Md Imran Hasan

Master's Thesis 2025
Examiner: Nils Björling
Supervisor: Evgeniya Bobkova &
Joanna Gregorowicz-Kipszak
Chalmers School of Architecture +
Department of Architecture & Civil Engineering

MAPPING INVISIBLE NARRATIVES FOR FUTURE IMAGINARIES

in Nandipara, Dhaka and beyond

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Master's Thesis profile
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Master's Programme
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Chalmers School of Architecture +
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Chalmers University of Technology
Gothenburg, Sweden

"Memory makes us human. Without it people are turned into a formless mass that can be shaped into anything the controllers of the past desire."

-Aleksandr Nekrich, Mikhail Heller (1986)

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Abstract

Urban planning has long relied on maps to understand and manage spatial relations, yet mapping is never neutral. It is a political act that shapes how cities are imagined, governed, and transformed, often reinforcing dominant power structures while rendering informal realities invisible. This research investigates the potential of mapping as a critical and participatory tool to challenge such narratives and support more ecological, just, and inclusive urban transitions.

Focusing on the Jirani Canal area in Nandipara, a rapidly urbanizing peripheral neighborhood in East Dhaka, the study examines how formal planning discourses overlook the everyday practices, spatial adaptations, and ecological logics of informal urban development. Nandi Para embodies many of Dhaka's contemporary challenges, climate vulnerability, infrastructural deficits, and migratory pressures, yet also offers grounded examples of community-managed public spaces, informal circulation networks, and small-scale urban agriculture.

Using a critical mapping framework, the research adopts a mixed-methods approach combining GIS-based spatial analysis, historical cartographic review, participatory mapping workshops, observational fieldwork, and speculative design. It engages with multiple actors, local residents, schoolchildren, farmers, and planning professionals, to map and interpret the lived realities of the area. By analyzing contested mappings, the study surfaces "invisible narratives": ecological corridors, informal economies, and adaptive urban strategies often omitted from official maps.

Rather than producing a fixed masterplan, the thesis embraces mapping as an open-ended, reflective, and collective process that foregrounds contested space, plural knowledges, and future possibilities. The research advocates for a more participatory and speculative modes of map-making that not only document but also reimagine the city. In doing so, it contributes to a broader discourse on the role of mapping in shaping urban futures, particularly in contexts marked by informality, rapid change, and institutional fragmentation.

Keywords: critical mapping, participatory mapping, informal urbanism, speculative design, participatory GIS, global south, urban futures, Circular and Ecological Urbanism

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As an architect, I enjoy collaborating with various stakeholders, bridging diverse ideas and generating shared knowledge. My research interests include sustainable transformation, social and ecological sustainability, the exploration of participatory and innovative approaches in architecture.

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> Drafting proposals to secure funding for projects that improve building adaptability, reuse, and lifecycle, with a focus on innovative construction and renovation solutions that support circular economy principles.
> Conducting research on sustainable tools, products, and techniques, and collaborating with a multidisciplinary team to validate solutions for the “Design for adaptability, re-use, and deconstruction of buildings” initiative (Built4People Partnership).

Architect and Partner
Atelier Avencia, Bangladesh | Jan 2020 - Present

> Led the winning design for the 20-kilometer Manda and Jirani Canal restoration project in Dhaka, focusing on climate resilience, public recreation, and accessibility.
> Conducted needs assessments, organized stakeholder meetings, and prepared detailed specifications, estimates, and tender documents for urban development projects with DSCC.

Architect
Shanta Holdings Limited, Bangladesh | Feb 2021- Mar 2023

> Architect overseeing coordination of 24 construction projects, ensuring alignment between architectural, structural, fire safety, landscape, lighting, and MEP drawings; notable projects include SHL Business District, Pinnacle (Bangladesh’s first 40-story skyscraper), and Forum (the first twin 25-story buildings).
> Developed modular construction techniques and cost-optimization frameworks in collaboration with the Project Director and site engineers, ensuring accurate implementation through daily coordination and site visits.

Architect
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> Worked Specialized in transient architecture with a focus on sustainable materials, reuse, and recycling.
> Led the 8-acre masterplan for a trade fair in Chittagong, attracting 2 million visitors; project featured in the September 2021 issue of Architecture Asia, titled “Living in the 21st Century.”

Associate Architect
FORM.3 architects, Bangladesh | Jan 2016 – Jan2018

> Led multiple national design competitions, securing three major consultancy prizes, including the Historic Preservation and Landscape Design of the Old Dhaka Central Prison, a 36-acre urban regeneration project.
> Prepared plans for authority approval, managed client meetings, and created architectural and landscape drawings; supervised construction to ensure project alignment and quality.

Reading Instruction

This thesis booklet is divided into six parts, each addressing a distinct aspect of the research.

Part I discusses the broader background of the project, addressing research questions, the research timeframe, methodology, and relevant theories.

Part II discusses interconnected mapping approaches.

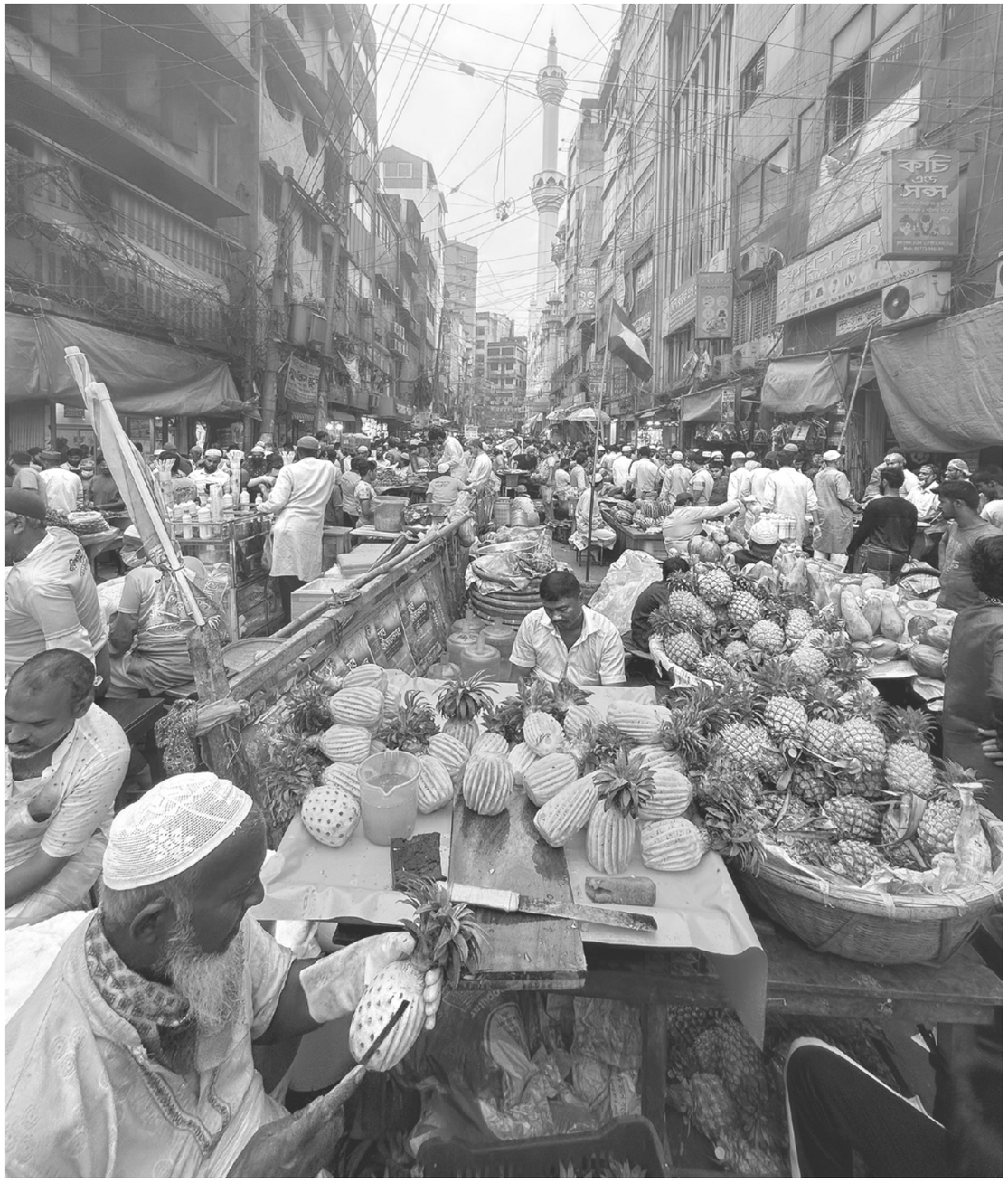
Part III details the research process and participatory mapping methodology.

Part IV explores findings of participatory mapping workshops in four key topics: Ecology and Ecosyatem services, Open space and meeting places, Formal and Informal Circulation and Local economy and food securiety.

Part V opens discussions on speculative narratives and collective future imagination for a circular and ecological urban transition in Nandipara.

Part VI offers conclusive remarks, highlighting the limitations of current mapping practices, what works in lived realities and what doesn't, understanding informal growth, participatory mapping framework and a future vision of a more circular, ecological and inclusive urban transformation.

Contents



Chapter I :

Introduction

Fig 01. *A street in Old Dhaka filled with street vendors during the month of Ramadan, temporarily transforming into a vibrant cultural and culinary destination for the city's residents.*

"If you ask anyone in Dhaka, apart from a local resident, about Nandipara or the Jirani Canal, the area at the heart of this study, chances are they will say they've never heard of it." This unfamiliarity is not accidental, it reflects a broader pattern in which many parts of Dhaka's expanding urban peripheries remain absent from public discourse and media narratives. These areas do not conform to the aesthetics or institutional priorities of planned urban growth, and as a result, they are largely invisible; socially, politically, and cartographically.

Between 1991 and 2019, built-up areas in the outskirts of Dhaka expanded by 234 km² (see Fig. 05), nearly doubling the 116 km² growth observed within the city's more established boundaries (Hasan et al., 2023). This transformation has been driven by population influx, housing pressures, and market driven development, but much of it has taken place without formal planning or recognition. Areas like Nandipara are not anomalies; they are representative of this organic and informal urban expansion that constitutes the everyday reality of much of Dhaka's population.

As one of the most climate-vulnerable countries in the world, Bangladesh faces the twin pressures of environmental fragility and rapid urbanization. Dhaka, its capital, is marked by high density, infrastructural deficits, pollution, and an urban governance structure that struggles to keep up. Its expansion continues outward into once-rural edges, transforming agricultural lands into dense, semi-urban settlements through self-organized, informal processes. Low housing costs attract rural migrants, and the resulting morphologies are often neither fully urban nor rural, but hybrid, adaptive, and deeply local.

Nandipara is such a neighborhood in the east Dhaka - transitional, dynamic, and shaped by everyday practices that go unrecorded in conventional planning frameworks. Here, street vending, informal circulation, urban farming, and community-managed spaces coexist alongside real estate-driven land conversion. The state's efforts to formalize such spaces, through road extensions, walkways, and canal dredging, are often misaligned with local realities, leading to displacement, ecological degradation, and increased social fragmentation.

This thesis explores whether mapping, done critically, inclusively, and reflectively, can serve as a tool to recognize, represent, and support these informal urban practices. Drawing on participatory mapping with community members, children, and local farmers, and combining spatial analysis with ethnographic observation, the project proposes an alternative way of seeing and understanding the city. Rather than treating informality as a problem to be solved, the study seeks to map the invisible structures that shape everyday urban life in Nandipara: informal mobility, ecological systems, community spaces, and local economies.

At its core, this research asks how mapping can shift from a top-down, technocratic exercise to a co-creative process of urban knowledge production, one that makes visible the lived experiences of those often left off the official maps. Can mapping become a speculative and empowering practice, opening space for imagining more inclusive, ecological, and just urban futures?

The rest of this introductory chapter is organized into two main sections. The first, "Mapping, Invisibility, and Informality," and second section, "Logic of Urban planning and Mapping in Dhaka, Bangladesh."

1.1 : Mapping, Informality and Invisibility

This section explores the theoretical and conceptual foundations of the thesis. It examines the roles that maps and mapping play in urban planning, the contested nature of informality, and how invisibility operates as a form of spatial and political exclusion. These ideas are grounded in both academic literature and the lived experiences of Dhaka's marginal communities.

1.1.1 : Maps and Mapping in Urban Planning

"Maps are not neutral representations of reality; they are expressions of power" (Wood, 2010, p. 4).

Maps and mapping processes have long played a vital role in urban design and planning. They inform spatial policies, allocate resources, and communicate future imaginaries. Yet during times of transformation, especially in the Global South, visualization tends to prioritize aesthetics or formal structure over social-spatial complexity. Movik, Benjaminsen, and Richardson (2021) observe that "maps create and sustain narratives about space and place that influence how people, spaces, and issues are perceived" (p. 145). In this way, maps act as instruments of power, not just technical devices.

While maps are the product, mapping is the process, the active exploration of relationships, spatial dynamics, and the layered politics of representation. As James Corner (1999) argues, "mapping is not just the production of maps, but a method of exploring relationships, power dynamics, patterns, and stories embedded in space." This distinction is critical, particularly when analyzing informal urbanism, where the act of mapping can either erase or illuminate lived realities.

Top-down maps produced by institutions, government agencies, or consultants tend to stabilize socio-spatial relations (Del Casino & Hanna, 2006), conveying a sense of control and authority. But such stabilization can exclude vital components of urban life, informal economies, adaptive mobility, and self-organized spaces, that often go undocumented. In cities like Dhaka, this is not merely a technical oversight; it is a political act. Critical mapping offers an alternative, revealing what formal maps often silence: the knowledge, resilience, and contributions of marginalized communities (Peluso, 1995; Wainwright & Bryan, 2009).

This thesis interrogates the limitations of official mapping and investigates how participatory and critical mapping can uncover the informal systems that underpin much of Dhaka's urban growth.

1.1.2 : Informality as a mode of urban production

The concept of the "informality" resists simple definitions and challenges binary classifications of urban form. Scholars like Dovey and Kalipour (2019) argue that there is still insufficient understanding of how informal urbanism functions in relation to urban image and place identity. While planners and architects may engage in physical upgrading or design interventions, the deeper issue often lies in the transformation of the image of informal areas, which frequently precedes meaningful evaluation of outcomes. This visual and perceptual aspect of informality significantly shapes how such spaces are treated within planning discourses.

Importantly, the line separating formal and informal urban development is not only blurry but also deeply political. Dovey and Ristic (2015) have referred to informal settlements as "off the map", spaces rendered invisible because the state does not officially recognize them, as Shatkin (2004) describes. The "formal" city is that which the state acknowledges and plans for, while the "informal" often emerges outside sanctioned channels, characterized by non-compliance with official regulations or occupation of land without legal entitlement. Yet this framing can be problematic, as it risks simplifying the diverse logics of informality.

Recent studies suggest a more nuanced understanding. Rather than viewing informality as merely unplanned or unlawful, it can be seen as a mode of urban production (Roy, 2005; Dovey, 2019), shaped by social, economic, and spatial practices that respond to specific contextual needs. For example, Thinh and Kamalipour (2022) argue that many so-called informal settlements emerge from the reclassification of previously rural lands into urban zones, further complicating simplistic definitions. Van Oostrum and Dovey (2022) similarly demonstrate that informal morphologies often follow coherent internal spatial logics, despite their deviation from formal planning norms.

In Dhaka, this theoretical ambiguity is reflected in the city's morphology. As Nilufar (2009) notes, Dhaka has grown largely without a robust planning framework or comprehensive urban design (see Fig. 02). Two dominant patterns characterize the city: planned areas developed through formal schemes (like Gulshan or Dhanmondi), and unplanned or organic areas that emerged spontaneously. Yet the boundaries between these are constantly shifting. Over time, even formally planned neighborhoods have undergone transformations, with land use evolving in response to community needs, weakening the distinction between planned and unplanned.

This thesis embraces the notion that informality is not a deficit or absence, but rather an alternative urban logic. Informality in this sense encompasses informal mobility networks, unrecognized ecological spaces, self-organized meeting places, and adaptive strategies developed in response to urban pressures. The thesis does not aim to resolve the binary between formal and informal but to explore how informal urbanism, often rendered invisible in official maps, constitutes a valid form of urban knowledge and agency.

(For more on Dhaka's historical planning trajectory and institutional dynamics, see Section 1.2: Logic of Urban planning and Mapping in Dhaka, Bangladesh.)

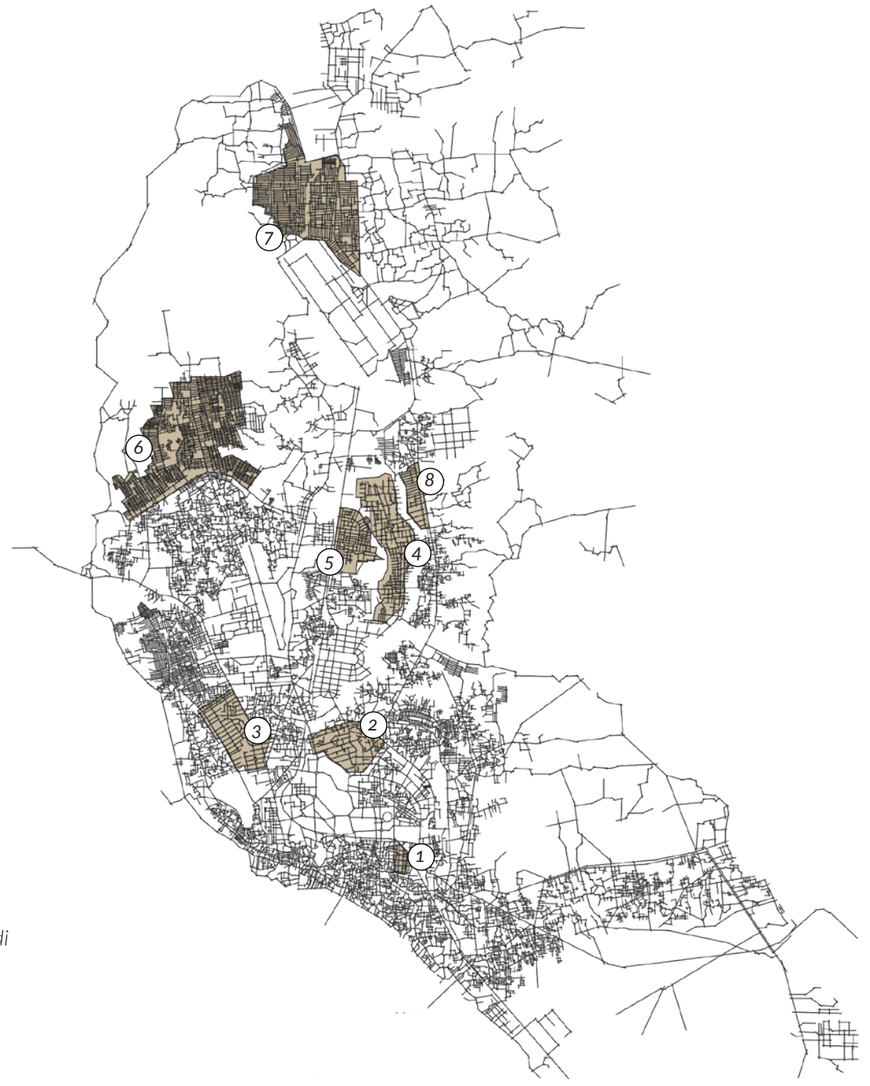
1.1.3 : Invisibility and the Politics of Representation

Invisibility in the urban context is not merely the absence of visibility, it is a constructed condition shaped by selective vision, structural marginalization, and the authority to determine what is worth seeing. Scholars such as Dyer and Butler have described the invisible as that which is unacknowledged, misrecognized, normalized, non-indexical, illegible, or trivialized within dominant perceptual frameworks (Burns, 2021). In cities of the Global South, including Dhaka, this invisibility is often imposed upon informal settlements, whose spatial and social realities are excluded from official maps, plans, and urban policy. Such exclusions are not incidental; they are part of a broader politics of representation in which planning authorities and mapping institutions define what constitutes the "real" city.

A striking example is Karail Basti, one of Dhaka's largest informal settlements, home to over 100,000 people (see Fig. 14). Despite its long-standing presence and internal organization, Karail appears as a blank space on many official maps, a cartographic void that erases the lives, livelihoods, and infrastructures that exist there. This erasure is not just symbolic; it translates into planning neglect, legal precarity, and policy invisibility. As documented in the Not-an-Atlas project, critical-mapping of Karail became an act of resistance, an assertion of presence in a system that refuses to acknowledge the urban poor (Bertuzzo, 2016). Such invisibility, as Movik et al. (2021) argue, is not a passive oversight but a performative mechanism that makes claims about what is important and what can be ignored.

Maps do not simply reflect reality, they shape it. The decision of what to include, what to leave out, and at what scale, fundamentally conditions how space is understood and governed (Sheppard, 1995; Kim, 2015). Even well-intentioned data collection efforts risk producing invisibility by reducing informality to numbers or generalizations. As Frenzel (2016) notes, the push to visually 'upgrade' informal areas often prioritizes cosmetic change over structural transformation, reinforcing the binary between the formal and the informal city. In doing so, informality is simultaneously spotlighted and stigmatized, made visible as 'other' rather than understood as integral to urban life.

The maps produced through this research do not claim to be comprehensive representations of all lived realities in Nandipara. Rather, they reflect a partial, situated perspective informed through site visits, participatory workshops with local residents and planning professionals, and my own journey of fieldwork as a researcher. In mapping the 'invisible', it becomes essential to be transparent about whose testimony is being recorded and why. Following Kim's (2015) argument in her work with street vendors in Vietnam, mapping should not seek to fix people to coordinates, but to surface the spatial tactics and lived knowledge that exist outside dominant frameworks. The thesis adopts a critical mapping lens not just to document what exists, but to foreground what has been strategically left out: informal paths, waste infrastructures, meeting grounds, and urban ecologies, all of which challenge the dominant visual regime of the city. In doing so, the work embraces mapping not merely as a technical exercise, but as a situated act of knowledge production that makes visible the structural blind spots of official planning and creates space for alternative urban futures.



