

SPATIAL PLANNING AND CLIMATE JUSTICE

A case study in Ho Chi Minh City

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For all those who have their voices silenced, their rights taken, their resources commodified, and their histories erased.

It is not enough to pick the leaf to make the medicine; you must know how to sing it and enchant it. To sing the leaf is to reverence the permanence of the tree.

Luiz Antônio Simas

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RESUMO

Este estudo adota uma postura contra-hegemônica, concentrando-se na justiça climática a partir de uma perspectiva adaptativa, transformadora e resiliente. Para isso, questões climáticas mundiais que afetam desproporcionalmente as populações marginalizadas e vulneráveis são observadas pelas lentes da equidade social e ambiental.

O principal objetivo desta pesquisa é investigar a articulação do planejamento espacial e da justiça climática e explorar como as práticas e abordagens de planejamento podem abranger tanto o desenvolvimento sustentável quanto as metas de justiça social. O estudo busca analisar e avaliar a integração dessas práticas nos processos de planejamento espacial, concentrando-se no impacto sobre o desenvolvimento sustentável e equidade multidimensional na cidade de Ho Chi Minh.

A metodologia é composta por duas abordagens principais: uma análise espacial do território e dos planos diretores e entrevistas focadas na governança com especialistas envolvidos e residentes. Por meio desses métodos, a pesquisa examina as estratégias de planejamento espacial existentes, seu alinhamento com os princípios de justiça climática e sua eficácia na abordagem dos desafios climáticos na área do estudo de caso.

Como resultado, o estudo identifica a importância crescente das infraestruturas verdes e azuis para mitigar os impactos climáticos na cidade de Ho Chi Minh. Entretanto, abordagens diferentes são evidentes nas duas propostas de planos diretores. Ambas as propostas carecem de enfoque e análise social mais democráticos, ampliando a inclusão do conhecimento e das necessidades locais. Além disso, a dependência de recursos digitais no atual monitoramento do plano diretor levanta preocupações sobre o distanciamento do tecido urbano dinâmico da cidade.

A pesquisa conclui que enfrentar os desafios na cidade de Ho Chi Minh exige uma abordagem holística que combine medidas de adaptação estruturais e não estruturais, enfatizando a importância de incorporar princípios de justiça climática ao planejamento espacial. A garantia de uma distribuição equilibrada de recursos entre os residentes promoverá a resiliência e contribuirá para a justiça climática para todos. Além disso, as percepções do estudo se aplicam a situações semelhantes no Sudeste Asiático, assim como em outros contextos. Promover maior inclusão social no planejamento urbano, abordando questões sociais críticas e capacitando as comunidades locais, tem o potencial de facilitar a superação de desafios rumo à resiliência urbana transformadora.

PALAVRAS-CHAVE: Justiça climática, Planejamento espacial, Infraestruturas azuis e verdes, Cidade de Ho Chi Minh, Resiliência urbana.

ABSTRACT

This study adopts a counter-hegemonic stance, focusing on climate justice from an adaptive, transformative and resilient perspective. To this purpose, global climate issues that disproportionately affect marginalized and vulnerable populations are observed through the lens of social and environmental equity.

The main objective of this research is to investigate the articulation of spatial planning and climate justice and explore how planning practices and approaches can encompass both sustainable development and social justice goals. The study seeks to analyze and evaluate the integration of these practices into spatial planning processes, focusing on their impact on sustainable development and multidimensional equity in Ho Chi Minh City.

The methodology is composed of two main approaches: a spatial analysis of the territory and master plans and governance-focused interviews with local or involved experts and residents. Through these methods, the research examines existing spatial planning strategies, their alignment with climate justice principles and their effectiveness in addressing climate challenges in the case study area.

As a result, the study identifies the growing importance of blue-green infrastructure in mitigating climate impacts in Ho Chi Minh City. However, different approaches are evident in the two master plan proposals. Both proposals lack a more democratic social focus and analysis and present a limited inclusion of local knowledge and social needs. Furthermore, the reliance on digital resources in the current master plan monitoring raises concerns about detachment from the complex and dynamic urban fabric.

The research concludes that addressing the challenges in Ho Chi Minh City demands a holistic approach that combines structural and non-structural adaptation measures, emphasizing the importance of incorporating climate justice principles into spatial planning. Ensuring a balanced distribution of resources among residents will foster resilience and contribute to climate justice for all. Moreover, the insights from the study apply to similar situations in Southeast Asia, as well as in other contexts. Promoting greater social inclusion in urban planning by addressing critical social issues and empowering local communities has the potential to facilitate overcoming challenges towards transformative urban resilience.

KEYWORDS: Climate justice, Spatial planning, Blue-green infrastructures, Ho Chi Minh City, Urban resilience.

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ACRONYMS

ADB = Asian Development Bank

BMA = Bangkok Metropolitan Administration

CCA = Climate Change Adaptation

DPA = Department of Planning and Architecture

DRR/Eco-DRR = Disaster Risk Reduction, Ecological Disaster Risk Reduction

EbA = Ecosystem-based Adaptation

EbM = Ecosystem-based Mitigation

FAO = Food and Agriculture Organization of the United Nations

GI = Green Infrastructure

GDP = Gross Domestic Product

JICA = Japan International Cooperation Agency

IFMA = Integrated Flood Management Approach

LE = Large Enterprises

LID = Low Impact Development

M&E = Monitoring and Evaluation

MARD = Low Impact Development

MMDA = Metropolitan Manila Development Authority

MR = Metropolitan Region

NGO = Nongovernmental organizations

Q&A = Question and Answer

SDGs = Sustainable Development Goals

SES = Social-ecological Systems

SMEs = Small and Medium Enterprises

ToC = Theory of Change

WB = World Bank

WTP = Willingness to pay

1

INTRODUCTION

1.1. FRAMEWORK AND JUSTIFICATION

Territories worldwide face diverse climate challenges with far-reaching social, economic, and environmental impacts, disproportionately affecting vulnerable and marginalized communities (McMillan et al., 2021; UNHCR, n.d.; WB, 2021). Amidst these challenges, spatial planning is crucial in guiding urban development and fostering climate resilience. By integrating climate justice principles into spatial planning processes, territories can address the climate impacts while promoting fairness, inclusivity, and sustainability.

Since the past decade, green infrastructure, including nature-based solutions, has been recognized as an essential component of sustainable management practices for climate adaptation (Taylor et al., 2007; Eggermont et al., 2015; Dhakal et al., 2016, op cit. Venkataramanan et al., 2020). These strategies leverage natural systems and processes to mitigate climate impacts, enhance urban biodiversity, and improve the overall quality of life. However, it is essential to consider the potential distributional outcomes and social implications of green infrastructure projects to ensure that they do not exacerbate existing inequalities or create new injustice scenarios (Dunn, 2010; Brehm et al., 2013; Miller, 2014; Newburn et al., 2016). Understanding the social dimensions and ensuring equity in implementing green infrastructure is critical for promoting climate justice.

Studies have examined how demographic, socioeconomic, or geographical factors may affect understanding, attitudes, wills, and manners toward green infrastructure programs. Nevertheless, there is a need for awareness of the social component within the socio-ecological-technical system to secure equity, inclusivity, and sustainability (Schifman et al., 2017, op. Cit. Venkataramanan et al., 2020). Therefore, the solutions for these and other possible upcoming challenges are to be sought together with the population, often relating to concepts of co-design and transdisciplinarity.

This Master's Thesis examines the intersection of spatial planning and climate justice, focusing on investigating the general context of climate challenges and their implications for the case of Ho Chi Minh City in Vietnam. The present analysis takes a counter-hegemonic approach by exploring the intangible relations between humankind and the natural and built environment.

This research is part of an Erasmus+ Internship between the Universidade do Porto and the Università degli Studi di Trento. The unique case study of Ho Chi Minh City presents exciting possibilities for learning from a global perspective, which deeply motivates the author's involvement. The research prioritizes methodological strategies and collaboration with experts and locals to understand the case study better.

The author's academic background, including studies conducted during the Master's program at the Universidade do Porto, provides a strong foundation for examining the intersection of spatial planning and climate justice from a multidisciplinary perspective. Moreover, its experiences in addressing social justice issues in informal settlements in Brazil contribute to a comprehensive understanding of the social implications of spatial planning interventions in developing countries. This unique background and a deep interest in the environment and justice-related topics from a social perspective inform the author's approach to this research.

Recognizing the interconnectedness between environmental sustainability and social equity, particularly in the face of global climate challenges, this Master's Thesis aims to critically analyze the relationship between spatial planning, climate justice, and the social dimensions of urban development processes.

1.2. OBJECTIVES

In summary, this Master's Thesis investigates the intersection of spatial planning and climate justice within the global context of climate challenges. Through a case study examination, the research identifies strategies and approaches that promote equitable and sustainable urban development while addressing the specific climate challenges in cities worldwide. By contributing to the understanding and implementing climate justice in spatial planning, this research aims to support the creation of resilient and inclusive urban environments.

Urban planning is crucial in shaping the built environment, and it can either increase/contribute to, or mitigate the effects of climate change on vulnerable populations. In this matter, the main objective of this research is **to investigate the articulation of spatial planning and climate justice and to explore coherent planning practices and approaches that embrace both sustainable development and social justice goals in the context of Ho Chi Minh City, Vietnam.**

Planning can assist communities to become more climate change-resilient on the social, ecological, and economic levels, increasing opportunities for genuinely sustainable development, improved governance, and increased security. Therefore, **how can spatial planning through the implementation of green infrastructure contribute to climate adaptation and guarantee climate justice?** And more, how does planning for climate adaptation and sustainable development answer vulnerabilities in urban design and in designing, developing, and monitoring the plan with social involvement?

Particularly considering the case of HCMC, the research intends to further respond to the following specific objectives:

1) to investigate how spatial planning can contribute to climate justice in Ho Chi Minh City. This will involve reviewing best practices in urban and landscape planning for climate adaptation and analyzing how current Ho Chi Minh City plans have been adopting them. The aim is to identify specific ways spatial planning can promote climate justice by ensuring equitable access to green spaces and participatory processes.

2) to examine at which level climate adaptation measures through the implementation of green infrastructure relate to, solve, or perpetuate vulnerabilities in Ho Chi Minh City. This will involve a review of literature on climate change impacts in the city and how the latest plans and policies are addressing these issues. This analysis will present two dimensions, in which the first will look into a broader city scale, and the second will focus on a specific portion of HCMC.

3) to better understand the conception, development, and envision of the recent Ho Chi Minh City plans concerning environmental and social justice. This will involve a review of the two latest Master Plan proposals and interviews with relevant actors. The aim is to identify the extent to which urban planning policies and practices in Ho Chi Minh City address the impacts of climate change and promote climate justice.

4) to propose recommendations for improving urban planning policies and practices in Ho Chi Minh City that address climate change and promote climate justice. The recommendations will be based on the study's findings and designed to be practical and actionable for policymakers and urban planners. The aim is to contribute to developing more equitable and sustainable urban environments in Ho Chi Minh City and other cities facing similar climate-related challenges.

1.3. STRUCTURE

This dissertation has a structure divided into seven chapters. Chapter 1 corresponds to the Introduction, where the general Framework of the theme and its importance is first presented (1.1), along with the principal and specific Objectives (1.2) and the present Structure of the text (1.3).

Chapter 2 contains the Literature Review divided into five subchapters. Subchapter 2.1. presents a general context around Climate Change Adaptation and Climate Justice. Subchapter 2.2. illuminates the discussion on how green infrastructures are present in Climate Adaptation measures and which type of infrastructures are that. Subchapter 2.3. explores how social justice and green infrastructure can integrate resilient urban systems, focusing on governance and co-design approaches. Subchapter 2.4. explores risks and strategies for Climate Adaptation in Southeast Asia, exemplifying with reference cases. Finally, the last subchapter, 2.5. presents a synthesis of the researched topics that build the base for the following section.

Following, Chapter 3 presents the Methodology used for the study. The chapter meticulously explains how the analysis supports the research objectives (3.1.). It also shows means for diverse data collection (3.2.), limitations, and contributions (3.3.).

Chapter 4 refers to the Case Study, divided into five subchapters. The first three present a background context of Vietnam (4.1.), Ho Chi Minh City (HCMC, 4.2.), HCMC East, or Thu Duc City (4.3.). These aim to expose multiple concerns regarding historical conformation, environment, economy, and social sphere within sustainable development. The following subchapter is 4.4. constitutes the methodology application, subdivided into two main approaches that compose the research: firstly, regarding the spatial analysis (4.4.1.), and secondly, regarding the interview results (4.4.2.). Lastly, subchapter 4.5. brings together a composed overview of both main approaches, highlighting important topics.

Finally, Chapter 5 corresponds to the conclusion of the dissertation, where the results are presented and related to the research objectives and main points of the literature review. This closure sews the research's principal dimensions, raising its limitations and contributions to the explored topics on Climate Justice.

The last two chapters correspond to the References (6) used for this research and Appendix (7) for complementary information.

2

LITERATURE REVIEW

This chapter contextualizes critical perspectives that are fundamental to exploring the role of spatial planning in shaping climate justice in contemporary contexts. First, exploring topics from a more conceptual approach to justice and the vital matter of green spaces, reaching practical frameworks that can assess transformation towards more resilient, inclusive, and just spatial configurations, complemented by a general understanding of the Southeast Asian climate challenges and strategies.

2.1 CONTEXT

Increased temperatures, prolonged droughts, and a thirsty atmosphere (NOAA, 2022) brought on by climate change have significantly contributed to extreme impacts on the planet's biodiversity and human life. Globally, sea levels are rising, clean water and other natural resources are running out (Descheemaeker et al., 2013), and ecosystems are under stress and impacting biodiversity. Also, land use changes are leading to increases in soil degradation and erosion, deforestation, and carbon emissions, as well as in experiencing extreme weather events such as intense heat waves and wildfire seasons.

More extensive and severe droughts are damaging freshwater resources and crop yields and degrading natural resources as the global population and urbanization increase, projected to increase by 50% by 2050, according to the United Nations (2015). As climate change is likely to worsen, problems such as air pollution, heat stress, water scarcity, biodiversity loss, and flooding will pose significant problems for cities of the future (IPCC, 2012).

A system composed of a growing population and deploying resources, such as water, arable land, and rural activities, is unsustainable. FAO emphasize that increasing food production with less water is one of the significant challenges of our time to achieve the 2030 Sustainable Development Goals (FAO, n.d.; SDG; UN, 2015). However, in a world where nearly 828 million people are hungry and waste or loss accounts for about one-third of production (FAO, n.d.), the fact is that the vast majority of these problems are due to efficiency rather than inadequacy.

This inherently exclusionary system directs aspects sought by the contemporary "progress," fueling a sensitive scenario in which vulnerability issues set the tone, notably when faced with accelerated social and environmental change, such as the global South. When an ethic of domination prevails, greed and exploitation become the norm (hooks, 2000), and a system that sustains itself via inequality is inherently broken. In other words, producers would not need to grow more food to sustainably develop and feed the world. Still, they must transform the production system and mitigate harmful environmental effects like ecosystem deterioration, nutrient loss, greenhouse gas emissions, and soil, water, and nutrient loss (FAO, n.d.).

The impacts of climate change on land use dynamics make these sensitive relationships even more threatened. Gentrification and displacement, for example, are some of the direct consequences affecting specific groups and neighborhoods. Each year, the increase in intense and frequent weather extremes forces 20 million people to relocate within their country (UNHCR, n.d.), and by 2050 these numbers are expected to add up to 216 million people in Asia, Africa, and Latin America (WB, 2021). The places where people are most vulnerable depend on context and relationships. Poverty and conflicts are among the main migrating reasons that affect rural and traditional communities, minorities (racial, gender, and age), and groups with less financial power. Of the 737 million severely impoverished people, three-quarters are impoverished rural dwellers who depend on agriculture for their livelihoods and food security (WB, 2021).

Moreover, 80% of global climate migrants are women (UN, 2022). Rural women, in particular, have a minimal share of cultivated land and historically limited access to land, resources, finance, and services. Statistics show they face violence and legal difficulties when obtaining financial support and credit (IBGE, op. cit. Mayer, 2021). At the same time, it points out the fundamental role of these people in overcoming food insecurity and preserving the country's agricultural biodiversity in line with the 2030 Agenda for Sustainable Development (UN, 2015).

Regarding sustainable development and water management in the contemporary global context, it is essential to analyze agricultural practices critically. The agricultural sector is not only the largest industry in the world but also the largest consumer of water. On average, 70-95% (in some developing countries) of water withdrawals from natural systems are used for agriculture (crop and livestock), 20% for industry, and only 10% for municipalities (Descheemaeker et al., 2013; UN, 2015). In emerging economies, particularly, the agricultural sector accounts for a significant portion of gross domestic product (GDP).

Based on this vast percentage share, it is clear that the agricultural economy is mostly running in a direction contrary to sustainable development. Most employees, particularly young people, are employed in low-wage, unstable jobs in the informal rural economy, frequently forcing them to relocate to cities with overcrowded labor markets (UN, 2015). Biodiversity, family farming, and responsible practices are far from the most important phenomena, proving there is still a long way to go.

Researchers at Cornell University (USA) were pioneers in raising worldwide awareness about the chain environmental impact caused by the use of pesticides in agricultural practices (Kovach et al., 1992). A classic example is that several countries worldwide, mainly in Europe, forbid aerial spraying. In many other "sub-developed" countries, not only is it allowed, but it is a recurrent practice in the agribusiness sector, financed and fomented by these same "developed" countries that have more strict rules for themselves. In other words, this namely progress often thrives upon associations between mega-corporations and corrupt governments, meanwhile benefiting from the lack of environmental and political coherence.

Forests, wetlands, mountains, and drylands provide clean air and water, biodiversity preservation, climate change mitigation, and other environmental advantages and services (UN, 2022). The United Nations implies that the environmental impact is so extensive that it not only affects or eliminates animals, many of which are necessary for the ecosystem to survive (such as pollinating bees, earthworms, fungi, and bacteria), but also affects soil and water (making it unsuitable for consumption) and accumulates and transports hazardous materials in rivers, lakes, beaches, and mangroves.

However, instead of trees, wildlife, protected watersheds, and delineated traditional community landscapes, our forests have become giant grazing allotments where livestock is raised (exacerbating climate change due to methane gas emissions). On the one hand, transgenic soy is grown to feed the

animals on the other. Even after centuries of colonialism, plantations - vast agricultural monocultures - are considered commodities whose value is determined by the world market and reproduced globally (Svampa, 2019). The Argentine sociologist refers to the expansion of these companies as "neo-extractivist," which concerning Latin America, leads to unprecedented land concentration, as it is "not only the most unequal region in the world but also the one with the worst land distribution due to the advance of monocultures and expropriation for the benefit of large corporations and landowners" (Svampa, 2019, p.163, op. cit. Mayer, 2021).

Climate change is primarily a moral and ethical dilemma (Nolt, 2015) created by increasing scientific knowledge that enables and creates demand for resources far beyond ecologically sustainable. The growing recognition that quick and significant change is required to solve contemporary issues leads to the notion of transformation arise in climate adaptation (Fazey et al., 2018). Transformative responses in both natural and human systems (IPCC, 2018) are an urgent challenge in the face of massive changes at an overwhelming rate. Fair judgments and actions require high-quality knowledge (Hanlon et al., 2012) and innovative methodologies that question knowledge creation and consumption and integrate it with ethics and esthetics in more refined and transparent ways (Fazey et al., 2018).

Therefore, spatial planning and urban policy have the challenging task of managing land use and the relationships derived from it - as traditional handling techniques - and integrating production and consumption systems into urban and landscape development plans. For example, land use choices can help communities and planners increase resilience (NOAA, 2022). Alternative practices can move from exploitative production models to agroecological, integrative, and regenerative management, with more responsible and sustainable practices that align with the SDGs. Promoting rights and gender equality measures and securing tenure rights in forestry, agriculture, and fisheries (UN, 2015) are also essential to reducing these inequalities. Together with the requirement for participation and knowledge sharing among different development actors, this can help countries implement and pursue these goals.

2.1.1. CLIMATE CHANGE ADAPTATION

In this context, climate change adaptation (CCA) is discussed as a dynamic framework combining several measures and application levels. The dynamic factor is crucial because it considers how a hypothetical solution may be affected, or in the case of climate change, how its frequency and intensity may be affected by relevant hazards (Calliari et al., 2019). Generally, within an adaptive management framework perspective, CCA is considered a complex phase that overlaps with, for example, *prevention* and *resilience* (Nguyen et al., 2014). These levels can complement each other and are crucial to finding gaps between knowledge, attitudes, intentions, and behaviors.

The term adaptation per se refers to adapting to existing or expected climate and its impacts (IPCC, 2018), changing existing practices or behaviors, and enabling structures of the current socio-ecological system to comply with, adapt, or embrace change (Barnes et al., 2020). In human systems, adaptation aims to reduce or avoid harm or take advantage of beneficial opportunities (IPCC, 2018). On the other hand, adaptive behavior aims to bounce back from and reduce the impacts of change. It can refer to flexibilities or changing strategies, influencing change, or even building choice capacity to decide whether or not to change (Barnes et al., 2020).

Moments of crisis - such as climate change -innovation, diversity, governance networks, leadership, and learning, often trigger or rapidly alter social-ecological conditions, leading to transformational processes (Thomalla et al., 2018). Given the urgency of the current context, the term *adaptation* is often associated with *transformation*, or it has even evolved into the term *transformative adaptation*, which refers to

changes in the fundamental properties of a system in response to climate change impacts (IPCC, 2018). Complementing this, Fazey et al. (2018) characterize transformation as a social process representing an opportunity for more desirable outcomes regarding equity, justice, long-term resilience, and sustainable development.

We adopt the IPCC's definition of resilience from to convey the capacity of social, economic, and ecological systems to respond and reorganize while retaining their essential function, identity, and structure (2018). In integrating this concept, adaptation can refer to settings that, instead of focusing on a single situation, support people's capacity to anticipate and adapt to change (Barnes et al., 2020). Resilience can bring about significant changes that transform existing social-ecological linkages and help build a new system and future.

On the one hand, researchers point out that the generation of empirical evidence to understand transformative policies (Gibson et al., 2016, op. cit. Thomalla et al., 2018) and the lack of clarity in their scientific definition (Pelling, 2014) may affect their use and inclusion in broader climate adaptation policies. However, beyond the conceptual struggle on the related terms, scholars emphasize that much of the existing work on different types of adaptation refers to hypothetical responses to potential effects instead of human reactions to change (Barnes et al., 2020). Although CCA focuses on an essential environmental situation and is related to sustainable development, the question remains: How can CCA be prioritized to support and ensure social security and inclusion?

According to Barnes et al., several linked aspects are divided into six categories—assets, flexibility, organization, learning, socio-cognitive conceptions, and agency—can influence how people respond to environmental change (2020). Nevertheless, when considering CCA as a global strategy, one finds that the relationships are highly unbalanced and that it is not easy to establish global regulations and guidelines. In this case, a systemic and holistic approach is imperative. The literature suggests urban governance demands alternative knowledge production and decision-making models, especially in developing countries.

In an ever-changing world, it is necessary to monitor the production of progress reports toward achieving SDG goals, commitments, and follow-up initiatives supporting Agenda 2030, including budgetary commitments, programs, partnerships, and investments. In this matter, the UN established the "Follow-up and Review," an assessment tool in which UN regional and global bodies analyze and evaluate UN system reports of the many involved countries at least twice in the 15-year cycle. To accomplish the goals, it is vital to enhance the private sector's accountability systems and evaluate its role in SDG implementation, particularly key transformative initiatives (FAO, n.d.). According to the organization, exchanging voluntary reviews of national experiences and reporting on the compilation and evaluation of statistical data based on the extended set of 230 SDG indicators are crucial components of the follow-up and review process. In this regard, the subchapter 2.3.3. presents more detailed assessment frameworks.

Thus, when an adaptive management framework embeds CCA measures from the planning and implementation phase, it should provide means for continuous monitoring, evaluation, and adaptation together with local communities, establishing a multidimensional approach in the present that has the power to build a safer, more resilient tomorrow.

2.1.2. CLIMATE JUSTICE

This subchapter explores concepts and behaviors related to climate, environmental, and social justice and how they interact and connect. These and other similar concepts are often seen as integral to talk of

climate change but somehow appear intangible and need more translation into objective facts. Although they fit into and speak for different knowledge and application domains, many of these justice-related themes are complementary when considering the spatial fabric, integrating a broad and complex network.

It may be appropriate to first situate the notion of social justice as one large right that spans the other two and speaks about fairness from a general perspective. According to Rawls (1971), justice depends on individuals using their abilities through fair equality of opportunity. This view, often associated with a liberal democratic political perspective, reaches its limits when it implies that persons have a normal lifespan, are fully functional, and have the resources to make equal use of their freedoms and opportunities. Sen (1992), on the one hand, distances himself from Rawls as he suggests using a capability-based approach to build a system that allows people the chance and capacity to live a quality of life. Daniels (2012), on the other hand, adds that social justice depends on social reform and that its principles must operate at multiple levels, such as individual and collective. The author argues that society must provide equal opportunity and access to public education, eliminate or limit racial or class disadvantage, and support the least advantaged. To guarantee equitable equality of opportunity for all citizens, social justice principles must rely on strengthening social institutions to ensure the provision of rights and benefits (Bhugra, 2016).

In the environmental context, justice takes on a targeted and more specific definition but still needs to be absolute. Environmental justice is the equal consideration and substantial inclusion of everyone in creating, implementing, and enforcing laws, rules, and policies that impact the environment and public health, regardless of race, color, national origin, or income level (EPA, n. d.).

Environmental justice processes call for equitable public policies in various governmental branches that ensure the right to a healthy environment for minority and low-income populations.

The authors affirm that initiatives must convert principles into actions to encourage systemic change and lessen exposure to inequities from past and present racialized policies (Van Horne et al., 2023). These policies strongly call for environmental justice by including multiple stakeholders in each step of the decision-making process to provide a tailored proposal appropriate for specific situations (2023).

While the academic literature focuses debates about climate justice on the ideal conceptions and theoretical arguments, and practical policy often encloses them within the realm of environmental nongovernmental organizations (NGOs; Schlosberg et al., 2014), we finally arrive at the concept that sews this investigation.

The adopted notion of climate justice emerges from a body of research with groups impacted by climate change that frames social justice in opposition to liberal and individualistic notions of justice (Schlosberg, 2013). From this perspective, environmental justice discourse is traced through the many values and demands of grassroots climate justice movements to current notions for equitable adaptation to climate change (Schlosberg et al., 2014). In this practical manifestation, environmental justice themes and guiding concepts are clearly and consistently expressed, say the authors (2014). However, they gain force from the significant organizational rhetoric of environmental politics and the environmental justice movement.

Community-based movements and leaders have historically pressured states and corporations to take action and invest in effective strategies to address climate change and its injustices (Gunningham, 2019). Climate justice movements are essential in popularizing the concept and spreading its principles (Climate Action, 2022), aiming to democratize the issue among the population and increase the number of supporters.

In China, nongovernmental civil society conservation organizations have established themselves as a force for land protection against degradation in urban and mainly rural areas. The term *shehui living*, literally "the power of society," refers to the nongovernmental sector and its role in ensuring the protection of the land on which they have long worked, but also in finding ways to maintain their relationships with the government and secure their intentions (Jenkins, 2022).

However, while these communities may live under local cohesion, a lack of more significant cohesion is foregrounded by self-interested individuals who function and reproduce in a particular way. According to Orr et al. (1978), this behavior is the core of the environmental crisis. By supporting or encouraging it at every level, liberal democratic institutions fail to prepare society for crisis survival.

It is unlikely that 'politics as usual' will lead to appropriate and necessary social changes (Dryzek et al., 2011 op cit. Fazey et al., 2018). Economic growth is essential for development. However, it affects society's and the environment's well-being, increases the amount of assets vulnerable to catastrophe risk, and could compound disaster losses (Noy, 2016, op cit. Thomalla et al., 2018).

According to Barnes et al. (2020), governments at all levels have invested primarily in adaptation or mitigation activities, with insufficient focus on mapping inequalities and managing investment funds to promote community improvements in the interim. As a result, few studies have been able to include representative samples of different demographic groups, for example, at the city level (Barnes et al., 2020). Also, advanced solutions successfully applied in developed countries may translate differently in developing countries due to a need for more suitable governance and awareness (Nguyen et al., 2014). Therefore, appropriate and diverse strategies must be developed to address various policy contexts (Tokar, 2013).

The Office of the High Commissioner for Human Rights (OHCHR) recommends promoting policy coherence and ensuring appropriate, adequately ambitious, non-discriminatory, and consistent human rights efforts to mitigate and adapt to climate change. To assess its proposals, the OHCHR organizes an annual panel on climate change that discusses various issues, including links to children's rights, mobility, human rights, gender justice, climate change mitigation, and the right to health (UN, 2022).

Concerning the mentioned Chinese case, multi-stakeholder engagement could fill gaps in conservation and improve the management of national parks and protected areas, integrating them into a giant mosaic of state-protected areas with greater effectiveness (Jenkins, 2022). These examples illustrate that climate justice movements and organizations are multifaceted and employ different strategies to protect vulnerable communities from climate change impacts.

This critical context requires intentional approaches to social transformation (O'Brien, 2012, op. cit. Fazey et al., 2018). Thus, achieving climate justice requires ensuring rights and emphasizing local impacts and experiences, the value of community input, and the demand for functioning autonomy in addressing vulnerabilities.

In many ways, diversity is the most important feature to emphasize, given the multitude of groups affected by climate change risks and impacts. Social justice promotes inclusive and systemic thinking, being crucial for a post-normal world (Fazey et al., 2018). Existing methods for minimizing climate vulnerability can be significantly improved by leveraging networks, fostering individual and collective learning, and meticulously examining power dynamics.

As a result, the potential solutions have numerous advantages based on accountability and social participation by exploring local knowledge. Nevertheless, it is of utmost importance that these participatory processes are not only secured but are constantly questioned, evaluated, and reviewed

based on specific parameters. A more in-depth debate on these models of co-creation and other complementary strategies is further discussed in subchapter 2.3.2.

More than ever, urban planners need climate knowledge to encourage new growth, ensure that it addresses climate change, and safeguard the most vulnerable (Arrighi et al., 2016). Studies suggest that to enhance program design and uptake, especially for vulnerable groups, investigators must systematically gather information regarding human aspects (i.e., knowledge, attitudes, intentions, and actions; Venkataramanan et al., 2020). As we have already seen, most studies have been exploratory and have applied few theoretical frameworks in social science investigation (Kellens et al., 2013, op. cit. Venkataramanan et al., 2020).

Addressing social justice issues is critical to building human capacity in a present that seeks transformation (Fazey et al., 2018). This perspective leads us to conclude that achieving climate justice through climate strategies is fundamental. It presents significant opportunities and challenges to facilitate, navigate, and shape pathways to more sustainable and equitable societal outcomes (Fazey et al., 2018).

2.2 GREEN INFRASTRUCTURE

Green infrastructures (GI) are essential for climate adaptation in spatial planning and territorial development, as they are located at the interface between the built and natural environments (Venkataramanan et al., 2020) and can potentially protect and enhance nature and natural processes. By supporting biomimicry¹ or referencing their ecosystem services, these interventions can provide several positive aspects, including enhancing human well-being and recreation, preserving fauna and flora, supplying goods, and lowering government expenses (Calliari et al., 2019). Rain gardens, green roofs, permeable pavements, bioswales, landscaped streets/alleyways, underground detention systems, and riparian buffers can be examples of different types of green infrastructure (Nature, 2017).

In addition to functioning alone, GI can operate on a variety of scales, which are determined by the discipline concerned (Felipe-Lucia et al., 2014; Tayouga et al., 2016). According to McLeroy's definition of the socio-ecological framework (1988, apud. Venkataramanan et al., 2020), four GI scales are presented and classified according to the main level of implementation.

On the **household** scale, strategies such as vertical gardens and green roofs, rain barrels, and permeable paving can optimize space by providing efficient opportunities even in urban remnant areas, especially in high urban density or abandoned buildings. At this level, strategies are also often classified as low-impact development (LID), an approach to ground development that mimics the behavior of a site before development (Ahiablame et al., 2015).

At the **neighborhood** level, street-level rain gardens and bioswales can be a great ally. Wildlife corridors, discrete linkages, and habitats that help species move through the urban landscape (Dover, 2015) facilitate seasonal migrations, promote gene flow between populations, and even protect certain species from extinction. Nonetheless, small-scale strategies can transcend individual boundaries across time and space, adding to a collective transformation (Rickards et al., 2012, op. cit. Fazey et al., 2018).

¹ A technologically oriented strategy that studies and replicates natural patterns or draws inspiration from them to address human problems (Benyus, 2002).

For example, using green roofs within a system can act as a wildlife corridor, delivering even more benefits.

On an even larger **urban** scale, GI can incorporate urban greening initiatives and be essential in addressing various challenges (Miller, 1988). Urban greening refers to planting, maintaining, and managing vegetation to provide residents with diverse environmental and social benefits. It is seen as a way to simultaneously make cities more livable and sustainable and directly affects people's health. Using GI in restored wetlands, natural or urban areas (such as parks and woodlands), or urban agriculture, urban green spaces are vital in providing ecosystem services to the environment. Supporting these initiatives also promotes local food production, reducing food miles, improving food safety, creating jobs, and increasing health benefits and socialization (Dover, 2015).

Urban **watersheds** are the last scale defined by the framework and relate primarily to strategies focused on protecting waterways and mitigating flood risk. LID Practices can be great allies to use in watersheds once they essentially employ stormwater management techniques that imitate natural hydrologic processes through on-site rainwater retention, infiltration, evaporation, and reuse, such as permeable pavement, bioretention systems, and vegetated swales (Dietz, 2007; Davis et al., 2009; Ahiablame et al., 2012, op. cit. Venkataramanan, 2020).

2.2.1. GREEN INFRASTRUCTURE IN CLIMATE ADAPTATION

Among the practices for climate adaptation, GI presents a series of benefits in flood management and risk reduction (Venkataramanan et al., 2020). The extent of implementation is fundamentally related to how GI performs, and the frequency of associated events is designed to support it. For example, in the case of disaster risk reduction (DRR) for CCA and pollution control, studies suggest that the GI used works best for high-frequency, low-intensity events (Calliari et al., 2019).

Aside from GI's many benefits and value, there may also be drawbacks or potential harms associated with its use and management. For example, the provision of related services changes due to how climate change affects ecological processes and functions' spatial and temporal arrangement (Nelson et al., 2013, op. cit. Calliari et al., 2019). Flood control structures designed according to narrow standards and estimation techniques based on insufficient data will be unable to coping severe weather exacerbated by climate change (Nguyen et al., 2014).

Venkataramanan et al. cite cases from Taiwan, Finland, and the U.S. that raise concerns about the practical effectiveness of GI in reducing stormwater runoff because it may: not yet have gained widespread acceptance or be insufficient to mitigate or cause more flooding (Cote et al., 2014; Chou, 2016; Church, 2015; Kati et al., 2016; Turner et al., 2016; Meng et al., 2017, op. cit. 2020), have effects like higher populations of mosquitoes, unappealing esthetics, raise worries about physical safety (de Sousa, 2003, op. cit. 2020), and decrease property values (Brown et al., 2016; Cote et al., 2014; Turner et al., 2016, op. cit. Venkataramanan, 2020).

Considering the living aspect of ecosystem components, it is also emphasized that these green solutions must be climate resilient to deliver expected outcomes and sustain effectiveness under future environmental and climate conditions (Calliari et al., 2019).

Investing in multi-stakeholder partnerships through a transdisciplinary approach is a meaningful way to ensure climate adaptation strategies. University research partners, for example, can subject these system models to various simulations related to climate change and enhance planning and decision-making (Arrighi, 2018).

In general, the quality of CCA measures and more sustainable public spaces depend better on integration into public policy and effective day-to-day management than on a baseline project or use of a particular infrastructure. Integrating these measures from a systems perspective can provide the means to analyze how they interact in different use scenarios and how they positively or negatively impact urban systems.

2.2.2. GI, NBS, AND ECOSYSTEM SERVICES: CONCEPTS AND APPLICATIONS

The present subchapter deepens the concepts and applications of GI and nature-based solutions as increasingly seen as an adequate practice for dealing with the challenges and many of its sensitive demands in the climate change context. Officially, the Green Infrastructure Plan (EC, 2013) defines GI as a network of strategically planned natural and semi-natural components with environmental features that are constructed and managed to offer both rural and urban areas a variety of ecosystem services.

Complementarily, ecosystem services are ecological processes, functions, or actions for protecting, sustainable management, and restoring natural or shaped ecosystems that successfully adapt to fulfill social needs while enhancing biodiversity and human wellness (Cohen-Sachman et al., 2016; IPCC, 2018). They are often categorized into four groups: (i) supporting services like biodiversity conservation, soil production, seed dispersal and pollination, nutrient storage, and cycling; (ii) supplying services like water, agricultural products, fish, textiles, or fuel; (iii) managing services like climate or carbon sequestration, microclimate regulation, flood control, noise reduction, water quality protection; and (iv) cultural services like tourism, spiritual, or esthetic appreciation (Farinha-Marques et al., 2014; IPCC, 2018). In addition, these strategies can provide other benefits at the societal level, such as recreation, promoting community cohesion, and strengthening land values (Farinha-Marques et al., 2014).

Consequently, their establishment can provide a practical plan for achieving economic sustainability (Maes et al., 2015a) and represent a possible way to reconcile the tension between socio-environmental issues and economic progress (Calliari et al., 2019).

However, given the prevailing pattern of soil sealing and land conversion (Maes et al., 2015b), Europe's ecosystem services are predicted to lose value by 0-5% by 2020 and by 10-15% by 2050 (Calliari et al., 2019). Such a decline may affect not only the current state of the landscape and the activities that depend on it but also the delivery of associated services in all four groups (Farinha-Marques et al., 2014).

As an integrating part of GI, nature-based solutions (NbS) are often considered innovative tools that follow an increasing trend toward transdisciplinary approaches (Lang et al., 2012). NbS practices focus on using nature to solve societal problems and promote people's and biodiversity's well-being. NbS manifests at several complementary levels: function, esthetics, health, safety, recreation, conservation, and culture (Venkataramanan et al., 2020).

Overall, the rising academic literature views NbS as a conceptual framework for other recognized ecosystem-based methods such as ecosystem-based adaptation (EbA), ecosystem-based mitigation (EbM), ecological disaster risk reduction (Eco-DRR; Nature, 2017), and others. It is still being determined if there is a fundamental difference between these terminologies. However, the requirement for precise standards for identifying NbS runs the risk of making them appear subjective and technically unfeasible (Albert et al., 2017, op. cit. Calliari et al., 2019).

On the one hand and related to the innovative perspective, the term "solutions" suggests a problem-centered approach and reinforces the benefits of managing environmental assets from an anthropocentric perspective (Potschin et al., 2016; Nesshöver et al., 2017). On the other hand, traditional communities

and farmers have been employing NbS for centuries without referring to them as such (Keesstra et al., 2018).

Since the notion of NbS is still up for discussion, it could prove better to establish a more social understanding of NbS built by relevant information and awareness generation instead of creating more specific definitions (Nesshöver et al., 2017; Venkataramanan et al., 2020). In this present topic, as for the whole dissertation, the terms GI and NbS are often applied as synonyms regarding the choice of focusing on their application, feasibility, benefits, and co-benefits instead of their idiosyncratic definitions.

NbS and GI are becoming more prevalent in the new policy due to several positive factors, attitudes, and values related to them. This ability conveys the well-known multifunctional qualities of NbS, which can simultaneously deliver environmental and socio-economic benefits (Boeraeve et al., 2014), besides several other co-benefits. Once the multifunctionality aspect is accounted for and situates the NbS application within a consistent evaluation framework, "working with nature" frequently produces beneficial results, proving that it can compete with traditional gray interventions (Calliari et al., 2019, p. 1).

The adopted NbS definition is accompanied by an assessment methodology to assess multifunctionalities, affordability, and collaboration of science-based knowledge through the participation of several stakeholders (EC, 2015). The framework highlights the direct benefits NbS provides and captures the variety of co-benefits and adverse outcomes they may have on challenging issues (Calliari et al., 2019).

In other words, it is required to break down the foreseen effects of direct and indirect environmental, social, and economic benefits and costs to provide a comprehensive basis for assessing and selecting alternatives (Calliari et al., 2019).

Despite its adaptive capacity over external influences (Ison, 2016), applying NbS is far from spontaneous or effortless. Especially considering the spatial condition of the urban environment in which land is a disputed and rare resource in many contexts.

Implementing NbS is a continuous work to be done and evaluated, especially considering the dynamic and holistic aspect of their environmental and social behavior. It fundamentally requires to be designed and supported by a substantial methodology, such as multi-criteria (MCA) and cost-benefit analysis (CBA).

The temporal scale is crucial. NbS are dynamic approaches and therefore need constant monitoring and evaluation of the delivered outputs and necessary adjustments once they may take years to be completed or reach their full potential. Also, their effectiveness might vary depending on external influences on the ecosystem's living elements after their development rate and maturity stage can significantly affect its effectiveness (Calliari et al., 2019). Other limitations rely on the broad yet superficial popularization of NbS as representative of a subjective concept that is hard to acknowledge. Those aspects justify the need to assess and implement GI and NbS from a broad stakeholder perspective, thus requiring a joint process with multiple actors to co-design solutions (Hajer, 2005).

Still, the literature's extensive geographic bias in GI initiatives reveals a massive disparity in representing distinct groups, meaning that the desired stakeholder involvement still needs to be improved (Venkataramanan et al., 2020). It may strongly limit their application if these approaches are situated on a limited, more private, and individual stakeholder process. About this, Kocisky (2016) brings the term "Willingness to pay" (WTP) related to the general economic distrust when dealing with

NbS implementation. A possible way to deal with this can be fomenting public policies involving many actors at different levels and proposing partnerships with the private sector.

Considering the exposed contemporary limitations of both temporal and spatial limitations, it may appear suitable to use hybrid interventions that mix traditional and NbS techniques, especially in urban settings (Depietri et al., 2017). Some examples of interventions that can integrate Flood Risk Reduction (FRR) strategies are concrete retention walls (traditional), willow spiling and renaturing riverbanks (NbS), and concrete blocks with vegetation (hybrid; Calliari et al.2019).



Fig. 1 - Examples of NbS²

2.3. GI AND CLIMATE JUSTICE TO BUILD RESILIENT URBAN SYSTEMS

This subchapter explores how green infrastructures relate to the social fabric as an integral part of systemic initiatives, not attempting to evaluate the effectiveness of NbS in the context of climate adaptation but to relate with justice issues. It explores how climate justice can be linked to providing green infrastructure, how GI influences climate justice or injustice, and which practices are adequate for addressing these challenges.

