including their homes and, in extreme cases, their lives. The desperate need for money to sustain their daily lives pushes low-income individuals to turn to these loan sharks and sell assets or goods to generate income. This vicious cycle of borrowing and indebtedness further exacerbates the financial struggles the local community faces in Karawang. As one resident in an interview who works as a tree trimmer, fence builder, and construction worker said, "Loan sharks such as Bank Emok and others take away the lives of poor people. This is due to the increase in lifestyle and needs where once the price was low but there was no money, but now, when we have money, everything is super expensive."

In Karawang, it had become increasingly common for farmers not to own the land they cultivate, a shift from the past when they operated their farms. This change reflects the challenges farmers face in adapting to the demands of the changing economy. In some cases, farmers have been compelled to sell their farms due to various factors, such as economic pressures, urbanization, or changing agricultural practices. However, selling the farm does not necessarily ensure their sustained livelihood as independent farmers. Instead, many find themselves forced to become

farm laborers, working on the land they once owned but which is now under new ownership. This transition can be a difficult and disheartening experience for farmers who once controlled their own agricultural enterprises. In other situations, farm owners opt for profit-sharing arrangements or rent their farms to other farm laborers. This allows them to maintain a degree of involvement in agriculture while shifting the burden of day-to-day labor and management to others. These arrangements provide a source of income for the farm owners without the direct responsibilities and risks associated with farming.

Farm laborers must invest their money into farming, including purchasing necessary supplies, renting land, and covering other expenses throughout the farming season. This financial responsibility solely rests on the farmers' shoulders, making it crucial for them to have sufficient funds to start their work. Unfortunately, the profits earned at the end of the harvesting season are often minimal due to the financial obligations farmers have incurred. The costs of loans, land rent, and agricultural inputs can significantly impact their overall income. Moreover, external factors such as adverse weather conditions and pest infestations can further decrease productivity, leading to potential losses for the farmers. Karawang locals also reported that they felt social and psychological pressure to keep up with changing trends and lifestyles. The desire to conform to these expectations drives people to seek additional income sources and take on more financial risks, they said. However, as the cost of living increases, individuals may be trapped in a cycle of economic hardship and debt.

During an interview, a local impacted by this phenomenon who now works arbitrarily as a construction worker, grave digger, and a religious figure said:

> "I lost everything because of Emok. It was truly evil. My wife owed hundreds of

> millions, and debt collectors took everything from us: my lands, my parent's land, and everything from the house. And now, my wife has run away to Malaysia to work as a maid. The last time I heard, she married there, leaving me and 3 of our children; the youngest was five. Even now, this house, without roofing and flooring, water, and electricity, debt collectors still come sometimes."

Also, an elderly resident who now works as vegetable seller, likewise states:

> "I lost everything from Emok. I used to have a large land and field, but now I only have a small area to live in. I sell vegetables from door to door, and my ears do not hear very well. I lived here in Karawang for over 60 years but never thought I would die poor."

Despite living in poverty and facing limited assistance from the local government, the residents of Karawang demonstrate remarkable resilience and find ways to sustain themselves. Some higher-income communities come together to offer support, donating essential items such as food and clothing to those in need, although some sought popularity and political interests by exposing their generosity to the public, internet, or social media. In this context, the ability to survive is not solely determined by monetary resources. To supplement their income, people pursue multiple sources of employment.

For instance, an interviewee with three children takes on numerous roles, working as a preacher, a construction worker, and a burial worker. Financial support comes from his two older sons working as a construction worker and a street food seller. This resilience and resourcefulness demonstrate the community's strength and ability to adapt to challenging circumstances. Through these collective efforts and multiple income streams, even with meager monthly earnings,

individuals in Karawang strive to provide for their families and meet their basic needs.

On the other hand, the emergence of Karawang urban area also creates a magnet for people from other nearby rural regions who see it as an opportunity. An interviewee from a family of scavengers said:

> "My entire family is scavengers, including me, my wife, and two of our older sons, sixteen and six years old. My daughter, three years old, will also be a scavenger when she grows up. The more members in the family, the more we can cover every corner of the city. Changing jobs is impossible. My older son applied to every store in Karawang, but none accepted him. No one would ever hire a scavenger who lives on the street. I know that we will never escape this life."

On a different occasion, a middle-aged woman beggar said:

> "I live in the neighboring regency where it was difficult to get a job. I washed some neighbors' clothes while living there, but it wasn't enough to raise three kids. So I came here, often with my kids, as a beggar. I teach my kids to beg for money too. After sunset, we will ride public transport back home. At least the kids and I can live."

While some people struggle to obtain their basic needs, others see Karawang as the land of opportunity. A resident who earns a living as a sex worker said:

> "I am 17 now, but I have been here for two years. I am not from Karawang. I don't need to go anywhere, and my client comes here to where I live now, in this residence. They order through this social media app. When a client comes, I

> request another room. Some pay more without condoms, and I am happy to receive more."

Another interviewee, originally from Central Java who works as a food seller, said:

> "I enjoy selling these snacks here. My brother is also here. I make 500 portions per day, and it typically sells out. From this job, I can come home at least twice a year and send some money to my parents back home."

The illegal fees and extortion that are perpetrated by local or neighborhood government employees exacerbates the community's challenges in Karawang, resident reported. This deceptive practice even within the culture of planning and development adds financial burdens to the already struggling residents, and undermines their trust in the government. Additionally, the government's failure to effectively address and curb loan sharks further compounds the difficulties faced by the community. Social justice is a fundamental principle in Indonesia outlined in Pancasila, the country's ideological foundation (Herawati, 2014). However, achieving social justice in practice proves challenging, as highlighted by the experiences shared in interviews conducted in Karawang in 2022.

The lack of trust in the government is evident among residents, with some expressing skepticism about the local government's effectiveness in addressing their needs. These sentiments reflect a more profound frustration and disillusionment with the governance system, where corrupt practices and ineffective measures to combat loan sharks have eroded public trust. Overcoming these systemic issues and achieving social justice in Karawang will require significant efforts to tackle corruption, enhance transparency, and ensure fair and equitable opportunities for the community's well-being.

A. Inundated Karangligar

Karawang, located in West Java Province, is vulnerable to natural disasters, particularly flooding. It ranks 6th most prone to such tragedies in the province, with 24 out of its 30 districts susceptible to flooding (Adi, et al., 2021). One of the primary causes of flooding in Karawang is the overflow of the Citarum River, the largest and longest river in West Java Province. The Citarum River traverses multiple regencies and cities, including Jakarta, in its downstream area. The issues surrounding the Citarum River stem from water overexploitation and rapid land use changes in the densely populated watershed areas. Improper planning and the lack of adequate infrastructure have led to a shift from agricultural to residential development in the downstream regions. Consequently, drainage systems and irrigation channels are inadequate, exacerbating flood risks. Moreover, the accumulation of household waste and improper waste management further obstructs river areas. The watershed management problem necessitates collaboration among all regions along the Citarum River to find comprehensive solutions (Rohmat, 2009; Halim, 2013).

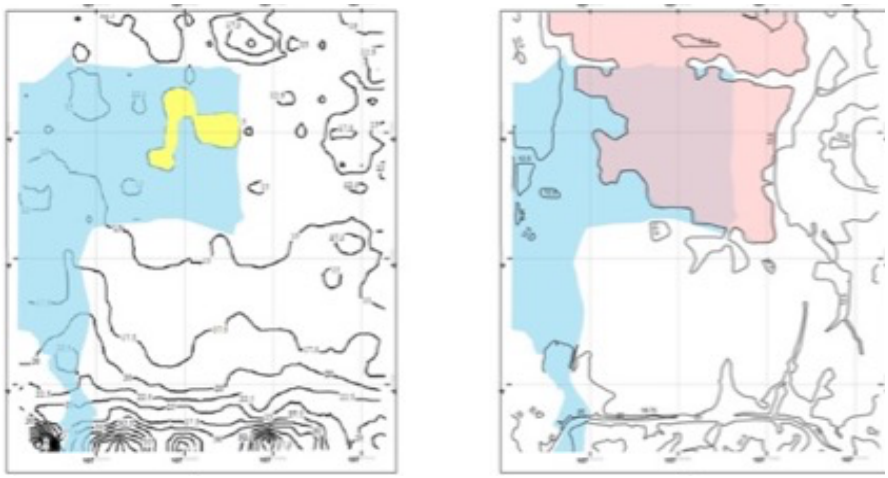
Karangligar, a village in the West Telukjambe district of Karawang, faces the ongoing challenge of chronic inundation. Despite its proximity to the Jakarta toll road exit, Karangligar remains hidden from the main road of Tarumanagara to the west, and might go unnoticed. As the urban area surrounding Karangligar continues to expand, there are concerns regarding the village's future development. It might be converted into a residential area or other recreational facilities to cater to the growing urban population. In the meantime, it is crucial to recognize that Karangligar is grappling with significant environmental issues.

Approximately half of the village's area has been submerged for over a decade, resembling a

lake. The ineffective drainage system and non-functional irrigation channels aggravate the situation. This is further exacerbated by the soil structure of Karangligar, characterized by fragile clay shell layers. The clay shell shifts and subsides depending on water volume, contributing to land subsidence. The industrial area south of the toll road exit has also affected environmental degradation, mainly through excessive groundwater exploitation. These factors have accelerated land subsidence and expanded the water's surface area in Karangligar (Saputra, Rifai, & Marsingga, 2021).

Figure 3.1 illustrates the extent of inundation in Karangligar. The yellow spot on the left and the red zone on the right indicate heavily expanded inundated areas of water between 2007 and 2015. During the rainy season, the water surface expands further due to heavy rainfall or upstream overflow caused by high water volume (Saputra, Rifai, & Marsingga, 2021).

Figure 3.1 The 12.5 Meters Contour Map of Karangligar (2007-left and 2015-right)



Source: Geospatial Information Agency of Indonesia, 2022

The field interviews conducted between 2021 and 2022 reveal a lack of practical solutions introduced to address the issues faced by Karangligar since 2007. One of the attempted measures

was the installation of a water pump connected to the nearest river. However, the volume of water in the area was substantial, rendering the pump relatively useless. There was also an attempt to utilize a long hose, approximately a hundred meters long, to connect the pump to the nearest river. Still, it didn't last long due to the constraints of budget, continued electricity, and the undersized pumping power and capacity. Figure 3.2 provides a visual representation of the situation.

Figure 3.2 Water Pump Alternative

Source: Field Observation, 2022

The affected neighborhood and the Karawang government have engaged in extensive discussions to find solutions to the flooding issue. As part of these efforts, dams have been developed to regulate and redirect water flow. Additionally, initiatives have been undertaken to repair and improve the irrigation channels and drainage systems, aiming to facilitate the return of water to the river. However, the situation is complicated by land subsidence, which leads to water accumulation in the inundated area. This accumulation, in turn, results in the buildup of household waste in and around the water flow, including both liquid and solid waste. It is worth noting that some houses lack septic tanks, leading to the discharge of black water into the sewage

system. Figure 3.3 below provides a visual representation of the situation.

Figure 3.3 Household Wastes along the Waterway

Source: Field Observation, 2022

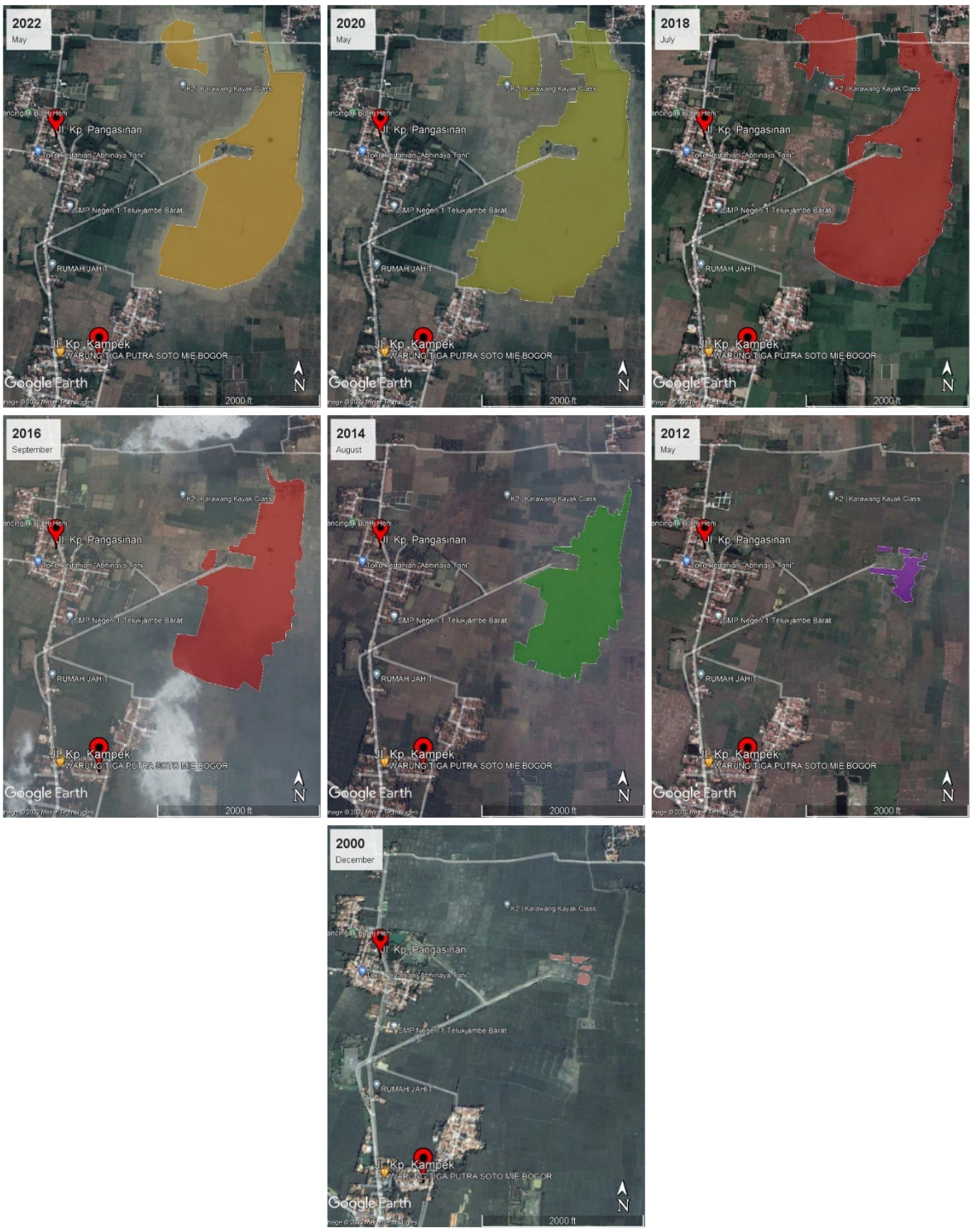
Flooding in Karangligar is a recurring issue and it may occur several times a year depending on the weather and the overflow of the Citarum river. Figure 3.4 show the effects of flooding, where houses and buildings are inundated with water. During this time, residents move to a designated

shelter area until the water evaporates/drains. Figure 3.5 shows how the flooded surface area has expanded rapidly from 2000 to 2022, where it currently covers more than half of the village.

Figure 3.4 Flooding and the Inundated Karangligar throughout the Time

Source: Field Observations, 2022

Figure 3.5 Expansion of Karangligar's Inundation



Source: Google Earth, Field Observations, and e-news (Tribun Karawang), 2022

Despite the environmental challenges and health risks associated with living in an area inundated

with unhygienic and dirty water, many individuals in Karangligar continue to choose to reside there. Reasons for this include limited resources and economic opportunities elsewhere, attachment to their community and land, and the lack of viable alternatives for relocation. In some cases, the residents may have deep-rooted connections to the area, such as family ties or cultural heritage, which make them reluctant to leave despite the adverse living conditions. Additionally, economic considerations may play a role, as the cost of relocating to a more favorable environment might be prohibitive for these individuals, particularly if they lack financial resources.

It is important to recognize that the decision to stay in such an environmentally disadvantaged area is often driven by a complex interplay of social, economic and cultural factors. Efforts to address the challenges faced by these communities should not only focus on providing immediate relief and assistance but also explore long-term solutions that empower residents and improve their overall well-being. This may involve implementing comprehensive environmental and public health initiatives, as well as exploring sustainable development options that can provide alternative livelihood opportunities for the community.

B. People's thoughts toward sustainability

The situation in Karangligar sheds light on the resilience of the local community in the face of environmental challenges. Despite the adverse conditions, the residents have found ways to utilize and benefit from the floodwaters (Figure 3.6). Their local knowledge and strategies have allowed them to turn what may be perceived as an undesirable place into a source of livelihood, recreation, and sustenance. The water in Karangligar, although contaminated with various waste materials, has become a medium for fishing. The flood events have led to the growth of fish

colonies, and people fish to acquire food for their families and even sell the surplus to their neighbors. This activity has provided sustenance and has become an important cultural and recreational aspect of the community's identity.

Additionally, visitors from other parts of Karawang who come to fish in Karangligar further highlight this place's significance. For some individuals, fishing in Karangligar is not merely a recreational sport but a vital means of survival. The income from selling snacks and drinks to the visitors has become a livelihood opportunity for those living near the flooded area.

However, it is essential to note that the living conditions in this area are far from ideal. The lack of basic amenities such as electricity and clean water, as well as the reliance on contaminated water for bathing and washing, present significant challenges to the well-being of the residents. The limited economic resources of the community also hinder their ability to improve their living conditions, as seen in an interviewee's desire to rent a wooden boat while still lacking the necessary funds to do so. The dynamics and resourcefulness exhibited by the residents of Karangligar can provide valuable insights for future urban planning in the broader context of the Karawang urban area. It highlights the importance of recognizing and incorporating local knowledge, strategies, and cultural practices into planning processes.

Figure 3.6 Survival and Thriving of Karangligar's Residents

Source: *Field Observation, 2022*

In the broader context of the Karawang urban area, residents are concerned about the city's critical cultural elements and identity. Traditional modes of transportation, such as the *becak* (pedicab, Figure 3.7) and *delman* (wagon pulled by a horse), which have been iconic in

Indonesian culture for generations, are gradually disappearing in Karawang. These modes of transport are not only practical but also carry cultural significance.

While some cities in Indonesia and around the world have recognized the value of preserving these traditional modes of transportation as curated tourist attractions or urban entertainment, Karawang has not prioritized their preservation. The fading presence of *becak* and *delman* in Karawang reflects the city's lack of emphasis on maintaining its cultural identity. Residents express their disappointment and perceive a blandness in a city that disregards its Indonesian character.

Many other regions in Indonesia have implemented grand designs and development plans that incorporate their cultural heritage, such as Bali, Yogyakarta, Makassar, and Semarang. However, Karawang seems to lack a clear vision for its development, resulting in a planning culture characterized by a lack of planning itself. This has left a lasting impact on the residents, who desire a well-designed city center that aligns with Indonesian culture and provides an environment where traditional modes of transportation like *becak* can thrive.

The residents' concern about the disappearance of cultural elements reflects the significant issue of maintaining a sense of identity in the face of rapid urbanization and globalization. They recognize the importance of preserving local wisdom and traditional practices to connect with their roots and create a unique urban experience.

Figure 3.7 *Becak* as the Local Public Transport

Source: Field Observation, 2022

In an interview in 2021, a planning lecturer offered a point of view on this idea, emphasizing the structural factors that perpetuate these conditions:

> "Emerging urban areas, highways, and infrastructures follow the realtors and businesses: the idealism dilemma into the economic profits. Nothing taught in the universities reflects what happens in actuality. The developer knows the market and freely expands everything above the land."

The resourcefulness and creativity of Karawang residents shines through under these circumstances in their entrepreneurial endeavors, as they take charge of their survival since they cannot rely solely on the government for support. One such example of their ingenuity is the

construction of small chicken or bird coops, as depicted in Figure 3.8. Many residents have embraced this idea and built their own coops.

Those fortunate enough can sell their chickens in the traditional market, while others opt for door-to-door sales. Some even go the extra mile, traveling to distant locations to sell their chickens and maximize their chances of making a profit. These entrepreneurial efforts demonstrate the residents' determination and ability to generate income in challenging circumstances.

By taking matters into their own hands and exploring various avenues for selling their products, Karawang residents showcase their self-reliance and resilience. Their ability to adapt and find innovative solutions to generate income exemplifies their entrepreneurial spirit in the face of adversity.

Figure 3.8 Small Scale Chicken Coop

Source: Field Observation, 2022

Figure 3.9 Street Businesses and Landfills as Opportunities

Source: Field Observation, 2022

Karawang residents rely extensively on street businesses, as depicted in Figure 3.9. These businesses sell a variety of products, including food, clothing, and household items. The residents' ability to creatively establish and operate street businesses is crucial for their survival. They adapt to challenging circumstances and leverage their entrepreneurial skills to generate income.

In addition to street businesses, landfills have become a significant income source for many Karawang residents. These landfills are potentially viewed as treasure piles by some, and they attract scavengers searching for recyclable plastics and materials to sell at recycling facilities. Moreover, some residents repurpose certain materials found in landfills into profitable items, while others seek usable items for personal use.

In this context, the intervention of numerous para-governmental associations (Ind.-LSMs) in Karawang may raise concerns. Hundreds of these LSMs effect modes of local governance and

often engage in predatory practices. LSMs control various sectors within the low economic strata, forcing the community to comply with their demands. They oversee parking lots near stores and along main roads and appoint their members as informal parking attendants. Additionally, LSMs assert control over walkways adjacent to roads, requiring street vendors to pay rent and security fees for using those spaces. This situation is ironic since public areas should not be subject to private ownership.

LSMs also form informal partnerships with certain factory insiders and neighborhood governments, resulting in the collection of entrance fees from job applicants. They compete to access parking lots and public spaces, and take over the sale of waste materials to companies for recycling and second-hand business purposes. Although the local government has mandated that Karawang's factories employ at least 30% of their workforce from the local population, the practical implementation is challenging. The locals often face occupational marginalization, hindering their employment prospects within the factories.

The prevalence of LSMs and their control over many aspects of the local economy presents complex dynamics and challenges for Karawang residents. An older resident who owns a small store near the river said, "Migrants immediately change their ID into Karawang residency and enter the job through Karawang locals employment: so many sneaky tricks to step over the regulations."

Figure 3.10 Dense Neighborhood and Social Cohesion

Source: Field Observation, 2022

The Karawang urban area has experienced significant population growth and the development of dense neighborhoods, as depicted in Figure 3.10. Residents live in close proximity to one another, which has traditionally fostered strong social connections and a sense of community. In these neighborhoods in the past, residents have relied on the principle of *gotong royong*, a concept deeply rooted in Indonesian culture that emphasizes cooperation, mutual trust, and collaboration for the common good.

However, the presence of social threats such as loan sharks, LSMs and scalpers has gradually eroded the social cohesion and spirit of *gotong royong* in Karawang according to interviews as well as my own field observation. These threats create social pressures and contribute to the

decline of community harmony and trust. The pervasive influence of loan sharks, for instance, can lead to financial hardships and strained relationships within the community. The dominance of LSMs, as mentioned earlier, further exacerbates social tensions and reinforces individualistic tendencies.

As a result, individualism has begun to thrive within the Karawang community, contrary to the collectivist values deeply ingrained in Indonesian culture, especially within dense neighborhoods or *kampungs*. The erosion of social cohesion and the rise of individualism hinder the community's ability to work together effectively during challenging times, such as heavy rainfall or flooding.

Figure 3.11 Military to Lead the Teamwork

Source: Field Observation, 2022

The transformation of the Citarum river and its surrounding areas in Karawang is a significant development demonstrating the potential of community-based action and collaboration with the military to address environmental challenges. The condition of the river, with slums and settlers

along its banks and polluted water, posed significant environmental and health risks for the community. However, implementing a military-led program in collaboration with the local community has brought positive changes. As depicted in Figure 3.11, the establishment of green buffers in the Citarum watersheds has helped improve the overall water quality, leading to greater transparency of the water. This indicates a successful effort in restoring and revitalizing the river ecosystem.

The decline in slum areas along the riverbanks is also encouraging. The joint work between the military and the community, initiated in 2017, has played a crucial role in this transformation. The armed forces' involvement has provided resources, expertise, and organizational support to facilitate community-based action.

This example of military-assisted community collaboration in environmental restoration showcases the potential of participatory approaches as analyzed in PE in order to address complex challenges. It highlights the importance of exploring and implementing various strategies to improve environmental suitability and mitigate future risks. By combining the expertise and resources of different stakeholders, such as the military, local communities, LSMs/NGOs working for social justice and government agencies, achieving significant positive change in the environmental landscape is possible.

Moving forward, it is essential to continue exploring and expanding upon these collaborative efforts to ensure the long-term sustainability and resilience of Karawang's environment. By learning from successful initiatives like the one along the Citarum river, other methods and strategies can be explored to address environmental issues in different areas of Karawang and beyond.