1. Wari
2. Ramna
3. Dhanmondi
4. Gulshan
5. Banani
6. Mirpur
7. Uttara
8. Baridhara

Fig 02. *Location of the planned residential areas within the urban grid of Dhaka city (Nilufar, F. , 2009)*

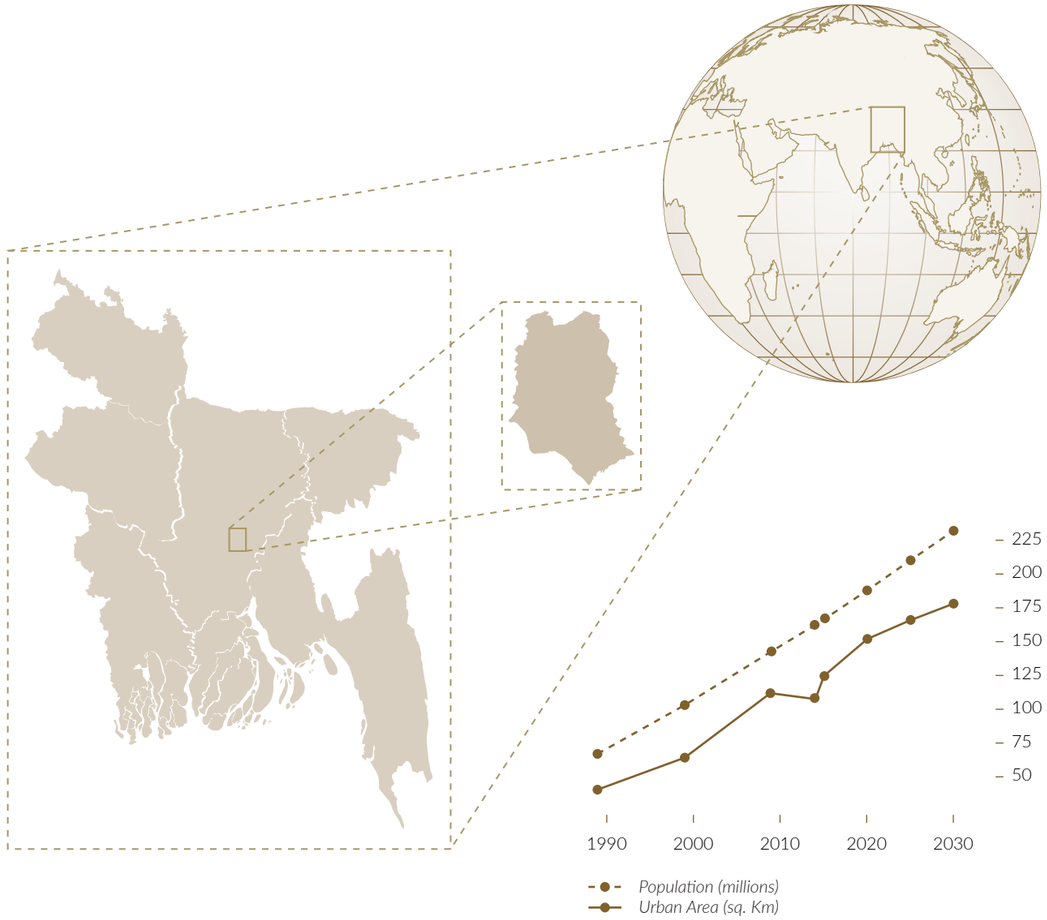


Fig 03. Map showing the geo-location of Bangladesh and Dhaka

Fig 04. Urban expansion vs population growth in Dhaka (1989- 2030)

Fig 05. Illustration shows thhe exponential growth of Dhaka city over the last three decades.

Fig 06. Water network of Dhaka: The official GIS data of Dhaka, shows the water bodies, including canals, lakes and ponds. However, many of these water bodies are already filled up.

1.2 : Logic of Urban planning and Mapping in Dhaka, Bangladesh

This section explores specific context of Bangladesh's capital city. It traces the colonial and postcolonial legacy of spatial planning, identifies the key actors involved in mapping and decision-making, and discusses the systemic challenges that prevent inclusive planning, such as the lack of participatory planning and contested land surveys. This background provides the foundation for understanding why a critical and participatory mapping approach is not only relevant but urgently needed in the context of Dhaka's informal urban futures.

1.2.1 : Historical and Political Legacy of Urban Planning : A Timeline of Dhaka's Morphological Transformation

Pre-Mughal to Mughal Era (Before 1600s–1757):

Under Mughal rule, Dhaka developed as an organic riverine city shaped by indigenous settlement patterns. Mixed land use, courtyard housing (uthan), alleyways (gali), and markets (chouk) supported vibrant public life. Waterways served as key transport routes, while spatial configurations accommodated socio-religious events and communal gatherings, reflecting a culturally integrated urban morphology (Mawla, 1997).

British Colonial Period (1757–1947):

Following the British conquest of Bengal, Dhaka's spatial structure was radically altered to suit colonial governance. A more rigid and hierarchical spatial order emerged, characterized by separating civil lines, formal administrative quarters, military cantonments, and European-style recreation grounds like Ramna and Shahbagh. Infrastructure such as the Buckland Bund (1864) and institutional buildings introduced formal zoning practices that displaced indigenous settlement logic. Yet, everyday life in Dhaka continued to resist these top-down interventions through persistent informal marketplaces, communal gatherings, and socio-religious traditions.

Pakistan Era (1947–1971):

After the 1947 Partition, Dhaka was designated as the capital of East Pakistan. The new administrative and political core moved northward. Yet, this development borrowed heavily from British planning ideals, with minimal adaptation to local needs. The 1953 Town Improvement Act (TIA), a carryover from colonial governance, formalized this top-down planning system, further marginalizing traditional practices.

Post-Independence Bangladesh (1971–Present):

Post-liberation development continued to reflect symbolic modernist ideals through monumental projects such as the National Parliament Complex by Louis I. Kahn. The ruling class largely inherited the spatial privileges of the colonial elite, preserving inequities in land use and access.

This timeline reveals that colonial and postcolonial planning in Dhaka has consistently prioritized aesthetic, technocratic, and hierarchical visions of urban order over lived experience and everyday spatial practices. As Mawla (1997) emphasizes, traditional urban spaces in Dhaka were deeply embedded in cultural and communal life, qualities that have been gradually erased in favor of modernist zoning principles. The enduring use of the TIA (1953), which contains no provision for community consultation, exemplifies how outdated policies continue to guide present-day planning (Swapan, 2016). Despite these constraints, informal markets, processions, and shared open spaces persist, testifying to the resilience of localized practices. This research calls for a more adaptive, participatory, and flexible planning paradigm, where mapping becomes a tool not just of control but of recognition.

1.2.2 : Who Has the Power to Map? Understanding Institutional Authority in Dhaka's Urban Governance

The governance of Dhaka's urban landscape is managed through a fragmented and overlapping network of institutions. Nandipara, the focus of this study, falls under the jurisdiction of the Dhaka South City Corporation (DSCC)(see Fig. 07). Along with its northern counterpart, Dhaka North City Corporation (DNCC), the city is governed by multiple actors, each with distinct, often conflicting, mandates that affect urban planning, service provision, and mapping practices.

Key Institutions Involved in Mapping and Planning:

DSCC (Dhaka South City Corporation): Oversees local infrastructure, roads, waste management, parks, and recently, canal development projects. It is a key urban planning actor in Nandipara.

RAJUK (Rajdhani Unnayan Kartripakkha): Holds primary authority over land use planning, zoning, and building approvals across metropolitan Dhaka, often overriding city corporations.

DWASA (Dhaka Water Supply and Sewerage Authority): Responsible for water and stormwater drainage, though its authority has recently been shared with DSCC for certain assets like canals and culverts.

DTCA (Dhaka Transport Coordination Authority): Manages public transportation infrastructure and strategic mobility plans.

DESCO/DPDC (Electricity Providers): Handle street lighting and electricity supply.

SREDA (Sustainable and Renewable Energy Development Authority): Collaborates on energy efficiency in urban buildings.

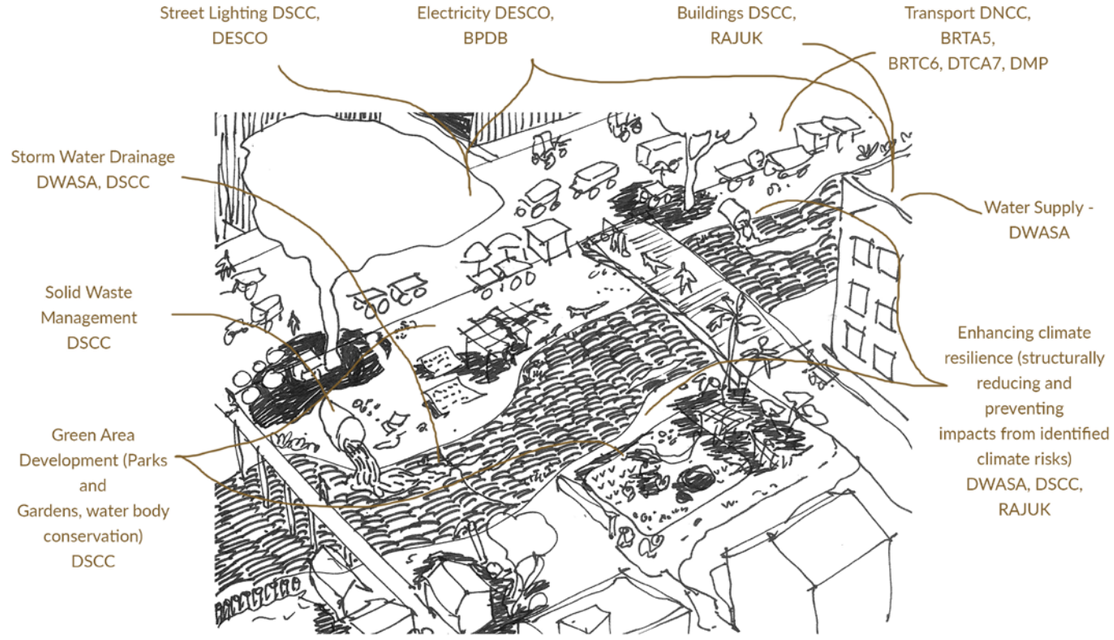


Fig 07. *Illustration shows the institutional authority mapping over different urban features in Nandipara, Dhaka*

Despite the diversity of stakeholders, coordination remains a major barrier. As observed in the Climate Action Plan for DSCC, even agencies under the same ministry (like DSCC and DWASA) operate with minimal collaboration, causing delays in infrastructural upgrades and resilience planning.

In 2017, DSCC assumed control of 26 canals and 10 km of box culverts from DWASA to mitigate chronic waterlogging issues. One notable initiative was the 2020 design competition for Jirani and Manda canals. The winning consortium, EK Architects and Atelier Avencia, was appointed in 2022. As part of this thesis, several meetings were held with the consultants to better understand the site, the participatory gaps in planning, and the workflow.

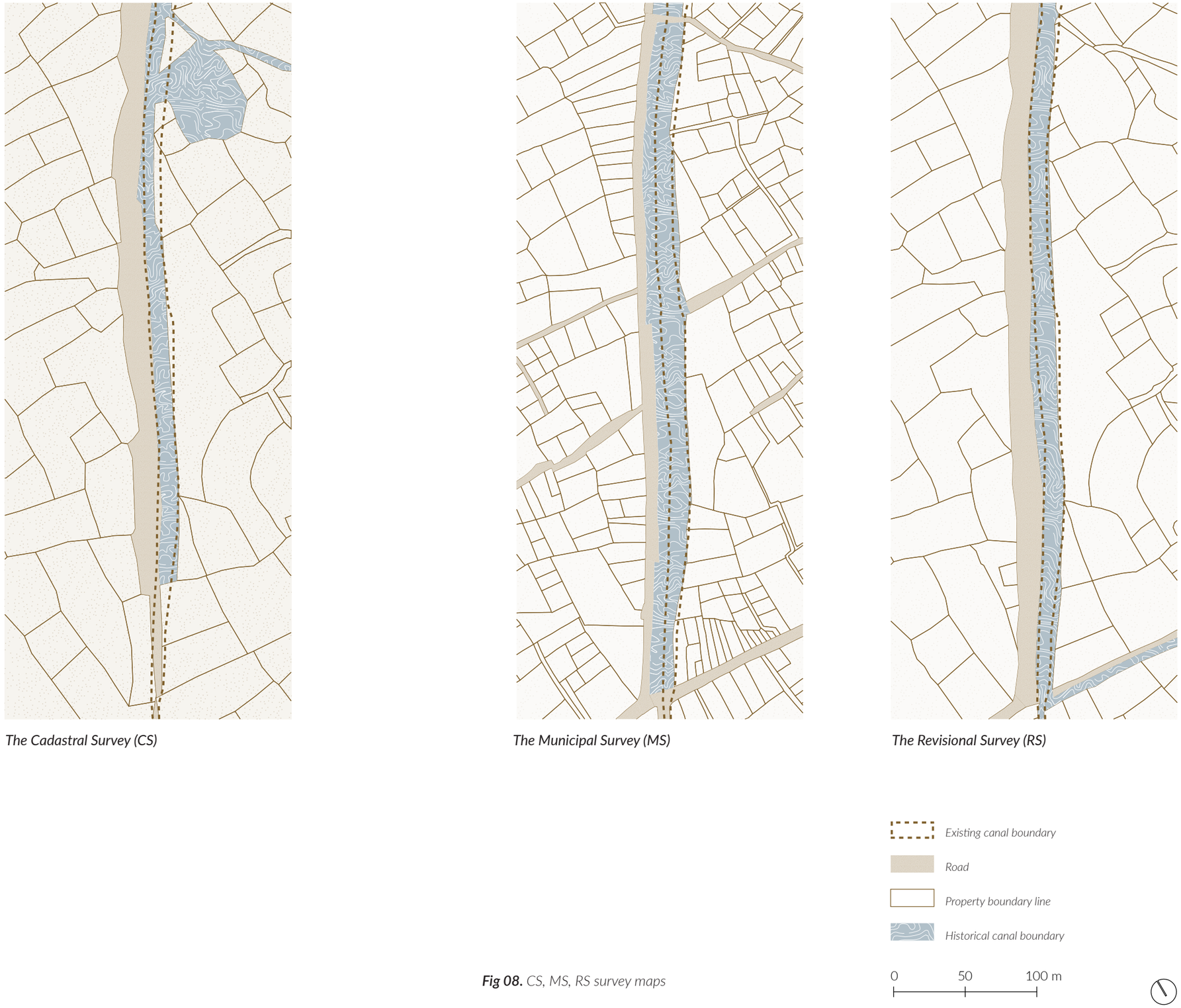
1.2.3 : **Participatory Planning in Dhaka: Gaps Between Policy and Practice**

Urban governance in Dhaka is marked by a predominantly top-down, expert-driven planning structure that significantly limits meaningful public participation. Although the Constitution of Bangladesh acknowledges democratic governance and participatory ideals under Articles 9 and 11 (Government of Bangladesh, 1972), in practice, these provisions have not translated into a planning process that embraces citizen engagement as a right. As noted by Asaduzzaman (2009), the absence of elected representation across many tiers of local government has enabled bureaucrats to dominate decision-making processes, reinforcing hierarchical planning traditions.

The legal framework further constrains participatory possibilities. The Town Improvement Act of 1953 (TIA), still the principal legal instrument guiding urban planning in Bangladesh, makes no provision for public consultation during plan formulation or needs assessment. While some Terms of Reference (ToRs) for master planning projects suggest community engagement, these remain non-binding and often tokenistic in implementation.

Institutional communication strategies are also notably outdated. Most planning agencies still rely on manual notifications, physical noticeboards, and poorly maintained websites to disseminate information, ineffective tools for raising awareness or fostering public dialogue. As a result, planning processes are opaque to citizens, and local knowledge remains underutilized in decision-making.

Bangladesh is among the world's top recipients of foreign development aid, with most urban development initiatives, particularly masterplans, being partially or fully donor-funded (Swapan, 2016). Disappointed by limited project outcomes, donors now emphasize community participation. This shift has opened space for NGOs and private actors to intervene. As Sarker (2008) notes, "the poor performance of the public sector and pressure from international donor agencies have paved the way for NGOs and the private sector to play an important role in society."



The Cadastral Survey (CS)

The Municipal Survey (MS)

The Revisional Survey (RS)

Fig 08. *CS, MS, RS survey maps*

Bertuzzo (2016) was inspired by maps produced by Karail's community-based organization (CBO) leaders, initially developed under the guidance of NGOs such as DSK. These maps supported the community's ongoing struggle for recognition and legalization of the Basti (informal settlement), while also strengthening their sense of ownership over the place.

This thesis responds to these gaps by proposing a participatory mapping methodology that combines ethnographic fieldwork, community workshops, and spatial analysis. However, it also raises a more critical question: can participatory mapping be genuinely transformative in a context where institutional structures do not support citizen participation? As Swapan (2016) asserts, rethinking participation must involve creating frameworks that bridge civil society, NGOs, and state actors to foster inclusive and empowering planning practices.

1.2.4 : **Contested Cartographies: Land Records, Political Shifts, and the Challenges of Mapping Urban Transformation in Dhaka**

The complexities of mapping in Dhaka are intensified by the ambiguity of land records and the overlapping legacies of historical survey systems. In neighborhoods like Nandipara, this becomes particularly evident. Property claim signboards, such as those seen in the study area (see Fig. 09,10), often cite multiple land record numbers, including CS (Cadastral Survey), RS (Revisional Survey), MS (Municipal Survey), and others, reflecting the contested and fragmented nature of land ownership.

The Cadastral Survey (CS), conducted under British colonial rule between 1888 and 1940, represents the earliest systematic effort to document land ownership. It is still considered the most authoritative reference for identifying original land boundaries and natural features such as canals.

The Municipal Survey (MS), carried out in the post-zamindari era between 1956 and 1965 under the State Acquisition and Tenancy Act, captures the transitional period of urban transformation.

The Revisional Survey (RS), largely conducted during the 1960s–1970s, was intended to update the CS records but often included illegal encroachments and informal changes, making it less reliable for legal verification.

These overlapping surveys create significant challenges for both property owners and planning authorities. Even publicly owned municipal land remains poorly demarcated. During stakeholder meetings for the Manda–Jirani Canal Redevelopment Project, consultants reported frequent difficulties in establishing clear property lines due to contradictions among the CS, MS, and RS maps (see Fig. 08). The resulting lack of clarity often allows for encroachment onto both public and private lands, exacerbating disputes and undermining conservation or development efforts.

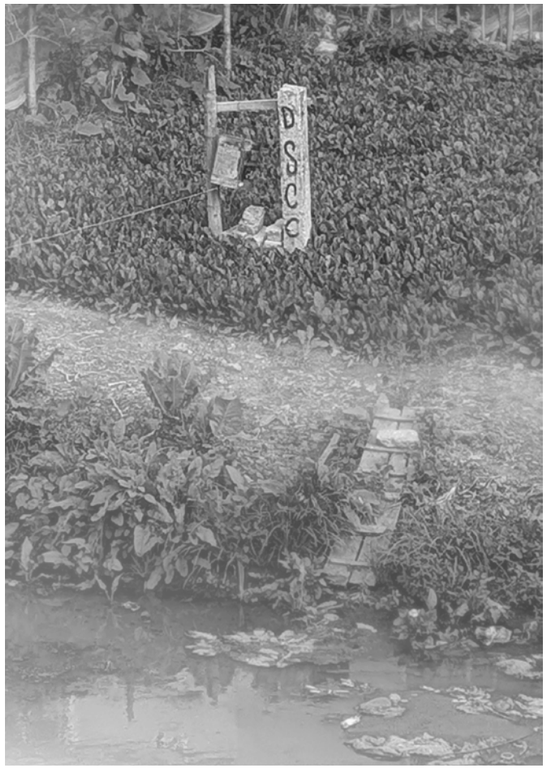


Fig 09. *A demarcation post installed by DSCC in the Jirani Canal area, Nandipara. Local residents have cultivated vegetables around it, visually blurring the boundary line. A scarecrow bell hung beside the post further expresses how everyday practices redefine and soften official boundaries.*

This issue is not new. In projects like the Hatirjheel - Begunbari canal restoration, agencies such as RAJUK and the Water Development Board (WDB) used CS maps to remove encroachments and reclaim land. However, in the case of the Jirani Canal, shifting political agendas further complicate decision-making. As noted by project consultants, changes in government, such as the post-August 2024 interim administration, led to reversals of previously approved boundary decisions, highlighting how planning becomes entangled with political volatility.

This thesis does not attempt to resolve the legal or bureaucratic challenges of land demarcation. Instead, it seeks to understand how such contested mapping processes affect the lived experience of residents and shape the conditions under which projects are imagined, negotiated, and implemented. In doing so, it emphasizes that spatial transformation in Dhaka is not simply a technical task but a deeply political and social process that demands contextual and adaptive mapping strategies.