² From up to down: riparian buffer (Land Studies, n.d.); wetland with cleansing biotope and underground detention systems (Portland, USA; Ramboll, 2010); and willow spiling (Gloucester, UK; JPR Environmental, n.d.).

NbS may work for individual locations but will not necessarily deliver connected services (Andersson et al., 2017; WB, 2017). As living systems, ecosystems change over time through either as a result of natural processes or external effects (Calliari et al., 2019). Therefore, investments in extensive and detailed planning processes are needed to create a "green network" composed of diverse infrastructure elements, strategies, and actions at different scales.

Social-ecological systems (SES) study ecosystem components dynamic interactions, defining them as *complex adaptive systems* that integrate the human and natural environment (McMillan et al., 2021, p. 171). Coupling SES and NbS can be a good practice for building positive, connected, and resilient urban systems in which benefits, co-benefits, transdisciplinarity, and multidimensionality are delivered simultaneously.

According to urban resilience principles, cities are multifaceted systems with several institutional, technical, and ecological subsystems (McMillan et al., 2021). In light of this holistic perspective, NbS and ecosystem services offer many possible advantages for the environment, biodiversity, society, CCA and CCM.

Global warming and sea level rise (SLR) are causing more climate-related disasters in contemporary times, which endangers the delivery of essential services, human safety, and governance stability (CIGI, 2009, op. cit. Arrighi et al., 2018). These conditions frequently lack the financial means or political influence to pressure the national government for improvements.

The result is models of extreme inequality that emerge (Venkataramanan et al., 2020), with many of the population living with low incomes and quality of life. These deprived communities often live in areas characterized by high climate risks, such as the risk of flooding. Moreover, the conditions of the traditional infrastructures are generally more deteriorated (Dunn, 2010; Miller, 2014, op. cit. 2020). At the same time, the authors point out studies where populations with higher incomes live in areas with greater use of green infrastructure (Brehm et al., 2013; Newburn et al., 2016, op. cit. 2020). Thus, wealthier, more privileged community residents frequently have the means to deal with flooding and can bounce back faster than other groups.

GI influences land value, and although their presence or application is often associated with making places greener, this complex and integrated configuration is not necessarily sustainable.

For applications of GI and NbS systems to be considered holistic instead of traditional technical approaches (Calliari et al., 2019), they must simultaneously provide additional economic, environmental, and social benefits (Kabisch et al., 2016; Albert et al., 2017). These initiatives can improve the system's overall resilience when integrated with other measures from a broader and more complex perspective (Calliari et al., 2019). Achieving widespread acceptance requires more than the technical effectiveness of the GI once the focus of many projects still reveals a need for more understanding of the human aspects of socio-ecological-technical systems (Venkataramanan et al., 2020). Integrated land use planning must be evaluated and guided to encourage sustainable urban growth and protect current investments (Nguyen, 2014).

2.3.1. GOVERNANCE FOR TRANSFORMATION

Current knowledge production systems often comprise elite-perpetuated disciplinary silos that contribute to ongoing and enduring global inequality (Kl  y et al., 2015, op. cit. Fazey et al., 2018). From the conceptual phase to the consultation, implementation, and beyond, the types of injustice can be diverse. Better equitable outcomes may result from challenging unfair power dynamics,

supporting vulnerable groups, and allocating the advantages and disadvantages of urban development (Folke et al., 2005; Lebel et al., 2006).

Facilitating change requires considering how social, environmental, and economic theories can support just, adaptable, flexible, and participatory governance structures that support multiple stakeholders in decision-making processes (Fazey et al., 2018). More specifically, it also refers to where the input for transformation comes from; for whom it is intended and provided; what are the mechanisms by which change is designed and implemented; how change is implemented and perceived at the everyday level of society; and what are the possible perceptions of winners and losers (2018).

Therefore, what might these more inclusive and equitable forms of governance look like, especially given the urgency of the current climate challenges? How might governance be more inclusive and institutionalized from the perspective of a green infrastructure system? How might non-governmental actors participate in spatial planning in line with climate justice initiatives?

Participatory and transformative research is fundamental to giving visibility and battling knowledge production systems that historically colonized and oppressed communities (McMillan et al., 2021). According to the authors, knowledge should enable awareness and engagement about everyday risks and create opportunities for producing and employing structures to improve policy (2021).

Moreover, framing these issues with a diverse human agency based on civic knowledge and creative expression can have great transformative potential (Fazey et al., 2018). Society should frame science in ethical and esthetic terms in a world that strives for transformation, not vice versa (Healy, 2011, op. cit. Fazey et al., 2018).

The concept of reflexivity, one of the six attributes of Resilient Urban Systems³ (Arup, 2014), is an essential aspect of adaptive management where cause and effect form a feedback loop to change the system. As societies, self-adaptive systems are inherently reflexive and can cope with unplanned changes in complex scenarios. Regarding climate change, the most vulnerable must be able to cope with these changes safely (Barnes et al., 2020). Reflexive decision-making in a social system can change the underlying values that led to those decisions (IPCC, 2018).

Thus, it is necessary to consider the social, environmental, and technological spheres when the system attempts to envision and comprehend change (Markard et al., 2012, op. cit. Fazey et al., 2018), and it is essential to prioritize the social sphere through transformative knowledge production (Eakin et al., 2017; Thorne et al., 2018).

2.3.2. CO-DESIGN FOR URBAN RESILIENCE

This subchapter discusses how collaborative processes can occur at all stages and how investing in knowledge can engage policymakers and civil society (Bulkeley et al., 2013, op. cit. McMillan et al., 2021). These aspects can provide equitable and effective ways to respond to climate challenges and ensure project effectiveness and sustainability for years to come. To this end, it is ideal that *co-design*, *co-exploration*, and *co-production* (Arrighi et al., 2018) guide the planning process to create meaningful connections and build trust. Regarding the latter, Knowles (1970) emphasizes the importance of creating a trusting environment where the mutual expectations of different stakeholders are clear and foster collaboration (Arrighi et al., 2018).

³ The six attributes of Resilient Urban Systems are Reflexivity, Inclusion, Resourcefulness, Redundancy, Robustness, and Flexibility (Arup, 2014).

First, the viewpoint would change to **co-designing** GI instead of proposing it to a community. Co-design has the potential to establish representative engagement, help cities, regional, and national actors build multi-level governance and institutional capacity, forge partnerships, systematically collect data with communities, and improve the sense of responsibility and ability to comply with and preserve GI (Dolowitz et al., 2012; Simons, 2017). As a result, co-design can promote a holistic multi-stakeholder approach to address urban resilience and develop more coherent and inclusive policies that potentially contribute to genuinely sustainable GI programs (Green et al., 2012; Loos et al., 2016, op. cit. Venkataramanan et al., 2020).

Given the complexity of the issues involved, a primary moment of **collaborative exploration** should include transdisciplinary approaches (Calliari et al., 2019) and engage a large, representative group of stakeholders (Wangel, 2011). Collaboration through cross-sector partnerships can join various actors, such as climate science researchers, local and federal governments, civil society, development agencies, businesses, nongovernmental organizations, social movements, and others, to examine climate policymaking from their perspectives. Moreover, adopting horizontal planning strategies and seeking connections to other fields can overcome already-established organizational silos (Lowe et al., 2018) and encourages active engagement to gain community buy-in at the highest possible level (Arrighi et al., 2018).

Complementary to this, social dialogue through **co-production** may be the most appropriate institutional support for social innovation, supporting the transition from a top-down to a participative and group management approach (EC, 2018, op. cit. Calliari et al., 2019). Co-production is about adding other sources of expertise to the well-known 'elite' scientific knowledge production, as practitioner knowledge is essential for comprehending complex urban dynamics (Gibbons et al., 1994; Bruckmeier et al., 2008). This diverse examination of complex problems can develop customized, practical, and innovative solutions that break the established notion of science-society interplay (Nowotny et al., 2001).

In global environmental change, community stakeholders are more familiar with their setting than scholars or experts outside the targeted context. It is crucial to passively listen to what is being said, to be humble, and to make sure that the information being spread is pertinent to the desires and necessities of the local community (Arrighi et al., 2018).

According to Hajer (2005), social processes, including mistakes, are valuable experiences and form the basis for social learning processes. Therefore, the goal of these initiatives should not be merely to propose incremental improvements or focus on problem-solving (Polk, 2015; Klein, 2013) but to promote transformative social change, capture the perspectives of diverse stakeholders (Venkataramanan et al., 2020), and challenge notions about complicated issues with a lasting time frame for decision-making (Calliari et al., 2019). Approximating a community leads to understanding if they are not participating in an initiative due to insufficient information, no sense of ownership, or another material limitation. It also can turn problems into potentials and make insightful contributions to maximizing individual and collective learning.

Traditional and indigenous populations, for example, tend to maintain a solid intangible relationship with the inhabited land through historical appreciation and resistance. This plurality has the power to value its identity and fight against historical erasure by strengthening the territory's resilience. In a study on a tropical fishing community, Barnes et al. (2020) imply that knowledge developed through interpersonal interactions with associated resources can enable people to internalize ecological feedback that catalyzes transformative action in response to environmental change. In another example by Venkataramanan et al. (2020), participatory research was conducted with communities to build a closer

relationship and better understand the reasons why they favor polished esthetics over native flora or their queries about their role in preserving the GI.

Intergenerational initiatives that bring youth together with elders can also be positive if a holistic approach is taken. They help address inadequate social support and lack of connectedness between generations (Newman et al., 1997).

For example, when co-producing with children, one should use imagination to illuminate techniques and eventful findings and explore the issues from a speculative and philosophical approach. On the other hand, adult education is more focused on solving problems than investigating content, as adults are particularly interested in learning about topics that directly impact and affect their lives (Arrighi et al., 2018). Adults are attracted to learning experiences that focus on change (Adult Education Centre, 2005) and therefore needs to be involved in planning and assessment (Arrighi et al., 2018). Elderly groups also respond well to clear, objective activities with delineated tasks that produce quick results. They are often very optimistic about learning processes involving intergenerational groups, namely children and students (Kato, 2009). They must be seen as producers to feel desired and valuable and enhance their self-esteem.

Differences and opportunities are critical when addressing individual, municipal, and non-municipal stakeholders, especially when considering their power relationships (Arrighi et al., 2018). To this end, the authors recommend establishing and maintaining an advocate or anchor for the participatory initiative, preferably a high-level delegation. Targeted campaigns in the form of community meetings can be a way to reach stakeholders and address the missing aspects of social participation and a sense of belonging (Venkataramanan et al., 2020). However, when bringing together municipal officials who receive an abundance of correspondence daily, it is essential to establish an eye-catching project identity that captures its character (Arrighi et al., 2018). Another example is the format of meetings, where large workshops among different stakeholders are most beneficial to raise awareness, engage, and gather different points of view. Minor, targeted meetings with essential stakeholders provide better results in enabling action and implementation (Arrighi et al., 2018).

In other words, the range of stakeholders and involvement might vary greatly, ranging from passive positions to direct connections with decision-makers (Calliari et al., 2019). In this context, assessing frameworks can support a project better, guide its requests, and obtain stakeholder responses.

2.3.3. REFERENCE FRAMEWORKS

Common scenarios of hazards ask for envisioning and actively generating and mobilizing various types of knowledge (McMillan et al., 2021). Transdisciplinarity represents a crucial epistemological shift to the complexity of contemporary society (Austin et al., 2008). This feature can operationalize theoretical knowledge on transformative planning (Thomalla et al., 2018) by including multi-scale and cross-sectoral opportunities. In conjunction with backcasting, it helps establish a baseline that reflects projection under the status quo and a set of longer-term visions for a desirable future (Soria-Lara et al., 2017, op. cit. Calliari et al., 2019).

Next, we present three examples of frameworks (A, B, C) that systematize sharing knowledge production experiences in complex urban systems.

A. The 'City Learning Lab' is an approach by Arrighi et al. (2018, p. 9) designed to facilitate multidisciplinary problem-solving in five cities in Southern Africa. It is based on a four-step framework developed to record related funding, direct benefits, and co-benefits.

- 1) "Scoping" objective(s) and sub-objectives aiming for an ideal solution. By applying an integrated assessment approach, this setting can provide a 'model solution' and allow opportunities to be identified and leveraged and avoid side effects.
- 2) "Planning and Engagement involves close collaboration with local partners and points to important questions:
 - "How can different stakeholders be encouraged to attend?"
 - "What specific resources would be useful?"
 - "What is an appropriate time frame and venue?"
 - "Have all relevant stakeholders been invited?"
 - "Can some baseline information be presented?"
 - "Is the planned process appropriate and engaging?"
- 3) "City Learning Lab itself."
- 4) "Closure."

B. Below, Fazey et al. (2018, p. 202) highlight some critical features of adequate methods for monitoring and evaluating (M&E) transformation:

- "Continuous M&E cycles are embedded in and part of the change process;
- Identification of triggers and thresholds;
- Long-term vision and outlook;
- Multi-level M&E;
- Identification of behavioral and institutional barriers and enabling conditions;
- Examining the extent of change (attitudinal surveys, resource allocation, horizontal and vertical collaboration);
- Mainstreaming monitoring and learning;
- Participatory approaches that support shared learning;
- Appropriate methods for rapid iteration and supporting innovation;
- Ability to examine outcomes of long-term measures;
- Process and outcome indicators;
- Quantitative and qualitative framework;
- M&E as a tool for learning and improvement, not just a mechanism for reporting and record keeping;
- Effective knowledge sharing and co-production of knowledge;
- Innovative data sources and mechanisms (e.g., open-access data and tools)".

C. The Theory of Change (ToC) is a framework for creating, carrying out, and assessing social impact initiatives. The ToC assists researchers in engaging, producing, and mobilizing transformative knowledge by providing a map of pertinent actors, systems, and processes. Vogel asserts that using a theory of change approach can "*create a strong organizing framework to improve program design, implementation, evaluation, and learning*" (Vogel, 2012, p. 5, op. cit. McMillan et al., 2021).

Despite their eventual specific contexts, all frameworks contain relevant lessons about sharing experiences in knowledge production related to climate adaptation and, therefore, can be used as a reference for other projects with similar concerns.

2.4. CLIMATE ADAPTATION IN SOUTHEAST ASIA

This subchapter overviews Southeast Asia's climate adaptation and mitigation context. This understanding aims to assess the case study regarding significant risks and strategies, especially GI and

NbS. For this, the discussion will examine how cities such as Manila (Philippines), Ninh Binh (Vietnam), Bangkok, Khon Kaen (Thailand), and Singapore relate these approaches to social issues.



Fig. 2 - Map of the geographic location of Southeast Asia cases

Southeast Asia is a geographical area of 11 countries and many island states where most people live in coastal capitals. It is biologically diverse and hosts many endemic species in marine and terrestrial ecosystems, making the region a global biodiversity hotspot (Sodhi et al., 2010).

In addition to being a densely populated region, Southeast Asia is highly diverse in culture and ethnicity. It has the fastest urbanization in the world, with a nearly six-fold increase in population between 1900 and 2000, especially in the last two decades (Schneider et al., 2015). According to projections, the urban population will expand to nearly 66% (500 million) by 2050 from roughly 15% (27 million people) in the 1950s (Estoque et al., 2015; UN, 2012).

These dramatically growing urbanization and economic development led to severe impacts on the region's biodiversity, both terrestrial (Sodhi et al., 2004) and marine (Chou, 2014), and local conflicts (UNDP, 2012), in which natural and built environment, economy, historical and cultural identity.

At the same time, climate change is evolving faster than predicted, with severe impacts on SLR that are particularly relevant to the tropics (McGranahan et al., 2007). The tropical climate of hot weather, the intense rainy season (monsoon), and the abundant water in coastlines, deltas, and floodplains have increased the vulnerability of previously ecologically vulnerable areas (Tanner et al., 2009; Un-Habitat, 2012). Moreover, evidence suggests that climate change disproportionately impacts low-income individuals (Hijioka et al., 2014).

SLR, frequent intense rainfall events, increase in flood intensity, and loss of the surrounding environment from landfill sites integrate a unique context of impacts on these low-lying delta cities (Hunt et al., 2011; Wong et al., 2014). Coastal cities have a limited configuration and face significant factors that affect their expansion in limited directions, posing a noteworthy difference between urban expansion in major cities in Southeast Asia and other regions around the globe (Xu et al., 2019). Therefore, understanding Southeast Asian megacities' urban growth is fundamental for the region's land use planning and sustainable development (Kontgis et al., 2014).

In general, the Southeast Asian urban development process has started with diffusion, a dispersive dynamic where emergent urban patches spread out of an initial urban core, characterizing an outlying growth pattern that results in sprawl development (Estoque et al., 2015). With the developing of the urban environment, the expansion underwent and progressed into the period of coalescence, which may cause an infilling growth trend. In coalescence, the various urban areas unite or evolve into one form (Dietzel et al., 2005). Considering this, the phenomenon of Megacities, defined as urban centers in metropolitan regions with more than ten million people, arose in the Southeast Asian region (Kennedy et al., 2015; Sengupta et al., 2018, op. cit. Xu et al., 2019).

Although having the common ground of rapid and intense urban expansion and the coastal location, other specific natural conditions led these urban centers to grow in a specific way and display a variety of urban forms (Xu et al., 2019). Urban sprawl has been addressed in some areas by promoting infill development, which coordinates the efficient use of already-existing urban infrastructure (Brooks et al., 2011; McConnell et al., 2011, op. cit. Estoque et al., 2015). This development can be observed in Bangkok (Thailand), and Manila (Philippines), coastal capitals where urban land densities gradual decline from the city's center to the suburbs.

New urbanism and the so-called smart growth are noted for maximizing the advantages of infill development, including fostering walkable neighborhoods and avoiding the unforeseen expenses of urban sprawl (McConnell et al., 2011). Nevertheless, infill growth has many potential disadvantages, including social and environmental vulnerabilities, elevated traffic and pollution, overcrowded amenities, and a lack of green spaces (Evans, 2004; Houck, 2010; McConnell et al., 2011, op. cit. Estoque et al., 2015). The authors emphasize how this damages the urban environment and essential ecosystem services necessary for human and environmental livability (2015).

Governments in Southeast Asia have struggled to build resilience to climate change and, particularly, to manage natural disasters due to lacking coordination and M&E, rigidity, insufficient transparency, corruption, and governance by well-connected elites (Manuta et al., 2006; Dasgupta et al., 2007; Lebel et al., 2011). According to critics, resilience programs are highly technical and primarily concentrate on preparing urban infrastructure for climate change (Ziervogel et al., 2017, op. cit. McMillan et al., 2021). Such approaches risk preserving the status quo by omitting how urban planning and development systematically exclude specific social groups despite the effects of climate change (MacKinnon et al., 2012; Welsh, 2014; Peyroux, 2015, op. cit. McMillan et al., 2021).

When it comes to defending vulnerable populations, resilience strategies that do not address inequality are, at best, unproductive; at worst, they exacerbate it by transferring responsibility to the most vulnerable citizens who lack the necessary coping mechanisms (MacKinnon et al., 2012, op. cit. McMillan et al., 2021). Moreover, given the ethnic and class diversity of the urban areas, McMillan et al. point out the "*persistently problematic distances between stakeholders*" (Turnbull et al., 2019, op. cit., 2021, p. 173) and the consequent disadvantaged groups' exclusion from governing processes.

2.4.1. SOUTHEAST ASIA CASES

Metro Manila⁴ which is now in the coalescence phase, has significant obstacles to the remaining urban open spaces, including priceless green areas that risk being developed into built-up territory for future urban development (Estoque et al., 2015). Although the nation's principal metropolitan hub has many long-term development plans for growth, Metro Manila still needs to improve urban planning implementation as these plans frequently deviate from the city's initial concept (Muijzenberg, 2005). According to Alvair et al. (2022), this difference is commonly caused by the competing interests of different actors of metropolitan governance, such as the state, the market, local landowners, and private institutions. As a result of these tensions, Metro Manila's shape is fragmented based on class inequalities and growing conflicts that spatially manifest as gated communities and enclaves that coexist with slums and shantytowns. Housing and mobility are other fields deeply affected by this fragmented urban form, severely impacting how areas are run and controlled (Garrido, 2019, op. cit. Alvair et al., 2022).

As a response, in 2011, the Regional Development Council in the National Capital Region (RDC-NCR) established a strategic planning process and created the Metro Manila Greenprint 2030, a long-term strategy part of the regional development framework for Metro and Mega Manila⁵. The Metro Manila Greenprint of 2030 is a planning process led by the Metropolitan Manila Development Authority (MMDA) that aims to improve livelihood opportunities for the metropolis growing population and make the area more competitive, resilient, and inclusive (MMDA, 2014). The plan works as an economic force and sustainable initiative to develop the area into a "green metropolis" meanwhile supporting social aspects of quality of living (safety, mobility, work, education, and leisure) and sustaining economic competitiveness (MMDA, 2014). Manila is intended to host five growth centers that will be developed and geographically dispersed from north to south: three in Mega Manila, one in the north, and another in the south. These hubs will use basic infrastructure, provide green systems, and cluster economic activity (JICA and NEDA, 2014).

The case of Ninh Binh, Vietnam, demonstrates how "green growth" initiatives might have trade-offs that threaten citizen security while potentially increasing the resilience of the metropolitan system. The city, roughly 100 kilometers from Hanoi and in the southern Red River Delta, is expected to become a top green tourism destination by 2030 and reach level 1 metropolitan status by 2050 (Hoang et al., 2019). In the Trang An Landscape Complex, a UNESCO World Heritage Site, researchers investigated how the development of the tourism complex caused the region to urbanize quickly, changing landscapes and ways of life (Nguyen Ngoc et al., 2018, op. cit. McMillan et al., 2021). There, a private tourism firm was given the rights to exploit the common land, which had previously been used for agricultural on 90% of the commune's area (Hoang et al., 2019). On the one hand, researchers discovered that ecotourism increased earnings and benefited climate resilience. On the other hand, they observed that urbanization was fostering new insecurity and changing neighborhood power structures that jeopardized locals' livelihood.

Bangkok, a major global city in Southeast Asia and the largest in Thailand, has also been working on spatial planning over sustainable development and adopting climate change adaptation and mitigation

⁴ Metro Manila, or the National Capital Region (NCR) is one of the three official metropolitan regions of the nation, according to the National Development Authority (NEDA), and includes Quezon City and Makati Central Business District.

⁵ Mega Manila is a megalopolis on the Philippine island of Luzon, typically interpreted to include the administrative regions of Central Luzon, Calabarzon, and Metro Manila.

strategies. Especially after 2011, when massive large-scale floods historically recorded economic and social damages, the area was revealed to be extremely vulnerable to hazards possibly induced by climate change.

As in other locations, economic and social activities - namely heavy traffic - have caused significant congestion and large greenhouse gas emission over the decades, resulting in air pollution and rising respiratory diseases among urban residents. Moreover, the air quality is also seriously affected by the odor and smoke produced by incomplete cremated remains in crematoria, an exclusive issue of the city (The Cities Alliance, 2007). Public health issues seem to be at the core of many of Bangkok's contemporary concerns, representing a frequently mentioned part in the Plans and Agendas to battle drug use, slum expansion, poverty, and HIV/AIDS (The Cities Alliance, 2007). Aligned with that, other measures that seek to tackle pollution-related challenges have been recently adopted, such as the Energy Efficiency Development Plan 2011-2030, the National Plan on Climate Change, and the Nationally Appropriate Mitigation Actions (NAMAs)

Regarding urban GI, the Bangkok Metropolitan Administration (BMA) developed the Green Areas Master Plan to promote public green spaces by undertaking multi-stakeholder involvement (The Cities Alliance, 2007; C40, 2020). Vacant public spaces, regions beneath freeways, gaps between buildings, sidewalks, and property adjacent to canals are some examples. Moreover, the plan encourages citizens to plant trees in front yards (The Cities Alliance, 2007).

On 15 December 2019, the BMA and other stakeholders proposed the Green Bangkok 2030 Project aiming to deliver environmental, health, and social benefits. The steering committee, integrated by the government, business, civil society, and academic institutions, began collaboratively implementing and monitoring the project. The BMA will focus on enhancing the green area by offering and expanding the five new green areas in Bangkok and will develop the supplied lands as public green spaces for the city in the future (C40, 2020). Between 2021 and 2022, 11 pilot projects started to be developed. Official land acceptance is underway as many SMEs and LEs in the private sector are interested in committing their lands to the initiative. (C40, 2020).

Further from the coast, the Thai city of Khon Kaen is also endangered by flooding, peri-urban livelihoods, access to water, and informal settlements. Research through qualitative interviews with residents about the flooding frequency showed a significant difference compared to other records, opening the question of how reliable the census and available data can be. In this case, the actor-oriented livelihood approaches became a fundamental element when coping with flooding and local livelihoods (Beringer et al., 2018, op. cit. McMillan et al., 2021).

Singapore has also been developing an integrated vision to become a global cultural capital (Kumar, 2020) and a "city in nature" (ULI, 2023), both to state its relevance among the finest contemporary high-tech urban centers, but also to cope with climate adaptation strategies. The Jurong Lake Gardens were intended to be the first national gardens outside the city core and were inspired by thousands of city-state residents' thoughts. Using nature-based solutions and delivering a wide range of ecosystem services, The lakeside park brings back the area's native freshwater swamp forest, which can improve biodiversity and climate resilience while re-engaging visitors with the island's diverse flora and fauna. It also expands recreational opportunities. On the other hand, the state has long avoided becoming an artificial tourism commodity inaccessible to locals.

In Singapore, as in other urban contexts, these intricate systems can be simultaneously innovative and promote a lack of sense of belonging and community attachment, facing moral and aesthetic obstacles (Kumar, 2020). The balance between technology and nature represents a complex condition with no

pre-made solutions that should address the processes and institutions which trigger climate vulnerability rather than relying solely on technocratic and superficial responses (McMillan et al., 2021).

One possible solution that has been developed is the urban development into mixed clusters that behaves as a transition between old-new and aim to compensate for excesses, in which too much heritage could provide a "living museum," or memorialized space atmosphere, or too much creative culture could lead to the formation of tourist hubs (Kumar, 2020, p. 14). Above all, these processes highlight how cultural values and morality can shape and mediate urban space production and how agents, groups, and institutions can manage tensions and develop new urban development strategies (Kumar, 2020).

2.4.2. LESSONS AND RECOMMENDATIONS

The cited cases illustrate that concern for livelihood support, the capability to engage in governance, and hazard mitigation are necessary for climate resilience. At the same time, climate-related damages affect the direct area and many others, and even the whole world. Therefore, a holistic view of how numerous parameters relate socially and culturally enrich the bigger picture.

Detailed adaptation planning (ADB, 2010) and land use decisions are critical to a resilient planning process because they can minimize risks before extreme events occur (Monthei, 2023). Communities can co-develop and install infrastructure on the ground to help contain or redirect hazards and identify and improve emergency actions. On a policy level, they can take action to restrict or forbid development in vulnerable areas (Monthei, 2023).

Understanding the consequences for urban coastal systems requires the integration of transdisciplinary techniques (Xu et al., 2016; Scussolini, 2017), and the climate change effects must be considered in the development strategies of all industries and areas through adaptation and guidance (ADB, 2010). Such a transformative approach to urban and climate resilience requires digging deeper into spatial conformation specificities and how they relate to contemporary sustainable development. It also demands better urban climate solutions that take low-income and vulnerable populations' concerns into account.

Therefore, combining systems thinking and political ecology with a closer look at localized vulnerability is one vital lesson from much of the knowledge production work. On the one hand, localized vulnerability analyses show how differential entitlements influence people's ability to absorb and react to shocks, focusing solely on local issues.

Combining the macroscope from a worldwide approach (i.e., the whole city) and microscopes from a localized approach (i.e., urban patches) can lead to comprehensively understanding and quantifying urban expansion (Zeng et al., 2014; Zeng et al., 2015, op. cit. Xu et al., 2019) as to estimate better future urban land use changes (Batty, 2008; Liu et al., 2017). A possible example is to couple *top-down* macro patterns and *bottom-up* micro dynamics to assess transformation rules and enhance the prediction of how a neighborhood can behave in future land uses (Lagarias, 2012; Liu et al., 2013; Xu et al., 2016b; Xu et al., 2019). As an example, scenario planning is a strategy that can engage and assist communities in identifying and planning for a range of possible futures (Monthei, 2023).

In light of climate change, urban expansion conditions must be verified from various perspectives to develop land use policies for spatial planning toward sustainable urbanization (Estoque et al., 2015; Xu et al., 2019). On the ground, communities can co-develop and install infrastructure and ecosystem services reaching multiple scales. Local and regional officials can map hazards to help determine when and where to act, develop pre-disaster plans, and proactively fund projects, such as infrastructure

upgrades. Furthermore, if these actions are taken, they must be measured, designed and coordinated in light of climate change.

The operational framework for thorough planning and adaptation actions in each sector and location should be provided through a comprehensive adaptation plan. Guaranteeing the efficient implementation of these and other plans and their multiple parameters configures an ultimate challenge (Estoque et al., 2015).

2.5. SYNTHESIS

This subchapter presents a closure systematization of crucial points of the literature review, with the main lessons and insights about the benefits, risks, and challenges of achieving climate justice.

Considering the climate-related issues, three main topics are highlighted: the climate change context, which requires adequate climate adaptation measures, and achieving climate justice as a final objective for reaching more sustainable and resilient outcomes.

Given the climate change context, transformative responses are needed in natural systems, shifting from exploitative production systems to alternative, agroecological, integrative, and regenerative management with responsible and sustainable practices, but also in human systems, dealing with vulnerability by promoting and securing rights and gender equality measures.

Dynamic frameworks are necessary to promote positive climate adaptation practices in existing behaviors, allowing the architecture of social-ecological systems to take in, accept, or absorb change and to create a transforming and resilient environment. For this reason, efforts should be made to increase knowledge, but mainly in developing new approaches that question how knowledge is produced and applied.

Climate justice can be seen as an evolution of social and environmental justice concepts within the climate change context, in which inclusive and systemic thinking embraces multiple aspects of diversity. Social transformation is therefore needed and can be achieved with more coherent policies and social engagement through participatory processes and the exploration of local knowledge.

When aiming for more resilient urban systems in climate adaptation, GI/NbS are often mentioned as best practices showing positive results; however, its presence highly influences the land value and may also distance it from sustainability. To be prepared for potential negative consequences and ensure climate adaptation strategies, it is required to more intensively gather information on the human aspects of GI (such as knowledge, attitudes, intentions, and behaviors) and invest in multi-stakeholder partnerships through a transdisciplinary approach.

Specifically, diverse human agency and creative expressions based on civic knowledge may provide great transformative potential in governance and social justice. Through co-design, co-exploration, and co-production, many benefits such as representativity, sense of ownership, and trust building can be achieved, especially by monitoring and evaluating multi-stakeholder and intergenerational processes that aim to deconstruct pre-established top-down models.

To contextualize the previous approaches and strategies in complex city systems, we complementary bring the methodology presented by Tyler et al. (2012) that analyzes the systems, classifies them into three broad groups, and describes the information they contain in addition to how it is transmitted.

1. The first category consists of the physical (constructed and natural) environment, including buildings, parks, water resources, mobility, and infrastructure in which people live and work.

2. The second category concerns institutions and organizations and their related subjects, such as knowledge, human behavior, and social cohesion.
3. The third category refers to laws, culture, and social norms that can either facilitate or impede the spread of information and decision-making.

Figure 3 presents the result of this multidimensional approach and locates the main exposed lessons inside these three categories in the form of a synthetic Infographic: *Climate Synthesis* concerning climate change, adaptation, and justice aspects, and *Resilient Urban Systems Synthesis* regarding GI, governance, and social justice aspects.

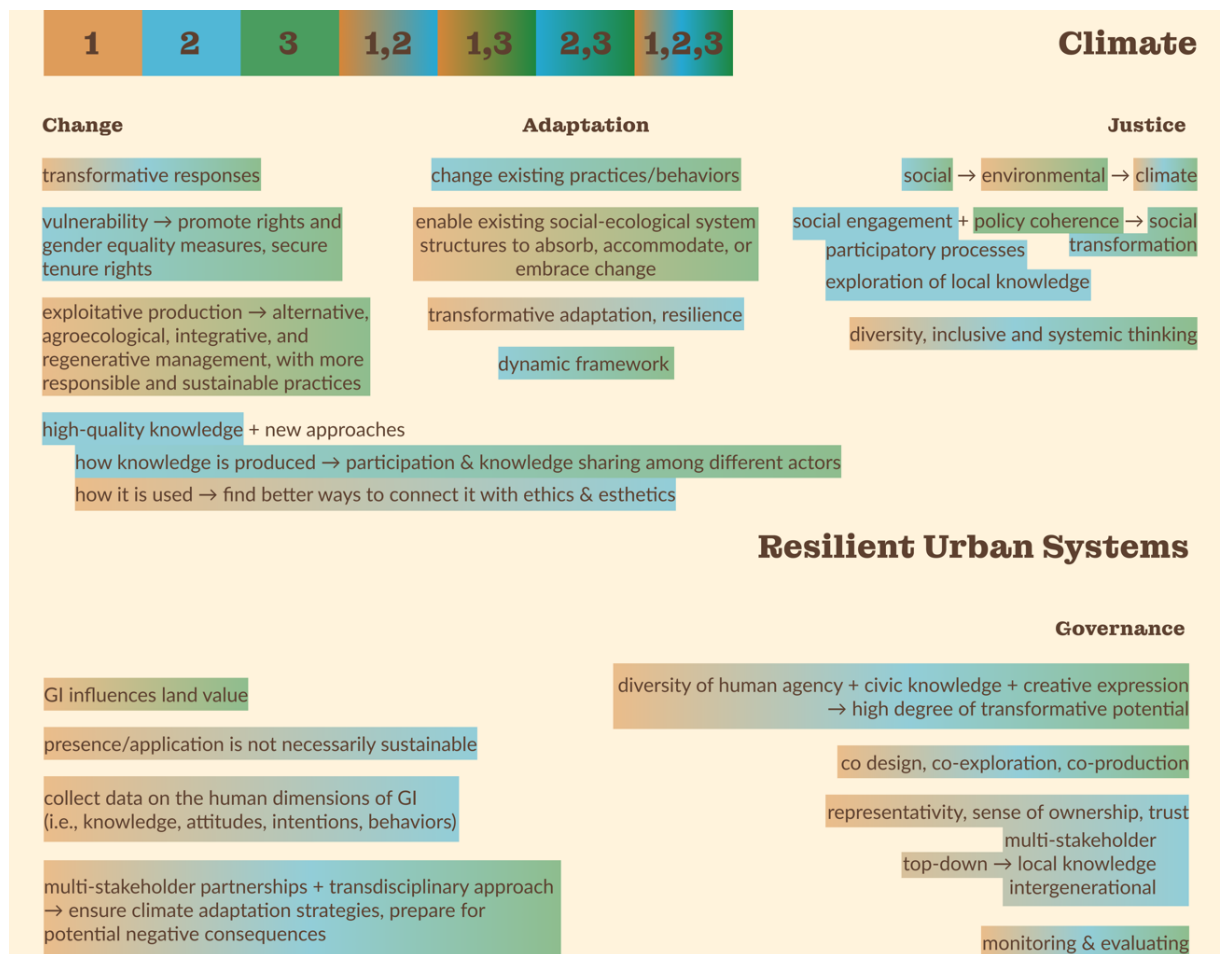


Fig. 3 - Synthesis of Climate and Resilient Urban Systems

The framing of the exposed highlights in the three broad categories led to exciting outcomes that helped to understand their domain and application. Potentialities and limitations were considered during the categorization, illustrating approaches that can guide future applications.

The exposed highlights can simultaneously fit into one, two, or even three categories. These multiple interpretations can either focus or expand their understanding but also present hints on possible associations, generating composed and more complete approaches.

Doing so aims to help construct the methodology framework to be analyzed in the next chapter.

3

METHODOLOGY

This study aims to examine the articulation of spatial planning and climate justice in the face of climate change and explore coherence between planning practices, sustainable development, and social justice in Ho Chi Minh City, Vietnam. More precisely, calling the objective of the answer “How does planning for climate adaptation contribute to and/or guarantee social and environmental justice through the implementation of green infrastructure?” This Chapter outlines the methodology used in the research, including the Research Design (3.1), Data Collection Methods (3.2), and Limitations and Contributions (3.3).

3.1. RESEARCH DESIGN

Employs an in-depth exploration through a case study approach of how spatial planning plays a role in contributing to climate justice in Chi Minh City, Vietnam. The case study involves an intensive investigation of the territory, climate-related policies, and current plans and proposals for sustainable development and climate adaptation.

Three main points are analyzed to meet the thesis objective and assess how spatial planning can promote climate justice by ensuring equitable access to resources and green spaces. They are:

1. How does planning for climate adaptation through urban design and implementation of green infrastructure relate to (overcome or promote) Ho Chi Minh City's vulnerabilities?
2. Do these new GI settings proposed by the analyzed plans respond equitably to environmental/climate and social vulnerabilities or influence land use and valuation? At which level?
3. How can spatial planning answer these vulnerabilities in designing, applying, and monitoring the plan through participative processes?

To facilitate further analysis, these three main questions were categorized into a framework composed of two broad fields: *Territory* and *Governance*.

The 2-component strategy framework is inspired by Tyler et al. (2012) but altered according to the climate justice objective that guides this research. The first component includes territorial issues of the constructed and natural environment (what would be the authors' category 1) and concerns aspects such as the provision of GI and ecosystem services (from a more significant to smaller scale), real estate market, land use valuation (evolution and trends), social infrastructure, social fabric constitution, and vulnerabilities. The second component regards governance issues, and it is related to behaviors,

institutions, organizations, laws, and norms (referring to categories 2 and 3). This strategy framework considers social engagement in designing, developing, and future envisioning.

Table 1 presents an overview of the research design as it contains the primary and secondary research questions, analyzed aspects and indicators, and the data and primary source of information. Based on the literature review topics, the table presents general directions that will also guide the further methodology application (4.4).

Table 1 - Research Design Overview

Issue	Main question	Secondary questions	Analyzed aspects	Data and main Source of Information (Literature Review, Plans, Statistics, Maps, Interviews)				
				LR	P	S	M	I
Territory	1. How does planning for climate adaptation through urban design and implementation of green infrastructure relate to (overcome or promote) Ho Chi Minh City's vulnerabilities ?	What are the good urban and landscape planning practices when dealing with climate adaptation?	- climate adaptation policies - contextualization of adopted measures					
		What are the main climate-related vulnerabilities in HCMC?	- climate change impacts - climate & environmental vulnerabilities - social vulnerabilities - vulnerable communities					
		How are current plans addressing climate justice issues in Ho Chi Minh City?	- town and sustainable development plans					
		How and which GI/NbS (nature-based solutions) are used?	- GI provision & organization in the territory - balance between GI/NbS & grey infrastructures					
	2. Do the provision of GI settings respond equitably to environmental/climate and social vulnerabilities or influence land use and valuation ? At which level?	Do they present climate-proof contributions?	- effectivity regarding CCA and CCM					
		Do they work within a system?	- provided ecosystem services					
		How is this territory in terms of social aspects?	- class					
			- race					
			- gender					
			- age					
		How do they relate to the previous and planned urban infrastructure?	- mobility					
			- public amenities - public schools - community center, organizations					
		How is GI related to land valuation?	- land use trends - displacements					
Governance	3. How can spatial planning answer vulnerabilities in conceiving, applying, and monitoring the plan through participative processes ?	Who created, developed, and envisioned the plans? To whom were they made?	- transdisciplinary processes - team building & governance					
		Were there participatory processes?	- participatory processes - consulted groups - representativity - stakeholder diversity - active/passive contribution					
			- complementary environmental & political mechanisms					
			- performance & monitoring					
		How do these plans behave over time?						

3.2. DATA COLLECTION

Data was collected from various sources, including primary and secondary data. Primary data was obtained through interviews with stakeholders, such as private companies, state-held organizations, NGOs, civic groups, and University research members involved with planning and/or sustainable development processes. On the other hand, secondary data was gathered through a detailed review of policy documents, reports, remote plan analysis, competition papers, statistics, mappings, and media

sources related to urban planning for climate adaptation and sustainable development in Ho Chi Minh City.

The division of the two broad issues, "Territory" and "Governance," is also somewhat related to the data and information source. The assets related to Governance were primarily collected through stakeholder interviews. In contrast, while drawing fundamental insights from interviews, the Territory section relied significantly on secondary sources such as plans, statistics, and maps.

Primary Data Collection: Interviews

The study mainly adopted a locally led multi-stakeholder approach through an interview format to obtain firsthand and broader insights into the territory. The research applies this strategy to enrich the approach to the case study context but also to incite an analysis aligned with transdisciplinary and resilient approaches and social engagement processes.

Regarding the planning processes, the study aimed to understand how they are conceptualized and evolve in practice in both territory and governance spheres. The strategy aims to facilitate the activation of diverse perspectives and promote a comprehensive human understanding of these processes beyond technical and design-led solutions. This is done by questioning whether planning processes align with the principles of co-design, bottom-up and participatory processes, public consultation, and the inclusion of local knowledge.

Participants

The contacts ranged from a diverse group of five stakeholder settings to better understand the concept, development, and envisioning processes. These included planners and authors (n = 31) of the master plans, members of university bodies (n = 13), local and national NGOs (n = 7), governmental organizations (n = 4), and civil society (n=1).

The planners and authors were selected based on their affiliation with companies according to the authorship information of the primary competition paper (HCMC, 2019). University members, such as professors, lecturers, and students, were sought from Vietnamese Universities and Faculties of Architecture, Urban Planning/Studies, Sustainable Development, Social Sciences, and Humanities. National NGOs from diverse fields and approaches, such as agroecology, community engagement, gender equity, general and environmental education, security, food inclusion, and poverty elimination, were also contacted as potential interviewees. Governmental organizations such as the Department of Planning and Architecture, the Office of the City People's Committee, and the Centre for Sustainable Rural Development were also approached. The majority of contacts for the potential interviewees happened via LinkedIn and email.