Planners with better tools and information can help to foster a renewed sense of community and strengthen social bonds within Karawang. Promoting initiatives that encourage cooperation, trust, and shared responsibility can help revive the spirit of *gotong royong* and rebuild social cohesion. Additionally, addressing the underlying social problems and implementing measures to safeguard the well-being and interests of the community will create a more harmonious and inclusive living environment in Karawang, alongside efforts to improve the land use and the built environment.

CHAPTER 4. ENVIRONMENTAL HISTORY AND MULTI-CRITERIA COMPREHENSIVE LAND ANALYSIS OF KARAWANG URBAN AREA

Due to their valuable semantic and geometric information, maps have inestimable value for planning. Mapping is an effective tool for understanding the wealth of talent and resources that exist in each community; the long-term development of a society rests on its ability to uncover and build on the strengths and assets of its people, institutions, and informal organizations (Casas, Sadat, & Urtasun, 2021; Beaulieu, 2002). This dissertation argues that maps can be a stepping stone for better planning in Karawang, and better mapping practices can also reform the planning culture for the better. Maps provide a good picture of both human and environmental systems, since as stated by Ostrom (2007; 2009), that show that details matter, and show that frameworks have to be developed from a rigid set of visual data. Maps may also complement and strengthen PE applications (Turner and Robbins, 2008; Turner, 2015), as discussed in the previous chapter.

This chapter, this dissertation utilizes geospatial analysis to examine and illustrate the extent of land degradation, environmental conditions, and land characteristics in the Karawang urban area. The aim is to emphasize the environmental aspect of the PE framework's analysis of the interaction between humans and the environment. It evaluates the land analysis within an Indonesian planning context, using the Karawang urban area as a case study for review and evaluation. Within the planning culture of Indonesia, maps and geospatial analysis play an integral role. However, bureaucracy and political processes often affect the outcome of planning documents, resulting fewer suggestions being incorporated into city or regional programs.

Interestingly, from many years of experience as a planner in multiple regions of Indonesia, I observed that maps were more prominently displayed than the planning documents themselves. They are printed and portrayed in city halls or other local government buildings. While the direct impact may not be readily apparent, these maps serve as a basis or reference for future changes.

Specifically, by visually representing the environmental characteristics and conditions of the Karawang urban area, these maps may raise awareness among residents about their city and neighborhood. Through these visual representations, individuals can better understand the environmental challenges and opportunities within their locality. They can identify areas of concern, such as land degradation, pollution hotspots, or areas with limited access to green spaces. This awareness can stimulate discussions and actions toward sustainable and environmentally conscious practices that align with the spirit of PE. It would be an excellent follow-up study to present the maps resulting from this dissertation to the community and analyze them further to elaborate more on the geospatial analysis's socio-cultural analysis, as this research did not investigate the maps in the community interviews.

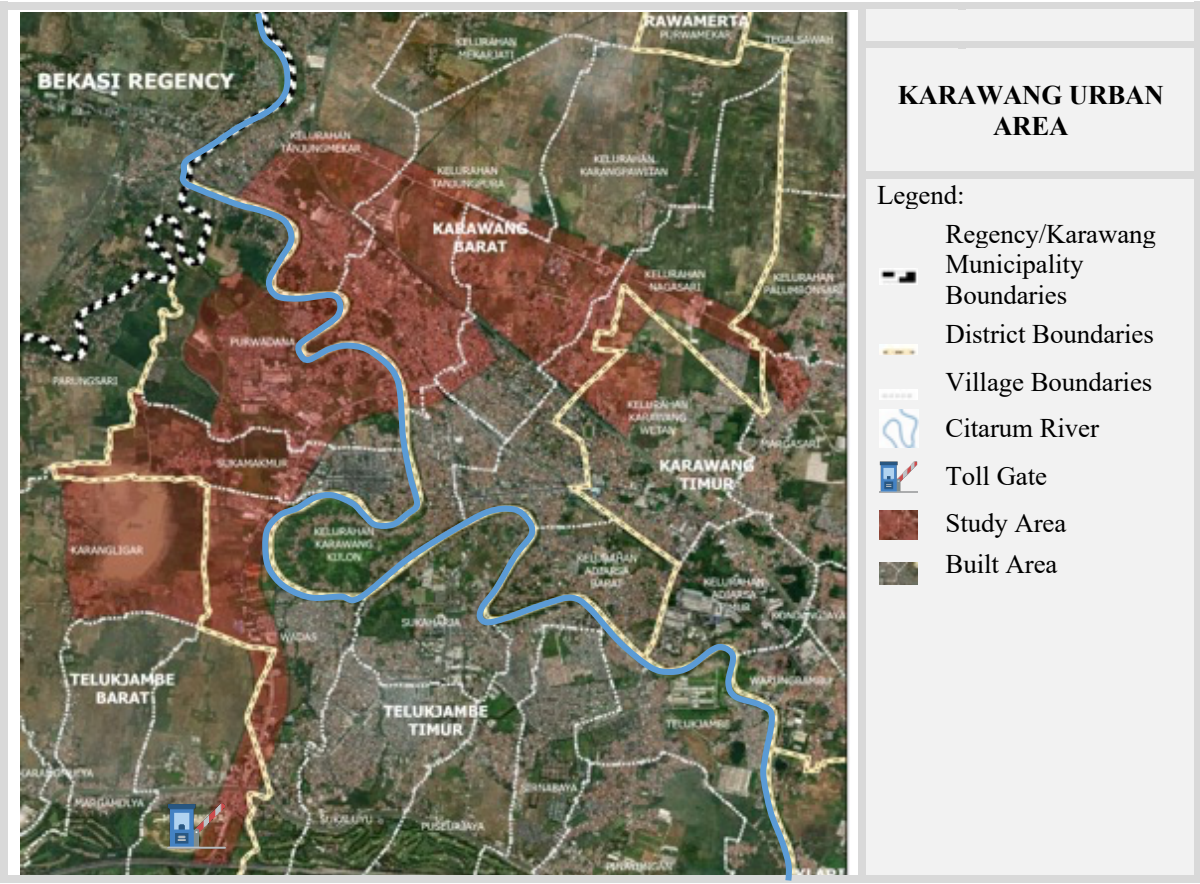
Although Karawang has an overall plan for the regency, detailed plans for its urban area have not been developed. All six planning lecturers interviewed for this study, as well as the planning consultant interviewed in 2021 implied that the detailed land use and plans are only informally discussed and subject to ongoing bureaucratic processes, which is characteristic of the planning culture for regional areas. This chapter explores the history of planning and underscores the importance of systematic detailed and comprehensive planning to improve the planning culture in Indonesia and also in West Java. It considers the principles of sustainable development, such as the environment (biophysical factors), as discussed in previous chapters, and now further integrates multi-criteria geospatial analysis and a humanistic perspective. The view of

sustainable development can enhance the process of map-making and interpretation.

This chapter will begin by examining a brief environmental history related to land degradation in Karawang. It will then delve into a case study of a multi-criteria land analysis and socio-physical analysis. A map illustrating the case study area, the Karawang urban area including Karangligar, in Figure 4.1 provides an overview of the chapter's content. This map was developed for the purpose of this dissertation, and serves as an informative reference for the socio-physical exploration throughout this chapter.

As seen in Figure 4.1 and building upon the examination of Jakarta's environmental history in previous chapters, the case study area is the Karawang urban region from the first exit of the toll road that connects Karawang to Jakarta, extending to the urbanized vicinity near the Karawang government offices. While the actual urbanized area is more expansive, this dissertation concentrates explicitly on the accessible space that an individual researcher can thoroughly investigate. The research is guided by the conceptualization of PE, as in the previous chapter, to explore the community's perspectives, comprehend the dynamics of environmental governance, and analyze the informal structures within the urban area.

Figure 4.1 Karawang Urban Area: Case Study



In this chapter, a comparison will be made between the geospatial analysis developed in this research and the current land analysis method that has been used in Indonesia since 2007. The present research's framework is considered more sophisticated as it not only improves the techniques for identifying physical characteristics, but also incorporates the idea of accessibility to urban infrastructure and considers environmental policies. For comparison, the chapter will present a past example of the 2007 method applied in a similar urban area of Karawang, which did not accurately represent the site's physical characteristics. Despite including land use policies in its framework criteria, the past method could not incorporate them in the GIS analysis, as is currently proposed in this dissertation of the 2007 framework. It primarily focuses on physical aspects and does not represent the area's current condition. In contrast, this chapter will demonstrate that the geospatial analysis framework of the present research offers a more comprehensive and improved approach to identifying the bio-physical aspects of the study area. This research also highlights the importance of incorporating accessibility to infrastructures and environmental policies and considerations into the analysis.

A. Brief environmental history and the land degradation of Karawang urban area

Since the 1600s, Karawang has emerged as a prominent agricultural center, primarily known for its rice paddy fields. Even after Jakarta became the capital city of Indonesia in 1945, Karawang maintained its crucial role in supporting Jakarta's food supply. Before its development, Karawang was characterized by swamps and forests, as reflected in its name's origin, "Ke-Rawa-an," with "Rawa" meaning "Swamp." Within Karawang are districts with terms related to swamps, such as the "Rawamerta" district.

Figure 4.2, displayed below, provides a current map of Karawang. Throughout history, dating back to the 15th century, the general area of Karawang has remained relatively unchanged. Therefore, this map can also represent the overall outline of Karawang's territory until the present day. Figure 4.2 depicts Jakarta, and the surrounding regions previously discussed in Chapter 2 are situated west of Karawang.

Figure 4.2 Map of Karawang Regency and Surroundings in West Java Province

Source: West Java in Numbers. West Java Statistical Agency, 2008

Karawang's significance dates back to the Pajajaran Kingdom in the 1500s, when it served as a vital transportation route connecting the northern area to the south. The Islamic kingdom attempted to incorporate Karawang to support the war against the Dutch and ended up assigning

Karawang as a "rice barn." (Bintang, 2007). This historical event cemented Karawang's role as the primary food supply center for the surrounding area, particularly Jakarta.

During the New Order era in the 20th century, establishing industrial estates in Karawang Regency was mandated by Presidential Decree Number 53 of 1989 to cater to the growing demands of Jakarta. These industrial estates were initially developed in unproductive rice fields located in the southern part of the region, namely Klari, Telukjambe, and Cikampek, as agriculture experienced a decline during this period.

The strategic significance of the industrial estate development was notable, as these sites were situated between Jakarta and Bandung, a mere 70 kilometers from Jakarta. The construction of the Jakarta-Cikampek-Bandung toll road further enhanced the district's strategic position, leading to the continuous growth of industrial and other economic activities. Consequently, starting in 1996, regional investments became increasingly intense and have persisted for over two decades.

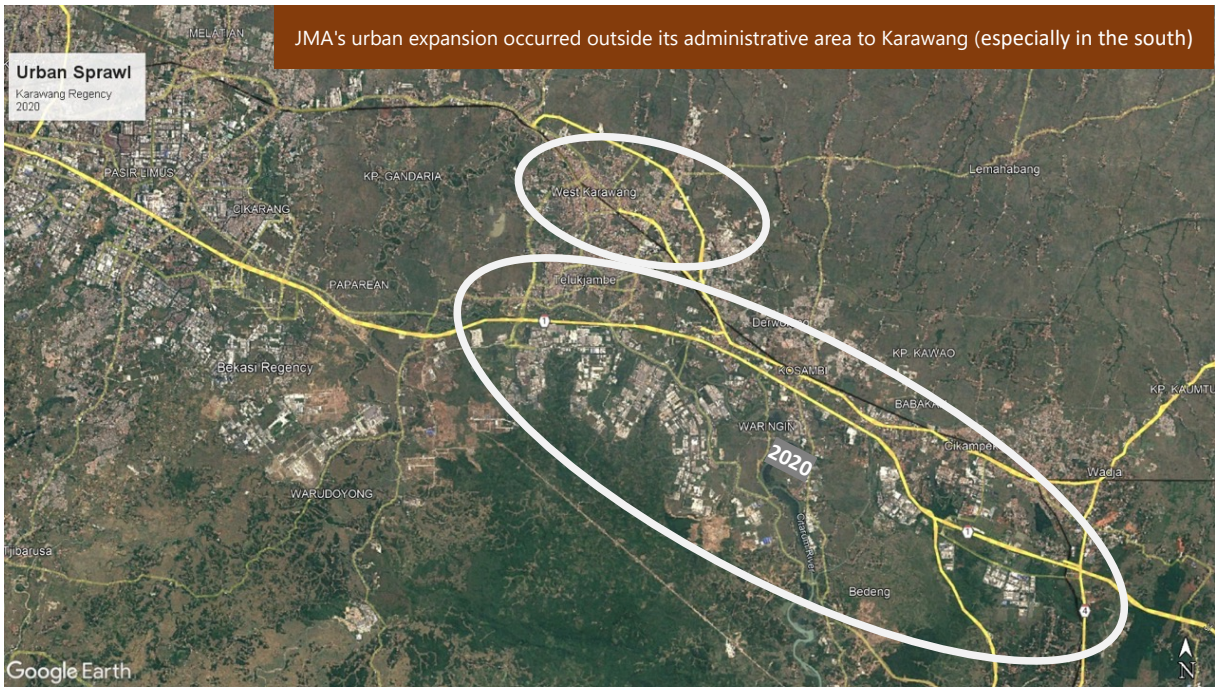
Karawang's rapid industrial growth has contradicted its historical image as a national rice supplier, which the local government had promoted until recently (Amalina, Binsasi, & Purnaweni, 2018). Over time, Karawang has undergone modernization and is now primarily known for its industrial sector. This is evident in the Karawang International Industrial City (KIIC) development in the Telukjambe Timur District (Tamariska, 2019). Despite rhetoric promoting other sectors, the Karawang government tends to prioritize the expansion of industrial and urbanized areas, resulting in the conversion of more agricultural land.

The growth of Jakarta have been significant drivers of land conversion in Karawang. Simultaneously, the uncontrolled pressure for Karawang to develop has led to increased demands for infrastructure. The need for housing and services, including hospitals, schools, amenities,

restaurants, and shopping centers, has concentrated around the urban areas of Karawang (Sipayung & Susanty, 2014). Consequently, agricultural and rice lands have experienced rapid and significant conversion. The districts with the highest land use changes include Pangkalan, Tegalwaru, Klari, Ciampel, Cikampek, Kotabaru, Telukjambe Timur, and Telukjambe Barat (Handayani, 2022), which have been almost entirely transformed into urban areas. This shift has also brought about a significant change in the occupational structure. Many farmers have transitioned to becoming factory workers and traders to adapt to the changing circumstances. The demand for labor has been immense, but the local human resources in Karawang have been inadequate, both in terms of quantity and qualifications. The skills required for farming are not necessarily suitable for factory work. Consequently, factories have favored workers from other regions, resulting in occupational marginalization of the local population in Karawang. The rapid growth has outpaced the ability of locals to adapt, leading to significant unemployment, with a large proportion of Karawang residents unable to find jobs, as most of the factory positions are dominated by immigrants, as signified in the 2022 field interviews with the 27 Karawang local families.

On the other hand, the life of a farmer has become increasingly challenging, as also affirmed by previous farmer families during the field interviews who had now completely changed their occupations. They added that in the 2000s, Karawang's industrial sector experienced substantial growth, and working in factories became a matter of pride for many residents. The map in Figure 4.3 depicts how industrial development and the construction of supporting infrastructure have encroached upon productive agricultural regions.

Figure 4.3 A Portrait of Urban Sprawl Phenomenon of JMA into Karawang, 2020: Karawang urban area (North) and Karawang industrial area (South)

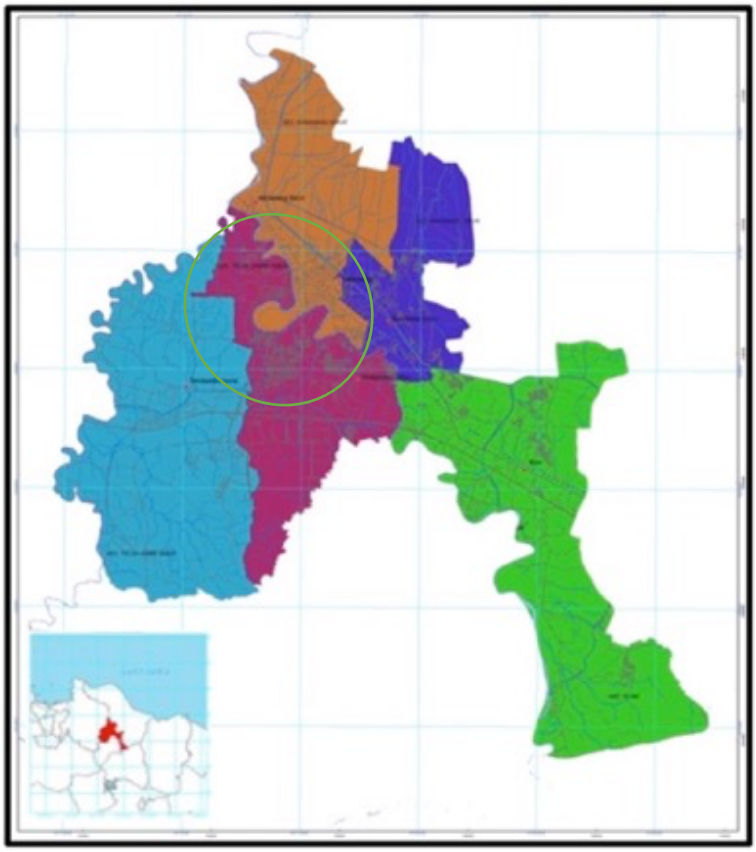


B. Identification of the Karawang urban area

The delineation of Karawang's urban area has never been officially recognized or established in formal documents or regulations, presenting a challenge when it comes to mapping for planning purposes. However, considering the observed growth patterns and the connection to the JMA, the Karawang government has identified five districts that have experienced significant urban expansion. These districts are characterized by their proximity to the JMA and their strategic locations near the toll road exits connecting Jakarta. Moreover, they have undergone substantial land use changes over the past three decades, accompanied by a rapid increase in population density. Figure 4.4 below illustrates these districts: West Karawang (depicted in brown), East Karawang (shown in dark blue), Klari (displayed in green), West Teluk Jambe (depicted in light

blue), and East Teluk Jambe (depicted in purple).

Figure 4.4 The Five Districts with the Major Urban Exposures



Source: Karawang Planning Development Agency, Karawang (2016)

Figure 4.1 represents this dissertation's specific urban area of focus, comprising three districts: West Karawang, West Teluk Jambe, and East Teluk Jambe. These districts have been are critical areas undergoing various changes and developments. Another key focal point of urban activity lies in proximity to the toll gate exit, encompassing the territory of the districts as mentioned above. This area holds significant importance within the urbanized region of Karawang. It is home to the Karawang governmental complex, serving as the area's administrative center. Additionally, it functions as the downtown core, representing the central hub of commercial and economic activities. The urban area surrounding the toll gate exit also serves as a prominent

settlement for Jakarta workers, attracting middle to high-income migrant workers who commute to Jakarta for employment. The delineation provided in Figure 4.1 offers a more detailed view, showcasing prominent buildings and density within the urban area. It represents a corridor-based development pattern that begins from the toll exit gate in the southern part of Karawang. This corridor follows the primary road, leading to a three-way intersection that is the boundary between the West Karawang district to the west and the Karawang governmental complex to the east. It is important to note that while this mapped area indicates where the city is currently experiencing growth, it may not encompass the entire urban area. As mentioned earlier, Karawang lacks defined city or urban boundaries.

The subsequent section will focus on dissecting and examining the geospatial analysis approach developed in this research. The objective is to present its effectiveness in comparison to existing literature and the traditional methods that have been in use in Indonesia for several decades. This analysis represents a departure from conventional approaches. It seeks to identify a more optimal model for interpreting the spatial characteristics of the environment and land degradation of the case study.

C. Updated multi-criteria land analysis of Karawang urban area

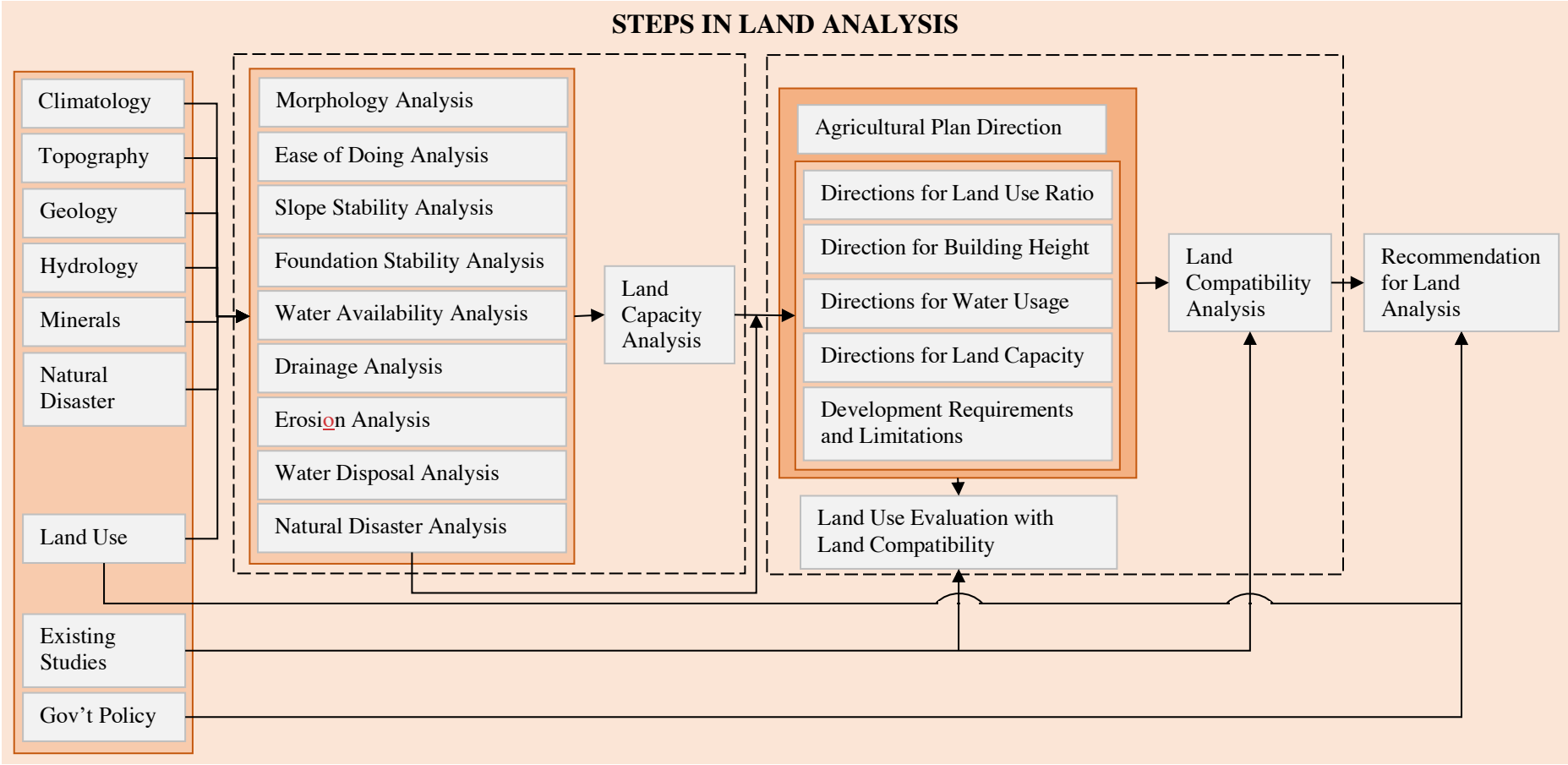
The Ministry of Public Works ordinance developed in 2007 provides the preferred measurements for geospatial analysis in Indonesia, as depicted in Figure 4.5. It is worth noting that these criteria have not been updated within the past 16 years. While the ordinance applies to all land analysis measurements in Indonesia's spatial plans, the extent to which geospatial analysis is utilized in spatial strategies can vary depending on the municipality. Based on extensive

observation and interviews with academics in planning, it is evident that not all processes of developing spatial strategies in Indonesia incorporate geospatial analysis.

In the case of Karawang, there has been no detailed discussion or application of land analysis at the district or urban area level. The focus has been primarily on the scale of the Karawang regency, resulting in a more general land use plan for the 140000 hectares of the total area. As the urban area becomes increasingly strategic, permissions and discussions regarding land use often occur behind closed doors, as revealed through interviews with local government officials, planning practitioners, and business owners in the span of 2021 to 2022.

Figure 4.5 depicts the land analysis methods based on the 2007 ministerial ordinance, which has been widely followed in Indonesia's planning culture. This approach primarily considers physical land characteristics such as climatology, topography, geology, hydrology, minerals, and natural disasters. However, this dissertation argues that continuous updates to the land analysis methods are necessary. The model proposed in this dissertation reveals that the 2007 method only accounts for one-third of the essential components developed in this research.