Fig 10. *A property claim signboard in Nandipara listing multiple land survey records; CS, RS, MS, and Dhaka city documents, illustrating the layered and contested nature of land ownership and documentation in the area.*

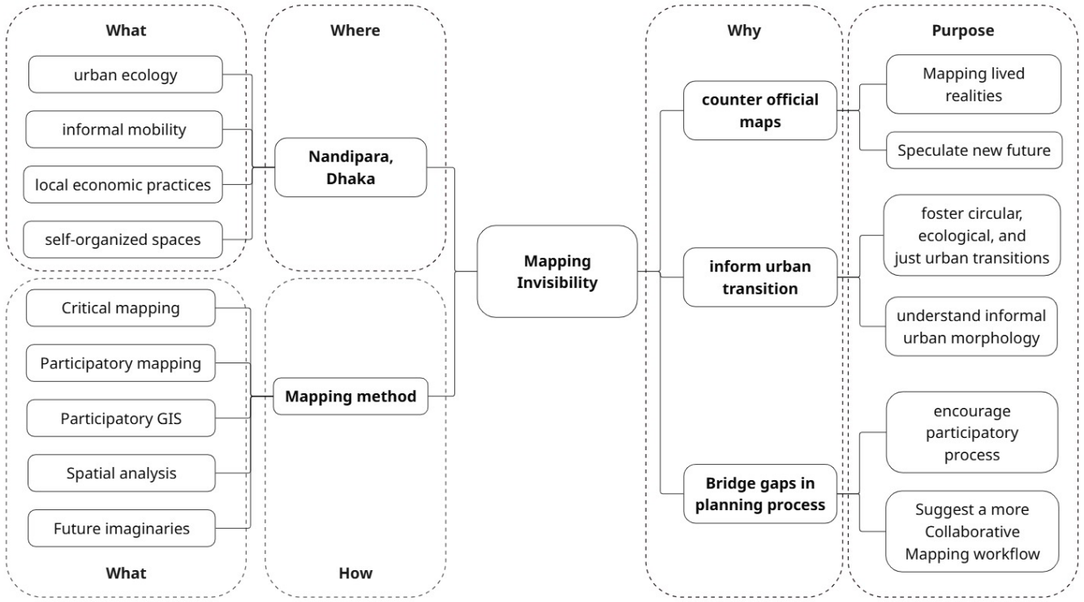


Fig 11. *Positionling the research (Why, where and how)*

1.3 : **Starting with Question(s)**

What limitations do current mapping practices face in capturing informal adaptive strategies in urban transitions?

- How can critical and participatory mapping approaches enhance spatial analysis in rapidly evolving urban areas?
- What alternative mapping strategies can better represent informal lived realities and their role in shaping urban transformation?
- In what ways can mapping informal ecologies, mobility networks, self-organized spaces, and local economies contribute to more circular, ecological, and just urban transitions?
- How can participatory mapping practices meaningfully engage communities in co-producing knowledge and influencing urban planning processes?

1.4 : **Aim and Objectives**

This thesis aims to critically examine how conventional mapping practices fail to represent the informal and adaptive strategies that shape urban life in transitional areas like Nandipara, Dhaka. By developing and applying a critical mapping framework, the research seeks to uncover invisible urban narratives, such as informal ecologies, mobility networks, and community-managed spaces, and explore how alternative mapping strategies can enhance spatial analysis, empower communities, and support more circular, ecological, and inclusive urban futures.

The key objectives are:

1. Critique Existing Mapping Practices: Identify and assess the limitations of official and conventional mapping methods in capturing informal urban dynamics, adaptive strategies, and everyday spatial practices in areas like Nandipara.

2. Map Lived Realities: Co-produce participatory and critical maps in collaboration with local communities and planning experts to visualize informal economies, self-organized spaces, and ecological systems.

3. Enhance Spatial Analysis through Participatory GIS: Combine participatory mapping with GIS and spatial analysis tools (e.g., space syntax) to analyze accessibility, movement, and ecological networks, and to understand the spatial logic of informal urban morphology.

4. Empower Communities and Contribute to Planning Discourse: Propose a participatory mapping framework that fosters inclusive urban planning, supports civic engagement, and enables collaborative decision-making beyond the research timeframe.

5. Speculate Future Scenarios for Circular and Just Urban Transitions: Develop speculative future imaginaries that integrate local knowledge with ecological and social dimensions to envision resilient, just, and contextually grounded urban transformation strategies.

1.5 : **Setting Framework: Exploring Tools and Theories**

Given the contested nature of mapping practices in Dhaka, and the necessity of acknowledging how the act of mapping influences what is represented, this research draws upon a diverse set of tools and theories. These were selected not only to document spatial realities, but also to reflect critically on the process of map-making itself. The research seeks to move beyond fixed, conventional representations, embracing a flexible and iterative methodology rooted in participation, observation, and imagination. The selection of tools and frameworks has been informed both by scholarly discourse and by grounded experiences in the field. A more detailed discussion of the theoretical grounding will follow in Chapter 2.

The following tools and theories have guided the research:

1. Interviews: Used to gather narratives from local residents, planners, and stakeholders, essential for grounding the mapping process in lived experience and community insight.

2. Observational Mapping: Through direct site visits, sketches, and real-time spatial observation, this tool captured informal, everyday spatial practices. Observational mapping supported the workshops by identifying key spaces of interaction and adaptation.

3. Photographic Documentation: Photographs and video footage were used to support visual storytelling and provide contextual evidence of material and spatial dynamics.

4. Transect Walks: Guided walks with local residents revealed ecological changes, infrastructural shifts, land transformations, and the socio-political negotiations embedded in space. These walks also helped identify historically significant places and present-day informal networks of use.

5. Knowledge Exchange Sessions: Conducted primarily with planning professionals and academic participants, these sessions created space for mutual learning. Introductions to GIS and Space Syntax were incorporated into the participatory mapping workshops to broaden engagement with analytical tools.

6. Critical Mapping: Critical mapping provided the epistemological lens for this research. Informed by counter-mapping literature and practice-based studies, it interrogated who maps, what gets mapped, and for whom. This perspective guided the compilation and interpretation of workshop outputs.

7. Participatory Mapping Workshops: Workshops with local residents and planning professionals were at the heart of this research. They enabled the co-production of spatial knowledge, the surfacing of lived experiences, and the collective imagining of urban futures.

8. Participatory GIS: Blending participatory engagement with digital spatial tools, this method allowed planning professionals collaboratively digitize informal paths, ecological systems, and key everyday spaces during the workshops. On-site sketching and community conversations informed these digital layers.

9. Spatial Analysis (Space Syntax): Using Space Syntax, the research analyzed movement networks, accessibility, and integration of locally significant places. This spatial analysis supported understanding of informal urban morphology and helped test scenarios for future spatial strategies.

10. Speculative Future Imaginaries: Speculative design and mapping introduced a ficto-critical dimension, allowing for open-ended thinking about urban futures. This approach also invites a broader motivation for future thinking around the role of maps and imaginaries in navigating urban transformation beyond immediate problem-solving.

Chapter II :

Interconnected Mapping Approaches

Fig 12. *Flood adaptive local construction practice in Nandipara*

While reflecting critically on the act of map-making in urban planning, this thesis explores a flexible and iterative mapping methodology rooted in participation, observation, and imagination. The approaches discussed in this chapter, critical mapping, participatory mapping, participatory GIS, space syntax, and speculative future imaginaries, are not only applied in isolation but integrated to produce situated knowledge about transitional urban areas such as Nandipara. The interconnected nature of these tools, as visualized in the accompanying diagram (see Fig. 13), allows this thesis to engage both with current spatial conditions and possible futures. By discussing their strengths and limitations, the chapter also aims to transparently position this research within the wider field of participatory urbanism and critical cartography.

2.1 Critical Mapping

Critical mapping challenges the assumption that maps are neutral representations of space. Instead, it exposes how maps are embedded with power relations, ideologies, and selective omissions. As Wood and Krygier (2006) note, critical cartography has grown to encompass a broad spectrum of counter, feminist, indigenous, and DIY mapping efforts, many of which aim to unsettle dominant narratives. Annette M. Kim (2015) describes critical mapping as an effort to “challenge power dynamics,” often through provocation, humor, or visual confrontation.

This approach forms the epistemological foundation of the thesis. It guides not only the technical aspects of mapping but also frames questions around what is made visible, who participates in representation, and for what purposes. The methodology used here draws from multiple media, photography, hand-drawn sketches, spatial analysis, and speculative design, and embraces the open-ended, iterative qualities of critical mapping. However, it also comes with risks: misinterpretation, predictable theoretical outcomes, or performative critique without meaningful change.

2.2 Participatory Mapping

Participatory mapping emphasizes co-creation, inviting residents, local experts, and stakeholders to represent their own environments. It is a democratic tool that fosters shared ownership, captures lived experiences, and surfaces overlooked spatial practices. As Alam (2019) cautions, however, participatory practices often risk becoming ritualistic or tokenistic, mere checkboxes for project validation. True participation, he argues, demands a willingness to question institutional structures and redistribute decision-making power.

In this research, participatory mapping took the form of workshops with local residents and planning professionals. Through site visits, discussions, and hand-drawn maps, participants visualized everyday spaces, ecological systems, and mobility routes. This method not only produced useful data but also created a platform for reflecting on community needs and aspirations. Importantly, when framed within critical mapping, participation was not treated as a solution in itself, but a tool for deeper inquiry into whose knowledge counts and how it is used.

2.3 Participatory GIS

Participatory GIS (PGIS) brings digital mapping tools into participatory frameworks, integrating local knowledge with geospatial data. Unlike expert-led GIS, PGIS decentralizes the mapping process, making spatial planning more accessible and transparent. As Hassan (2005) notes in his work on arsenic mitigation in Bangladesh, PGIS can enable spatial problem-solving even in resource-limited contexts. Yet its implementation often depends heavily on expert facilitation, and its long-term sustainability in community hands remains under-explored.

In this thesis, PGIS served as a bridge between community-generated content and more formal spatial analysis. Site-based maps produced by participants were digitized and georeferenced, creating a shared spatial language that could be analyzed and refined collaboratively. This also allowed for multi-scalar analysis, connecting intimate, lived geographies with broader urban patterns. The inclusion of PGIS workshops with planners helped foster dialogue between institutional and community perspectives, though sustaining such collaboration beyond the project remains a question for future work.

2.4 Space Syntax

Space syntax provides a computational framework for analyzing the configuration of urban form. Rooted in Bill Hillier’s (1996) concept of “non-discursive spatial logic,” space syntax examines how spatial arrangements influence movement, visibility, and social interaction, even when users are not consciously aware of these effects.

In this research, syntax analysis was used to explore how informal paths, ecological spaces, and meeting areas, though absent from official maps, play critical roles in the daily life of Nandipara. One analysis showed that if the ecological strip around the Jirani canal remains preserved, over 70% of nearby residential units would have green access within 500 meters. Another analysis revealed that informal mobility routes create centrality zones not captured in the official road network, indicating their vital role in connectivity and flow.

While space syntax offers a “neutral, analytic lens,” it is not without challenges. As Berghauser Pont (2025) observes, integrating spatial analysis into urban design requires interdisciplinary collaboration and a reform of planning education. In this thesis, syntax analysis was used both as a design support tool and as a method for making visible the hidden logic of informal urbanism.

2.5 Speculative Future Imaginaries

Speculative mapping functions as a means to imagine “fictional but possible” futures (Dunne & Raby, 2013). By detaching from immediate feasibility, it allows for critical reflection on present constraints and potential transformations. In Nandipara, speculative future

imaginaries were co-created with youth, farmers, and professionals through drawing, photomontage, and AI-assisted visualizations.

Rather than proposing fixed solutions, these speculative maps posed questions: What would a canal-side community look like if ecology, food, and mobility were at its center? What if local initiatives like Abdul Rob's farm were preserved rather than erased? These provocations highlight the political nature of imagination and the map's role in shaping not only what is, but what could be. As you noted, this approach invites a motivation for future thinking around the issue of maps and the images of urban transition.

Concluding Note

This research is not about finding definitive solutions to Dhaka's informal urbanism but about opening interpretive space, what Isabelle Stengers (2004) describes as the "arousal of a slightly different awareness" of the problems that mobilize us. Instead of relying solely on technocratic or expert-led frameworks, it proposes a situated mapping practice that embraces the fragmentary, emotional, and political dimensions of urban life.

Stengers reminds us that it is "our" knowledge, the facts produced by "our" technical systems and institutional practices, that often dominate how we understand and address global challenges. Her call is not to reject scientific knowledge but to slow it down, to allow for hesitation, multiplicity, and alternative ways of knowing. In this light, critical mapping is not just a representational act but a refusal to forget: a deliberate insistence on surfacing situated perspectives, even when they unsettle dominant narratives.

The mapping approaches explored in this chapter, critical, participatory, spatial, and speculative, each offer distinct strengths and limitations. Their true potential, however, lies in their integration. This research tests these methods by developing an interconnected mapping workflow across pre-onsite, onsite, and post-onsite phases (discussed further in Chapter 3), in order to examine the limitations and possibilities of capturing informal adaptive strategies in urban transition.

Summary of Strength and challenges

Critical Mapping

- Challenges official and institutional narratives
- Sets counter-narrative frameworks
- Asks critical questions about power, representation, and participation
- Flexible, open-ended, and non-conclusive
- Integrates diverse media and interdisciplinary approaches

Challenges: Risk of misinterpretation or overly theoretical framing

Participatory Mapping

- Facilitates co-creation and community-led knowledge production
- Captures lived experiences, stories, and everyday spatial practices
- Gathers spatial stories, suggestions, and aspirations
- Strengthens collective spatial understanding

Challenges: Outcomes can be heavily shaped by facilitators. Participant selection may limit representativeness. Long-term use and integration of results often unclear

Participatory GIS

- Links local knowledge to digital spatial representation
- Supports bottom-up approaches in planning
- Effective for collaborative, long-term stakeholder engagement
- Can produce georeferenced, evidence-based planning outputs

Challenges: Requires GIS expertise to implement and maintain. Still an emerging methodology with limited field-tested tools

Space Syntax

- Offers neutral, analytic tools for spatial configuration analysis
- Helps identify non-discursive spatial logic in informal morphologies
- Supports quantitative assessment of accessibility, connectivity, and integration
- Useful for both retrospective and prospective urban analysis

Challenges: Technical; depends on expert knowledge and GIS tools

Speculative Future Imaginaries

- Encourages imagining alternative urban futures
- Combines fiction, narrative, and visual tools to provoke thought
- Bridges participatory design and future-oriented planning

Challenges: Not grounded in policy or regulatory frameworks. Often perceived as abstract or non-binding.

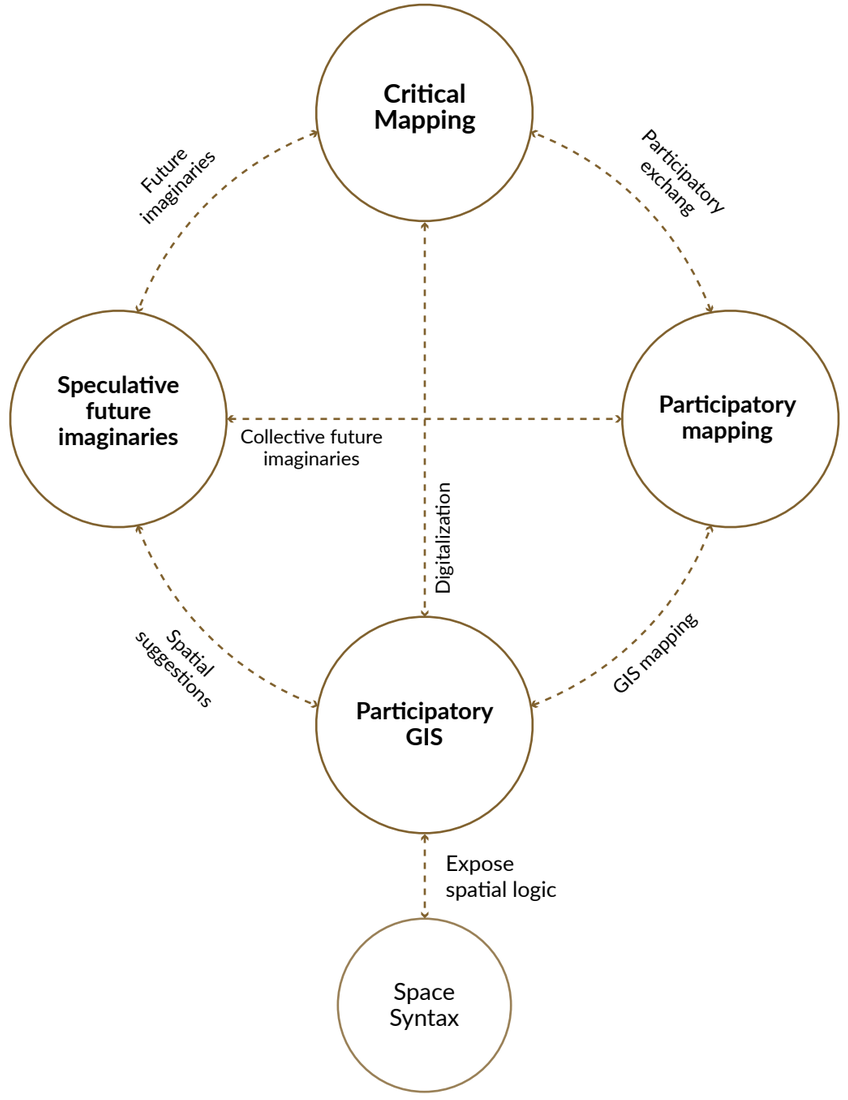
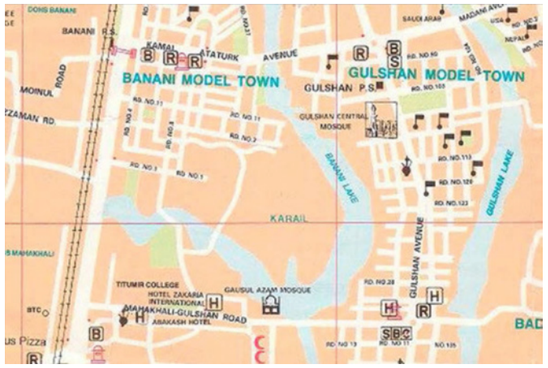
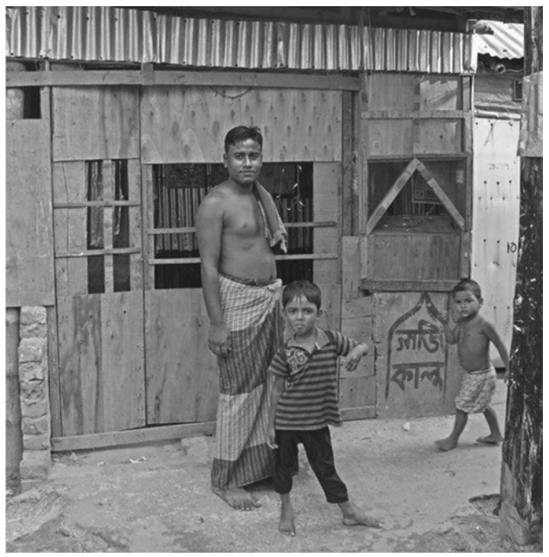


Fig 13. *Interconnected mapping approach*





Karail: Mapping the Invisible City

Karail, Dhaka's largest self-organized settlement, is home to over 100,000 residents, yet it remains a blank space on official city maps. In response, a critical counter-mapping initiative led by Elisa T. Bertuzzo and Günter Nest challenged this erasure by building on the work of Karail's community-based organizations (CBOs), who had been producing hand-drawn maps since 2009. These community maps, originally supported by NGO DSK, evolved into tools for local planning, technical learning, and asserting spatial ownership. By overlaying fieldwork insights onto Google Earth imagery, the project highlighted both the potential and limitations of mapping informal settlements. It became not just a spatial documentation exercise but a form of storytelling, turning the act of mapping into a collective reflection on visibility, identity, and resistance in Dhaka's contested urban landscape.

Fig 14. *Mapping of Karail Basti*

Chapter III :

Mapping framework for Nandipara

Fig 15. *Notes form an interview conducted during the pre-onsite phase of the thesis*

The research adopted a reflexive and iterative mapping framework, structured into three interconnected phases: pre-onsite, during-onsite, and post-onsite, following the model proposed by Laituri et al. (2023). In alignment with participatory mapping goals, each phase was shaped by key questions: Who is involved? What is being asked? Whose voices are being centered? The flexibility of the framework allowed space for critical reflection, situated storytelling, and adaptive research design. Trusted local contacts and planning professionals played essential roles in facilitating access and co-producing knowledge on-site.

Pre-Onsite Phase: Individual Researcher's Voice

(August 2024 – January 2025)

This preparatory phase focused on shaping the research foundation through contextual understanding and stakeholder engagement. Key activities included literature review, online interviews, gathering available maps and spatial data, and identifying potential mapping themes. Initial outreach with urban planners and GIS professionals provided logistical support and critical perspectives for the participatory GIS mapping to follow. This phase established the groundwork for ethical engagement and effective collaboration during the fieldwork stage.

