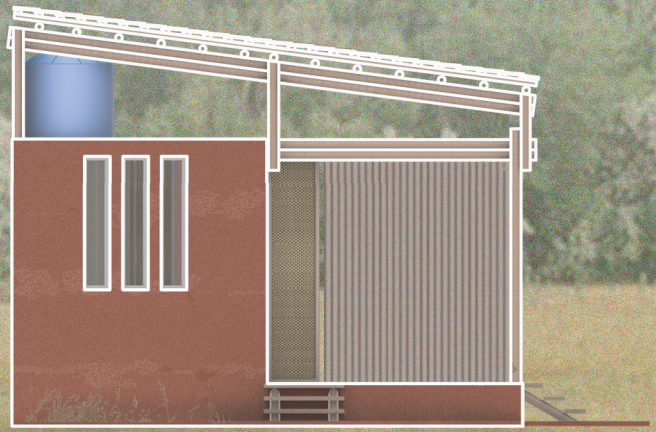
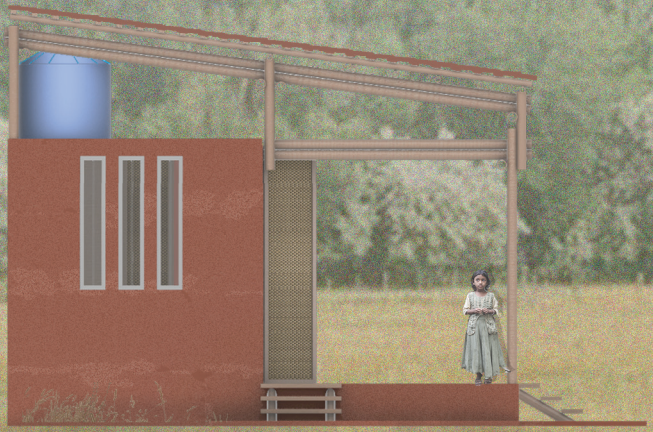


Half Pucca

Danai Makri



Half Pucca

Temporary to permanent.
Housing for internally displaced communities in Bangladesh

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Graduation Report
MSc3/4 GRADUATION STUDIO (AR3AD105)
Architecture of Transition in the Bangladesh Delta
2024/2025

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Motivation

My interest in housing began during my previous education, where I came to see it as far more than just a basic need. Housing carries deep societal and emotional significance, yet it often remains overlooked in favor of more high-profile, public projects—a perspective I've never quite understood. When it was time to write my motivation letter for my application to TU, I knew with certainty that I wanted to focus on housing for my graduation project.

After attending all the studio presentations, it quickly became clear that Global Housing was the perfect fit. This studio shifted the focus from the West to the urgent challenges and opportunities in the Global South, especially in Bangladesh. As a country experiencing rapid changes due to its deltaic geography, Bangladesh provides valuable lessons on how architecture can engage with issues like housing, climate resilience, and equity.

I chose the Global Housing Studio because I believe housing is a basic human right. I am also very concerned about the increasing effects of climate change, particularly in vulnerable areas of the Global South. This studio offered a unique chance to explore innovative, context-specific solutions to these interconnected issues, focusing on creating fair and climate-resilient housing for the most at-risk communities.

CONTENTS


SIC CABLES

INTRODUCTION

Bangladesh is one of the most climate-vulnerable countries in the world due to its low-lying geography. Three major rivers—the Ganges, Brahmaputra, and Meghna—flow through the country, forming a vast and fertile delta before emptying into the Bay of Bengal to the south. This riverine landscape makes Bangladesh highly susceptible to flooding and erosion. The country experiences a tropical monsoon climate, marked by hot, humid summers and heavy seasonal rainfall, which further influences its vulnerability to climate change and natural disasters.

The Global Housing Graduation Studio centers around the theme of architecture in transition, focusing on Sylhet, a rapidly growing second-tier city in northeastern Bangladesh. Sylhet and its surrounding region face numerous challenges related to industrial growth, internal migration, and the impacts of climate change. Through the studio, we explored the broader context of the Sylhet Division, with particular attention to its material culture, urbanization patterns, housing practices, and evolving spatial demands.

Most importantly, it challenges the prevailing policy approach of providing temporary shelters as a solution for climate-displaced populations. Instead, it advocates for a shift toward more permanent, resilient housing solutions that offer long-term security and adaptability for vulnerable communities.

To develop the design, the first part of this report presents the research and problem statement. This includes an investigation into climate-related challenges in Bangladesh, migration patterns—especially climate displacement—and an ethnographic study of living conditions in Shonatola village. Additionally, it incorporates design research conducted as part of the studio, focusing on Belapur Housing in Navi Mumbai, India, and the Kazedewan apartment building in Dhaka, Bangladesh.

The second part of the report presents an urban vision, developed and implemented in response to the findings. Each critical aspect of the vision is examined in detail across individual chapters. The final design proposal is then explained across all architectural scales, from the urban level to detailed building components.

RESEARCH PLAN

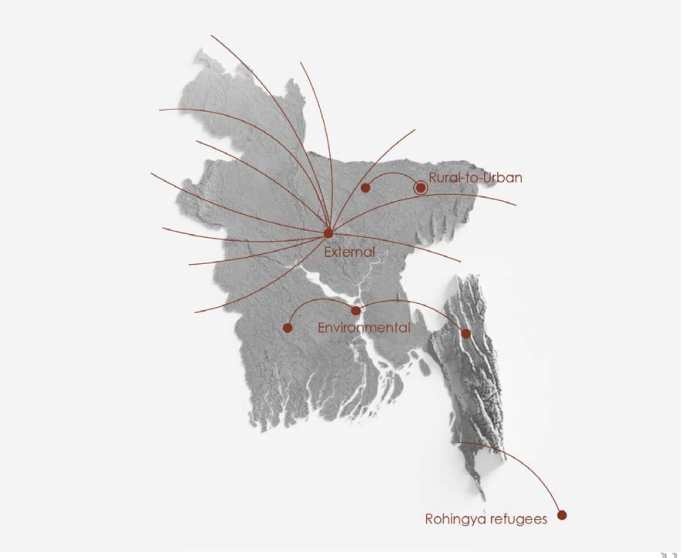
Bangladesh is widely recognized as one of the most climate-vulnerable countries in the world, facing severe and ongoing threats from rising sea levels and other climate-related hazards. The country's landscape is shaped by the vast Ganges-Brahmaputra-Meghna river system, which empties into the Bay of Bengal. Due to its low-lying topography, Bangladesh is exceptionally prone to flooding and other natural disasters (Van Lohuizen, 2021).

As sea levels rise and climate-related disasters such as cyclones, floods, and river erosion become more frequent, increasing numbers of people are being forced to abandon their homes—particularly along the coast—and move in search of safety, shelter, and livelihood. This has resulted in large-scale internal displacement, often toward urban centers or more elevated regions inland. The strain of these migrations is felt not only by those displaced, but also by the communities receiving them, as existing infrastructure, housing, and job markets struggle to keep pace.

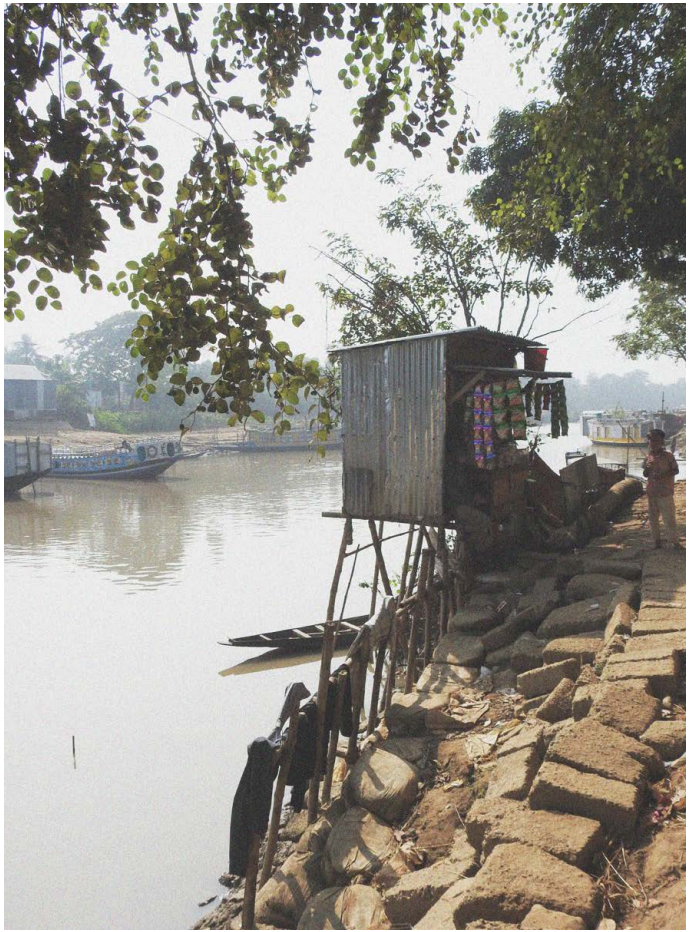
In rural and urban areas alike, these ecological pressures intensify existing socioeconomic issues such as poverty, unemployment, and housing shortages (Ministry of Disaster Management and Relief et al., 2021).

The Sylhet region, located in northeastern Bangladesh, presents a particularly complex case. While it is geographically removed from the coastal zones, Sylhet has experienced increasingly devastating flooding in recent years. One major contributing factor is the degradation of haors—natural wetland ecosystems that historically acted as buffers for excess rainwater. Infrastructure development across these wetlands has disrupted water flow and diminished their flood-absorbing capacity. In addition, Sylhet is heavily impacted by upstream rainfall from neighboring Indian states like Meghalaya and Assam. Combined with river siltation caused by deforestation and pollution, these factors have led to dangerous swelling of rivers. The result has been severe flooding, such as the 1,500 mm of rainfall recorded in June 2022—nearly twice the average for that month—which inundated vast areas of the region (Zahid, n.d.; Rafiqul Islam Montu, 2022; NRC, n.d.).

In response to these urgent challenges, the government of



Bangladesh introduced the National Strategy on Internal Displacement Management in 2021. The strategy focuses on prevention, protection, and durable solutions for those displaced by disasters and climate change. Its long-term vision is to create a "safe, climate-resilient, and prosperous Delta" by 2100. However, despite these policy efforts, the scale and complexity of the displacement crisis demand immediate, sustainable housing solutions that go beyond temporary relief (Ministry of Disaster Management and Relief et al., 2021).