Figure 4.5 Indonesia's Reference for Land Analysis in Spatial Planning



Source: Minister of Public Works of Indonesia Regulation No. 20 / PRT / M / 2007 about Physical and Environmental Aspect Analysis Techniques, Economics, and Socio-Culture in Spatial Planning.

To enhance the land analysis technique, this chapter conducted an extensive literature review on similar land analysis models used for environmental assessment and spatial planning. Fourteen models from different cities worldwide, including the 2007 method developed by the Ministry of Public Works of Indonesia, were reviewed. Furthermore, the geospatial analysis in this dissertation was performed using the latest land data and characteristics from 2022. The methods employed in this dissertation also incorporate social-cultural considerations, thus providing a more comprehensive approach. Notably, the feasibility of this model in Indonesia was demonstrated by considering data availability and contextual factors.

The geospatial analysis employed a triangulation and weighting approach using the Analytical Hierarchical Process (AHP) developed by Saaty (1987). Table 4.1 provides an overview of the criteria used in the analysis, which were carefully analyzed and categorized to contribute to the overall land analysis process. Figure 4.6 illustrates the step-by-step GIS method used in each analysis iteration. The top diagram in the figure depicts the overall method, while the bottom chart showcases the GIS tools employed in each iteration to analyze the ten parameters and the three components. This iterative process was repeated to generate the final maps, effectively summarizing the results obtained from the different components. The AHP methodology ensured a rigorous and transparent analysis, while the GIS tools facilitated the visualization and interpretation of the data, contributing to a more informed understanding of the research area.

Table 4.1 Multi Criteria Analysis Framework

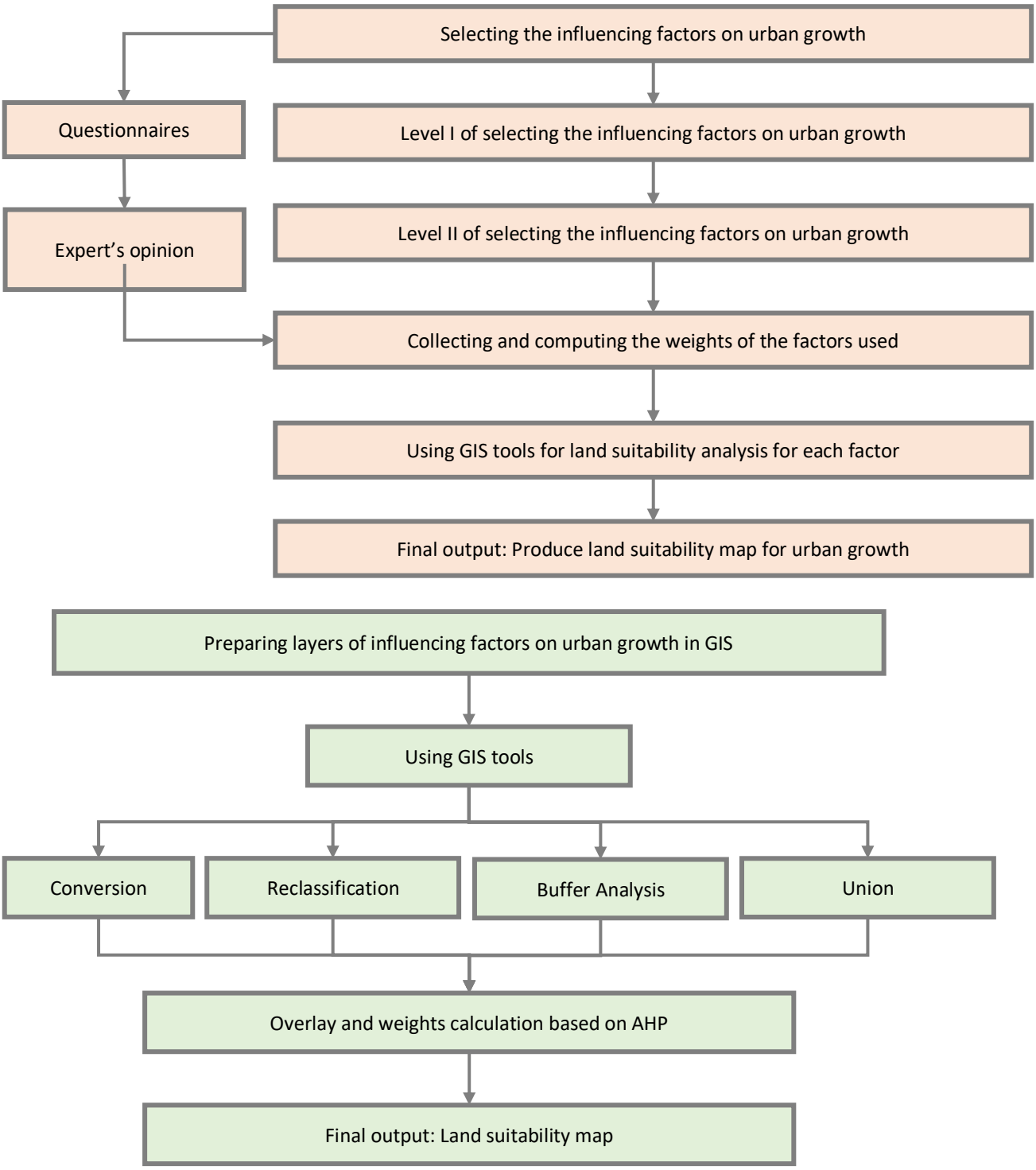
Component	Parameter	Indicator	Source
Biophysical	Geology	Type of Land (1-3,7,8,11,12)	1. Land Suitability Analysis for Urban and Agricultural Land Using GIS (Puntsag, 2014) 2. Land Suitability Evaluation to Determine the Appropriate Areas of Development: A Case Study of Hormuz Island (Ahmadi, Mosammam, & Mirzaei, 2017) 3. Land Suitability Analysis of Urban Growth in Seremban Malaysia, using GIS based AHP (Aburas, Abdullah,, Ramli, & Asha'ari, 2017) 4. GIS based land suitability analysis using AHP model for urban services planning in Srinagar and Jammu Urban center of J&K, India (Parry, Ganaie, & Bhat, 2018) 5. Site suitability analysis for urban development using GIS based multicriteria evaluation technique; a case study in Chikodi Taluk, Belagavi District, Kamataka, India (Santosh, Krishnaiah, & Deshbhandari, 2018) 6. Prediction and Comparison of Urban Growth by Land Suitability Index Mapping Using GIS and RS in South Korea (Park, Jeon, Kim, & Choi, 2011) 7. A Review of Land Suitability Analysis for Urban Growth by Using the GIS Based Analytic Hierarchy Process (Aburas, Abdullah, Ramli, & Ash'aari, 2015) 8. The Assessment of Land Suitability for Urban Development in the Anticipated Rapid urbanization Area From Belt and Road initiative: A Case Study of Nong Khai City, Thailand (Bamrungkhul & Tanaka, 2022) 9. Land-Use Suitability Assessment for Urban Development Using a GIS-based Soft Computing Approach: A Case Study of Ili Valley, China (Luan, Liu, & Peng, 2021) 10. Evaluation of Land Suitability for Urban Land-Use Planning-Case Study Dhaka City (Ullah & & Mansourian, 2015) 11. Land Use Suitability Analysis for Urban Development in Beijing (Liu, Zhang, Zhang, & Borthwick, 2014)
		Foundation Stability (13)	
	Morphology	Elevation (2,3,6,7,9,11,12)	
		Slope Stability (13)	
	Land Use	Land Cover/Land Use (1-12)	
		Vegetation (1,2,7)	
		Land Ownership (14)	
	Natural Disaster	Natural Disaster (2,8-11,13)	
		Erosion Sensitivity (9,13)	
	Hydrology	Water Availability (1,9,12,13)	
		Drainage System (13)	
		Ease of Doing of Reshaping (13)	
		Waste Disposal (13)	
Accessibility	Access to Transportation Facilities	Access to the Primary Road (3-6,9-12)	
		Access to the Station and Terminal (6-8)	
	Access to Public Facilities	Access to the Open Green Spaces (8,10)	
		Access to the Healthcare Facilities (8,10)	
		Access to the Commercial Area (3,8,10)	
		Access to Educational Institution (3,8,10)	
		Access to Religious Buildings	
		Access to Recreational Facilities (2)	
	Access to the Community Center	Access to the Urban Center (6-8,14)	
		Access to the Environmental Center (8,14)	
		Low Income Settlement Distribution	
		Distribution of People around the Conservation Area	
Policies	Environmental Regulations	Policies around Environmental Preservation (8)	
	Land Use Plans	Accordance to Land Use Plans (14)	

Component	Parameter	Indicator	Source
			12. GIS-Based Geo Environmental Evaluation for Urban Land-Use Planning: A Case Study (Dai, Lee, & Zhang, 2001) 13. Public Works Decree no. 20 year 2007 (Ministry of Public Works, 2007) 14. Guidelines to Identify the Slum, Squatter, and Metropolitan Buffer Area (Ministry of Public Works, 2006)

Stages of Analysis:

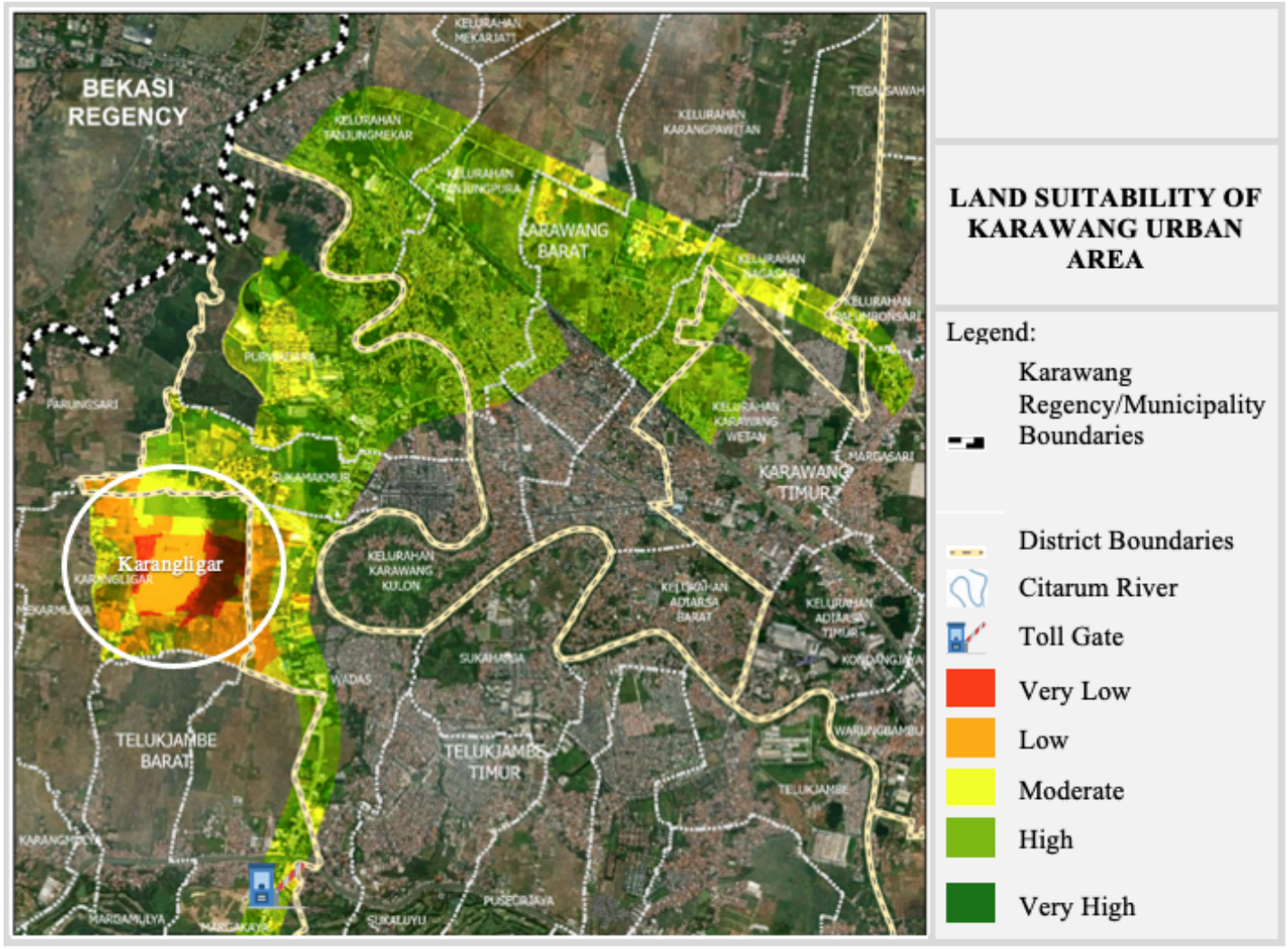
1. **Explain the idea of the Indonesian Method**
   (Geddes, 1915; McHarg I. L., 1969; McHarg I., 1981; Geddes, 1915; Zong, Wang, Wang, Wang, & Zhang, 2007; Irjadi, Rogi, & Makarau, 2020; Fonataba, Osly, & Ihsani, 2020; Ministry of Public Works, 2007)
2. **Explore additional frameworks to complement**
   (Steiner, McSherry, & Cohen, Land suitability analysis for the upper Gila River watershed, 2000; Collins, Steiner, & Rushman, 2001; Marull, Pino, Mallarach, & M., 2007; McHarg I. , 1981; Ahmadi, Mosammam, & Mirzaei, 2017; Puntsag, 2014; Yin, et al., 2020; Ullah & & Mansourian, 2015; Liu, Zhang, Zhang, & Borthwick, 2014; Gebre, Cattrysse, Alemayehu, E., & Van Orshoven, 2021)
3. **Find a Meeting Point based on the data availability and the character of the region**
   (Ministry of Public Works, 2007)

Figure 4.6 Geospatial Stages of Analysis



The geospatial analysis conducted in this dissertation resulted in maps representing each overlaid category of the three stages of analysis. A total of 27 indicators were derived from the 14 models reviewed, and each indicator was associated with the literature where it had been applied (as indicated in the second column from the right). These 27 criteria were then grouped into ten parameters: Geology, Morphology, Land Use, Natural Disaster, Hydrology, Access to Transportation Facilities, Public Facilities, Access to the Community Center, Environmental Regulations, and Land Use Plans. The first analysis stage involved creating ten map layers based on these ten parameters. The ten parameters were overlaid and divided into four parts in the second stage. Finally, the final land degradation analysis was produced. It is important to note that each criterion/indicator was not given equal weight. The Analytical Hierarchical Process (AHP) was used to assign weights to the indicators based on their importance in depicting the land characteristics (Saaty, 1987). In essence, the biophysical features were deemed more critical than the non-physical criteria since the analysis aimed to assess land degradation in the area.

Figure 4.7 Land Analysis Results – Marendraputra's Final Output



A detailed step-by-step land analysis, along with the corresponding maps generated from the parameters, can be found in the appendix of this dissertation. These maps provide a comprehensive understanding of the land characteristics and degradation in the study area.

Figure 4.7 present the synthesized results of the geospatial model developed in this dissertation, focusing on the case study of the Karawang urban area. The map comprehensively depicts the land degradation and characteristics in the study area by integrating biophysical information, accessibility to significant infrastructures, and associated environmental policies. While the biophysical factors were given more weight in the analysis, this dissertation emphasizes that geospatial analysis should consider human needs along with physical characteristics, highlighting the concept of political ecology and the human-environment relationship. The measurement values in Figure 4.7 range from very low to very high and apply to all indicators, parameters, and components. A high value indicates that a particular area is in a better environmental and social state, with reduced exposure to harmful environmental impacts, pollution, contamination, and natural disasters. Areas with high land capacity dominate Karawang Urban Area, with 68.44% of the area. The map shows that the case study is divided into two parts with a dominance of moderate-very high land capabilities in the north, east, to south. In contrast, the latter has very low-moderate land capabilities on the west side. This map also sheds light on place-making and environmental justice in the urban area. High-value areas coincide with luxurious settlements and structured neighborhoods developed by realtors. In contrast, lower-value areas (yellow to red areas) are where unstructured housing and low-income settlements are concentrated. This information, combined with insights from Chapter 3, obtained through further exploration of the community, enhances the understanding of the land analysis presented in this chapter.

The area of Karangligar in the south is of particular significance, since it serves as a social and physical representation of the challenges associated with political ecology. Over the decades, Karangligar has witnessed remarkable stories of land degradation, survival challenges, and struggles, all within the context of the Karawang urban area. The analysis raises the question of why substantial land assessment at this level has been overlooked, despite its potential to provide a brighter future for Karawang and its residents. Understanding the land and environment can offer a better vision for the growth of the metropolitan area and the region, aligning with the principles of PE.

Maps are crucial in planning as they provide valuable semantic and geographic information. They facilitate the understanding of a community's strengths and assets, enabling long-term development based on talent and resources. This dissertation argues that maps can serve as a stepping stone for better planning in Karawang and revolutionize the planning culture. Maps offer a comprehensive picture of both human and environmental systems, aligning with the notion that details matter and a framework should be developed based on a robust set of visual data.

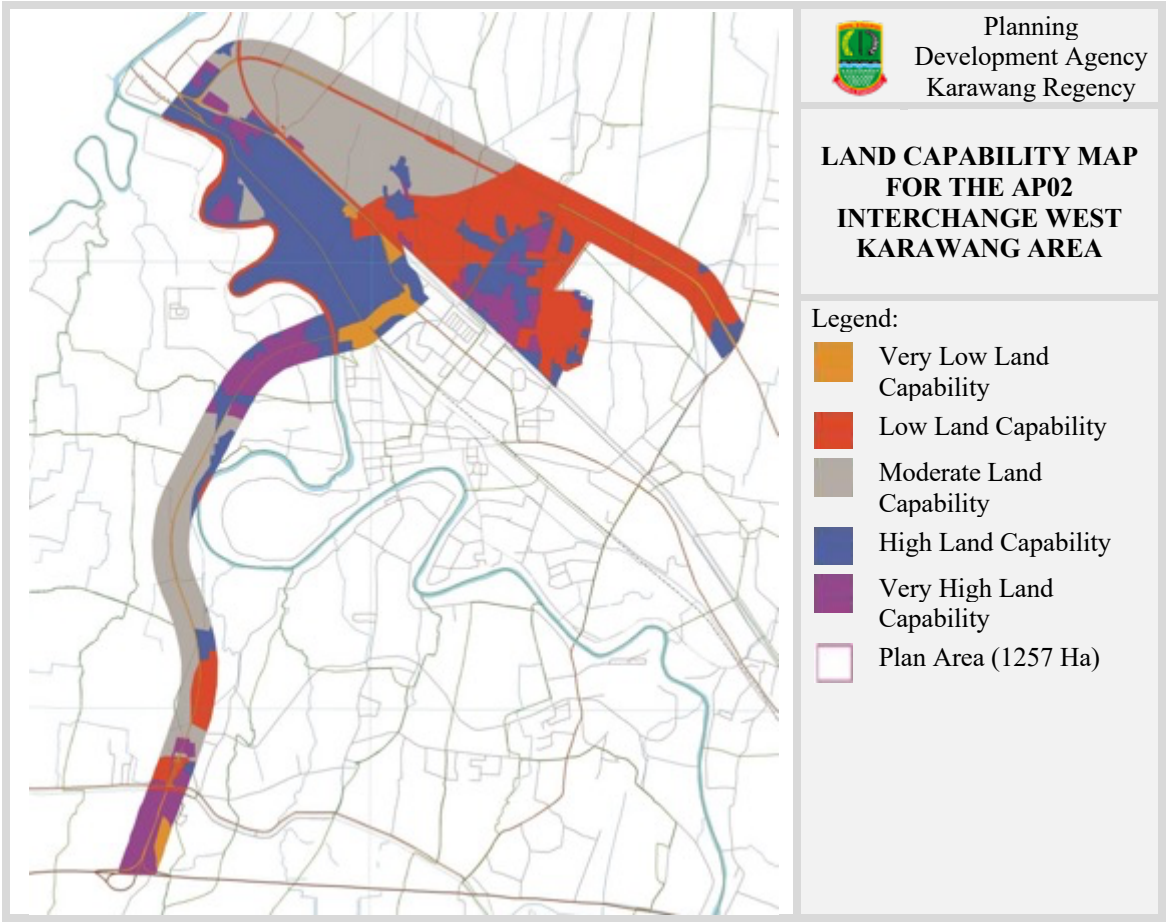
Figure 4.8 showcases a map from an abandoned project in Karawang in 2016, which applied the 2007 Indonesian method for geospatial analysis. Despite the project's attempt to identify the urban area of Karawang and conduct a land analysis, it is unfortunate that it was ultimately overlooked and did not receive any follow-up in terms of integration into the planning policies of Karawang. By presenting this map in comparison to Figure 4.5 (representing the 2007 method) and Table 4.1 (reflecting the developed analysis framework in this research), I argue that the GIS model developed in this study has contributed to a deeper understanding of this land's physical condition. The developed framework considers various parameters and employs the Analytical

Hierarchical Process (AHP) to prioritize and evaluate the criteria. Also, the improved framework and methodology enable a more nuanced analysis providing a better foundation for decision-making and planning processes.

It is crucial to consider the differences in the study area and the limitations of the maps when comparing the 2016 and 2022 analyses. The extension of the study area in this research, including Karangligar and other areas south of the river, introduces variations in land characteristics and conditions that may not be reflected in the 2016 map (Figure 4.8). Additionally, factors such as data availability and the GIS iteration process conducted in each analysis can also impact the accuracy and comparability of the maps.

That being said comparing the 2016 map (Figure 4.8) with the 2022 analysis highlights a significant difference in the depiction of the Karawang urban area. The 2016 map suggests generally poor land conditions throughout the area, with over 50 percent of the coverage falling within moderate to poor land quality. This contrasts with the analysis in 2022, which provides a more relevant representation of the field observations and indicates a different land quality distribution. It is worth noting the discrepancy between the 2016 map's categorization of the area around the governmental complex as low-quality or detrimental, while the field observation of the present study indicates otherwise. This highlights the limitations of relying solely on visual interpretations from maps without considering the on-the-ground reality. While comparing the 2016 and 2022 maps may have some limitations, it does indicate a significant difference in the land quality portrayal of the Karawang urban area. This emphasizes the need for up-to-date and contextually relevant analysis that integrates multiple sources of information, including field observations, to accurately assess and understand the land characteristics and conditions in a given area.

Figure 4.8 Karawang Urban Area, Land Suitability Analysis (2016)



Source: Karawang Planning Development Agency, Karawang (2016)

In the final synthesis, all the findings and observations from field interviews conducted in 2021 and 2022 were overlaid onto the final map derived from the multi-criteria land analysis, as shown in Figure 4.9. The information presented in the boxes on the map comes from interviews and site visits rather than formal documents. This map provides critical insights into the land, residential areas, and human activities. It can potentially support better and more effective planning that considers both the land and people, comprehensively capturing multiple perspectives. In addition to the primary case study, supplementary information was collected from physical observations conducted in areas adjacent to the study site. This broader context was included to provide a more comprehensive understanding of the social, cultural, and environmental factors influencing the case study area.

The combined approach of geospatial analysis and fieldwork conducted in this research has revealed distinct patterns in land use distribution and socio-economic conditions within the study area. One prominent pattern observed is the concentration of high-capability land utilized by the upper middle class for various economic activities. These areas are characterized by well-developed infrastructure and amenities that support daily activities and contribute to the local economy. In contrast, low-income individuals and families tend to occupy land with lower capabilities, often facing unfavorable environmental conditions and challenges. These areas may be prone to natural disasters or have limited access to essential services and resources. Moreover, a social stigma may be associated with these areas, making it difficult for low-income individuals to improve their living conditions. For people experiencing poverty, the choice of where to live is often constrained by limited options and resources. Their primary concern is finding shelter, and they may have to settle for any available space, even if it lacks many benefits or amenities. This can lead to individuals relying on informal arrangements, such as hitchhiking,

to access opportunities and meet their basic needs.