During-Onsite Phase: Collective Voice

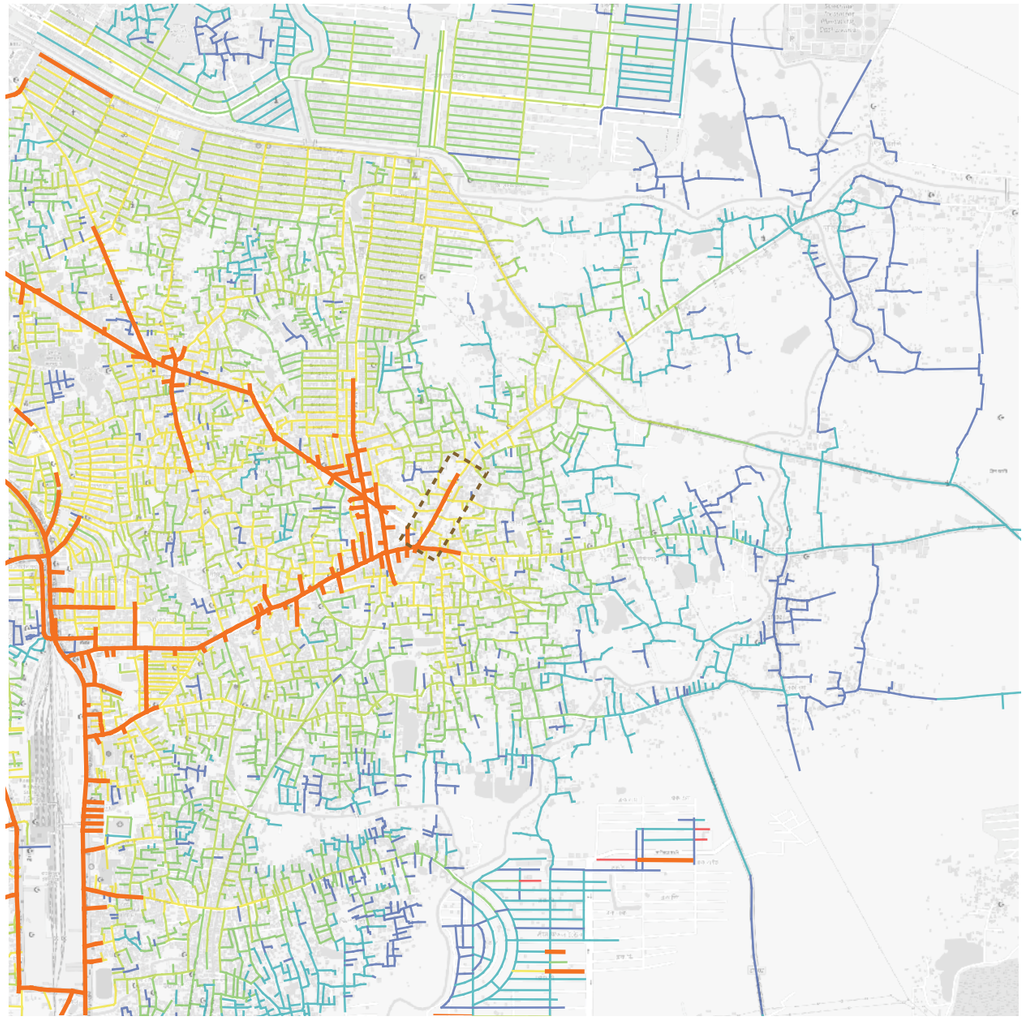
(February – April 2025, Dhaka, Bangladesh)

On-site engagement began with immersive field visits, building trust with community members, and observing everyday practices. Participatory mapping workshops were co-organized with local residents, children, farmers, and planning professionals. These sessions included drawing, storytelling, GIS mapping, and knowledge exchange. The mapping topics were co-defined with participants to reflect both lived realities and shared aspirations. Spatial analysis tools like GIS and space syntax were introduced in expert sessions to further investigate the informal morphology. The process prioritized dialogue, feedback, and iterative refinement of outputs.

Post-Onsite Phase: Researcher-Interpreted Collective Voice

(April – June 2025)

The final phase focused on interpreting and synthesizing the data collected during the fieldwork. Workshop maps were digitized and georeferenced, attribute data was processed in GIS, and spatial analysis using space syntax was conducted to understand urban logics. These outputs were shared with selected participants and planning professionals to gather feedback. The insights and visuals generated during this phase were compiled for the thesis and prepared for broader dissemination, offering a grounded yet speculative reflection on Nandipara's urban futures.



Selection of study area

The research focuses on a representative site characterized by organic development, peripheral location, and ecological constraints, yet with potential integration into the city's wider network. The Jirani Canal connects Nandipara to Dhaka's water system, and despite its informal street layout, spatial analysis identifies the area's centrality and growth potential. A 500-meter stretch along the canal, beginning at Nandipara Bazar, was selected for detailed mapping.

Fig 16. *(top left), location of study area*
Fig 17. *(bottom left), the Jirani canal in Nandipara.*
Fig 18. *(right), angular integration with space syntax shows street networks higher centrality of the study area.*

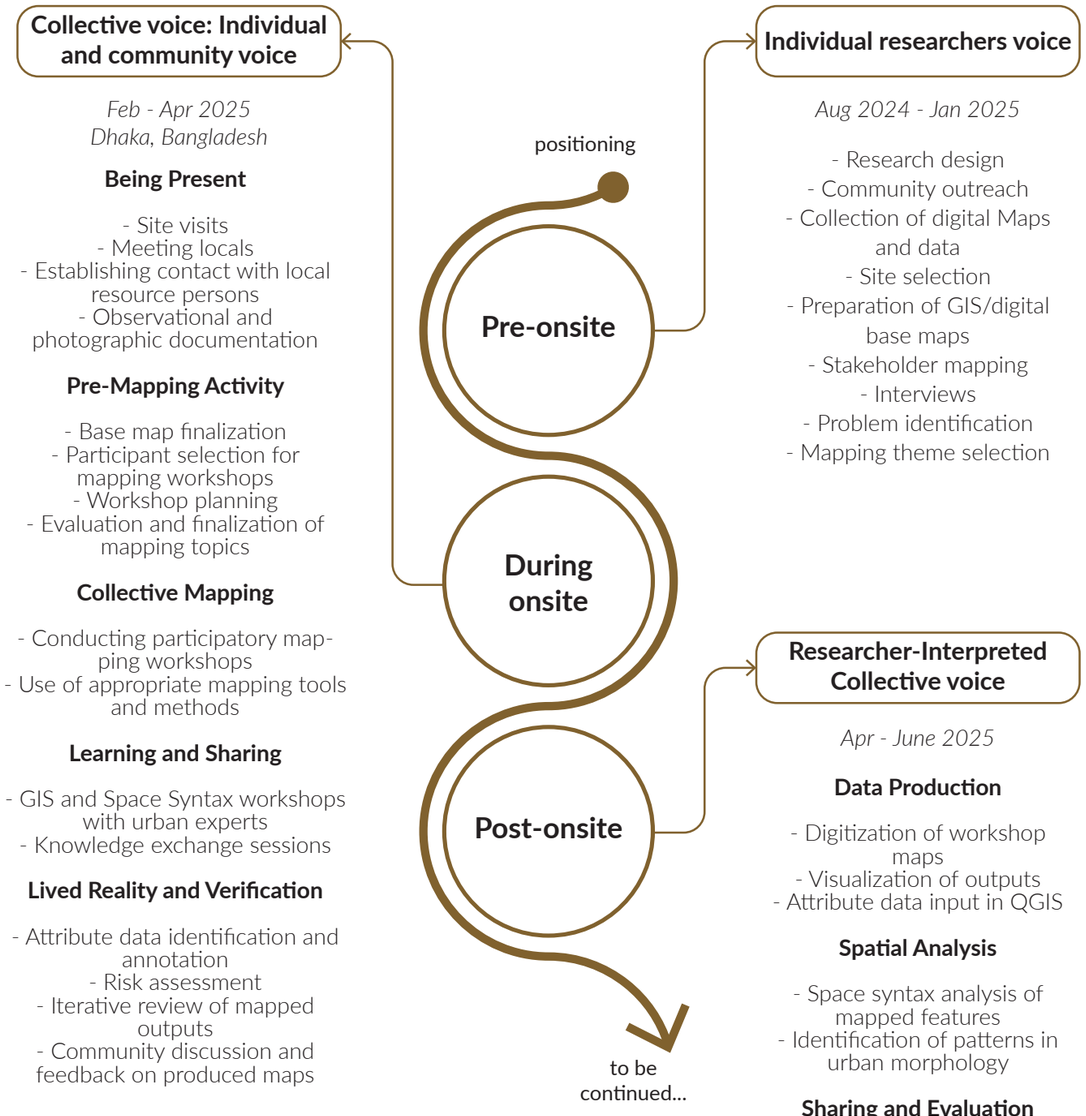


Fig 19. *Mapping workflow phases diagram*

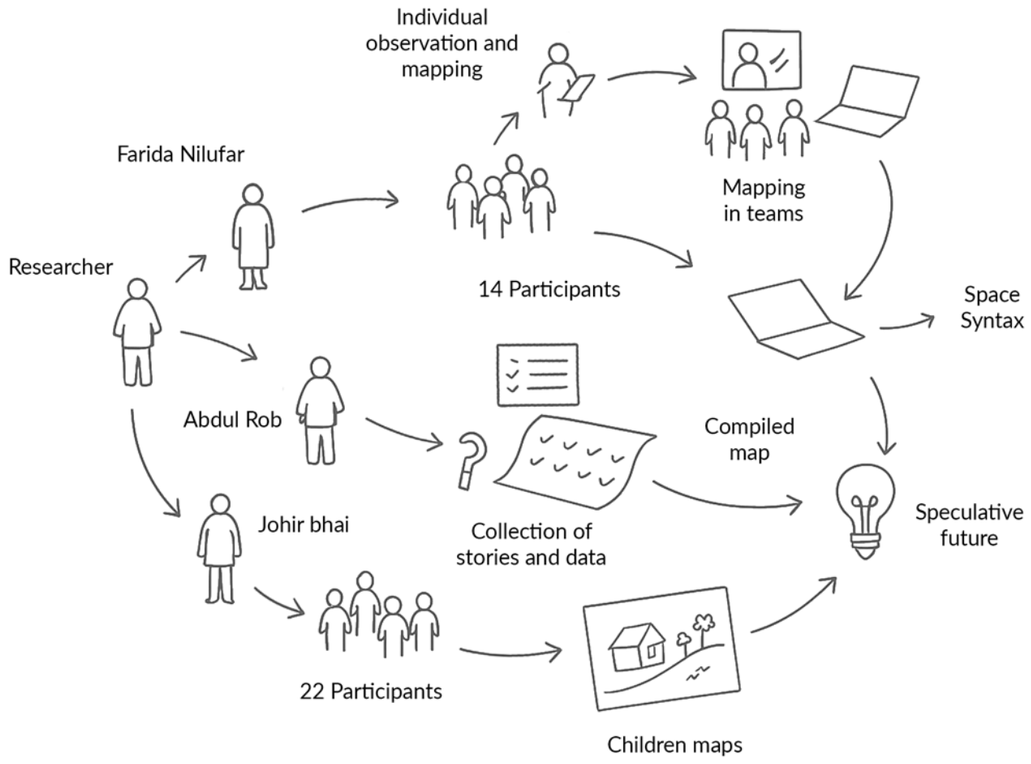


Fig 20. *Participatory mapping workflow diagram (during-onsite phase)*

Fig 21. *Workshop poster (Dhaka, Bangladesh)*
24 and 25 February, 2025

Workshop structure

Step 01: Site visit and Data Collection
(4 themes, 4 groups, 2-4 person/group)

Step 02: Combining all data on a Hard copy Map
(4 maps in total, 1 map/theme)

Stem 03: Creating a GIS map (4 GIS layers)

1. Ecology and ecosystem services
(on base GIS Waterbody layer)
2. Open space and meeting places
(on base GIS Waterbody layer)
3. Formal and informal circulation
(on base GIS road layer)
4. Local economy and food security
(on base GIS Structure layer)

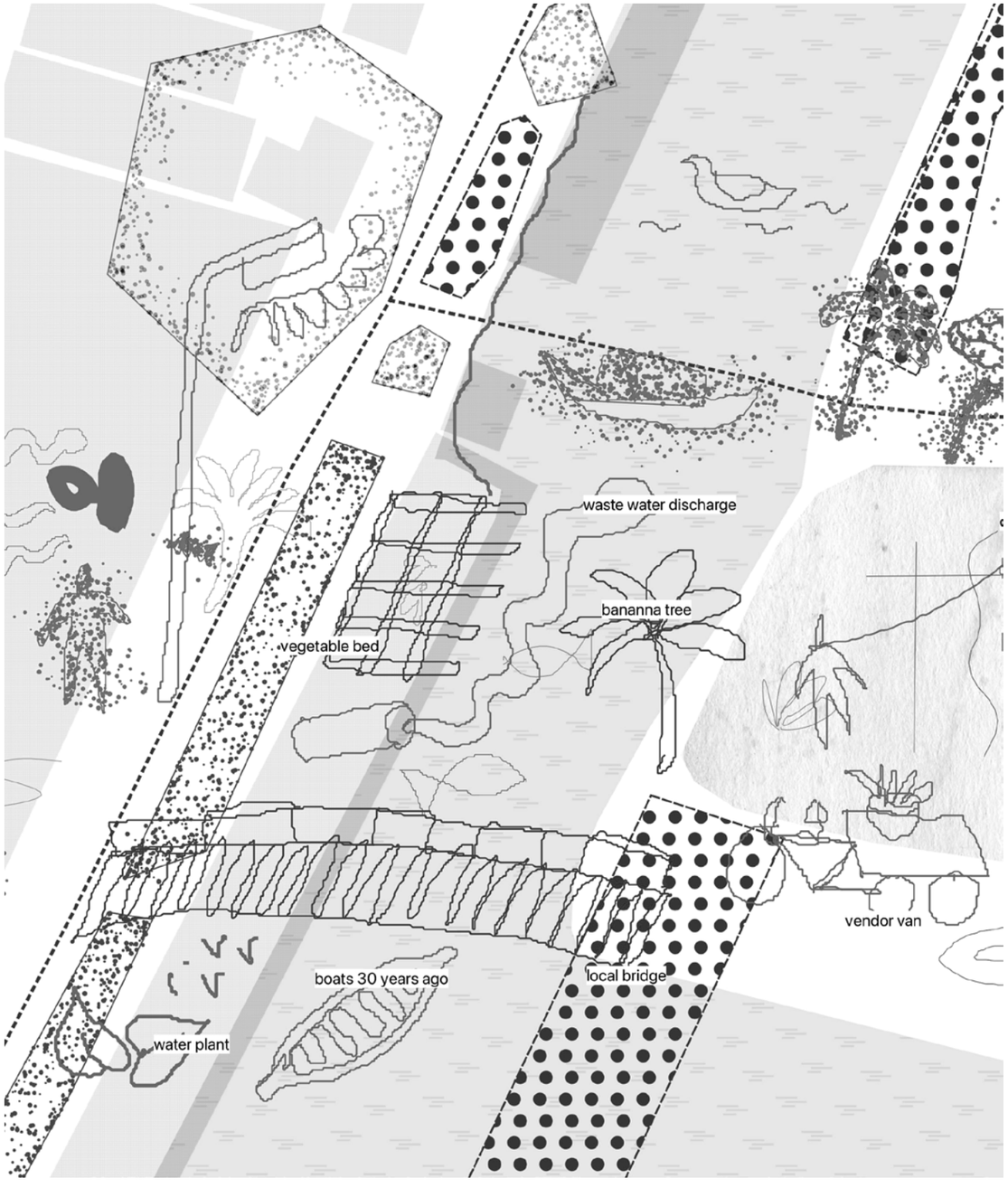
Step 04: Run analysis in PST
Whole Dhaka street network analysis
Creating Nandipara local network
Angular integration analysis
Angular betweenness analysis
Attraction reach analysis
Attraction distance analysis

Step 05: Future Imaginaries (2-4 teams)
Test ideas for a sustainable socio-ecological future transformation of Nandipara (ie. speculative design ideas for ecological integration, meaningful meeting place, improved circulation, like walkways along canal, supporting local economy etc.)

Step 06: Run analysis in PST
For future imaginaries

Step 07: Share ideas and Discussion

Fig 22. *Participants during the site visit*



Chapter IV:

Maps of Invisible Narratives

Fig 23. *An initial test of compiling participatory mapped features in the QGIS*

4.1 : Ecology and ecosystem services

This topic investigates the ecological landscape surrounding the Jirani Canal and the relationships between natural systems and urban life. Ecology refers to the study of interactions between organisms and their environments, both natural and human-altered. Ecosystem services, which encompass the direct and indirect benefits that humans obtain from ecosystems, such as food production, climate regulation, water purification, and cultural value.

Mapping ecological conditions in rapidly transforming urban settings like Nandipara is crucial for integrating novel strategies into policy and planning. This research adopted both observational and perception-based mapping methods. As the local adaptive strategies are closely tied to seasonal variation and disaster risk, collecting long-term data was not feasible in the scope of this study. However, storytelling and community memory proved vital for capturing ecological insights that remain invisible to conventional maps.

Historical and Local Knowledge of the Canal :

Historically, the Jirani Canal (see fig. 24) functioned as a significant water route connecting Shitalakshay river, the Balu River, Rampura canal, and eventually into Dhaka's urban core. The name "Jirani" meaning "to rest" in Bengali, reflects its historical use as a rest stop and docking point for boats, with elders recalling the presence of wide harbors and active fisheries just three or four decades ago. Abdul Rob, a long-time resident, recalls boating across the canal before a concrete bridge was built, an era when most of the area consisted of low-lying agricultural land or rural homesteads. Today, much of the study area examined in this research has been artificially elevated through sand filling.

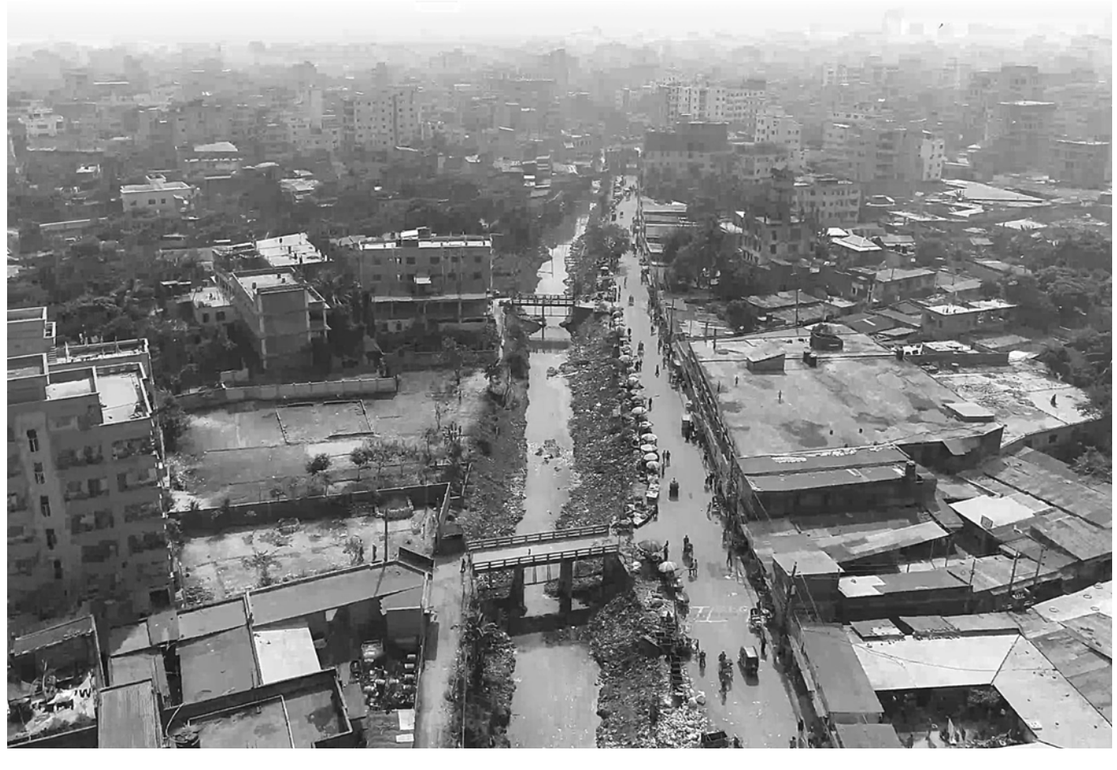
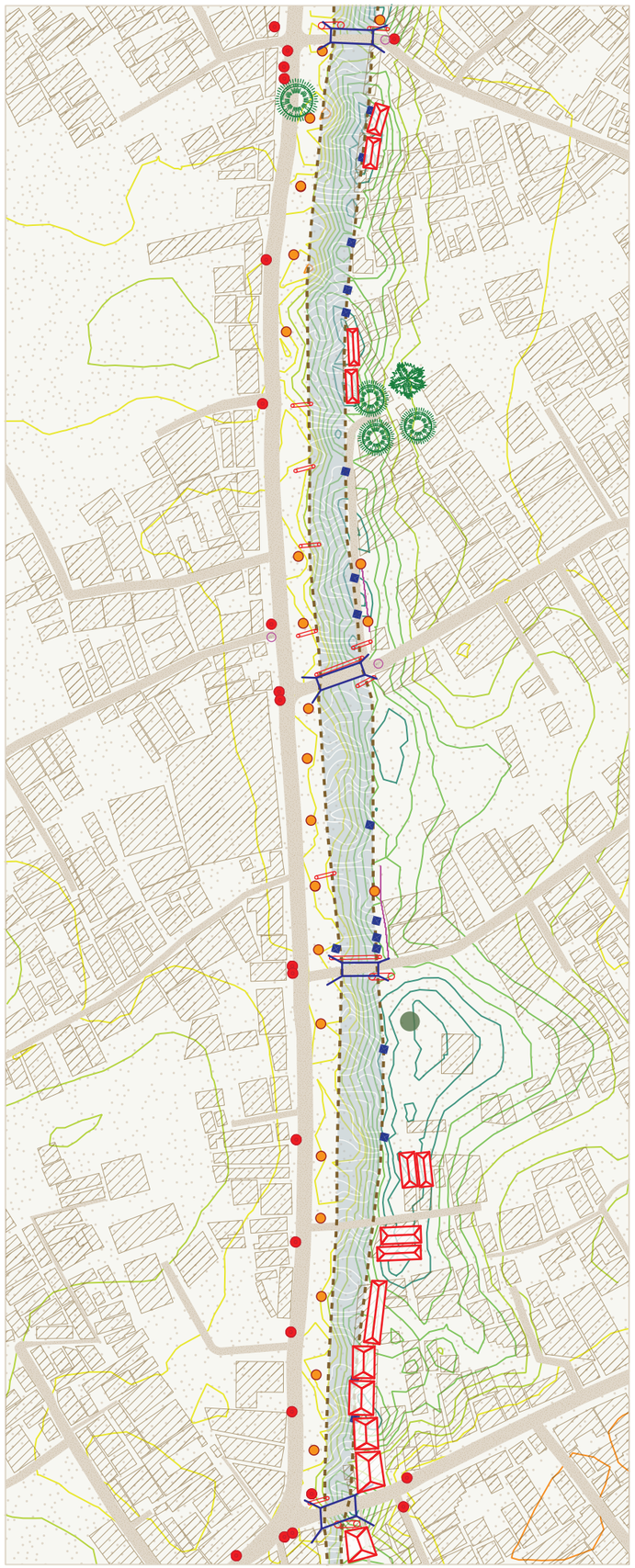


Fig 24. *Arial image of the study area at Nandipara. The Jirani canal and Trimohoni road runs parallel.*



Jirani canal survey by DSCC, 2023

- Robs' garden
- Stilt house
- 2.1- 3
- 3- 3.9
- 3.9- 4.5
- 4.5-5.1
- 5.1-6
- Rain Tree
- Panthapadap
- Electric Pole
- Manhole
- Light pole
- Boundary pillar
- Bridge
- Road
- Structure
- Water
- Canal boundary
- Waste water pipe

0 25 50 m

Official survey data from the Dhaka South City Corporation (DSCC) and GIS sources were used to prepare the basemap for participant workshops. Strikingly, the 2023 DSCC land survey identified only five trees within the study area, four rain trees and one panthapadap (Terminalia arjuna) (see fig. 25). This limited ecological inventory prompted further inquiry: What ecological features actually exist on the ground? How are they adapting to the altered urban landscape? And how do local residents perceive and interact with this ecology?