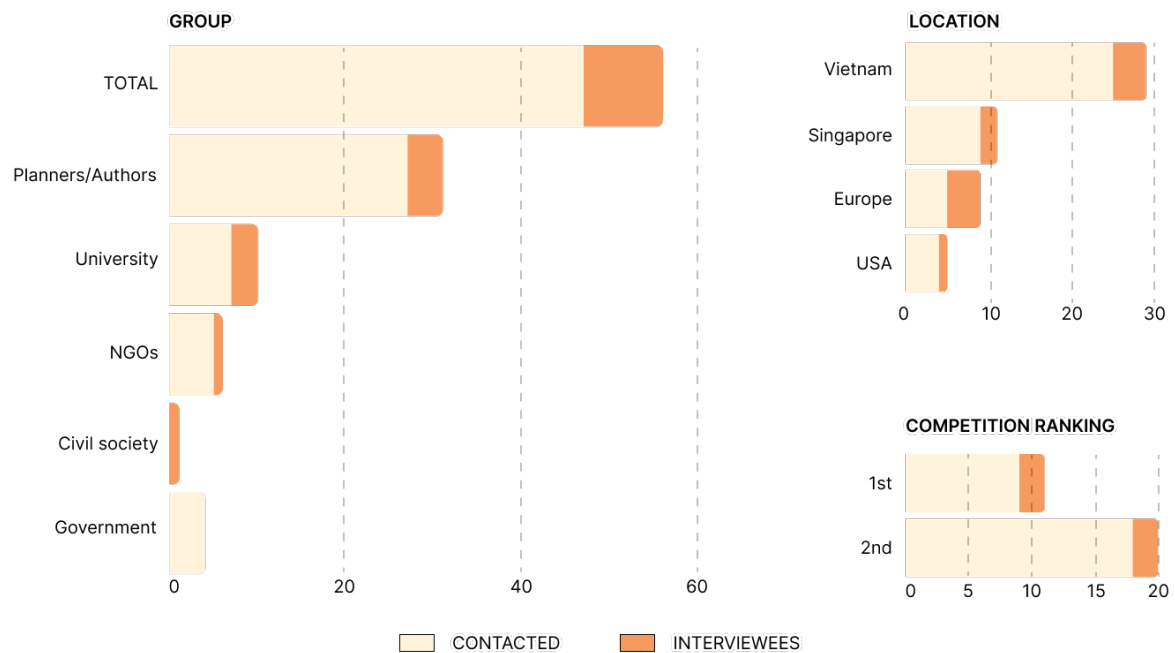


Fig. 4 - Chart of the Potential Interviewees

Since the master plans are developed by more than one company, planners and authors are the highest number of stakeholders contacted. This proportion sustains the interview participation. As a result, there was a balance between the actors' participation in both the first and second prizes. Unfortunately, governmental organizations were not responsive to the contacts, resulting in a lack of participation in the research.

Regarding the activation of local inputs, most of the contacted stakeholders and interviewees are from Vietnam, followed by individuals currently working in Singapore.

Instruments

The interview schedule consisted of specific, open-ended questions that queried stakeholders about impressions of the territory and governance, their part in the project, contributions and constraints, and future suggestions. The questions were sent to the interviewees in advance, as presented in Table 2.

In total, nine interviews were conducted with diverse stakeholders, of which eight happened via video call, with an average duration of 50 minutes, and one via email.

Much of the gathered content presents reproduction limitations, as the projects are somewhat confidential, especially the first prize and ongoing Masterplan. Due to data privacy, the content was paraphrased, and names and companies were protected. The complete edited transcription of all interviews is in the Annexes of this research.

The questions are flexible and address main concerns, such as transdisciplinarity, team building and governance, participatory processes, environmental and social vulnerabilities, GI use, land use changes, and valuation. Above all, the interviews aim to be an open and fluid dialogue space in which the interviewees provide comments and contributions according to their expertise and relation to the inquired topics.

Table 2 - Interview Guide

Stage		Concern		Question		
Concept	1. Elaboration process	Base	1a.	What is the central vision or objective of the plan?		
			1b.	What are the features of this city?		
			1c.	How long did it take to develop the plan?		
			1d.	What were the main steps/stages when conceiving the plan?		
		Complementary mechanisms, transdisciplinarity	1e.	Is the plan articulated with previous and other plans? How?		
			1f.	Was the plan a follow-up to environmental, spatial, climate adaptation, and public policies? To which?		
		Team building, governance	1g.	Who integrated the team? How did it balance international knowledge with local expertise?		
			1h.	What about governance and hierarchy? Was it based on a top-down or bottom-up model?		
			1i.	Mainly, to whom is the plan built?		
			1j.	Was there public participation?		
Development	2. Engagement process	Participatory processes	2a.	Was the population involved?		
			2b.	What kind of population was this?		
			2c.	Were there local stakeholders involved?		
			2d.	Was there a focal point or local champion most interested in the project participation?		
			2e.	How did real estate investors show up or not?		
			2f.	How was the participatory process (biased or open)?		
	3. Results and final design of the plan	Environmental vulnerabilities	3a.	What were the major climate hazards found in the plan areas?		
			3b.	Did any area in specific get highlighted and shown to be more vulnerable to climate change effects?		
			3c.	Which main measures were taken?		
		Green Infrastructure (GI)	3d.	Were there mostly gray infrastructure, nature-based solutions, or mixed strategies?		
			3e.	Regarding NbS, on which scale were they thought? (small, neighborhood, city)		
			3f.	Were they applied or incentivized in a more public or private context?		
			3g.	Were there also preoccupations with connecting ecosystem services?		
			3h.	How were these strategies conceived?		
			3i.	When it comes to resilience, how does it relate to the adopted strategies?		
			3j.	Was local knowledge also considered? If yes, how?		
			Social vulnerabilities	3k.	What were the biggest social vulnerabilities identified within the territory?	
		3l.		How did the plan look at the differences in the territory in terms of climate and social challenges?		
		3m.		How does it relate to informality?		
		4. Present and future	Land Use Valuation	3n.	What are the social gains provided by the plan?	
				3o.	Does the plan proposes considerable land use changes?	
				3p.	Have there been relocations according to the new land uses?	
				3q.	How did these processes happen?	
				3r.	May the plan alter established real estate configurations? In which way?	
3s.	Can the influences in land valuation be anticipated?					
Performance & Monitoring	3t.		Are the measures being implemented? If yes, at which level?			
	3u.		Does the plan proposes a Performance and Monitoring assessment? How does it work?			
Comments & Recommendations	3v.		What are the expectations?			
	3w.		Any recommendations or improvements to the proposal?			
	3x.	Any other comments or suggestions for planners, organizations, civic communities, and researchers in dealing with climate challenges that may facilitate environmental justice?				
	Planners/Authors (1st and 2nd prize)					
Flexible						

Secondary Data Collection

The secondary data analysis assessed competition papers, reports, policy documents, and other media sources through a detailed review of the ultimate climate adaptation plans for planning in Ho Chi Minh City. The leading guide was the competition paper (HCMC, 2019) issued that briefly presents the challenging climate context in HCMC, the jury, and a resumed content of the first and second prizes, the object of this analysis.

Furthermore, once already in contact with the specific stakeholders, they shared other complementary reports containing more detailed information about each proposal. However, these documents are confidential and present limitations regarding their reproduction.

The Table A (Appendix) presents the composition of the main aspects of the secondary data analysis: factors, data collection methods, and relevant data sources.

3.3. LIMITATIONS AND CONTRIBUTIONS

Several limitations to this study should be acknowledged. Firstly, the study relies on a relatively small sample of stakeholders and may not represent the broader social perspective, especially regarding civic groups, Government sectors, and NGOs. Secondly, the study focuses mainly on contemporary plans and proposals and may not capture the full complexity and evolution of the climate justice issue in Ho Chi Minh City. Finally, considering the data protection of some research components, the study could be improved by the availability and quality of the material.

Despite these limitations, this study provides valuable methodological insights into resilience, climate justice, governance learning research, and contemporary spatial planning strategies in Ho Chi Minh City. Finally, we offer recommendations for scholars and practitioners that could be aligned with promoting more sustainable and equitable development and contributing to building transformative climate resilience in Southeast Asia and beyond.

4

CASE STUDY

To reach the specific case study analysis, a contextual overview of Vietnam and Ho Chi Minh City is provided as they emerge as crucial players in Southeast Asia and grapple with the impacts of climate change. It becomes increasingly essential to understand the shaping dynamics of these urban centers to explore strategies for adaptation and sustainable development in the face of these challenges. Acknowledging Vietnam's role in Southeast Asia and situating the case study within multiple contexts assesses a better visualization of the complex interplay of factors that shape its development and identifies the potential for fostering resilience and sustainability. This overlook will help illuminate the particularities and challenges that arise in its unique setting through the lenses of climate justice.

4.1. VIETNAM

Vietnam, a socialist Southeast Asian nation characterized by its long, narrow coastline and diverse topography, faces significant contemporary climate challenges. The country's unique geographic context, with its expansive coastline and many water bodies, makes it especially susceptible to climate change effects.



Fig. 5 - Map of Vietnam's interest points and population density⁶

Vietnam's landscape ranges from the highlands in the North to the Mekong Delta in the south, encompassing various climatic zones and ecosystems. The increasing frequency and intensity of extreme weather events such as storms, typhoons, floods, and droughts pose significant threats to Vietnam's socio-economic development, particularly in areas with high population density and economic activity. The low-lying Mekong Delta is home to approximately 20% of Vietnam's population

⁶ Based on Scussolini (2017) and World Trade Press (2020).

(Scussolini, 2017). Due to its susceptibility to sea-level rise and salinization, millions of livelihoods that depend on agriculture and aquaculture are jeopardized and migrating to big urban centers.

Considering its recent independence from France in 1945 and the later implementation of the Doi Moi Policy ('renovation') in 1986, Vietnam has been experiencing many recent changes and rapid economic growth as a significant manufacturing hub. Due to this economic transition, Vietnam's economy had become predominantly integrated by SMEs, fueled by a young, low-cost, skilled workforce, which led to rapid urban growth as local leaders sought to create a modern urban image to attract foreign direct investment (FDI; Phuc et al., 2014), particularly in the housing market (Chung et al., 2018).

Vietnam has strived to accommodate the need for urban amenities, infrastructure, and services, including employment and housing, causing high pressure on the land market. After an initial moment of limited regulations and inadequate housing conditions, particularly for low-income households (Kokko, 2007), essential milestones happened between 1993 and 1996, defining significant steps toward the development, access, and management of housing (Vietnam Law and Legal Forum, 1994; Ministry of Construction of Vietnam, 2018; Le et al., 2019).

The housing perspective changed once the nation saw fresh economic growth and opened up, becoming a status symbol and an speculation item since the 2000s (Phe et al., 2002). Overall, Vietnam's transition from a centrally planned, state-led economy to a market-oriented economy has led to institutional changes, including the role of government (Phuc et al., 2014).

Yet to meet the growing demand, government agencies made critical decisions regarding land use planning and compensation schemes without input from local communities, including applying 'land conversion for public purposes' policies (Suu, 2009). However, the compensation payments typically fall lower than market prices, especially when the land shifts from agriculture to urban uses (Land Law, 2003), leading to conflicts throughout the country.

That is the case of Hue in Central Vietnam, where local authorities have used this technique to convert vast farmland areas into highly valuable residential and commercial property while lawfully converting low-value agricultural land in rural and peri-urban areas (Phuc et al., 2014). Local landowners stated that the engagement was poor and simply to inform of the land purchase and compensation scheme, *"If we had participated and presented our ideas, we would not have agreed to set up a modern town in the rice fields; instead, it would have been built close to the hills and mountains. That location is high and has fresh air. It is a pity that nobody consulted us"* (Phuc et al., 2014, p. 5).

Combined with the 2008 global financial crisis, the Vietnamese government has amended the land law to allow foreigners to own property and attract investment in new housing projects (Anh et al., 2017), aiming to reanimate the economy. This amendment led to significant investment into new large-scale apartment buildings and mixed-use upper-class and commercial facilities, with expectations to increase popularity among different social classes (Chung et al., 2018).

The Department of Planning and Architecture (DPA) in Vietnam, also established in 2008, plays a central role in shaping the country's spatial planning (General Department of Land Administration [GDLA], 2008). Orientation plans (national policy), regional plans, master plans (provincial or city), and specific site plans (encompassing a commune, ward, or industrial zone) are the four levels of detail that the DPA is in charge of developing, implementing, and supervising (Phuc et al., 2014). Collaborating with international organizations and leveraging their expertise, the DPA creates comprehensive plans addressing climate, urbanization, and socio-economic development challenges. Two notable examples of such collaborations are the plans developed with the Ministry of Agriculture and Rural Development (MARD) and the Japan International Cooperation Agency (JICA).

The country is committed to sustainable development, human rights, workers' rights, environmental protection, and relatively liberal sharing of climate change information (McMillan et al., 2021). This dedication to sustainable development is essential to Vietnam's growth, as it seeks to balance rapid urbanization and economic growth with environmental preservation and social equity. On the other hand, it raises the question of whether government management or market-driven conversion procedures result in more fair outcomes (Phuc et al., 2014).

4.2. HO CHI MINH CITY

Formerly the nation's capital, Ho Chi Minh City (HCMC) or Saigon, is the largest city and biggest economy of Vietnam, but also one of the top ten cities in the world that would be most severely impacted by climate change (ADB, 2010). Following the national dynamics, HCMC has experienced significant urban growth since the 1990s, from 2.6 million in 1990 to over 9 million residents today (WB, 2021), summed to migrants from all over the country drawn by its dynamic economy (ADB, 2010).

On the one hand, the most significant average per capita incomes (over US\$2,000, which is more than quadruple the norm for Vietnam) are found in HCMC. On the other, nowhere else in Vietnam can one find the same level of polarization and fragmentation of urban society (Taylor, 2004; Waibel, 2005).

HCMC is a typical megacity of the twenty-first century dealing with unregulated hyper-growth (Truong-Young et al., 2020). The city has experienced a rapid population increase over the last few decades, dramatically impacting its urban form and infrastructure, resulting in numerous environmental and socio-economic challenges.

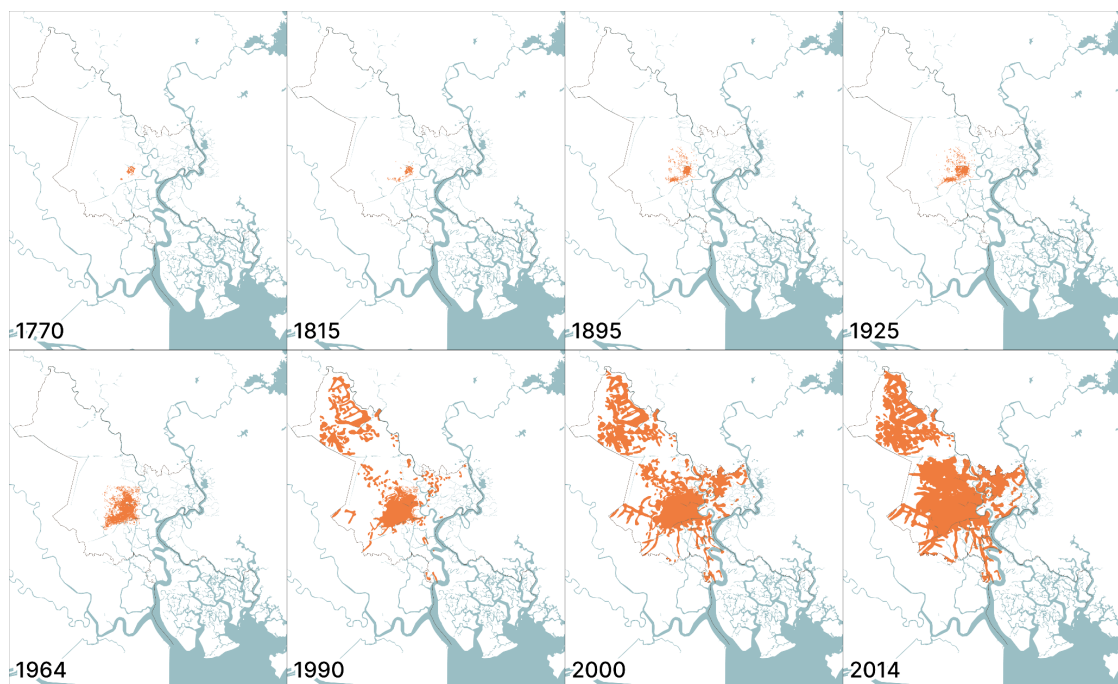


Fig. 6 - Evolution of the HCMC Territory⁷

⁷ Based on Kontgis (2014), Xu et al. (2019), and Ballarin et al. (2023).

Initially, HCMC's urban expansion was dispersed and decentralized, predominantly where unchecked urban sprawl developed in suburban areas on the outskirts with lower population density (Waibel et al., 2007). Followed by a more compact development with high-density urbanization as surrounding towns and smaller cities grew (Thinh et al., 2016; Xu et al., 2019) into conurbation patterns.

Between 1990 and 2013, the urban built-up area of the city expanded more than tenfold, going from 55 km² to 635 km² (Xu et al., 2019). Still, according to Waibel et al. (2007), the HCMC mega-urban region shows inconsistencies when labeled polycentric once it is still largely controlled by HCMC's core.

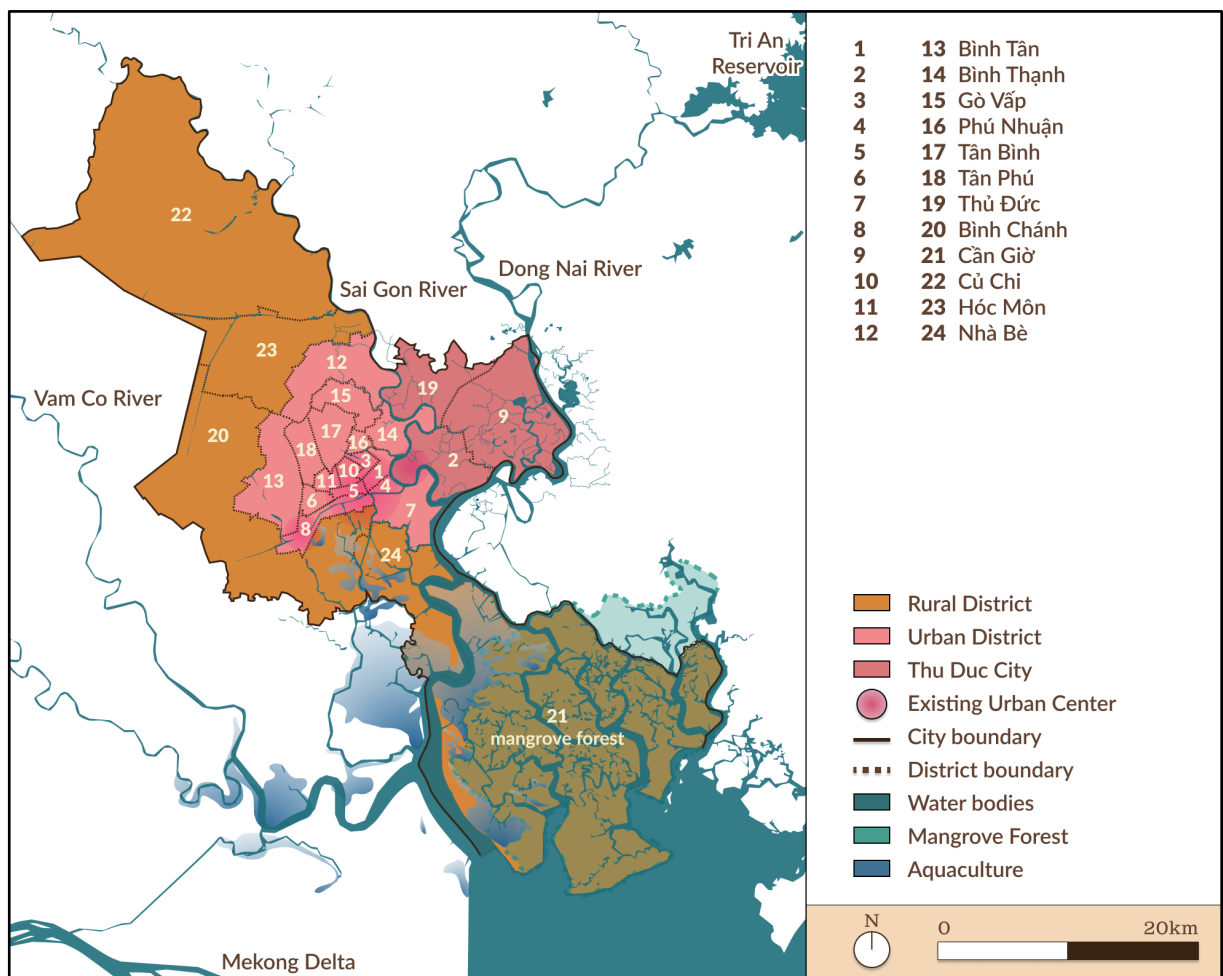


Fig. 7 - Map of HCMC districts and Thu Duc City⁸

Although approximately 75% of HCMC is composed of rural districts, as seen in the map above, 80% of the population is concentrated in urban districts (HCMC Statistics Office, 2021).

⁸ Based on HID (2019) and HCMC Statistics Office (2021).

At the same time that suburban areas like District 12 (+77%), Thu Duc (+64%), and Binh Tan (+58%) experienced the fastest rates of population growth from 1999 to 2005 (Gurby et al., 2002; GSO, 2006), the population density in other inner districts of the central city of HCMC significantly decreased. These changes are due to converting residential into commercial uses in response to rising demand and the postponed creation of a Central Business District (CBD; Waibel, 2004).

HCMC has also undergone significant changes in its suburban and rural areas. Thu Duc City, previously a borderland between the Saigon and Dong Nai rivers, is now a multi-center megacity, mirroring the old Saigon, according to state and master plans under approval (Bonizzoni, 2023). However, it is highly disputed by the expansive needs of HCMC and the monsoon and tidal waters.

Overall, the territory of HCMC is diverse and comprises tube houses (a unique and successful locally produced informal housing system), industrial sites, old Chinese apartments, gated communities for the wealthy classes, rice fields, small farming and aquaculture sites, and religious temples (Bonizzoni, 2023). According to the authors, this dense housing system performs diverse functions such as work, commerce, relaxation, and leisure and, summed with motorbike laneways, shapes the entire urban form and is deeply integrated into the everyday urban culture of HCMC (Bonizzoni, 2023). However, since most tube houses are built spontaneously, they frequently lack the technical infrastructure or transportation links (Waibel et al., 2007).

Added to that and similar to what is seen in Hue, local authorities in HCMC often place the responsibility for water bodies pollution on citizens inhabiting boats, leading to the removal of their households (Phuong, 2005). The situation calls for more comprehensive and equitable solutions to pollution that do not exacerbate social inequalities.

On the other hand, Vietnamese people believe that the downtown Districts 1 and 3 and their high-density apartments constructed by local developers have a better quality of life. This perception is due to pedestrian-friendly surroundings, colonial-era buildings and streets, business prospects, lively neighborhoods, varied cultural events and performances, and the chance to enroll in the top public schools (Chung et al., 2018).

Public planners are under pressure to accommodate the growing demand of HCMC and build large-scale housing, transportation, and utilities, as the overall development projects tend to follow Western-style medium-height residential complexes, skyscrapers, and urban parks. When doing so, the political-economical hegemonic governance often proposes that these “anachronistic and illegal forms” (Bonizzoni, 2023) are incompatible with the type of progress sought. Nevertheless, these modes are often seen as a barrier to urban modernization by government planners, who have attempted to eliminate tube housing, motorcycles, and laneways on all three fronts (Spencer, 2014, op. cit. Truong-Young et al., 2020).

According to Quang et al. (2002), formal non-state contributions to urban planning are often discouraged by the strict, non-participatory master planning methodologies. These top-down factors harm development quality and widen the gap between “good planning” and an unsustainable reality (Waibel et al., 2007). Consequently, it fomented an urban development pattern of densely constructed homogeneous blocks that affect the urban quality of life, and social and environmental vulnerabilities, as it increases inequalities and contributes to localized flooding (Chung et al., 2018).

Urban Development and Land Market

Following the national tendencies since the Doi Moi Policy of economic reform in 1986, HCMC has also experienced significant economic growth, attracting substantial foreign direct investment that has

increased the housing supply (Chung et al., 2018), urbanization, land-use planning, and infrastructure development. However, the housing market in the city remains nascent, with unpredictable price fluctuations and high-interest rates that make it difficult for citizens to obtain loans (Bui, 2020; Tse et al., 2014). To stabilize the market, authorities have established a stable interest rate for housing purchases to prevent market bubbles (Bui, 2020).

According to Chung et al. (2018), several factors influence apartment prices positively and significantly in HCMC. Swimming pool (due to the tropical climate) and mixed-use development belong to the category of local qualities. Apartment prices are favourably impacted by locational factors like being close to a park and an international school, while negatively impacted by being far from the city center. The district's high population density also has a detrimental impact on apartment costs.

Housing policies, such as the NHO and the DPA, are critical in managing the housing market and influencing apartment prices, especially planning laws for land use and building infrastructure (Chung et al., 2018). Nevertheless, it can also contribute to the production of socioeconomic inequalities by perpetuating existing inequalities, prioritizing certain land uses over others, and implementing land allocation processes that are not equitable and transparent.

To address the city's challenges, the government should address socio-economic disparities in the allocation of land resources, focusing on measures to improve governance and promote sustainable development through equitable access to land and resources (Chung et al., 2018). According to the authors, this is particularly important in HCMC and Hanoi because they are essential examples for other cities setting development objectives (2018).

To address the adverse effects of urbanization on property costs, the HCMC authorities should adopt a holistic approach to the challenges of the housing market and the broader implications for urban development and sustainable growth, meanwhile ensuring transparent and participatory land use planning processes. More practically, it should allocate residential land in a way that would provide road capacity, connectivity, and enhanced access to public amenities (Chung et al., 2018). However, it also values, assesses, and includes standard forms of urbanism by city planners in master plans (Truong-Young et al., 2020).

Environment and Flooding

Ho Chi Minh City faces numerous climate-related challenges due to rapid urbanization, industrialization, and land-use changes. Natural factors include tidal surge and excessive rainfall due to climate change, and human factors due to poor city planning, higher impermeability, littering, inadequate drainage maintenance, over-exploitation of groundwater, and poor drainage system design (ADB, 2010) exacerbate the city's existing vulnerabilities. Furthermore, the city's growing population, dense urban fabric, and shallow elevation make it highly susceptible to flooding and magnify other climate-related hazards such as heatwaves. Nevertheless, the absence of designed water infrastructure has resulted in severe flooding.

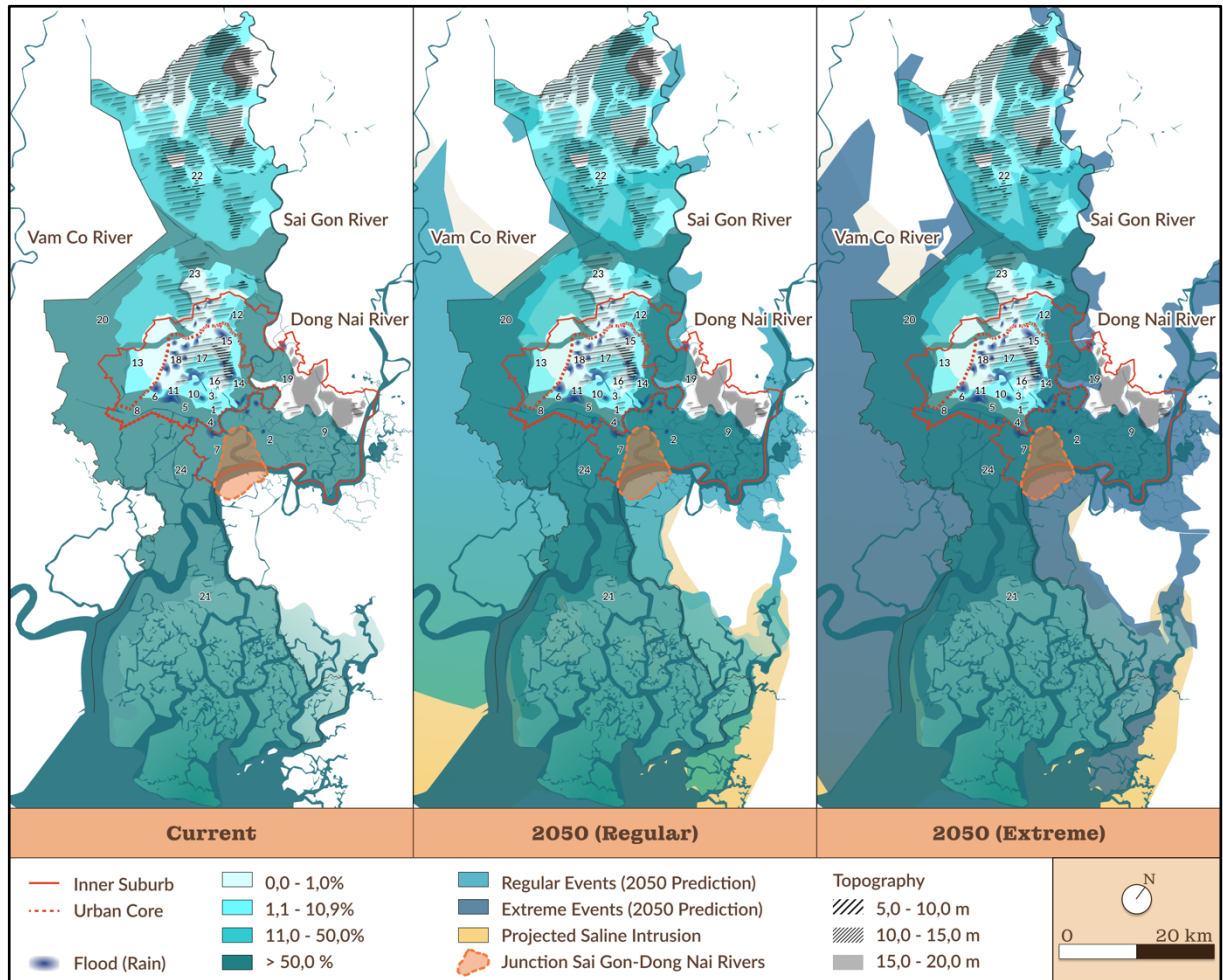


Fig. 8 - Map of Flood and Topography⁹

Since the mid-1980s, water levels have been rising throughout the city, leading to an already extreme current climate and hydrodynamics, as 70% of the HCMC region is at risk from urban flooding. Half of the HCMC East is in the floodplain (Nguyen et al., 2014), significantly impacting society, economy, and the environment. Moreover, this issue is expected to further aggravate in the future as landfill expansions and other water management innovations to transform lowlands and waterways into housing and business structures. These factors negatively contributed to some of the most significant vulnerabilities in the city, causing storms, storm surges, and tidal flooding to become more intense, especially in newly developed districts such as those in HCMC East (HCMC, 2019).

Assuming that the current infrastructure conditions persist unchanged, and it is projected that the southern portion of the HCMC East region will be submerged by 0.5-1.0 meters by the year 2100 (HCMC, 2019), given the escalating threats of global warming, the amplitude of tidal oscillations.

⁹ Data from ADB (2010), Nguyen et al. (2014), and Tran (2014).

Climate Adaptation

Although Ho Chi Minh City's vulnerability to climate change is a national policy priority, the city can only survive and thrive on being a top regional innovation hub if its planning and management of water resources can sustainably tackle this chronic flooding issue in the long term (HCMC, 2019). In light of these challenges, it is crucial to approach the development of Ho Chi Minh City holistically by improving climate resilience over structural and nonstructural measures in the city's most vulnerable industries and areas (ADB, 2010).

Figure 9 presents two significant examples of master plans for urban planning and flood management for HCMC.

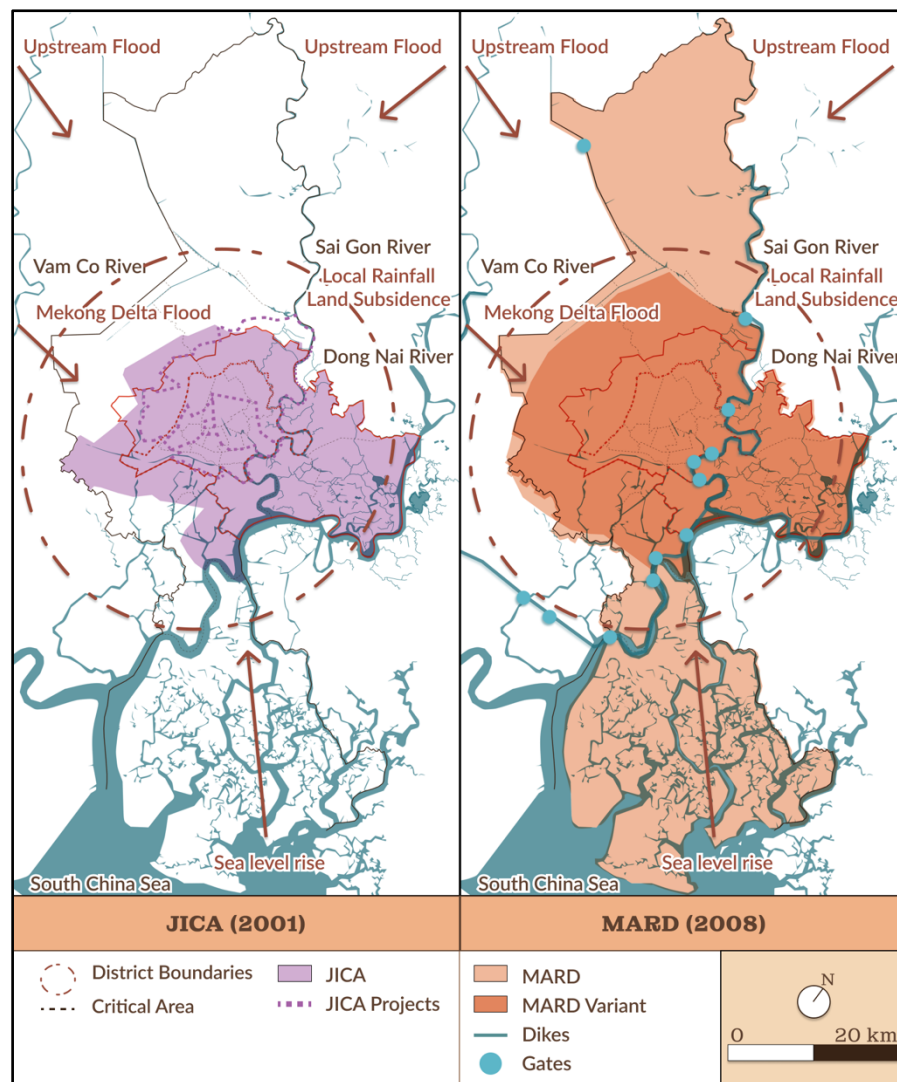


Fig. 9 - JICA and MARD Masterplan with Hydrological Impacts¹⁰

¹⁰ Based on Nguyen et al. (2014) and Phi et al. (2015).

In 2001, the JICA formulated the first master plan for Ho Chi Minh City, prioritizing storm sewer upgrades and resolving challenges in urban planning and management related to the local landfill. Significant interventions were implemented in the Central sub-catchment area in 2003, achieving remarkable results in improving the city's urban inundation issues (Nguyen et al., 2014). In 2008, the MARD proposed an extensive polder system for Ho Chi Minh City, aiming to construct dikes, tidal gates, and smaller gates to keep the polder's water level constant. However, concerns were raised about its cost-effectiveness, timing, and the necessity of incorporating flood diversion and retention measures (Nguyen et al., 2014).

The JICA master plan and the MARD polder system proposal are ongoing efforts to address flood-related challenges in Ho Chi Minh City. The successful implementation of the JICA master plan can provide valuable insights for revising the MARD proposal and ensuring its effectiveness (Nguyen et al., 2014).

The prevention-biased strategy developed for Ho Chi Minh City since the late 1990s can safeguard the city by up to 80%, assuming no changes regarding both climatic and non-climatic factors (Nguyen et al., 2014). However, an integrated flood management approach (IFMA) comprising protection, adaptation, and resilience strategies is crucial for addressing challenges and ensuring sustainable growth. Applying the principle of 'Flood-smart development' and considering the social and environmental implications of urban planning decisions are important factors (Venkatamaran et al., 2020).

Robust decision-making, including uncertainty analysis, helps assess the effectiveness of IFMA amid climate change and uncertainties (Nguyen et al., 2014). Recommended measures include stormwater sewer upgrades, urban detention facilities, and legal frameworks for better governance and community involvement (Tran et al., 2018). Exploring people's notions about flood risk, GI, and NbS and their behavior towards it ensures more informed decision-making and active community participation (Venkatamaran et al., 2020).

4.3. HCMC EAST – THU DUC CITY

Within the regional context, HCMC East occupies a highly favorable location along the eastern growth route that leads to Hanoi. The Central Business District of Thu Thiem and the Central Area of Ho Chi Minh City are directly bordered by it, making HCMC East a critical intersection on proposed transportation and business routes. It is crucial in the East-West and North-South economic axes and transportation corridors. Additionally, HCMC East has great potential to profit from planned strategic infrastructure, like highway linkages and high-speed rail connections to Hanoi. Its strategic stance is further strengthened by its closeness to essential entry points like the new airport and linkages to the deep-sea port.

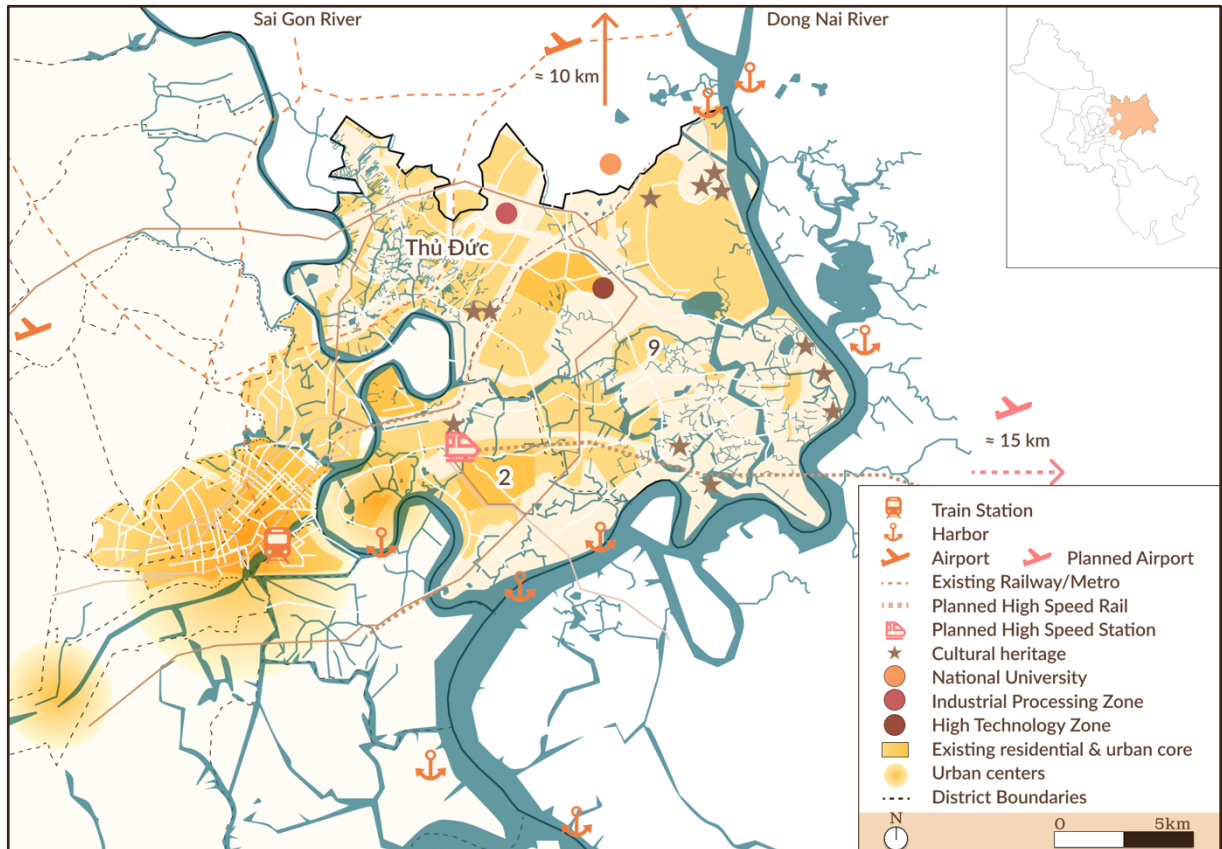


Fig. 10 - Map of HCMC East, current Thu Duc City¹¹

The region encompasses Districts 2, 9, and Thu Duc, officially becoming Thu Duc City at the end of 2020. These districts concentrate on projects developed by foreign investors and notable existing functional areas, including the Saigon Hi-tech Park (High Technology Zone), Linh Trung Export Processing Zone and Industrial Park (Industrial Processing Zone), and the National University. These established functional nodes provide favorable circumstances for the Eastern Area to emerge as an innovative hub with distinct place-making and character attributes facilitated by local cultural, touristic, and sports areas.

Because bus stops are solely located along major highways, few people use public transportation (only buses are accessible while metro lines are being built). At the same time, most city dwellers live in tube houses in long, narrow ways (Truong-Young et al., 2020).

Combining these functional nodes and planned strategic transport infrastructures will effectively link Thu Duc City to the southern mega-port and the future substantial entryways of the eastern airport hub. This positioning endows the Thu Duc City area with the potential to serve as a vital link and gateway,

¹¹ Based on Chung et al. (2018) and HCMC (2019).

connecting Ho Chi Minh City's central area and bordering Thu Thiem to the adjacent Vietnamese economic arteries and extending its reach to the global stage (HID, 2019).

4.4. METHODOLOGY APPLICATION

This subchapter aims to answer the primary and secondary questions by analyzing the indicated aspects through their corresponding source of information. A spatial analysis of Ho Chi Minh City territory is first presented on the Districts scale, visually assessing the data interpretation. In Vietnam, but more precisely in HCMC, most publicly available data reaches the city and sometimes the Districts scales. Other private data sources go into more detail, such as Districts, communes, and blocks, but it is often more inaccessible due to economic, format, and language aspects. As a result, this first analysis concentrates on the District-wide scope, using as a basis a personally purchased statistical material gladly provided by one of the interviewees.

The second analysis focuses on the territory and master plans proposals. Lastly, the interviews with involved stakeholders are presented as a premier source of information, including valuable data from many of the analyzed aspects.

4.4.1. HCMC SPATIAL ANALYSIS

The introductory Ho Chi Minh City subchapter shows that the city experienced intense urban sprawl over the last decades, resulting in exciting occupation forms. The following maps present a history of HCMC spatial occupation and the current population density of the Districts.