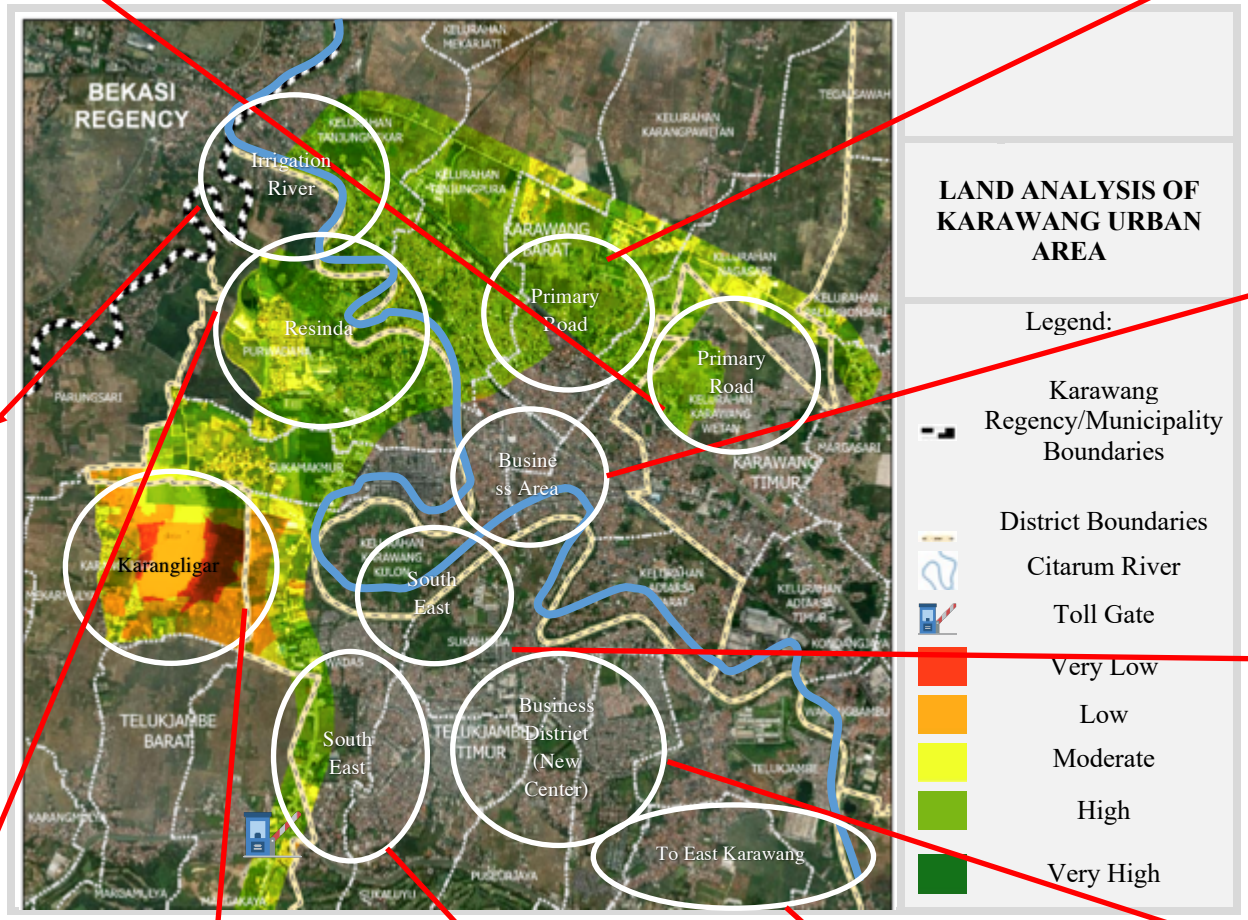
It is argued that perspectives from PE can play a significant role by promoting interdisciplinary approaches and extending beyond traditional boundaries to enhance planning methods. This approach has the potential to substantially improve planning methods in Indonesia and how planners think and connect with the community.

Public University. Sports Arena
Open Spaces. School Complex
Unstructured Housing. Structured Housing

Governmental Complex
Beggars Area
Circulating LSM and Resting Spots
Few LSM Homebase
Crowded from Halting
Public Transport (Angkot)
Bike Taxi and GOJEK spots

Beggars Area
Scavengers Family
Stores Along the Road
Street Food Seller
Open Spaces – Hangout
Bike Taxi
GOJEK Rest Area

Figure 4.9 Land Analysis Results with Socio Cultural Analysis



Housing along Irrigation Channel (Buffer Area- Lease to Government)
Squatters next to the River
Recycling Facilities (Scavenger Collects Here)
Chicken Coops Along the Irrigation
Fish Pond along Irrigation
Unstructured Housing
Less busy roads on the north (sometimes used for drag race)
Going to Bekasi (Origins for many beggars and scavengers) and non tollway to Jakarta

Scavengers Family
Small Stores
Small Food Wagon (*Angkringan*)
Market (Pasar)
Motels (Non Prostitution)
Motels (Prostitution)

Becak
Beggars Area
Factory Workers (Lower Budget Residential)
Landfills
Landfills Community (Residential)
Small Space Rent (Seller)

Six Star Hotels
Resinda Malls (Higher Price Goods)
Flood Prone (with Pumps to the Neighboring Area)
Unstructured Housing
Next to River Housing
Homebase (Few LSMs)

Lower to Poor Income
Non-Permanent Position
Contract Farmers
Goat Herd – Chicken Coop
Large Inundated Area
No Land Ownerships
Flood Prone
Unstructured Housing

Crowded with Trucks and Big Vehicles
Several Massage Spots
Motels and Hotels
Apartments (Prostitution)
Food Seller
Food Prone
Accidental Fish Pond

Going to East Karawang
Industrial Areas
Factories
Workers residences
Motels
LSMs Homebase

Five Star Hotels
Luxurious Settlements
Waterpark
Amenities (Mid Income)
One Stop Service (Karawang Government)
Malls (Middle Income)
Beggars Area

CHAPTER 5. CONCLUSION – MOVING FORWARD

The five theses of Political Ecology (PE) can be applied to issues of land degradation and urban management in Karawang. Here are the five theses, as described by Robbins (2012), indicating how they can be relevant to the context of Karawang:

1. *Degradation and marginalization*

   The continuous exploitation of industries and agricultural practices alongside urban development have contributed to centuries of land degradation in Karawang. These activities have put significant pressure on the land, leading to soil erosion, deforestation, pollution, and the depletion of natural resources. As a result, the land has become less fertile, affecting agricultural productivity and the livelihoods of local communities. The conflicting goals of industry and agriculture can create competition for land, water, and other resources, leading to unsustainable practices and further exacerbating land degradation. The expansion of urban development often involves land conversion and the destruction of natural habitats, further contributing to biodiversity loss and ecological imbalances. This pattern of land degradation has had a significant social and economic impact on the people of Karawang. Land degradation reduces productivity, affecting agricultural yields and farmers' livelihoods. As land becomes less suitable for agriculture, people are marginalized occupationally and economically, undermining their traditional livelihoods. The consequences of land degradation also cause social inequality and marginalization. The negative impacts are often disproportionately borne by marginalized communities heavily dependent on natural resources for their livelihoods. These communities face challenges in accessing sufficient

and sustainable livelihood opportunities, leading to increased poverty and socio-economic disparities.

2. *Conservation and control*

The environmental history of Karawang indicates that conservation efforts have faced significant challenges and have not successfully preserved the land and natural resources. The controls and regulations surrounding land use and resource management have been undermined, leading to unsustainable practices and environmental degradation. One contributing factor to this situation is the dominance of informal sectors, such as para-governmental associations (LSMs), which have exerted significant influence over the local economies. These informal institutions often operate outside formal regulatory frameworks and prioritize their own interests over sustainable environmental practices. The power dynamics and influence of LSMs in Karawang has challenged effective environmental governance and conservation. They exploit and control various aspects of the local economy, including parking lots, public spaces, waste management, and informal trade, which can further degrade the environment and impede sustainable development. Furthermore, the influence of informal sectors and institutions creates barriers to implementing formal environmental regulations and conservation efforts. This results in weak enforcement mechanisms and limited accountability for unsustainable practices.

3. *Environmental conflict and exclusion, environmental subjects and identity*

Environmental conflicts and the "tragedy of the commons" are significant challenges in Karawang. The depletion of resources and water scarcity exacerbate these conflicts, leading to competition for limited resources and potential environmental degradation. The competition between migrants and locals adds another layer to the existing challenges.

Migrants who move to Karawang, especially those who work in Jakarta, often have better financial opportunities and a higher quality of life. They may benefit from urban growth and have access to wealthier neighborhoods, luxury stores, and better job prospects in factories or urban sectors. On the other hand, residents, particularly those traditionally engaged in agriculture, struggle to adapt to the changing urban landscape. Their livelihoods are affected as their agricultural land diminishes or becomes less viable. This disparity in economic opportunities and quality of life between migrants and locals intensifies social and economic inequalities within Karawang. Conflicts have arisen due to uneven resource distribution, access to services, and job opportunities.

4. *Political object and actors*

In Karawang, the bureaucratic nature of policies and programs hinder effective environmental governance. The dominance of informal economies further complicates the situation, as they operate outside of formal regulations and oversight. This can create challenges regarding resource management, accountability, and transparency. The presence of LSMs and their influence on the local economy and governance can contribute to power imbalances and opacity in decision-making processes. It is vital to understand the various environmental management actors, including government institutions, LSMs, community organizations, and individual users. Elinor Ostrom's (2009) framework on common-pool resources highlights the interactions between Resource Systems (RS), Resource Units, the Governance System (GS), and Users (U). This framework emphasizes the need to recognize the complexity of socio-ecological systems and the importance of inclusive and participatory decision-making processes. In Karawang, residents often play a de facto role as "planners" in managing their local environment, despite their voices being excluded from formal

participatory planning processes. Recognizing local residents' knowledge, experiences, and agency is crucial for effective environmental governance. Including and engaging their perspectives in decision-making can lead to more sustainable and contextually appropriate solutions.

In applying the lens of both Political Ecology and Sustainable Development along with the local culture, this dissertation suggests better spatial planning policies in order to accommodate all stakeholders. Open-minded and adaptive future planning is necessary, as pointed out in a 2021 interview with an academic from a reputable Indonesian university: “The planning system is not completely honest and transparent and is affiliated with a culture of corruption: the development beyond the capital city is not well-distributed and equal.”

Power relations and politicization in urban space management influence urban expansion in the Jakarta Metropolitan Area (JMA). Power inequalities have existed between actors involved in urban transformation, including the Dutch government and indigenous communities, local governments and communities, and the private sector and local government. More powerful actors often drive urban development, while the weaker ones, particularly marginalized communities, are excluded and do not have a meaningful role in decision-making processes.

As highlighted in the cases presented by Ajibade and McBean (2014), communities with lower social, economic, and political power tend to benefit least from urban development. They often live in environmentally disadvantaged areas with degraded land and inadequate infrastructure. Discrimination in policy-making further exacerbates the challenges faced by these communities, making it difficult for them to improve their conditions due to limited capacity and bargaining power. Their voices are often unheard and disregarded in the planning process.

Addressing the unequal access to basic needs and social justice is crucial for building community resilience, as emphasized by Bullard and Wright (2009). However, in the JMA and broader urban planning in Indonesia, communication and engagement in the planning process are often constrained by predetermined outcomes. This hinders the ability of communities to actively participate in urban development.

Urban development is a complex and dynamic process, as Anderies, Janssen, and Ostrom (2004) highlighted. Spatial planning should align with sustainability goals and consider the community's cultural values and historical context. Open and inclusive planning processes that allow for multiple options and the active participation of the community can help address urban challenges and generate creative solutions. Budihardjo (1998) argues that urban planning in Indonesia, including the JMA, should be rooted in cultural values and acknowledge history's influence on shaping a place's culture.

The current trend of urban development, driven by a desire for a technologically advanced and visually appealing city, often neglects the sense of ownership and fails to build democracy, humaneness, and sensitivity to the surroundings. To overcome these challenges, value-based development is needed, where specific values upheld by the community guide the development process rather than market-driven approaches (Wirutomo, 2003). This shift can contribute to more inclusive and sustainable urban development that reflects the needs of local communities.

Marginalized communities, such as the kampung neighborhood communities in Karawang, often possess stronger social capital compared to gated communities. This is primarily due to their necessity for survival and the close-knit nature. The knowledge and expertise gained from coping with challenges like yearly floods can serve as a foundation for participatory planning. By

emphasizing collective intelligence and involving the local community, urban development can move away from the conventional top-down approach and incorporate bottom-up initiatives that align with the needs and aspirations of the community (Schilling, 2020). As a planning lecturer in a 2021 interview said: “Planning is not supposed to be neutral. It has to lean toward the public interest and the anti-politics.”

Lessons from various places worldwide, particularly in the Global South, can serve as valuable references for the JMA to progress. The Global South, with its diverse cultural heritage and resilience, should adapt and contextualize knowledge from the Global North to suit its unique characteristics. This requires a transformation of traditional planning approaches in Indonesia to better align with the region's environmental history, authenticity, and community perspectives (Simone, 2008). Adopting a multi-perspective and interdisciplinary approach, as advocated by PE, is crucial. It is important to consider all groups living within the territory and the dynamics of power relations in environmental governance.

The exclusive focus on Jakarta as the central point of development has resulted in other regions, such as Karawang, experiencing adverse consequences. Massive land use changes, industrialization, and urbanization have led to environmental degradation, extreme annual flooding, air pollution, and the expansion of inundated areas like Karangligar.

Karawang has been continuously impacted by annual flooding, with many people forced to evacuate to shelters. Dumping waste into rivers and waterways remains a cultural practice, reflecting the neglect of environmental concerns in modern society. The government's limited resources have led to the neglect of the area, further exacerbating the problems.

The neglected area of Karangligar presents a significant opportunity from a PE perspective. The

neglected area is a vast pool of opportunity, seeing from a different perspective (D'Alisa & Kallis, 2016; Cadiex, 2008). Despite the challenges of social and environmental justice, people have been able to find ways to thrive in this area. The water in Karangligar serve as a crucial fishing ground, providing food for many households. Additionally, fishing offers recreational opportunities for people who may not have access to such experiences elsewhere. Some individuals live near the water without concerns about land ownership and have established businesses providing food and snacks to visitors. Others have taken advantage of the abundant food sources and open spaces to grow their livestock economically.

The community in Karangligar has demonstrated resilience and adaptation to its circumstances. They have constructed elevated (staged) houses to accommodate their needs and make the most of the available resources. However, it is essential to recognize that social capital plays a vital role in further improving the situation for the people in Karangligar. Strengthening social capital, which refers to community networks, relationships, and trust, can enhance collective action and promote a more sustainable and inclusive environment. Unfortunately, the lower-income community in Karangligar is struggling. The presence of loan sharks, the exploitative practices of financial institutions like Bank Emok, and the manipulative aspects of certain NGOs have contributed to the decline of social cohesion and togetherness among the people. Addressing these issues is crucial to foster a sense of solidarity and empowerment within the community.

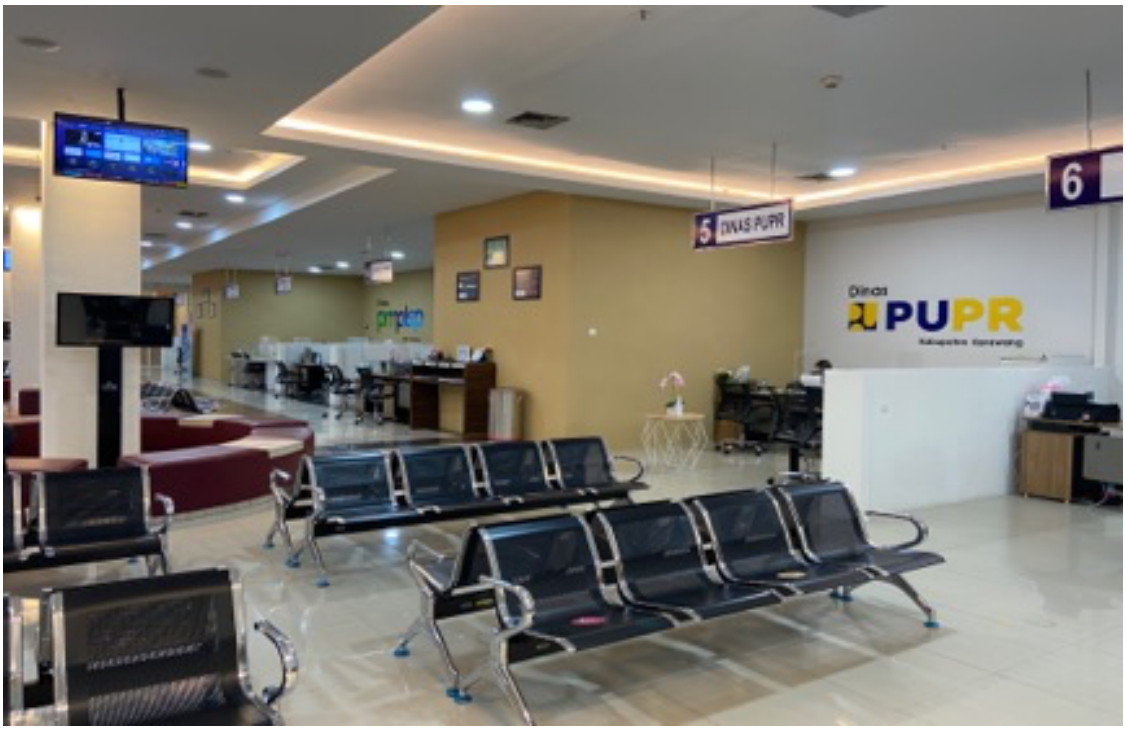
Drawing on the discussions of planning culture, social exploration, and land characteristics in previous chapters, it becomes apparent that there are potential ideas to improve the future of Karawang, rooted in the local context and requiring close attention. These ideas should align with the principles of ecological responsiveness, meaning they should consider the environmental dynamics and the needs and aspirations of the local community. By engaging with

the community and incorporating their expertise, it is possible to develop strategies and interventions that are more effective, sustainable, and aligned with the principles of PE. The pictures taken during field observations over the past two years can provide visual evidence of the conditions in the Karawang urban area and help inform discussions and decision-making processes regarding future planning and development initiatives.

1. Reformation of the Karawang government to be closer with the community, less political and bureaucratic, and inclined toward the public interest. Taking control of the market and prioritizing vision and planning over market forces is crucial for sustainable development. It is the government's responsibility to own, maintain, and manage the land for the benefit of the community. By asserting their power, governments can shape the direction of development to align with the needs and aspirations of the people. Figure 5.1 below, taken in a mall, showcases the Karawang government's initiative to centralize public services in one location. This approach aims to streamline administrative processes and reduce opportunities for corruption. Concentrating various services in a single place eliminates the need for people to visit multiple locations for different services, reducing bureaucratic hurdles and potential avenues for corruption. This centralized model enhances the efficiency, transparency, and accessibility of public services, as it allows for better coordination and integration among different departments and agencies. By creating a convenient and user-friendly environment for citizens to access government services, the Karawang government demonstrates its commitment to improving governance and serving the public more effectively. However, it is essential to ensure that such initiatives are implemented with careful consideration of potential challenges and unintended consequences. While centralization can be beneficial, there is a need for effective oversight mechanisms to prevent any abuse of power or concentration of decision-making authority.

Additionally, efforts should be made to engage and involve the community in planning and implementation processes to ensure their needs are adequately addressed.

Figure 5.1 Illustration of the Reformation of Government



2. The preservation of local culture and identity. Culture and authenticity are essential aspects that should be preserved and celebrated in development (Morita & Jensen, 2017; Simone, 2008). As Karawang emerges as a global city and attracts international brands, it is crucial to ensure that the unique cultural identity of Indonesia, including traditional dances like Jaipong, is not overshadowed or forgotten. Preserving cultural heritage helps maintain a sense of identity and pride among the local community. It also contributes to the diversity and richness of the urban fabric, making it a more vibrant and inclusive place to live. Integrating cultural elements into urban development can create a sense of place and foster a strong connection between people

and their surroundings. Figure 5.2 below features Jaipong dancers about to perform at a mall stage, exemplifying the efforts to showcase and promote a local culture within the urban environment. By providing a platform for traditional performances, the mall not only entertains visitors but also supports local artists and contributes to preserving and disseminating cultural practices. Furthermore, it is essential to emphasize that urban development should not only focus on physical aspects but also consider intangible cultural heritage. This includes supporting local artisans, musicians, and performers and ensuring their continued involvement and representation in the evolving urban landscape. By integrating culture and authenticity into urban planning and design, Karawang can create a harmonious balance between modernity and tradition, offering residents and visitors a unique and memorable experience. This approach recognizes the importance of preserving cultural identity and promotes sustainable development rooted in the local context and values.

Figure 5.2 Illustration of the Preservation of Local Culture and Identity

3. Improving the Public Open Spaces. Open spaces and amenities are crucial for people's well-being in urban areas (Beatley, 2012). They play a vital role in enhancing the quality of life for residents by providing opportunities for relaxation, physical activity, and social interaction. Creative solutions like rooftop gardens and public spaces can effectively offer recreational opportunities and contribute to the city's overall livability. Figure 5.3 below depicts a rooftop space in a motel that is accessible to the public and demonstrates an innovative approach to creating open spaces in urban environments. Rooftop gardens and public spaces provide a green, serene escape from the busy city life and contribute to environmental sustainability by mitigating heat island effects, reducing energy consumption, and improving air quality. They can also serve as platforms for community events, cultural activities, and gatherings, fostering social cohesion and a sense of community among residents. It is essential for urban planning and development strategies in Karawang to prioritize the provision of open spaces and amenities that cater to the diverse needs and preferences of the local population. By integrating these spaces into the urban fabric, Karawang can create a more inclusive, healthy, and vibrant environment for its residents, promoting physical and mental well-being while preserving the natural and cultural heritage of the region.

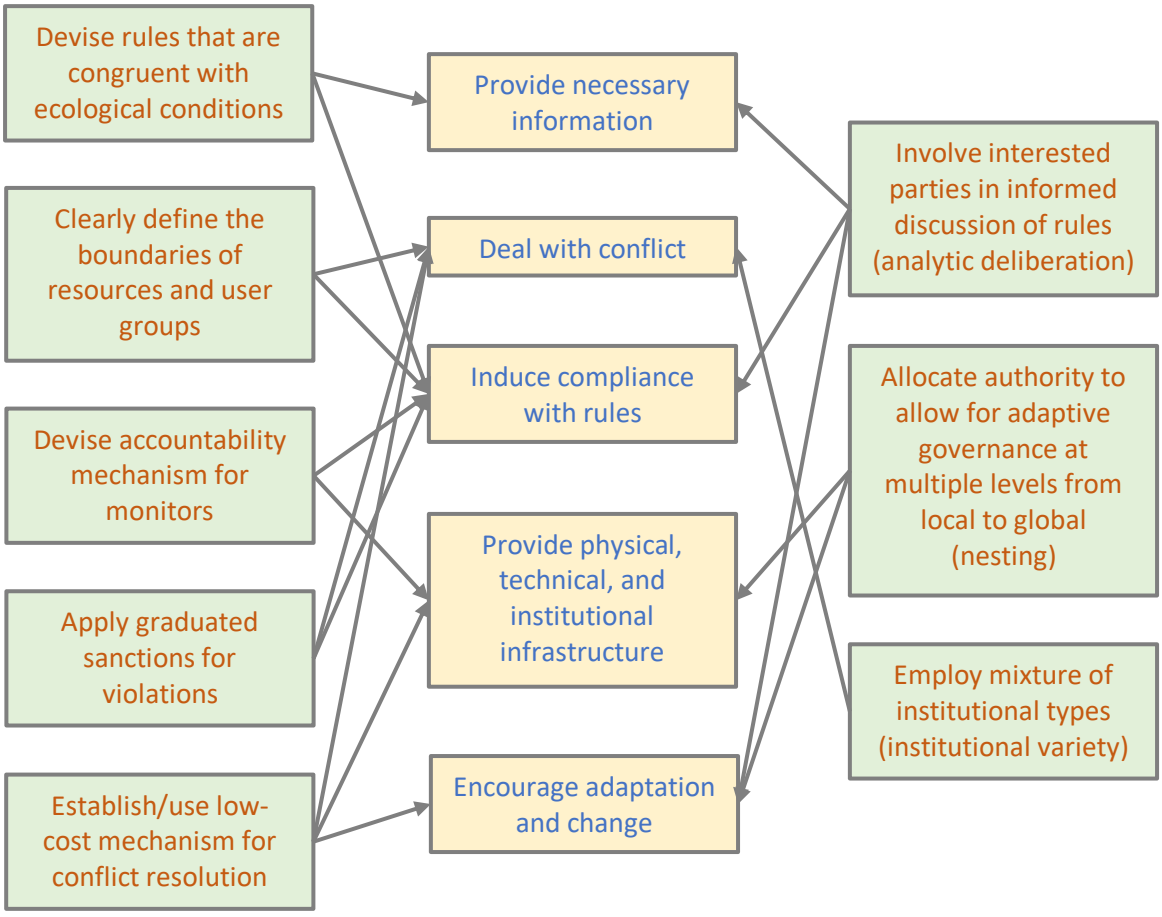
Figure 5.3 Illustration of Improving the Public Open Spaces

4. Transit-Oriented Development. Transit-oriented infrastructure is vital to prevent casualties from accidents and the path to sustainable urbanism (Beatley, 2012). Figure 5.4 below shows the only area in the Karawang urban area that secures the railway and fences off primary roads to force people to use the crossing bridge.