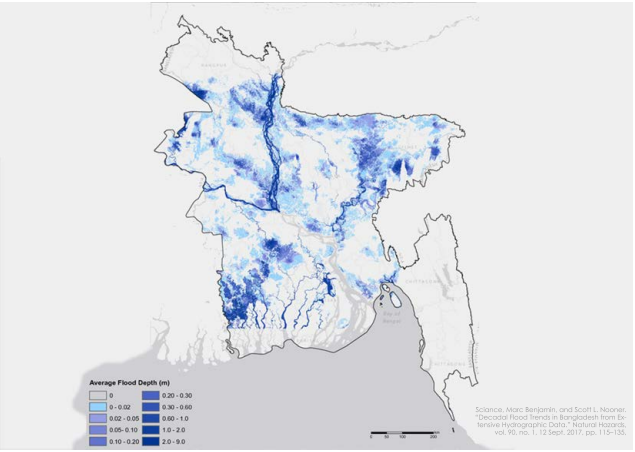


Literature Review

Climate challenges

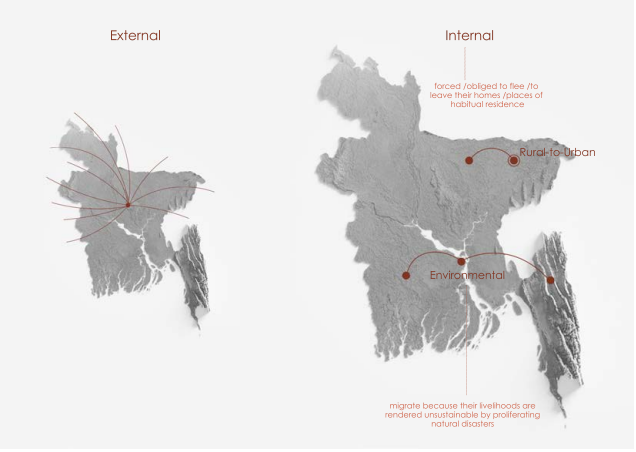
The most vulnerable areas in Bangladesh lie along the coasts and within river delta zones, where livelihoods are deeply tied to agriculture and fishing. These areas are already experiencing severe impacts from climate change. According to Displacement Solutions (2012), 24 out of Bangladesh's 64 districts are currently facing significant levels of climate-induced displacement.

Sea level rise is a particularly pressing threat. It is rising faster in some parts of Bangladesh than the global average—at rates between 3.1 mm and 4.5 mm per year (Molla, 2024). By 2050, sea levels could rise by up to 0.30 meters, displacing an estimated 900,000 people (Emmaüs International, 2023). Looking further ahead, a one-meter rise in sea level could submerge 17.5% of the country's land, with catastrophic consequences for both the economy and the population (Sarwar, 2005).



Displacement

Bangladesh is also one of the world's largest sources of migration. Over 7.4 million Bangladeshis live abroad, and the country ranks sixth globally for international migrant-sending (Wikipedia contributors, 2025). However, internal migration is three times larger than international migration (Dynamics of Internal Migration in Bangladesh, n.d.).

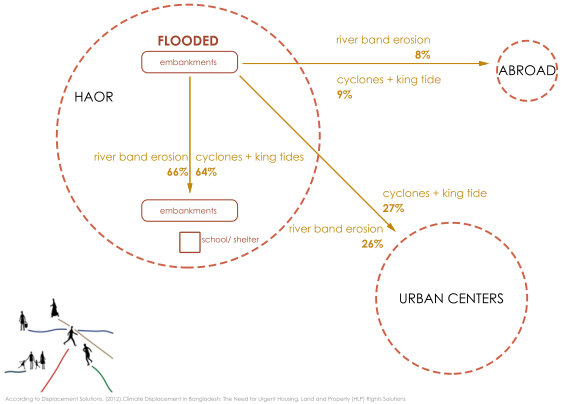


Between 2008 and 2014, natural disasters displaced 4.7 million people within the country (Van Lohuizen, 2021). These displacements often affect the poorest and most marginalized populations, who lack the resources to move long distances or adapt to new environments. Projections suggest that 13 to 18 million people may be displaced by climate change by 2050, with 17,000 to 22,000 km² of land at risk of submersion.

Coastal Bangladesh alone has seen 236 sub-districts impacted by tidal floods and saline intrusion. Repeated exposure to cyclones and high tides has destroyed homes and farmland, displacing around 2.46 million people, with 64% relocated locally and 27% moving to other regions such as Dhaka. The remainder—about 9%—have crossed international borders (Displacement Solutions, 2012).

Inland, 179 sub-districts face annual riverbank erosion and flash floods. Over 1.45 million people have lost homes and land, with most displaced locally. A smaller number have relocated domestically or internationally.

Interestingly, most climate-displaced individuals in Bangladesh prefer to remain near their place of origin if basic needs—like secure housing, land rights, and livelihood op-

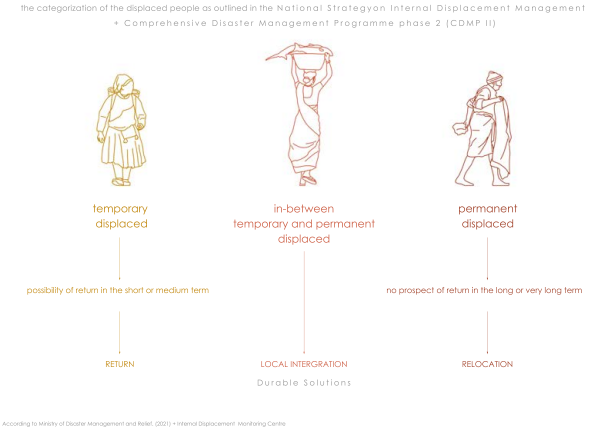


portunities—can be met.
According to the Internal Displacement Monitoring Centre (IDMC), internally displaced persons (IDPs) are those who are:
"...forced or obliged to flee or leave their homes or places of habitual residence without crossing an internationally recognized state border." (Ackethoft, 2008)

Within this broad category, environmentally displaced persons form a significant and growing subgroup. Recognizing both temporary and permanent displacement is vital to developing nuanced policies and protection strategies. Yet, establishing clear, universally accepted definitions has proven difficult.
To improve data accuracy and policy planning, the Association for Climate Refugees (ACR) conducted division-level workshops across Bangladesh in 2010. Additionally, a 2014 baseline survey by the Comprehensive Disaster Management Programme examined the effects of environmental hazards—floods, erosion, salinity, and waterlogging—in nine districts.
The survey categorized displaced households into three main groups based on the nature and duration of their displacement. The temporarily displaced are those who were forced to leave their homes during environmental disasters—such as floods or cyclones—but typically return within six months once conditions improve. These individuals often seek refuge with relatives, on higher ground, or in makeshift shelters during the crisis period.
The second group falls into an in-between category, consisting of households that have been displaced repeatedly but have not yet established a permanent residence elsewhere. These families often move to adjacent areas, only to face recurring displacement due to repeated exposure to hazards, making their living situation highly unstable.
The third group comprises the permanently displaced, who have relocated to distant areas that are presumed to be safer and less exposed to future environmental threats. These households are considered unlikely to face further displacement and are attempting to rebuild their lives in their new settlements.
The findings from the survey were stark. Approximately 46% of respondents had experienced temporary displacement, while 29% fell into the in-between category. Around 12%

According to Ministry of Disaster Management and Relief. (2021). National Strategy on Internal Displacement Management

reported having been permanently displaced. Alarmingly, only 13% of surveyed households in environmentally vulnerable districts had never been displaced. This indicates that over 85% of the population in these areas has faced some form of climate-induced displacement—highlighting an urgent need for durable, long-term housing and policy solutions.



Bangladesh's traditional architecture

The traditional architecture of Bangladesh is a reflection of centuries of cultural adaptation to the country's environment, climate, and social structures. In rural areas, homes built from mud walls and bamboo are a familiar sight—structures that are not only economical and locally sourced but also remarkably effective in responding to the tropical heat. These materials provide natural insulation, keeping homes cooler in the scorching summers. Built with the rhythm of nature in mind, such homes often sit on raised plinths, a practical response to the frequent floods that sweep through much of the country.

Roof styles are another distinctive feature of vernacular Bangladeshi architecture. Designs like the gable-shaped "dochala" or the hipped "chochala" roofs are crafted to withstand the deluge of monsoon rains, channeling water away efficiently. Open spaces such as verandahs and internal courtyards serve not just as climate buffers by allowing ventilation but also as social spaces—places where families gather, meals are shared, and daily life unfolds in

the open air. These features are more than architectural—they are cultural, supporting communal lifestyles and intergenerational living. (Vernacular Architecture of Bangladesh, 2020; Wind, Water, and Clay: The Architecture of Bangladesh, n.d.)

Yet, despite the ingenuity of these traditional forms, many of these structures today are fragile and deteriorating. In fact, over 85% of rural homes are considered inadequate or deficient, made from impermanent materials that offer little resistance against the escalating threats of climate change. A significant portion—about 42%—is kutcha houses with walls and roofs made of tin or corrugated iron sheets. Another 34% are even more vulnerable, constructed from straw, wood, and jute stalks—materials that simply can't withstand strong winds or flooding. Among the poorest, many live in jhupries—makeshift shelters cobbled together from polythene, sacks, and straw. These homes offer scant protection from the elements, leaving residents exposed and at risk. (Khare, 2016)

Compounding the vulnerability of rural housing is the unequal distribution of land. Many families own only tiny plots—sometimes not enough to build on, or certainly not enough to invest in long-lasting improvements. This land scarcity traps people in cycles of poverty and limits their options for better housing. (Hossain et al., 2023)

Sanitation and clean water access remain major challenges as well. Many rural households still rely on kutcha latrines, basic toilets that often lack proper slabs and sanitation infrastructure. During the rainy season, when floods are common, these facilities frequently overflow or break down, contributing to the spread of waterborne diseases. Drinking water—typically sourced from tube wells—can also become contaminated during floods, further endangering health and well-being. (Hossain et al., 2023)

For many families, these conditions are unbearable. Without safe housing, clean water, or secure land, rural life becomes increasingly untenable. As a result, a growing number of people are leaving their villages behind, migrating toward urban centers in search of better opportunities and more secure living conditions. But the cities are struggling to absorb them. Urban infrastructure is under immense pressure, and many migrants end up in overcrowded informal settlements or slums, facing a new set of challenges while still lacking the stability they seek.

In this context, housing is not just about shelter—it's about dignity, health, opportunity, and resilience. And it's increasingly clear that without addressing the rural housing crisis, the pressures of urban migration will only intensify.

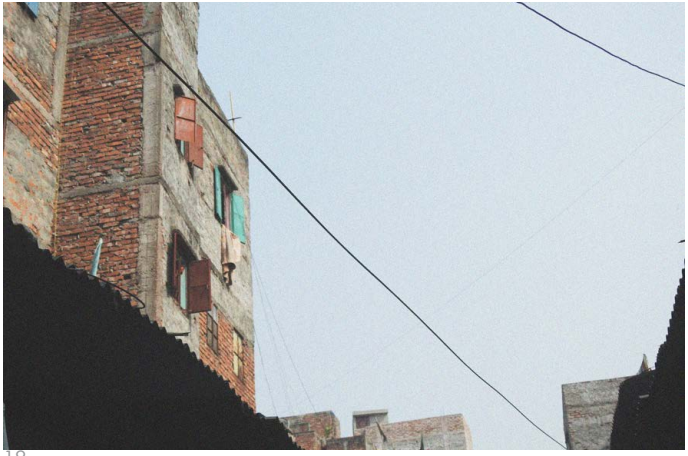
Current policies for housing the displaced communities

As the number of climate-displaced individuals continues to grow, the Bangladeshi government has recognized the urgent need for systematic and humane responses. One of its core strategies has been to improve data collection on displacement, allowing for better tracking of affected populations and a clearer understanding of their evolving needs during recovery.