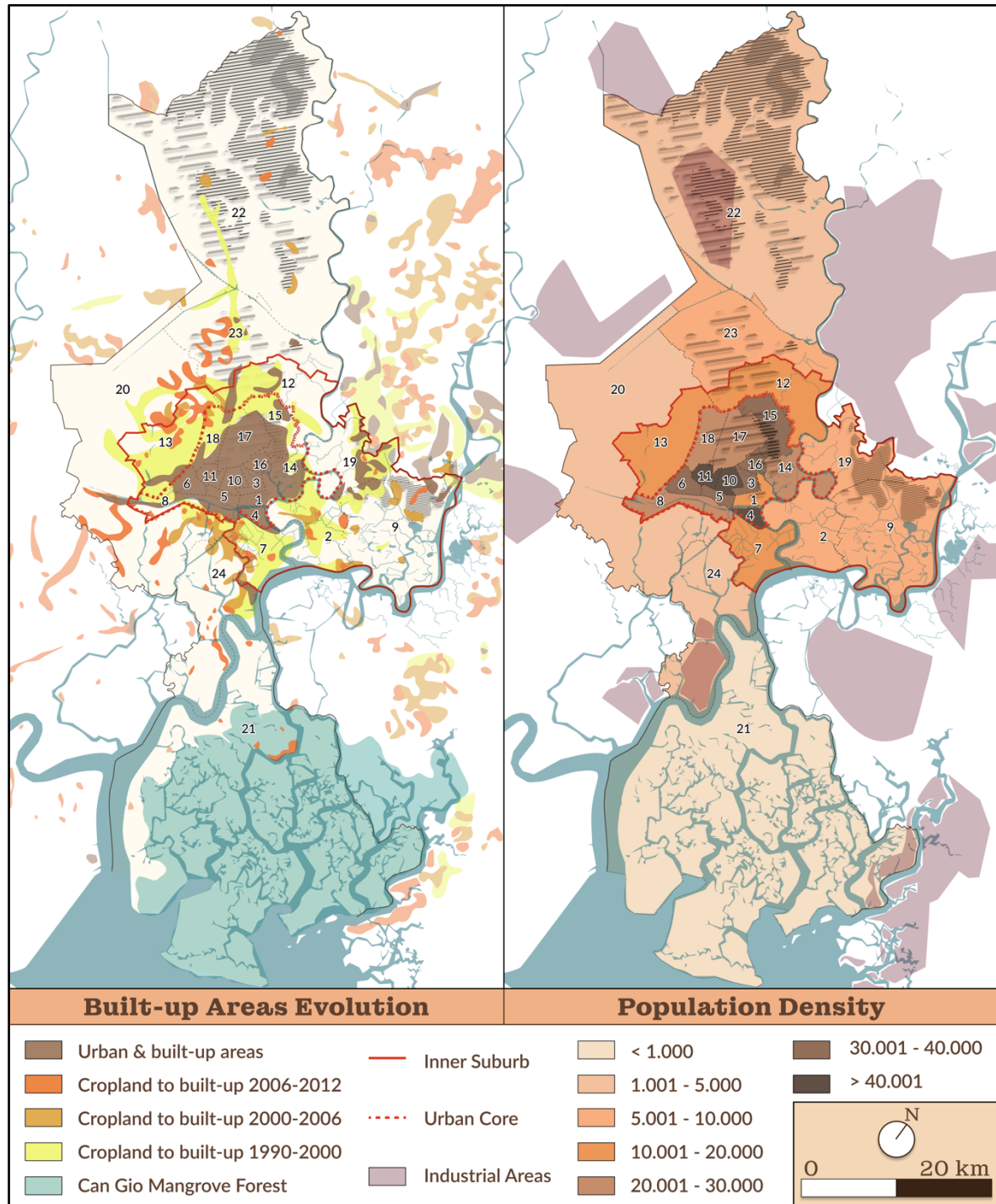


Fig. 11 - Map of Built-up Areas Evolution and Map of Population Density¹²

¹² The Map of Built-up Areas Evolution is based on Kontgis (2014) and Scussolini (2017). The map of Population Density is based on Waibel et al. (2007), Nguyen et al. (2014), Tran (2014), and data from HCMC Statistics Office (2021).

The urban core is still the more densely occupied area in HCMC. However, since the creation of Thu Duc City, the inner suburb has expanded, also encompassing the newly included Districts 2, 9, and 19 in the eastern portion of the city.

For example, District 2, also known as the ‘Western Quarter,’ is home to a series of luxury villas and apartments of increased price, attracting investors and foreigners. The connection to the financial center area of District 1 or Binh Thanh and District 3 only takes a few minutes, and it is easy to go to the Southeast provinces: international schools, restaurants specializing in European dishes, imported supermarkets, tree-lined streets, and luxury shops. The living environment of Thu Thiem's new urban area is currently on the rise, promising an international standard metropolitan area shortly.

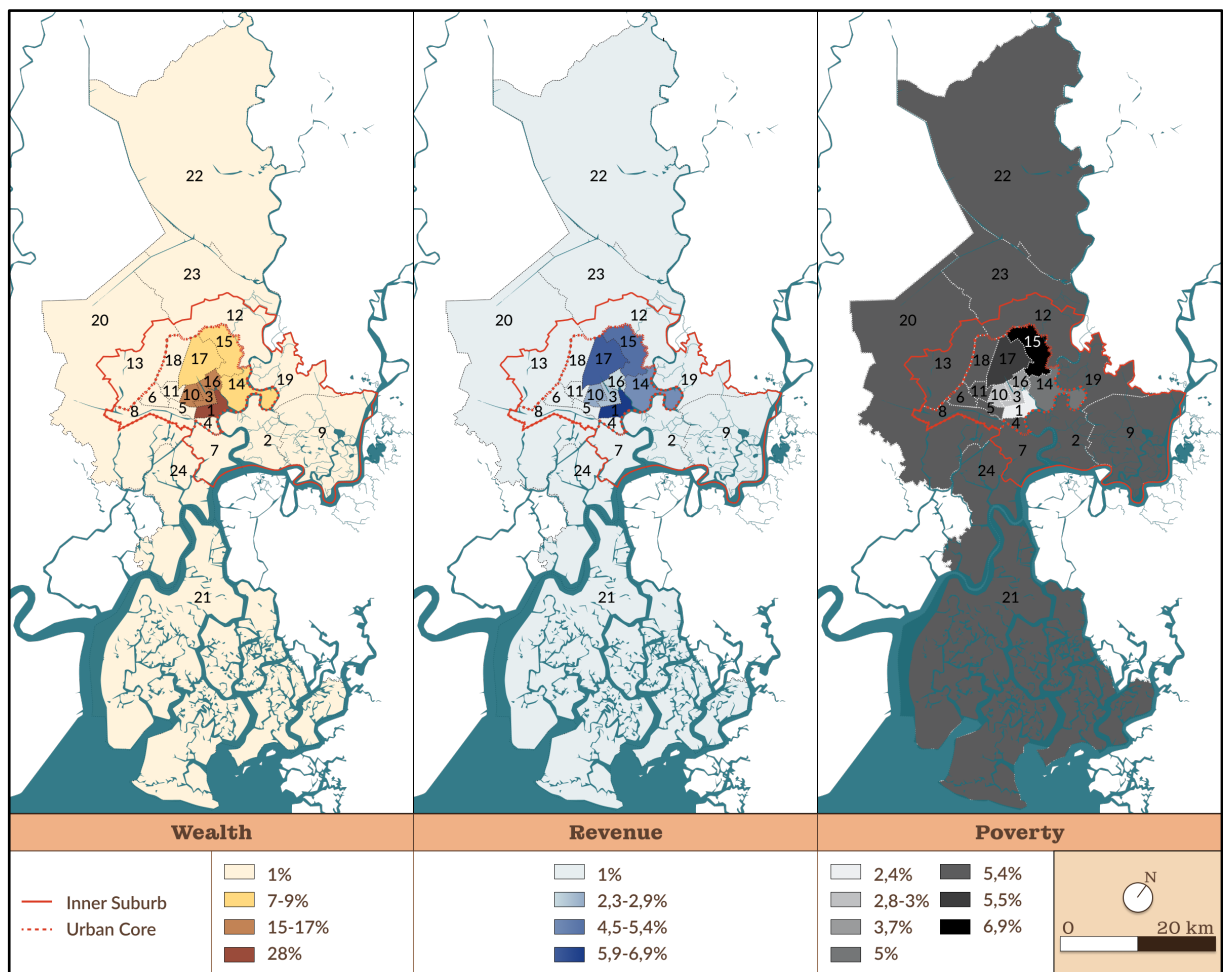
Moreover, District 7 concentrates on the biggest expat community in HCMC, long known as an international city. Infrastructure, planning, construction, and architecture meet international quality standards. It hosts urban developments projected by International real estate developers, mainly from Japan, that reproduce Western living models as it presents a series of high-end amenities.

In the South, the Mangrove Forest configures a unique setting that often shows boundaries to the modern urban form, being one of the reasons why the urban occupation seeks ground in the Great HCMC in the city outskirts. Meanwhile, in the North, the urban sprawl is disrupted by agricultural lands and more mountainous terrain.

However, the need to accommodate the highly growing population and migration increase leads to the expansion of urban form, whether fomenting irregular housing practices in the inner suburb Districts, but also on the more geologically unstable terrain of the southern portion. In both cases, the financially disadvantaged population is exposed to higher vulnerabilities, primarily due to increased climate threats.

4.4.1.1. Socio-economic Analysis

In HCMC, the inner suburb Districts produce the highest percentage of HCMC's revenue, presenting higher wealth, inequalities, and poverty rates. The following maps of Wealth, Revenue, and Poverty illustrate what Lempert et al. (2013, p. 11) call “exogenous uncertainties,” which are outside decision-makers control but may affect near-term measures to attain goals and are elaborated based on a multitude of data exposed by the authors.

Fig. 12 - Maps of Wealth, Revenue, and Poverty¹³

In the Map of Wealth¹⁴ is possible to observe that the inner suburb concentrates the highest wealth, ranging from the top 28% in District 1, followed by Districts 10 and 16, and after that, Districts 14, 15, and 17. The wealth distribution is far unequal in the whole city territory, with the remaining Districts presenting a rate of 1% of the wealth factor.

The Map of Revenue shows to be connected with the last, in which District 1 gets highlighted with the most significant municipal percentage, followed by the same districts, however, with minor ranking variations. These results reflect the context of HCMC as the economic center of a country that

¹³ Data from Ho Chi Minh City Statistics Book (n.d., op. cit. Lempert et al., 2013).

¹⁴ The Normalized Wealth Factor (Inequitable wealth distribution) is based on the “economic value and geographic data used to calculate boundary cases of wealth distribution across districts” (Lempert et al., 2013). The calculation uses the parameters: Percent of Total Ho Chi Minh City GDP, Percent of Total Ho Chi Minh City Area (Equitable wealth distribution), and Wealth Factor (Percent GDP/ Percent Area).

increasingly shifts¹⁵ from a rural to a manufacturing and technology powerhouse. The agricultural districts of HCMC, although occupying the most prominent area, are responsible for not more than 1% of the city's revenue.

At the same time, the Map of Poverty¹⁶ enhances that these same wealthy districts present extreme economic inequality: some present the lowest poverty rates, while others have the highest of the whole city. As Districts 15 and 17 get negatively highlighted, it brings questions over class and social hierarchy in HCMC. In other words, HCMC is an emblematic example that for capitalist economies to thrive, they demand equally strong power plays nurturing their dynamics.

Vietnam's economy has grown significantly over the recent decades, leading to the consequent rise of the middle-class population and increasing the average citizen's buying power and life standard. From a comparative perspective, Ho Chi Minh City still presents economic vulnerabilities as the city's overall poverty rate sits around 5,4% (one of the highest presented values).

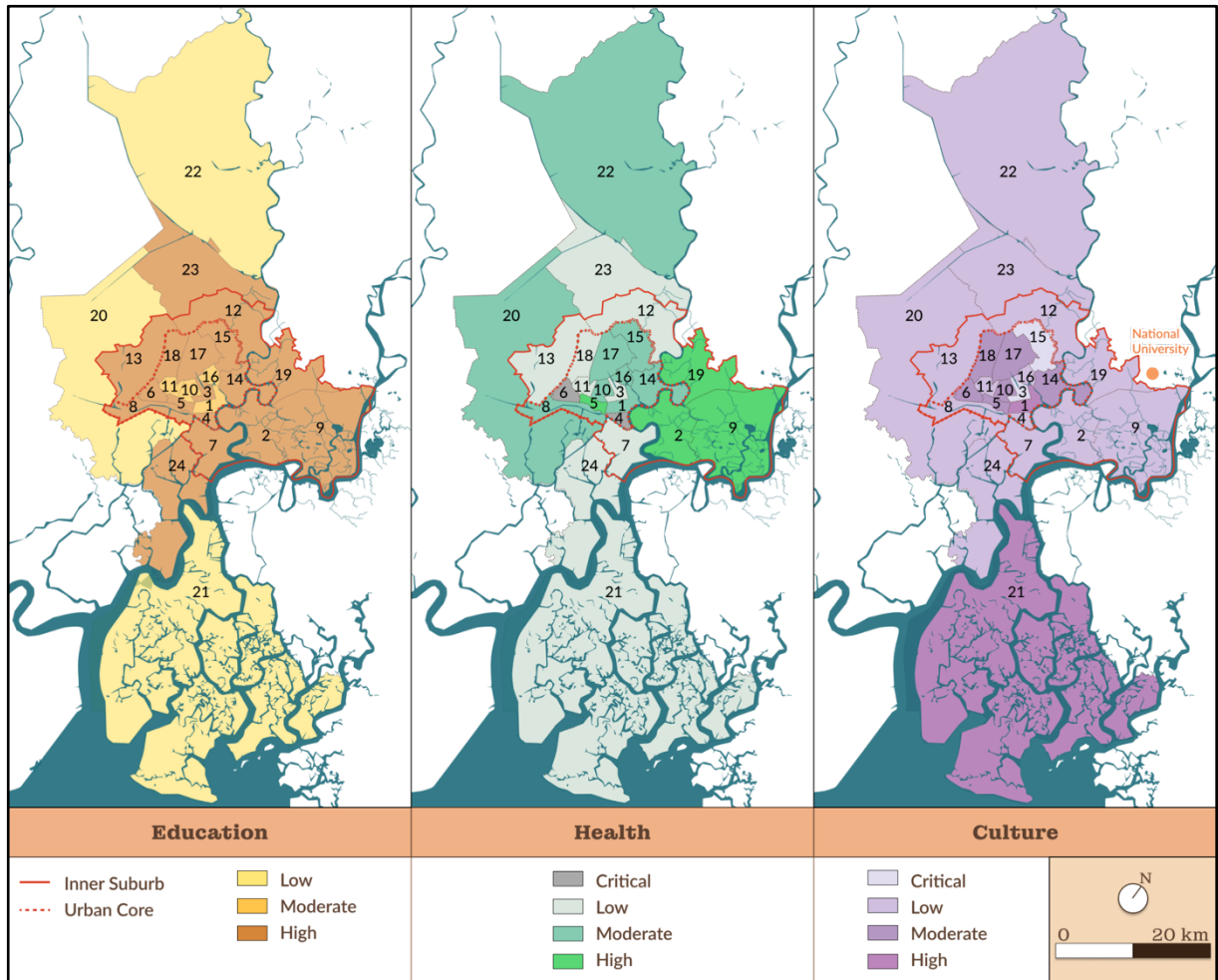
Even though agriculture accounts for a small portion of HCMC's GDP, it is vital to consider its vulnerability since it provides subsistence for some of the poorest sections of the population, but also due to permeable surfaces improving flood management strategies. Urbanization's loss of agricultural land could make HCMC even more vulnerable as it affects agricultural fields, production forests, and parks (ADB, 2010). Therefore, geography plays a crucial role in influencing poverty in both rural and urban areas, although keeping in mind that the vulnerability relations may differ significantly between the two groups.

Sensitive urban communities, on the other, are vulnerable due to their geographic placement, poor housing, and environmental circumstances. Poverty in both situations indicates a lack of resources to deal with adverse economic shocks like flooding incidents and, as a result, vulnerability to climate change effects (ADB, 2010a).

The Maps of Education, Health, and Culture are presented sequentially to understand HCMC's district's spatial configuration better. The three maps were elaborated according to data parameters provided by the HCMC Statistics Office (2021). Each specific parameter value integrates an arithmetic mean for each case, ranking the results between *Low*, *Moderate*, and *High*. In the case of Education and Culture, where there is a bigger overlapping of District values, the level of *Critical* was added.

¹⁵ In 2021, investments in the agricultural, forestry, and fisheries sectors were 1,070 billion VND, or 0.4% of the total gross domestic product (GRDP; HCMC Statistics Office, 2021).

¹⁶ Poverty Rates are from the Inter-ministerial Poverty Mapping Task Force (2003; ADB, 2010b, op. cit. Lempert et al., 2013, p. 41).

Fig. 13 - Maps of Education, Health and Culture Standards¹⁷

The Map of Education¹⁸ presents a clear division between the urban and rural settings, in which the rural Districts 20, 21, and 22 present the lowest result for the education crossed analysis. Overall, the majority of HCMC districts present high comparative values regarding the analyzed educational parameters. Districts 1, 10, 11, and 16 are exceptions, presenting moderate or average values. Regarding the last, the results can be related to the higher population concentration in these districts and the consequent lower proportion between pupils and teachers.

The Map of Health¹⁹ shows a similar distinction between urban and rural settings. The higher numbers of health establishments are primarily concentrated in the inner suburbs, namely District 5 and Thu Duc

¹⁷ Data from HCMC Statistics Office (2021).

¹⁸ Elaborated based on District's data of relation between the number of professors and pupils for pre-schools (public and private), and general education (HCMC Statistics Office, 2021).

¹⁹ Elaborated based on the District's data of concentration of health establishments and highest numbers of HIV/AIDS deaths (HCMC Statistics Office, 2021).

City (composed of Districts 2, 9, and 19). Meanwhile, the rural districts present low or moderate standards.

At the same time, the highest cases of HIV/AIDS deaths are located in Districts 3, 4, and 6 (HCMC Statistics Office, 2021) in the inner suburbs; two present critical health results according to the dual analysis. These findings bring exciting questions on the reasons for its results, and except for District 3, it may be related to the economic aspects previously analyzed. However, a more careful and precise investigation must be made to approach further enlightenment over this critical topic.

The Map of Culture²⁰ illustrates that urban users are the majority in frequenting district libraries, concentrating the highest numbers, except in District 21, the location of the Can Gio Mangrove Forest, which also presents high results.

On the other hand, Thu Duc City offers a low use of these facilities while physically close to the National University, meaning that students and academic members could frequent specific libraries of study areas inside the University complex and other urban core districts.

In sequence, the Maps of Apartment Prices and Urban Vitality²¹ present two more layers analyzing urban and rural land valuation and the ability of physical settings and human contexts to foster thriving social interactions. According to Jacobs (1961, op cit..Yue et al. 2021), Urban Vitality can be understood as the production of a diverse urban life comprised of human activities and living places.

20 Elaborated based on the District's data on the use frequency of district libraries and adequation to cultural standards (HCMC Statistics Office, 2021).

21 Yue et al. (2021) employ alternative ways to reflect urban vitality from the standpoint of constructed and human environments that can enhance it, once incorporating the social dimension, could go beyond the parameters of their research.

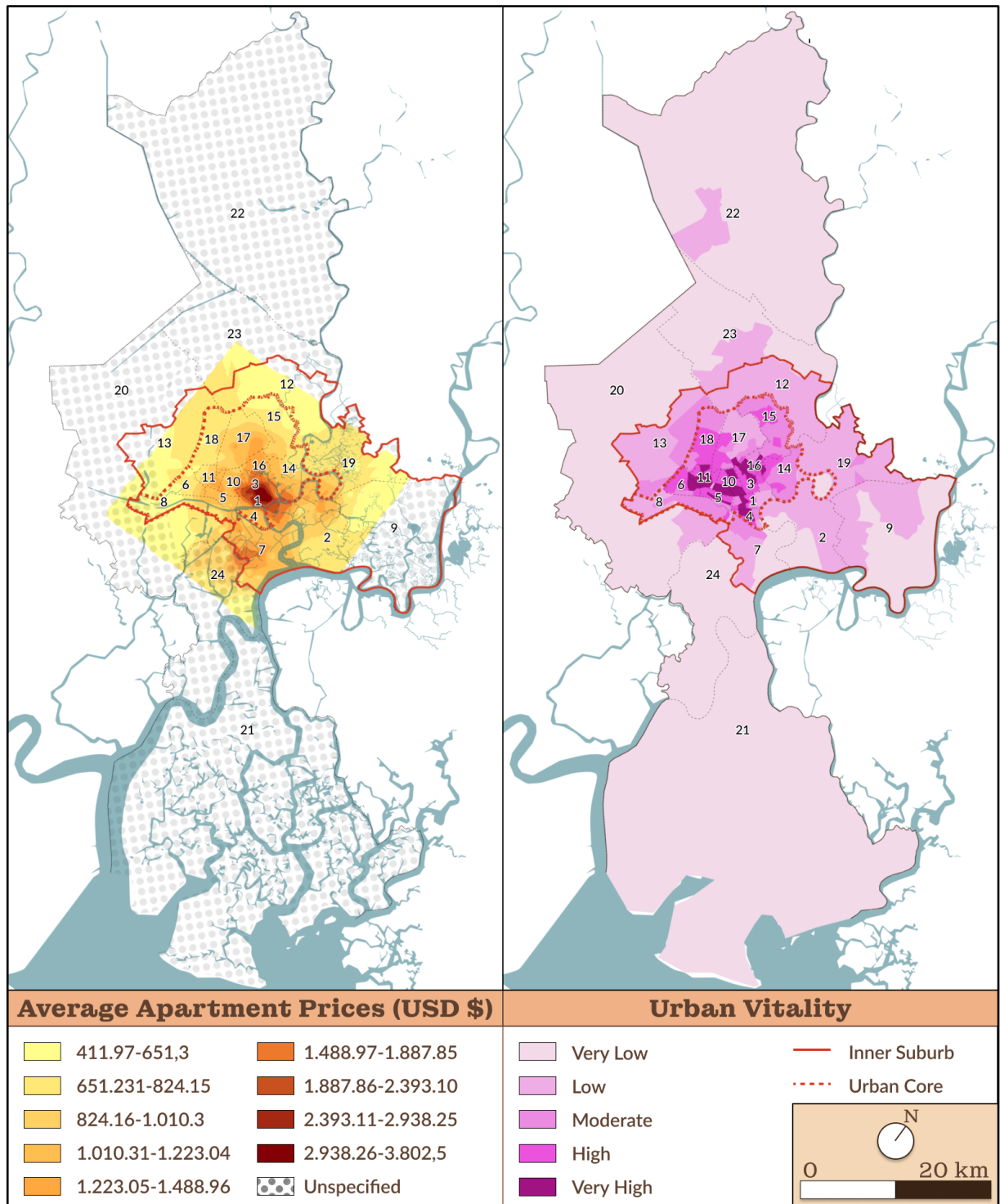


Fig. 14 – Map of Average Apartment Prices (in USD \$) and Map of Urban Vitality²²

²² Based on Kontgis (2014), Chung et al. (2018), and Yue et al. (2021).

The central location determines both Average Apartment Prices and Urban Vitality in HCMC. Central areas often provide better infrastructure networks, amenities, and educational, health, and cultural. The economic distances are diverse and can vary more than 900% from the lowest to highest prices, showing an enormous gap in economic power within the same urban society

As observed in the Map of Average Apartment Prices (left), the housing prices rhythmically decrease as it distances from the central urban node. At the same time, the advent of development and investments in Thu Duc City in the Eastern portion of the city may represent an increasing land valuation dynamic towards this area. It remains to be observed, accompanied and assessed how these dynamics would evolve and influence the urban fabric and its many integrating layers.

Many factors integrate the urban environment and directly reflect on the Map of Urban Vitality (right), as the built environment-human activity relationship is unprecedentedly strong in developing countries' large-scale urban redevelopment and rapid population expansion (Yue et al., 2021).

However, the conditions on which vitality is conceived and measured can be questionable once it implies a perspective of a representative urban model that presents specific and not limiting dynamics. For example, assuming that vitality can be a general human measure automatically implies that a human individual behaves under certain circumstances in the urban environment. In contemporaneity, this individual is often represented by a young adult or adult at working age, producing a workforce and contributing to the labor market under a standard pattern. Idiosyncratically, kids or elderly populations are often excluded from these standardized urban modes, deeply reflecting their sense of belonging, comfort, and safety when occupying these spaces. Women are also often marginalized groups, although gradually conquering more space in this setting.

These fast-growing dynamics are also undermining rural models of living and development. In this movement, not only land loses to space but also cultural and social aspects that are usually hard to be measured or visualize. This significant shift is far from bilateral, as it represents an increase in the middle-class rise and overall buying power of the HCMC and Vietnamese population. However, it can also represent shortcomings for more traditional modes of living that present a deep connection with the inhabited land and all the immaterial bonds attached to it.

4.4.1.2. Environmental Analysis

Flooding is undoubtedly the main challenge HCMC faces, especially with increased extreme climate events. The maps below present two composed perspectives of these circumstances: firstly, analyzing the relation between regular or tidal flooding and the topography, and secondly, between the significant rain flooding spots and the urban impervious surfaces.

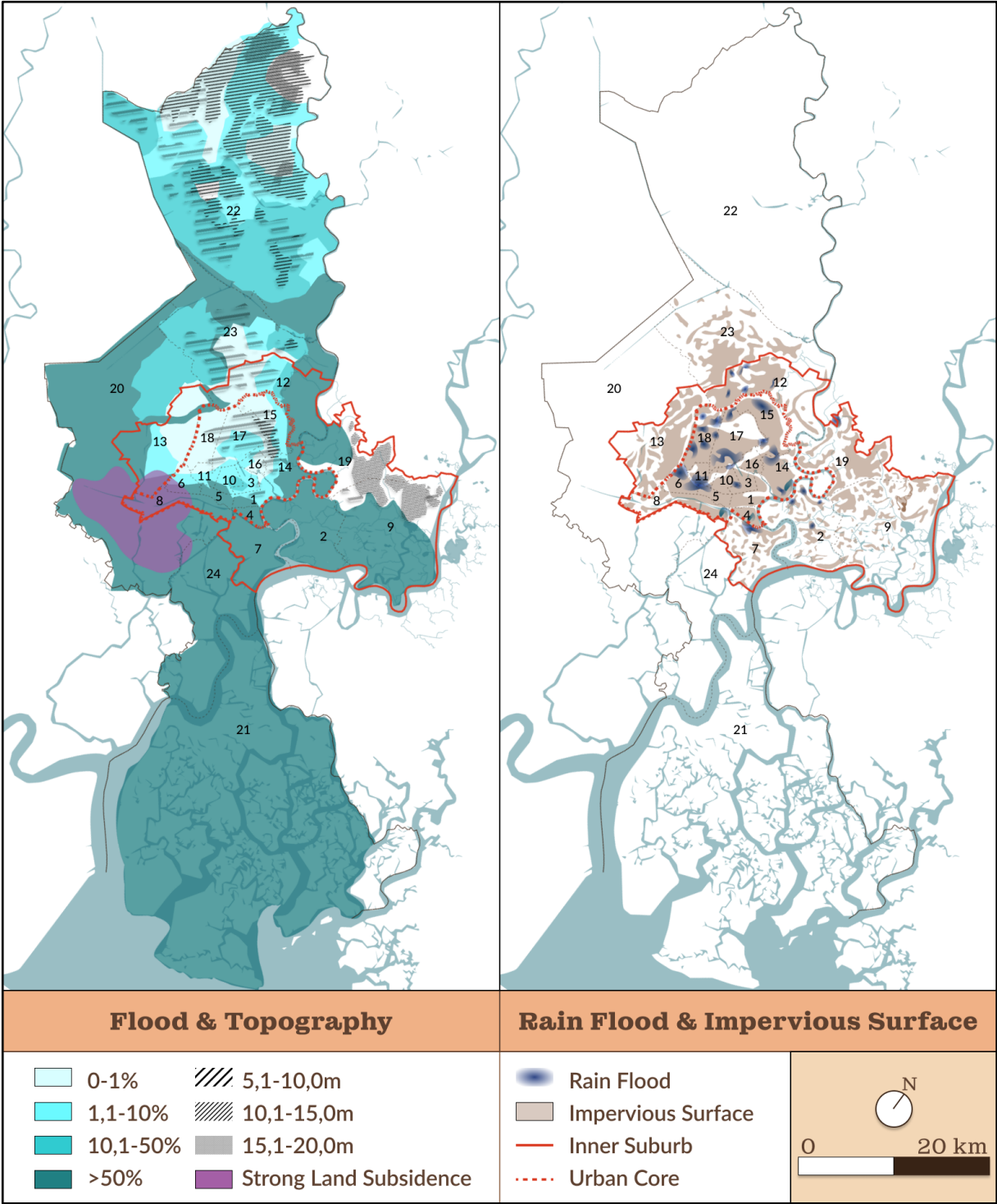


Fig. 15 - Map of Flood and Topography, and Map of Rain Flood and Impervious Surfaces²³

²³ Data from ADB (2010), Nguyen et al. (2014), Tran (2014), and Son et al. (2017).

When analyzing both tidal and rain flooding, a fundamental difference is perceived in the territory. The first case is deeply related to how the urban occupation initially sought to establish itself over higher ground, which presents lower tidal or regular flood-proneness, as observed in the left map. With the increase in climate events, these areas are more than ever the safest.

At the same time, the high density of the urban form is often related to the conformation of impervious surfaces, as seen in the map on the right. These conditions increase the incidence of rain flooding, as it decreases the soil runoff. These areas lack green infrastructure and surfaces that help absorb and retain rainwater.

This composed analysis enriches the understanding of flooding in the case of HCMC by adding complementary perspectives on this issue. The increase in climate hazards certainly affects the unpredictability of the events, but they are not the only factor that puts the city in such a vulnerable position. The extraordinarily dense and impervious urban occupation modes significantly influence the water runoff in the inner suburb or urban core and in the blue network of HCMC.

The provision of green areas, its influence on the temperature, and the production of urban heat hotspots are other layers deeply interconnected to these modern living modes. They are also the balance factor for possible attempts to deal with contemporary climate challenges. The two maps below present the green infrastructure organization in HCMC and its profound contribution to urban and rural climates.

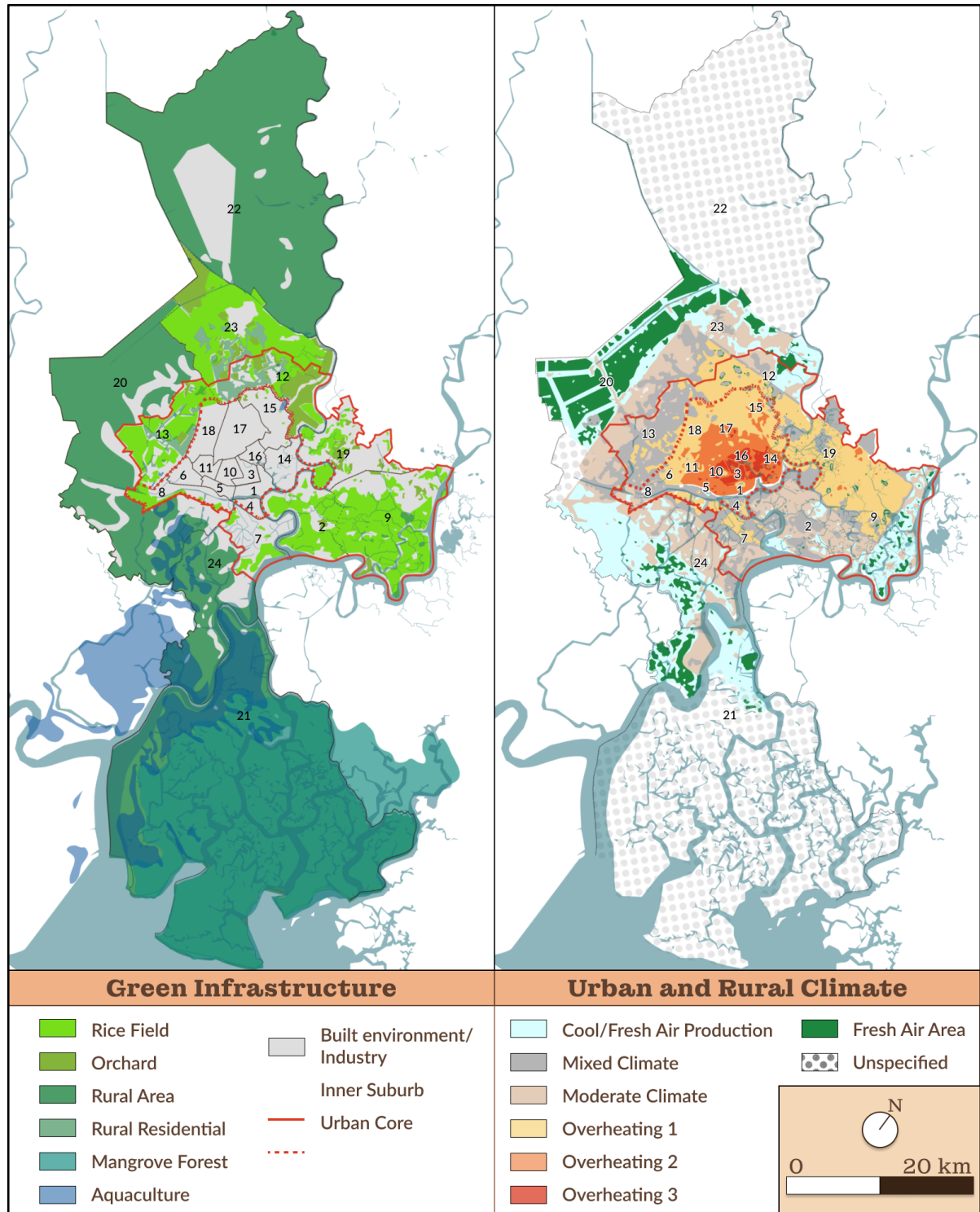


Fig. 16 - Map of Green Infrastructure and Map of Urban and Rural Climate²⁴

²⁴ Map of Green Infrastructure (data from Waibel et al., 2007; Kontgis, 2014; Son et al., 2017). Map of Urban and Rural Climate (data from Kraas et al., 2023).

Overall, the green areas in Ho Chi Minh City sit below the recommended. According to the Vietnamese Government, the regulation on average public green area per person is 12 to 15m² ²⁵, while in HCMC, the estimations are 2.4m² per person.

The Map of Green Infrastructure presents the GI provision in HCMC as related to urban and rural land uses. However, it also shows significant differences between the inner suburb and the urban core. First, there is an extreme lack of urban green areas, being not even sensitive to the visualization on the left side map. On the other hand, the inner suburb can be seen as a transition area between the highly dense urban and the rural uses in HCMC. In this wedge, most green areas are related to the presence of orchards and perennial trees, remaining rice fields, and a few rural housings.

The most significant portion of HCMC is still composed of vast dimensions in rural areas, with rice fields. Alongside the city's southern portion, aquaculture and mangroves integrate the landscape, and industrial and urban built-up areas towards the northern portion.

The Map of Urban and Rural Climate (right, Kraas et al., 2023) is calculated based on the index PET²⁶, which relates to physiological thermal comfort. The analysis shows rich layers, ranging from Cool and Fresh Air Production or Fresh Air Areas, passing by Mixed and Moderate Climates until three levels of Overheating. Overall, the analysis assumes that thermal comfort is diminished if heat storage is increased.

Districts 3, 10, 14, and 16 are negatively highlighted as the main points of convergence of higher PET values, also strongly affected by the urban heat island because of the severe lack of trees on major roads. At the same time, current investments in urbanizing Thu Duc City utilize the image of District 2 as an area of fresh water and trees suitable for a Western standard living environment.

The relation between the GI provision and urban climate is noticeable by placing the two maps side to side. While the urban core is a solid overheating center, the inner suburbs present similar transition conditions (as observed in the Map of Green Infrastructure), with a few Cool and Fresh Air Production and even fewer Fresh Air Areas. These, especially the last, are concentrated more in rural settings.

With that, initiatives that support the re-insertion of GI into the inner suburb of HCMC could positively influence the increase of thermal comfort, possibly influencing the living standards and public health. GI and NbS in multiple implementation scales, from city-wide to the neighborhood, and more individual initiatives can find a place considering the consolidated urban uses. An assessment of HCMC potentialities and needs from a more general to detailed scale can assess these issues and promote tailor-made guidelines for specific situations while building a cohesive green system over the city.

²⁵ Available at <http://dwrn.gov.vn/index.php?language=vi&nv=download&op=Sa-ch-Ta-i-lieu-tham-kha-o/Bao-cau-Hien-trang-moi-truong-Quoc-gia-giai-doan-nam-2016-2020>, accessed in 25-07-2023.

²⁶ The index PET (Physiological Equivalent Temperature, Höppe, 1999) is a widely used index that adapts well to outdoor settings and is used to assess the classification of the urban climate in various climate areas and the urban climatic maps (Kraas et al., 2023). In the exposed Map of Urban and Rural Climate (Fig. 16), the classification ranges from cooler areas to the Overheating 3 or high potential risk areas (with a PET of 30-35°C).

4.4.1.3. The Master Plans

In 2019, the DPA in Ho Chi Minh City organized an international competition to select a development model for HCMC East or a "highly interactive and innovative district" (HCMC, 2019, p. 1), as Thu Duc City was yet to be established as a city. This initiative solicited innovative concepts and approaches to urban planning, specifically focusing on integrating urban spaces with a comprehensive socio-economic development strategy.

The overarching objective of the competition was to explore new possibilities for urban development, focusing on addressing the challenges and promoting sustainable and inclusive growth. The competition was a significant milestone in the city's efforts to transform the Thu Duc area by generating many ideas, insights, and recommendations that could inform future planning initiatives and policy decisions (HCMC, 2019).

This analysis component focuses on comparing aspects of the first²⁷ and second-prize²⁸ proposals for the competition under the lens of climate justice. For this, material from the two masterplans is graphically analyzed, investigating parameters such as the GI provision, climate adaptation, and mitigation initiatives, land use development and changes, relation with the existing urban fabric, and land valuation, among others.

It is fundamental to highlight that the access to material of the two proposals needed to be balanced. The volume of information related to the first-prize team was considerably scarcer than the second-prize team due to what would later be perceived as confidentiality regarding the winning proposal. Even after direct contact with involved members, this circumstance established a considerable barrier to reaching a deeper analysis of the first master plan. On the other hand, the second-prize team could personally share complementary material as long as it would be appropriately managed in terms of authorship and regard for the content produced.

Therefore, the main objective of this dual approach is to enlighten discussion points related to the analyzed parameters instead of arbitrating on the adequacy of the proposals.

Figure 17 presents land use overview maps of the two competition entries.

27 The first prize team was integrated by Sasaki Associates (USA) and enCity Urban Solutions (Singapore) and established guidelines for a timeframe until 2030 (HCMC, 2019).

28 The second prize, entitled "HCMC East Innovation District, The Future is here," was composed of a joint venture between G&A Architecture and Urban Planning (Vietnam), KCAP Architects & Planners (Switzerland), ARUP (Singapore), and Ramboll Studio (HCMC, 2019).

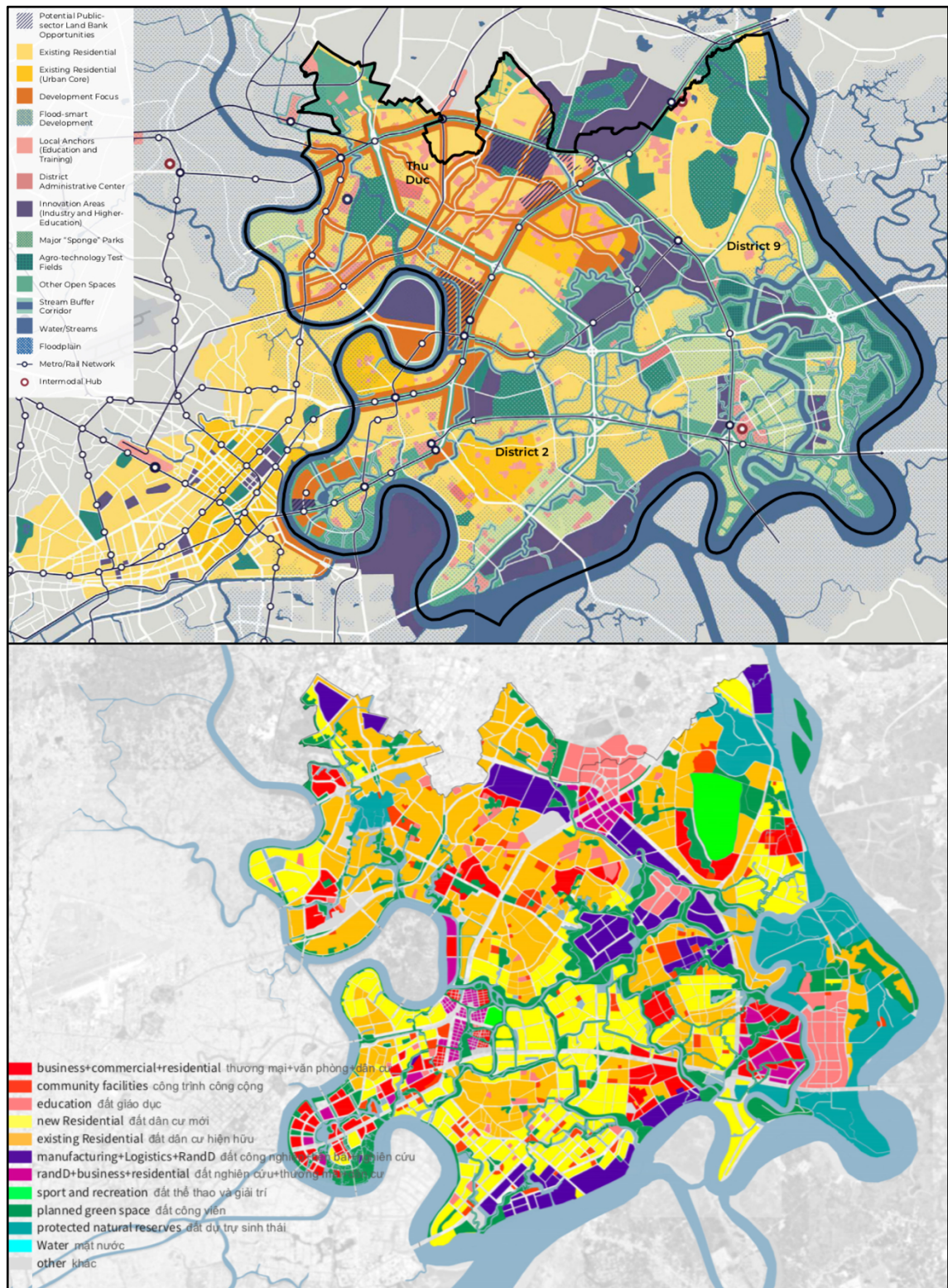


Fig. 17 - Map of Regional Development Framework and Land Use Plan²⁹

The first image presents the composed framework of the correspondent team, including land use, transport, and flood mitigation information. Although this combination seems appealing and complete,

some divergences are observed when observed together with the second image and from its correspondent team.