Figure 5.4 Illustration of Transit-Oriented Development

Finally, to move forward with the attempt to improve the planning culture and the environmental governance of Karawang, this dissertation suggests Figure 5.5 below as a summary of the principles to foster robust governance in managing the human-environmental relationship or socio-ecological systems by Ostrom (2007). Ostrom has been improving these principles since she first paid attention to the institutional frameworks and management in the natural resources, the commons, and socio-ecological systems in the 1990s. She also emphasizes breaking down these principles according to the specific characters of the region to avoid universal solutions (Ostrom, 2007).

Figure 5.5 General Principles for Robust Governances in Socio-Ecological System



Source: Dietz, Ostrom, Stern, 2003, page 420

In other words, these principles guide designing governance systems that effectively manage socio-ecological systems. It is important to tailor these principles to the specific characteristics and needs of the region, as context-specific solutions are often more effective than universal approaches (Ostrom, 2007). Finally, this research also points out the idea of advancing the geospatial maps to elaborate with the socio and cultural analysis as seen in Chapter 4. Further study of returning the sociocultural analysis and the biophysical maps to the community will also improve the effectiveness of applying PE and explore more of the community's thoughts on this further human-environment analysis.

BIBLIOGRAPHY

Aburas, M. M., A. S., Ramli, M. F., & Asha'ari, Z. H. (2017). Land suitability analysis of urban growth in Seremban Malaysia,using GIS based Analytical Hierarchy Process. *Procedia Engineering*. 1128-1136.

Aburas, M. M., Abdullah, S. H., Ramli, M. F., & Ash'aari, Z. H. (2015). A Review of Land Suitability Analysis for Urban Growth by using the GIS Based Analytic Hierarchy Process. *Asian Journal of Applied Sciences*. 869-876.

Adi, A. W., Shalih, O., Shabrina, F. Z., rizqi, A., Putra, A. S., Karimah, R., . . . Seniarwan. (2021). *Indeks Risiko Bencana Indonesia Tahun 2021.* (R. Yunus, Ed.) Indonesia: Pusat Data, Informasi dan Komunikasi Kebencanaan Badan Nasional Penaggulangan Bencana. Retrieved September 22, 2022, from https://inarisk.bnpb.go.id/pdf/BUKU%20IRBI%202021%20(PDF).pdf

Ahmadi, A., Mosammam, H. M., & Mirzaei, N. (2017). Land Suitability Evaluation to Determine the Appropriate Areas of Development: A Case Study of Hormuz Island. *Open Journal of Ecology*, 518-534.

Ajibade, I. (2017). Can a future city enhance urban resilience and sustainability? A political ecology analysis of Eko Atlantic city, Nigeria. *International Journal of Disaster Risk Reduction, 26*, 85-92.

Ajibade, I., & McBean, G. (2014). Climate extremes and housing rights: A political ecology of impacts, early warning and adaptation constraints in Lagos slum communities. *Geoforum, 55*, 76-86.

Ali, T. H. (2003). Perkembangan Kelembagaan Pertanahan/Agraria dan Keterkaitannya dengan

Penataan Ruang. In Ministry_of_Public_Works, *Sejarah Penataan Ruang Indonesia.*

Amalina, Binsasi, S. D., & Purnaweni, H. (2018). Formulasi Kebijakan Perlindungan Lahan Pertanian Berkelanjutan di Kabupaten Karawang. *Jurnal Manajemen dan Kebijakan Publik*. Retrieved November 2, 2022, from https://ejournal.undip.ac.id/index.php/gp/article/view/21293

Anderies, J. M., Janssen, M. A., & Ostrom, E. (2004). A Framework to Analize the Robustness of Social-cological Systems from and Institutional Perspective. *Ecology and Society, 9*(1). Retrieved from http://www.ecologyandsociety.org/vol9/iss1/art18

Bakker, K., Kooy, M., Shofiani, N., & Martijn, E. (2008). Governance failure: rethinking the institutional dimensions of urban water supply to poor households. *World Development, 36*(10), 1891-1915.

Bamrungkhul, S., & Tanaka, T. (2022). The assessment of land suitability for urban development in the anticipated rapid urbanization area from the Belt and Road Initiative: A case study of Nong Khai City, Thailand. *Sustainable Cities and Society*. 1-22.

Bassett, T., & Fogelman, C. (2013). (2013) De´ja` vu or something new? The adaptation concept in the climate change literature. *Geoforum, 48*, 42–53.

Beatley, T. (2012). *Green urbanism: Learning from European cities.* Island press.

Beaulieu, L. J. (2002). Mapping the Assets of Your Community: A Key Component for Building Local Capacity.

Bintang, T. (2007). *Catatan Sejarah Karawang dari Masa ke Masa.* Retrieved November 1, 2022, from https://www.karawangkab.go.id/sekilas/sejarah-karawang

Blaikie, P. (1985). *The Political Economy of Soil Erosion in Developing Countries.* London and New York: Longman.

Bruntland, G. H. (1987). *Bruntland commission, Report of the world commission on environment and development: our common future.*

Budihardjo, E. (1998). *Kota yang Berkelanjutan (Sustainable City).* Jakarta: Ul Press.

Budisantoso, K. S. (2003). Diklat Fungsional Bidang Penataan Ruang. In PUPR, *Sejarah Penataan Ruang Indonesia* (pp. 60-68).

Bullard, R. D., & Wright, B. (2009). Race, place and the environment in post-Katrina New Orleans. *Race, place and environmental justice after Hurricane Katrina: Struggles to reclaim, rebuild and revitalize New Orleans and the gulf coast*, 19-48.

Cadiex, K. V. (2008). Political ecology of exurban ‘‘lifestyle’’ landscapes at Christchurch’s contested urban fence. *Urban Forestry & Urban Greening, 7*, 183-194.

Casas, S., Sadat, A., & Urtasun, R. (2021). A unified model to map, perceive, predict and plan. *The IEEE/CVF Conference on Computer Vision and Pattern Recognition*, (pp. 14403-14412).

CNBC_Indonesia. (2022, March 11). *Biden Pernah Sebut Jakarta Terancam Tenggelam, Cek Riset Ini!* Retrieved from CNBC Indonesia: https://www.cnbcindonesia.com/news/20220311074413-4-321883/biden-pernah-sebut-jakarta-terancam-tenggelam-cek-riset-ini

Collins, M. G., Steiner, F. R., & Rushman, M. J. (2001). Land-use suitability analysis in the United States: historical development and promising technological achievements. *Environmental management, 28*(5), 611-621.

D’Alisa, G., & Kallis, G. (2016). A political ecology of maladaptation: Insight from a Gramscian theory of the State. Global Environment Change. *38*, 230-242. Retrieved from http://dx.doi.org/10.1016/j.gloenvcha.2016.03.006

Dai, F., Lee, C., & Zhang, X. (2001). GIS-based geo-enviromental evaluation for urban planning: a case study. *Engineering Geology*. 257-271.

Daniels, T. L. (2009). A trail across time: American environmental planning from city beautiful to sustainability. *Journal of the American Planning Association*. *75*(2), 178-192.

Dietz, T., Ostrom, E., & Stern, P. C. (2003). The Struggle to Govern the Commons. *science, 302*(5652), 1907-1912.

Djafar, H. (1987). Hunian-hunian Pertama di Jakarta. *Seminar Jakarta Dalam Perspektif Sejarah.* Jakarta.

Djalal, A. (1977). *Perkembangan Penduduk Jakarta Abad 16-20.*

Douglas, I., & James, P. (2015). *Urban Ecology: An Introduction.* Abingdon, UK: Routledge.

Fainstein, S. S., & DeFilippis, J. (2016). *Readings in Planning theory* (Vol. Fourth Edition). (S. S. Fainstein, & J. DeFilippis, Eds.) Wiley Blackwell.

Firman, T. (1997). Land conversion and urban development in the northern region of West Java, Indonesia. *Urban Studies, 34*(7), 1027-1046.

Firman, T. (1998). The restructuring of Jakarta Metropolitan Area:: A “global city” in Asia. *Cities, 15*(4), 229-243.

Firman, T. (1999). From "Global City" to "City of Crisis": Jakarta Metropolitan Region Under Economic Turmoil. *Habitat International, 25*(4), 447-466.

Firman, T., & Dharmapatni, I. A. (1994). The challenges to sustainable development in Jakarta metropolitan region. *Habitat International, 18*(3), 79–94.

Fonataba, B. B., Osly, P. J., & Ihsani, I. (2020). Classification of land capability in manokwari area using geographic information system (GIS). *Jurnal Infrastruktur*, 129-139.

Furlong, K., & Kooy, M. (2017). Worlding water supply: Thinking beyond the network in

Jakarta. *International Journal of Urban and Regional Research, 41*(6), 888-903.

Gebre, S. L., Cattrysse, D., Alemayehu, E., & Van Orshoven, J. (2021). Multi-criteria decision making methods to address rural land allocation problems: A systematic review. *International Soil and Water Conservation Research, 9*(4), 490-501.

Geddes, P. (1915). *Cities in evolution.* London: William and Norgate Limited.

Goldman, M. J., Nadasdy, P., & Turner, M. D. (2011). *Knowing Nature: Conversations at the Intersection of Political Ecology and Science Studies.* Chicago: University of Chicago Press.

Handayani, A. (2022). Analisis Pola Perubahan Penggunaan Lahan Pertanian menjadi Lahan Non Pertanian Tahun 2011-2020 di Kabupaten Karawang Provinsi Jawa Barat (Penelitian Semester 9 Tahun Akademik 2021/2022 Jurusan Pendidikan Geografi Fakultas Ilmu Sosial). Retrieved November 2, 2022, from http://repository.unj.ac.id/22535/

Heetjans, H. (1923). Ingezonden:. *De Waterstaats Ingenieur, 3,*, 91–2.

Herawati, Y. (2014). Konsep Keadilan Sosial Dalam Bingkai Sila Kelima Pancasila (The Concept Of Social Justice Within The Fifth Principle Framework Of Pancasila). *Paradigma: Jurnal Masalah Sosial, Politik, dan Kebijakan, 18*(1).

Heynen, N. (2014). Urban political ecology I: The urban century. *Progress in Human*.

Indonesian_Planning_School_Association. (2021). *Anggota*. Retrieved February 1, 2023, from Asosiasi Sekolah Perencanaan Indonesia: http://aspi.or.id/?page_id=24

Indraprahasta, G. S., & Derudder, B. (2019). World City-ness in a historical perspective: Probing the long-term evolutionof the Jakarta metropolitan area. *Habitat International, 89*, 102000.

Irjadi, A., Rogi, O. H., & Makarau, V. H. (2020). Evaluasi Pemanfaatan Terhadap Kemampuan

Lahan Di Kota Bitung. *Spasial, 7*(3), 278-289.

Istiqomah, Z. (2020, July 7). *Nusantara*. Retrieved September 23, 2022, from Perusahaan Karawang Wajib Rekrut 60 Persen Pekerja Lokal: https://www.republika.co.id/berita/qd39db370/perusahaan-karawang-wajib-rekrut-60-persen-pekerja-lokal

Jati, W. R. (2012). Manajemen tata kelola sumber daya alam berbasis paradigma ekologi politik. *POLITIKA: Jurnal Ilmu Politik, 3*(2), 98-111.

Johan, I. M. (1987). Segi-segi Fisik dalam Perkembangan Kota Jakarta 1950-1980. In E. Sedyawati, S. Rahardjo, I. M. Johan, & G. A. Ohorella, *Sejarah Kota Indonesia* (pp. 92-135).

Kadfak, A., & Oskarsson, P. (2020). An (Urban) Political Ecology approach to Small-Scale Fisheries in the Global South. *Geoforum, 108*, 237-245. Retrieved from https://doi.org/10.1016/j.geoforum.2019.11.008

Karawang_Planning_and_Development_Agency. (2016). *Report of Integrated Area Development of Karawang Urban Area.* Karawang Regency.

Karawang_Regional_Secretariat. (2011). Regional Regulation of Karawang Regency of 1 the year 2011 about Employment Implementation. Karawang Regency, West Java, Indonesia. Retrieved January 23, 2023, from https://peraturan.bpk.go.id/Home/Details/166132/perda-kab-karawang-no-1-tahun-2011#:~:text=Karawang%20No.%201%20Tahun%202011,Penyelenggaraan%20Ketenagakerjaan%20%5BJDIH%20BPK%20RI%5D

Karpouzoglou, T., Marshall, F., & Mehta, L. (2018). Towards a peri-urban political ecology of water quality decline. Land Use Policy. *70*, 485-493. Retrieved from

https://doi.org/10.1016/j.landusepol.2017.11.004.

LeGates, R., & Stout. (2015). *The city reader* (Vol. Fourth Edition). City:Routledge.

Lehmann, S. (2011). Transforming the city for sustainability: The principles of green urbanism. *Journal of Green Building, 6*(1), 104-113.

Liu, J., Dietz, T., Carpenter, S., Alberti, M., Folke, C., Moran, E., . . . Ostrom, E. (2007). Complexity of coupled human and natural systems science*, 317*(5844), 1513-1516.

Liu, R., Zhang, K., Zhang, Z., & Borthwick, A. G. (2014). Land-use suitability analysis for urban development in Beijing. *Journal of Environmental Management, 145*, 170-179.

Luan, C., Liu, R., & Peng, S. (2021). Land-use suitability assessment for urban development.

Marull, J., Pino, J., Mallarach, J., & M., C. M. (2007). A land suitability index for strategic environmental assessment in metropolitan areas. *Landscape and urban planning, 81*(3), 200-212.

McHarg, I. (1981). Human ecological planning at Pennsylvania. Landsc. *Plan, 8*(2), 109 – 120.

McHarg, I. L. (1969). *Design with Nature.* New York: American Museum of Natural History.

Ministry of Law. (2009). Act of The Republic Indonesia of 32 the year 2009 about the Protection and Management of Environment.

Ministry of Law. (2020). Act of The Republic Indonesia of 11 the year 2020 about Job Creation.

Ministry of Public Works. (2006). Identifikasi Kawasan Permukiman Kumuh Daerah Penyangga Kota Metropolitan.

Ministry of Public Works. (2007). Minister of Public Works and Public Housing Regulation of 20/PRT/M/2007 about Technical Guidelines for Analysis of Physical and Environmental, Economic, and Socio-Cultural Aspects in the Preparation of Spatial Plans.

Ministry of State Secretariat. (1960). Act of The Republic Indonesia of 5 the year 1960 about

Agrarian Fundamental.

Ministry of State Secretariat. (1967). Act of The Republic Indonesia of 1 the year 1967 about Foreign Investment. Indonesia.

Ministry of State Secretariat. (1968). Act of The Republic Indonesia of 6 the year 1968 about Domestic Investment.

Ministry of State Secretariat. (1982). Act of The Republic Indonesia of 4 the year 1982 about Basic Provisions for Environmental Management.

Ministry of State Secretariat. (1997). Act of The Republic Indonesia of 23 the year 1997 about Environmental Management.

Morita, A., & Jensen, C. B. (2017). Delta Onto logies: Infrastructural Transformations in the Chao Phraya Delta, Thailand. *Social Analysis, 61*(2), 118-133.

Mustajab, R. (2022, November 30). *Mayoritas Tenaga Kerja RI dari Sektor Informal pada Agustus 2022*. Retrieved February 6, 2023, from DataIndonesia.id: https://dataindonesia.id/sektor-riil/detail/mayoritas-tenaga-kerja-ri-dari-sektor-informal-pada-agustus-2022

Muthmainnah, L., Mustansyir, R., & Tjahyadi, S. (2020). Kapitalisme, Krisis Ekologi, dan Keadilan Inter-Generasi: Analisis Kritis atas Problem Pengelolaan Lingkungan Hidup di Indonesia. *Mozaik Humaniora, 20*(1), 57-69.

National Agency for Disaster Countermeasure. (2018). Tren Kejadian Bencana 10 Tahun terakhir (2008-2017). Retrieved from https://bnpb.cloud/dibi/

Ohorella, G. A. (1987). Berbagai Perstiwa dan Tempat Penting. In E. Sedyawati, S. Raharjo, I. M. Johan, & G. A. Ohorella, *Sejarah Kota Jakarta 1950-1980.*

Open Data Karawang. (2021). Retrieved February 3, 2023, from Open Data Karawang:

https://opendata.karawangkab.go.id/datasets/disperindag/jumlah-perusahaan-industri-menurut-klasifikasi-industri-di-kabupaten-karawang-1630683100

Ostrom, E. (2007). A diagnostic approach for going beyond panaceas. *Proceedings of the national Academy of sciences, 104*(39), 15181-15187.

Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. *Science, 325*(5939), 419-422.

Park, S., Jeon, S., Kim, S., & Choi, C. (2011). Prediction and comparison of urban growth by land suitability index mapping using GIS and RS in South Korea. *Landscape and Urban Planning*. 104-114.

Parry, J. A., Ganaie, S. A., & Bhat, M. S. (2018). GIS based land suitability analysis using AHP model for urban services planning in Srinagar and Jammu urban centers of J&K,India. *Journal of Urban Management*. 46-56.

Peet, R., & Watts, M. (2004). *Liberation Ecologies: Environment, Development, Social Movements.* London: Routledge.

Poerwo, I. F. (2003). Perkembangan Pendidikan Perencanaan di Perguruan Tinggi Swasta dan Lahirnya Asosiasi Sekolah Perencanaan Indonesia (ASPI). In PUPR, *Sejarah Penataan Ruang Indonesia* (pp. 48-59).

Poesponegoro, M. D., & Notosusanto, N. (1984). *Sejarah Nasional Indonesia III.*

Pratama, A. W., Hidayat, R., & Azizah, A. N. (2022). Capacity Building Dinas Sosial Dalam Penanggulangan Kemiskinan Ekstrem Di Kabupaten Karawang. Retrieved November 5, 2022, from https://zenodo.org/record/6634313#.Y2OWt3ZBy3A

Puntsag, G. (2014). *Land Suitability Analysis For Urban and Agricultural Land Using GIS. UNU Land Restoration Training Programme.*

Puradimadja, S. (2003). Kelembagaan Penataan Ruang di Lingkungan Departemen Dalam Negeri. In Ministry_of_Public_Works, *Sejarah Penataan Ruang Indonesia.*

Robbins, P. (2012). *Political Ecology: A Critical Introduction* (Second ed.). London: Blackwell.

Roosmalen, P. K. (2003). Awal Penataan Ruang di indonesia. In Ministry_of_Public_Works, *Sejarah Penataan Ruang Indonesia* (pp. 9-37).

Saaty, T. L. (1987). Concepts, Theory, and Techniques: Rank Generation, Preservation, and Reversal in the Analytic Hierarchy Decision Process. 157-177.

Santosh, C., Krishnaiah, C., & Deshbhandari, P. G. (2018). Site suitability analysis for urban development using GIS based multicriteria evaluation technique: a case study in Chikodi Taluk, Belagavi District, Karnataka, India. *OP Conference Seri.*

Saputra, N. G., Rifai, M., & Marsingga, P. (2021, April). Strategi Penanggulangan bencana Banjir Kabupaten Karawang di Desa Karangligar sebagai Desa Tangguh Bencana. *Dinamika : Jurnal Ilmiah Ilmu Administrasi Negara, 8*. Retrieved September 22, 2022, from file:///C:/Users/ASUS/Downloads/STRATEGI_PENANGGULANGAN_BENCANA_BANJIR_K.pdf

Schilling, M. A. (2020). Platform Competition: A Systematic and. *Journal of Management, 47*(6), 1528–1563. doi:10.1177/0149206320969791

Sedyawati, E. (1987). Tarumanegara: Penafsiran Budaya. *Diskusi Panel Menggali Kembali Sejarah Kerajaan Tarumanegara.*

Sedyawati, E., Rahardjo, S., Johan, I. M., & Ohorella, G. A. (1987). *Sejarah Kota Jakarta 1950-1980.*

Silitonga, Y. F. (2022, March 1). *detikjabar*. Retrieved September 26, 2022, from Karawang jadi

'Primadona' Tujuan Pencari Kerja Terbanyak di Jawa Barat: https://www.detik.com/jabar/bisnis/d-5963173/karawang-jadi-primadona-tujuan-pencari-kerja-terbanyak-di-jawa-barat

Simon, M. (2019, July 2019). *Jakarta's Giant Seawall Is Useless if the City Keeps Sinking*. Retrieved February 15, 2023, from WIRED: https://www.wired.com/story/jakarta-giant-sea-wall/

Simone, A. (2008). The politics of the possible: Making urban life in Phnom Penh. *Singapore Journal of Tropical Geography, 29*, 186-204.

Sipayung, D. L., & Susanty, A. (2014). Penilaian Kesiapan Kawasan Industri Candi untuk menjadi Eco-industrial Park. *Industrial Engineering Online Journal, 3*.

Soefaat. (2003). Pembangunan Pendidikan Tinggi Penataan Ruang Pertama di Indonesia (1953-1959). In Ministry_of_Public_Works, *Sejarah Penataan Ruang Indonesia* (pp. 41-47).

Soegijoko, B. T. (2000). Pembangunan Kota Dalam Rangka Otonomi Daerah.

Spirn, A. W. (2011). *Ecological Urbanism: A Framework for the Design of Resilient Cities.* (F. O. Ndubisi, Ed.) Washington, DC: Island Press.

Statistics of West Java. (2008). West Java Statistical Agency.

Steiner, F. (2011). *Landscape Ecological Urbanism: Origins and Trajectories.* (F. O. Ndubisi, Ed.) Washington, DC: Island Press.

Steiner, F., McSherry, L., & Cohen, J. (2000). Land suitability analysis for the upper Gila River watershed. *Landscape and urban planning, 50*(4), 199-214.

Suhartini. (2009). Kajian Kearifan Lokal Masyarakat dalam Pengelolaan Sumber Daya Alam dan Lingkungan. *Seminar Nasional Penelitian, Pendidikan dan Penerapan MIPA, Fakultas MIPA, Universitas Negeri Yogyakarta.* Yogyakarta.

Surjomihardjo, A. (1977). *Pemekaran Kota Jakarta.* Jakarta: Jambatan.

Susanti, F. D., & Richwanudin, S. A. (2020, October 6). *Empat Potensi Dampak Kebijakan Omnibus Law di Sektor Kehutanan dan Lingkungan*. Retrieved February 16, 2023, from Sebijak Institute Fakultas Kehutanan UGM: https://sebijak.fkt.ugm.ac.id/2020/10/06/empat-potensi-dampak-kebijakan-omnibus-law-di-sektor-kehutanan-dan-lingkungan/

Tamariska, V. (2019). Perkembangan Kawasan Galuh Mas Kabupaten Karawang Tahun 2000-2018. Retrieved November 2, 2022, from http://etd.repository.ugm.ac.id/penelitian/detail/175074

ten_Dam, H. (1951). *Verkenningen Rondon i Pajajarari.*

Turner, B., & Robbins, P. (2008). Land-change science and political ecology: Similarities, differences and implications for sustainability science. *Annual Review of Environment and Resources, 33*, 295-316.

Turner, M. D. (2009). *Ecology: Natural and political. A companion to environmental geography.* (N. Castree, D. Demeritt, D. Liverman, & a. B. Chichester, Eds.) West Sussex, United Kingdom: Wiley-Blackwell.

Turner, M. D. (2015). Political ecology II: Engagements with ecology. *Progress in Human Geography, 40*(4), 13-421.

Ulfa, M. (2022, December 9). *Proyek Kereta Cepat dan Dilema Transportasi Publik di Indonesia*. Retrieved February 17, 2023, from IDX Channel: https://www.idxchannel.com/economics/proyek-kereta-cepat-dan-dilema-transportasi-publik-di-indonesia

Ullah, K. M., & & Mansourian, A. (2015). Evaluation of Land Suitability for Urban Land-Use

Planning: Case Study Dhaka City. *Transactions in GIS*.

Walhi. (2018). *Tinjauan Lingkungan Hidup 2018: Bagaimana Masa Depan Keadilan Ekologis 2018?* Retrieved from https://walhi.or.id/wp-content/uploads/2018/12/Layout_Tinjauan-Lingkungan-2018.pdf

Watts, M. (1983). On the poverty of theory: natural hazard research in context. *Environment*. Routledge, 2017. 57-88

West_Java_and_Human_Rights, W. (2022). *Act of The Governor of West Java of 561/Kep.732-Kesra/2021 about District/City Minimum Wages in West Java in 2022.*

Winarni, F. (2022). Problematika Undang-Undang Nomor 11 Tahun 2020 tentang Cipta Kerja terhadap Pemenuhan Hak Atas Informasi Lingkungan Hidup. *Bina Hukum Lingkungan, 6*(3), 386-409. doi:https;//doi.org/10.24970/bhl.v6i3.276

Winarso, H. (1999). *Private residential developers and spatial structure of Jabotabek. In P. Chapman, A. K. Dutt, & R. W. Bradnock (Eds.), Urban Growth and Development in Asia.* Aldershot: Ashgate.