One major initiative has been the allocation of khas land—unused government-owned land—for resettling displaced communities. This program aims to provide secure land tenure to families who have lost everything to floods, cyclones, or erosion and who might otherwise continue to face repeated cycles of displacement. By offering stable plots of land, particularly in flood-prone or cyclone-affected areas, the government hopes to give families a chance to rebuild without the looming threat of losing their homes again.

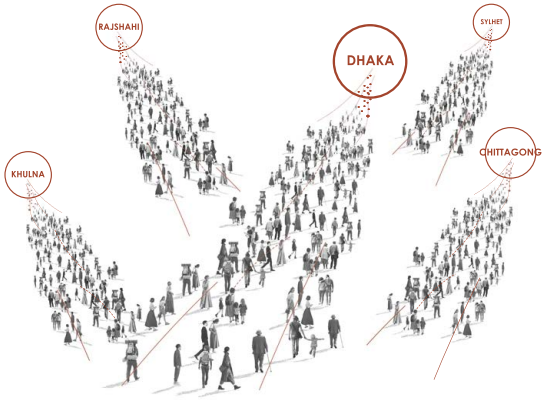
Alongside land distribution, the government has made disaster-resilient housing a policy priority. These new homes are designed with the climate in mind—built on raised plinths, using durable materials that can withstand extreme weather. They represent not just shelter, but safety, dignity, and a future less vulnerable to catastrophe.

In the aftermath of disasters, emergency responses begin with organizations like Habitat for Humanity Bangladesh, which provide shelter kits for affected families. Once the immediate crisis passes, transitional housing steps in—offering more stability until permanent solutions are in place. One particularly impactful initiative has been the construction of



multipurpose cyclone shelters along the coast. These buildings serve a dual purpose: in times of danger, they provide safe refuge for both people and livestock; during calmer days, they function as community schools, anchoring daily life and education in some of the country's most vulnerable areas.

As part of its broader climate adaptation strategy, Bangladesh has set six national goals aimed at building a more resilient society. These goals, outlined in the National Adaptation Plan (NAP), emphasize not just protection from future displacement, but also long-term rehabilitation. Recognizing that cities like Dhaka are already overcrowded and overstressed, the government is also developing migration strategies that encourage relocation to secondary cities and peri-urban centers, distributing population pressure more evenly across the country.




Protection against
climate change variability


Develop climate-resilient agriculture


Develop climate-smart cities


Promote nature-based solutions


Integrationof adaptation
into the planning process


Ensure transformative
capacity building

At the heart of these efforts is a holistic program known as the Resettlement and Livelihood Solution Program. This initiative doesn't stop at moving people into new homes. It addresses the full spectrum of human needs—physical, economic, social, and environmental. New housing and infrastructure are accompanied by the careful relocation of personal belongings and assets. To help people rebuild their lives economically, the program offers job training, microfinance, and small business support.

But recovery is not just about buildings and income—it's also about rebuilding communities and futures. That's why the program includes access to education, healthcare, and social services, helping families reintegrate and thrive.

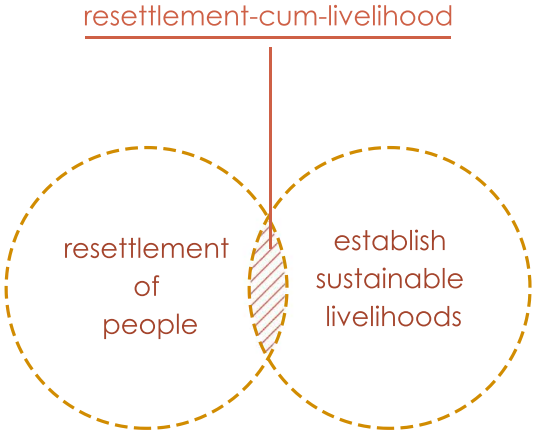
Environmental sustainability is also a core focus: families are provided with land for agriculture and secure access to natural resources like clean water and forest products—essential tools for rebuilding self-reliant lives.

Together, these initiatives represent a significant step toward a future where climate displacement does not mean the end of stability, identity, or opportunity—but the beginning of something more secure, resilient, and hopeful.

Despite these well-intentioned policies and programs, the reality on the ground remains deeply challenging. The scale of displacement is vast, and the availability of land is limited. Cities are already overcrowded, and many displaced people end up in precarious conditions, far from the promised support. Implementation gaps persist, and only a fraction of affected families have benefited from pilot projects, such as those initiated in the Chittagong district.

This research seeks to explore those pilot initiatives further, along with a closer examination of the duration and conditions of emergency and transitional shelters. Critical questions remain unanswered: How long are families allowed to stay in these shelters? What happens when temporary displacement turns permanent? Do communities remain together or become fragmented during the relocation process?

To understand the full picture, this study will turn to government records, local case studies, and most importantly, the lived experiences of displaced people themselves. Only by listening to these voices can we begin to envision a truly inclusive and sustainable future for Bangladesh's climate-displaced communities.



According to NHA - National Healthcareer Association

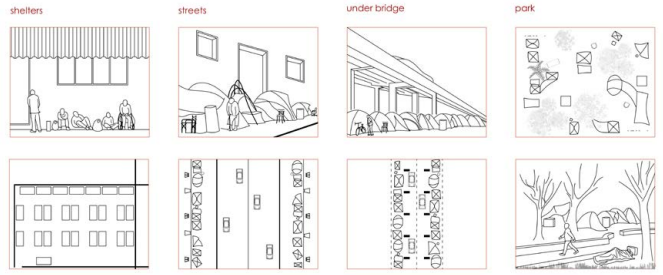
Problem Statement

Bangladesh is grappling with a deepening and complex housing crisis—one that has been made far worse by the escalating impacts of climate change, particularly in its rural and coastal regions. Over the decades, the country has made remarkable progress, rising from the ashes of war in the 1970s to become one of South Asia's most resilient economies. Yet, fragile infrastructure, political uncertainty, and the country's unique hydro-geographic vulnerabilities have created a perfect storm—especially for those living in areas most exposed to flooding, river erosion, and cyclones. The architectural traditions that once helped communities adapt to climate extremes are now struggling to keep pace with the scale and frequency of environmental shocks. (Ashraf, 2016)

At the heart of this crisis lies a rising tide of internal displacement. Families are being forced to move—not just once, but repeatedly—as climate-related disasters erode homes, farmland, and entire ways of life. These displaced populations are not monolithic. They fall into three broad categories: those temporarily displaced, those in a transitional "in-between" state, and those who are permanently displaced. Each group faces distinct challenges, and each requires tailored responses involving return, local integration, or long-term resettlement solutions.

Among these, the transitional group is especially vulnerable. These are families who cannot return to their homes but also lack the resources to relocate permanently to safer ground. Trapped in uncertainty, they face the ongoing risk of being uprooted again and again, often with little support or security. This precarious state of limbo makes them highly susceptible to poverty, exploitation, and further displacement. (Ministry of Disaster Management and Relief et al., 2021)

Bangladesh's Disaster Management Act (DMA) has laid the groundwork for emergency response—focusing primarily on shelter and relief immediately after disasters. But its scope is limited. It lacks a comprehensive strategy for managing the different stages of displacement, especially the long-term challenges faced by people who don't fit neatly into short-term recovery frameworks. Effective shelter management must go beyond just providing a roof—it must ensure food, healthcare, education, and protection for vulnerable groups, including women, children, the elderly, and the disabled. (Zahid, n.d.)

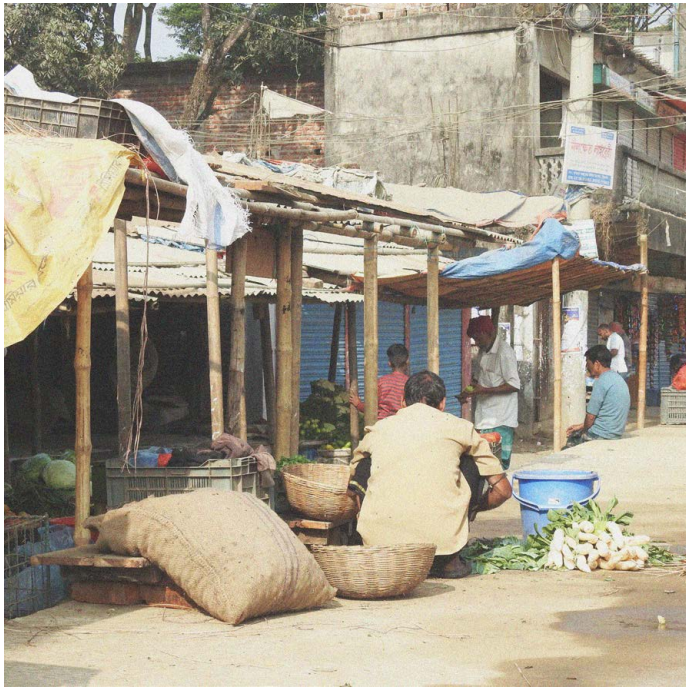


For most displaced families, the loss goes far beyond housing. Many rely on agriculture to survive, so when disaster strikes, they lose not only their homes but also their land, livestock, and primary sources of income. Transitional housing, therefore, cannot be treated as just a temporary fix. It must respect and preserve social ties, cultural identity, and community structures—all of which are central to how Bangladeshis live and rebuild. It must also acknowledge the reality that what begins as "temporary" often becomes long-term or even permanent. (Displacement Solutions, 2012)

As disasters become more frequent, temporary shelters are being stretched to their limits. Recovery is slow—often taking years—and as new disasters strike, fresh waves of displaced families arrive before the previous ones have even left. This constant churn creates immense strain on shelter systems and deepens the trauma and instability that communities already face. Without a shift toward resilient, semi-permanent transitional housing, many of these families will remain in a state of prolonged displacement, caught in a cycle they cannot escape.

What's missing from today's conversation is a long-term vision: one that balances the urgency of immediate shelter with the stability of permanent housing, livelihoods, and community rebuilding. A vision that takes seriously the reality that climate displacement in Bangladesh is not a one-time emergency—it's a recurring crisis that demands sustainable, context-specific, and rights-based solutions.

Despite the clear and growing threat, there remains a significant gap in institutional and policy responses, both nationally and globally. While climate change continues to displace tens of thousands across the country, there are still far too few comprehensive plans that address housing, land rights, and long-term property security for those affected. Without urgent, coordinated efforts to close these gaps, Bangladesh's displaced communities will continue to face uncertainty, instability, and exclusion from the country's development journey.