The first team image is primarily more graphic, following standard and patterned hatches and lines with a noticeable hierarchy, while the second presents a more detailed and realistic scale of blocks and ways. Another example is the information on both maps regarding some of the existing residential areas, as in the westernmost portion, where there is a considerable mismatch between the existing land use.

On the other hand, the choice of the first team in expanding the drawing outside of the Thu Duc City area is noticeable as it shows to be specially connected with the city core in the West and to the National University in the North. This graphic strategy and approach heighten the intentions of promoting the area as a solid urban tissue that would enhance existing uses and promote new possibilities.

In developing Ho Chi Minh City into an international gateway, innovative urban development configures an opportunity to benefit from the young labor, rapid expansion, and high rate of urbanization (HID, 2019). In this matter, wording choices are also remarkable points that can be observed not only in the subtitle of these representative images but in the entire speech of the masterplans. The first prize proposal, for example, often implies terms and strategies towards development and innovation, being these used to name aspects of the above map. This strategy represents one of the many alignments of the winning proposal with the competition's intentions.

Another important aspect of this concordance can be observed in the subsequent maps. Besides establishing a *vision*³⁰ and *urban quality objectives*³¹, the DPA exposed a Map of Hotspot Priority Areas of Interest According to the Call for Proposals, locating these functional sites (Figure 18) in the current Thu Duc City area.

²⁹ Map of Regional Development Framework (first prize team; HCMC, 2019). Land Use Plan (second prize team, HID, 2019).

³⁰ Some of the cited aspects are building a knowledge-based, high-tech, and intelligent city to build the City and Southern central economic region, knowledge clusters, and startup-industry collaboration (HCMC, 2019).

³¹ Namely “Innovative city,” “Urban for people,” “The balance between development and the environment,” “Fast and easy mobility”, and “Scale and location” (HCMC, 2019, p. 7).

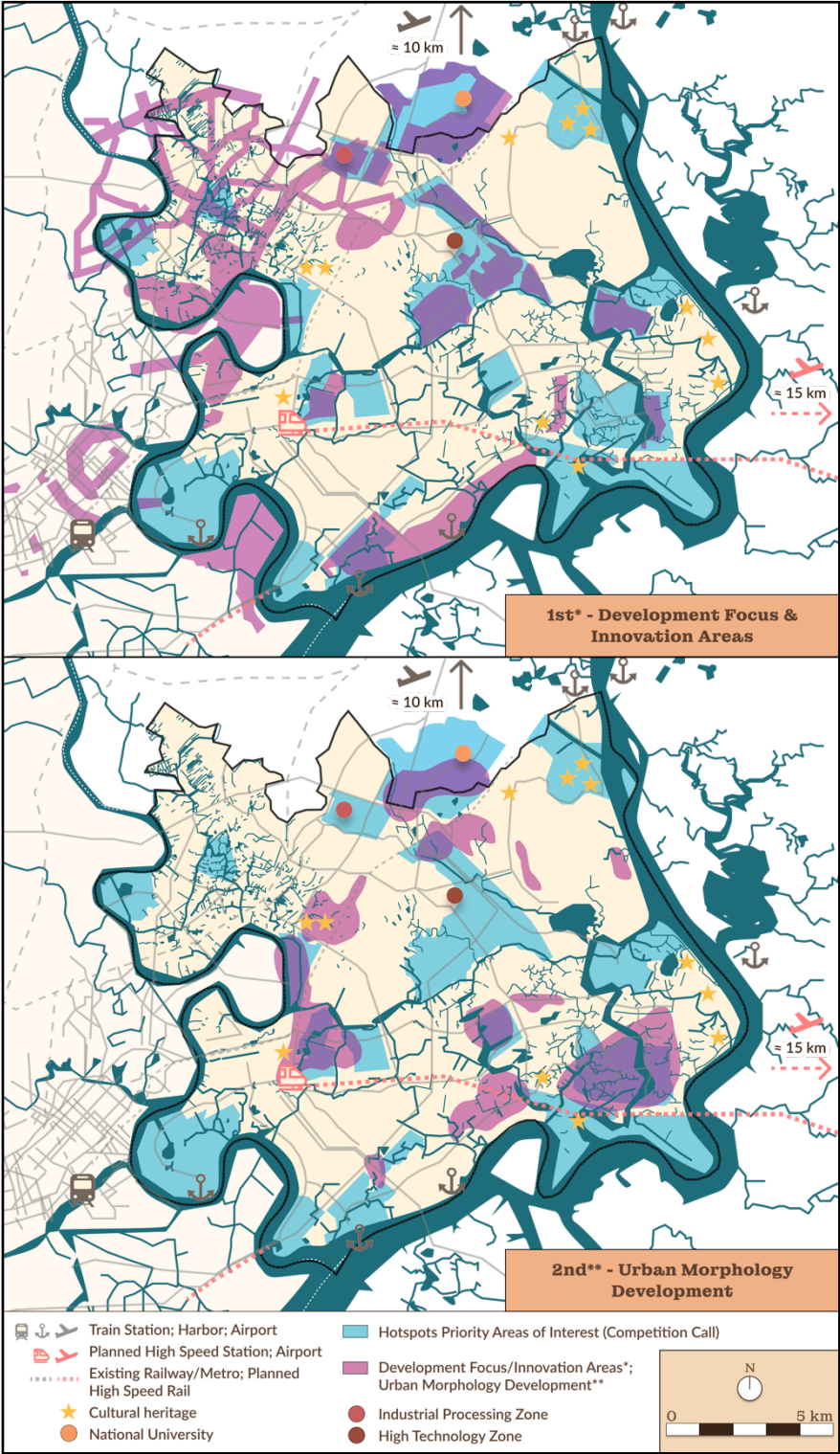


Fig. 18 - Maps of Hotspots Priority Areas, Development, and Innovation³²

³² Based on HCMC (2019) and HID (2019).

The hotspots are first presented in blue in both maps. In sequence, the two masterplans' main proposed changes (in pink) are analyzed to notice overlapping (purple) between these guidelines to establish relations to this aspect of the proposal. In the case of the first-prize team, the analyzed parameters consist of the *Development Focus* and *Innovation Areas*. In contrast, the second-prize team is represented by the primary urban morphology and development changes. Again, the content of the provided material configures why this strategy is based on uneven parameters.

When analyzing the overlapping, the first-prize proposal presents considerably more areas than the second-prize, many of which follow precisely the shape of the hotspots. This result shows that, once more, the winning team seeks requisiteness to the competition call. Meanwhile, the second prize team also follows the established guidelines and takes liberties to design alternative outcomes for their proposal.

In both cases, the highlighted proposed areas also consider the connection with the National University, the Industrial Processing and High Technology Zones, and the importance of the local cultural heritage.

The varied spatial organization proposed by both masterplans is undoubtedly related to diverse specific reasons for each interpretation. However, considering HCMC's sensitive climate and flooding conditions, it feels necessary to look at the two proposals through the lenses of climate adaptation and risk reduction.

From a general perspective, the second proposal presents a more robust planning assessment for how the Thu Duc City territory could seize its environmental potentialities, consequently improving its vulnerabilities and preparing for extreme events. The extensive document provided by the second team presents concerns regarding establishing a cohesive and blue-green infrastructure that would follow a "*liquid geography*" (HID, 2019, p 56) among a detailed framework.

The maps below present a comparative perspective of how both proposals provide GI within the network and how flooding conditions are interpreted in the area.

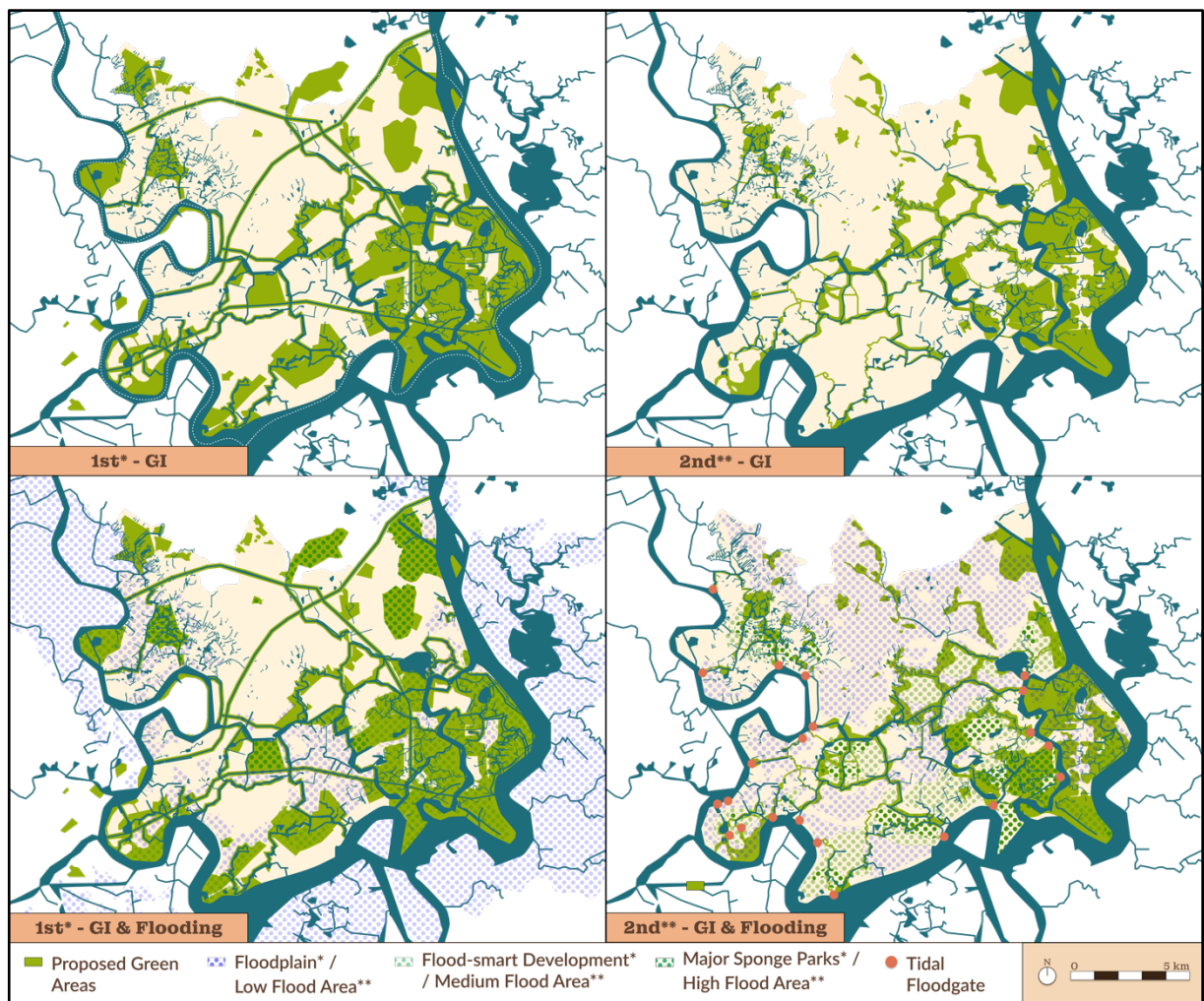


Fig. 19 - Maps Proposed Green Infrastructure and Anti Flooding Measures³³

It is known that the provision of GI and its scale, provided ecosystem services, and delivery of simultaneous benefits impacts differently in the spatial tissue. However, in this case, both Masterplan proposals' Maps of Green Infrastructure are interpreted quantitatively for better visualization.

Under these conditions, the first proposal presents a superior number of green areas compared to the second. However, the shapes and forms differ considerably from one proposal to another, from a planning point of view and regarding the scale and adequation of the urban landscape. Considering the already perceived graphic strategies of the first team, it is questioned if they represent a realistic character. Moreover, this considerable number of green areas is compatible with HCMC's observed urban development and future tendencies.

³³ Based on HCMC (2019) and HID (2019).

Spatial planning has the power to shape the built and natural environment. Therefore, efforts to enhance current conditions are more than valuable. However, one needs to consider and deeply understand the existing dynamics of the territory, which in the case of HCMC, follows organic and unprecedented patterns that adapt to the cultural aspects and needs of the population. When proposing guidelines for this specific territory, this spatiality must be envisioned and act as the backbone of the proposal.

Among the proposed areas, from a closer look, the first proposal establishes 'major sponge parks,' described as sponge landscapes that reduce downstream flooding in the area. The proposal also plans to locate the built environment over higher ground to mitigate possible flooding damages.

The second proposal, on the other hand, highlights an environmental network that becomes the center of the project, described as an urban system organized in functional islands interconnected by the network.

Hence, in terms of scale, the extensive wetlands identified by the first-place winner are contrasted with a system of networks proposed by the second.

Also, the representation of flooding is graphically divergent in both masterplans, as observed in the figure above.

The first team chooses to represent 'floodplains' and 'smart-flood development' as an integral part of planning, often interpolating with the proposed GI, but more restricted to the outskirts of Thu Duc City and, consequently, HCMC. By doing so, this approach illustrates the technical flood efficiency of the proposal.

On the other hand, the second-prize team interestingly placed flooding aspects integrally inside the Thu Duc City territory. Although ranking the areas by the level of flood-proneness, this approach assumes the interconnectedness of a system that presents specific vulnerabilities but that tackles them from a more holistic perspective. It also chooses to place tidal floodgates to sew the proposal from an integrated point of view.

Analyzing the territory under the lens of climate justice makes it necessary not only to investigate the provision of GI, the deepness of its characteristics, and related ecosystem services but also how the GI is related to social vulnerabilities and land valuation processes. By doing so, conflicts of interest between various stakeholders, tendencies, and assessment frameworks must be perceived to prepare for the constantly evolving land valuation dynamics.

The maps below bring a collection of parameters, such as a more detailed look at the average apartment prices in the territory, mapping of informal settlements and spatial organization, and quantity of developer's units (locals and foreign).

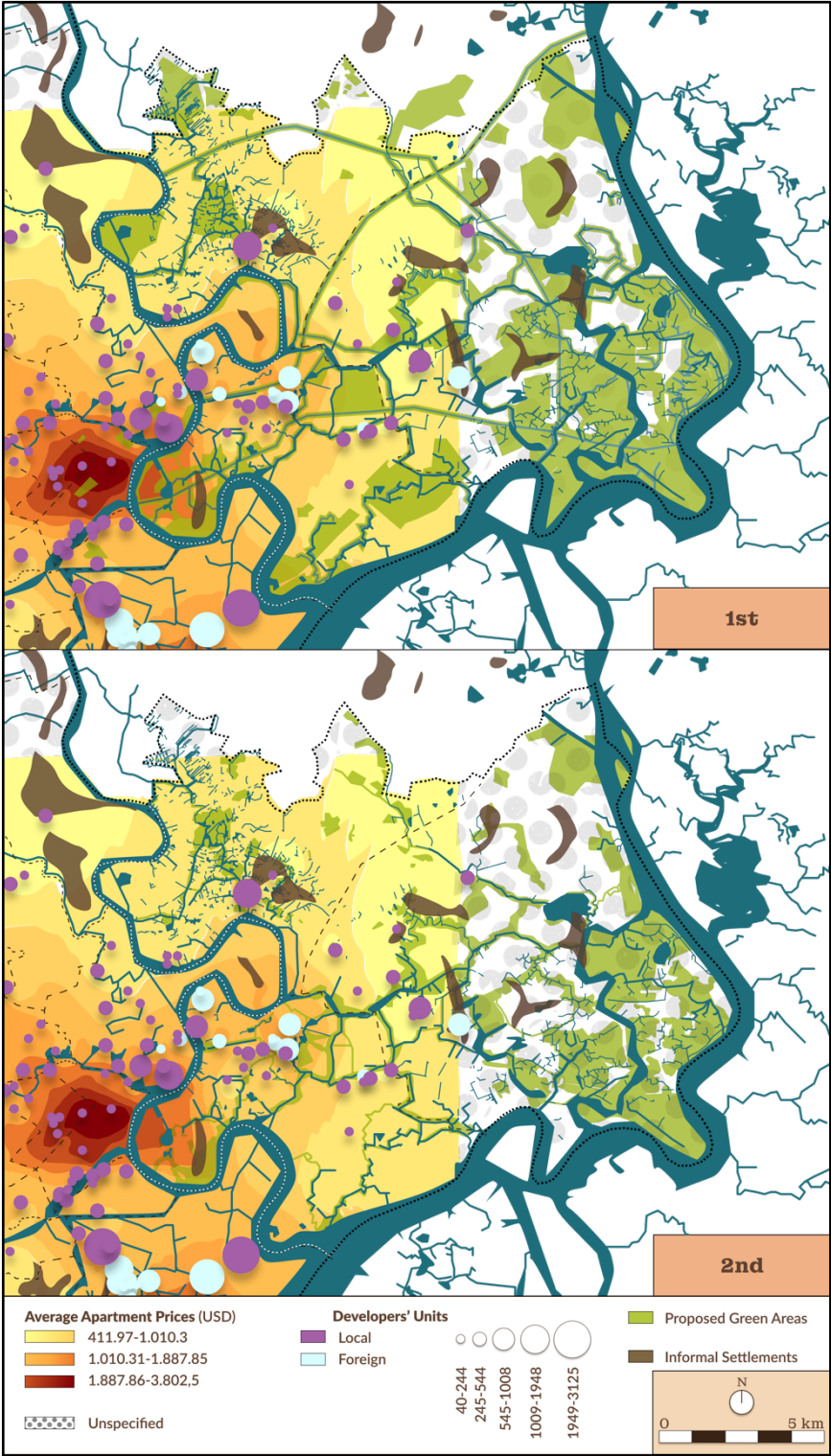


Fig. 20 – Map of Land Valuation and GI³⁴

³⁴ Based on HCMC (2019), HID (2019), Kontgis (2014), and Acolin et al. (2022),

Unlike the other presented maps, this final analysis aims to slightly assess a much more complex interpretation that should be done over time and under a multitude of other different aspects.

In HCMC, aspects such as proximity to the center, green areas, and international schools are already highly influenced by land valuation dynamics (Chung et al., 2018). However, the new planning efforts to re-urbanize Thu Duc City will add new layers of complexity to the existing fabric and reflect considerable changes in the land valuation dynamics. They are, furthermore, pulling the real estate market towards the most valuable areas according to each proposal. Moreover, the various existing dynamics will also add dimensions to the process as the development evolves in the urban tissue and the citizens perceive and relate to the environment.

On the one hand, HCMC has been investing in attracting FDI to its industries, construction sector, and real estate market (HCMC Statistics Office, 2021). On the other hand, as observed in both maps, foreign investors invest in more consolidated areas closer to the urban center. However, an expanding movement toward the eastern portion of Thu Duc City is equally perceived.

On-site upgrading initiatives often comprise the provision of infrastructure and subsidized loans for house renovations or the diversification of sources of income. Despite the fact that this method has already improved living conditions in a number of HCMC districts, it might not be the best long-term strategy for particularly susceptible places (for instance, regions that frequently experience floods). As seen in the above maps, Thu Duc City is home to significant informal settlements, mostly tube houses along riversides and highways, some of which are in the newly planned green areas. In certain situations, relocation could be required.

Therefore, displacements are a fundamental aspect to be analyzed, especially considering the noticeable land use and morphology changes and the adaptation to a more environmentally centered urban design. Since the increase in extreme events, there is a scheme in place in Ho Chi Minh City to relocate families away from rivers, canals, and sewers (ADB, 2010).

Sustainable urban development is connected with healthy social conditions, in which housing configures the basis of these relations. However, in any of the masterplans, no mention of terms such as *informality*³⁵, *resettlement*, *displacement*, *relocation*³⁶, and *social housing* was within this context.

4.4.1.4. Results Discussion

Considering the specific case of HCMC, the material on environment, flooding, and climate information is more present in academic and literature references. To build a more holistic overview of the current context of the city, the exposed composed analysis aimed to assess not only environmental potentialities and vulnerabilities but also to add socio-economic layers to these analyzed aspects. In this context, social

³⁵ Only two incidences were noticed in the second-prize proposal during the morphological analysis of the territory in which “low-rise informal shop houses” were mapped (HID, 2019, p. 21; 47).

³⁶ The only incidence was perceived in the first-prize Masterplan, but regarding relocating industries and investments only (HCMC, 2019, p. 21).

vulnerability can be understood as a collection of indicators that distinguish between actual vulnerability and coping capacity, or the capability to recover after an impact, on the one hand (Blaikie et al., 1994).

However, when building the maps of analysis, it was a challenge to illustrate how the social layer manifests in the territory due to its restricted publicity, the scale of analysis often limited to the district level, and the accessing data sometimes solely in Vietnamese.

However, the choice of spatially distributing these layers comes together with the need for a better understanding of the social vulnerabilities to possibly develop solutions. Unfortunately, the social level of analysis was perceived as generally lacking in both masterplans.

As behalf of dynamic human relations, social layers certainly add deepness to the analysis and feasibility of development plans as they relate to one another. Education, for example, can also be highlighted as it is deeply related to gender equality; once having a quality education infrastructure allows women to occupy more places in the labor market.

Moreover, when assessing diverse vulnerabilities from social, economic, and environmental layers in an integrated perspective, many interpolations are often perceived as a result of the richness and complexity of a particular territory.

The Urban Climate Map is one example, as it links environmentally vulnerable areas in terms of climate and resulting heat stress increase with social factors and identifies overlapping. Older people are more sensitive to heat in a dangerous way, determining risk areas, including social vulnerabilities to heat stress. Especially regarding climate change scenarios, the master plan of the urban development of HCMC can also be integrated into sector planning. Future land use developments can be added as a layer to the urban climate map to see their effects and show how the urban climate will change due to newly developed regions or something similar.

When crossing the GI provision in the territory and land valuation, it is noticed that the most expensive locations in HCMC currently need to be directly connected to the high-scale presence of GI. However, a growing trend is proposed by the newest urban planning efforts, including the masterplans, in which the proximity to the green areas and the valuation of green-blue infrastructure would become the most desired areas to inhabit.

Ultimately, the competition represented a critical step toward realizing the city's vision of creating a more livable, equitable, and prosperous urban environment. By embracing a collaborative, forward-looking approach to urban planning, the city is positioning itself to meet the complex challenges of the 21st century and to build a better future for its residents. Nevertheless, balancing the trends from the past, assuring respect and inclusion of local knowledge, and attempting to build a new image for the country is still a considerable challenge.

Moreover, among the proposed framework of innovation and urban development and the current climate context of HCMC, it is wondered how the masterplans can also ensure climate justice. Furthermore, specifically regarding the GI provision, remains the question of whether the proposed improvements will follow a balanced distribution among the general population despite its economic condition instead of limiting its access and establishing segregating dynamics.

4.4.2. INTERVIEWS

The interviews aimed to approach the case study through multiple insider perspectives and to build knowledge about governance and multidimensionality in decision-making processes.

The first four subchapters present a continuous narrative of the results from the interviews with authors and planners. For each subchapter, the content of the interviews is systematized in tables following a comparative perspective on the questions from the Interview Guide.

The fifth and last subchapter presents an overall vision of the most highlighted inputs from authors and planners directly involved with the master plans, researchers, NGOs, and civil society. In this case, a SWOT Analysis presents the results to connect the previous concerns and build a multidimensional picture of the contemporary planning context in HCMC.

4.4.2.1. Design - Elaboration and Governance

The table below presents aspects regarding the elaboration processes of both masterplan proposals, such as technical information, articulation with other policies, and governance.

Table 3 – Elaboration Process and Governance

	Questions	Answers	
		1st prize team	2nd prize team
Base, Complementary mechanisms, Transdisciplinarity	What is the central vision or objective of the plan?	Promote innovation & entrepreneurship; Paradigm shift in urban living: resilience, climate change & entrepreneurship to coexist (16); Enable public-private collaboration & flexibility within the rigid existing system (18)	Water & stormwater management; Allow nature to flourish; Shift the client industry's perspective & thinking process (13)
	What are the features of this city?	Restore the water identity & prioritize its integration into the city (18); More compact & walkable urban fabric to enhance connectivity (16)	Green-blue network as backbone; Narratives & placemaking techniques; Recover & support wildlife habitats; Encourage close contact with the water (13)
	How long did it take to develop the plan?	3 months; After approval: adjustments & further development (16; 18)	2-3 months (15)
	What were the main steps/stages when conceiving the plan?	Competition; Government funding & close collaboration with the DPA to develop the brief; Initial analysis stage; High-level notion; Government review; Implementation (current) (16; 18)	Competition
	Is the plan articulated with other plans? How?	Yes. HCMC & each District has a master plan (18)	-
	Was the plan a follow-up to environmental, spatial, climate adaptation, and public policies?	Yes. Inheriting all these layers asks for balance between strategic strokes, legal boundaries & physical implications of the proposal (18)	-
Team building, Governance	Who integrated the team?	2 companies; Collaboration: landscaping, basic concepts, & engineering (16); Team partner responsible for landscape & urban design (18)	4 companies with diverse focus: (i) engineering, landscape & green infrastructure; (ii) human-centered urban design; (iii) local know-how; (iv) economy & transport (13; 15)
	How did it balance international knowledge with local expertise?	Local team partner & currently a second local planner (16)	Singapore partner as local know-how; Employed local experts (15)
	What about governance and hierarchy? Was it based on a top-down, or bottom-up model?	Top-down	Top-down
	Mainly to whom is the plan built for?	High-income and foreign professionals (17)	-

The central vision of the masterplan proposals configures a primary and fundamental difference between the approaches described by the two teams. When inquired about this topic, the winning duo highlighted that innovation and entrepreneurship are central aspects of their proposal. Besides that, resilience and climate adaptation configure a “paradigm shift” in urban living (I6). They also mentioned the project's feasibility, finding support in public-private partnerships to seek flexibility within the existing rigid system (I8). On the other hand, the second-prize team highlighted the environmental dimension of the delicate climate situation of HCMC. Water and stormwater management are at the core of their proposal, which aims to allow nature to flourish meanwhile shifting the thinking process and the client's perspective (I3).

Both teams have mutual environmental features and strategies for climate change adaptation, such as floodable and sponge landscapes to supply the significant water demand. However, the interview with the second-prize team presented a more detailed program on how these features shape and integrate the existing and proposed urban environment.

Due to the result of the competition and further established decisions, there is a clear gap between the actual development of both proposals. Therefore, the blank answers of the second-prize team are often related to the fact that the proposal could not evolve in specific aspects. This condition is clearly expressed in the fourth question and reflected in the subsequent answers.

Regarding articulation with other projects and policies, the first-prize team explained that when developing the master plan for Thu Duc City, they also “inherited” the task of balancing it with other districts and the city master plan. According to I8, this is a highly challenging task because it asks for strategic strokes in the political and design aspects of the proposal.

Regarding team building, the teams also show significant differences. A member of the first-prize duo described the integration of two companies as collaborative, in which they had shared tasks (I6). However, another team member commented that their team partner was responsible for landscape and urban design (I8), leading to unclear answers about how the task sharing happens in their development process. On the other hand, the second-prize team shows a more apparent distinction between the four integrating companies' parts and awareness of their collective mindset (I3; I5).

Nevertheless, regarding governance spam, both teams based their approach on a top-down model during the approximate three months they had to develop the proposal. When asked if their scope includes any type of participatory processes, one of the members of the first-prize team said that “(...) planning competitions, especially with short timelines, often do not allow sufficient time for extensive research and community engagement required for a comprehensive Master Plan.” (I8), the last answer about whom the plan is built for is a short synthesis of a civil perspective (I7), a local currently observing some of the changes proposed by the masterplan development.

4.4.2.2 Development - Engagement process

Table 4 presents questions and answers regarding the participatory components of the first-prize team proposal. In the case of the second-prize team, engagement processes did not happen during the development of the competition proposal due to time and format constraints, according to I5.

Table 4 - Participatory Processes

	Questions	Answers	
		1st prize team	2nd prize team
Participatory Processes	Was there public participation?	After the competition. Online due to the COVID pandemic, but not as much as expected (I6; I8)	No
	Was the population involved?	After the competition. Research & engagement process with government agencies & companies (I6; I8); 8 workshops with local authorities, diverse experts, districts representatives & universities; Surveys with 170 businesses (I8)	No, due to time constraints (I5)
	What kind of population was this?	Most businesses (SMEs) (I8)	-
	Were there local stakeholders involved?	Yes	-
	Was there a focal point or local champion most interested in the project participation?	Businesses: The area's nature attracts young, innovative & dynamic companies; Close connection to the high-tech park manager (I8)	-
	How did real estate investors show up or not?	Few (I8)	-

In the case of the winning team, engagement processes started being developed after the master plan approval, following a biased approach in different steps. Regarding public participation, the team created an online platform³⁷ to gather opinions from civil society during COVID, seeking flexibility within the physical and political limitations. However, the engagement could have been stronger, and this website component is currently defunct (I8).

Although potentially engaging, this initiative still assumes that one has to have minimal knowledge of the processes, internet access, and functioning mental abilities to participate, and therefore it can be exclusionary.

More robust engagement processes happened with the government sector, experts, district representatives, universities, and businesses (mainly SMEs). I8, a member of the first-prize team, affirmed that, among all groups, businesses were the most engaged, and considerable efforts were made to supply their interests and needs. *“Considering Thu Duc’s vision as an innovative economic hub, engaging with them was particularly important. We conducted surveys on which kind of innovation and startup we had with about 170 businesses to understand what they need, where they are, and how they feel about the development. And then after, we organized two business conferences where we shared the master plan and incorporated their perspectives to understand their needs.”* (I8).

When asked about real estate investors' participation, the interviewee said only a few attended the activities.

I6, from the winning team, reinforces that their local partner leads a robust engagement process in which they listen to city stakeholders to become a more bottom-up approach. *“These participatory processes*

³⁷ <https://projects.sasaki.com/thuduc/>, accessed in 13/06/2023.

are something we're working on right now. Part of this was done during COVID, so we did many things online. But now it's become much more engaging." (I6).

However, in the talk with their local team partner, the interviewee seemed somehow surprised by this statement, as they are not directly engaging with the civil population (I6).

The limitations of the political environment in Vietnam are fundamental aspects that must be highlighted once it stipulates strict guidelines to be followed, not leaving much room for flexibility in community engagement practices. *"Unfortunately, due to the government's control and the interconnected nature of Vietnamese society, stepping outside the established boundaries and asking questions to others can lead to trouble. There is no space for such actions within this context."*, says academic interviewee I9.

I8, from the first-prize team, says, "It's essential to follow organizational processes and procedures methodically. Everything you do needs legal backing, and you must justify incorporating it into something like this. You can't just start talking to people on the street. Due to the challenges involved, organizing workshops with selected participants and staying within legal boundaries is crucial."

As a result, the civil population represented by government sectors is not often directly engaged in the participatory processes. I7, a civil interviewee, comments, *"Most people will not be informed or consulted about policies that are being drafted or are about to be enacted."*

Interviewee I9 interestingly states, "It is paradoxical because the bottom-up process was once based on democracy in the country, particularly during the period of communism from 1975 to 1990 (...)", approximately until the establishment of the Doi Moi Policy.

Therefore, "Understanding the underlying systems (...) is crucial. (...) Developers can often build without strict regulations and set standards. However, developers must align with the Communist Party's vision and contribute to its interests. Failure to do so can result in accusations of corruption and imprisonment" and complements that "This dynamic exists in several countries in Southeast Asia, such as China and Indonesia.", says I9.

4.4.2.3. Development - Results and final design of the Plan

This subchapter presents the gathered results regarding the development of the masterplan proposals for Thu Duc in the form of two tables, due to the content extent. The first table regards the environmental vulnerabilities of the site and the adopted green infrastructure measures, as presented in sequence.

Before analyzing the development aspects, we highlight the saying of I8 from the first-prize team, *"The winning entry from the competition does not necessarily represent what is currently being implemented."*, either due to governance, design, feasibility, economic or other reasons. Therefore, the firsthand information the first team interviewees provided represents a complex source of the most up-to-date development of the winning masterplan, which inclusively differs from the competition entry. On the other hand, the information provided by the second-prize team is strongly based on the competition entry. It, therefore, has a more theoretical character once its proposal does not go further in practical development.

Table 5 - Environmental Vulnerabilities and Green Infrastructure

	Questions	Answers	
		1st prize team	2nd prize team
Environmental vulnerabilities	What were the major climate hazards found?	Flooding (I8)	Flooding (I3), water-related issues (I5)
	Did any area get specific highlights or shown to be more vulnerable to climate change effects?	Old Thu Duc District, a soon-to-be relocated industrial cluster with a vulnerable population living in the waterways (I8)	Not solely about individual points; Necessary to consider the entire system; Identified three development corridors susceptible to flooding (I3)
	Which main measures were taken?	Understand the low-lying & vulnerable areas; Map ecologically sensitive areas; Development strategically situated on higher ground (I6)	Water runoff reduction: address the flow, promote additional space & release; Drainage for dry periods & prepare for extreme weather events; Integrate infrastructure plans and future developments into the risk analysis (I3)
Green Infrastructure (GI)	Were there mostly gray infrastructure, nature-based solutions, or mixed strategies?	Mixed (I6)	Mixed; NbS everywhere as a base; Structural measures as a control mechanism to regulate runoff & water levels (I3)
	On which scale were the NbS thought?	City, neighborhood: floodable & sponge landscape/parks (I6)	Large-scale to fine-grained: wildlife habitats, green roofs, swales, rainwater harvesting tanks, bioretention basins, vegetative swells, rain gardens & detention ponds (I3)
	Were there also preoccupations with connecting ecosystem services?	-	Blue-green infrastructure system; Fauna & flora habitats; Robustness (I3)
	How were these strategies conceived?	Maintain existing canals; Widen buffers for increased holding capacity; Preserve wetlands & mangroves (I6)	Rethinking the landscape while considering urban expansion; Protecting the development from potential disasters (I3)
	How do the adopted strategies relate to resilience?	Heat resiliency by providing the right level of shade; Ensure circular economy recycling gray water (I6)	Following the landscape morphology; Holistic flood prevention system; Rainwater harvesting, purification, storage & reuse (irrigation, domestic, leisure); Seasonality; Biophilic perspective; Human interaction (I3)
	Was local knowledge considered? How?	The team partner has a local well-renowned firm of flood mitigation and hydrology experts (I6)	Local partners (I3)

Flooding and water-related issues can be significant climate threats to HCMC, as agreed by both teams. However, the answers diverged when asked if any area got particular attention. The first-prize team highlighted that the northern part of the old Thu Duc District encompasses an environmentally sensitive area with a strong presence of water channels and vulnerable communities living under inadequate conditions. However, this answer was not established in the early proposing stage, being later evaluated to address improved housing conditions for vulnerable groups (I8).

The second-prize team accentuated that systemic water management is not about individual spots but recalls for a multidimensional perspective (I3). In this sense, the interviewee mentioned that their proposal recognizes what they call three “*development corridors*” more susceptible to flooding: “(...) if a current channel is 100 meters wide, why not widen it to 400 meters by designating reserved areas for water expansion and detention? This approach creates a fluid geography that we have conceptualized and embraced.”

In terms of adopted measures, both proposals again have common points, although the level of explanation of the details regarding these features differs from team to team. For the first-prize team, it was fundamental to understand the low-lying and vulnerable areas to situate the development on higher ground strategically (I6).

On the one hand, the first-prize team was either upfront about their limitations in discussing topics due to confidentiality reasons; or succinct, with some responses mainly limited to "yes," and "no,"; or even seemed to avoid addressing specific topics. For instance, when inquired about plans and measures for relocating people due to the potential overflow of extreme predictions, the interviewee stated that their stormwater management strategy would prevent such a situation (I6). This absolute answer shortens the discussion as it admits that the system is unfailing and does not contribute to dealing with the risk prevention of major climate issues.

On the other hand, the second-prize team mentions precise strategies for water runoff reduction, dry periods, and extreme weather events as it integrates infrastructure plans and future developments into the risk analysis (I3). This asymmetry reflects the impression that the second-prize team has a more robust strategy and is prepared for uncertain scenarios.

This same difference is also noted regarding the related ecosystem services. Meanwhile, the first team does not underline specific strategies in their speech; the second team often mentions how the blue-green infrastructure system provides fundamental connections to fauna and flora habitats (I3). *"We create distinct public spaces that reflect seasonality and help people understand the fluctuations associated with water. And when we harvest it locally, gradually releasing it into more extensive waterways, we protect against flooding."*, says I3.

Another resembling point is the wide usage of NbS, supported by gray infrastructure, within a mixed water management system. The second-prize proposal adopts NbS in the entire system as a base, from small to large-scale, meanwhile also adopting heavy engineering measures as a control mechanism to regulate runoff and water levels (I3).

When inquired about the innovation of the adopted strategies, specifically regarding NbS, the interviewee adds that they are based on ancient techniques, *"It's just along the way, we've forgotten what nature has given us as opportunities, and we've chosen the engineered approach above anything that character has to provide us. (...) We haven't discovered anything entirely new; we just forgot about these practices."* (I3).

Regarding resilience, the second-prize team brings human interaction as a vital component for the maintenance of the project over time. By adopting this biophilic design approach, I3 says, *"By rediscovering and embracing them, we become their protectors. Through this process, we learn about ecology and water management and become activists who say, 'Don't develop this area because it's essential to me as a person.'"*

However, integrating these GI strategies with local knowledge was resumed to involve local experts in both teams' design and implementation processes. The inclusion of popular knowledge or a deeper connection with these terms of the local culture was not perceived in any interviews with planners and authors.

Ultimately, the environmental vulnerabilities seem well perceived and count with rich perspectives on how to be approached. The second table presents findings on social vulnerabilities and how the masterplan proposals relate to land use valuation processes.

Table 6 - Social Vulnerabilities and Land Use Value

	Questions	Answers	
		1st prize team	2nd prize team
Social vulnerabilities	What were the biggest social vulnerabilities identified within the territory?	Affordable housing (especially for immigrants), public health & urban overcrowding (I8)	Infrastructure & social amenities (I5)
	How did the plan look at the differences in the territory in terms of climate and social challenges?	Competition: no proactive effort to engage directly with vulnerable populations; Later: collaborating with local authorities & gathering on-the-ground knowledge (I8)	Current urban development as unplanned; Lead to risk vulnerability (I5)
	How does it relate to informality?	Development considers the existing illegality of the local population & ensures their access to the improvements (I8)	Considers the existing land uses & applies an urban regeneration approach (I5)
Land Use and Valuation	What are the social gains provided by the plan?	Place-making livability (I6); Equitable access, public parks (I8)	Climate & environmental awareness; Sense of connection & appreciation; Creation of small communities, altering the overall scale of the landscape & providing opportunities to enjoy the outdoors (I3)
	Does the plan propose considerable land use changes?	Significant. Seeks for balance in restoring & rehabilitating the existing urban fabric (I6)	Minimal, due to the existing programs on-site (I5)
	Have there been relocations according to these new uses?	There will be (I8)	Speculative: not a choice but a necessity; give-and-take approach (I5)
	How did these processes happen?	Will be strategically relocated to new areas (I6)	Speculative: another zone should be allocated; open & public spaces as compensation (I5)
	May the plan alter established real estate configurations? In which way?	Yes, strategically; Organizing building heights along the central spines to capitalize; Preserving view sheds & access to ventilation (I6)	Green or water areas should become the most expensive location; Emphasizes strategic planning (I3)
	Can the influences in land valuation be anticipated?	The project is well accepted; Initially, investors thought the density should be higher, but now they are approaching (I6)	Natural outcome; People recognize & appreciate the beauty & benefits of urban green areas; Ensure that the edges of the landscapes do not get privatized; Maintain public accessibility to prevent the exclusion of individuals (I3)

Based on both team impressions, there is a general lack of awareness and addressing of social vulnerabilities in the territory. In the competition and even in the current development stage, no team proactively endeavored to engage directly with vulnerable populations (I8). Recalling the mentioned case, the first-prize team later envisioned integrating these communities into the master plan after collaborating with local authorities and gathering on-the-ground knowledge (I8).

To fulfill part of the social demand, the teams mentioned social gains provided by their proposals, such as place-making livability and guaranteeing equitable access to public parks, for example. Furthermore, promoting a sense of connection and appreciation, creating small communities that would alter the overall scale of the landscape and also provide opportunities to enjoy the outdoors.

The provided land use changes consist of significant divergence between the two teams. While the first-prize team proposes considerable changes, the second proposes minimal due to the existing programs on-site (I5). Nevertheless, both teams mention restoring, rehabilitating, and regenerating the urban fabric.

Therefore, the development of the master plan reflects big alterations over established real estate configurations. The teams focus on organizing the buildings along the central spines to capitalize (I6), saying that green or water areas should become the most expensive location (I3). The last interviewee also mentions that this valuation is a natural outcome of rejuvenation projects and that people recognize and appreciate the beauty and benefits of urban green areas.

However, this statement can be limited for several reasons and recalls a highly complex debate about equity and aesthetics. It also reflects unequal situations within the urban tissue, where wealthier and formally educated citizens have more access to these areas. Civil interviewee I7 adds, *“This development will provide more housing for the market, but the situation of real estate speculation in Vietnam makes housing and apartment prices soar beyond the reach of many people. Therefore, developing new projects does not have many positive impacts on the above vulnerable groups.”*

The relocation topic was approached under two circumstances. In the general case of land use changes, relocations were described as strategic, and compensations would be related to the access to open spaces with public edges that guarantee balance among users (I3). Moreover, for the second-prize team, this issue posed a concern but not an anticipated strategy that showed up in terms of the plan due to the nature of the competition and the fact that the team did not win. *“When certain areas were intentionally flooded, it became evident that if people lived there, they would need to be relocated. Displacing the population was not a choice but a necessity. (...) Additionally, another zone should be allocated as part of a give-and-take approach. This is me planning ahead (...) We didn't get to the necessary details. (...) You have to subtract at some point to provide for those uncertain events in the way you design.”*, says I5.

Above all, even with the top level of preparedness, one still may be surprised by how nature behaves under extreme flooding events. Due to unspecified reasons, none of the teams mentioned precise relocation measures for these circumstances.

When inquired if the masterplan includes social housing or specific sites for relocation in its features, the first-prize team said that *“(...) it's not within the scope of the master plan's spatial planning to designate a specific area for social housing, especially one that spans thousands of hectares. That needs to be addressed through policy and administration, which we are working on. However, the spatial plan can only provide limited recommendations. Social housing is better suited for smaller-scale implementation rather than being represented as a large plot of land within the plan.”* (I8).