Winarso, H. (2000). *Residential land developers' behaviour in Jabotabek, Indonesia.* University College London, University College London. unpublished.

Winarso, H. (2001). Access to main roads or low cost land: residential land developer's behaviour in Indonesia. *International Workshop on The Impact of New Roads on Urban and Regional Development in International Workshop on The Impact of New Roads on Urban and Regional Development in.* International Institute for Asian Studies, Leiden University.

Winarso, H., & Firman, T. (2002). Habitat International. *Residential land development in Jabotabek, Indonesia: triggering economic crisis?, 26*(4), 487-506.

Wirutomo, P. (2003). Paradigma pembangunan di era otonomi daerah: memanusiakan manusia.

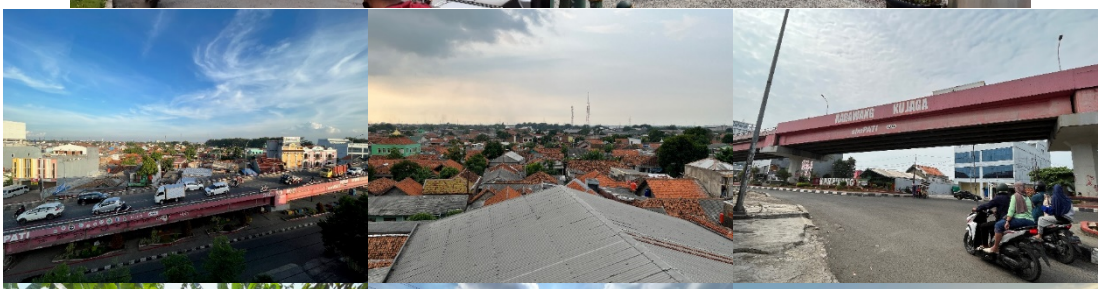
Yin, S., Li, J., Liang, J., Jia, K., Yang, Z., & Wang, Y. (2020). Optimization of the weighted linear combination method for agricultural land suitability evaluation considering current land use and regional differences. *Sustainability, 12*(23), 10134.

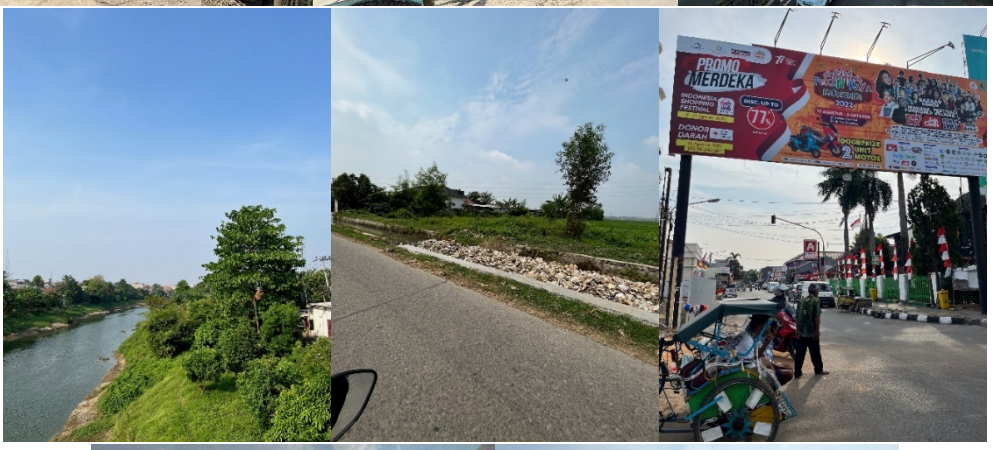
Zaenuddin, H. M. (2013). *Banjir Jakarta dari Zaman Jenderal JP Coen (1621) sampai Gubernur Jokowi (2013).* Jakarta Selatan: CHANGE PUBLISHER.

Zong, Y., Wang, R., Wang, C., Wang, H., & Zhang, L. (2007). Ecological suitability assesment on land use based on potential-constrain approach: the case urbanized areas in Dalian city, China. *Geogr, 26*(6), 1117-1126.

Appendix 1.1 Field Survey Photos (2021-2022)


Gramedia

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Appendix 1.2 List of Questions

1. Government Institution

NO.	LIST OF QUESTIONS	
1	Environment	How do you think of the current development trend of the Jakarta Metropolitan Area towards sustainability? What has been well? What has been wrong?
2		What are the current environmental problems that you or your company (team) notice for the past 10 years (such as water, soil and air pollution)? Have you been assigned any projects related to formulating strategies for environmental problems?
3		How did you see the environmental condition of JMA during the pandemic? What is your institution doing differently?
4		How would you involve other stakeholders and the community in your future program?
5		How do you support sustainable urban development for JMA? What roles or activities do you take?
6		What are the constraints and difficulties to achieve sustainable urban development?
7		How do you define the Sustainable Urban Development? Are there any plans or collaboration or efforts from your institution towards the future sustainable urban development for Jakarta Metropolitan Area?
8	Human	How do you think of the current development trend of the Jakarta Metropolitan Area towards cultural preservation? What has been well? What has been wrong?
9		What do you think about the inequality of development of JMA? Which areas are affected?
10		Have you noticed the ethnic minorities and marginalized groups in Jakarta Metropolitan Area? Do you know where they reside? Can you describe more about this?
11		Do you know if there are any plans or efforts to improve the quality of life of ethnic minorities and marginalized groups? Are they experiencing environmental and social injustice?
12		Are there any plans to elaborate culture to shape the future urban form?
13		Are there any plans to promote or integrate ethnic minorities and marginalized groups with future plans or programs?

2. Planning Practitioners

NO.	LIST OF QUESTIONS	
1	Environment	How do you think of the current development trend of the Jakarta Metropolitan Area towards sustainability? What has been well? What has been wrong?
2		What are the current environmental problems that you or your company (team) notice for the past 10 years (such as water, soil and air pollution)? Have you been assigned any projects related to formulating strategies for environmental problems?
3		How did you see the environmental condition of JMA during the pandemic? What is your institution doing differently?
4		How do you support sustainable urban development for JMA? What roles or activities do you take?
5		What are the constraints and difficulties to achieve sustainable urban development?
6		How do you define the Sustainable Urban Development? Are there any plans or collaboration or efforts from your institution towards the future sustainable urban development for Jakarta Metropolitan Area?
7	Human	How do you think of the current development trend of the Jakarta Metropolitan Area towards cultural preservation? What has been well? What has been wrong?
8		What do you think about the inequality of development of JMA? Which areas are affected?
9		Have you noticed the ethnic minorities and marginalized groups in Jakarta Metropolitan Area? Do you know where they reside? Can you describe more about this?
10		Do you know if there are any plans or efforts to improve the quality of life of ethnic minorities and marginalized groups? Are they experiencing environmental and social injustice?
11		How do you think of elaborating culture into the urban planning?
12		What would be the best strategies or application to elaborate ethnic minorities and marginalized groups into (sustainable) urban planning?

3. Planning Academia

NO.		LIST OF QUESTIONS
1	Environment	How do you think of the current development trend of the Jakarta Metropolitan Area towards sustainability? What has been well? What has been wrong?
2		What are the current environmental problems that you or your company (team) notice for the past 10 years (such as water, soil and air pollution)? Could you describe more of your experience and observations?
3		How did you see the environmental condition of JMA during the pandemic? What is your institution doing differently?
4		How did you discuss about the urban environmental problems in the academia network? What have the academia done so far?
5		What are the constraints and difficulties to achieve sustainable urban development?
6		How do you define the Sustainable Urban Development? Are there any plans or collaboration or efforts from your institution towards the future sustainable urban development for Jakarta Metropolitan Area?
7	Human	How do you think of the current development trend of the Jakarta Metropolitan Area towards cultural preservation? What has been well? What has been wrong?
8		What do you think about the inequality of development of JMA? Which areas are affected?
9		Have you noticed the ethnic minorities and marginalized groups in Jakarta Metropolitan Area? Do you know where they reside? Can you describe more about this?
10		Have you heard or known of any plans to improve the quality of life of ethnic minorities and marginalized groups?
11		How do you think of elaborating culture into the urban planning?
12		What would be the best strategies or application to elaborate ethnic minorities and marginalized groups into (sustainable) urban planning?

4. Ethnic Communities

NO.	LIST OF QUESTIONS	
1	Human	How long have you been living in this neighborhood? Where did you live previously? Where did you come from originally?
2		Is there any problems of water, soil and air pollution in this neighborhood? Could you describe more of your experience and observations?
3		How do you get clean water and electricity?
4		Do you or family members practice ethnic dance, music, or literacy?
5		How do you think of the expansion of Jakarta in regards to your neighborhood?
6		How do you think of Jakarta's expansion regarding your occupation and the difficulties of finding a job that fits your passion?
7		How do you think of the local government of Karawang developed the urban area near your neighborhood for the past ten years?
8		How did you see the efforts to Karawang to preserve and promote ethnic culture for the past ten years?
9		How did you see the growth of ethnic cultures and identities for the past 10 years in Karawang or other areas near Jakarta?
10		What are your thoughts for culture to thrive in this modern era?
11		What do you think would be the best ways to promote or integrate the ethnic or local culture with future plans or programs of Karawang?

5. Marginalized Groups

NO.	LIST OF QUESTIONS	
1	Human	How long have you been living in this neighborhood? Where did you live previously? Where did you come from originally?
2		Is there any problems of water, soil and air pollution in this neighborhood? Could you describe more of your experience and observations?
3		How do you get clean water and electricity?
4		How do you think of the expansion of Jakarta in regards to your neighborhood?
5		How do you think of Jakarta's expansion regarding your occupation and the difficulties of finding a job that fits your passion?
6		How do you think of the local government of Karawang developed the urban area near your neighborhood for the past ten years?
7		How did you see the efforts to Karawang to reduce regional disparities for the past ten years?

NO.	LIST OF QUESTIONS	
8		What do you think would be the best ways to reduce regional disparities in future plans or programs of Karawang?

Appendix 2.1 Indonesian Urban and Regional Planning History

The discipline of urban planning has long existed in Indonesia, but its formalization occurred in the 1950s when the first planning studies in ITB were erected in 1959 with Regional Planning (Urban and Rural). Previously, ITB (Institut Teknologi Bandung) was named Technische Hoge Schoof, which had a series of lectures about the art of urban development and called Stedebouwkunsf in Dutch. Urban and Regional Planning was introduced at the Master's level to accompany the engineering and development studies in the organization and the management of a city and region in many parts of the world. Indonesia, on the other hand, after a diplomatic effort, was acknowledged by Harvard University to develop the urban and regional planning background for the 4-year minimum college degree in 1959 in ITB. ITB then became the original model of the planning discipline of the other 86 departments in about 60 universities in Indonesia (Indonesian Planning School Association, 2021).

During the colonial era, in 1903 - 1905, the Dutch introduced the Local Council Ordinance or *Locale Radenordonnantie* or the establishment of local government. In 1910, the congress of the local ordinance became a yearly event because cities were managing their territories, so the city councils created a forum to discuss all associated issues. In 1911, the Dutch built an association named Local Interest Association or *Vereeniging Voor Locale Belangen* and the magazine of *Locale Belangen* and *Locale Techniek*, created by the city councils to arrange the necessity also to find solutions. Cities also consulted with the internal affairs department as a middle institution between the national and local governments (Roosmalen, 2003, p. 11).

In 1918, Batavia suggested a new expansion for European Menteng and Gondangdia. And a

couple of years later, in 1921, spatial planning started involving social and aesthetic dimensions. Batavia permitted the private sector to allow some limited public and commercial companies to apply in the housing developments because of the emergence of housing supply problems at the local level. The locals continued to advocate the expansion of their regions, and then Batavia established regional expansion regulation and further managed the rights of city governments in 1926. These guidelines were expanded in 1928 to regulate the village improvements and the idea of a 50% subsidy. In 1930, the Committee of Development Restriction changed the name into Spatial Planning Committee to learn about the history and the future of cities and recommend the track of spatial planning discipline. A few years before the independence, in 1938, the Committee proposed the Ordinances of City Establishment to organize the development of local government or other parties through a strict set of regulations to consider (Roosmalen, 2003, pp. 12-14):

1. Social characteristics, geography, and growth of each region
2. Equity in fulfilling the needs of all groups
3. The harmonious function of cities
4. Environmental aspects with the location awareness of each city
5. Only until the 1940s that Batavia decided to put these Ordinances in the status quo considering the political situation in the world, which concluded the colonial era.

After the independence of Indonesia, the situation changed rapidly. The pre-war institutions were dismantled. The cities were still in shambles from the past wars and required a significant reconstruction and redevelopment. The Department of Transportation and Public Works was then changed into the Department of Public Works and Reconstruction. The center of the nation was also suggested in Jakarta and Madura to focus on communication, gathering resources, and

making guidelines for the cities' authorities. It came with many critics because the previous organization was already decentralized, but in this case, the national government was still overly ruled and controlled. Jakarta saw only a national issue and wasn't synchronized with the local issues. The meeting point from these two arguments was to establish a national institution with the roles to supervise and provide suggestions for urban development. A continuous discussion occurred, and by the end of 1945, the national organization (government) began dispensing the responsibilities to the regional and local levels (Roosmalen, 2003, p. 15).

In 1946, the Department of Public Works and Reconstruction declared that they lacked planning experts. This message's response was to gather all of the experts in Jakarta to measure the demand and provide solutions. The organization worked according to tripartite (advice, coordination, and research). From here, and when the situation was settled and stable, the Ordinance of City Establishment was suggested. In parallel, the planning bureau wrapped up mapping the damaged lands (post-war), examined all necessities, and built the reconstruction guidelines. Following this progress, the representative of planners departed to Europe to study the planning curriculum and strengthen the belief that planning education was essential for the future of Indonesia (Roosmalen, 2003, pp. 16-17).

In 1947, the Center for Spatial Development Center under the national government of Indonesia, which was located in Yogyakarta, was established. It was the first official spatial planning institution in Indonesia. Not long after, in 1948, the government ratified the Ordinance of City Establishment by comparing the design between pre and post-war to adjust the necessities of urban developments. The government was also aware that the urban development was much different from the regional and rural developments. This year also marked a sudden increase of the Jakarta residents so that they needed to design the new neighborhood in Kebayoran Baru

(Roosmalen, 2003, pp. 25-26).

The Ordinance was fully acknowledged and legitimated on September 5th, 1949, after previously was not recognized by the Dutch. The institution, however, was not able to fully establish its foundation. As the talk continued, the previous concern about rural planning was taken into the picture along with the economy, finance, and social aspects within planning jurisdictions. The Ordinance was able to release some founding documents to discuss: the focus of city redevelopments; the rights and duty of the related institutions; the procedures of city developments including the elements of the city, work management, buffer zone, accessing different infrastructures in cities; the amount of compensation; and the probability of land ownership changes. At the same time, the plan they built included the urban spatial plan to measure the number and dimensions of the city's elements, schemes of a detailed plan with legal support, and policies to regulate the buildings (Roosmalen, 2003, p. 22).

By the end of the 1950s, Indonesia admitted that the experts in planners were still very few. The current formation had various and different backgrounds. Planners mainly came from Civil Engineering backgrounds, and they were identified as still lacking in the sense of urban aesthetics and comprehensiveness, despite being trained (Soefaat, 2003, pp. 42-43).

The thought of developing planning as an official program in the university came before the Indonesian independence. It was during 1940 to 1950 that the necessity of a program in planning came into attention. Initially, professors negated the formation of the planning department at ITB as it was still oriented towards agreement in the Dutch East Indies era, where the Faculty of Engineering at Bandung Institute of Technology was still participating in the Delft College of Technology (Netherlands). Upon receiving approval to initiate planning education, there were

challenges in determining the level of the program. In most other countries, spatial planning is common at the post-graduate level because programs at the undergraduate level are not successful. However, because Indonesia needed more experts from undergraduate education and interest in continuing post-graduate education was still minimal, the Harvard University Team agreed to open a spatial planning program in Indonesia at the undergraduate level. The formation of such educational programs was tailored to the needs of each country, where Indonesia at that time focused on regional planning, while developed countries at that time had a focus on solving problems in the development of urban life (Soefaat, 2003, pp. 45-46).

Technically, there were still many Dutch influences on Indonesia, and it was still challenging to develop a national educational center without Dutch intervention. The Center of Spatial Planning Development was not recognized as part of an Indonesian that a formal national framework change was needed in 1950. From 1952 to 1954, regional planning, interconnectedness, and urban-rural linkage were considered necessary to accompany urban planning: disrespecting these would cause massive urbanization and lack of attention on rural areas (Soefaat, 2003, pp. 45-46).

In 1954, preparation to develop Urban and Regional Planning program in Indonesia was initiated, with also the support of Kenneth Watts, a representative from the United Nations. They also assisted in developing the Master Plan of Jakarta. Until 1959, the first program was pitched in Bandung with the name of Division of City and Regional Development Planning, limited to understanding the procedures and steps of building a city plan and infrastructures. Gradually, there was also a necessity to expand into economic analysis and the awareness of the quality of life (Poerwo, 2003, p. 50).

In 1979, the second program of Planology in Bandung and Indonesia was established at the

Bandung Islamic University. The trend also continued to develop the master's degree of planning in the National Technology Institute of Malang and regional planning in Bogor Agricultural Institute under the faculty of agriculture. A few years later, during 1980 and 1990, numerous universities continued to develop the planning program for both undergrad and master's degrees. Some of the universities were also accepting government employees to resolve the education gap amongst them (Poerwo, 2003, p. 50).

In 1987, the heasd of these planning programs was able to communicate together and formed the National Forum of Planning Education (FNPP). They took turns holding a meeting where they discussed issues in the teaching environment and planning practices. At the time, they didn't have a fixed curriculum where each program built its own courses. In response, 1995 marked the year when the Directorate of Higher Education of the Ministry of Education mandated all universities to prepare a design of the planning curriculum to be applied nation-wide. The following year, with the decree from the Ministry of Education, this forum changed its name into the National Forum of Regional and City Planning Education (FNP-PWK). At the same time, the name Planology was adjusted into Regional and City Planning. Finally, in 2000, the Association of Indonesian Planning Schools (ASPI) was established to strive a discourse to stimulate the development of the lecturers, researchers, and planning students. It also had a purpose to influence the system development and as a medium to solve the development and planning issues (Poerwo, 2003, p. 53).

In addition to formal education, the government of Indonesia relies on workshops and trainings to ensure that their resources possess the spatial planning knowledge and capacity. The trainings focus on the physical aspect and technical guidance to support the local government in spatial planning. They are designed mostly for government employee from all backgrounds to get the

sense of spatial planning. From 1950 to 1965, the government developed the first such technical guidance of new urban settlement planning. The Center of Planology acted only as a supervisor in the development of new urban settlements of Kebayoran Baru and Slipi. In 1966 to 1978, the training was limited to the introduction of the spatial planning concept to staff in the local government. The material for the workshop involved the making of spatial urban plan for the local governments. In the years 1979 to 1984, the trainings expanded to affiliate with international institutions, and the geospatial mapping was introduced. In 1985 to 2000, and the further years, the trainings continued further to include zoning regulations and for the first time, spatial planning was a reference for the physical development (Budisantoso, 2003, p. 64).

The planning program continues to expand along with the increase of the number of universities in Indonesia. The planning domain, which mostly goes to the governmental sector, also spreads out to many government institutions, for national or local governments. Most of the ministers also have a planning division. Table 2.1 below presents some of the ministries with the planning division.

Planning Division within Ministries of Indonesia

Public Work (Kemen PU)	**Environment (Kemen LH)**	**Internal Affairs (Kemendagri)**	**Land and Planning (BPN and ATR)**	**Development (BAPPENAS)**
Pre 1950 - Directorate of Spatial and Local Planning 1950 - Center of Planology 1956 - Center of Spatial Planning and Development 1961 - Center became Directorate 1985 - Coordinated infrastructures projects 1983 - Involve in Transmigration and Settlement Plan 1990 - Dynamic Spatial Plan Concept 1999 - Department of Settlement and Regional Development	Ease the attempts of environmental management: pollution control and land degradation management (Ineffective) 1985 - Environmental Impact Assessment 1990 - Conservation and Cultivation Area	1974 - Directorate of Urban Development 1979 - Directorate of Economy and Local Development 1980 - Guidelines in the Formulation of City Plan 1981 - Directorate General of Regional Development 1982 - Confirming the Guidelines of Local Planning and Control 1987 - Directorate of Regional Development 1992 - Added sub-directorate of Spatial Plan	Agrarian Law stipulates that land management is an obligation to meet the needs of the community with the responsibility falls to the government. Land use can also be interpreted as the use of land in a balanced manner by respecting the rights to land that function socially in accordance with applicable laws and regulations.	Bappenas' main role is to be responsible for producing policies that encourage the establishment of quality spatial planning, such as drawing up plans and coordinating plans and alignment between sectoral and regional plans and integrating those plans into national development plans.

Source: Ministry of Public Works (2003)

The table above does not mention all vacancies for planning alumni at the level of national

governments. Other ministries might also have planning divisions, and the list of ministries is varied based on the current president's decision. Accordingly, local governments also have planning divisions distributed through some of their departments. Besides the planning alumni working in governmental sectors, the consultant is also a dominant sector for planning alumni. Due to the flexibility in Indonesian occupational systems, lecturers can also work as consultants.

Consultants became active after 1965. Before that, the spatial planning work was considered a government task and carried out by government officials. The consideration of appointing consultants began with a self-management system in government agencies working toward spatial planning. Initially, the Public Works assisted the local government in urban spatial planning by sending a team of planners, preparing plans, and eventually conveyed over to the local government. At the start of the 1970s, the budget of government agencies increased, and there was a desire to expand aid to the region through private services. Finally, consultant services began to be used to assist the region in preparing spatial plans. Along with using foreign assistance within various regional and urban development jobs, consultants increased. The role of consultants is also growing in spatial planning after using the Integrated City Infrastructure Development Program approach, which requires urban development programs to be adjusted and based on development strategies in urban spatial plans (Puradimadja, 2003, p. 105)

In recent decades, the planning domain has become complicated as competition has grown intense. The sectoral and top-down approaches from the national government created conflicted yet competitive policies and regulations amongst different ministries. Accordingly, several national institutions' intensive yearly new policies confound the local governments. Reacting to this, the local consultants in the local levels strive to justify the moving forward local policies by doing the mix and match of the national policies so the local policies may proceed. Consultants

may also attempt to translate these new national policies to local policies by conducting more workshops and training. In parallel, the workshops and training are most beneficial for local governments due to the nature of the local governments that routinely rotate their employees despite their backgrounds. The main reason for this policy is to avoid the comfort zone in the bureaucracy but leave the persons in charge, most time, lack of capacity about their ‘jurisdictions (Field Interviews, 2021-2022).

There was no foundation of spatial planning until the 1990s, although the discussion has started soon after the Indonesian independence. Spatial planning relied on the 1960 Act about Agraria but was left without any meaningful content. The first draft of the Act about Urban Advisory that was supposed to be the first to regulate spatial planning encountered a dead end. It was initially proposed in 1972. When the bill was not progressing, the Minister of Internal Affairs stood in to develop guidelines for drafting city plans. Yet, this made a spark regarding the authority between the Ministries of Internal Affairs and Public Works unclear. It went through numerous discussions until it indirectly stipulated economic growth and urban as well as industrial expansion (Ali, 2003)

The function of cities in Indonesia tends to shift from the center of manufacturing industry activities to service and business activities that intensively utilize the land. In contrast, industrial activities move to the suburbs. The need for land in the city encourages the government to cooperate with the private sector in meeting these needs by carrying out coastal reclamation, which is likely to disrupt coastal and marine ecosystems. Granting flexibility to the region through the autonomy system can increase city competitiveness, thus affecting the improvement of the city's economy and foreign exchange income. The number of urban development approaches that are currently developing should further encourage the government to establish a

democratic system by involving the community and the business world and handling good governance (Soegijoko, 2000).

Despite the existence of many regulations mentioning sustainability, they were not significant in practice because the New Ordeal was highly oriented toward economic growth. Unfortunately, although the policies have evolved over time (The Act No. 24 the year 1992 was adjusted to Act No. 26 the year 2007 about spatial planning and Act. No. 32 the year 2004 about the Regional Autonomy), development was still oriented toward the economy and still business-centered, disregarding the environment. When the digital lifestyle began to enforce awareness in the future and sustainability, the pandemic hit hard since 2020. In the same year, Indonesia released the Omnibus Law through Act No. 1 the year 2020 about Job Creation, which propelled heavily backward due to the sole purpose of recovery and maximizing investment into the economy (Field Interviews, 2021-2022).