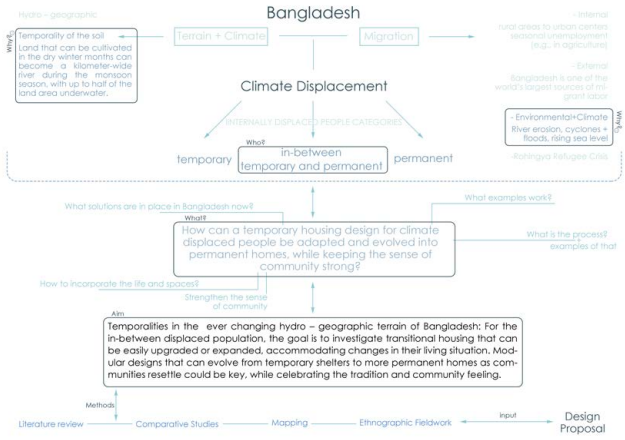
Theoritical framework

The theoretical framework for this research is based on the concept of climate vulnerability and its implications for displaced communities in Bangladesh. It is critical to recognize the unique challenges presented by Bangladesh's low-lying deltaic geography and socioeconomic conditions, both of which increase the country's vulnerability to climate hazards. As communities face repeated displacement, understanding and addressing their vulnerabilities becomes critical for developing effective response strategies that address all of their needs, from immediate shelter to long-term.

The Ministry of Disaster Management and Relief's categorization of displaced people into three major groups: temporary, transitional, and permanent, will be used throughout the research since each category has unique requirements. Temporary displacement frequently necessitates immediate humanitarian assistance and shelter, whereas transitional displacement necessitates interim solutions that provide stability while families wait to return home or settle elsewhere. However, permanent displacement necessitates resettlement strategies that promote long-term integration into new communities. Temporality is used as a central factor, addressing the fluid and uncertain nature of displacement as well as the soil itself.

Participatory planning will be an important tool for developing effective solutions for displaced communities. Community participation in planning ensures that Bangladeshi communities' distinct social networks are preserved, even in resettlement settings. Local engagement fosters a sense of ownership and empowers communities to express their specific needs, which is critical for long-term housing solutions and the preservation of cultural and social cohesion.

Given that temporary shelters frequently become long-term homes, this research will emphasize the value of incremental and adaptable design. Transitional housing must be adaptable, both for current residents and future displaced populations. Given that repeated displacement frequently results in overlapping waves of people in need of shelter, housing solutions must be both scalable and sustainable. Modular, expandable housing can evolve over time to meet the needs of a growing population, preventing temporary solutions from degrading into poor living conditions.



Research question(s)

Even though there are a lot to be said about the displaced people due to climate disasters, there is not enough discussion about what happens to the sense of community when many individuals and families relocate in different areas. Then there is the question of the plain numbers of it all, both for temporality and for moving to completely different places as the ones they originated. The majority of the displaced individuals are originated from rural areas, by the water. The temporary shelters are in embankments close by some times but the relocation areas more often than not are further away, to other villages for example. And in some cases, people need to move into an urban center to be able to find work after their livelihoods are destroyed.

How can a temporary housing design for climate displaced people be adapted and evolved into permanent homes, while keeping the sense of community strong?

-How to address spatially the privacy and safety challenges faced by people living in temporary shelters?

-How can these solutions be protected from floods?

-How to strengthen the sense of community and belonging?

-How to incorporate the life and spaces the displaced people used to have in the new ecosystem they relocated in?

-What will the process from temporary to permanent be?

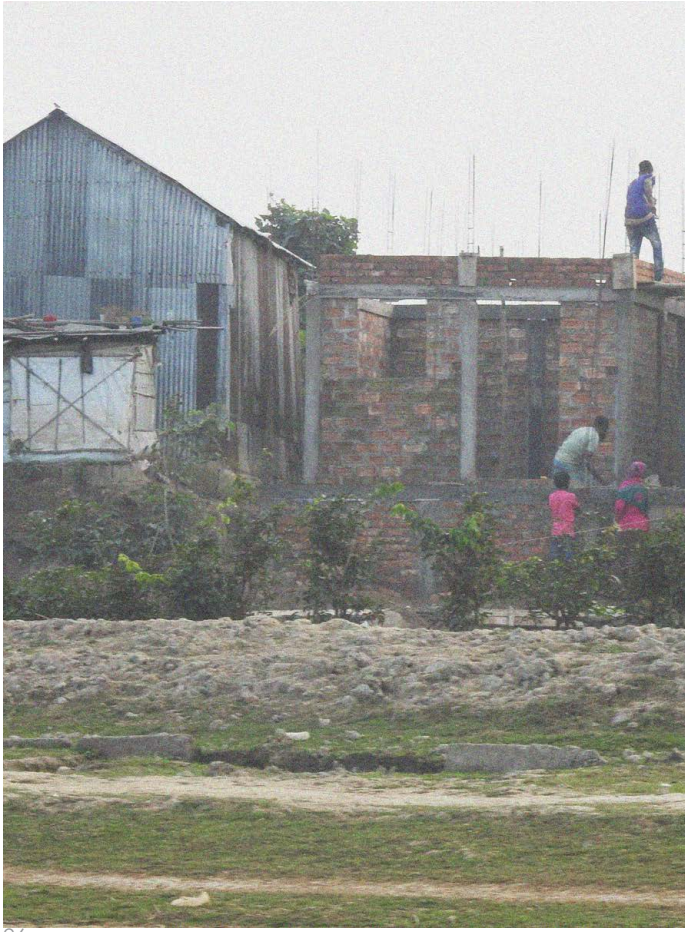
Design Hypothesis

Hypothetically, at the end of this research the design outcome will be a modular, adaptable housing model that utilizes and reinvents traditional architectural features—such as raised foundations for flood protection, open verandas, and communal spaces—and more importantly, can facilitate a seamless transition from temporary to permanent housing for climate-displaced people in Bangladesh. By integrating participatory planning and adaptable layouts, this design approach will support the preservation of social ties, address privacy and safety concerns, and strengthen the resilience and cultural continuity of displaced communities.

Core Aspects of the Hypothesis

- Adaptability and Modularity
- Flood-Resilient Foundations
- Community-Centric Spaces
- Local Materials and Traditional Forms
- Participatory and Flexible Planning

The design should be adaptable enough to provide both short-term shelter and a longer-term home, giving individuals a sense of agency in a disruptive situation. This hypothesis proposes that such a design approach will create housing that is more than just a shelter—it will foster stability and community cohesion, ultimately helping displaced families transition more easily from temporary to permanent living arrangements if needed.



Goal/ Aim

The primary goal of this study is to develop a housing design specifically for people who are neither fully temporarily nor permanently displaced—individuals caught in a "in-between" situation. The goal is to create a structure that can serve as a temporary shelter while also transitioning into a permanent home if necessary. This design seeks to balance the urgent need for temporary housing with the long-term requirements of stability, cultural preservation, and social cohesion.

A key aim is to understand how these transitional housing units can adapt to Bangladesh's unique, dynamic hydro-geographic landscape, where flooding and erosion influence both where and how people live. The design aims to respect cultural norms while providing adaptability and security against climate impacts by analyzing how traditional Bangladeshi homes naturally blend indoor and outdoor spaces, emphasizing thresholds for privacy and communal interaction. This housing model will prioritize privacy, adaptability, and communal cohesion, providing residents with a sense of continuity and belonging even in a displaced environment.

Different places but similar routine.

Methods

How to address spatially the privacy and safety challenges faced by people living in temporary shelters?
Methods: Literature, interviews, case studies focused on thresholds, refugee camps
Outcomes: Diagrams, collages, Catalog of existing strategies (successful vs. unsuccessful)

-How can these solutions be protected from floods?
Methods: Literature, Case studies focuse on flood resistant strategies, policies in place
Outcomes: Diagrams, pictures, plans

-How to strengthen the sense of community and belonging?
Methods: Literature, interviews, site visit, Case focused on community and participatory design
Outcomes: Diagrams, images, plans, collages

-How to incorporate the life and spaces the displaced people used to have in the new ecosystem they relocated in?
Methods: interviews, site visit, mapping, workshops with locals
Outcomes: Diagrams, pictures, collages, a catalog of existing shelters in the Sylhet region

-What will the process from temporary to permanent be?
Methods: Case studies of temporary projects that became permanent, literature
Outcomes: Diagrams, timetable, collages

Research Scheme

WHY?

The design will address the urgent need for adaptable, stable housing that preserves cultural values and supports social ties. Specifically, it will account for Bangladesh's unique, flood-prone landscape by using elements of traditional architecture, such as adaptable indoor-outdoor spaces and privacy-focused layouts, to ensure cultural continuity, security, and resilience.

WHAT?

Research Aim

The main goal is to create a flexible housing model for people in "in-between" displacement, offering both temporary shelter and a potential long-term home.

Sub - Aim	Sub - Aim	Sub - Aim	Sub - Aim	Sub - Aim
provide security to the vulnerable groups	adapt to the hydro-geographic landscape	enhance community cohesion, helping residents maintain a sense of belonging despite displacement	make the transition from rural areas to more urban, less strange	providing residents with a sense of continuity and belonging even in a displaced environment

WHAT?

Research Question

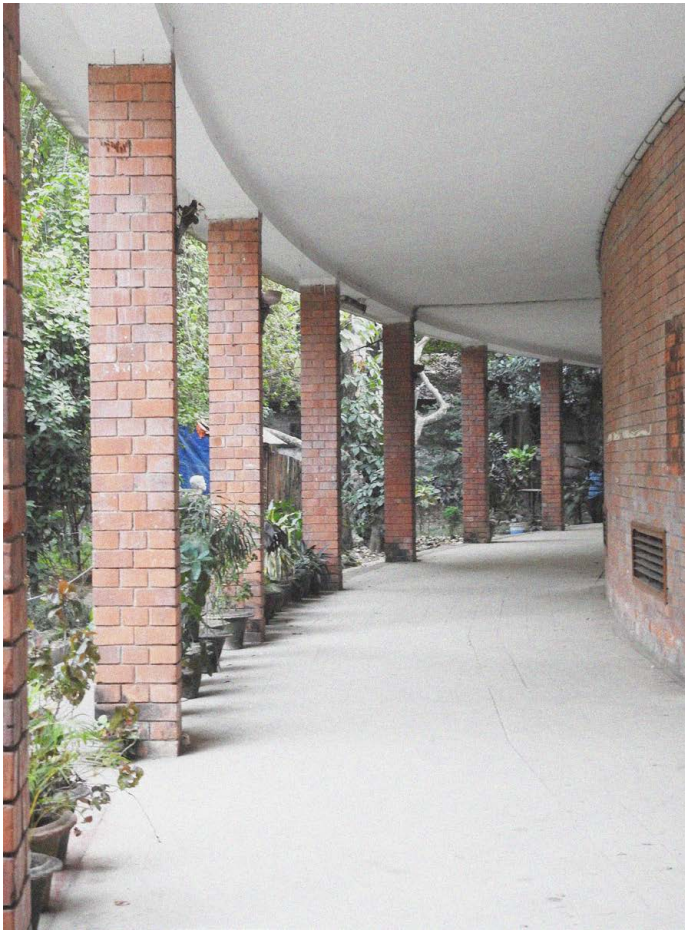
How can a temporary housing design for climate displaced people be adapted and evolved into permanent homes, while keeping the sense of community strong?