Overlaying DSCC's topographic data with current building footprints revealed that Abdul Rob's garden sits at the lowest elevation in the area (see fig. 26). Could this vulnerability have unconsciously contributed to its survival? This question is explored further in chapter 4.4. Another key observation was the presence of stilt houses (see fig. 12) , which are often located in similarly low-lying areas. These structures reflect a traditional flood-resilient building practice, elevated to protect against seasonal inundation. Access is commonly provided via makeshift bamboo bridges, while the open ground below supports aquatic plants, amphibians, and even small mammals, effectively acting as microhabitats zones.

These adaptive structures also contribute to balancing the city's groundwater table and absorbing excess rainwater during monsoon seasons. Compounding the ecological stress, much of the area is now subject to unregulated waste dumping, and landfilling, threatening both biodiversity and traditional practices that once supported coexistence with the landscape.

Fig 25. *(left) Canal survey map by DSCC, 2023*
Fig 26. *(right) Abdul Robs' garden under water during monsoon.*

Fig 27. *Arial image of Jirani canal*

A Greener Imagination of Jirani Canal

During a participatory mapping workshop with children from Baby School in Nandipara, a striking pattern emerged: many of their maps depicted the eastern side of the Jirani Canal as significantly greener (see Fig. 28) than it appears today. This contrasted sharply with the western side, which borders the busy Trimohoni Road and is already shaped by dense, mixed-use development.

Yet, walking along the eastern edge of the canal, the envisioned greenery was not immediately apparent. Much of the land is fenced off by private owners, concealing the canal's edges and hiding the spatial potential the children intuitively mapped. However, when later examined through drone imagery (see Fig. 27), a patchwork of green spaces could indeed be seen, subtly embedded within the neighborhood fabric.

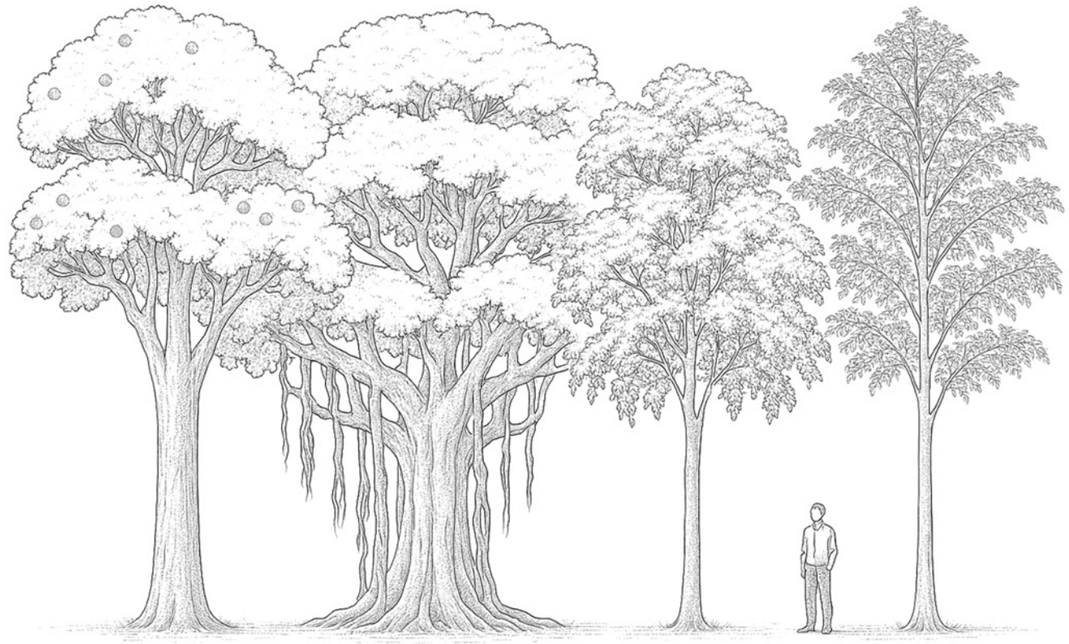
Although these areas are largely under private ownership, the alignment between the children's speculative maps and the aerial images reveals something deeper: a perceptual mapping of potential. Their drawings, freed by land ownership boundaries or visibility from the street, captured latent ecological possibilities, what could be, rather than what currently is. This underscores the value of perception-driven mapping as a tool for imagining an alternative future.

Fig 28. *A map made by 13 years old Bablee form Baby school at Nandipara*

Map of Trees and Shrubs

- Agriculture
- Big tree
- Shrubs
- Road
- Structure
- Water
- Canal boundary
- Waste water pipe

0 25 50 m



Mapping the Ecological Memory

In contrast to the barren categorization of official land surveys, the participatory mapping workshop revealed a far richer ecological narrative. During a single-day on-site session, participants were able to identify 35 different plant species along the Jirani Canal, underscoring the overlooked biodiversity embedded in this urban edge. Among the species documented were culturally and ecologically significant tropical natives such as the Burflower tree (Neolamarckia cadamba), Banyan tree (Ficus benghalensis), Neem tree (Azadirachta indica), and Drumstick tree (Moringa oleifera) (see Fig. 30).

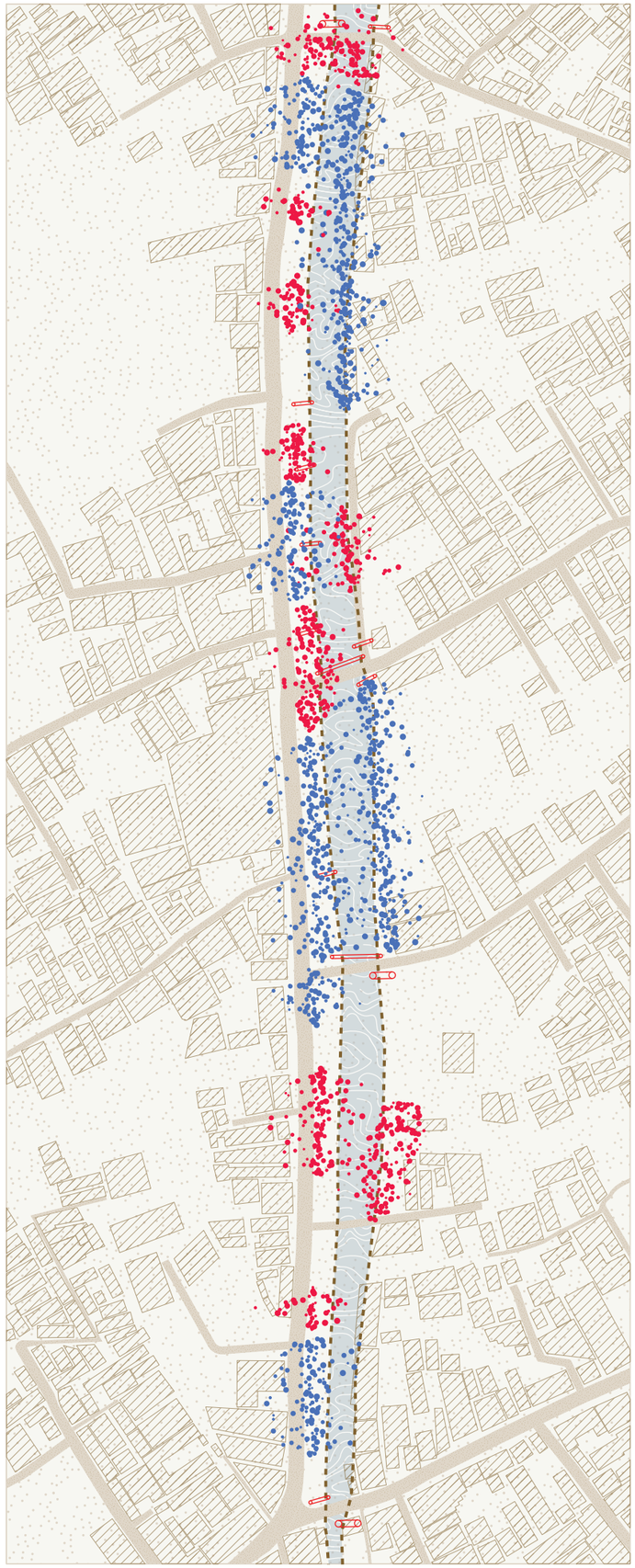
Each of these trees carries deep-rooted cultural, medicinal, and environmental associations. The Burflower, known locally as a harbinger of monsoon, blooms with the season's arrival and marks a change in the climatic rhythm. The Drumstick tree is valued not only for its drought resistance and water-purifying properties but also for its use in traditional medicine. Remarkably resilient, it thrives with minimal care and rarely suffers from disease in its native range.

The Banyan tree, deeply respected across South Asia and often associated with sacred practices, stands as both a cultural and ecological anchor. Two mature Banyan trees located along the canal, known locally as Chhoto Bot Tola and Boro Bot Tola, function as informal gathering spaces, testifying to the enduring cultural role of trees in urban life. Beyond their symbolic value, such trees serve as "ecological linchpins," hosting a wide array of flora and fauna within their canopies and root systems.

The resulting tree and shrub map (see Fig. 29), created collaboratively through observation and sketching, was later digitized in GIS. Although modest in scope, it makes visible what official maps omit: the lived ecological richness of informal spaces and the intimate relationships between people and their environment. In this sense, it is both a scientific record and a cultural testimony.

Fig 29. *(left) Map of trees and shrubs*
Fig 30. *(right) Trees mapped along the canal*

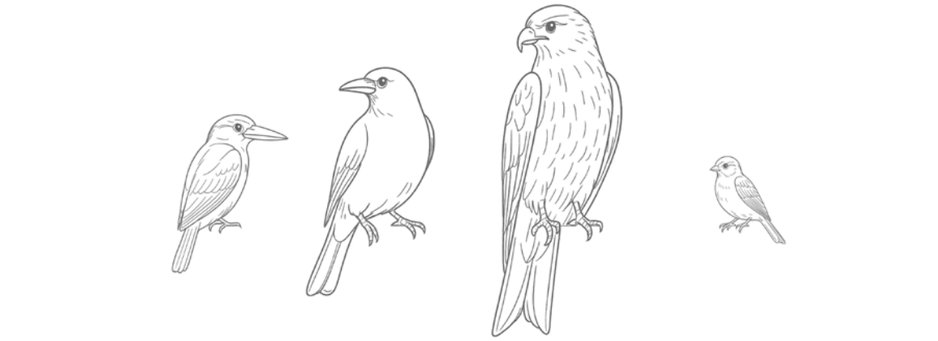
Burflower Tree (Neolamarckia cadamba)
Banyan Tree (Ficus benghalensis)
Neem Tree (Azadirachta indica)
Drumstick Tree (Moringa oleifera)

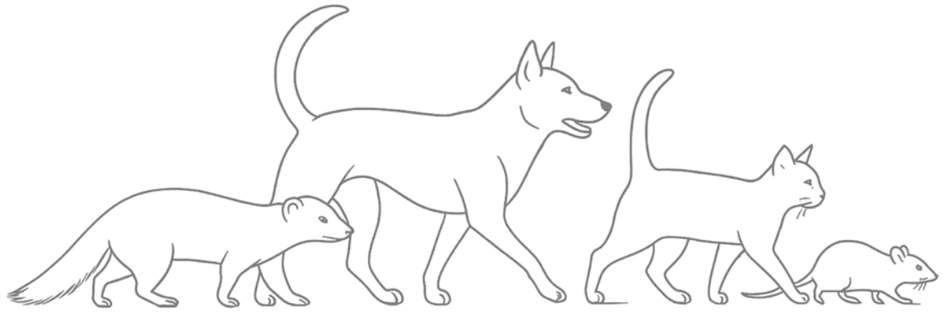


Map of Birds and Animal

- Animal observed
- Birds observed
- Road
- Structure
- Water
- Canal boundary
- Waste water pipe

0 25 50 m





Non-Human Actors of the Jirani Canal

Beyond its human narratives, the Jirani Canal also sustains a diverse range of non-human actors that reflect the ecological vitality of the area. During a morning site visit, participants first observed a White-throated Kingfisher (Halcyon smyrnensis), a species known to inhabit both aquatic and terrestrial environments. Its presence indicates not only a habitable landscape but also the availability of a varied food chain, including small reptiles, amphibians, rodents, and even smaller birds.

As the day progressed, other species were identified through observation, including Indian grey mongooses (Urva edwardsii), street dogs, domestic cats, frogs, house sparrows, crows, and black kites. The Indian grey mongoose, frequently spotted on both sides of the canal, is known to thrive in scrublands, open fields, and cultivated areas near human settlements. Its diet, largely composed of live prey such as rodents, birds' eggs, lizards, and invertebrates, further evidences a functioning local ecosystem. Notably, this species is famous for its capacity to confront venomous snakes, a cultural element echoed by the presence of a snake charmer performing with both a snake and a mongoose by the canal (see Fig. 32).

The mapped observations (see Fig. 31) do not quantify populations but instead represent a spatial narrative of the non-human lives encountered, an experiential and ecological reading of Nandipara that complements and challenges dominant human-centric mappings of urban space.

Fig 31. *Map of Birds and Animals*
Fig 32. *Non-human actors of Nandipara*

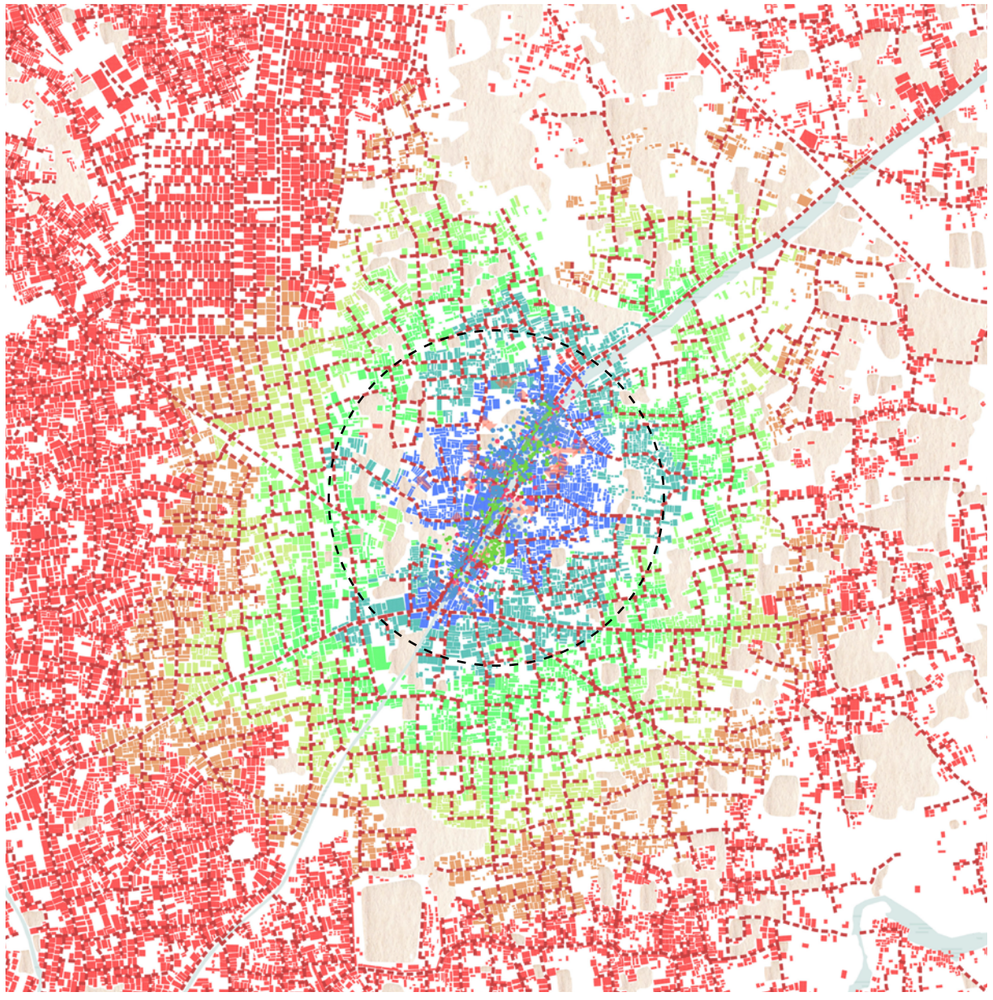


Fig 33. *Attraction reach analysis*
Mapped ecology to structure (500m)

Spatial Analysis of Mapped Ecology

The attraction reach analysis (see Fig. 33) in space syntax evaluates the accessibility of mapped ecological features within a 500-meter radius. For this analysis, the newly mapped ecology layer was selected as the destination, the existing structure layer as the origin, and the road centerline layer as the network to run the analysis.

This map illustrates the reach of house center points to newly mapped ecological features within a 500-meter radius, highlighting the potential accessibility of green spaces and ecological elements for residents in the surrounding area. However, informal mobility features have not yet been incorporated into this analysis. For further insights, see the Spatial Analysis in Topic 03.

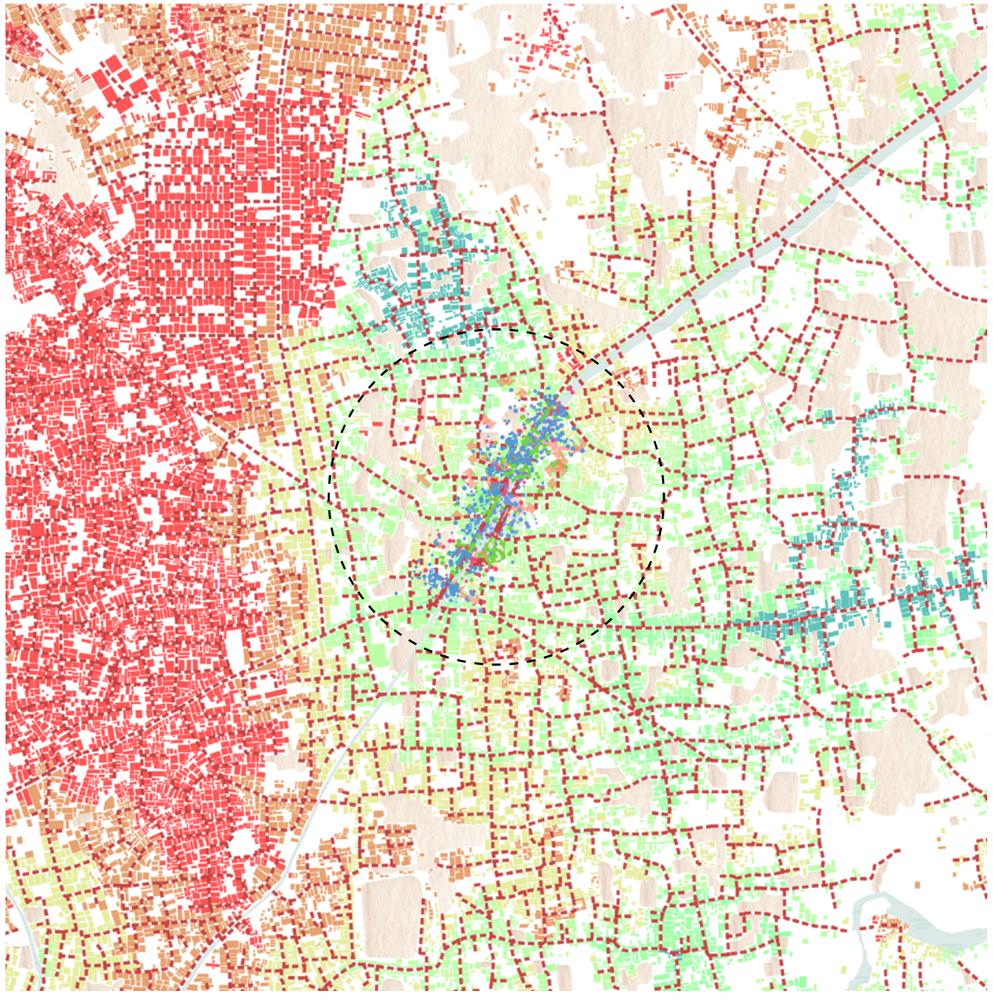


Fig 34. *Attraction reach analysis- canal to structure (500m)*

Spatial Analysis of Connection to Canal

What if the entire Jirani Canal were ecologically restored? This analysis examines the potential impact of restoring the canal by assessing accessibility from surrounding structures. Similar to the previous analysis, the structure layer serves as the origin, and the road centerline acts as the network. However, in this case, the destination is set to the canal polyline, with access points placed every 10 meters.

The resulting map illustrates the potential reach of structures and the accessibility of ecological features for residents within a 500m radius. The red area on the left represents the already built-up city core, while the right side shows the expanding urban area. This analysis highlights (see Fig. 34) how restoring the canal's ecology could significantly enhance access to nature and contribute to a more sustainable urban transformation.