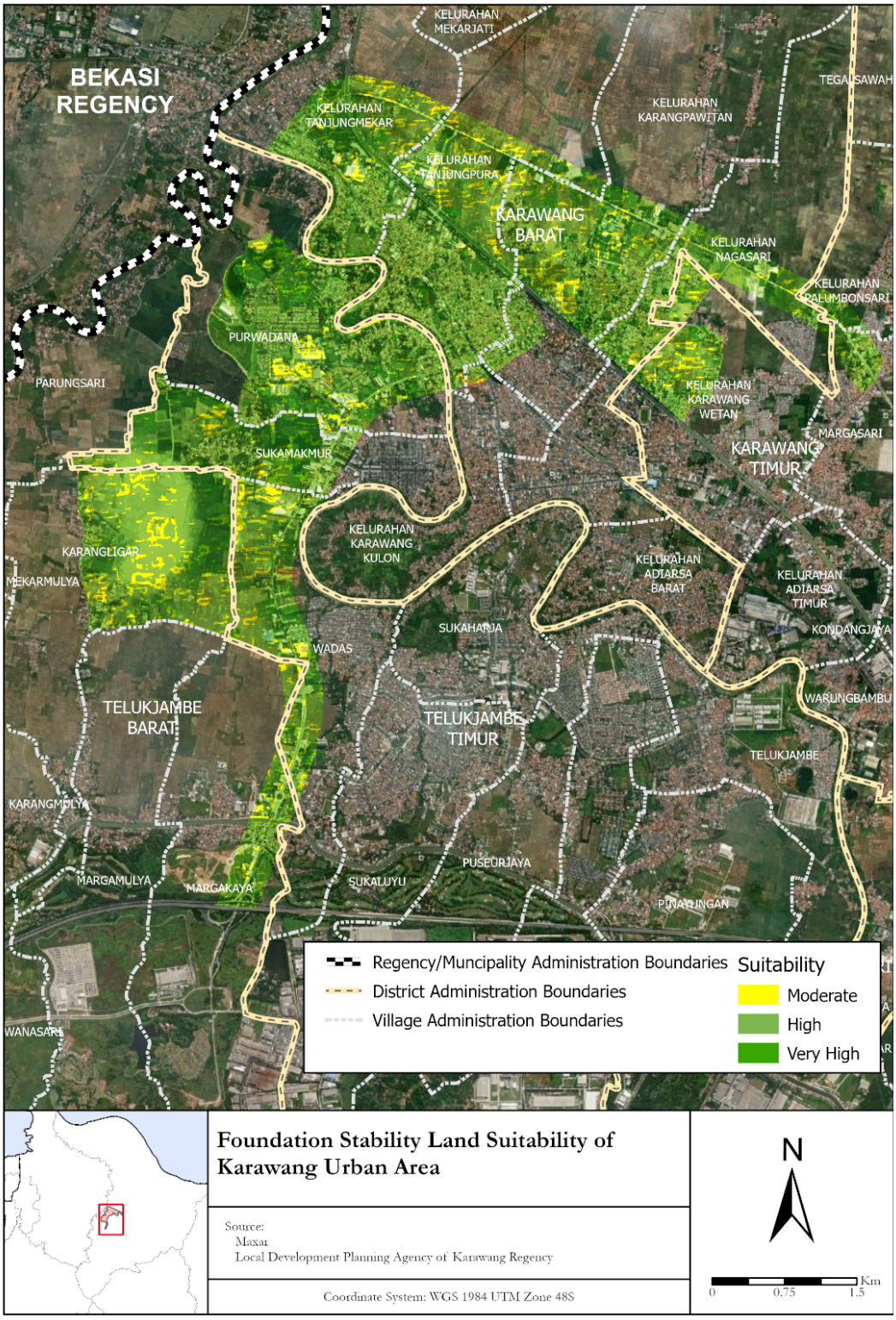
The 2020 Job Creation Law stresses investments to accelerate economic growth after the pandemic, especially in the industrial sector. The Job Creation Law also positively impacts community employment. However, the jobs are taken mainly by immigrants from outside the region or foreigners. Another recent trending discussion in Indonesia is the Jakarta-Bandung high speed train. The Jakarta-Bandung high-speed rail project is currently the focus of development from the national government. However, many people judge this project as a waste of the nation's budget as it takes at least 30 years to rebuild capital. It is ineffective as the distance is too close for fast train function. Funding from the project was also conflicted, and many people doubted the interest behind this idea (Ulfa, 2022).

Appendix 3.1 GIS analysis stages - Multi Criteria Analysis Framework

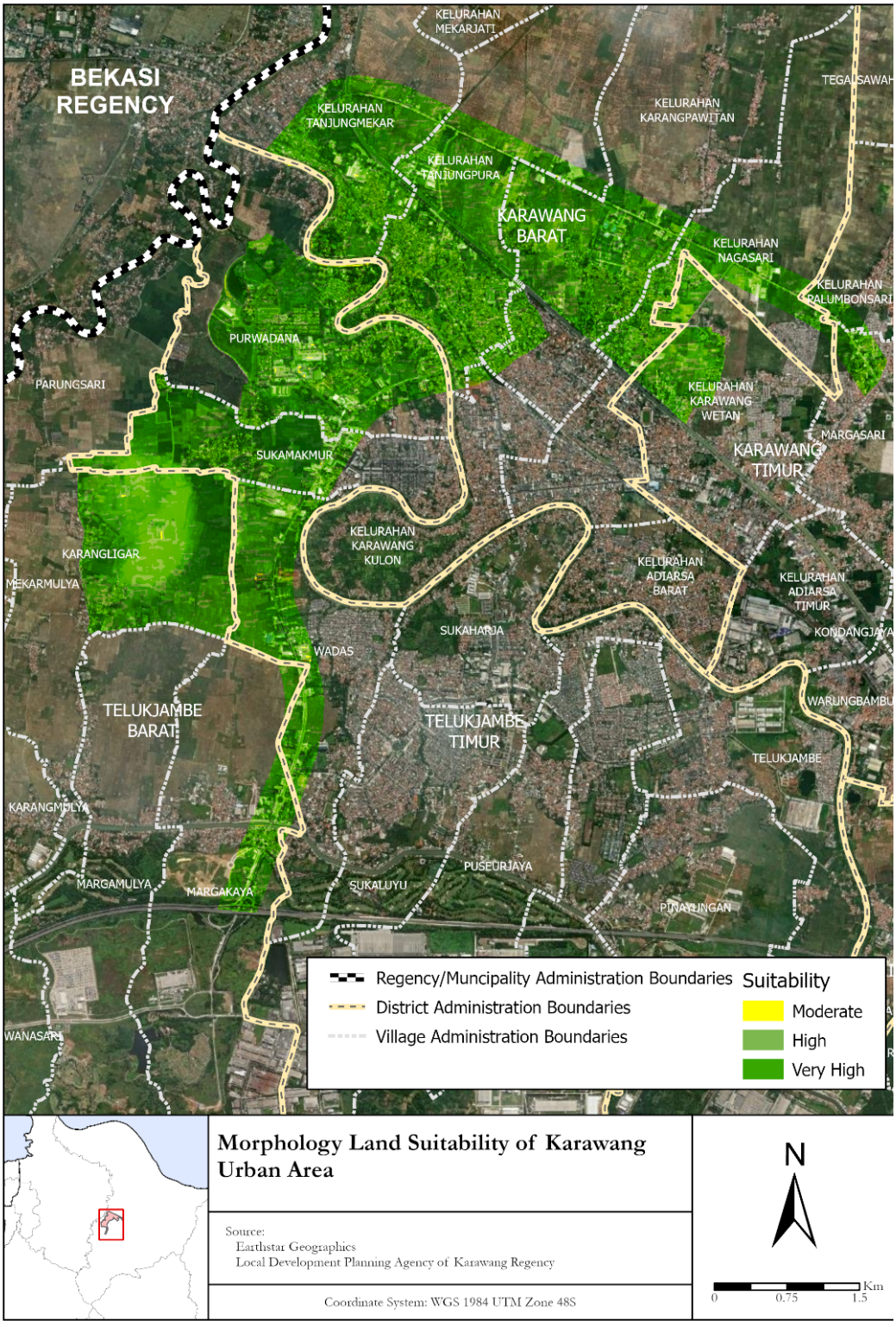
Component	Parameter	Indicator	Source
Biophysical	Geology	Type of Land (1-3,7,8,11,12)	6. Land Suitability Analysis For Urban and Agricultural Land Using GIS (Puntsag, 2014) 7. Land Suitability Evaluation to Determine the Appropriate Areas of Development: A Case Study of Hormuz Island (Ahmadi, Mosammam, & Mirzaei, 2017) 8. Land Suitability Analysis of Urban Growth in Seremban Malaysia, using GIS based AHP (Aburas, Abdullah,, Ramli, & Asha'ari, 2017) 9. GIS based land suitability analysis using AHP model for urban services planning in Srinagar and Jammu Urban center of J&K, India (Parry, Ganaie, & Bhat, 2018) 10. Site suitability analysis for urban development using GIS based multicriteria evaluation technique; a case study in Chikodi Taluk, Belagavi District, Kamataka, India (Santosh, Krishnaiah, & Deshbhandari, 2018) 11. Prediction and Comparison of Urban Growth by Land Suitability Index Mapping Using GIS and RS in South Korea (Park, Jeon, Kim, & Choi, 2011) 12. A Review of Land Suitability Analysis for Urban Growth by Using the GIS Based Analytic Hierarchy Process (Aburas, Abdullah, Ramli, & Ash'aari, 2015) 13. The Assessment of Land Suitability for
		Foundation Stability (13)	
	Morphology	Elevation (2,3,6,7,9,11,12)	
		Slope Stability (13)	
	Land Use	Land Cover/Land Use (1-12)	
		Vegetation (1,2,7)	
		Land Ownership (14)	
	Natural Disaster	Natural Disaster (2,8-11,13)	
		Erosion Sensitivity (9,13)	
	Hydrology	Water Availability (1,9,12,13)	
		Drainage System (13)	
		Ease of Doing of Reshaping (13)	
		Waste Disposal (13)	
Accessibility	Access to Transportation Facilities	Access to the Primary Road (3-6,9-12)	
		Access to the Station and Terminal (6-8)	
	Access to Public Facilities	Access to the Open Green Spaces (8,10)	
		Access to the Healthcare Facilities (8,10)	
		Access to the Commercial Area (3,8,10)	
		Access to Educational Institution (3,8,10)	
		Access to Religious Buildings	
		Access to Recreational Facilities (2)	
	Access to the Community Center	Access to the Urban Center (6-8,14)	
		Access to the Environmental Center (8,14)	

Component	Parameter	Indicator	Source
		Low Income Settlement Distribution	Urban Development in the Anticipated Rapid urbanization Area From Belt and Road initiative: A Case Study of Nong khai City, Thailand (Bamrungkhul & Tanaka, 2022) 14. Land-Use Suitability Assessment for Urban Development Using a GIS-based Soft Computing Approach: A Case Study of Ili Valley, China (Luan, Liu, & Peng, 2021) 15. Evaluation of Land Suitability for Urban Land-Use Planning-Case Study Dhaka City (Ullah & & Mansourian, 2015) 16. Land Use Suitability Analysis for Urban Development in Beijing (Liu, Zhang, Zhang, & Borthwick, 2014) 17. GIS-Based Geo Environmental Evaluation for Urban Land-Use Planning: A Case Study (Dai, Lee, & Zhang, 2001) 18. Public Works Decree no. 20 year 2007 (Ministry of Public Works, 2007) 19. Guidelines to Identify the Slum, Squatter, and Metropolitan Buffer Area (Ministry of Public Works, 2006)
		Distribution of People around the Conservation Area	
Population and Policies	Population	Policies around Environmental Preservation (8)	
	Policies	Accordance to Land Use Plans (14)	

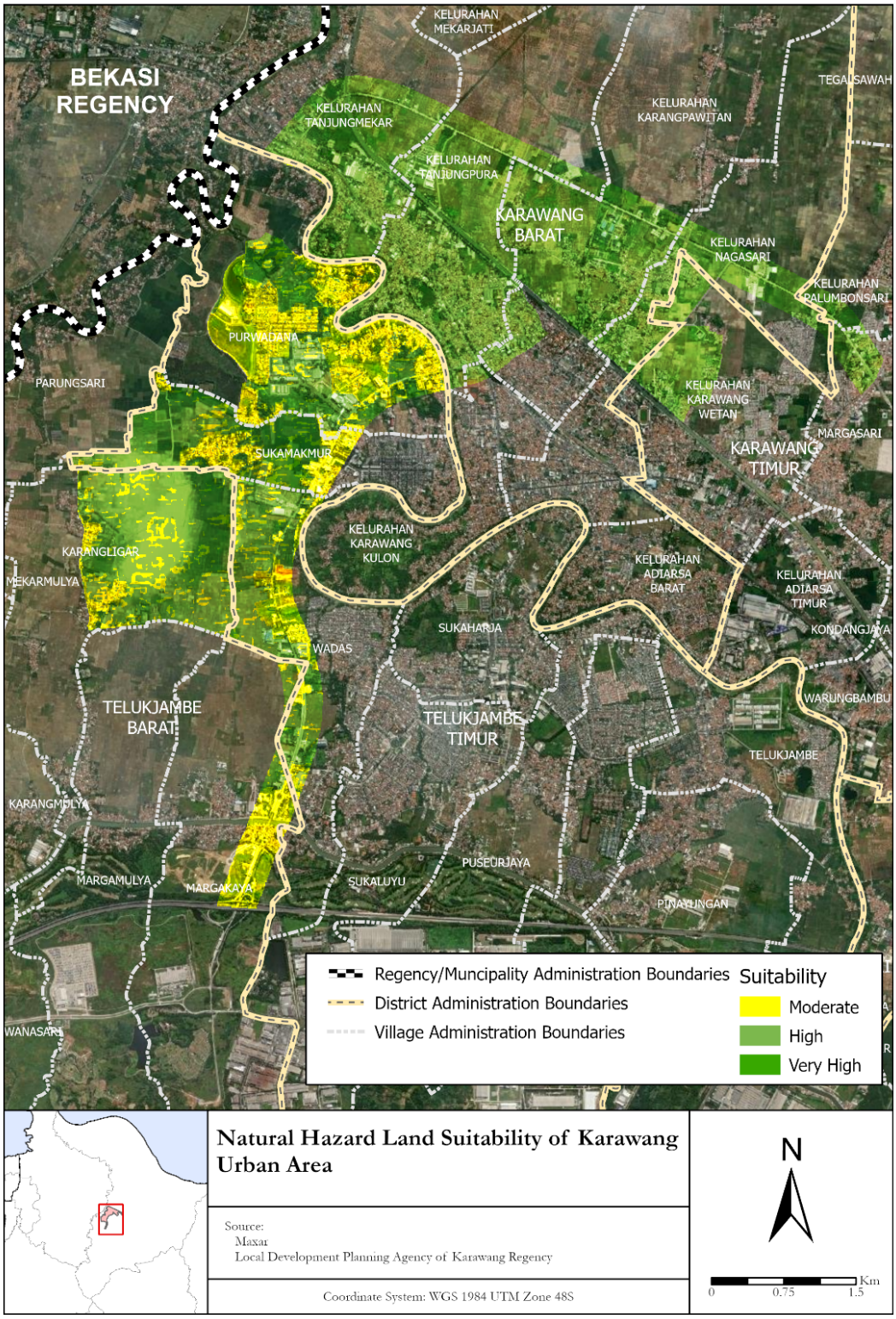
Appendix 3.2 GIS analysis stages – Geology (Biophysical)



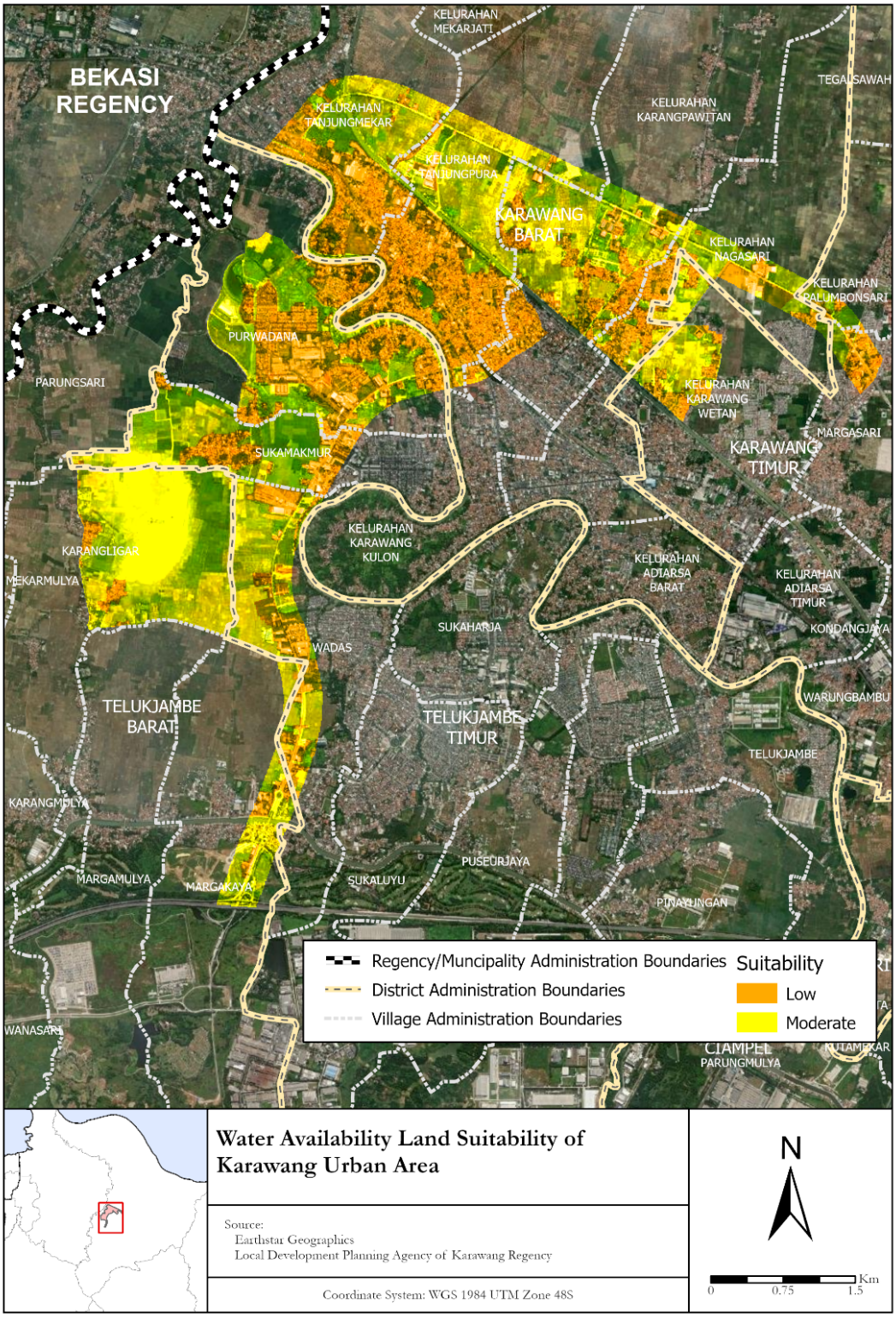
Appendix 3.3 GIS analysis stages – Morphology (Biophysical)



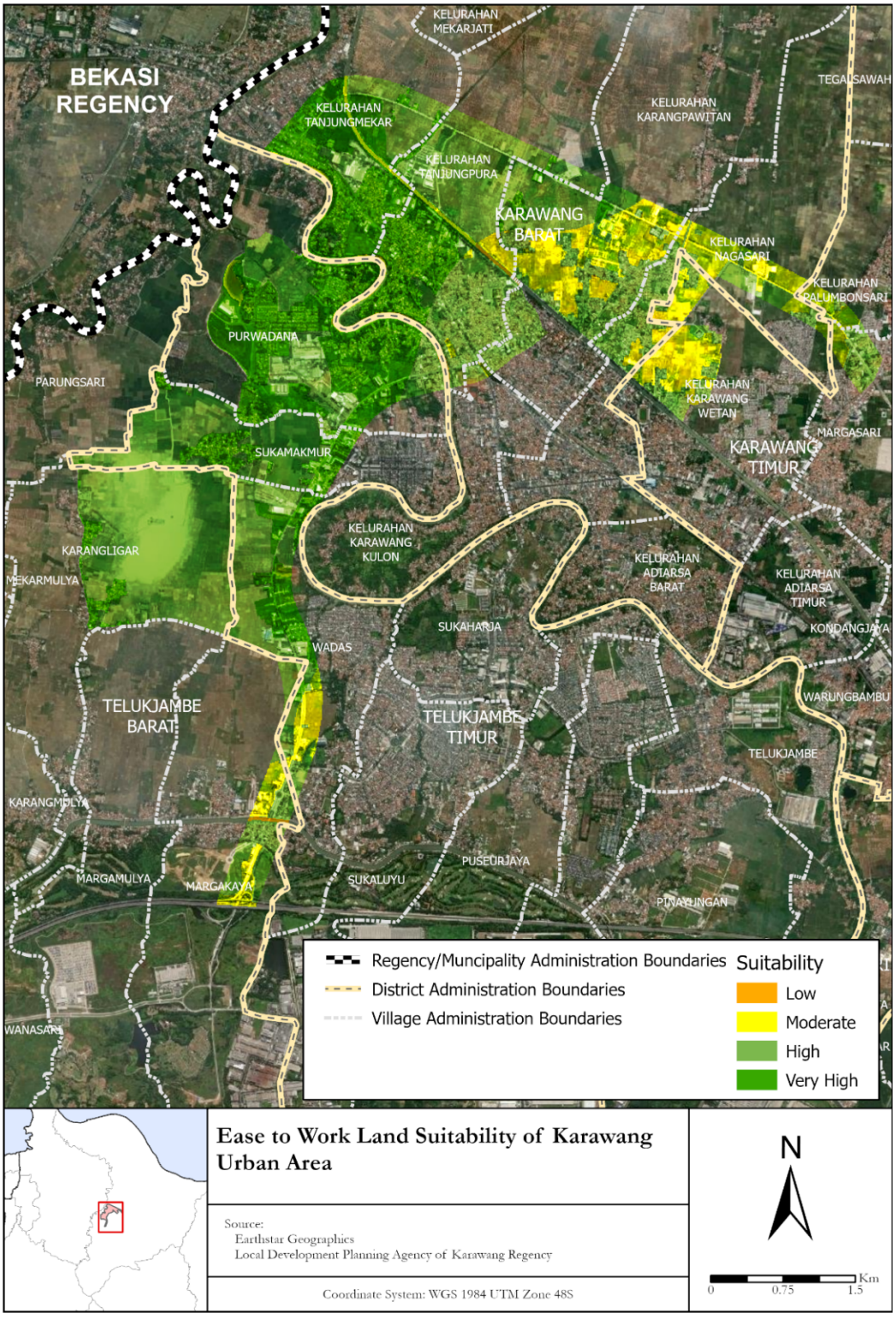
Appendix 3.4 GIS analysis stages – Natural Disaster (Biophysical)



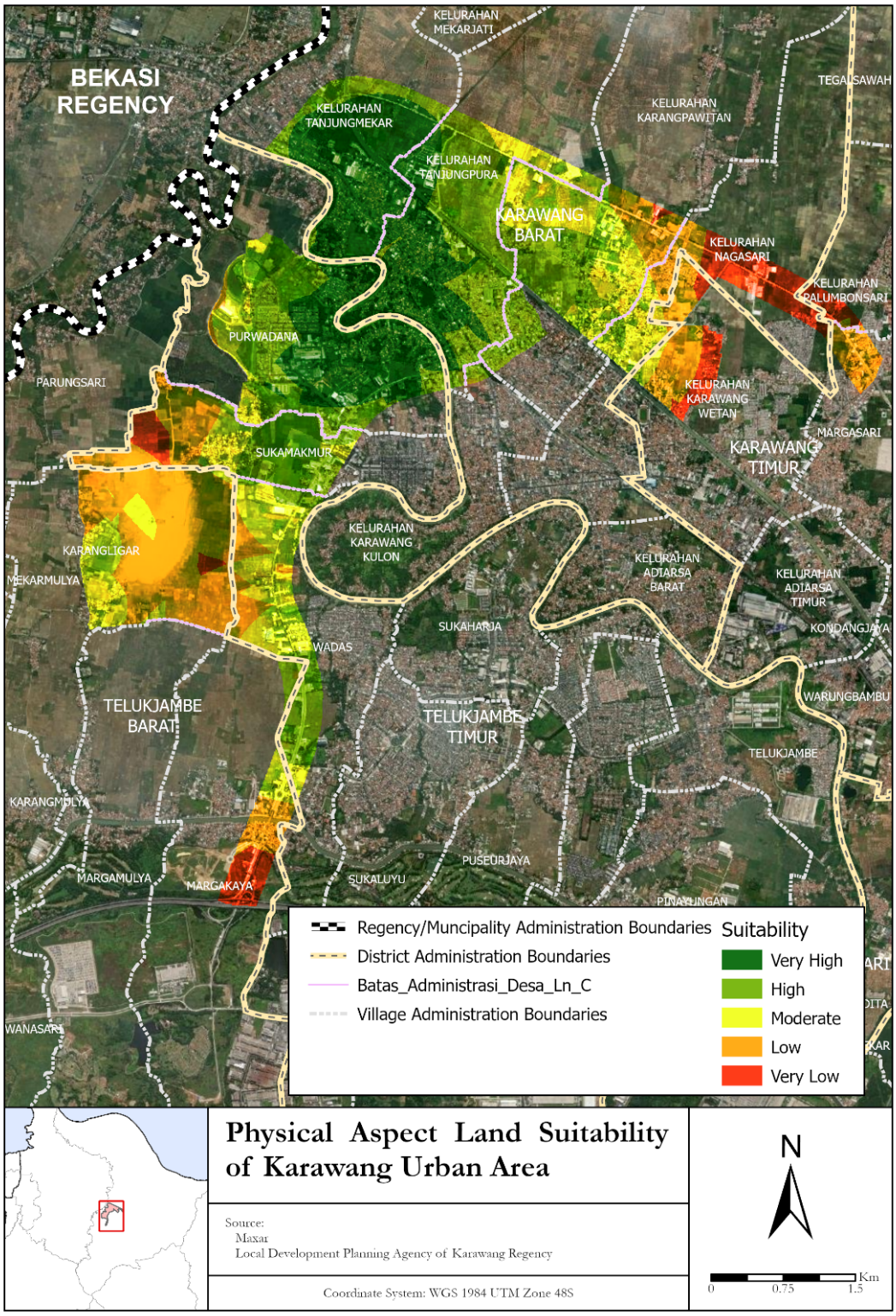
Appendix 3.5 GIS analysis stages – Hdrology (Biophysical)