Sub-Question	Sub-Question	Sub-Question	Sub-Question	Sub-Question
How to address spatially the privacy and safety challenges faced by people living in temporary	How can these solutions be protected from floods?	How to strengthen the sense of community and be-	How to incorporate the life and spaces the displaced people used to have in the new ecosystem they relocated	What will the process from temporary to permanent be?

HOW?

Literature Interviews Case studies Refugee camps	Literature Case studies Policies in place	Literature Interviews Site visit Case studies	Interviews Site visit Mapping Workshops	Case studies Literature

Outcome	Outcome	Outcome	Outcome	Outcome
Diagrams Collages Catalog of existing strategies	Diagrams Pictures Plans	Diagrams Pictures Plans Collages	Diagrams Pictures Collages Catalog of existing shelters	Diagrams Timetable Collages



Revise

The research plan and core questions were developed before our trip to Bangladesh. However, it was only through being there—walking through the neighborhoods, speaking with residents, and listening to local students—that I truly began to understand the lived realities behind the data. Through ethnographic research and informal interviews, I gained insights into how people navigate everyday challenges and what they value in their homes and communities.

The site itself played a crucial role in shaping the direction of the project. Experiencing it firsthand helped me better define the specific issues our design needed to address. Rather than approaching the project with a fixed solution, the visit helped me ground my ideas in the physical, social, and environmental context of the place.

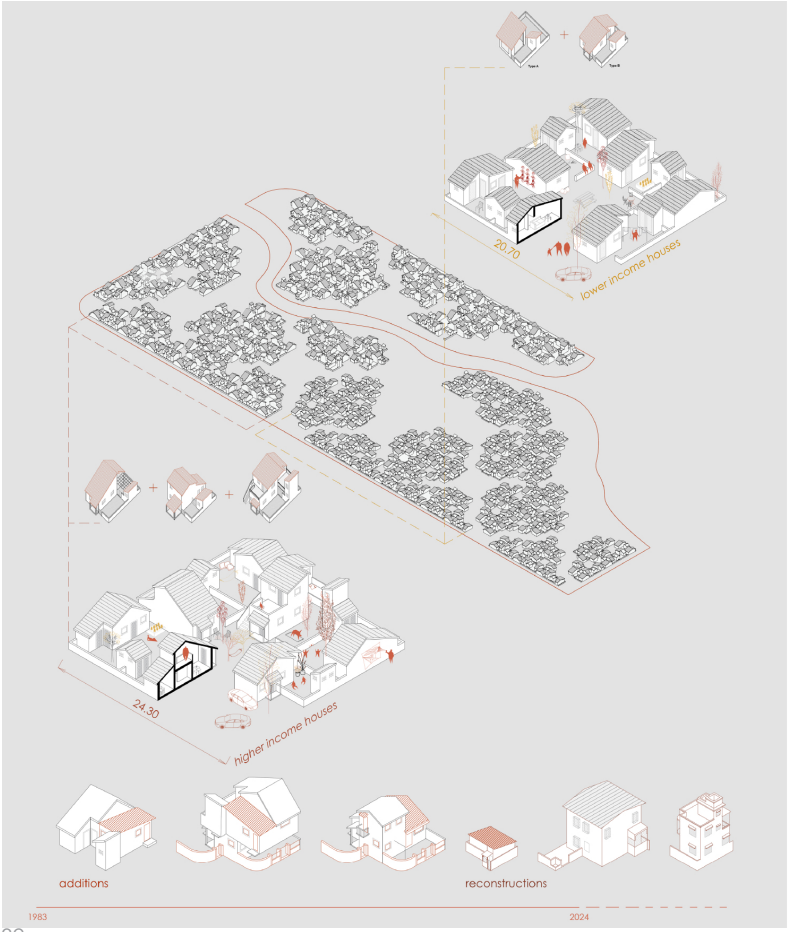
DESIGN RESEARCH - Global Housing

The studio began with an individual assignment focused on design research through global housing case studies. Each student was asked to select a housing project and analyze it across three spatial scales: neighborhood, cluster, and dwelling. After reading about the housing challenges and the culture in Bangladesh, I became particularly interested in the concepts of incrementality and social housing. I wanted to explore how housing can grow and adapt over time, while remaining affordable and focused in a strong sense of community. With these themes in mind, I intentionally looked for a case study that represented these values and was geographically close to Bangladesh. That's how I chose Belapur Housing by Charles Correa.

Belapur Housing
Navi Mumbai, India, Charles Correa, 1983

Plot Area: 5.4ha
Number of Dwellings: ~550
Density: 100 dw/ha
FSI: 0.75
Unit Sizes: 45sqm - 70 sqm
GSI: 0.6
Client: CIDCO
Scheme: Collective
HousingDesign: Charles Correa
Tenure: Plot ownership

Belapur's booklet and flier for advertisement

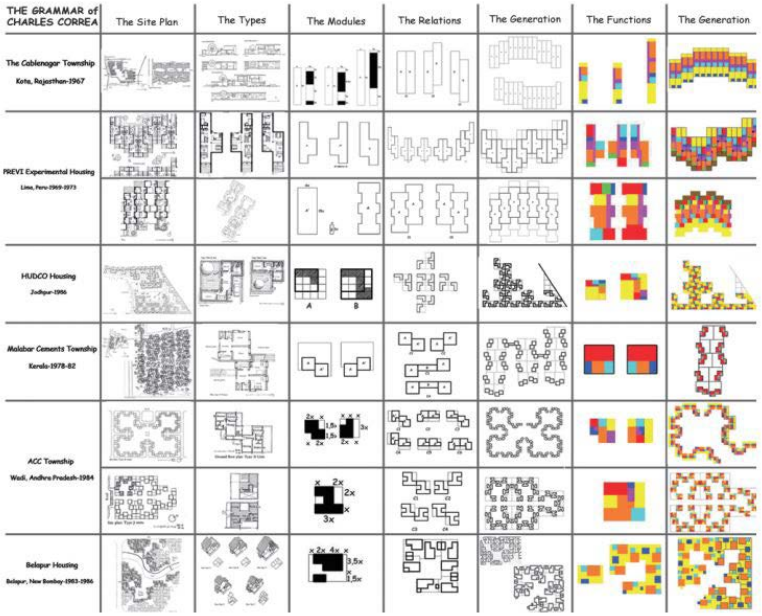


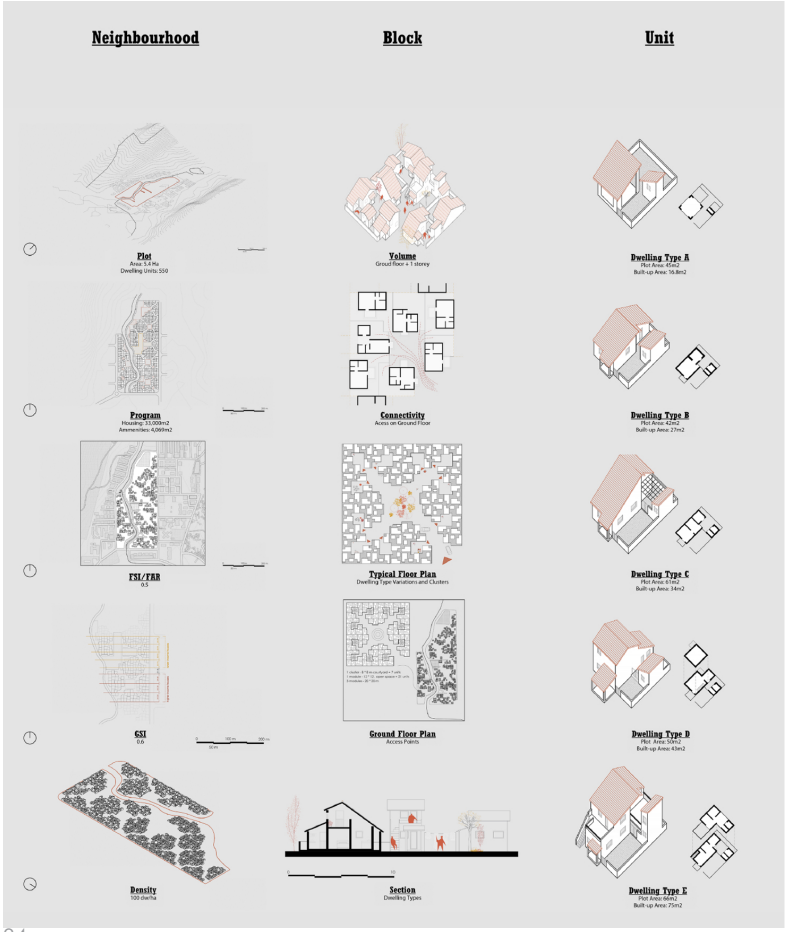
Designed by Charles Correa in 1983, the Belapur Incremental Housing Project in Navi Mumbai stands as one of the most innovative and human-centered housing models in India. Correa envisioned a solution for the growing urban housing crisis—especially for low-income families—by creating homes that were not only affordable but also culturally grounded and adaptable over time. At the heart of the project was a simple yet powerful idea: people should be able to start small and expand their homes as their needs and resources grow.

This project is often celebrated as one of Correa's most influential works. It challenged the dominant model of high-rise, impersonal housing blocks by offering a dense yet low-rise alternative. Rather than stacking families in identical towers, the design focused on community-oriented clusters arranged on a clear, grid-like layout. Each housing unit came in different sizes and types, and the repetition of varied scales—at both the unit and cluster level—created a rich, dynamic environment.

What made Belapur truly revolutionary was its incremental approach. Correa believed housing should grow with its residents. The idea was to provide an affordable starting point—one that didn't overburden families financially—but allowed them to invest in and improve their homes over time. This flexibility helped foster a strong sense of ownership and dignity, especially for low- to middle-income families who often feel excluded from formal urban development.

By putting people, culture, and adaptability at the center of design, Correa's Belapur project has become a global reference point for humane, inclusive urban housing. It shows that when architecture is rooted in empathy and real human needs, it can be both beautiful and transformative.