Reflection

As Kim (2015) notes, to effectively engage diverse audiences, "a critical map project would either require multiple maps for different audiences or multiple reads of the same critical map." The maps of lived realities presented in this chapter do not aim to be exhaustive or quantitative; rather, they reveal spatial layers and narratives often absent from official cartographies. These maps explore how built form interacts with topography, how children perceive and imagine space, how nature adapts within transitional environments, and how recognizing and preserving existing ecological features can significantly enhance urban livability. In this context, the name of the canal Jirani, derived from the local notion of 'to rest', offers a timely reminder: perhaps what is most urgently needed is the space and intention to let nature pause, regenerate, and thrive within the urban fabric.

Fig 35*: Participants during the site visit at Nandi Para preparing hand drawn maps.*

4.2 : **Open space and meeting places**

This topic explores the formal and informal production of open and social spaces, such as open fields, play areas, cultural spaces, and other gathering spots. Given the social and morphological ambiguity of the area, participants adopted a flexible approach in identifying these spaces. The discussion also led to a deeper understanding of their spatial configurations, behavioral patterns, and positioning within the urban network.

Nandi Para, home to around 40,000 residents, lacks a formal playground provided by the municipality. However, during the workshop, several self-organized play areas were identified within the 500-meter study area along the Jirani Canal, many of which were located on landfills. One such site on the east bank of the canal has been informally recognized as a playground, where children were seen flying kites and playing football (see Fig. 37). The space also featured a cricket practice net and a badminton court. However, as the land is privately owned, leaving its long-term accessibility uncertain.

Another important recreational space is The Baby School, (see Fig. 38) a small, privately run educational institute. Its small courtyard, though modest in size, is an active play area for children during school hours. The space is enhanced by fruit trees and plants, making it more inviting for the students, who were seen eagerly reaching for the small fruits while playing.

Beyond designated play areas, the canal buffer zone between the road and the waterbody serves as a vibrant meeting place for local residents. This informal space is occupied primarily by street vendors selling goods from portable stalls, attracting locals who gather for casual chats over tea. Although the buffer lacks a defined footpath, it functions as both a commercial and social hub (see Fig. 39).

Fig. 40, presents a spatial representation of municipal street lighting along the Jirani Canal. A notably higher concentration of lights is observed on the western side of the canal, which aligns with the greater density of street vendors and informal commercial activities in that area. These vendors often remain open into the late hours, catering to the working-class population whose shopping hours are largely restricted to the evening. In this context, street lighting emerges as a critical enabler of nighttime economic and social activity.

Furthermore, the map identifies clusters of streetlights and electric poles at key bridge intersections connecting to Trimohoni Road. These nodes appear to function as vibrant meeting points, reinforcing the relationship between infrastructural lighting and public interaction.

In contrast, the eastern side of the canal features minimal street lighting and lacks a clearly defined pedestrian walkway. This infrastructural absence contributes to a noticeable reduction in public activity and the underutilization of open spaces. For instance, the informal playground situated along this edge remains largely unused after dark due to inadequate lighting. However, from a more critical ecological perspective, the reduced human presence and limited disturbance on this side of the canal may, in fact, support the preservation of local biodiversity and ecological balance. Further on-site inquiry would be required to examine the nuances of this relationship.

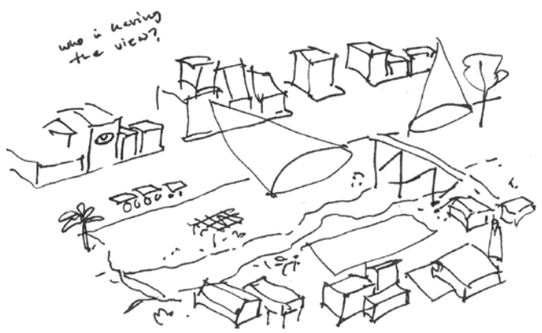


Fig 36. *Observational mapping of visibility of Jirani canal*

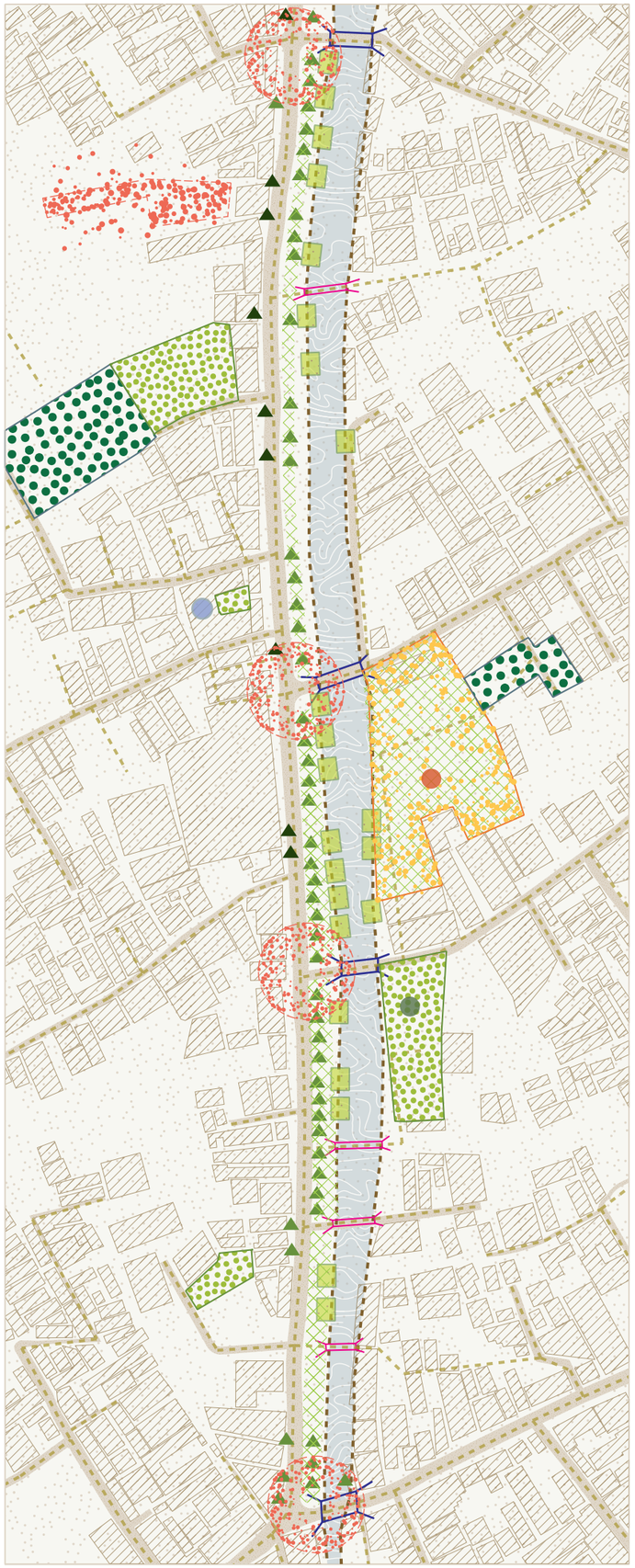
Fig 37*: On the east bank of the canal has been informally recognized as a playground, where children were seen flying kites and playing football.*

Fig 38*: Children Playing in the inner courtyard of the Baby School, a small, privately run educational institute.*

Map of open space and meeing places

- Baby School
- Playground (informal)
- Rob's garden
- Informal bridge
- Formal bridge
- Street vendors
- Road center line
- Canal buffer space
- Landfill
- Meeing place
- Open field
- Open space
- Road
- Structure
- Water
- Canal boundary

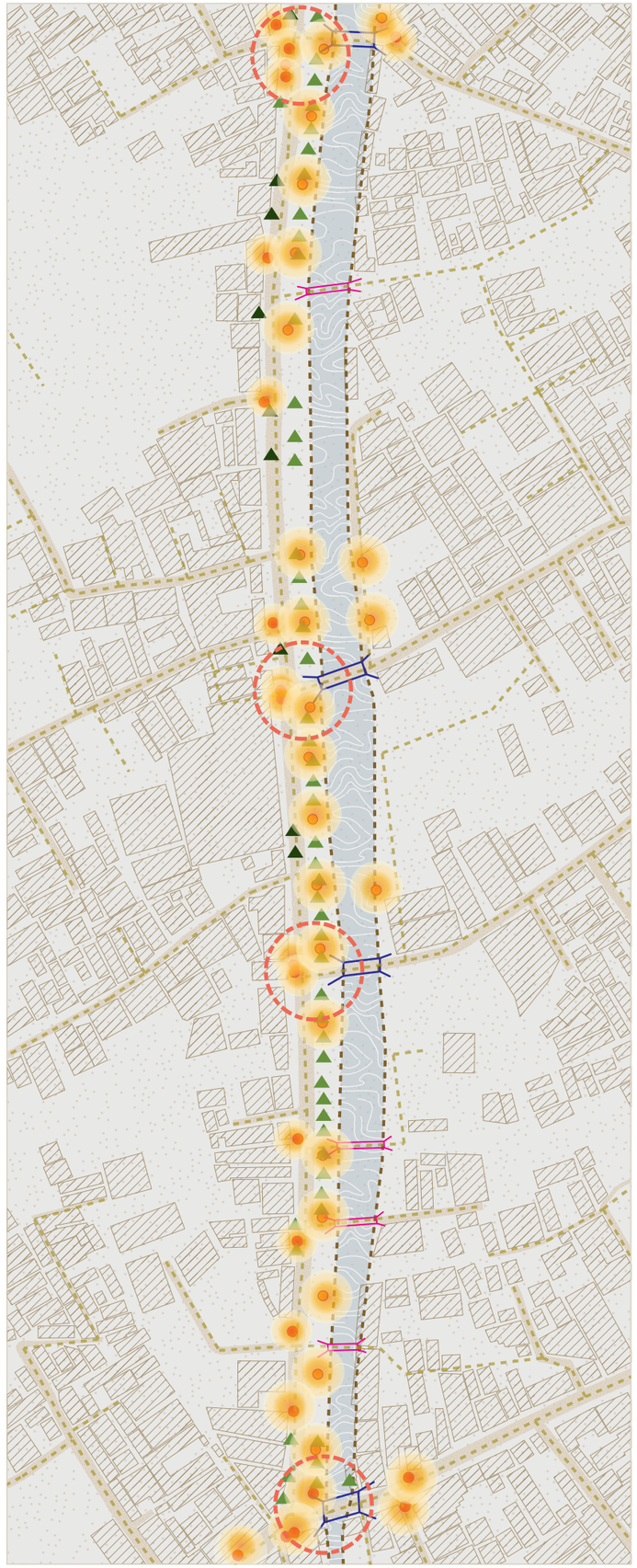
0 25 50 m



Map of street light, meeting places and street vendor

- Active meeting place
- Street light
- Electric Pole
- Light pole
- Street Vendor
- Informal bridge
- Formal bridge
- Road center line
- Road
- Structure
- Water
- Canal boundary

0 25 50 m



4.3 : **Formal and Informal circulation**

This section explores the interplay between formal and informal mobility networks within the study area. Fieldwork revealed a fascinating coexistence: while formal roads follow planned alignments, informal circulation routes have emerged organically in response to community needs. These self-constructed paths are not reflected in official maps or planning frameworks, yet they form an essential part of the everyday spatial experience. This dual vision of the city, planned and improvised, became increasingly apparent during our site surveys.

Informal paths serve diverse functions. Some penetrate deep into residential clusters, while others link private properties to main thoroughfares (see Fig. 42, 44). These routes often remain invisible from the main road and only reveal themselves upon closer inspection. Through this exploration, a “hidden spatial language” emerged, one that has evolved over time through localized, need-based interactions with the environment.

The alignment of circulation with economic activity also stood out. Formal roads typically coincide with larger scale, regulated commercial development, whereas informal paths support residential access and small-scale, often home-based enterprises. In many instances, these informal routes provide shorter, more efficient connections than the formal street grid.

We also identified three formal bridges and an additional four informal bamboo footbridges (see Fig. 42,45). These makeshift crossings, constructed by residents on the eastern side of the canal, often serve clusters of houses lacking direct road access. Though these structures reflect an "unplanned" mode of urban adaptation, they represent critical access points for daily use.

However, the informal circulation network presents infrastructural and safety challenges. For example, a major school in the area was found to have only a narrow 3 to 4 foot-wide access path, raising serious concerns about emergency response in the event of a fire or other hazards. Additionally, bamboo bridges obstruct water flow and trap solid waste, exacerbating environmental stress. In some cases, utility pipes carrying electricity, gas, or water, were precariously attached to these structures, further entrenching them within the area’s infrastructural system.

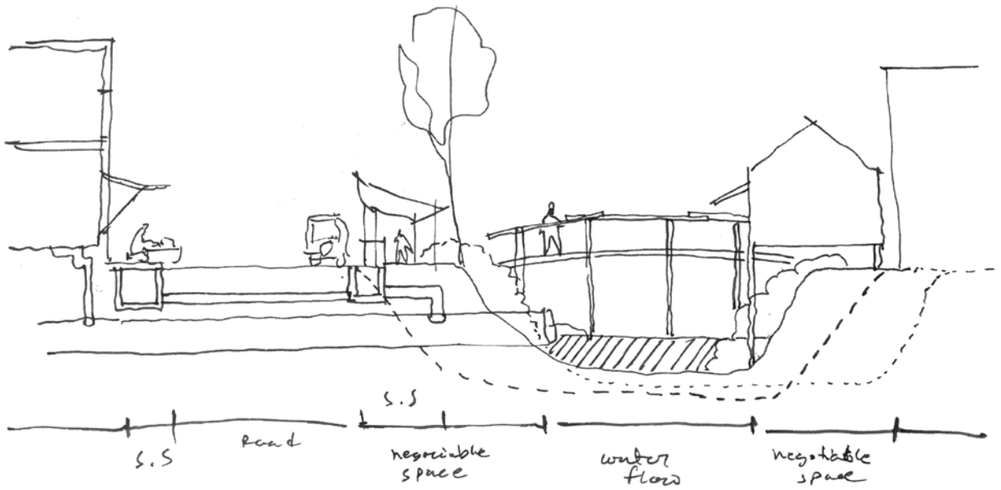
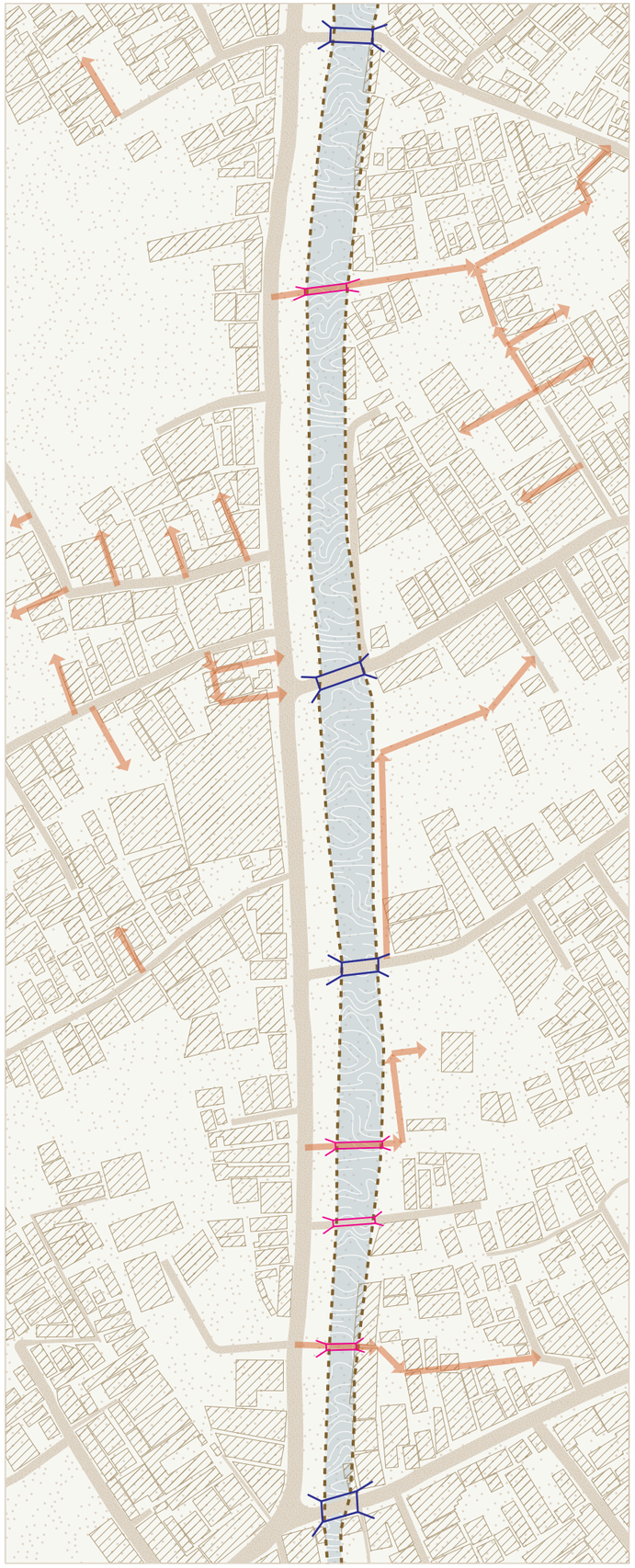


Fig 41: *Observational sketches from site visit*

Perticipants interview during the site visit

Fig 42: *Makeshift bamboo bridge connects houses over the other side of the canal.*
Fig 43: *An informal path by the canal leads to a Rickshaw garage and informal housing area.*



Map of informal mobility

- Informal paths
- Informal bridge
- Formal bridge
- Road
- Structure
- Water
- Canal boundary

0 25 50 m

***Fig 44**: (Left) map of informal mobility*
***Fig 45**: (right) Bamboo bridges over the canal*

Angular Integration Analysis
2000m walking distance

- Playground (informal)
- Rob's garden
- Informal bridge
- Formal bridge
- Street vendors

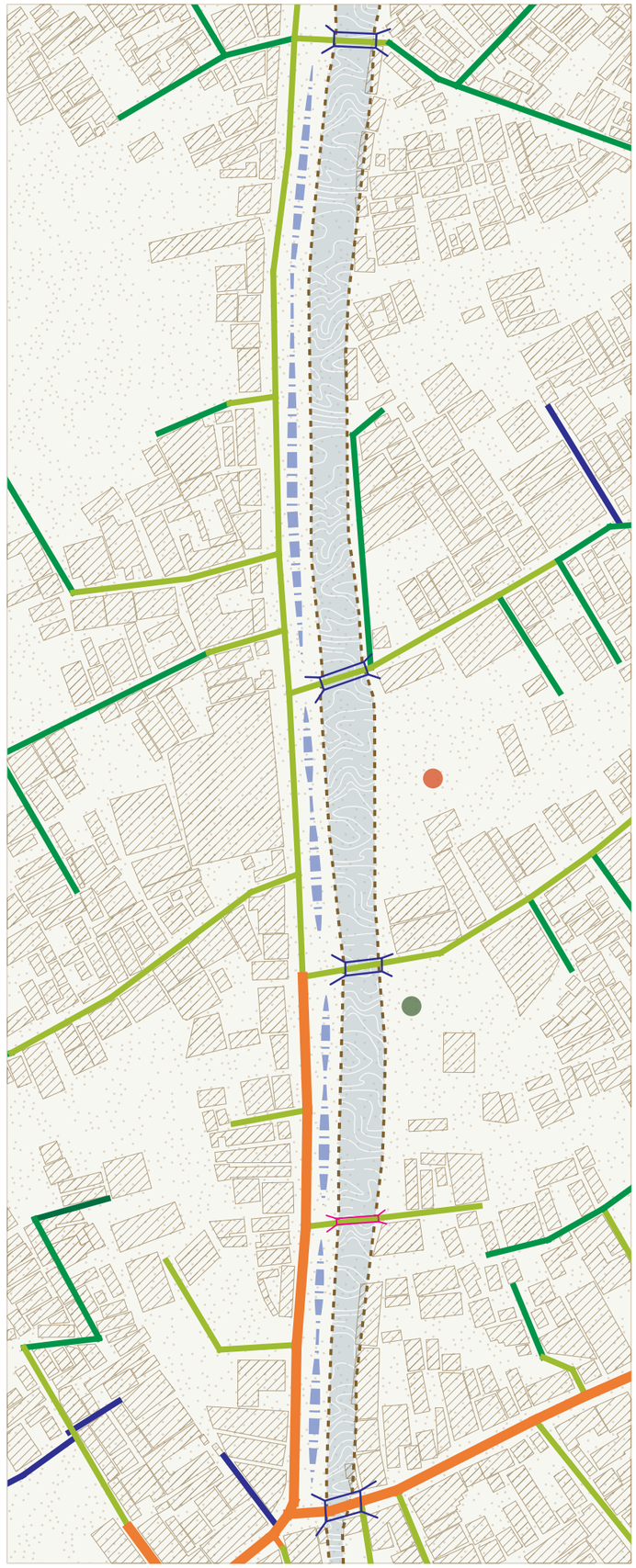
Without informal network (Left)

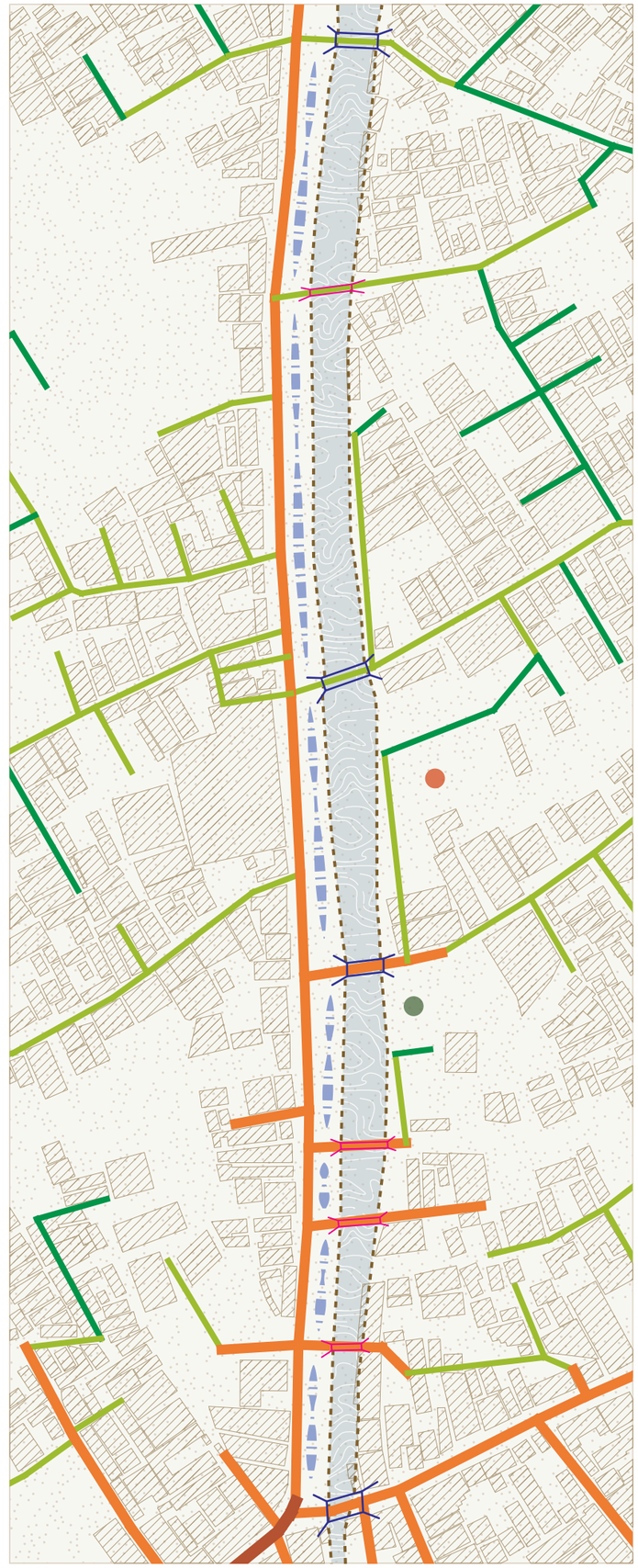
- 5235 - 9050
- 9050 - 12246
- 12246 - 15261
- 15261 - 18729
- 18729 - 23549

With informal network (Right)

- 9050 - 12246
- 12246 - 15261
- 15261 - 18729
- 18729 - 23549
- 23549 - 38637
- Structure
- Water
- Canal boundary

0 25 50 m





Angular Integration Analysis
2000 m walking distance

A spatial analysis of the mobility network (Angular Integration of 2 km) was conducted with and without informal mobility routes. The results showed a significant impact when the new informal routes were included, increasing integration along Trimohoni Road, which aligns with the high concentration of vendors and pedestrian activity in the area.