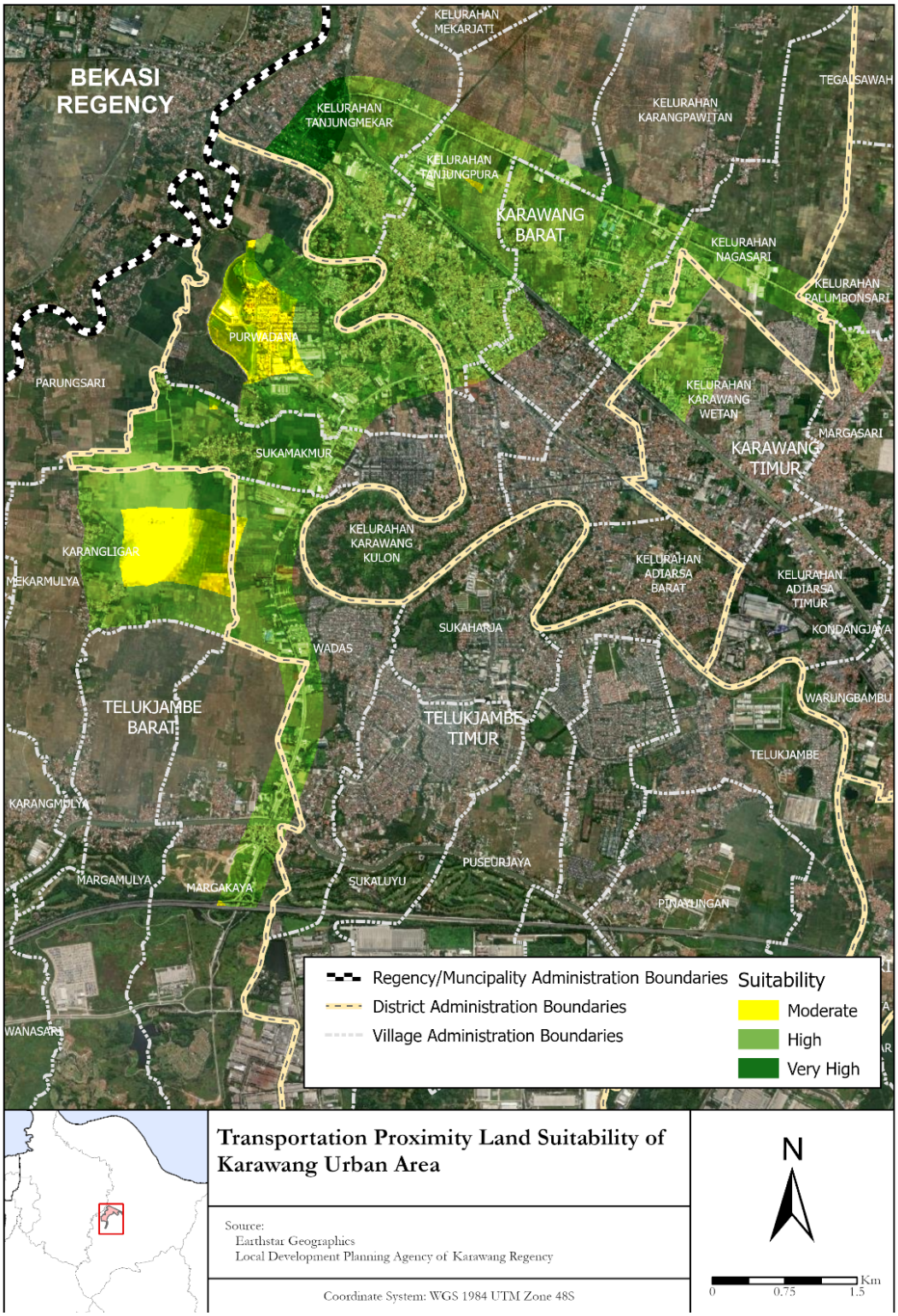
Appendix 3.6 GIS analysis stages – Ease of Doing Reshaping (Biophysical)



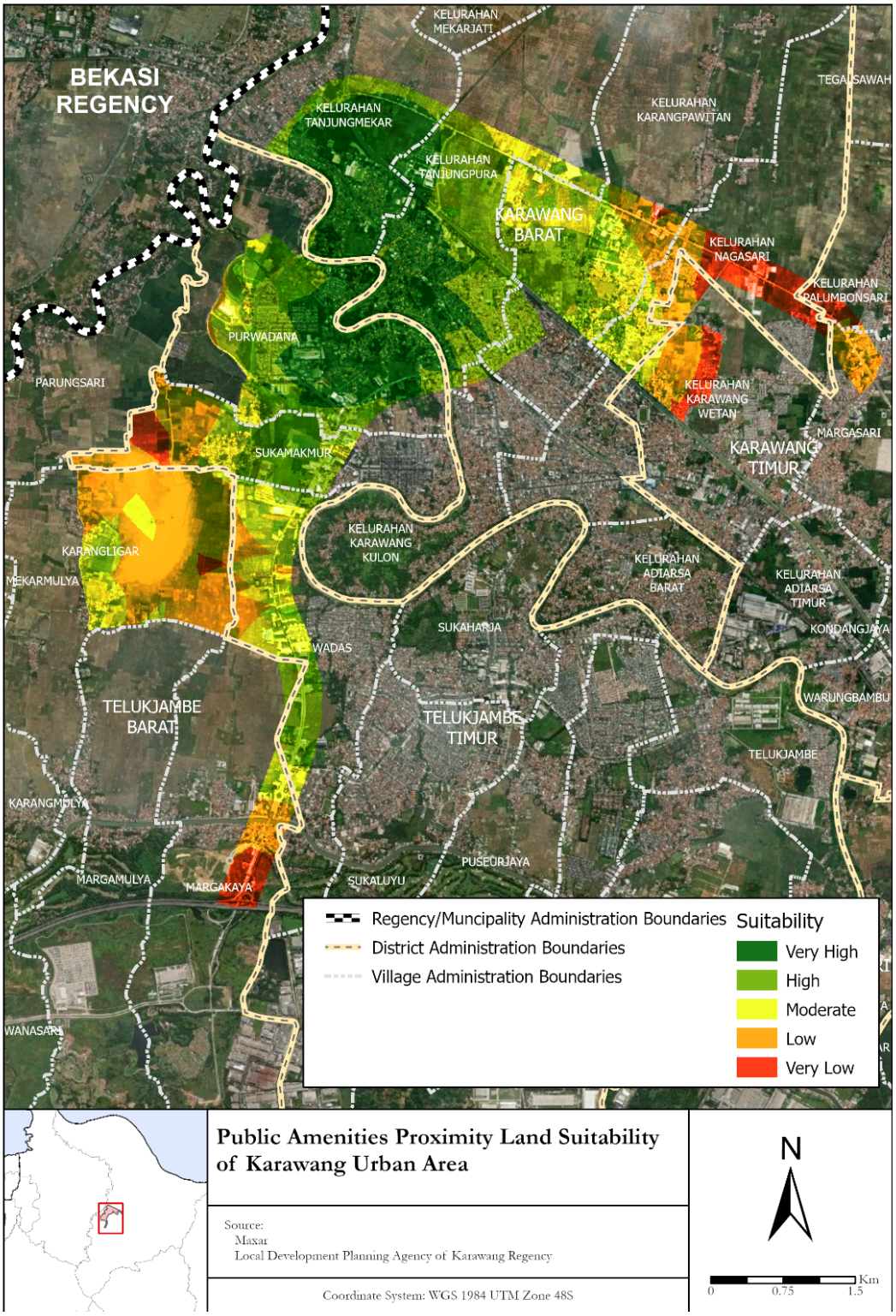
Appendix 3.7 GIS analysis stages – Biophysical



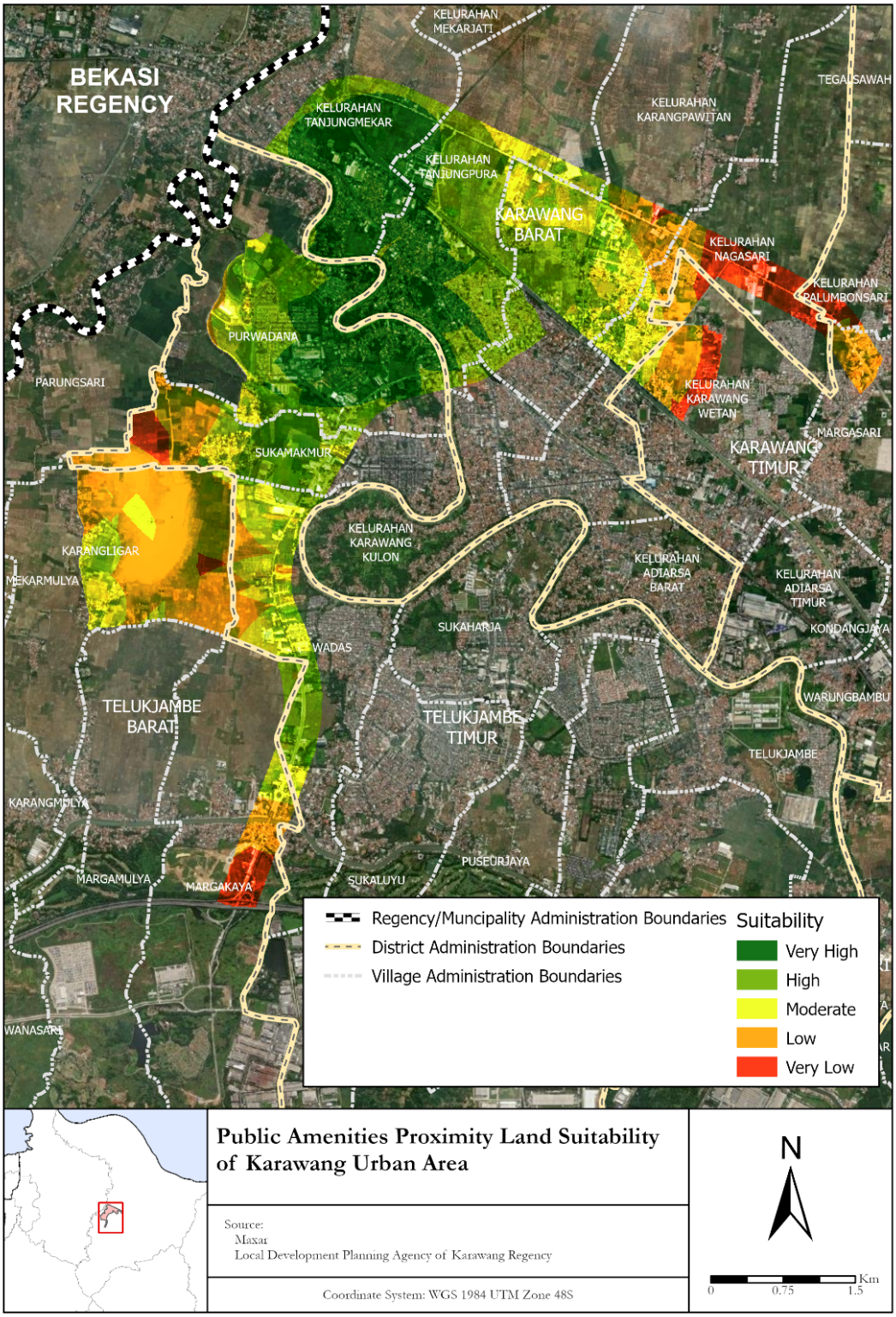
Appendix 3.8 GIS analysis stages – Transportation (Accessibility)



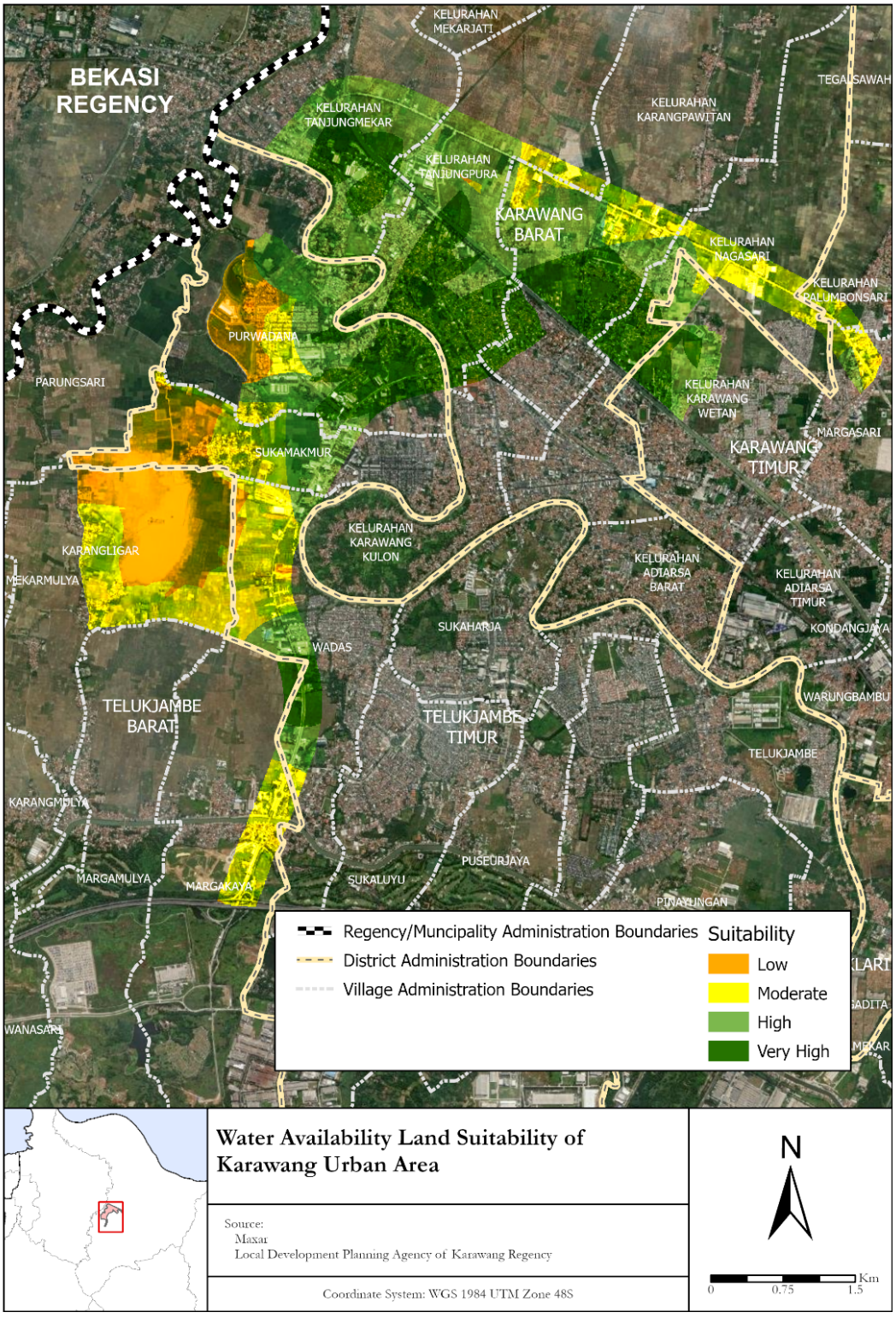
Appendix 3.9 GIS analysis stages – Public Facilities (Accessibility)



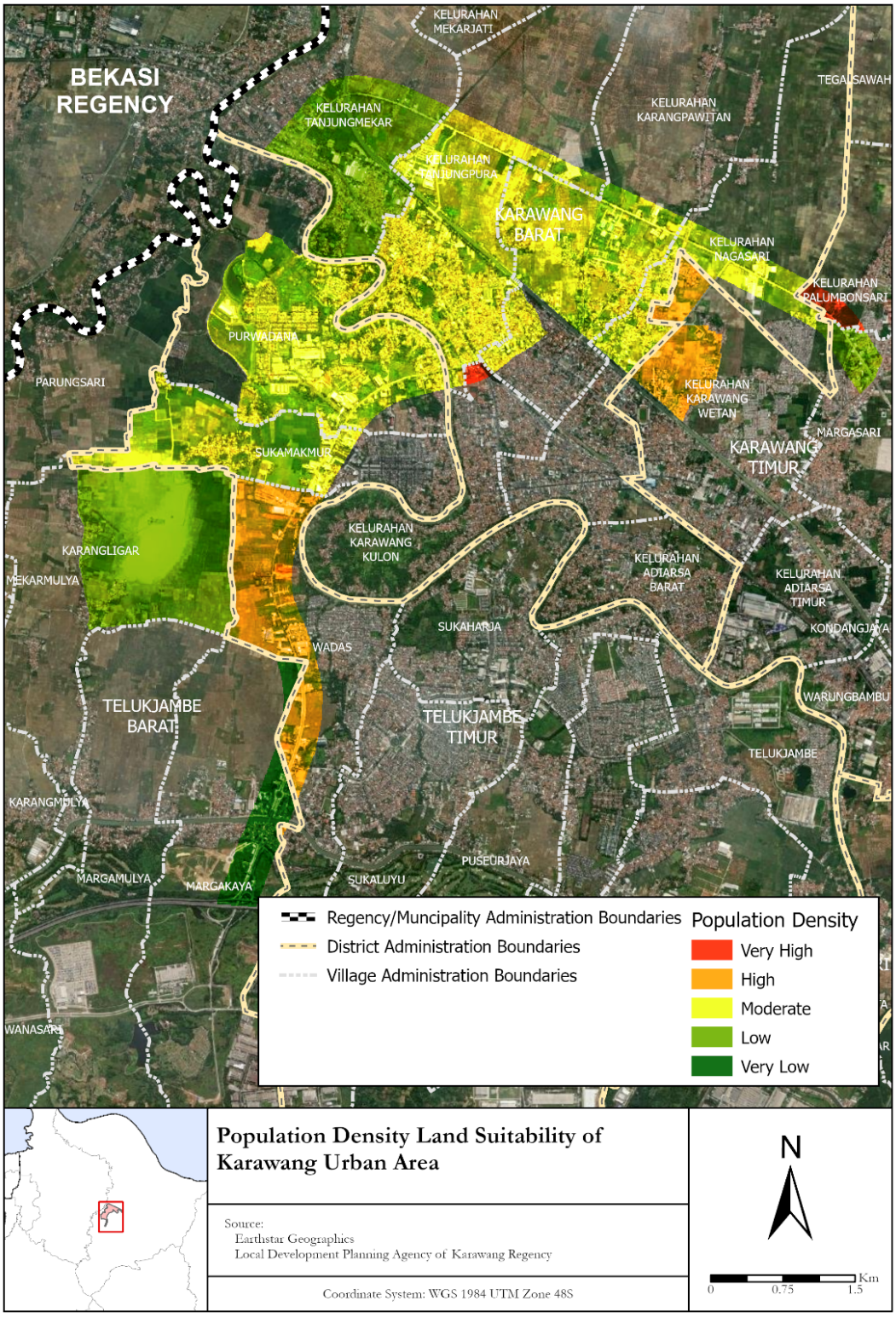
Appendix 3.10 GIS analysis stages – Community Center (Accessibility)



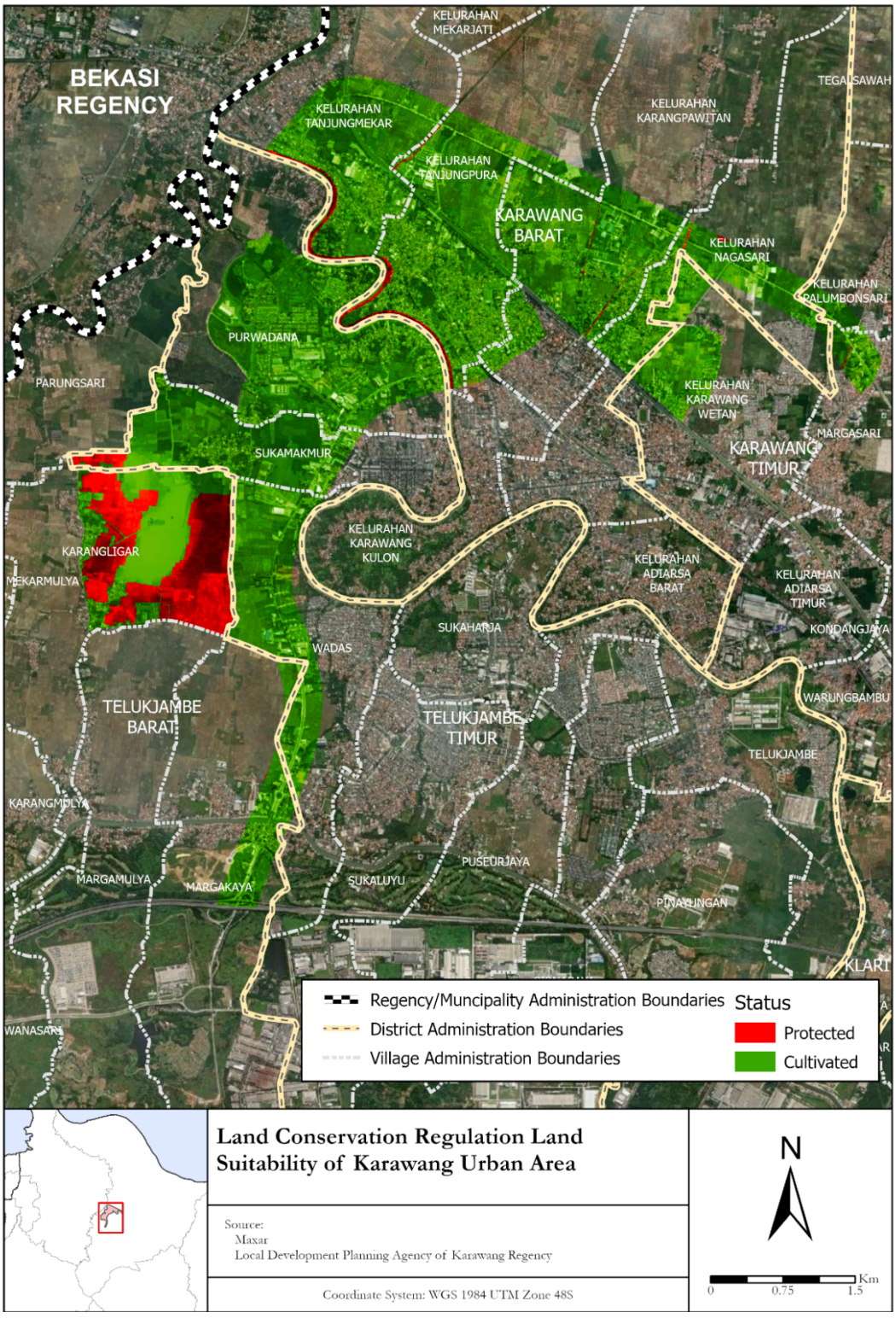
Appendix 3.11 GIS analysis stages – Accessibility



Appendix 3.12 GIS analysis stages – Policies (Environmental Regulations)



Appendix 3.13 GIS analysis stages – Policies (Land Use Plans)



Appendix 3.14 GIS analysis stages – Policies