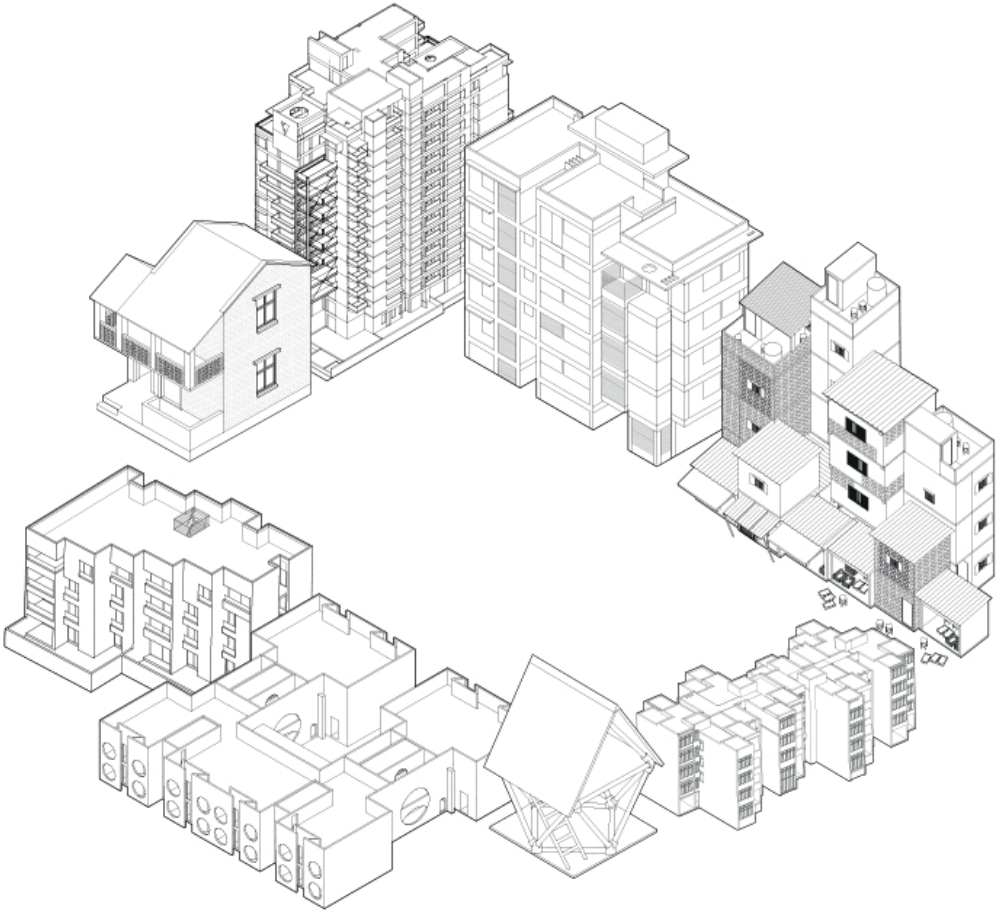
The Belapur Incremental Housing Project is a great example of how thoughtful design can build not just houses, but real communities. Instead of isolating people in rows of identical buildings, architect Charles Correa created a cluster-based layout that feels more like a neighborhood than a housing scheme. Each cluster consists of seven homes arranged around a shared 8×8 meter courtyard, where neighbors naturally come together—whether it's children playing, families chatting, or people simply looking out for one another.

Three of these clusters come together to form a larger unit of 21 homes centered around a bigger 12×12 meter open space. When multiple of these modules combine, they form a larger community that mirrors the sense of a village within the city—which is why the project is sometimes called the "artist's village."

Though the layout achieves a relatively high density of 100 dwellings per hectare, it remains low-rise and human-scaled, allowing for interaction, sunlight, and airflow. Each home sits on its own individual plot, with no shared walls, giving families the freedom to expand over time. The only shared element is the lavatory block, smartly paired with the neighbor's to minimize service lines. The homes themselves start off as compact, functional units—ranging from 45 to 70 square meters—but they're designed to grow with the family's resources, supporting incremental building.

Correa's signature "open to sky" approach is beautifully realized here. The homes are carefully oriented to capture natural light and ventilation, reducing the need for artificial systems and making life more comfortable in the long term. This blend of privacy and community—space to breathe, room to grow, and places to connect—makes the Belapur project a rare example of how high-density housing can still feel warm, intimate, and deeply connected to the people who live there.

Today's situation

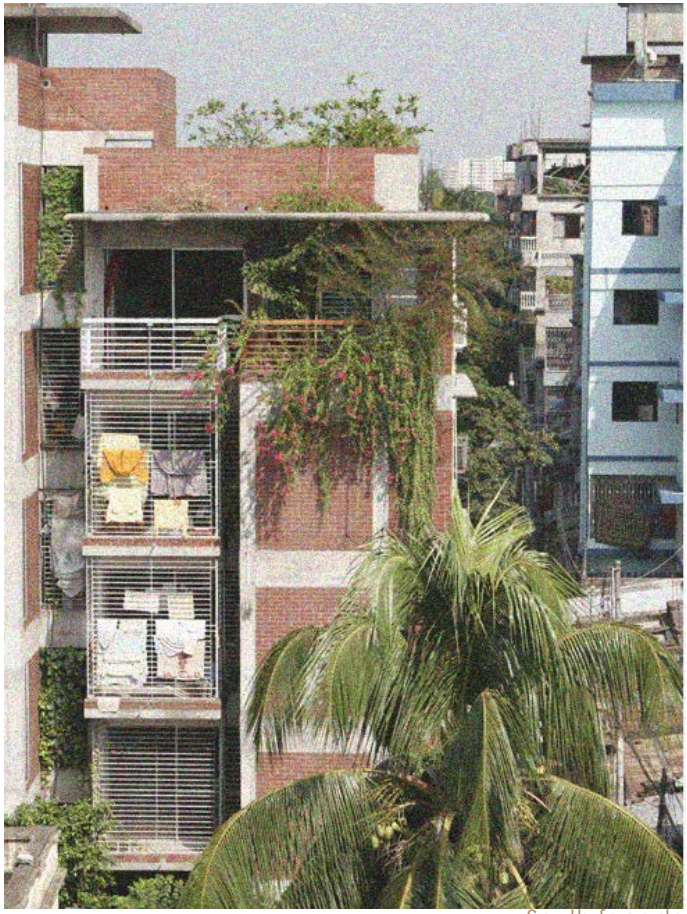


DESIGN RESEARCH - Housing in Bangladesh

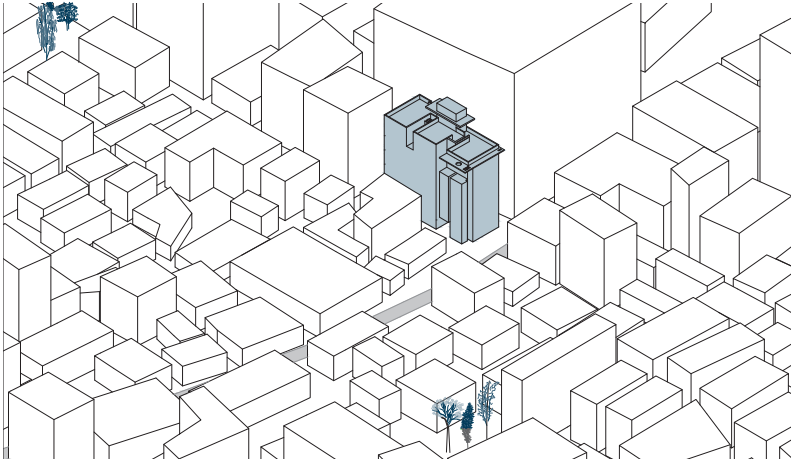
Following our initial design research, the next phase of the studio zoomed in on Bangladesh, with a specific focus on the Sylhet division. This stage helped us build a more grounded understanding of local housing conditions and played a key role in shaping our research framework and design direction. We worked in groups, exploring different building scales, and as a final outcome, we compiled a booklet that served as a collective knowledge base.
The booklet features a rich collection of visual documentation and analytical drawings, all produced by students. It's organized into chapters based on housing types, aiming to expand knowledge in a field that remains relatively underdocumented.
What makes this collection unique is its broad and balanced scope. It places high-profile projects in Dhaka alongside everyday commercial housing in Sylhet, offering insight into both celebrated and overlooked examples. Vernacular forms like the Bangla-Baton house are studied with the same care as the iconic MP housing in Sher-e-Bangla Nagar.

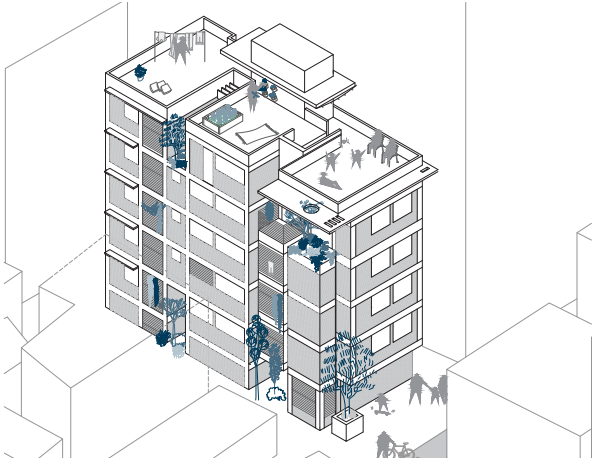
Kazedewan Apartment Building - SMALL/MIDDLE URBAN HOUSING

Plot Area: 0.026ha
Number of Dwellings: 14
Density: 538 dw/ha
FSI: 3.7
GSI: 0.7
HousingDesign: Rafik Azam



South facade





Old Dhaka is rapidly losing its unique character and livability as unchecked population growth and poorly regulated construction reshape the city. Traditional courtyard homes are being replaced by cramped apartment blocks, driven by the fragmentation of extended families into smaller units and the growing number of heirs claiming land. This has led to a dense, chaotic urban fabric where thoughtful planning is often ignored.

Many of the new buildings disregard basic elements of good living—like access to light, air, and green space. In the absence of safety and trust, homes turn their backs on the street, creating isolated, defensive environments rather than vibrant neighborhoods.