***Fig 46**: (Left) Analysis without informal network*
***Fig 47**: (right) Analysis with informal network*

Attraction reach analysis

500m walking distance
(Structure to canal)

- Playground (informal)
- Rob's garden
- Informal bridge
- Formal bridge
- Street vendors

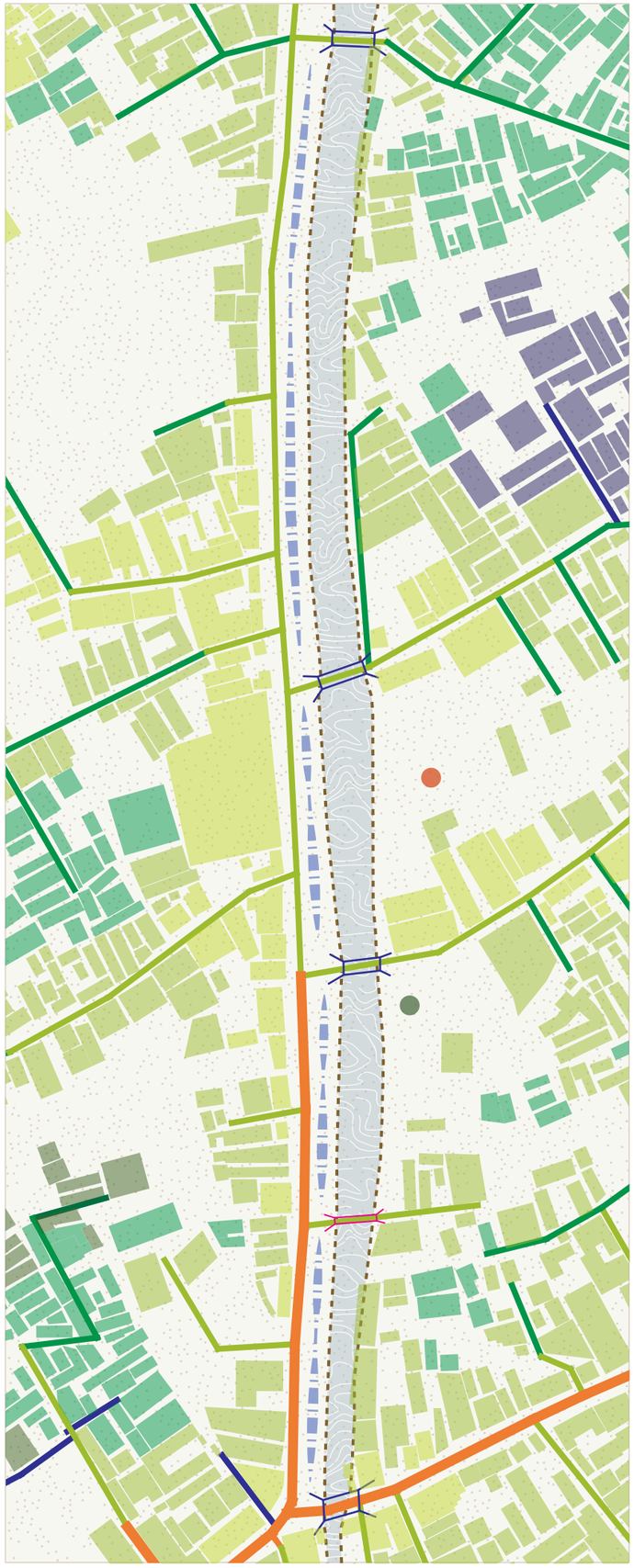
Without informal network (Left)

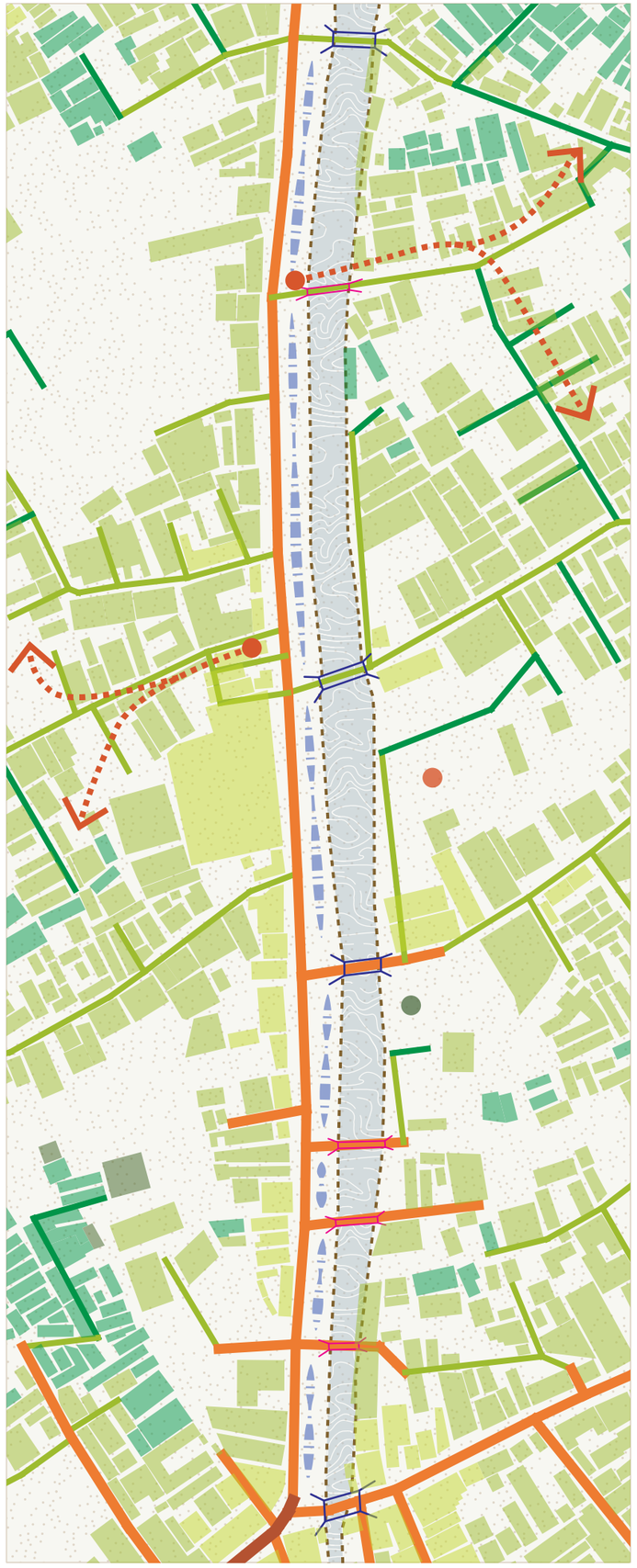
- 0 - 0.53
- 0.53 - 1.68
- 1.68 - 3.3
- 3.3 - 5.31
- 5.31 - 7.84

With informal network (Right)

- 0.57 - 1.84
- 1.84 - 3.57
- 3.57 - 5.69
- 5.69 - 8.3
- Water
- Canal boundary

0 25 50 m





Attraction Reach Analysis

Canal to Structure (500m)

A spatial analysis of accessibility to ecological features revealed that informal mobility plays a key role in enhancing access to green spaces. The study mapped housing clusters as origins, Jirani canal as destinations, and the street with informal mobility network as the connection layer. The findings confirmed that residents had greater access to ecological services when informal paths were included in the analysis.

***Fig 48**: (Left) Analysis without informal network*
***Fig 49**: (right) Analysis with informal*

4.4 : **Local economy and food security**

The spatial analysis of Dhaka's urban network, conducted at both global and local scales, positions Nandi Para as a highly integrated node, suggesting its growing commercial and logistical relevance within the expanding eastern fringe of the city. Nandipara Bazaar serves as a key commercial center for both the local neighborhood and surrounding peripheral areas. Within the 500-meter study radius, a diverse range of economic activities was observed, notably street vending, formal and informal markets, and small-scale urban agriculture, each contributing to the area's food security and livelihood strategies.

Street vending is an integral part of Dhaka's urban economy, largely driven by regional migration and limited formal employment opportunities. A study found that around 300,000 street vendors live and work in Dhaka (Islam 2005; Siddiqui et al. 2010). Benjamin Etzold's (2015) research on street vendors in Dhaka estimates that 97,000 vendors sell prepared food items, supporting around 425,000 people (2.9% of the city's population). Etzold (2015) notes that informal power structures extract an estimated 49 million USD annually from vendors through unofficial agreements allowing the use of public land, revealing a deeply entrenched system of negotiated illegality.

Despite their economic contributions, street vendors face constant threats of eviction, harassment, and environmental challenges such as extreme weather, pollution, and unsafe working conditions. Their absence from official maps underscores a broader institutional failure to recognize their legitimacy, thereby facilitating their displacement. During the workshop, both static and temporary vending activities were mapped (see Fig. 53), static vendors occupied building facades, while temporary vendors clustered along the canal buffer zones, revealing a layered spatial economy that remains largely invisible in formal planning narratives.

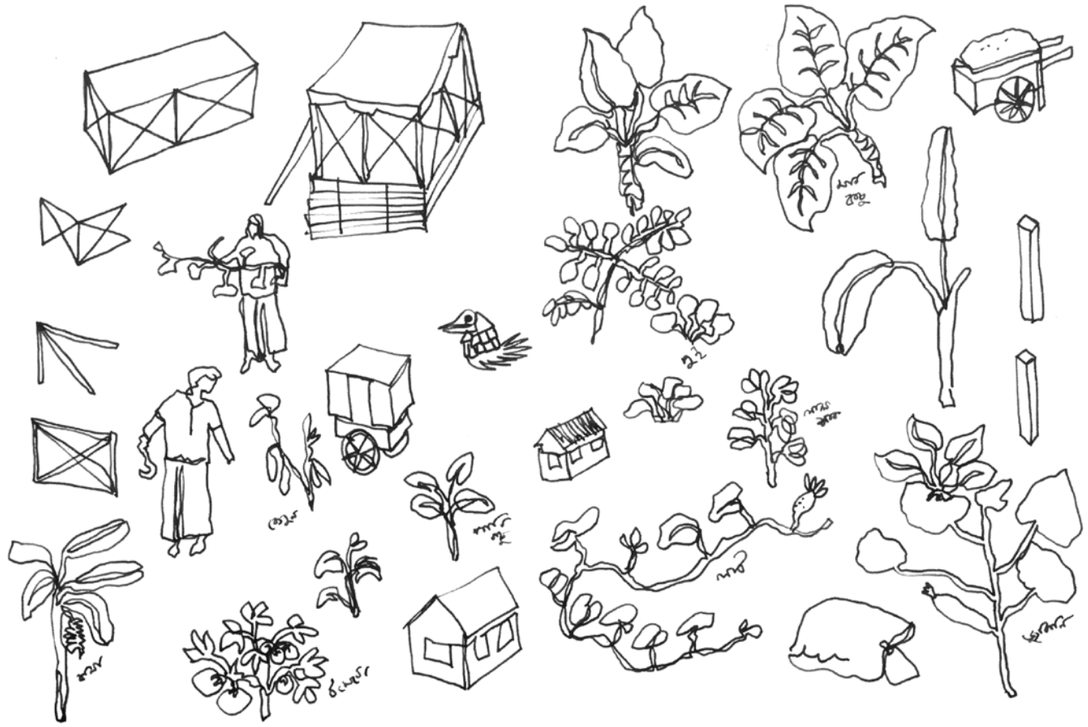


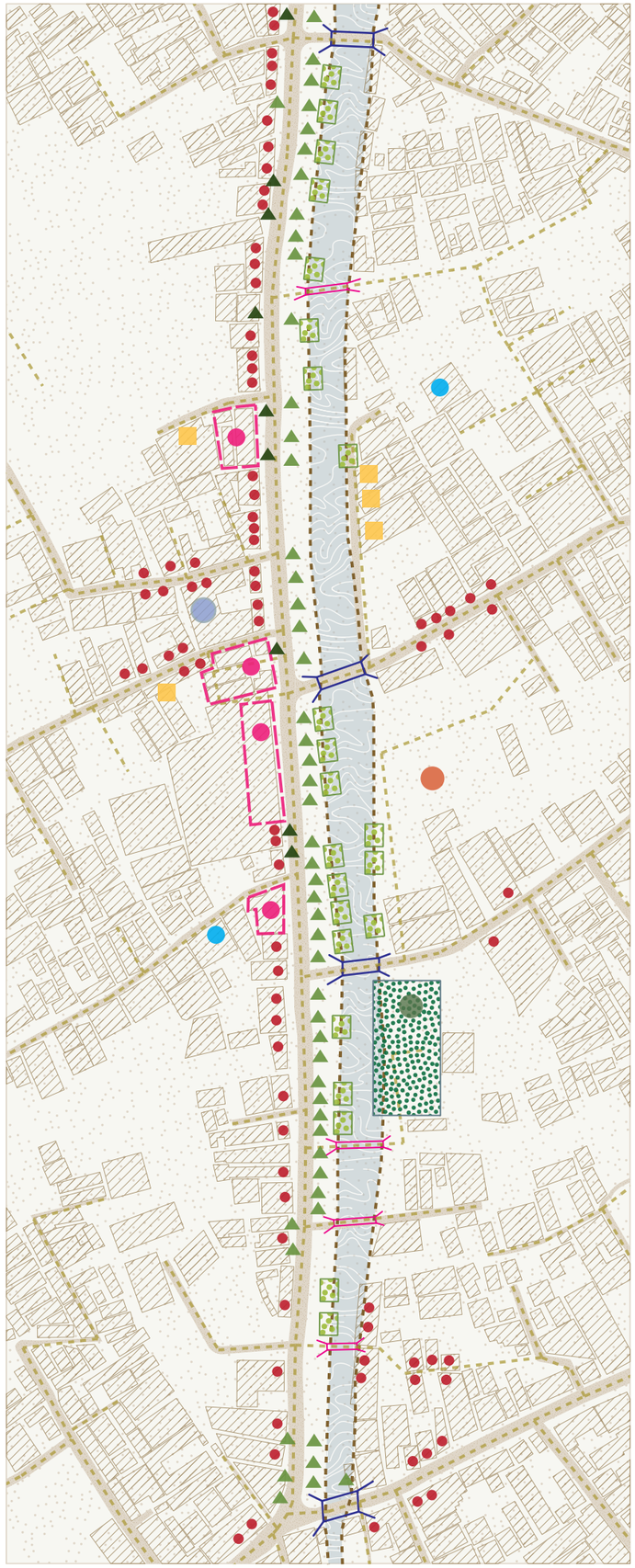
***Fig 50**: Observational sketches of agricultural activities*

***Fig 51**: In the early morning, a local vendor carefully unpacks fresh vegetables, arranging them for display at his shop. His stall, like many others, is set up on a three-wheeled rickshaw, allowing for quick mobility if needed.*

***Fig 52**: Nearby, a fruit seller arranges his goods, showcasing pineapples in an inviting display. His stall, too, is on a rickshaw, enabling him to relocate swiftly in case of an eviction sweep by authorities.*

Map of economic activity

- Large Agricultural plot
- Vegetable beds
- Markets/Cluster shops
- Street vendor (temporary)
- Street vendors (static)
- Garage/ Godown
- Individual shops
- Factory
- Baby School
- Playground (informal)
- Rob's garden
- Informal bridge
- Formal bridge
- Road center line
- Road
- Structure
- Water
- Canal boundary



Food security

A significant portion of the mapped street vending activity in Nandipara was directly or indirectly connected to food (see Fig.51,52,54). Vendors offered a wide variety of items, including street foods, tea, snacks, fruits, vegetables, fish, dry goods, spices, and cooked meals such as lunch plates. A notable intersection emerged between street vending and urban agriculture. One vendor, a local resident, cultivated vegetables on a plot of land east of the study area and sold the produce on the street. In other instances, vendors engaged in small-scale farming along the canal banks, growing vegetables on raised beds located adjacent to their vending stalls. Abdul Rob, another local resident, maintained a garden by the canal that supported his household needs while also generating surplus produce for sale. These practices not only contributed to food security but also fostered greater environmental awareness, as vendors showed increased care in managing waste around their cultivation areas.

***Fig 53**: (left) Map of economic activity*
***Fig 54**: (right) A temporary food vendor at Nandipara*

Chapter V :

Future Imaginaries

***Fig 55**: Local effort to add a bit greenery in a dense urban street in Dhaka*

Movik et al. (2021) assert that maps are often read simultaneously as both “background documents” and “future visions.” This dual function of mapping is particularly relevant in contexts of urban transformation, where the line between representation and projection becomes blurred. Dovey and Ristic (2017) further explore this relationship, asking how mapping can open up “the urban imagination: the space of possibility.” They argue that while planning and design traditionally focus on the possible city, mapping, too, has the power to disclose and unfold latent potentials, aligning with DeLanda’s (2011) notion of the “space of possibilities.”

Annette M. Kim’s (2015) research in Ho Chi Minh City, a Southeast Asian megacity facing challenges similar to Dhaka, reveals how dominant future visions often erase informal populations such as migrant street vendors. Her findings demonstrate how the future visions produced by private real estate developers and urban design firms strategically depopulate urban areas, thereby legitimizing future plans that exclude marginalized groups. The absence of these populations from visualizations not only reinforces exclusionary planning logics but also facilitates their physical removal from city space. A similar phenomenon is observable in Dhaka’s formal future imaginaries (see Fig. 56).

When these lived realities are ignored, the resulting projects frequently face implementation failures or post-construction contestation. For example, walking paths conflict with informal street vending, and public parks are now enclosed by high metal fences (see Fig. 57) to control access and separate intended uses. In some cases, imported ornamental flora like Delonix regia (krisnochura) are planted in place of native vegetation. These trees, not suited to the local ecology, are prone to collapse during seasonal storms, leading to casualties and further undermining resilience (see Fig. 58).

One key tension lies in the mismatch between the rapid, adaptive growth of informal urbanism and the slower, often rigid frameworks of formal planning. Formal systems, constrained by bureaucratic apathy and a lack of participatory mechanisms, struggle to respond to the dynamic needs of growing urban populations. In contrast, local actors, through street vending, informal housing, or spontaneous placemaking, shape urban futures through continuous negotiation and adaptation. These informal strategies, while rarely acknowledged in institutional frameworks, are deeply embedded in the lived experiences of residents and constitute a powerful mode of urban production.

This chapter explores how mapping practices can bridge these divergent futures. It asks: In what ways does mapping lived realities contribute to more inclusive urban transitions in Nandipara? and How can participatory mapping serve as a tool for co-producing knowledge and shaping alternative urban imaginaries? By testing these future imaginaries against the mapped findings, this section evaluates the extent to which mapping can inform more adaptive, inclusive, and context-aware approaches to urban development.

***Fig 56**: Turning Dholaikhal reservoir into a park, a urban redevelopemnt project by DSCC, Source: the daily star*

***Fig 57**: Children play cricket on a Hazaribagh road in Dhaka recently as a nearby playground has been kept closed for years. Photograph: Sourav Lasker, NewAge*

***Fig 58**: People walk past trees brought down by Cyclone Sitrang, Dhaka, Bangladesh. Photograph: Monirul Alam/EPA*

Lessons from Children's Maps

During a participatory workshop with students from Baby School in Nandipara, the exercise initially focused on tracing their daily journeys to school. However, the activity quickly evolved into a more imaginative process. Children began drawing what they envisioned as an ideal future for their neighborhood. Across their drawings, recurring themes emerged: green landscapes, fish and birds, clean water, open play areas, gardens, agriculture, and social infrastructure such as pedestrian walkways, shops, and libraries.