However, looking closely at the new Masterplan for HCMC, it presents “A network of innovation hotspots for breakthrough development, with supporting infrastructure from city-district-ward level to give opportunities to everyone” (enCity, n.d.). In other words, small-scale fine-grained architecture and urban design projects for a business and formal education development hub.

Consequently, these contradictions leave a few open questions about the nature of the plan. On the other hand, interviewee I8 adds, “All new development and commercial projects in Vietnam are legally required to allocate 20% of land for social housing. This requirement applies to every project, so if you have a 100-hectare commercial land, 20 hectares must be reserved for social housing.” which seems a possible approach to deal with the concern.

4.4.2.4. Envision - Present and Future

The Table 7 presents the results from the last part of the interview questionnaire.

Table 7 - Monitoring and Evaluation and Comments

	Questions	Answers	
		1st prize team	2nd prize team
M&E	Are the measures being implemented? At which level?	Still at a conceptual stage, yet to be implemented; Pilot phase-wide strategy is done; Government is working on the resources to implement (I6)	No, due to the competition's result
	Does the plan proposes a Performance and Monitoring assessment? How does it work?	Smart monitoring system to access all the planning stages; Digital city version, monitor resource optimization efficiencies, & create feedback loop (I6)	Observe how the environment evolves; Make necessary adjustments (I3)
	What are the expectations?	To be soon implemented (I6)	Allow nature to adapt (I3)
Comments	Any recommendations or improvements to the proposal?	Adjustments are being made as the plan is implemented (I8)	Cannot pinpoint a specific change; Learn from every project, including mistakes; Proposal underlying principles are the right path forward (I3)

The implementation of the winning proposal is still at a conceptual stage in which a pilot phase-wide strategy is done. Meanwhile, the Vietnamese Government is working on the resources to implement it (I6).

Even though the second-prize team did not get to develop its proposal, I5 comments on the importance of envisioning further development in high-quality plans: *“Urban planning and design involve preparing for a 50-year timeframe with inherent uncertainty. We aim to create flexible frameworks that can adapt to changing circumstances.”*

Nevertheless, these aspects must be envisioned beyond design approaches and articulating the plan with complementary tailor-made frameworks that will assist the plan over time. I2, an academic interviewee, adds, *“The government tends to believe that creating a plan is sufficient without recognizing that planning is an ongoing communication process. We continuously tell them it's more than creating an excellent fancy plan.”*

When inquired about adopting performance, Monitoring and Evaluation (M&E), and other frameworks, the winning team commented about the current development of a smart monitoring system based on a digital city version to access all the planning stages, monitor resource efficiency, and create a feedback loop (I6). According to the interviewee, this tool is soon to be implemented.

Finally, when asked about recommendations or improvements to the proposal, the interviewees provided distinct perspectives. In the case of the winning team, adjustments are made as the plan is implemented (I8). Furthermore, the second-prize team mentioned believing that the underlying principles of their proposal are the right path forward and that pinpointing a specific change is challenging once the proposal is not chosen. However, the team also mentions that every project provides lessons, including its mistakes (I3).

4.4.2.5. Results Discussion

Although supported by the guide, the interviews proceeded naturally without a rigid Q&A format, resulting in enlightening discussions that went far beyond the interview scope, especially with academics, NGOs, and civil society. A composed SWOT Analysis that synthesizes some of these valuable additional inputs under the lenses of climate justice is presented below.

Table 8 - Composed SWOT Analysis

	Strengths	Weaknesses	Opportunities	Threats
Elaboration & Governance	● Challenge the status quo; Showcase a different perspective, more than a business case (13); ● Modesty & respect for local knowledge (15); ● Expertise reference cases (12; 14; 15).	● Contest: highly political; existing connections could influence the result (13); time-constraining & demanding (15); ● Design-driven projects; Insufficient cost estimation: short, medium, & long term; Dynamics' underestimation (12); ● Commercial approach (15).	● Awareness: climate, sustainable development & urban planning (12); ● Communication and cross-sectoral alignment; Enhance city's ranking; Attract foreign expertise (11); ● Understand the underlying systems (19).	● Contest: highly political; existing connections could influence the result (13); time constraining & demanding (15); ● Design-driven projects; Insufficient cost estimation: short, medium, & long term; Dynamics' underestimation (12); ● Commercial approach (15).
Engagement	● Development of social media & access to information; Engage younger generations (11; 14); ● Collaboration with local specialists & universities (15); ● Inclusive & community-driven development (12).	● Lack of official effort to engage directly with vulnerable populations (18); ● Data collection due to lack of openness (18; 19).	● History of openness to foreign influences & collaborations (12; 19); ● Support & engage vulnerable communities (14); ● Understand people's mindset; Evidence-based findings (12).	● Lack of representation & communication between local authorities & people (11; 17); ● Passive civic contribution; Lack of systemic thinking (11; 14); ● Limited participation in planning; Tokenistic nature (18).
Results, GI & Vulnerabilities	● High-rises: space efficient, reduced need for land sealing (12); ● Support & integrate sustainable practices (14); ● Diversify urban typologies (11; 15; 19); ● Integrate buildings with the water system (19); ● Define character areas & spatial qualities (15).	● High-rises: main option for relocations (19); ● Infrastructure demand; Traffic increase (11); ● Resistance to relocation due to attachment & work relations (11); ● Fixed programs (15); ● Lack of comprehensive anti-flood solutions (17).	● Increase of middle-class population & educational standards (12); ● Support individual & systemic approaches (13; 14); ● Flooding as potential (15); ● History of hydraulic civilization (19).	● Lack of action (12) & civic awareness (17), especially migrants (11); ● Vulnerability to climate change; Mekong refugees influx; Unsafe development practices: soil sealing, retention areas (12); ● Irregular housing conditions (11).
Land Use Value, Performance & Monitoring	● Connect development through infrastructure (11); ● Prevent public edges' privatization (13); ● Consider economic evolution; Plan for potential new industries & workforces (15); ● Room for flexibility within the legal framework (15; 18).	● Unprescribed urban development (15); ● Deviations from the regulations, particularly in setbacks & river corridors (18); ● Housing prices soar beyond the reach of many people (17; 18); ● Masterplan scale incompatible with social housing developments (18).	● ToC: develop & evaluate strategic plans, promote sustainable models; M&E: training, engage various stakeholders (14); ● Diverse partnerships forms (16); ● Foster balanced growth (11); ● Prepare for longer & inherently uncertain timeframes (15).	● High influence of private companies (15); ● FDI targets industries & larger companies (11); ● Legal boundaries & legacies as constraining due to multiple interests (18).

International competitions are opportunities to attract foreign expertise and enhance a city's ranking. In the contemporary scenario of increasing climate, sustainable development, and planning awareness, the provided partnerships can be a fantastic opportunity for communication and cross-sectoral alignment.

The interviewees described the HCMC East competition as time-constraining, demanding, and highly political, in which existing connections could have influenced the result (I3; I5). Although the outcome does not necessarily lead to the implementation of the chosen proposal, these conditions question the suitability of this format for deciding such significant changes that would influence millions of individuals.

While some plans aim to challenge the status quo and showcase a perspective other than a business case, interviewees comment on the overall trend of delivering design-driven and commercial projects that underestimate existing dynamics (I2; I5). Still, this mismatch is far from binary as multiple factors influence the practical development of a particular project, usually corroborating in a gap between what is proposed and what is materialized. Insufficient cost estimation in the short, medium, and long term is highlighted as a common characteristic that distances these proposals from reality.

HCMC has a history of openness to foreign influences and collaborations that benefit the city by activating foreign inputs. However, it lacks internal representation and communication between local authorities and people, whose participation is limited to a passive contribution. Some interviewees also highlight the lack of systemic thinking and the tokenistic nature of the restricted public engagement processes (I1, I4, I8).

This scenario consequently reflects limited participation in planning processes, as they show insufficient efforts to engage with vulnerable populations directly. In none of the cases, the mapping of vulnerable communities happened before the plan development or gotten represented in terms of design. Later, the winning team included it in its reviewed master plan program.

To address public participation issues and promote more inclusive and community-driven development, collaboration with local specialists and universities is vital, but mainly supporting and engaging vulnerable communities in processes where planners build knowledge on people's mindset based on evidence findings. Online and social media are shown to be powerful ways to engage younger generations and foster transformation on an intergenerational level. However, these tools must integrate a wider network of multiple engagement strategies.

Regarding HCMC's demand to supply for the growing urban population and migrant influx from the Mekong, high-rises can be space efficient and require reduced land sealing processes. On the other hand, this high-density typology strongly increases traffic and the demand for in-land infrastructure and amenities. In this matter, interviewees highlight the necessity of diversifying urban typologies and safely and harmonically integrating them with the water system (I1; I4; I5; I9).

When commenting on the ongoing master plan development, academic interviewee I9 said: "I have concerns about the generic nature of the master plan, as it appears to prioritize profit generation in developing areas without proper consideration for water management and ecological factors. (...) They focus on developing high-density districts for leisure purposes, disregarding the well-being of low-income communities near rivers. This approach risks negatively impacting vulnerable populations."

Apart from a focal situation, interviewee I9 comments on the recent trend in Vietnam and other Asian cities of "(...) maximizing density and transforming agricultural areas into leisure destinations, disregarding the impact on people and the ecological aspects of water."

Supporting and integrating truly sustainable practices is more urgent than ever to address HCMC's high vulnerability to climate change effects. Regarding the current city design, civil interviewee I7 says, "I

see little justice and concern for the environment (...) a road full of big old trees was cut down to give way for a new bridge (Thu Thiem 2 Bridge), leaving the new road bare and overheated in the afternoon. Another example is that a part of the Sai Gon River was filled to make a part of a residential area."

High-rises are also the standard option for relocations of low-income individuals that often present resistance. Regarding this situation in HCMC, the academic interviewee I1 states, *"Some people are unhappy with relocations because of their emotional bond with their work-related locations, even if they lack legal property rights. Many of them live on boats."*

The academic interviewee I9 complements: *"I have witnessed a similar situation in Hanoi, where people were stacked in towers to modernize the city while disregarding their living conditions. And nobody goes against it because their housing infrastructure conditions were below these new apartment developments. This model, typical in Asia, poses a potential time bomb for the city and society."*

While Vietnam has a history of hydraulic civilization, the academic interviewee I2 makes another point: *"I fail to see it as a comprehensive, long-term plan to address those problems. (...) You need to figure out a way to coexist with the water. There is no other option. Technically and financially, it is not feasible."* The interviewee complements, *"Alternatively, you may follow the Dutch example and spend billions of euros building dams. However, the Netherlands' overall sea exposure is far lower than the Mekong. Structural adaptation alone cannot address the challenges; there is a need for non-structural adaptation as well (...) the urgency of finding comprehensive solutions."* (I2).

Interviewees also commented on the possible approach of seeing flooding as an inherent threat to be overcome and that it is necessary to reestablish a relationship with water (I5; I9).

The increase in the middle-class population and educational standards in HCMC can be a great ally in this matter, capacitating environmental educational-led aspects to support individual approaches within a wider system.

HCMC real estate market currently holds unsafe development practices highly influenced by private companies and foreign investments. Moreover, it presents legacies and legal boundaries that are significantly constraining due to the multiple interests in play.

Housing prices soar beyond the reach of many people, leading to unprescribed and illegal urban developments, particularly in setbacks and river corridors, that deviate from the regulations. Still, social housing developments are not predicted in the master plan due to their scale of intervention, as previously mentioned.

Safeguarding public uses within the system is fundamental to guaranteeing more balanced access from multiple groups. To do so, protecting the public edges of these new features from privatization and connecting the development through infrastructure can be important strategies.

Regarding the evolution of the proposal over time, interviewee I5 mentions the strategy of defining character and spatial qualities for development and urban regeneration areas, making room for urban resilience as the project evolves, differently than establishing specific programs of fixed uses.

As territories constantly change, a quality plan must consider economic evolution and potential new industries and workforces while sparing room for flexibility within the legal framework. Frameworks such as the ToC can assess the development and evaluation of strategic plans that promote transformative and more sustainable urban development models.

Complementary M&E frameworks can provide effective directions in engaging and training various stakeholders, establishing diverse partnerships, fostering balanced growth, and preparing for future and inherently uncertain timeframes. In the case of the current master plan, an M&E based fundamentally

on a digital city version and film monitoring illustrates a system much based on a mimicked urban component and potentially distant to the real and visceral tissue happening under these same cameras.

Regardless, planners and involved stakeholders must seek a deep understanding of the underlying systems, show modesty and respect for local and popular knowledge as it integrates it with foreign expertise, and incorporate these sensibilities in all the stages of development.

“(…) when I was there the last time in March, the Dean of a local University proudly showed me his new car. For the middle class, buying a car is a significant achievement because it means that you shift from a motorcycle to a car, and they are so proud of this. In Europe, we are moving another direction to bicycle traffic, pedestrian traffic, and public transportation. (...) But this is a different lifestyle and state of society, and modern belonging is firmly connected to traditional status symbols (...). This example shows that we have this famous value action gap that we still have to work on making people aware that buying a car has a lot of consequences for the urban built environment. (...) But I always say, in general, that I'm very happy for the Vietnamese because now they have a better life compared to recent past years. The Vietnamese can and should be proud of this.” (I2).

4.5. MAIN FINDINGS

Complementary speeches emerged from both spatial analysis and the interviews, integrating a broader perspective of the richness of the HCMC territory and how current planning efforts relate to it.

Sustainable City Planning

City planning in Ho Chi Minh City faces significant challenges, particularly in addressing the social layer manifested in the territory. Existing trends prioritize design-driven and commercial projects, often overlooking the environmental and socio-economic potentialities and vulnerabilities. Both masterplans lack a comprehensive analysis of the social aspects, failing to map vulnerable communities and understand their needs fully. The drive to maximize density and transform agricultural areas into leisure destinations has recently been observed in Vietnam and other Asian cities. Unfortunately, this trend disregards the impact on people and the ecological aspects of water.

As a result, housing prices have surged, pushing many people beyond their means and driving the emergence of unprescribed and illegal urban developments in setbacks and river corridors, deviating from regulations. Surprisingly, even with these issues, social housing developments remain absent from the master plans, calling for a more inclusive and socially conscious approach to sustainable city planning.

Social Engagement

In HCMC, social engagement remains an area that requires significant improvement. The lack of internal representation and effective communication between local authorities and the people has led to a passive and tokenistic nature of public engagement processes. Currently, people's participation is limited, and there needs to be more systemic thinking in planning initiatives.

Processes such as the master plans competition presented a tight time format that constrains public engagement, according to involved planners. Due to this, when projects include the social component, this is done only in later steps, whether adopting virtual approaches that may not represent a broad group

of stakeholders or engaging consolidated or institutionally designated groups. Still, these processes generally lack establishing physical engagement components with the more vulnerable groups.

Blue-Green Network and Land Valuation

In HCMC, recognizing the importance of water in guiding urban development and green infrastructure organization has become increasingly crucial in climate adaptation contexts. Embracing a harmonious relationship with water calls for holistic perspectives, integrating it seamlessly within the urban landscape.

Moreover, integrating GI with urban areas through flexible NbS and ecosystem-based practices is essential for supporting sustainable development and fostering a thriving blue-green network. For instance, adopting guidelines on urban agroecology offers a space-efficient approach that contributes to long-term growth transformation while enhancing sustainable resource management. This kind of initiative reduces social vulnerability and improves the quality of life, public health, leisure time, and economic stability, particularly in underprivileged areas.

As the city undergoes new urban planning efforts, including master plans, a notable shift is observed in land valuation. While traditionally, the most expensive locations remained disconnected from extensive green infrastructure, a significant change is now evident. The sought-after attribute has shifted to proximity to the blue-green network, reflecting the city's recognition of the vital role of blue and green in sustainable development.

Infrastructure and Design Strategies

The state of infrastructure, especially traffic, stands out as a primary concern among residents, yet it might need more attention from city planners. To address this, planners must recognize the impact of economic plans on transportation and transit and acknowledge the interdependence between these elements.

A successful approach involves defining the character and spatial qualities of development and urban regeneration areas, allowing flexibility for urban resilience to evolve throughout the project. Instead of rigidly establishing fixed programs, diversifying urban typologies becomes essential. Safely and harmonically integrating these typologies with the water system while safeguarding public spaces further enhances the city's overall sustainability and livability.

Past, Present, and Future

Balancing past trends, respecting and including local knowledge, and creating a new image for the country remain significant challenges. As territories continually evolve, an effective plan must consider economic advancements and potential new industries, allowing flexibility within the legal framework. The current master plan's reliance on a mimicked city version and film monitoring raises concerns about its detachment from the visceral and dynamic urban tissue.

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CONCLUSION

Although the drive to maximize density and transform agricultural areas has recently been observed in Vietnam, current efforts and initiatives on urban development show the **increased importance of blue-green infrastructures**, especially for dealing with climate adaptation. In the case of Ho Chi Minh City, both analyzed master plans set the blue-green network as a vital feature that is fundamentally interconnected with the predicted urban development. Nevertheless, their approaches differ in representation, prescription, and deepness of associated strategies, such as NbS and the provided ecosystem services, which were highlighted in the interviews with involved planners.

Yet, the guiding aspects for sustainable development are still very much concentrated on the environmental dimension, being the social component often underrated by contemporary developing models. However, social conditions increase existing vulnerabilities as they expose groups unequally to hazards and are also deeply interconnected with other layers. Therefore, it is vital to profoundly read and understand the territory and its intricate, interlinked layers. However, the **absence of a social approach and analysis** was perceived in both master plans, whether due to the competition's time constraints or the distance in the online participatory processes. The winning team adopted complementary engagement methods, such as events and partnerships with Universities and businesses. Still, this choice represents a socially limiting process rather than engaging the most vulnerable groups.

Nevertheless, both groups included a local partner for developing the plan, to a minor or more significant degree, to possess local knowledge in the design and elaborating processes. This resource represents a valuable incorporation of cultural aspects into each proposal or project. However, the included **local knowledge is still very much limited to an intellectual elite** from an urban-led approach. Therefore, it may distance itself from other social layers' real needs and wishes.

As territories continually evolve, assessing plans, objectives, and strategies over time is fundamental. The current master plan **monitoring and evaluating reliance on digital features** raises concerns about detachment from the visceral and dynamic urban tissue. Nevertheless, planners and stakeholders must deeply comprehend the underlying systems, humbly embrace local and widespread knowledge, and integrate foreign expertise to incorporate these sensibilities at every stage of development. By doing so, the path toward a sustainable and inclusive future can be navigated with confidence and adaptability.

In summary, addressing HCMC's challenges requires a holistic approach that combines structural and non-structural adaptation measures. Structural changes are needed; however, non-structural adaptations are crucial to finding comprehensive solutions. In both cases, planning strategies must encompass short, medium, and long-term considerations, assuming the essential time of natural processes to incorporate resilience. By combining nature's time cycles into development timelines and decision-making processes, HCMC can exercise sustainable development, improve quality of life, and promote public health.

Moreover, it is vital for proposed improvements to be accessible to the entire population, irrespective of economic conditions, and to avoid establishing segregating dynamics. To address the challenges of urban growth, it is also vital to recognize its impact on housing prices and suitable land allocation. Ensuring a balanced distribution of resources among the city's residents will contribute to building resilience and fostering climate justice for all.

Urban planning demands careful orchestration, integration, and negotiation in rapidly developing urban centers like HCMC. Policy recommendations must direct the city to adopt approaches to support spatial planning and governance to nurture sustainable development. Collaborative efforts between urban planners, multi-stakeholders, and community organizations are indispensable for successfully implementing and maintaining these initiatives. The public must be involved in the search for solutions to these and other potential impending problems, frequently using the principles of co-design and transdisciplinarity.

This study presents diverse limitations, including the scope of analysis limited to investigating the case study over a notable physical distance. To overcome this distance, the research prioritizes methodological approaches and works with specialists and locals to better comprehend the case study. The data limitation was another considerable aspect for multiple reasons. Firstly, due to the availability of data, often limited to a city-wide or district-wide scale. Secondly, due to publicity and readability, some data has to be translated from Vietnamese and reorganized for future analysis. Thirdly, due to the nature of the collected data about HCMC, evident attention is given to the climate and environmental aspects of flooding rather than the social or justice-related dimensions. A last considerable limitation is the number and scope of interviewees, generating results that may not represent a broader part of the population. Regarding this point, the lack of governmental participation in the interviews is highlighted as its contribution would deepen the understanding of the HCMC context and aspects of the competition.

This approach takes a counter-hegemonic standpoint, focusing on climate justice from an adaptive, transformational, and resilient perspective and offering valuable insights applicable to similar situations in Southeast Asia and beyond. Although challenges may arise when implementing transformative resilience research, these can be overcome by fostering inclusivity in urban planning, addressing significant social challenges in the territory, and empowering local communities.

To expand the current analysis further, a more detailed conditional and potential breakdown of the natural environment—urban, peri-urban, and rural—from metropolitan to local scale could bring interesting considerations on how to approach sustainable initiatives. Also, specific attention can be given to the city territory specificities, mapping and assessing potentialities and vulnerabilities within a more detailed scale. Additionally, exploring how masterplan proposals relate to previous and planned urban infrastructure, particularly in terms of mobility, can address pressing issues residents highlight, necessitating planners' attention. Moreover, specific attention can be directed to governance and monitoring, aiming to guide approaches more connected to the physical component of ongoing projects.

Above all, it's still possible to co-design suitable solutions and adjust. Ho Chi Minh City has the capacity to become a role model for sustainable and inclusive urban planning, where resilience and climate justice prevail. A holistic approach is required to achieve this, recognizing the interdependence of nature, development, and community well-being.

Moreover, balancing past, present, and future trends, respecting local knowledge, and embracing new possibilities are crucial. By applying these principles, the city can progress towards a resilient, climate-just future while mitigating the challenges of urbanization and promoting sustainable development in the region.

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7

APPENDIX

7.1. TABLES

Table A - Secondary Data Analysis

Factor (A-Z)	Data Collection	Relevant Data Source
Apartment Price (Average)	Literature, Maps	Chung et al. (2018)
Built-up area (Urban)	Literature, Maps	Kontgis (2014)
Climate (Urban)	Literature, Maps	Kraas et al. (2023)
Communes Classification	Statistics	Kontgis (2014)
Culture	Statistics	HCMC Statistics Office (2021)
Development Units	Literature, Maps	Chung et al. (2018)
Economic Activities	Literature, Maps	Waibel et al. (2007), ADB (2010), Kontgis (2014)
Education	Statistics	HCMC Statistics Office (2021)
Expansion (Urban)	Maps	Kontgis (2014), Scussolini (2017), Xu et al. (2019)
Flood, Flood Control, Flood Predictions	Literature, Maps	ADB (2010), Nguyen et al. (2015), Phi et al. (2015)
Green Infrastructure	Literature, Maps	ADB (2010), HCMC (2019), HID (2019)
Health	Statistics	HCMC Statistics Office (2021)
Hydrological Impacts	Literature, Maps	Nguyen et al. (2014)
Impervious Surfaces	Literature, Maps	Son et al. (2017)
Land Subsidence	Literature, Maps	Nguyen et al. (2014)
Land Use	Literature, Maps	Waibel et al. (2007), ADB (2010), Kontgis (2014), Nguyen et al. (2015), Son et al. (2017), Acolin et al. (2022)

Master Plans	Literature, Maps	Nguyen et al. (2014), Phi et al. (2015), HCMC (2019), HID (2019)
Population Density	Statistics, Maps	Kontgis (2014), Chung et al. (2018), World Trade Press (2020)
Poverty Rate	Literature, Statistics	Ho Chi Minh City Statistics Book (n.d., op. cit. Lempert et al., 2013)
Revenue	Literature, Statistics	Ho Chi Minh City Statistics Book (n.d., op. cit. Lempert et al., 2013)
Salinization	Literature, Maps	ADB (2010)
Temperature (Increase of; Land Surface)	Literature, Maps	Nguyen et al. (2014), Son et al. (2017)
Topography	Literature, Maps	Nguyen et al. (2014), Tran (2014)
Vitality (Urban)	Literature, Maps	Yue et al. (2021)
Wealth	Literature, Statistics	Ho Chi Minh City Statistics Book (n.d., op. cit. Lempert et al., 2013)

Table B - SWOT Analysis 1: Elaboration and Governance

Elaboration and Governance		
	Helpful (to achieving the objective)	Harmful (to achieving the objective)
Internal origin (attributes of the organization)	● Challenge the status quo; Showcase a different perspective, more than a business case (13); ● Modesty & respect for local knowledge (15); ● Expertise reference cases (12; 14; 15).	● Contest: highly political; low chances of winning due to existing connections (13); time constraining & demanding (15); ● Design-driven projects; Insufficient cost estimation: short, medium, & long term; Development dynamics underestimation; Limited participation; No gender addressing (12); ● Commercial approach (15).
External origin (attributes of the environment)	● Awareness: climate, sustainable development & urban planning (12); ● Communication and cross-sectoral alignment; Enhance city's ranking; Attract foreigner expertise (11); ● Understand the underlying systems (19).	● Corrupt political environment (12; 15; 19); ● History of confidentiality; Conflicts with powerful growth companies (12); ● Male-dominated, limited women representation (12).

Table C - SWOT Analysis 2 Development: Engagement

Development: Engagement		
	Helpful (to achieving the objective)	Harmful (to achieving the objective)
Internal origin (attributes of the organization)	• Development of social media & access to information; Engage younger generations (11; 14); • Collaboration with local specialists & universities (15); • Inclusive & community-driven development (12).	• Lack of official effort to engage directly with vulnerable populations (18); • Data collection due to lack of openness (18; 19).
External origin (attributes of the environment)	• History of openness to foreign influences & collaborations (12; 19); • Support & engage vulnerable communities (14); • Understand people's mindset; Evidence-based findings (12).	• Lack of representation and communication between local authorities & people (11; 17); • Passive civic contribution; Individualism, lack of systemic thinking (11; 14); • Traditionally limited Public Participation in planning; Reduced to filling & submitting forms to local departments; Tokenistic nature (18).

Table D - SWOT Analysis 3 Development: Results, GI and Vulnerabilities

Results, GI, Vulnerabilities		
	Helpful (to achieving the objective)	Harmful (to achieving the objective)
Internal origin (attributes of the organization)	• High-rises: space efficient, reduced need for land sealing (12); • Support & integrate sustainable practices (14); • Diversify urban typologies (11; 15; 19); • Integrate buildings with the water system, avoiding speculation (19); • Define character areas & spatial qualities (15).	• High-rises as the main option for relocations (19); • Infrastructure demand; Traffic increase (11); • Resistance to relocation due to attachment & work relations (11); • Fixed programs (15); • Current anti-flood projects don't clarify comprehensive flood control solutions (17).
External origin (attributes of the environment)	• Increase of middle-class population & educational standards (12); • Support individual & systemic approaches (13; 14); • Flooding as potential (15); • Singapore as major development reference for locals & planners (13; 17); • History of hydraulic civilization (19).	• Lack of action (12); • Vulnerability to climate change; Refugees influx from the Mekong Delta; Unsafe development practices: soil sealing, retention areas (12); • Irregular housing conditions; Lack of awareness, especially migrants (11); • Lack of civic awareness of systemic measures (17).

Table E - SWOT Analysis 4 Present and Future: Land Use Value, Performance & Monitoring

Present and Future: Land Use Value, Performance & Monitoring		
	Helpful (to achieving the objective)	Harmful (to achieving the objective)
Internal origin (attributes of the organization)	● Connect development through infrastructure (I1); ● Prevent public edges' privatization (I3); ● Consider economic evolution; Plan for potential new industries & workforces (I5); ● Flexible frameworks for changing circumstances (I5); Room for flexibility within the legal framework (I8).	● Unprescribed urban development (I5); ● Deviations from the regulations, particularly in setbacks & river corridors (I8); ● Housing prices soar beyond the reach of many people (I7; I8); ● Masterplan scale incompatible with social housing developments (I8).
External origin (attributes of the environment)	● ToC: develop & evaluate strategic plans, promote sustainable models; M&E: training, engage various stakeholders, promote independence (I4); ● Diverse partnerships forms (I6); ● Foster balanced growth (I1); ● Prepare for a 50-year timeframe with inherent uncertainty (I5).	● High influence of private companies (I5); ● FDI targets industries & larger companies (I1); ● Legal boundaries & legacies as constraining due to multiple interests (I8).

7.2. INTERVIEW TRANSCRIPT 1

I1 is the Deputy Head of Diplomatic Politics in an HCMC University Faculty of International Relations. Experience in foreign policies and global issues. Born and raised in HCMC.

Interviewer - *Do you observe Vietnam actively implementing climate adaptation as a public policy and sharing climate information?*

I1: HCMC is among the top ten cities most vulnerable to climate change³⁸ and faces increasing challenges due to a growing population of economic migrants. To address these issues, HCMC is launching projects to improve infrastructure and promote climate adaptation in coastal and riverine areas. But according to our political system, the focus of our president is primarily on improving the people's living standards and providing societal funds to assist those affected by climate change.

Interviewer - *Is there a general awareness among the Vietnamese population regarding climate hazards and the associated challenges?*

I1: There is a notable lack of awareness among the general population in Vietnam, particularly among individuals who migrate to HCMC. Many have limited knowledge about climate change beyond recognizing the existence of dry and rainy seasons. However, in a high flood, you go out to the street and don't see your car. It is an urgent issue. Efforts are being made to educate vulnerable communities

³⁸ Nicholls et al. (2007), OECD, Paris.

through various activities, especially in districts near the coast. My organization allocates a budget to support these communities in improving their living conditions and providing access to social housing.

The local government encourages people to cooperate and relocate from vulnerable locations to others with improved infrastructure. However, there are significant challenges associated with supporting these communities. Some individuals have built houses without proper documentation, which makes it difficult for the government and local authorities to provide financial assistance without proper evidence or legal documentation.

Interviewer - *How do vulnerable people affected by climate hazards typically respond to relocations? Are they satisfied with the changes, or do they face challenges adapting?*

I1: It's a difficult question to answer. Some people are unhappy with relocations because of their emotional bond with their work-related locations, even if they lack legal property rights. Many of them live on boats. This lack of ownership makes it challenging for local authorities to provide financial assistance.

Also, the recent damage caused by natural disasters has led to much debt. Since strong storms and more tropical activity are expected, the government is looking at different ways to move vulnerable areas and improve infrastructure. But since the scenario is changing, it becomes crucial for them to collaborate and embrace the transition to new social housing relocations.

Interviewer - *How do you observe HCMC investing in urban development?*

I1: Despite the numerous challenges in HCMC, we've made significant changes. Our city has witnessed infrastructure improvements and exciting projects across all regions. Additionally, the university plays a crucial role in shaping urban infrastructure and attracting new residents.

Interviewer - *Is land market FDI balanced with local knowledge in Vietnam, particularly in HCMC? Or is there a noticeable imbalance or dominance between the two?*

I1: FDI primarily targets the central city, focusing on industries and larger companies. However, recent government efforts have attracted investments to the outskirts and vulnerable areas, aiming to address the imbalanced development. Our city's population distribution is also uneven, with investments often concentrated in specific locations.

Improving infrastructure is key to connecting these developments and fostering balanced growth. A notable example is Thu Duc, where infrastructure enhancements have facilitated connectivity among various industries and transportation networks. As a result, we are changing our image as a city.

But Central Park has a big river nearby high buildings and isn't very safe. Especially during the rainy season, it feels like everything is sinking. We should consider having different types of buildings in each district to create a better balance. As we discussed earlier, improving the infrastructure of homes and buildings is important.

Interviewer - *When you refer to this one target, what place do you refer to?*

I1: It's Thu Duc. I've noticed the growing pressure on District 7 and District 2. I hope they find a way to balance things out and develop a comprehensive city-planning solution. Having too many high buildings is not ideal as it impedes infrastructure development. With the increasing population pressure in our city year after year, we'll be unable to tackle traffic and other climate change-related issues effectively.

Interviewer - *The master plans I've been researching are specifically for Thu Duc. Are people in the area aware of the ongoing and upcoming changes?*

I1: Honestly, people in the area aren't accessing this information online as they primarily focus on their work and daily lives. This disconnect and miscommunication between the local authority and the people, especially those in vulnerable areas, results from our limited understanding. As an educational institution, we struggle to communicate effectively with people from diverse backgrounds and educational levels. During my interactions with regional residents, I discovered that some had experienced property damage from natural disasters in the past year. However, they resist moving to safer locations due to attachments and work-related reasons. We acknowledge the importance of involving the community in these processes, working alongside them to address their concerns. Strong communication and alignment across sectors are essential for successful collaboration.

***Interviewer** - Considering land and climate change issues, is the awareness more present at an individual level, or can you think of any NGOs or groups that effectively represent the people?*

I1: Some concerned citizens, particularly those residing in areas like Thu Thiem, have expressed their views online about meetings with the city's presidents or chairman. We have a system to represent local citizens and convey our recommendations and expectations to the government. However, land-related issues and people's expectations regarding climate change can be sensitive because they directly impact their lives. For example, suppose you live in an area slated for change. In that case, you may be asked to relocate without proper evidence or legal documentation, making it difficult to receive assistance from the local authority. The authorities may offer limited financial support or discounted rental options. The community's response varies, with some agreeing and others disagreeing but often lacking cooperation with the local authority.

While NGOs organize environmental protection activities in our city, their efforts are often specific and lack systemic connectivity.

Some people prefer to remain silent and listen, even during community participation. Our project currently faces this issue, where people in vulnerable conditions hesitate to share their opinions. When questioned about their lack of contribution, they cite limited information and the need for higher authorities to plan projects and allocate budgets.

***Interviewer** - Do you agree that the civic population has a passive contribution and lacks awareness of the overall system and its consequences, leading to a focus on palliative solutions?*

I1: Yes. The leaders representing the people in our city need to improve communication channels and engage various professions to bring about transformation and work in different areas.

***Interviewer** - Are you generally optimistic or pessimistic about how people engage with these processes?*

I1: It's a mix of both. On the one hand, there is a growing awareness among people, albeit slowly. The development of social media and access to information brings an advantage in that individuals are exposed to environmental documentaries and videos created by NGOs, helping raise awareness about climate change issues. However, I also get pessimistic when observing people, mostly focusing on their concerns and lacking systemic thinking.

Authorities must invest in various communication channels to spread messages and information about projects and master plans. Collaboration between authorities and corporations is crucial to improving living standards and infrastructure and attracting foreign investments. While educational centers play a role in solving the problem, it also requires a collective effort and stronger connections between stakeholders.

Efforts have been made to engage students, as they are the younger generation and can influence their families and communities. Creating proposals focused on environmental conservation and submitting them to NGOs and local authorities help raise awareness and seek support. So, it is challenging to categorize one's conception of it because there is a wide range of perspectives.

***Interviewer** - Any additional comments or suggestions for planners or organizations?*

I1: To solve our city's problems, we must focus on three main pillars. Pillar one is changing the awareness of people about climate change and adaptation. So we have two-way communication between the local authority and those living in the vulnerable location. Another approach could involve encouraging individuals, students, and educational institutions to submit proposals to international organizations for funding to support activities for raising climate awareness.

The second pillar is to reduce the traffic pressure, which is a big problem. And the third is to improve the infrastructure or establish higher buildings in other districts that are not focused on one business location. If we establish balance, then we get to change.

Also, local businesses often express concerns that lead to seeking foreign investments for various reasons, such as enhancing the city's ranking and attracting expertise. So, inviting international experts from developed countries like Japan, Singapore, or other countries can contribute to creating a master plan or establishing educational initiatives within our city.

7.3. INTERVIEW TRANSCRIPT 2

I2 is a Senior researcher and project leader at the Department of Human Geography at a European University. Background in Economic Geography and involved in various projects related to sustainable building development, governance, and economy in Vietnam and Cambodia.

***Interviewer** - What is your professional experience in Southeast Asia?*

I2 - In Vietnam, I'm engaged in a government-funded research project that promotes sustainable building materials and addresses governance and socio-economic aspects. We conducted a comprehensive survey and shared our results to close the communication gap between the public and engineers. I also integrate another project in Vietnam that combines urban environment and health, bringing together urban planning, architecture, and health specialists for interdisciplinary collaboration.

My most considerable involvement is in Phnom Penh, Cambodia, where we advocate for human-centered urban development in the neighborhood and work with environmental psychologists. We aim to understand people's mindsets and gather evidence-based findings to promote inclusive and community-driven development. However, this project faces challenges due to a more corrupt political environment and higher levels of inequality compared to Vietnam, including a small wealthy elite, a significant population of poor individuals, and a relatively minor middle class. Additionally, there is substantial Chinese investment in the construction sector.

Although the flood issues in Cambodia are more related to heavy rainfall rather than sea level rise due to the distance from the coast, there are similarities with Vietnam, such as land subsidence due to the accumulation of alluvial sediment and the transformation of former swamp areas. In both cases, urban flooding events have increased while urban density continues to rise.

***Interviewer** - I got intrigued by what you said about how you approach planning in Cambodia from a more human or psychological standpoint. Could you elaborate on that?*

I2 - We are a diverse team of four universities, two companies, an architecture office specializing in eco-city development, climate experts, green experts, and political scientists. Our collaboration also extends to supporting a young entrepreneurs' incubator focused on developing business models in the field. Recently, we have joined forces with a significant developer company, creating overlapping initiatives. Our approach involves transformative strategies where we bring together experts from various disciplines, the local government, and the city hall of Phnom Penh. Together, we challenge the traditional paradigm by developing alternative visions for sustainable building development that are not solely focused on engineering but also emphasize design-led approaches.

***Interviewer** - How do you see collaborative and participatory approaches happening in Vietnam? Do they find space to manifest?*

I2 - Collaborative and communicative processes should be the norm, but it often only occurs sometimes. The government tends to believe that creating a plan is sufficient without recognizing that planning is an ongoing communication process. We continuously tell them it's more than creating an excellent fancy plan.

The approach to planning in HCMC, especially in terms of incorporating modern and participatory elements, remains to be determined. In my previous research project on climate change adaptation, which concluded in 2014, the planning framework was predominantly driven by design, government, and state-led initiatives. There was limited emphasis on participatory processes.

I was also involved in the master plan of Hanoi, where a consortium from South Korea and an American company collaborated. However, even in that project, participatory components were not extensively integrated. Although there was a desire to establish a green belt, the new plan has already compromised the preservation of the green belt. Overall, only some of these innovative ideas have materialized in recent plans.

However, the urgency and pressure in HCMC are much higher due to the city's vulnerability to climate change and the imminent influx of refugees from the Mekong Delta. Looking at the predictions, the situation is quite alarming. Yet, the cities often continue to materialize the same model without significant changes or adaptations.

***Interviewer** - What are the primary hazards in HCMC right now? How are they handled overall?*

I2 - A hydrologist once told me that around 90% of flooding in HCMC is caused by unsafe development practices like the sealing of the ground and many retention areas rather than climate change. But considering the increasing severity of climate change, more than half of the site remains highly vulnerable, with a significant portion of the city located below one meter.

The whole Mekong Delta is in really severe danger. If we have one of these famous tipping points and the sea level increases by 1 meter within 20 years, which could happen, then the whole Mekong Delta will be drowned. You are dealing with several issues at once, including reduced Mekong pressure due to the dam in the upper stream, saline intrusion, sea level rise, an increase in weather extremes, land subsidence in the soft alluvial sediment, sealing of the ground, and a large number of migrants for flooding. So everything's coming together.

I am still figuring out how to develop a practical, technical answer. I fail to see it as a comprehensive, long-term plan to address those problems. It is so unbelievable, threatening, and exposed to the water. Furthermore, there is little you can do. You need to figure out a way to coexist with the water. There is no other option. Technically and financially, it is not feasible. There must also be more time left on the building material side.

Alternatively, you may follow the Dutch example and spend billions of euros building dams. However, the Netherlands' overall sea exposure is far lower than the Mekong. Structural adaptation alone cannot address the challenges; there is a need for non-structural adaptation as well. Given HCMC's role as a haven for people from the Mekong, a significant influx of affected individuals is expected, emphasizing the urgency of finding comprehensive solutions.

Interviewer - *Which solutions to address the challenges of increasing urban density and land subsidence do you observe in Vietnam?*

I2 - There is a significant trend towards high-rise condominium development. This recent focus on high-rise buildings is driven by their space efficiency and the reduced need for extensive land sealing. These buildings often have deep foundations, reaching depths up to 60 meters.

I also took a tour of HCMC's southern region at the mangroves. I was surprised by how many activities and construction take place there. Many new buildings are happening, and most typically need to be done on elevated ground. And they will be severely affected because it's the Northeastern part of the Mekong Delta. I hardly noticed that they raised it by two or three meters like they currently do in the city. They frequently carry out construction work in private urban residences since they see how it has evolved. But there, they create a pile of sand and other materials to raise the construction two or three meters above the previous level. I was truly surprised by these new developments there.

Interviewer - *In addition to these structural issues, would you add that governance contributes to lack of addressing these contemporary challenges?*

I2 - As a consultant for the Master capital development plan, I noticed a lack of participatory components, as I told you, but also the absence of cost estimations for the extensive infrastructure work. The plan should have addressed the financial implications of making the city flood-prone and installing water and ecosystem-based services. There were unanswered questions about who would bear the expenses and what the cost estimation would be in the short, medium, and long term. It remains uncertain if these questions have been answered in the Master plans. Based on my conversations with the people, their efforts need improvement.

Interviewer - *I only had partial insight into the integral plans due to limited access to confidential materials. But I'm also looking forward to hearing from the planners what they have to say about this matter.*

I2 - In previous times, master plans were kept secret, so it is unsurprising that they still don't go to the public.

At the same time, I'm not so sure if the previous Master plan reflected the development that happened after it was published. I think the whole development in HCMC, or most of it, happened without significantly influencing that Master plan. Ultimately, it was a piece of paper, maybe some overall vision. They underestimated the development dynamics. At that time, the development dynamics were higher. There was much more spatial growth. Meanwhile, some development was slower in the urban periphery, for example, in Thu Thiem, the peninsula opposite District One. Still, the progress is pretty slow compared to what was expected 15 years ago. I was told that the reason was that the people in North Vietnam owned the land, so the Southern Vietnamese didn't want to fill the pockets of the Northern Vietnamese.

But I need to find out how many underestimated the whole flood proneness of Thu Thiem, because times the high tide, the area is already almost overflowed. I know it was just established, in 2020, as it was Districts 2, 9 and Thu Duc; now it's Thu Duc City. Many new developments are happening at a high-tech park; Samsung has a giant factory there, a University town, and the airport is close enough,

plus the new airport. It makes sense to pay particular regard to this elevated area, not so far relative to the sea, like District 7, District 8, or the whole South area. It may make sense to focus on urban development between the city center and the new airport in an area less flood-prone than other areas of HCMC.