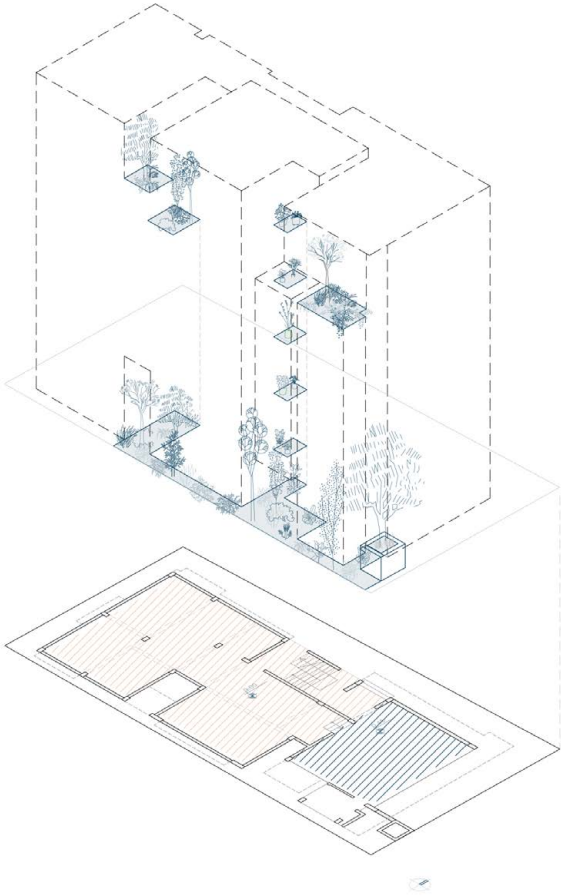
In response to these challenges, a small apartment building was designed in Nur Fatah Lane, Kazedewan—one of the most crowded pockets of Old Dhaka, with around 400 households packed into just 40 buildings along a 137-meter lane. The project aims to offer more than shelter: it proposes a new way of building—one that fosters community, encourages connection with nature, and reimagines how architecture can support human dignity in even the most challenging urban settings.

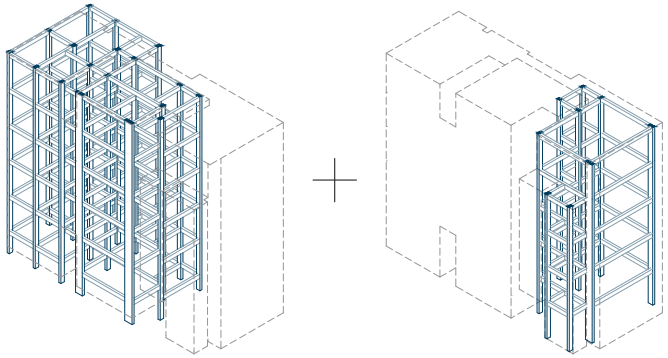
The 14-unit apartment building focuses on greenery. The architect believed that everyone has the right to experience green spaces, even if only visually, from within their own homes. He felt it was his responsibility to show the people of the old city that it is possible to build a well-ventilated, airy, and well-lit apartment building in their neighborhood. Noting the shortcomings in conventional apartment blocks, the architect and his team designed their scheme based on four principles:

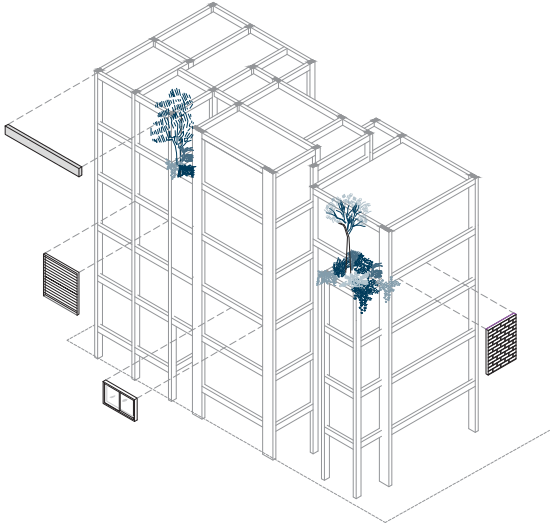
- Small but abundant
- Revival of traditional values
- Cost-effective
- Simple but modern

On the ground floor, connected to the street, there is a common area for community gatherings, celebrations, and times of sorrow. There is also a maintenance office` that can double as an office for the owner, allowing him to be more accessible to the residents. Residents have access to a storage area in the semi basement. The next five stories are entirely residential, with fourteen units in total. The roof was designed to capture the ambience of a traditional roofscape, as well as to serve as a gathering place for residents to hang clothes, socialize, grow plants, and provide a safe space for children to play.

Greenery can be found at various levels, and while it cannot be physically accessed, it does create a pleasant sense of openness psychologically. The project's various green areas feature local palm trees and indigenous plants.







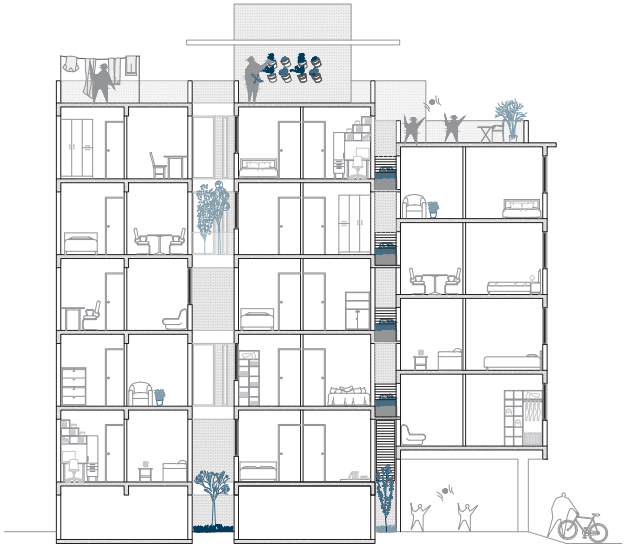
The construction technology used for this building follows standard practices common in Dhaka and across the subcontinent. However, additional attention was given to drainage and waterproofing in areas with garden features. The structure is built with a reinforced cement concrete column and beam frame, fully compliant with the Bangladesh National Building Code (BNBC) standards for moderate earthquake zones. Beam and column joints were reinforced with extra ties to ensure rigidity. With each floor split across two levels, beams are set at varying heights, which is illustrated in the two structural diagrams.

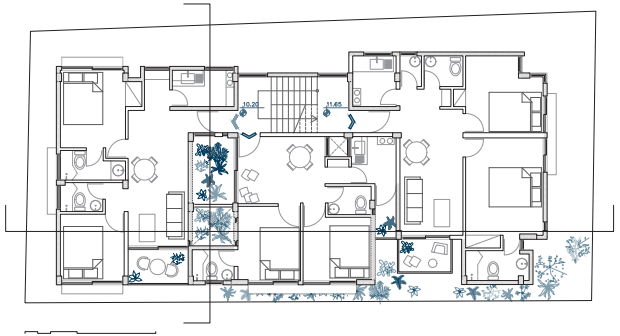
The building's materials were carefully chosen to balance durability, local sourcing, and cost-effectiveness. The concrete structure is visible and terracotta bricks, which are readily available in Dhaka, were used as infill due to their thermal properties. The 25-centimeter-thick walls have an inner face of handmade bricks and an outer face of machine-made bricks, with locking bricks added at regular intervals to ensure stability. The exterior surfaces of all structural elements were coated with SARA to ensure damp resistance, particularly given Dhaka's heavy rains, while the interior surfaces were plastered and finished with emulsion paint. RAK tiles, manufactured locally, were used for the flooring because they were a cheaper alternative to the originally planned terrazzo while maintaining high quality.

Because the program was extremely tight and the project required accommodating a large number of families on a small plot of land, it was a challenge to create spacious conditions in a limited amount of space.

The Kazedewan Apartment Building is home to fourteen families (some with extended members). There are sixty-six people in total, including thirty-nine adults, fourteen adolescents, and thirteen children. Ten of the families are from the neighborhood, and all are associated with the old city. Household sizes range from four members in nuclear families to six members in extended families heads are entrepreneurs, three work in public and private sectors, and two are professionals (one lawyer and one medical practitioner).

In the old city, women spend a lot of time inside their homes. The architect, fully aware of this, designed small but comfortable kitchens where women can spend time. Another new feature is the fuchkee khidki, a special window with louvres that allows women and children to see the streets outside without being noticed by passersby. The only truly private space once the doors are closed is the bedroom. Although the apartments are small, they benefit from natural light, air, and greenery. Eleven of the fourteen apartments have verandas, but all are oriented to face greenery.





FIELD TRIP

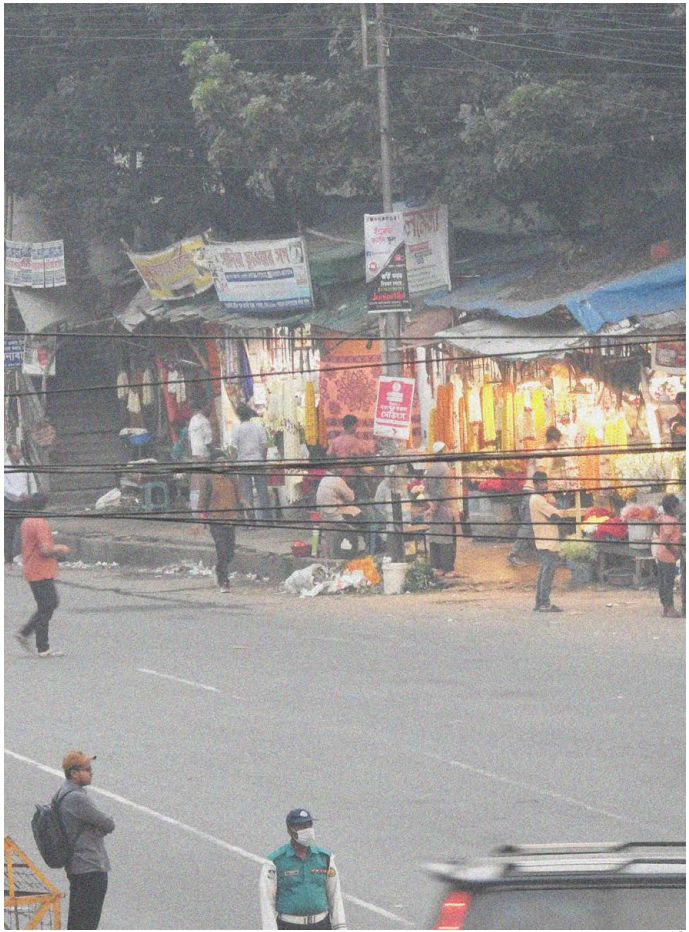
One of my biggest concerns coming into this studio was navigating the cultural differences. I wanted to approach the work with sensitivity—to truly understand the way of life in Bangladesh and respect the customs, beliefs, and everyday rhythms of the people. Designing a home—something deeply personal and sacred—felt like a real challenge, especially in a country I had never visited before.

Over the course of 18 days, our trip began in Dhaka—the arrival city for many displaced people and those searching for work. The scale of the city, both in size and population, was overwhelming. Dhaka's energy was intense, and so was the pressure on its infrastructure. Walking through its slums, it became clear how many people had arrived here from elsewhere, forced to leave their homes by environmental or economic pressures.

From Dhaka, we traveled to the Sylhet division, where our design sites were located. The contrast between the two places was striking—not just in density, but in atmosphere and pace. Sylhet, while still urbanizing rapidly, carried traces of rural life that were more difficult to find in Dhaka.

One of the most important moments of the trip for me was visiting the haors. Together with a small group of students, we chose to go—knowing that these wetland areas are where many of the displaced people in Sylhet originate from. I wanted to understand the beginning of their journey: how they live, what forces them to leave, and how those realities compare to the other villages we had seen.