Although the drawings were simple in technique, they conveyed a nuanced awareness of the relationship between ecology, social life, and the urban environment. The maps expressed a desire for a city that not only accommodates but nurtures everyday life. These visions were later digitized and integrated into the GIS base to spatially situate the suggestions and better understand the children's spatial logic. Many of their propositions went beyond existing structures, advocating for integrated social-ecological imaginaries.

The spontaneity of form, expressive symbolism, and clarity of values in the children's maps offer compelling insights into the kinds of futures younger residents imagine, and deserve. Their voices illustrate the value of broadening the scope of urban design participation to include younger generations, whose imaginaries are rooted in empathy, curiosity, and collective well-being.

***Fig 59**: Children maps form the workshop*

Children wish map

- a big bridge
- a garden plot
- a house
- a shop
- a swing
- another shop
- baby school
- bees
- big tree
- bird
- birds
- tree
- vegetable garden
- boat
- bot tola
- boy
- bridge
- butterfly
- court
- cycle path
- dragon fly
- fence
- fish
- fishing
- water lily
- weekly market
- flag
- flower
- flower garden
- garden plot
- girls play area
- grass
- grass
- boundary
- hammock
- house
- kans grass
- walking path
- our library
- our playground
- paddy field
- play ground
- restaurant
- rickshaw
- school gate
- small grass
- street light
- swing
- toy shop

***Fig 60**: GIS mapping of childrens speculative future imaginaries*

Abdul Rob: Cultivating Resilience in a Changing Urban Landscape

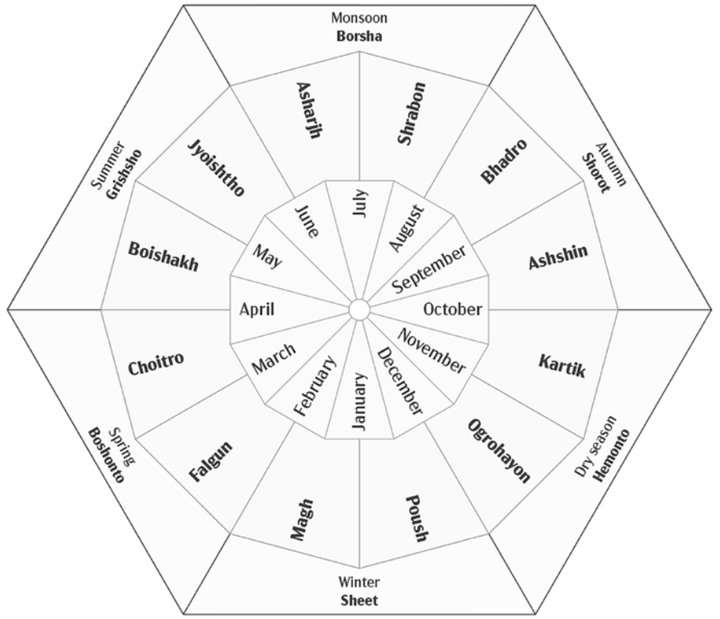
In the heart of Nandipara's transitional urban fabric lies a modest agricultural plot, cultivated for over 30 years by Abdul Rob, a regional migrant from southern Bangladesh. Rob does not own the land but has maintained it through an informal agreement with the landowner. His farming methods reflect a deep adaptation to both ecological and infrastructural challenges. Despite proximity to the polluted Jirani Canal, Rob continues to grow vegetables year-round, selecting crops resilient to waterlogging during monsoon months.

Rob's plot exemplifies polyculture farming: raised beds, small ponds for irrigation, and basic drainage systems protect the crops from neighboring wastewater discharge. His practices align with seasonal rhythms based on the Bengali calendar (see Fig. 62) and demonstrate a hybrid logic of indigenous knowledge, ecological sensitivity, and practical urban adaptation.

Importantly, his plot also functions as a social node. Neighbors gather here to collect vegetables and exchange news. Rob's stall bridges urban agriculture and informal economy, linking food security to place-based identity. Yet, current plans to formalize the canal's edge (see Fig. 63) threaten to sever his plot's access to the water and disrupt its ecosystem.

This raises a critical speculative question: what if Rob's garden were recognized, protected, and reimagined not as leftover land, but as a future commons? Could it become a space for seed exchange, learning, and ecological stewardship? As with the name Jirani, which means "to rest", Rob's garden suggests a pause from rapid development to consider slow, locally rooted urban futures.

Fig 61: *Rob working at his garden*



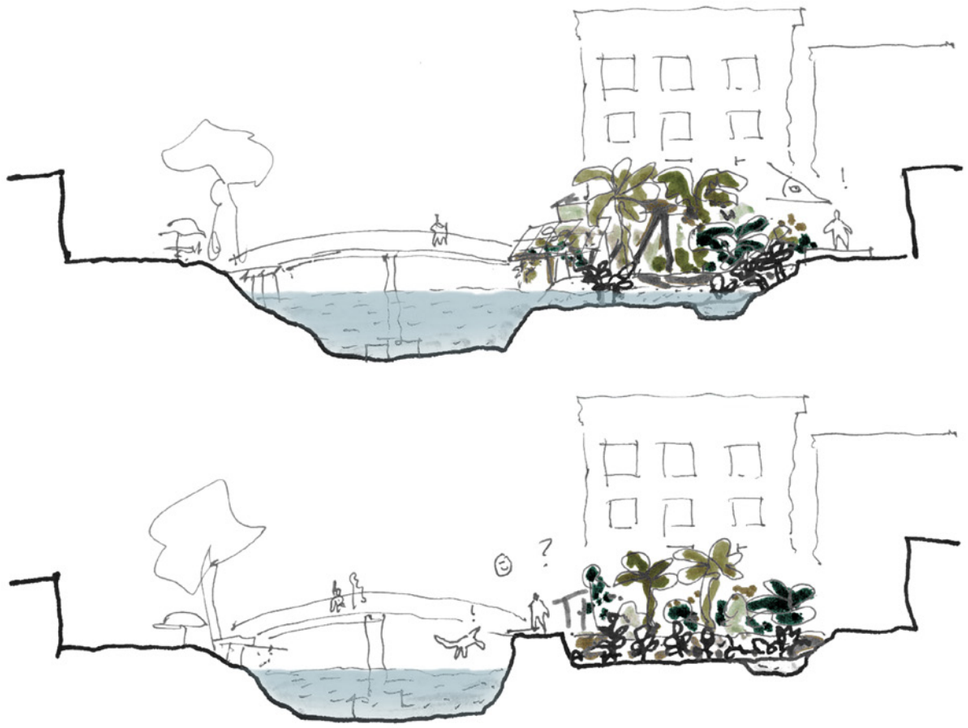


Fig 62: *Bengali Calander*
Fig 63: *Study of Robs garden with and without a formal walkway by the canal.*

Fig 64: *Mapping Robs Garden as a future commons*

AI and future imagination

As part of the speculative mapping process, this thesis examines the potential of AI-generated imagery, using tools such as ChatGPT and SORA, to visualize local spatial conditions in Nandipara. These experiments focus on often overlooked yet vital public spaces: an informal playground on landfill, adaptive stilt housing, and banyan trees serving as communal gathering points. These spaces are not merely functional; they are culturally embedded and socially significant nodes within the neighborhood.

While AI offers new possibilities for visual storytelling, it also introduces ethical and practical constraints. Platform guidelines restrict depictions of vulnerable populations, and generated visuals tend to produce sanitized, idealized representations. Even when employing fictional prompts and reference images, the outputs often simplify complexity, obscuring informal or adaptive qualities.

In this research, AI-generated visuals are not presented as design solutions but as speculative provocations; tools to test whether visual storytelling can foster deeper dialogue around lived experiences. The images provoke critical questions: How might futures be imagined from the ground up? Can speculative visuals catalyze community reflection or amplify otherwise invisible urban narratives? To generate these prompts, research findings were integrated into the script, proposing transformations of Nandipara's built environment. However, the resulting images appear overly polished, failing to capture the layered dynamics of the context. Furthermore, their static nature conveys an aesthetic bias aligned with mainstream design norms, contradicting the adaptive, fluid realities evident in the community-made maps, particularly those created by children, which are more open to interpretation, dynamic, and non-conclusive.

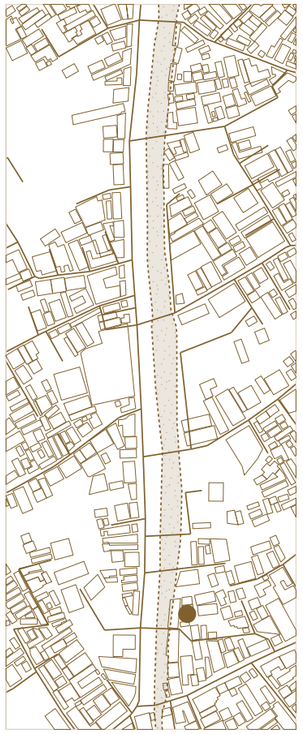
Moving forward, it would be valuable to explore participatory image-making with the community, replacing refined renderings with co-created, grounded visions of the future. While AI-generated images remain a powerful tool for visual narration, a critical examination of these place-based representations can help redefine whose imagination shapes the future city.

AI prompt test example: The left side of the canal features a **locally made** modern looking grid three story wooden multistory house, with colorful **local signs and billboards in Bengali** outside, the canal side has **long circulation veranda** with **vertical wooden support on the facade**, people standing inside of the house and talking in **local dress**, building material has **wood, tin, colorful fabric**, plants in the long veranda and walk way, inside there's **shop or small business**, the house stands on **locally made round thin red concrete posts**, veranda wooden supports come down on thin round red cement posts. **clean water and water plants under the house**. The canal is slightly wider, with clean water, **water lilies floating**, and small birds flying around. On the right side, there's a **small red paved walking path** by the canal, and after that a pitch road for cars, **two auto rickshaws** standing by the pitch road, with **small local businesses**, **hawkers under colorful umbrellas**, and **informal stalls by the canal. Along the canal's edge**, there are **small-scale farming patches** supported by **bamboo scaffolding.** One thin but tall **Alstonia Scholars tree** by the sidewalk on the right side, people with children walking on the walkway in a relaxed mood, sitting on benches by the canal. After the wooden house on the horizon, there's a **small concrete bridge** over the canal. It's an afternoon scene with bright sunlight and a soft breeze. Follow the **reference picture** for the camera angle.

***Fig 65**: Testing AI prompts*

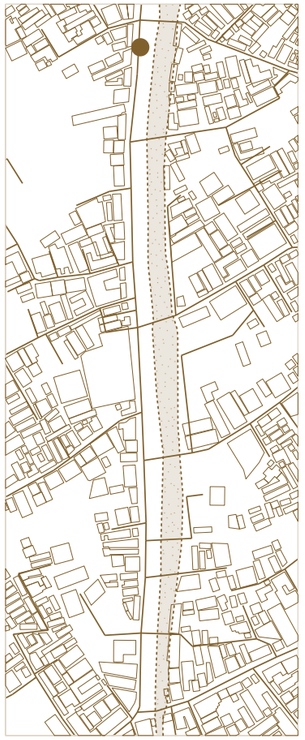
The Stilt Houses

A long-standing tradition in low-lying canal-side areas, stilt houses are still seen today in self-built homes and markets. These adaptive structures respond to monsoon floods and allow for easy dismantling and relocation. Letting seasonal water flow into these low-lying zones also supports the recharge of the city's aquifer layers. The image explores how this building type could be reimagined for sustainable use in Nandipara's context.



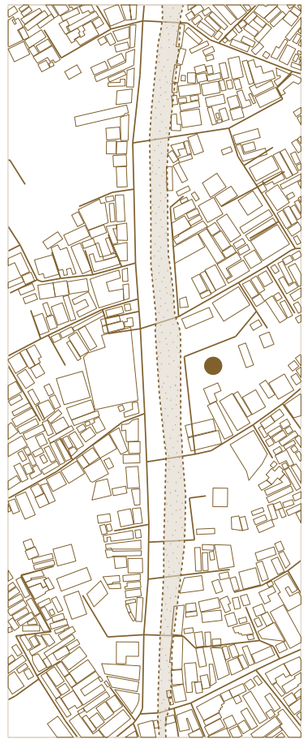
Boro-Bot Tola: A Living Landmark

An old banyan tree by the canal, long recognized as a local gathering spot. Surrounded by morning markets, a mender's shop, and a tempo stand, it remains central to daily life. Once part of a pair, only the "big" banyan tree remains. The image explores how this space could be enhanced through placemaking to become a more vibrant local destination.



Playground on a Landfill

The only identified play space in the area, an informal playground on a former landfill. Despite uneven ground and waste, local children gather here daily, sharing the limited space. AI visuals explore how small, thoughtful changes could make it safer and more joyful for young users.



Chapter VI :

Discussion

***Fig 66**: The name of the canal "Jirani", meaning "to rest" in Bengali, offers a timely reminder: perhaps what is most urgently needed is the space and intention to let nature pause, regenerate, and thrive within the urban fabric.*

This thesis adopts a critical lens on urban mapping practices to examine the limitations of conventional approaches in capturing the 'lived realities' and adaptive strategies shaping transitional urban areas such as Nandipara, Dhaka. Through this perspective, a critical mapping framework was developed to explore often-overlooked dimensions of urban life, informal ecologies, mobility networks, economic activities, and community-managed spaces, while also testing speculative future imaginaries derived from these findings.

The thesis juxtaposes official maps with community-informed mappings, and formal urban visions with speculative imaginaries rooted in lived experience. This comparison highlights the gaps between institutional representations and on-the-ground realities. Building on these results, this chapter reflects on the challenges and limitations of mapping in such contested contexts and revisits the central objectives of the study. In doing so, it opens space for further questions and considerations for future research and practice.

Limitations of Mapping and Ways Forward

This research highlights a significant gap in Dhaka's urban planning discourse: the absence of grounded, critical mapping practices that adequately capture the lived realities and adaptive strategies of residents in transitional areas like Nandipara. Despite the limited time and scope of this study, the adoption of a critical and participatory mapping framework made it possible to document spatial features often excluded from official maps.

While mapping lived realities and developing speculative future imaginaries, the research not only produced spatial representations but also posed reflexive questions, such as "What happens because of the map?", an inquiry often absent in official planning documents. The questions asked during mapping directly influenced the outcomes, whether through participatory workshops or GIS-based analyses. In this way, the critical mapping framework enabled a more deliberate and reflexive positioning of the researcher as an engaged actor within the urban transformation process.

The participatory engagements, whether with children, local residents, or planning professionals, extended beyond data collection. They became social encounters that fostered a collective sense of place and shared ownership. Informal moments such as story-sharing, exchanging snacks, and crafting wristbands underscored what Isabelle Stengers (2004) refers to as "accentuating our own rather frightening particularity among the people of the world with whom we have to compromise." In a planning context shaped by colonial legacies, hierarchical bureaucracy, and limited citizen participation, such critical mapping practices do more than generate data. They create platforms for shared learning, foster community solidarity, and open up space for imagining alternative, more inclusive urban futures.

***Fig 67**: Playful workshop session with children at Dhaka*

What Works in Lived Realities, and What Doesn't

The research discussed 'lived realities' in connection with the aspects of invisibility, features, spaces, and practices that are often excluded from official planning frameworks. The mapping outcomes presented here do not claim to be exhaustive or representative of all realities in Nandipara. Rather, they offer a situated perspective, shaped through site visits, participatory workshops with residents and planning professionals, and the embodied field experience of the researcher.

A key insight is that Nandipara functions effectively in meeting community needs, despite its informal, organically developed character. Spaces such as the canal buffer, landfill-turned-playgrounds, informal routes, local landmarks like Boro Bot Tola, canal-side farms, and Rob's garden reflect vibrant and diverse urban life. Ecological observations, including birds, amphibians, and small mammals, point to the resilience and richness of this urban ecosystem. Likewise, flood-adaptive typologies like stilt houses offer vernacular responses to climate change and seasonal shifts.

However, challenges persist. Discussions during the research identified core issues such as inadequate waste management, water and air pollution, unregulated development, and a lack of climate-sensitive planning. This is where mapping can play a strategic role. Critical and participatory GIS methodologies provide tools to integrate locally rooted adaptive practices into broader urban governance frameworks.

For instance, speculative imaginaries generated in this research open up discussions on how neglected spaces might be leveraged for ecological resilience. Technological leapfrogging could be explored in areas like Rob's garden or canal-side farming to promote ecosystem services. A locally adapted Payment for Ecosystem Services (PES) model might incentivize residents to maintain green infrastructure, providing modest financial support or policy incentives such as tax relief or development flexibility. By recognizing small, self-managed green plots as essential socio-ecological infrastructure, these models could support biodiversity, cultural continuity, and urban wellbeing. In this way, mapping becomes more than a representational tool, it serves as a step toward community-informed urban futures.

Understanding Informal Morphological Logic

This thesis embraces the notion that informality is not a deficit or absence, but a legitimate mode of urban production. As outlined in the introduction, the aim is not to resolve the binary between formal and informal urbanism but to explore how informal spatial practices, often rendered invisible in official maps, constitute valid forms of urban knowledge and agency. Through the use of 'non-discursive' tools such as space syntax, the thesis applies a neutral and analytic lens to understand the underlying morphological logic of informally developed areas like Nandipara.

From an ecological standpoint, spatial analysis highlights the Jirani Canal as a potential ecological corridor that could enhance nature accessibility, not only for Nandipara's residents but for the broader eastern part of Dhaka. In terms of mobility, the mapping reveals that self-organized informal paths and makeshift bridge connections significantly influence everyday movement, providing direct access to the formal road network. When informal routes are integrated into the spatial model, Trimohoni Road becomes more central in the analysis, reinforcing its status as a commercial corridor and explaining the high concentration of street vendors along the canal. Conversely, the lower level of spatial integration on the canal's eastern edge appears to support a more stable habitat for non-human actors, including birds and small mammals.

These findings raise critical questions about the municipality's canal redevelopment plans, particularly the use of hard retaining walls and paved walkways on both banks, which may threaten existing ecological and spatial dynamics.

Importantly, the process of mapping itself, especially through participatory GIS and space syntax workshops with planning professionals, fostered a space for collaborative reflection and critical dialogue. This hybrid methodology offered an evidence-based approach to understanding informal spatial logic and presented new opportunities to communicate findings with formal institutions such as municipalities, landowners, and developers. However, the process also revealed practical challenges: data collection design, data representation, access to updated base maps, coordination of participants, and the technical complexity of spatial analysis software, which open up further opportunities for research and methodological refinement.

Participatory mapping framework

This thesis proposes a participatory mapping framework developed through direct engagement with a range of local stakeholders. Drawing on the earlier discussion in Chapter 1, which highlights both the limitations of Dhaka's institutional support for participatory practices and the need for transparency regarding whose voices are being represented, the framework was tested through collaborations with urban professionals, children, and local residents.

The inclusion of these multiple perspectives enabled a multi-scalar reading of Nandipara's urban condition. Children's maps, while simple in form, were powerful in content, highlighted what mattered most to them. Mapping with farmers, such as Abdul Rob, introduced vital ecological and seasonal knowledge tied to local food systems, risk mitigation strategies, and climate-responsive spatial practices. Planning professionals brought another layer of analysis by engaging in participatory GIS sessions, enabling dialogue between lived experience and spatial data.

Importantly, the maps produced are open-ended rather than definitive. They invite iteration, expansion, and dialogue with formal institutions rather than serving as static outcomes Given the growing interest in participatory approaches in Dhaka, especially under pressure from international donor agencies, the mapping framework developed in this research offers a structure that can be refined and applied in future participatory planning efforts.

Visioning a more circular, ecological, and inclusive Nandipara

The findings of this thesis emphasize that inclusive urban futures in Nandipara cannot emerge from formal planning logics alone. Instead, a more circular, ecological, and inclusive vision for Nandipara must recognize the value embedded in informal adaptation, vernacular ecological knowledge, and bottom-up spatial practices.

Integrating local-led practices into urban planning does not require replicating Northern models but rather leapfrogging them, as argued earlier through the lens of adaptive PES schemes. Circularity here also refers to social and economic loops, ensuring that value circulates within the community through shared access to open space, safe mobility networks, and care infrastructures.

Ecological inclusion, meanwhile, means acknowledging non-human actors, such as birds and amphibians, in planning dialogues, and recognizing the canal as both an ecological corridor and a cultural space. By centering these plural relationships, the mapping framework and future imaginaries explored in this thesis open up possibilities for a different kind of urban transition, one that resists extractive logics and instead fosters regeneration, equity, and co-creation in Dhaka's evolving urban periphery.

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Appendix

List of workshop participants
Dhaka, February 2025

Team o1	Team o2	Team o3	Team o4
Topic 01: **Ecology and ecosystem services**	Topic 02: **Open space and meeting places**	Topic 03: **Formal and Informal circulation**	Topic 04: **Local economy and food security**
1. Canal 2. Trees and plants 3. Water retention area 4. Birds, animals and other non-human actors	1. Open field 2. Vacant plot 3. Cultural space 4. Public buildings 5. Play area	1. Makeshift bridge 2. Informal circulation 3. A punch in a wall 4. Pass through private property	1. Local vendors 2. Agriculture 3. Livestock farm 4. Markets
1. Sumaiya Tasnim Prottasha 2. Fadia Binte Shahidullah 3. Md Tauhid	1. Simita Roy 2. Fouzia Masud Mouri 3. Nayna Tabassum	1. Md Tariquzzaman 2. Dr. Maher Niger 3. Md. Muktadir Rahman	1. Nayeem Bin Abedin 2. Fahmida Nusrat 3. Yeafi Ahmed

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MAPPING INVISIBLE NARRATIVES FOR FUTURE IMAGINARIES
- in Nandipara, Dhaka and beyond

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Master's Thesis 2025