***Interviewer** - You mentioned learning to live with water, but standard development often goes another way. Could this be a contradictory direction?*

I2 - Although I am aware of the latest Masterplan, I'm far from HCMC's most recent events, so I cannot make a definitive judgment on their level of preparedness. Based on my observations, there is awareness of these issues, and competent experts may be involved. I see awareness, but I see little action.

Particularly in more significant developments in the South, I didn't see any proactive flood prevention measures. I was surprised so little attention was paid to this kind of acute flooding danger due to climate change and the sealing of the ground. These developments are probably done by private developers or companies from the industrial sector. They may need to gain the knowledge, or it's too expensive, or there are no regulations.

But from my experience in Vietnam, I can answer very generally. The country was impoverished when I was there for the first time in 1996. HCMC (or Saigon) was a rundown city, with most buildings dilapidated and no new housing development. The most striking feature was that most of the population was poor.

The most significant change in the past 20 years was that we have had a considerable increase in the middle-class population. We have regained the popularity of the high-rise condominium development with a relatively decreasing importance of the village typology, which dominated the fabric for many decades. So I see this shift in predominant housing typologies. I see increased income standards and the middle-class population's educational standards. Most of them have quite a globalized lifestyle and are not so traditional anymore, particularly in the South compared to the North. So I see a lot of positive things going on.

A recent example of when I was there the last time in March, the Dean of a local University proudly showed me his new car. For the middle class, buying a car is a significant achievement because it means that you shift from a motorcycle to a car, and they are so proud of this. In Europe, we are moving another direction to bicycle traffic, pedestrian traffic, and public transportation. I sold my car last year because I just don't need it anymore, and I'm because I no longer have to be afraid of accidents, high bills, and maintenance. But this is a different lifestyle and state of society, and modern belonging is firmly connected to traditional status symbols, which are not as strong anymore in the Western world.

This example shows that we have this famous value action gap that we still have to work on making people aware that buying a car has a lot of consequences for the urban built environment. If you have a car, you must use the vehicle, you need public space for parking, and you emit many emissions. And a lot of things are very harmful to the urban environment. We must find new ways to make a city livable and provide good quality of urban life. But I always say, in general, that I'm very happy for the Vietnamese because now they have a better life compared to recent past years. The Vietnamese can and should be proud of this.

***Interviewer** - How does the local government or the DPA demonstrate their interest in sustainable development and urban planning in HCMC?*

I2 - The local administration in HCMC has shown a significant interest in sustainable development and urban planning through several initiatives. For example, in 2020, they planned an exhibition at the Department of Planning and Architecture, accompanied by training on sustainability and young staff

members from the City Administration. The city administration's leadership demonstrates a deep understanding of the fundamentals of sustainable development and the significance of people-centered development.

They run into problems, though, when their choices go against those of powerful growth companies. This leads to compromises and the breaking of existing laws. One example is the conflict over building in the city next to City Hall when the government tried to protect cultural assets but was stopped by a group of prominent developers and the People's Committee. Another example is the Baisin Riverside development, where large residential complexes are being built by other developers, which may harm attempts to plan sustainably.

Interviewer - *One reason HCMC thrives economically is the foreign inputs. How do you see this balanced with the local knowledge?*

I2 - HCMC has a history of openness to foreign influences like other harbor cities. Even during the French colonial era, it had a more liberal and globalized economy than the politically centered Hanoi. The American influence period until 1975 further shaped the city, with millions of American soldiers introducing a globalized lifestyle. This cultural clash was evident when North Vietnamese soldiers arrived in HCMC and encountered people with colored TVs and cars in what was previously a bicycle-dominated city. The aftermath of the war saw over 1.6 million South Vietnamese fleeing to countries like Australia.

And, of course, many remittances went to the South after the country reopened. That's why the remittance is not so much the FDI, the foreign direct investment that the whole South developed way better than the North because fewer remittances arrived in the North than the South.

Interviewer - *You mentioned this past division between South and Northern Vietnam. How do you see it influencing the country or HCMC nowadays?*

I2 - If you talk to European Chamber of Commerce representatives, they'll tell you that Vietnamese individuals from local or foreign companies are hesitant to go to the North. On the other hand, many Vietnamese workers in the North eagerly want to work in the South. The South has a more open and less corrupt climate than the North. The overall economic environment is also more positive and conducive to success as an entrepreneur. Some say success without corruption is possible in the South but not in the North. This narrative might have some truth to it.

It's not surprising that HCMC has become an economically thriving city that attracts many people. Some areas could have been developed better, but the town has an appealing built environment, and we need to understand their perspective and show empathy and respect. The city has faced financial constraints, especially in the past, with limited public resources due to significant income sent to the North and only a few returned. This underfunding issue persists. Tax evasion by the urban population has improved but remains a considerable challenge, as it hampers the availability of public services. So, the city was under-financed and still needed to get more money. Also, we have evasion of taxes by the urban population, which is getting better because if you don't pay taxes, you don't get public services. So, it's a vicious circle. It has improved, but it's still a big issue.

Interviewer - *Any final comments on how spatial planning issues are dealt with in the Vietnamese scenario?*

I2 - Of particular importance, the field of urban planning in Vietnam is still predominantly male-dominated, with limited representation from women. This lack of gender inclusivity is evident, as the previous master plan did not address gender considerations.

At the same time, I see a growing community awareness of urban planning issues and architecture. A few years ago, I attended the book presentation of Jan Gehl, which took place in 2019 or 2020. His book, "Cities for People," was translated into Vietnamese, and the event attracted a large crowd, sparking extensive discussions. Additionally, a notable journal called Saigon Year, led by an American, represents the voice of young people and holds great potential.

7.4. INTERVIEW TRANSCRIPT 3

I3 is member of the second-prize team and Landscape Architect in the Masterplan, and Design Director at a company in Singapore, exploring green-blue infrastructure and its interaction with urban design. I3 is also connected to a European design brand that works with architecture, landscape, and master planning.

***Interviewer** - What is your professional experience in Southeast Asia?*

I3 - I am currently involved in a World Bank project that focuses on developing guidelines and features for HCMC, with some level of public engagement, although primarily with the government bureaucracy. ADB funds another project I'm working on, which involves transforming a 60-hectare park on the river's west bank, considering water management and community interaction. While there is yet to be a definitive answer to how these initiatives will address community needs and challenges, we are actively exploring different approaches and engaging with stakeholders at various levels.

***Interviewer** - How was participating in the HCMC Masterplan competition?*

I3 - Our team partner approached us and described the project as exciting but highly political. We also somehow knew that the contest was predetermined, and our chances of winning were low due to the connections of the first team. Yet we saw it as an opportunity to challenge the status quo and showcase a different perspective for the space in HCMC. Our approach was driven by a higher ambition than the client expected, knowing we would end up in second place or last. Ultimately, our goal was to push boundaries and present more than a business case, fully aware that winning was not the likely outcome.

***Interviewer** - How was the team integrated?*

I3 - Our company had a strong engineering focus, with close collaboration between our water experts and the team working on the master plan. Additionally, one of our partners had a clear vision for meaningful human-centered urban design. In contrast, another partner's local presence in Singapore and proximity to HCMC made them a valuable addition to our team. This combination of expertise and location made us confident in our decision to collaborate.

***Interviewer** - What is the fundamental vision behind your proposal?*

I3 - We wanted to put water management and the thinking of stormwater management at the center of our development. To give the people access to the space while protecting them from threats associated with the water, we set out to develop narratives and placemaking techniques. Incorporating habitats for fauna and flora, supporting migration and recovering destroyed habitats, and encouraging close contact with the water were all parts of our concept. Overall, our technique included rethinking the landscape and its use while considering the city's expansion in a way that respects and responds to its surrounding context.

***Interviewer** - What were the significant climate hazards found in the plan areas?*

I3 - When considering the surrounding context, water management becomes a crucial aspect of the discussion, mainly due to the significant flooding issues faced by HCMC. We focus on reducing water

runoff and addressing the water flow in the area. We consider the origin of the water, the topography, and the existing water inflow and outflow patterns. It is essential to safeguard the area from a water management perspective, including ensuring adequate drainage during dry periods and preparing for extreme weather events. Additionally, the site plays a role in releasing water from HCMC. We also consider the existing landscape technologies and strive to preserve green areas.

Our main question revolves around protecting the development from potential disasters while considering urban constraints, maximizing the strategic location, and integrating infrastructure plans and future developments into the risk analysis. Ultimately, we aim to shift the client industry's perspective and thinking process.

Interviewer - *Which main measures were taken?*

I3 - When discussing blue-green infrastructure, we focus on understanding how water management works in river systems but also how it functions as a cohesive environmental system. The green infrastructure aspect involves creating habitats for flora and fauna to migrate to, addressing the urgent issue of biodiversity reduction on our planet. In dense urban areas like HCMC, it is possible to establish distinct narratives and vital habitats for wildlife while allowing people to engage closely with the stormwater system and gain awareness of its significance. Our previous projects reflect these principles.

We build upon the existing streams, canals, and waterways within the landscape, expanding their capacity to accommodate more water. For instance, if a current channel is 100 meters wide, why not widen it to 400 meters by designating reserved areas for water expansion and detention? This approach creates a fluid geography that we have conceptualized and embraced.

Interviewer - *How do the features of this city integrate NbS and ecosystem services? And on which scale were they thought?*

I3 - We integrate nature-based solutions and ecosystem services into the features of the city. This includes considering seasonality, even though they have two or even one. We create distinct public spaces that reflect seasonality and help people understand the fluctuations associated with water. And when we harvest it locally, gradually, later releasing it into more extensive waterways, we protect against flooding.

To implement our vision, we utilize various small solutions such as green roofs, swales, rainwater harvesting tanks, bioretention basins, vegetative swells, rain gardens, and detention ponds. These interconnected features reduce runoff flow and increase water-holding capacity. They integrate this cohesive blue-green infrastructure system that connects minor elements to the more extensive river system. The plan showcases a network of water that grows and interacts with the parallel green ecological network, creating a more robust overall system. The solid green network guides the growth and organization of the master plan from both large-scale and fine-grained perspectives.

This holistic approach safeguards the area from a water management perspective and creates safe havens for water management and habitat creation. It allows fauna and flora to migrate through the network while providing a space for human interaction. We have learned valuable lessons through our previous projects, such as transforming concrete rivers into naturalistic ones. Our approach goes beyond managing water; it creates additional water space and establishes wildlife habitats, allowing nature to flourish. It also fosters a sense of connection and appreciation among people for these natural environments.

Green-blue infrastructure utilizes natural elements and nature-based solutions while incorporating engineering measures to mitigate flooding risks. We emphasize using structural measures at various

scales, from large-scale pieces to individual buildings, such as rooftops and rainwater harvesting systems.

Meanwhile, larger developments are happening all over Vietnam, and nature-based solutions have come to harmonize the neighborhood scale with existing development patterns. This ensures a balanced and responsive approach that integrates organically into the surrounding context. We create a harmonious and sustainable urban environment by utilizing the inherent qualities of natural elements and considering the existing development flows.

Interviewer - Can you elaborate on this point in which you comment about the neighborhood scale and how it can promote urban livability?

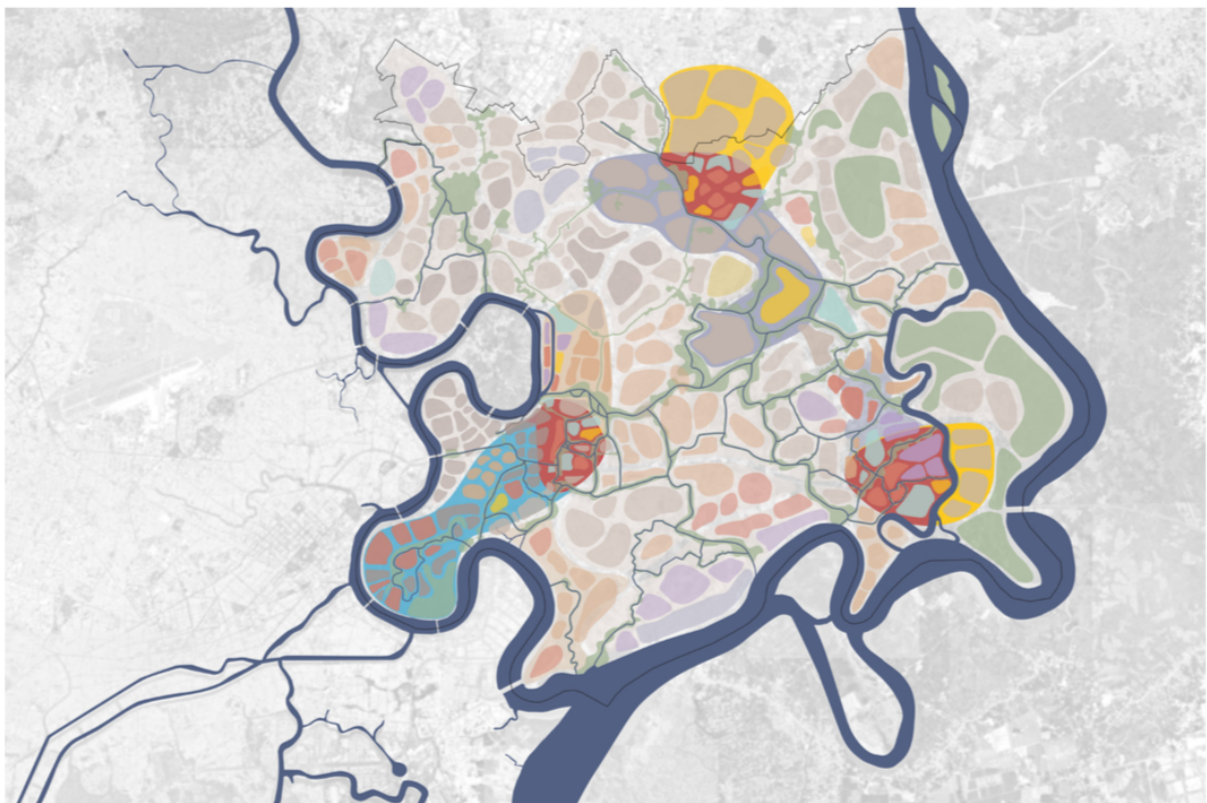


Fig. A - Potato Plan of HCMC East presented by the Interviewee (Ho Chi Minh City, 2019: Conceptual planning and development strategy for a highly interactive and innovative district in the east of Ho Chi Minh City (composed of District 2, District 9, and Thu Duc District).

I3 - We call it the "Potato Plan" due to its organic, growing, naturalistic environment. It operates on a specific scale that intrigued us and informed our approach to development. Within this framework are central development nodes, with one already being addressed by the winning team. Other nodes in the neighborhood contribute to the overall development as well. This pattern emerges from three interconnected areas on a smaller scale that accommodates habitation while considering connectivity and other factors. These spaces serve as a place for gardens and water, illustrating a diverse and naturalistic network that safeguards larger areas like wetlands susceptible to flooding.

We create this green network alongside our blue infrastructure, ensuring a harmonious blend. These green corridors extend into the urban tissue, as demonstrated in this neighborhood where water is absent.

We reintroduce water flow by utilizing green fingers as drainage canals, connecting it to the more extensive river system and channels within the landscape. And when you bring it all together and establish it as an interconnected ecosystem, the advantages are accessible to everyone.

Interviewer - *Besides previous projects, which other references inspired your methods in preventing future floods and promoting sustainable water management?*

I3 - In the Netherlands, severe flooding occurred in 1953 due to rain and the moon's position. This event serves as an important lesson we can learn from. It led to developing a comprehensive plan to build the entire coastline and protect against future floods. The gates were closed in advance of subsequent inundation, and the concept of expanding the river's area became a feasible solution. In a way, we can draw parallels to our current situation.

Our primary concern now is ensuring the safeguarding of future growth through the construction of a dike. Taking this inspiration, we are implementing techniques to accommodate extreme weather. Utilizing a green-blue network creates spaces that can hold, and release water as needed, allowing for greater resilience. This approach mirrors the concept of providing more room for the river. Excess water can be pumped out when nearby rivers are at lower levels, creating additional capacity.

Interviewer - *When it comes to resilience, how does it relate to the adopted strategies?*

I3 - The blue network and the flooding vulnerability are highlighted when you look at the site from an existing context perspective. Everything has to do with the current morphology of the landscape, which is relatively developed, and how it behaves when flooding comes along. So you see your dry spots, but you also see your low areas. Reacting to this from an urban perspective and safeguarding this environment is one of our critical objectives from a landscape perspective. And that allowed us to consider this concept of building a destination.

Rather than decentralizing stormwater management and improving it, the question is how to develop a holistic flood prevention system. The concept of a green-blue resilient network emerged as a solution, ensuring controlled water release and intake as needed. While our primary aim is often to remove excess water, we must also consider how to manage water during dry seasons. The green-blue resilience system encompasses various features, including rainwater harvesting, purification, storage, and reuse for purposes like irrigation, domestic use, or as a place for kids to play it. And the maintenance of these public spaces plays a significant role in shaping our landscape. We emphasize an approach that allows adaptability and integration with nature rather than solely focusing on aesthetic or engineering design so strongly that it doesn't allow nature to change.

Taking a biophilic perspective, designing for green-blue infrastructure means embracing the idea that the landscape should not remain static. It should transform itself, adapting to the behavior of nature.

Interviewer - *You mentioned that people are drawn in by promoting these green and blue elements, and there is a learning component. What are the social benefits that the plan offers?*

I3 - We need to remember that people are already living in this place and want to grow and continue living here. So, let's prioritize safeguarding the landscape from a water management perspective by incorporating gardens and park spaces. This approach takes us further, creating an interaction between industry and the social context, resulting in a vibrant environment. We should focus on creating a place with gardens and water that resonates with us.

At the same time, this approach also creates small communities, altering the overall scale of the landscape while providing opportunities to enjoy the outdoors. Much of our work involves studying the network, including major rivers and minor canals.

The plan offers various social benefits, such as raising awareness and understanding of the importance of water in our lives. It's worth noting that the practices we're implementing existed in old villages, where water management was used to irrigate fields and flood them when there was excessive water, all to protect their own space. We haven't discovered anything entirely new; we just forgot about these practices. By rediscovering and embracing them, we become their protectors. Through this process, we learn about ecology and water management and become activists who say, "Don't develop this area because it's essential to me as a person."

***Interviewer** - Interestingly, you can also include the social dynamics once ecosystem services are provided. How do the environmental and social benefits come together in the plan?*

I3 - We developed this approach and network where the green-blue network is the backbone of our development. Integrating green spaces into the heart of the development creates beautiful spaces for people to enjoy. Combining the water network with the ecological green network amplifies its strength. It protects this area from a water management perspective and provides a haven for managing water and creating habitats. This allows for the migration of fauna and flora through the network. Additionally, it offers humans a space to interact and serves as a central hub connecting the entire network. These are the initial ideas and thought processes behind it.

This approach enables the creation of distinct, natural environments for us to inhabit. It also allows us to engage closely with the water narrative, fostering awareness and understanding of ecology, habitats, and risk assessment.



Fig. B - Bishan-Ang Mo Kio Park (Singapore) flooded (available at <https://www.straitstimes.com/singapore/not-flooding-but-draining-bishan-ang-mo-kio-park-functioning-as-planned-amid-high-water>, accessed on July 28, 2023).

Two years ago, Singapore experienced a significant flood that resulted in the Bishan-Ang Mo Kio Park flooding. The pictures of the park submerged in the water went viral, showcasing the design and functionality of the space. We designed it to accommodate and understand the dynamics of dry and wet situations. During the flood, the river valley swelled up to three times its standard size, but the design ensured the safety of the adjacent neighborhood by creating additional space for water within the river.

The feedback on social media was remarkable, with people sharing that the park was intentionally designed to manage and adapt to flooding. The design process's goal was to ensure that we could prevent the nearby community from flooding by enlarging the river and adding additional water space within the river. Bishan-Ang Park exemplifies the possibilities and necessity of green-blue infrastructures, as it serves as a productive landscape with features such as rainwater harvesting and abundant natural elements.

This park offers a unique experience, transitioning between dry and wet conditions. In the dry season, the river reveals its bottom, allowing visitors to observe fish swimming and otters playing. The water is clear and inviting, providing opportunities for close interaction and enjoyment. However, during floods, the park demonstrates productivity by effectively managing and accommodating the excess water.

This is the beauty of park spaces like Bishan-Ang Park. It showcases the possibilities of nature-based solutions and the need for the adaptability of green-blue infrastructure. It turns into a very clear and safe place for you to be in, like the picture you see on the screen right now. This is a safety beacon, and these are interesting transitional times between the dry and wet parts of the same place. And the results have a magical sequence of events.



Fig. C - Safety beacon tells people not to go past this low point because the river's floodplain is after that (available at <https://mothership.sg/2017/01/heres-why-you-shouldnt-be-alarmed-by-pictures-of-flooding-in-bishan-ang-mo-kio-park/>, accessed on July 28, 2023).

Interviewer - *When giving space for the water naturally accommodates, it feels like you're looking to the past, and that's indeed magical. But at the exact moment, the engineering behind it is so advanced.*

I3 - Yes, you're right about that statement. But at the same time, it's also a very ancient technique. Bioengineering is more than 500, 600 years old so. And along the way, we still need to remember that the methods we use from a bioengineering point of view are so old. So yes, it is. We talk today about using nature-based solutions and discussing bioengineering like it is something innovative.

Interviewer - *Do you think that NbS falls just over a different name and a different way to handle it due to climate context?*

I3 - I don't think so. It's just along the way, we've forgotten what nature has given us as opportunities, and we've chosen the engineered approach above anything that character has to provide us. Anyway, that's my opinion.

Interviewer - *Were there primarily gray infrastructure, nature-based solutions, or mixed strategies within your projected system?*

I3 - It's a mixed strategy whereby you say, we use nature-based solutions everywhere as a base. But where needed, we introduced hardcore engineering to regulate the runoff speed as a control mechanism to regulate the water levels. So, we can't go around the need for hard infrastructure. We say it combines gray and green because we need both.

Interviewer - *Thinking about the whole area, could you point out any that have highlighted environmental or flood-prone vulnerability?*

I3 - I cannot point them on the map because we considered the vulnerability to environmental issues and flooding in the entire area. Identifying a critical item or declaring a particular area more prone to flooding in HCMC is difficult. The whole neighborhood requires attention and measures to protect investments made in the region. It is not solely about individual points or interventions. Managing stormwater through a network approach is crucial in collectively safeguarding these investments.

Our process involved zooming in from the broader master plan to more minor scales and utilizing various layers of approach. For this, it is necessary to consider the entire system comprehensively, which involves assessing features at the building block level, the network of systems, the river, and everything in between. To address these challenges, we have identified three development corridors within the master plan susceptible to flooding. This holistic perspective allows us to create an ecosystem that effectively mitigates potential issues and ensures the area's resilience to environmental factors.

Interviewer - *Do you recognize if the plan may alter established real estate configurations? In which way?*

I3 - It talks about reorientating a city, and generally, within developing countries, water is seen as the backside, not so much the front side of the cities. And what we're trying to do is to flip that thinking process so that living on the green or living at water becomes the most expensive location.

When you go to Venice, I don't have to tell you that the houses standing along the Grand Canal are the most expensive. And what happened in cities like Venice is that they embraced the water to transport themselves and their goods and actually to rethink the development flow.

Interviewer - *When considering the proposal's potential implementation, have you considered the possibility of certain groups benefiting more due to changes in land values?*

I3 - The impact on land values and the possibility of certain groups benefiting more are essential factors to consider. Investments in green-blue infrastructure can transform the context and turn currently undervalued areas into thriving environments in the future. Rejuvenation projects often increase the value of housing and spaces near these features as people recognize and appreciate the beauty and benefits of urban green areas.

While this increase in value is a natural outcome, the challenge lies in ensuring that the edges of these landscapes do not become privatized. It is essential to maintain public accessibility to prevent the exclusion of individuals from these spaces. For example, privatizing the water's edge restricts public access to beaches. Instead, creating publicly accessible pathways and boardwalks within the community helps preserve the accessibility and communal nature of these spaces.

Maintaining public access to these areas requires careful planning and investment decisions. One approach is to prioritize development in the outer areas first, gradually moving towards the heart of the project. By strategically controlling and selling the land at higher values, you can rehabilitate and continue building your environment using the value in the long run.

It is important to view such developments from a private sector perspective and a government standpoint. Governments can leverage this strategy to sell land at higher values while investing in public infrastructure and spaces. An example of this approach is seen in the waterfront Toronto project, where the land was acquired for a nominal fee and the subsequent development prioritized public spaces. The increased value of the land from public space development was then used to fund the rejuvenation of other areas, creating a sustainable and profitable system. While this approach has been successful in specific contexts, it is crucial to adapt it to each situation and consider the balance between public accessibility and private development.

Finding the right balance and preventing the privatization of public edges is vital. Not all spaces must be fully public, but a thoughtful and strategic approach to maintaining accessibility is necessary. By carefully managing the relationship between green and red zones and making intelligent decisions about what remains accessible, we can prevent privatization and promote a sense of ownership and shared responsibility for the waterfront areas.

***Interviewer** - Can you elaborate more on monitoring and assessing frameworks in the context of spatial and urban plans?*

I3 - These frameworks play a vital role in spatial and urban plans. Because it's also about learning from it, you must allow nature to modify and beautify itself beyond simply constructing a project with many different actors envisioning its behavior. It involves continuous monitoring and assessment to observe how the environment evolves and to make necessary adjustments. Maintenance plans cannot be fixed as circumstances may change, requiring modifications. This adaptability influences our perception of the space and adds challenges and excitement to the project.

A study conducted in 2018 on Bishan-Ang Park exemplifies this concept. It compared the original design, including the plant species and habitats created for fauna and flora, with the site's current state. The differences were significant. Despite our efforts in bioengineering for stabilization, the river adjusted its flow naturally. Additionally, new habitats emerged as birds brought seeds, and their droppings facilitated the growth of new plants. Some initially planted species survived the flooding regime, while other habitats formed spontaneously.

This highlights how nature can modify and enhance itself, enriching our envisioned environment. The dynamic nature of projects brings both challenges and unexpected beauty. It emphasizes the importance of monitoring and assessing frameworks to understand and adapt to these changes.

Interviewer - *After working on the plan for a few years, do you see any areas that could be improved?*

I3 - You just don't look back at a plan like this; therefore, I can't answer that question. However, we learn from every project, including our mistakes. The value lies in scaling up our knowledge and adjusting our approach. It involves considering bioengineering, and different planting typologies and continually evaluating and transforming our designs.

It goes back to something that my grandfather used to say that when you have an apple tree, you have to prune it every year if you want it to be productive. We can address previous mistakes and improve by adjusting, such as removing unproductive branches. Nature's beauty lies in its ability to adapt and compensate, providing us with valuable lessons as designers for our future projects.

In the Thu Duc environment context, I cannot pinpoint specific changes to make. However, I firmly believe the master plan and underlying principles are the right path forward. The level of design detailing is a separate matter, which we have discussed but are not directly involved in.

7.5. INTERVIEW TRANSCRIPT 4

I4 is member of a Vietnamese NGO focusing on contemporary agroecology practices for over ten years. Coordinator of Theory of Change (ToC) and Monitoring and Evaluation (M&E) activities. Background in Agricultural Science and Conservation.

Interviewer - *What role does the NGO play in contemporary Vietnamese sustainable development?*

I4 - Our primary focus is on conservation agriculture, and we are working hard to use the results to increase farm output on a larger scale. As part of our efforts, we are using the Theory of Change (ToC) to evaluate the development of a strategic plan for the country, to promote more sustainable and agroecological models.

Regarding monitoring and evaluating (M&E), we've set up training classes to determine how our training and other activities in a network affect people. This network comprises people from many different areas, such as local and national NGOs, businesses, organizations, and journalists. This network aims to make the change from standard farming to agroecology easier and more popular. By working with different groups, we want to encourage a group effort toward healthy and agroecological practices.

Interviewer - *What is the current scenario for agriculture in Vietnam, and how does agroecology find space amidst the increasing urban development?*

I4 - This problem has been discussed in the past few years, but we are still at a pretty early stage. We have started doing things like residue management, where food remains are left on the field after each season instead of being burned. We also encourage conservation techniques in agriculture, like contouring, to stop soil erosion and make the most of chemical fertilizers. These simple steps can help farmers save money and reduce environmental damage.

In developing livestock, we make silage from fresh plants, which keeps animal food fresh and reduces methane emissions. We also encourage using microorganisms that work well for hand treatment, which reduces methane emissions even more. But we are still in the beginning stages of putting things in place. Agroecology includes many things, such as field management, community interaction, social concerns, and how markets work. It takes time to get to a better level of implementation.

Things are different in the country's South, where the fields are bigger. But in most places, fields are spread out, and families own small pieces of land in different places. Because of this, it's hard to use the same methods on all plots.

It's essential to think about individual strategies and a systemic method in which multiple strategies work together and fit into a more extensive system. For example, we want to connect producers in the suburbs with customers in the city and encourage openness. However, getting farmers to keep detailed notes and give precise information that urban consumers want to have is hard.

Overall, even though progress is being made, there is still a long way to go to adopt agroecological practices and deal with the problems and challenges of the agricultural system.

Interviewer - *We know that nowadays, most practices tend to be separated by silos and sectors that don't communicate as much as they should with one another. Considering a more sustainable approach, how do you deal with this issue?*

I4 - It's a big problem that areas don't talk to each other enough, which makes it hard to fix. But I can give you an example from the area where we work. We use a two-step process to set up a new entry and make it bigger. First, we make a model that shows how farms, communities, and local governments can work together. Second, we set up training sessions to get the local people involved and teach them about the model's benefits.

Interviewer - *Are most interventions on a local or neighborhood scale? Are they aligned with rural or urban development plans?*

I4 - We are investing in social communication training for different partners to integrate projects on a larger scale. One real-world example is holding workshops on making short movies and sharing them on popular social networks like YouTube or TikTok. These movies are meant to spread the word about our projects and get people involved, like consumers and producers. This plan came out of the ToC Workshop that took place last year. We want to make a big difference by expanding our activities beyond the physical world and combining them with communication strategies.

Interviewer - *It is interesting that you also engage in strategies outside of the materiality of the productive space by integrating other tools to engage people. Regarding ToC, which types of knowledge are necessary for transformation? From the general development in space, but also in the mindset of people towards more sustainable development.*

I4 - To make the change to sustainable development and agroecology easier, it is essential to raise understanding. People need to understand the basic ideas and rules, which have different levels of how they can be used. Even though it's unnecessary to hit all levels, giving people basic information lets them think about where they are now and take steps to move up. Making good display models is an excellent way to help people learn. Putting on training and teaching on the field also helps farmers share information and talk to each other. Using social networks to spread information and get more people to join the cause is a powerful way to do both.

Interviewer - *The methods you described are contemporary and based on transformative theories. However, older, traditional agricultural practices also influence some methods and strategies. How does this balance take place?*

I4 - Changing how farmers and producers think can be challenging because they like how things have always been done and care about how their goods look and how well they sell. Even though they may see the benefits of agroecology and sustainable farming, the imagined risks and unknowns of switching to these practices can make it hard to get people to do it. Education, demonstration plots, and platforms

for sharing knowledge can be beneficial in giving farmers the knowledge and trust they need to use more sustainable methods.

Interviewer - *You mentioned the challenge of applying agroecology in urban areas, but do you also see its potential in the cities?*

I4 - I'm not sure about that. In the context of Vietnam, like Hanoi, developing agroecology within the city is challenging due to limited farming land. Most agricultural production occurs in the surrounding provinces and is transported to the city. The urban areas have limited space for agriculture.

Interviewer - *What about smaller-scale strategies? Something that doesn't require a large plot but can be applied in urban parks or even at a private level. Are there any strategies from the fields that could be adapted for urban areas?*

I4 - In cities, many people engage in small-scale gardening on their rooftops or in small gardens for personal consumption. They prefer using fewer chemical fertilizers and homemade, natural alternatives like garlic or chili-based pesticides. Another interesting practice is incorporating aquaponics systems, where water from fish farming irrigates crops. These approaches can be adapted and expanded to suit urban environments and promote sustainable food production.

Interviewer - *That's an interesting example. In HCMC, aquaculture plays an important role. Integrating it with the city's green network could be a great idea. Are these strategies, whether on a larger scale or an individual level, steps toward the transformation we're discussing?*

I4 - I'm unsure because not many people in the city grow their food. It's only a tiny group compared to the whole population. So, while it fits the strategy, much more progress is still needed.

Interviewer - *With the growing awareness of climate change worldwide, do you observe increased initiatives to address these challenges in Vietnam? Do you believe that the mentioned trends of growing vegetables in small urban spaces or similar strategies are aligned with climate change awareness?*

I4 - I don't see a strong connection between the two. Urban citizens seem more interested in having high-quality vegetables and fruits for their families rather than directly addressing climate change. It's more of a hobby of producing clean food rather than directly responding to climate change awareness.

Interviewer - *Like other sustainable development practices, does agroecology potentially reduce social vulnerabilities in productive areas?*

I4 - Agroecology can help make people less vulnerable by promoting sustainable control of resources. For example, allowing and protecting water resources, lowering labor needs through intercropping, and keeping the crop residue. This gives people more time to enjoy their lives. Agroecology can also help stabilize the economy and family incomes, especially for small households in poor areas. Agroecology also cuts costs for each crop season by lowering chemical fertilizers and focusing more on fertilizing by hand. It also has something to do with public health. Overall, it can reduce social vulnerability and promote lasting growth.

Interviewer - *If you could give urban or space planners a tip on bringing these fields together, what would it be?*

I4 - For agroecology to work in big cities like Hanoi or HCMC, more green areas with different kinds of trees are needed. Animals can find homes in these parks, and agroecological techniques can be used there. Another option is to build hydroponic fields, which can be affordable and doable because materials can be quickly brought in from nearby countries like China.

But the real problem is how people who live in cities are mindset. To get people to use agroecological models, they need to see how important and helpful they are to the city and their lives. It is essential to get past the mental challenge. Farmers in my area are aware of the benefits of agroecology, but they are worried about how the food will look and how much it will sell without chemical treatments. In these situations, getting people to use agroecology is still hard.

***Interviewer** - Is there anything else you would like to discuss or add?*

I4 - It can take a long time to see changes regarding agroecology techniques like conservation or reconstruction. But farmers often have problems because they can't wait years to see benefits. They need money immediately to care for their families and do what they must. This haste sometimes goes against the rules that the city or other factors put in place. It's challenging for farmers who know the benefits of sustainable farming but also need to make money quickly. Fixing this economic problem for households is essential and complex, and it needs to be done in tandem with the use of advanced or new techniques.

Also, because everything in agroecology is linked, it needs a complete system, which makes it hard to use on small plots without integrated policies. These are some of the most critical problems we face as a country.

***Interviewer** - Balancing the time of natural cycles with the demands of development is challenging. How can we find a balance between the two?*

I4 - That's a tricky question. To support sustainable development models in both rural and urban areas, we need to link the approaches to the green infrastructure of cities and use flexible ecosystem-based practices that recognize how nature and development are linked. Because of this, it's essential to raise knowledge, make demonstration models, and involve stakeholders in different ways.

7.6. INTERVIEW TRANSCRIPT 5

I5 is a member of the second-prize team. Urban Designer with a background in practice, teaching, and research background studying cities and urbanization and the context in Southeast Asia. Lived in Southeast Asia for over 10 years.

***Interviewer** - What is your professional experience in Southeast Asia?*

I5 - Our company has been bustling in Asia for a long time. We worked on projects in China until we opened the office there a few years ago. So, regarding implementation, I can tell you about other master plans that were implemented. From this one, I can tell you about the design aspect of the competition. However, when it comes to some of your specific questions about climate justice and implementation, I cannot help, unfortunately. You should contact Doan from the winning team because he's from Vietnam and has many other projects there.

***Interviewer** - How long did it take to elaborate the plan?*

I5 - I don't remember exactly, but it was a tight competition. Two or three months. It was a pure design competition, and we were only three or four consultants together. Some contests are sometimes longer.

***Interviewer** - How was the team organized?*

I5 - One company was responsible for sustainability, landscape, and green infrastructure. Another company, for economy and transport - but also sustainability. Then the third company was the local architect and know-how. And we were urban designers and planners. As an urban designer, you are an orchestrator. We are always team leaders. We guided the disciplines towards a shared vision and

integrated their agenda and ideas into a unique plan. It's about integrating, negotiating, and understanding how the economic plan will impact transport and how it depends on the transit. It is a challenge for you to combine all of that. It demands a lot of coordination, listening, and then explaining what it is, meanwhile showing them working together to adapt that plan. And that's how we work at our company: we spend much time working with people because you need help to plan that territory. It's not possible.

Interviewer - *About the project, how did you respectfully balance international knowledge with local expertise regarding culture and tradition?*

I5 - We always approach any project from that perspective. You can ensure that knowledge is valuable, even though it is not local, in different ways from a certain level. It's not black or white. At our company, we work a lot with local universities and spend time researching every project. Most of all, because of the scale of those projects and the dimension of issues, we have to work with different disciplines. When you work at the city scale, you must collaborate with local specialists in multiple disciplines, such as economists, transport planners, landscape architects, and environmentalists dealing with climate change. We work with those big companies with different fields under the same hat. So we employ a lot of them locally.

Because it is the most urgent concern, water-related issues in Southeast Asia, particularly Vietnam, often call for foreign expertise. It is now taking place due to the ongoing flooding brought on by the Mekong Delta and monsoon rainfall. Because the Netherlands has had this information ingrained in them for generations, many consultants working on those climate challenges are from there. But on the other hand, it involves working with and employing locals, so you both learn from them and they from you. This information exchange has been taking place for years. Although some architectural firms approach their work from a completely different and more commercial standpoint than we do, you must exercise caution.

Interviewer - *What were the most pressing challenges of the site?*

I5 - One is flooding because half of the site is under the flood zone of the Mekong Delta. But flooding is not necessarily an issue; it can also be a potential. It depends on how you work with it. For example, to reorganize the spatial frame, 28,000 ha it's an enormous territory, and you cannot ignore floods. So we placed park connectors following the existing streams and topography, allowing certain site areas to be flooded in the future. And this new green became the updated backbone on which the urban structure was reorganized, along with the current streams we uncovered. We had an entire engineering system with flood protection, but at the same time, you cannot always limit it. The water will come, and it can be a good thing that you have to plan with it 100 years ahead. Therefore, the flood became a potential rather than a challenge. It depends on how you look at it.

A primary obstacle was that the region wasn't a white plate but a tabula script. The majority had already been urbanized, and there was much development, houses, and habitation. What does this signify for the urban design you are designing, then? It brings to mind "regeneration." As a result, we thought about the current region and created a plan for where the new nodes should be placed. You already had a lot of potential for the program up North. The university, multiple businesses, and industrial and technological parks are nearby. There is thus a lot of work and activities. How can you improve upon those? It's one of the reasons the winning team strategy was chosen because, precisely in terms of how it will be executed with the local government, they know more than us. The winning team member will be able to tell you a lot about that since they have more significant local expertise.

A problem in Vietnam is that urban planning needs to be prescribed. It is improving, but you still need to envision the future. This international competition was about defining the vision for this future area, but it had yet to be planned in the past. So, you had this sort of entirely unplanned and erratic urbanization that covered the entire territory without any planning—so building houses where they should not be created, in the flood zone with inadequate road infrastructure. You had a few roads completely packed with traffic because the site is between the old city center of HCMC and the airport. So you have this vast zone node, and in the middle, you have this territory with a lot of traffic. You have the port in the South as well. So it had a lot of issues with unplanned regions. The urban fabric is everywhere, and traffic is your typical challenge in Southeast Asia. It's the same in Jakarta, Indonesia, and all that in a territory under threat regarding climate change.

Another problem in Vietnam is that private companies are pushing. You need a planning system that protects room for the future and gives clear rules about what you can do, what you can't do, where you can build, and how. Planning is for this, right? At the same time, even if you get it to a certain level, a private developer can come in and say, "No, I'm going to purchase and develop that property in that manner, with that height, and I want that amount of money," and the government will agree. Therefore, we were aware upon entering that we would have to deal with that type of, I don't know, honestly, corruption, but yeah, you can't ignore such things because they will occur. How can you include them in your strategy without really jeopardizing it? Incorporating this into our strategy took time and would be considerably harder now. But we didn't get there, right?

***Interviewer** - As you mentioned, water can be the biggest threat to HCMC. And if nothing is done, according to the forecasts, the city will nearly entirely be under water until 2050. Have you ever planned for relocations while taking into account such unlikely events? Was that a worry as well?*

I5 - Yes, indeed. When certain areas were intentionally flooded, it became evident that if people lived there, they would need to be relocated. The situation was exciting because, in the southern region, it primarily affected future buildable areas along the flood zone intended for private developers. However, there were also existing settlements in some areas. The challenge was to make necessary decisions without alternatives. In certain regions, it involved speculation and determining the best approach for building in the flood zone. Floating houses were considered a potential solution, but long-term planning in a country like Vietnam posed difficulties. Unfortunately, there have been cases where territories were urbanized without a strategy, resulting in life-threatening issues. Displacing the population was not a choice but a necessity. Efforts were made to compensate for the displacement by creating open and public spaces. Additionally, another zone should be allocated as part of a give-and-take approach.

***Interviewer** - Was this anticipated in the strategy, though? I have access to this thorough report from your team, but I must specifically recall this section.*

I5 - This is me planning ahead. But again, it was just an international competition. We didn't get to the necessary details. But in the zones, we allowed flood. Suppose there was existing construction; of course, there would have been relocation. The goal was to manage and incorporate the overflows into the design while creating new parks and open spaces for the community. But it's not a light issue, for sure. Although floodgates were implemented, their effectiveness could have been improved. The flooding originated from the sea and intensified due to heavy monsoon rains in the Mekong Delta South. You have to subtract at some point to provide for those uncertain events in the way you design.

***Interviewer** - Before the plan, did you have professional experiences in Vietnam? It's not a formal inquiry; it's just out of curiosity.*

I5 - No, it's a good question. It was not the first time I was going there. I went there many times. And also worked a lot in Southeast Asia before, in Indonesia, Singapore, and Cambodia, but Vietnam was the first time. After that, we had some work with local developers but on more localized projects.

***Interviewer** - And now and initially, you are based in Europe. For what reason did this professional approximation to Southeast Asia happen to you?*

I5 - My primary work is outside of Europe on foreign initiatives. Because it's such a significant cultural issue, I value new contexts and alternative perspectives on new topics. How do you handle a customer? How do you interact with the regional group? Your communication and listening styles must change. So much of it revolves around social interaction.

***Interviewer** - I became attracted by the subject because of this. I'm from Brazil and can see connections to my home country in politics. From a planning viewpoint, stepping outside the European comfort zone and exploring new environments is also intriguing.*

I5 - At the end of the day, it's about appreciating the worth of the people you work with, being modest, and not bringing your "big knowledge from Europe," which is, let's say, the challenges that there are so much more than those we face here in Europe.

Countries like the Netherlands have successfully lived below sea level through extensive planning and artificial territories designed for long-term sustainability. This knowledge serves as a valuable reference for us. In many projects, client briefs increasingly emphasize the importance of capacity building and training local individuals within our team of consultants to ensure knowledge transfer even after our departure. Client requests for training are common in our projects, and we fulfill this through various means such as workshops and on-site meetings, fostering idea sharing and team growth. The capacity-building aspect is also a key consideration in the second project I'm currently involved in. However, it's important to note that in the specific context of this master plan, capacity building did not occur due to time constraints and the demanding nature of the project, which was one among several competitions we participated in that year.

***Interviewer** - In your urban planning coordination, did you consider the impact of the promoted land use changes on future land valuation and the potential risk of green gentrification in your urban planning coordination efforts?*

I5 - There were existing programs on-site, so we made minimal changes to the land use if I recall correctly. However, a significant new transfer node was planned, which involved the establishment of a new Central Business District (CBD) near the city center, with a river and a peninsula in between. Additionally, a train stop was planned for the area. The land value in the new CBD was expected to be very high, and it was one of the critical focus areas we examined in detail during the design process. Gentrification was not a relevant consideration since there was no development in that area. Our focus was on planning for the new.

Regarding anticipating the future of the local context beyond reorganizing the territory and identifying areas and nodes in the region, we did not delve deeper into that aspect during the competition because it was separate from the competition's scope, and time constraints limited our exploration. However, in other plans, especially market-driven ones, we consider the region's economic evolution and plan for potential new industries and workforces. Urban planning and design involve preparing for a 50-year timeframe with inherent uncertainty. We aim to create flexible frameworks that can adapt to changing circumstances.

Typically, we plan with something other than specific programs in mind. Instead, we focus on defining character areas and spatial qualities, such as street networks and open spaces. We also consider

typologies, setting guidelines for building height and depth. Prescribing specific programs is more challenging. When we work on market-driven plans for private developers, it follows a distinct approach from the territorial scale planning discussed earlier.

Interviewer - *When researching, I found plenty of environmental information regarding environmental vulnerabilities, which, most of the time, are also connected with social vulnerabilities. Could you point out some of the most significant social vulnerabilities of the territory?*

I5 - It's a good question. But I have less local knowledge about it, so I prefer not to get too specific. Naturally, flooding occurs frequently, and the surroundings can be hazardous. I don't know how much access the children in that region have to education or how many schools they can attend. Given how unplanned the organization was, it also has to do with all the infrastructure and social amenities. Although you have the university up North, educating them first is necessary. I also have some doubts regarding hospitals, for instance. You should ask this company from the winning team. They have much more accurate information to share.

Interviewer - *One final question. It has been a while since the master plan proposal, but can you consider any possible improvement, change, or something that could be better developed?*

I5 - We needed to go into detail. The spatial concept and the structure were in place, but we could only construct two or three target areas to explore more deeply. We had two or three weeks to build those zones, though, to reiterate. Thus, we may now approach it differently. To thoroughly examine the regeneration site, more time was required. What was there, and how did you deal with the situation but on a more specific level? Those are the questions we should be asking. But once more, additional specificity was required. Our strategy would be completely different right now if we were to win. Because competition is about creation, having a valid notion or idea is essential, as is coming up with a strong image. Although it's awful to say, it's true. Regarding the science, you need a team of consultants on your side.

7.7. INTERVIEW TRANSCRIPT 6

I6 is member of the first-prize team and principal at one of the winning companies. Background in urban design and architecture. Integrate local and international projects on different scales of urban design and master planning projects.

Interviewer - *Have you been professionally close to Southeast Asia or Vietnam before doing the master plan*

I6 - I'm originally from South Asia and have been working with Vietnam for a while. Much of my practice has been in that part of the world, Singapore and China.

Interviewer - *What is the current status of the plan?*

I6 - The master plan is now being implemented. We won the competition three years ago, and then it was on pause while the government secured the funds. We began working on the master plan six months ago and are working through a methodology. The initial stage of analysis and high-level notions is complete. We will start the second phase next month as the government reviews them. It is intended to be finished by the end of this year.

Interviewer - *Regarding the contest, how long did it take to develop the master plan?*

I6 - For the competition, that was just a three-month practice.

Interviewer - *What it's the central vision or objective of the plan?*

I6 - After we won the contract, three distinct areas were intended to promote more innovation and entrepreneurship in HCMC. The government later merged these districts, creating a new city (Thu Duc City) with centralized administration to help this city to move forward. The vision is to develop a paradigm shift in urban living, focusing on resilience, climate change, and entrepreneurship to coexist and become part of the Vietnamese economy. HCMC houses a high-tech manufacturing zone, with companies like Intel and others, a national university zone, and the notable Thu Thiem area, which aims to become a financial technology hub. It's about creating a new paradigm for city living and city-making. These initiatives aim to redefine city life and drive economic growth.

Interviewer - *It's impossible to talk about HCMC and not about flooding and all the hazards arising quickly and scarily. How does the plan deal with these significant challenges?*

I6 - Our team partner has a local well-renowned firm of flood mitigation and hydrology experts. We've looked at everything from sea level rise conditions to hundred flood planes, topography, and deviants to understand the low-lying areas of the site and the vulnerable areas. We mapped all those and ensured that development was kept away from the most ecologically sensitive areas, preserving them for wetlands and sponge landscapes. Development was strategically situated on higher ground while maintaining the existing canals with widened buffers for increased holding capacity. We also ensured that the issue is mitigated in the future.

Additionally, intentional landscapes, combined with a comprehensive water management strategy, were created as holding or sponge landscapes for water. We are also looking at heat resiliency by providing the right level of shade, whether in terms of trees, canopies, or organizing buildings. So we looked at it from multiple lenses.

Interviewer - *How did you divide the task regarding landscape architecture and green-blue infrastructure? Was it done by your company or by your partner?*

I6 - It's a collaboration. The landscaping, basic concepts, and engineering work together.

Interviewer - *I noticed some nature-based solutions when you mentioned some adopted strategies. How do you describe the system's balance between gray and green infrastructure?*

I6 - It is a significant balancing act, and we want to ensure a circular economy. We are recycling gray water because of our extensive residential population on the site. I'm going to share my screen.

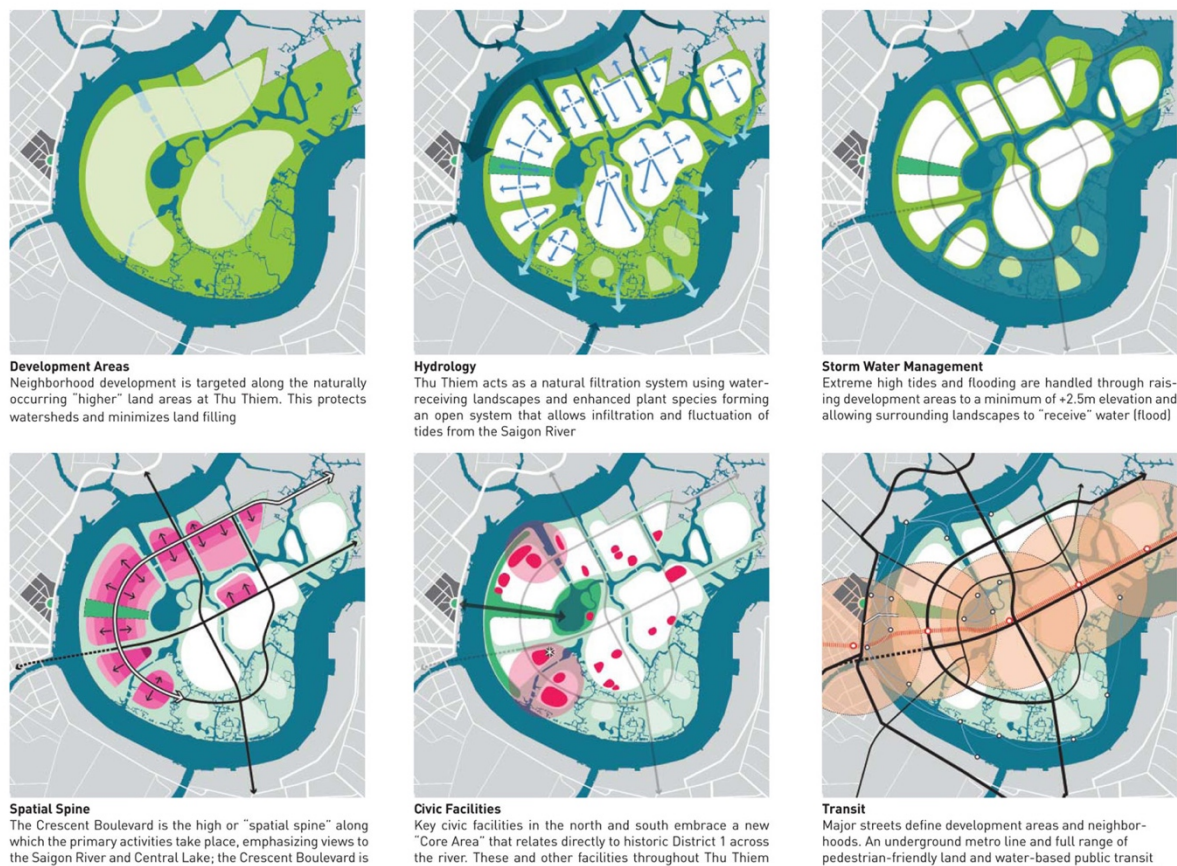


Fig. D – Masterplan's Flooding Development Strategy, shown by the interviewee (available at <https://www.sasaki.com/wp-content/uploads/2019/10/04.International..Thu-Thiem-1800x1414.jpg>, accessed on July 28, 2023)

This is the westernmost edge of HCMC. This low-lying area approach was to preserve and enhance sensitive wetlands and mangroves. The development was placed in areas further away from them. We created a secondary inside lake to help with stormwater management. The whole grading system was organized so that the spine in the middle was higher. And then, the development steps down so the water can cascade to the edges. You can see this diagram. The blue represents the floodable landscape. If there's a change in water levels or areas, the development is projected so the landscapes can get flooded as needed. This became a spatial spine showing how development is constantly along the central infrastructure spines with amenities and extensive facilities. Transit plays a significant role in connecting all of them. So, this is an excellent example of how we approach things from a nature-based solution and balance it against place-making livability and density for investment value.

Interviewer - According to the predictions of the ADB, the whole HCMC will be underwater if the measures are not taken. You pointed out the third image in which no housing and amenities are in flood-prone areas. But what about possible plots or areas to relocate the people in case of extreme events?

I6 - We planned this strategy for managing the stormwater and trade engine so the landscapes can help absorb it.

Interviewer - Does the plan proposes many lands use changes?

I6 - Yes, significant land use changes. This part has also been constructed according to our plan; quite interesting to see how this is coming. You see the development pushed, an entire outlined area preserved with significant green spaces and mangroves for holding capacity.



Fig. E (left) – Current stage of development. Fig. F (right) - The winning Masterplan (available at https://vir.com.vn/stores/news_dataimages/kimoanh/052018/02/16/in_article/nine-land-plots-in-thu-thiem-new-urban-area-to-be-auction-for-starting-price-of-118-billion.jpg; <https://charmington.org/public/upload/images/tin%20tuc/2020/thu%20thiem%201.jpg>, accessed on July 28, 2023)

Interviewer - Was local knowledge also considered when designing the plan, specifically regarding the green infrastructure?

I6 - Yes, significant local knowledge is being incorporated. Besides our partner, which is local, we also have another local planner on our team.

Interviewer - You mentioned that the plan proposes considerable land use changes. At the same time, people with fewer economic advantages will sometimes have different access to certain areas. Do you also estimate how these new land uses influence land valuation now or in the future?

I6 - The intent is to do this strategically. We've preserved much of the land, and existing settlements in flood-prone areas are being revitalized. So, it's not all new; it's a balance of restoring and rehabilitating existing neighborhoods and urban fabric and strategically inserting them into new ones. The land values or valuation are based on strategically organizing building heights along the central spines to capitalize on them, preserving view sheds and access to ventilation. We are doing todos to leverage transit through transit-oriented development in areas with transit stops. We also promote a more compact (other than sprawl), walkable urban fabric to enhance connectivity throughout the city.

Interviewer - Regarding performance and M&E, do you also have an assessment framework or team that supports this plan as it evolves? How do you deal with this?

I6 - That's a great question. It is still at a conceptual stage and has yet to be implemented. The intent is to create a smart monitoring system to access all the planning stages. They will make a digital city version, monitor resource optimization efficiencies, and create that feedback loop. But I'm hoping that that can be implemented soon.

Interviewer - How are you dealing with this strategy? Are both companies involved?

I6 - We have it as a concept, but it'd be up to the government to get the resources to implement it. They must do that with the technology company or someone who can set up the infrastructure.

Interviewer - Do you have an example of how to stabilize this type of monitoring regarding the time frame?

I6 - A pilot phase-wide strategy for a particular phase is being done. We will see how that works and apply it in different parts of the city.

Interviewer – Is there anything else that you would like to share?

I6 - The information regarding the competition is more open source. On the other hand, it is hard to share too much of the plan since we're still developing it. But we also have a robust engagement process where we listen to city stakeholders, so it becomes a more bottom-up approach instead of a top-down approach. These participatory processes are something that we're working on right now. Part of this was done during COVID, so we did many things online. But now it's become much more engaging. An essential part of our process is getting adequate stakeholder input, including people in the community and different government agencies. So, it's a wide-ranging impact and hopefully transforms planning.

Interviewer - Regarding this engagement, how are you doing this? Are you connected with any sort of institution?

I6 - Our local partners are contacting different organizations in the city, including town halls, et cetera, to solicit important feedback.

Interviewer - Can you share some information on the feedback on how the people accept it?

I6 - It seems well accepted, so many investors are now trying to get into it. Initially, they felt the density should be much higher than we had proposed, but we also wanted to balance that out. So that's an interesting dialogue to see, the investment into creating the infrastructure experience with other forms of partnerships.

7.8. INTERVIEW TRANSCRIPT 7

I7 is a Journalist in a Local Magazine focusing on Business Stories. Background in Public Policy, Economics, Law, and Foreign Economics. Born and raised in HCMC.

Interviewer - As outsiders, we hear about how climate adaptation has become a public policy in Vietnam and that the information in this regard is liberally shared. What is your impression considering the national context, but especially HCMC?

I7 - My biggest impression is the Program to plant 1 billion trees for 5 years, from 2021 to 2025³⁹. Under this program, the Government calls for planting more trees in urban areas, residential areas, and industrial zones to increase green density, reduce carbon emissions and absorb urban heat. The program also places more emphasis on tree planting in the city than on afforestation because of the limited area of forest land.

³⁹ Available at <https://en.vietnamplus.vn/joint-efforts-made-to-plant-1-billion-trees-by-2025/248522.vnp>, accessed on July 28, 2023.

In addition, there are provisions in the construction law on the density of trees or parks for each type of city and area. However, my research shows this ratio is not achieved in big cities. For example, in Ho Chi Minh City, the average public green area per person is 2.4m², while the regulation is 12 to 15m²⁴⁰.

Interviewer - *In previous talks, you mentioned that you see little justice and concern for the environment in the current city design. Regarding other concerns such as climate, land market, economics, etc., what gets the attention of the HCMC public sector nowadays? For what reason?*

I7 - Climate-related, but the current anti-flood projects do not clarify comprehensive city flood control solutions.

Interviewer - *Much of Vietnam's land market inputs come from foreign investors. Regarding the latest projects and developments, how do you see them influencing the urban fabric?*

I7 - As these projects are located on the city's outskirts, they do not affect the traffic density in the downtown area too much, especially across bridges.

Interviewer - *Do you think their general presence balances international and local knowledge?*

I7 - Maybe. For example, the Estella project in District 2 (now Thu Duc City), jointly developed by a Singapore and Vietnam company, has many green areas. It has the design style of green buildings in Singapore. Projects developed by foreign investors are often located in District 7 and District 2 (now Thu Duc City).

Interviewer - *To whom do you think these projects and developments are built?*

I7 - Most of these projects are for high-income people, foreign professionals living and working in Vietnam (owned or rented for a few years), or Vietnamese with high-income levels.

Interviewer - *How is the public participation in HCMC (or Vietnam)? Does the population often get involved in public policies? Is there civic awareness about upcoming, ongoing, and/or past development projects?*

I7 - Only those who do related work are interested and receive information related to policy design in their field. For example, architects or real estate development companies will know how to find information related to planning at familiar sources such as the websites of relevant associations and ministries. Most people will not be informed or consulted about policies that are being drafted or are about to be enacted.

Interviewer - *About the significant climate hazards like flooding (due to flood tide and rains), which areas of HCMC do you see as more vulnerable with regular events happening? Please also point out one area of Thu Thiem.*

I7 - The central area of Ho Chi Minh City, such as District 1, District 3, and Phu Nhuan District, is strongly affected by the urban heat island because of the severe lack of trees on major roads such as Ton Duc Thang Street, the area near Tan Son Nhat International Airport.

Regarding floods or high tides, areas near rivers and canals will be most affected. These are areas around the Saigon River, such as Thanh Da Peninsula, some in the Nha Be District near Dong Nai River,

⁴⁰ Available at <http://dwrn.gov.vn/index.php?language=vi&nv=download&op=Sa-ch-Ta-i-lieu-tham-kha-o/Bao-cao-Hien-trang-moi-truong-Quoc-gia-giai-doan-nam-2016-2020>, accessed on July 28, 2023.

Nguyen Huu Canh Street near Vinhomes apartment complex and Saigon Bridge. Areas near Thu Thiem Bridge in the direction of District 2 (now Thu Duc City) are also often flooded during high tide. Real estate developers often raise the road surface to cope with this phenomenon.

Interviewer - *Do you notice a growing preoccupation with sustainable development, especially regarding the environment in HCMC? If yes, since when? If not, do these efforts happen through initiatives from more private or smaller contexts (such as individuals planting trees in their houses, self-organized community gardens, etc.)? Can you give some examples?*

I7 - There are projects to deal with flooding in the city, for example, renting a pump to prevent flooding on Nguyen Huu Canh Street⁴¹. However, I have not heard publicly and widely that there is a solution to sustainable development that comes from the public sector.

On the contrary, there are many initiatives from the private sector related to fighting climate change in urban areas, such as GreenViet Da Nang⁴²'s initiatives to plant millions of urban trees, calling on businesses and people to plant trees of Gaia⁴³, or young people working together to clean up the canals⁴⁴.

Interviewer - *What do you recognize as HCMC's most significant social vulnerabilities?*

I7 - The most vulnerable groups are low-income people and immigrants to the city to work. They don't have many options for where to live, often living in public parks that sometimes get flooded when it rains heavily.

Interviewer - *Do you see the new land use changes affecting them? How?*

I7 - Currently, the city is mainly developing to the east (Thu Duc City) and the west (Long An Province). The land fund used for new projects was previously agricultural land. This development will provide more housing for the market, but the situation of real estate speculation in Vietnam makes housing and apartment prices soar beyond the reach of many people. Therefore, the development of new projects does not have many positive impacts on the above vulnerable groups.

Interviewer - *Have you heard of any relocations according to the land use changes due to the new developments in the city? If yes, do you know these processes happen?*

I7 - I know a case of residential relocation when District 2 develops the Thu Thiem area. In the past, this area was close to people's houses, and I once tutored a middle school girl who lived in a one-story house in this area, around a small road with a width of about 10m, close to people's houses and a market. All houses have been razed, and many apartment buildings and villas have been built on a four-lane road. People are promised housing in a social apartment complex in the planning area.

I don't know the specific relocation process, clearance, and compensation, but many articles reflect the litigation related to this compensation between the people and the government.

⁴¹ Available at <https://thanhvien.vn/to-tphcm-lat-keo-ong-chu-may-bom-chong-ngap-duong-nguyen-huu-canh-se-khoi-kien-185230510143701554.htm>, accessed on July 28, 2023.

⁴² Available at <https://greenviet.org/en/million-trees-in-cities/>, accessed on July 28, 2023.

⁴³ Available at <http://gaiavn.org/chuong-trinh/nang-cao-nang-luc.html>, accessed on July 28, 2023.

⁴⁴ Available at <https://thanhvien.vn/mang-xa-hoi-dang-ran-ran-boi-nhom-gen-z-don-rac-o-dong-kenh-den-1851542665.htm>, accessed on July 28, 2023.

Ho Chi Minh City has added support for some cases affected by the Thu Thiem New Urban Area project for people to stabilize their lives with a total amount of VND 1,353 billion.

The resolution on supplementing the compensation, support and resettlement policy for people affected by the Thu Thiem New Urban Area project was approved by the Xth Ho Chi Minh City People's Council at the first meeting on June 25.

This is the second time the City Council has issued a resolution on this issue. In October 2019, the People's Council of Ho Chi Minh City approved a policy to settle additional compensation, support, and resettlement with 331 households in a 4.3 ha land area. The plan is to apply the land price according to the conversion coefficient of 331 households. money, land, and resettlement house.

Regarding the payment, the People's Committee of Ho Chi Minh City proposed using the revenue from the auction of land use in Thu Thiem New Urban Area. The city will adjust and supplement compensation and resettlement policies in urban areas following regulations, ensuring people's interests.

Thu Thiem's new urban area was approved by the Prime Minister in 1996 with a scale of 930 ha (of which: New urban area 770 ha, Resettlement area 160 ha), population of about 200,000 people, resettlement area of about approx. 45,000 people, located on the east bank of the Saigon River opposite District 1.

Expected to be the most beautiful and modern in Southeast Asia, but after 25 years of approval, Thu Thiem New Urban Area has not developed as expected due to many violations. Many people here think that their land is outside the planning boundary but still has to be cleared, recovered and compensated in contravention of regulations.”⁴⁵

***Interviewer** - Any other comments or suggestions for planners, organizations, civic communities, and/or researchers in dealing with climate challenges that may facilitate social and environmental justice?*

I7 - I suggest having a long-term master plan. Plans are often fragmented and uncoordinated because of tenure (5 years each) and group interests. If there is a general long-term plan like the case of Phu My Hung, the city infrastructure and fairness for all social sectors will be better implemented.

7.9. INTERVIEW TRANSCRIPT 8

I8 is member of the winning team. Senior Associate in Policy and Planning, Learning and Development Coordinator, and Manager of the Singapore Office. Born in Vietnam.

***Interviewer** - What is your specific part in the development of the Masterplans at the moment?*

I8 - I was not in the competition because I was not in the company back then. But since joining our company, I've been in the master planning team. And most of the time, I'm involved in projects like the larger citywide general master plan and looking at strategies, visioning, processes, and systems. And thinking about the big picture. So, for most of the massiveness, I'm more involved in the first part where we're trying to shape it up, and then my colleagues take over to go into the technical aspects, the legal requirements, the hydrology, the transportation, things like that.

⁴⁵ Available at <https://vnexpress.net/bo-sung-hon-1-350-ty-dong-ho-tro-dan-thu-thiem-4300082.html>, accessed on July 28, 2023.

Interviewer - *Can you contextualize the 2019 contest and frame it within the new Masterplan for HCMC?*

I8 - HCMC has a unique context. To give you some background, Thu Duc City was formed between 2018 and 2019, combining three previous districts: District Two, District Nine, and Thu Duc District. During the competition for Thu Duc City, it was not yet established as a city itself but instead referred to as a "highly interactive and innovative district."

After the competition concluded, there were about nine months during which our company worked closely with the Department of Planning and Architecture of HCMC. Together, we developed the brief for the Master Plan of HCMC. This collaborative approach is common in Vietnam, where authorities and institutions work together before calling for a Master Plan. Our team and another local institution formed a group to complete the Master Plan.

I think it's important to clarify that winning the competition did not automatically lead to implementing the Master Plan. The competition served as a recognition, and consultants were chosen separately to develop the Master Plan. While being the competition winner may have provided some advantages, it was not the sole reason for our team's selection. The winning entry from the competition does not necessarily represent what is currently being implemented.

In Vietnam, winning a competition does not guarantee the right to implement the Master Plan. It may seem silly, but that's the reality. I wanted to emphasize this distinction because planning competitions, especially with short timelines, often do not allow sufficient time for extensive research and community engagement required for a comprehensive Master Plan.

Our team had the opportunity to conduct further research and engagement when we started the project in 2020. Perhaps it would be more beneficial to discuss the ongoing work, as we are currently in the initial stages of the HCMC Master Plan. Since the project has just begun, I cannot provide detailed information.

Interviewer - *Are the Thu Duc City and HCMC being developed as simultaneous master plans? How does the Thu Duc City master plan align with the area's existing planning strategies, features, and policies?*

I8 - There have been significant changes in Vietnam's planning system in the past. Each district has its planning zones of different sizes that need to be approved by the Department of Planning and Architecture. So, there's the master plan for each district and a master plan for HCMC at a larger scale. When we inherited the plan for Thu Duc, it involved many of these planning zones.

It is essential to follow the legal boundaries and legacies from the past, as it can be challenging to make changes once something is approved because of other people's interests. So, there must be respect for previous decisions. For example, this case applies to clearing houses for public purposes. You cannot suddenly turn that into commercial use, for example.

So, inheriting all these layers with all master plans asks for balance between strategic strokes, legal boundaries, and physical implications of the proposal.

Interviewer - *How do planners balance the need to protect against purely commercial strategies while dealing with significant foreign investment in Vietnam, particularly in HCMC? What measures, limits, or boundaries are in place to safeguard against potential risks associated with foreign investment in the real estate market?*

I8 - In Vietnam's planning codes, there are precise requirements for various aspects like height, plot ratio, and the number of schools based on population walking distance. The challenge is not about

protection but creating room for flexibility within the legal framework. It is essential to allow opportunities for private developers to contribute and enhance public infrastructure, even if it means deviating from strictly dictating certain areas for specific purposes. The goal is to enable public-private collaboration and find space within the existing rigid system and legacy from the past.

Interviewer - *Do these strict regulations genuinely reflect in the city's urban fabric? Is there a significant adherence to these regulations, or is there a disconnection between what is planned and what is implemented?*

I8 - On the ground, there are often deviations from the regulations, particularly in setbacks and river corridors. Unless it's a newly planned area, it's unlikely to see strict adherence to the plans. The city tends to develop more organically and naturally. This mismatch creates a significant gap between the reality and the planned outcomes, especially for developments predating regulations. However, meeting the regulatory requirements is essential to gain approval and establish a legal basis. The planning practice in Vietnam is very legal based and seeks ways to accommodate flexibility within the regulations.

Interviewer - *And this legal base it's mostly coordinated by the DPA?*

I8 - The DPA can be seen as a monitoring authority, but it operates under the central government's guidance, specifically the Ministry of Action. Some clear guidelines and documents must be followed when undertaking master planning in Vietnam. These guidelines are deeply ingrained in the planning process, and getting approval is the crucial initial step. Without approval, there is no legal basis for proceeding with subsequent steps.

Interviewer - *While you may not be directly involved in landscape planning, when considering the organic nature of the environment in HCMC, how do the existing infrastructure and green components interact with the new features being developed?*

I8 - Our team partner was responsible for the landscape and urban design in the Master Plan so that they could answer more detailed insights. However, regarding water management, both the Thu Duc and HCMC Master Plans aim to restore the water identity and prioritize its integration into the city so that you're not just boxing up the city regarding protection. Thu Duc has two rivers, Dong Nai and Saigon, and smaller water channels and canals. The goal is to utilize the existing natural landscape and canals for flood management while preserving the water networks and incorporating protection measures along the larger river corridors and the internal canals. This approach ensures the preservation of the city's waterways, maintains the landscape and allows for more localized and nuanced protection strategies instead of relying solely on major infrastructure investments.

Interviewer - *I also spoke with your partner, who said our company is currently responsible for the governance and participatory processes.*

Considering the limited time for community engagement in the contest, how are the public receiving ongoing and upcoming changes? Can you provide insights into the process, including any involvement of specific local anchors?

I8 - Public participation in planning has traditionally been limited in Vietnam, often reduced to filling out forms and submitting them to local departments. In other master plans, it's done in a very tokenistic way.

We are exploring different approaches to enhance public involvement in our master plans. We created a website as part of our team's efforts to facilitate public engagement online. The website is still active and serves as an information platform for planning. However, its launch coincided with the peak of

COVID in Vietnam, resulting in fewer responses than expected. However, I don't know how publicly they want to talk about these things anymore.

Regarding the high-tech part management, we conducted eight workshops with local authorities, experts from different departments, and representatives from different districts and universities to gather insights and input. At this point no companies and no public. That was very helpful in building the direction for the city.

Of all groups, businesses are the ones that we engaged the most. Considering Thu Duc's vision as an innovative economic hub, engaging with them was particularly important. We conducted surveys on which kind of innovation and startup we had with about 170 businesses to understand what they need, where they are, and how they feel about the development. And then after we organized two business conferences where we shared the master plan and incorporated their perspectives to understand their needs. Balancing public and private interests is crucial, and we are also considering similar approaches for HCMC, although it is still in its early stages.

Interviewer - *Did many real estate investors show up also? How do they relate to these businesses' engagement?*

18 - Only a few, to be honest. We mostly work with SMEs in Thu Duc. It's not a deliberate choice, but the area's nature attracts young, innovative, and dynamic companies. And then there's a high-tech park in the middle which we also know the manager, so that's how we approach that.

Their platform and stage might be elsewhere for real estate developers. Not in a public platform like this. In a public platform, it's a different mix of groups and people.

Interviewer - *The processes did not engage civic or public participation, especially with vulnerable populations. Is this something that you're trying to work on?*

18 - We've always tried to work on it, but the level of success varies due to different factors. Sometimes it's not the right time, or it's not the right tool. Officially, the only way to receive and cover feedback is through paper forms, which poses a significant barrier. It's essential to follow organizational processes and procedures methodically. Everything you do needs legal backing, and you must justify incorporating it into something like this. You can't just start talking to people on the street. Due to the challenges involved, organizing workshops with selected participants and staying within legal boundaries is crucial.

Interviewer - *The most impacted by climate change are often the vulnerable population living in informal settlements or near rivers. And with the master plans highly influencing land uses, people often have to be relocated to social housing somewhere else. How is this population receiving these changes?*

18 - Big changes will not happen quickly, considering how the system operates. Implementing a plan, from approval by the Prime Minister to actual execution, is a slow process. This condition can be both good and bad. Most changes won't occur within the next five years. However, this is a fair point. Officially, there isn't a proactive effort to engage directly with vulnerable populations.

Let's consider Thu Duc City's division into three areas. District 2 is an up-and-coming district that has undergone extensive land clearing to develop a new financial center. It is an affluent and relatively new area. District 9, on the other hand, remains ecologically rich and undeveloped, while the northern area, known as Thu Duc, is where many working-class people reside, and there's a higher concentration of poverty.

We identified specific spots that required attention during our analysis and data collection from local authorities. While census and scientific data provide valuable insights, gathering on-the-ground

knowledge is sometimes crucial. Local authorities helped us identify hotspots for flooding. Then we proposed a strategy to create more natural water channels, proposing parks with detention retention ponds or revitalizing deteriorated canals and waterways that no longer function properly. The goal is to develop the area while considering the existing issues the local population faces, ensuring their access to these improvements. While the park will remain public, private entities may fund its development. The connection of canals and waterways to the resettlement area and the larger river will be public, and we hope private real estate developers will contribute to building public infrastructure. This approach was developed with these considerations in mind.

Although the competition proposal did not mention this area as a primary development focus, it will be included in the new master plan precisely because it offers an opportunity to establish a new natural infrastructure that addresses the existing issues. This change occurred between the competition and the master plan.

Interviewer - *This question is outside the scope, but I have trouble finding social data for my research. Can you mention a data source you usually use for this purpose?*

I8 - This information is accessible but may not be publicly available. You might need to pay to access it. There's a website called the General Statistics Office to purchase the data. However, it's important to note that the data is in Vietnamese, and sometimes it may not be in the desired format. You also need to put effort into understanding and organizing the data once we receive it.

Interviewer - *In this regard, what are the biggest social vulnerabilities you observe in HCMC?*

I8 - Now we're talking in the post-COVID context. During COVID, one pressing issue that gained attention but has since diminished is housing for immigrants. It was a hot topic in the news, and the Prime Minister even mandated the construction of a million houses. However, the focus on this matter has somewhat faded during the pandemic. The housing conditions in Ho Chi Minh City were highlighted, as many people lacked proper housing, especially with the influx of migrant workers returning to the city after COVID. The threat to public health remains a concern, as many people live in poor conditions.

For instance, if we look at District 7, there used to be a large industrial cluster that will soon be relocated. The surrounding areas, particularly the waterways, are filled with illegal housing, and many occupants are immigrants. This situation has caused considerable alarm during the pandemic and remains a topic of conversation in the city. It poses a continued threat to public health and contributes to the overcrowding of the city. Additionally, there is a mismatch in development, as most of the newly built and marketed housing is priced beyond the means of most people.

There is a clear imbalance between the demand and supply of affordable housing, which is a challenge faced by all cities in Vietnam. This issue was particularly urgent during COVID, and it remains to be seen if it will continue to be a prominent concern. Private developers committed to fund and contribute to social housing units or projects, but progress in this area has been slower than anticipated a year ago.

Interviewer - *Are social housing or specific sites for relocation included in the master plans features?*

I8 - No, it's impossible to do that at a master plan level. To be honest, at a large-scale planning level, it's not within the scope of the master plan's spatial planning to designate a specific area for social housing, especially one that spans thousands of hectares. That needs to be addressed through policy and administration, which we are working on. However, the spatial plan can only provide limited recommendations. Social housing is better suited for smaller-scale implementation rather than being represented as a large plot of land within the plan. All new development and commercial projects in Vietnam are legally required to allocate 20% of land for social housing. This requirement applies to

every project, so if you have a 100-hectare commercial land, 20 hectares must be reserved for social housing.

Interviewer - *Any final comments?*

I8 - In the next few weeks, there might be some updates on the HCMC Master Plan, so it's worth checking out. It also emphasizes resilience. If you're interested, you can delve deeper into the strategies mentioned in the book because it represents the latest progress in the city's master plan.

7.10. INTERVIEW TRANSCRIPT 9

I9 is Professor of Landscape Architecture at a European University. Background in dealing with the interaction between the shapes of built environment and landscape in Europe and abroad, particularly in South East Asia.

Interviewer - *Can you mention a data source you usually use when researching social data?*

I9 - It's tough to figure out. Vietnam has the information, but they're not sharing it because it's sensitive and belongs to the government. And let's remember that we're also in the dark when dealing with these projects because they don't disclose much. Dealing with this situation is highly complicated for us. Collecting data has been a significant challenge because they use the term "communities" to safeguard data protection. They're going through conflicting phases in their lives. And in this stage, when there's such a high level of interest, even the most minor bits of data hold significant power.

Interviewer - *Can you comment on the 2019 contest background?*

I9 - I believe that one of the integrating companies within the winning team played a significant role as an umbrella organization for broader operations. In 2020, a person associated with this company was appointed by the Mayor of Thu Duc City, aiming to transform Thu Duc into a city similar to New York City. The focus was on finding a company capable of facilitating ecological transformations, particularly in hydrological matters, through collaboration with their local partner. That is ultimately just private society taking care of hydrological and ecological issues.

The contest was a top-down decision driven by the desire to create a New York-like city. The umbrella office of the winning team is not genuinely concerned about HCMC; the rest is merely political. This approach diverges from past experiences, such as in Singapore, where stakeholders and developers are chosen beforehand. The winning team entered the picture with a predetermined city design, involving discussions and agreements with developers and investors.

Interviewer - *Nearly everyone I interviewed was very responsive. However, one of my interviews with the winning team was the shortest and less enlightening because they didn't share much.*

I9 - In the past, I've had interviews like that which were relatively superficial. You can only gather limited information because they are related to agreements.

Even with the other team member, our local partner in the project, we felt uncomfortable during their last visit to HCMC for various reasons. Despite being our partners, they need to share information adequately. It's odd because we're working on the same project with our ministry on the other side. It's always like this when big interests are at stake, as people tend to safeguard information. I also suspect that they are doing the same.

Interviewer - *Apart from the political terms, how would you describe the design and climate adaptation features of the master plan?*

I9 - I have concerns about the generic nature of the winning master plan, as it appears to prioritize profit generation in developing areas without proper consideration for water management and ecological factors. The plan emphasizes constructing large concrete platforms and skyscrapers, neglecting important ecological and flooding considerations. I question the suitability of such a master plan for the designated areas. It is frustrating that they only promote positive features when approaching them and fail to address the underlying problems.

In our project, we have conducted physical and hydrodynamic flow analysis and found that the master plan does not align with the needs of the environment and wildlife. It is discouraging that they are unwilling to engage seriously with foreign countries, despite past collaborations with other nations on water-related issues. They focus on developing high-density districts for leisure purposes, disregarding the well-being of low-income communities near rivers. This approach risks negatively impacting vulnerable populations.

Interviewer - *How do you observe this behavior between balancing the trends from the past and attempting to build a new image for the country?*

I9 - Vietnam has a history of collaborating with foreign affairs ministries of countries such as Denmark, Netherlands, and Belgium to find solutions. Their focus is primarily on maximizing density and transforming agricultural areas into leisure destinations, disregarding the impact on people and the ecological aspects of water. As a result, low-income individuals are being relocated near rivers, such as Saigon or Dong Nai, where high-rise towers are being constructed. They need to address this issue, and I have witnessed a similar situation in Hanoi, where people were stacked in towers to modernize the city while disregarding their living conditions. And nobody goes against it because their housing infrastructure conditions were below these new apartment developments. This model, typical in Asia, poses a potential time bomb for the city and society.

Interviewer - *Would the adequate approach be in the direction of improving how they live with the water?*

I9 - In the past, they were hydraulic civilizations, managing and maintaining canals while experiencing less pollution. However, in the present, there is a new approach to water, where measures like building basements and raising road levels are taken to avoid problems caused by water. This change indicates a strained relationship with water, as we have it but do not consider ourselves as water elements. Instead of overcoming water, there is a need to establish a renewed connection with it. The new master planning incorporates water more aesthetically, often focusing on affluent areas. This artificial nature of the relation with water may evoke specific images and perceptions.

Interviewer - *One interviewee commented that significant land use changes take time. But the issue is critical as we're dealing with a systemic model operating over decades.*

I9 - In HCMC, there is a concerning practice where the southern part of the city is designed as high-density islands despite being highly vulnerable to land subsidence. During a conversation with the developers, they expressed a need for new development models and a disregard for the place's vulnerability. When I inquired about these vulnerabilities, he answered, "Yes, but this takes time, and we'll be dead before this happens."

There are suspicions of speculation with illicit funds flowing into the city, driven by the urgency to accumulate wealth before the next economic bubble. Vietnam aims to maximize profits quickly, even though questionable methods.

Interviewer - *Can you comment on your project's current development?*

I9 - Our current research is centered on the F3 areas of the Thu Duc Masterplan, which consist of natural areas predominantly inhabited by low-income communities. We are exploring how these rural areas can be utilized as tools for water management, enabling people to coexist with water without the need for demolishing or rebuilding housing.

We demonstrated through models how the water could flow by implementing gates and allowing the water to circulate freely. This approach aimed to enhance water circulation and explore innovative systems for water management.

This approach towards sustainable futures is closely tied to their livelihoods and work. We are working on other strategies to reconnect with local communities and restart from minor architectural elements and fabric on the ground. The goal is to integrate buildings with the water system, moving away from speculation processes.

***Interviewer** - How does the project relate to or find space in the new master plan? How are the relations that connect them?*

I9 - Initially, our project focused on the natural environment, tides, and architecture. Meanwhile, in 2019, it was launched the contest for the new master plan. We then had to figure out how to align our project strategies with it. So, there were positive and negative aspects to consider.

After that, our key focus became making the water breathe again, reviving its natural flow, and improving its ecological health. We emphasized the importance of creating space for water within the canal network, ensuring proper connections with rivers and the built environment. We wanted to address the ecological infrastructure aspect rather than purely leisure spaces.

We didn't aim to propose alternative strategies since there were already numerous alternative strategies from various countries with expertise in flood control. Over the years, there have been several master plans and consultations with countries, including Denmark, Holland, and the USA, to find suitable solutions.

***Interviewer** - When considering these other alternative strategies, is there a specific one that serves as a firm reference or example for your planning approach?*

I9 - In the Netherlands, a major governmental project called "Room for the River"⁴⁶ aimed at adapting 70 rivers to address climate change. The project focuses on enhancing river infrastructure using natural solutions rather than concrete structures. Various techniques are applied to create spaces connecting water and nature.

***Interviewer** - How are your partners open to your proposal?*

I9 - They maintain a distinct separation, not acting as contributors.

***Interviewer** - And how does your project activate local inputs or local knowledge?*

I9 - Unfortunately, due to the government's control and the interconnected nature of Vietnamese society, stepping outside the established boundaries and asking questions to others can lead to trouble. There is no space for such actions within this context.

⁴⁶ Available at <https://www.dutchwatersector.com/news/room-for-the-river-programme>, accessed on July 28, 2023.

It is paradoxical because the bottom-up process was once based on democracy in the country, particularly during the period of communism from 1975 to 1990. However, since the Doi Moi, which opened up the market to the global economy, land ownership has remained with the government. People do not purchase land but rent it through specific agreements that typically span 100 years, with the amount paid determining the terms. Nobody has ownership rights if the government requires the land, creating a highly unbalanced situation that resulted in many individuals transitioning from traditional tube houses to high-rise towers.

***Interviewer** - Are people aware of this situation? One of my main concerns is the need for more representation and limited access to information.*

I9 - It's challenging to make a definitive statement because Vietnam is a country experiencing a significant rise in the middle class. While salaries may not compare to Western countries, financial compensation is crucial in their decision-making. Educated middle-class individuals can benefit financially from development projects. However, there is a large population of low-income people, including climate migrants from the Mekong region. Accommodating their needs poses a unique challenge.

Understanding the underlying systems behind what is visible in the branding is crucial. The government establishes these systems. Developers can often build without strict regulations and set their standards. However, developers must align with the Communist Party's vision and contribute to its interests. Failure to do so can result in accusations of corruption and imprisonment. This dynamic exists in several countries in Southeast Asia, such as China and Indonesia.

A clear example is Jakarta, where rising sea levels have led to the abandonment of specific areas, including the relocation of monasteries, as the city struggles to manage the impact of climate change.