Although it wasn't monsoon season and the land was dry, the difference in elevation was already visible. From the boat, we could see just how high the villages were built



above the waterways, and yet the locals told us that during the floods, half their homes go underwater. Many of them take temporary shelter in schools during those weeks. You could still see the high-water marks on buildings and trees—reminders of just how dramatically the landscape changes.

Visiting all these places—urban slums, peri-urban villages, and flood-prone haors—gave me a fuller picture of displacement in Bangladesh. It helped me think through the full arc of a person's journey: before, during, and after disaster. I began to imagine not just the physical spaces they pass through, but also the emotions and vulnerabilities involved.

This is where my design approach was formed. To move as far away as possible from the idea of "temporary shelters" and start thinking about permanence. I realized that even the most displaced communities deserve more than survival. My project began to focus on introducing elements of permanence—structures that are resilient but also foster long-term safety and community.

INTERVIEWS

Dr. Pijush Sarkar, Dr. Ashutus Singha | 16.12.24.
Professors at the Bangladesh Agricultural University

On December 16, me and 3 other students visited the Department of Irrigation and Water Management at the Bangladesh Agricultural University to discuss with Dr. Sarkar and Dr. Singha on the topic of the destructive losses faced by farmers in Bangladesh during floods.

Question: Floods seem to be a huge issue in Bangladesh. Can you tell us more about how they impact agriculture?
Answer: "Absolutely, flooding is a major problem. Imagine this: farmers work all season, and just as their rice crops are ripening in April, flash floods come rushing in from upstream in India—no warning, nothing. The entire crop gets destroyed [...]. And the problem isn't just the floods; it's also poor river management. The dikes and barriers we have just aren't strong enough or well-maintained to handle these situations."

Question: How do farmers prepare for or adapt to these floods?
Answer: "There are a few things they can do. One is to plant short-duration rice varieties, which mature faster and can be harvested before the floods. These varieties yield less, but at least they offer some protection. Another strategy is building small dikes along riverbanks using low-cost, indigenous methods [...]. Finally, after the floods recede, farmers can grow a second crop, like Aman rice, with supplemental irrigation. However, many farmers lack the training and resources to implement these measures effectively."
Question: What happens when floods destroy everything? Do people leave their villages?
Answer: "Yes, they often migrate. Those who lose their crops and livestock sometimes move to places like Chittagong to find work as laborers, rickshaw
pullers, or in garment factories. Women, in particular, join textile industries. Some families return to their villages during the dry season, hoping to rebuild and cultivate again, but it's a difficult cycle of losing and starting over."

Question: What steps are being taken to address these issues?
Answer: "The government and agencies like the Water Development Board are working on river dredging, diking, and irrigation projects, but these efforts are often inadequate. There's a lack of resources, and sometimes the funds aren't used effectively. NGOs and local groups are doing what they can to help, but the problem requires a much larger, coordinated effort."

Question: How is urbanization impacting flood management and agriculture?
Answer: "Urbanization is reducing the amount of agricultural land—about 1% of arable land is lost every year to housing and industrialization. Cities like Sylhet are expanding into rural areas, leaving less soil to absorb water. This

lack of planning makes the flooding problem even worse."
Question: What needs to happen to improve flood management and help these communities?
Answer: "There's no single solution, but better riverbank protection, improved irrigation systems, and the use of climate-resilient crops would make a big difference. The bigger challenge is implementation. We need proper planning, sufficient funding, and honest governance. Public awareness and community involvement are also essential—without them, even the best plans won't succeed."

Notes:

Agriculture in Bangladesh:

1. General Characteristics
- Agriculture is one of the main sources of livelihood in the country.
- Highly diversified agricultural practices.
- Farmers often lack access to modern technology and awareness of climatic changes.
2. Challenges
- Seasonal flash floods destroy crops, particularly boro rice, during critical agricultural periods, specifically before the harvest period.
- Flooding disrupts planting schedules, reduces soil fertility through erosion, and damages irrigation systems.
- Urbanization reduces arable land (~1% annually), decreasing water absorption capacity.
3. Possible Adaptation Measures
- Cultivation of short-duration rice varieties (January–April), though these are typically lower yielding.
- Construction of dikes along riversides with government and NGO support.
- Crop diversification to include multiple varieties, requiring training
in irrigation and mixed cropping.

Flooding and its Impacts:
1. Erratic Flood Patterns
- Climate change has made flooding increasingly unpredictable.
- Rainy seasons (traditionally May to August) are no longer reliable.
2. Effects on Livelihoods
- Significant losses in agriculture and livestock, forcing temporary or premanent migration to urban areas for alternative jobs (e.g. rickshaw pulling, construction, textile work).
- Many farmers lack land ownership, cultivating rented plots ; poverty often leads to land sales.
- Communities rely on temporary shelters (e.g. schools) for weeks, supported by government, NGOs and mutual aid.

Mr. Dipak Dev | 16.12.24.
Director at the Bangladesh Water Development Board

On December 16, me and 3 other students visited the Bangladesh Water Development Board to discuss with Mr. Dev about water management challenges in Sylhet, including flooding and riverbank erosion, and their impact on local communities. We talked about strategies like dredging, bank protection, and community involvement and the challenges posed by climate change, unplanned urbanization, and limited resources

Question: How often does erosion happen per year?
Answer: "Erosion typically occurs during the flash flood season, which runs from May to August. During this time, the water level rises and falls sharply over short durations, triggering riverbank erosion. In the dry season, as water levels drop, the riverbanks also start collapsing."

Question: How do you strengthen the riverbanks?
Answer: "We focus on the concave parts of the river where erosion is most severe. We use concrete blocks to stabilize these areas and dredge nearby sections to direct the river flow. However, new erosion can occur at other points the following year, and continuous intervention is challenging due to limited funding."

Question: Is it becoming worse because of climate change?
Answer: "Yes, climate change is a significant factor. In the past, water levels rose gradually, allowing us to prepare. Now, heavy rainfall occurs over just two or three days, causing water levels to rise dramatically in a short time. The same monthly rainfall now falls within a week, making it harder to manage."

Question: Why do people want to live so close to the riverbanks?
Answer: "Living near rivers is practical for transportation and livelihoods. Transporting goods by ship is much cheaper than by truck, and many fishermen and their families depend on the river for their work. Historically, civilizations have always settled near rivers for easy communication and resources."

Question: Do the people in the affected areas have their own techniques to deal with the floods?
Answer: "Yes, people in rural areas often move their houses when necessary. If erosion threatens their homes, they relocate lightweight structures made from bamboo or corrugated metal to safer land. However, houses made of concrete cannot be moved, which creates additional challenges."

Question: Do you think community involvement in water management strategies is important?
Answer: "Absolutely. From my studies in the Netherlands, I've seen how crucial stakeholder involvement is for successful projects. Unfortunately, in Bangladesh, many people are not educated enough to understand or support development projects, focusing instead on immediate personal benefits rather than long-term progre

Notes:

Water Dynamics and Monsoon Impact

- Water flows from the Indian mountains into Bangladesh during the monsoon season.
- Major rivers such as the Barak River bifurcate into the Kushiyara and Surma rivers, carrying significant water volumes.
- Heavy rainfall in the Meghalaya mountains can raise water levels in Sylhet rivers drastically within 24-36 hours, sometimes by as much as 3.7-5.5 meters.
- Average water level rise during flood seasons in Sylhet is 1-3 meters.

Flooding Challenges

- Flash floods and river overflows affect Sylhet 3-4 times annually, damaging homes, crops, and infrastructure.
- Floods lead to massive agricultural losses, especially for rice, vegetables, and cereal crops, contributing to poverty cycles.
- Unpredictable flooding patterns, exacerbated by climate change, make preparation and mitigation difficult.

River Systems and Management

- Rivers are crucial for transportation and exporting products, offering a cost-effective alternative to road transport.
- Efforts to manage flooding and erosion include:

Dredging Projects: Conducted on major rivers to increase water-carrying capacity.

Bank Protection: Use of heavy concrete blocks to stabilize riverbanks against erosion.

- Challenges include limited funding and public resistance to relocation or infrastructure projects.
- Unplanned urbanization and insufficient drainage systems lead to urban waterlogging, especially in Sylhet city.

Climate Change and Human Adaptation

- Climate change intensifies flooding and unpredictability, with rainfall occurring in shorter durations but higher volumes.
- Rural and poor communities are disproportionately affected, often becoming "climate refugees" within their own country due to land loss and erosion.
- Many homes near riverbanks are built from lightweight materials, allowing for relocation, but wealthier households often build concrete homes for durability and status.

Gendered Challenges

-Women and children are most vulnerable during disasters due to societal and cultural constraints.
- Women often depend on men for decision-making and action during emergencies, limiting their ability to respond rapidly.
- Schools and other institutions serve as temporary shelters during floods, prioritizing women and children.

Stakeholder Involvement and Education

-Effective stakeholder engagement, a successful strategy in countries like the Netherlands, is limited in Bangladesh due to low public awareness and education.
- Resistance to government projects is common, with people prioritizing personal or immediate needs over long-term benefits.
- Education alone is insufficient; broader community involvement and trust-building are necessary.

International Solutions and Relevance

- The Dutch project "Room for the River" project serves as a model for flood management:
- Strategies include lowering floodplains, relocating dikes, creating bypasses, and enhancing storage capacity.
- In Bangladesh, only dredging and dike improvement are commonly implemented due to resource constraints.
- Expanding canal systems for water storage and agriculture could be beneficial but is challenging due to population pressures.

Housing and Construction

- Building homes away from floodplains (200-300 meters from riverbanks) is recommended to minimize flood risk.
- Elevated structures and lightweight materials (e.g., bamboo) are common in rural areas but vulnerable to destruction.
- Reinforced concrete homes, while more durable, are expensive and not easily relocated.

Mr. Mohammad Zobair Hassan | 17.12.24.

Chief member at Development Organization for the Rural

On December 17, me and Lida Gannotaki had an online conversation with Mr. Hassan about the women's initiative, 'The Mother's Parliament". He shared insights into their work, the challenges they face, and their efforts to motivate and empower women in remote areas, who are often socially restricted and live under the poverty line.

Question: What are the main issues that the Mother's Parliament focuses on, especially for women and children?
Answer: "The Mother's Parliament is a platform for raising voices about basic rights—housing, shelter, and activities in hard-to-reach areas. They mainly focus on water, sanitation, hygiene, and health rights. For example, adolescent girls often face challenges during their menstrual cycles because of poor toilet facilities. They end up staying home and missing three or four days of school. You can see how these issues—lack of proper housing and sanitation—create interconnected problems for women and children."

Question: What measures are being taken to adapt housing and infrastructure to climate challenges?
Answer: "These days, when installing hand pumps, people are considering higher platforms because floods and cyclones are becoming more frequent. It's about thinking long-term—elevating houses, toilets, and even cattle shelters above the usual levels. This integration of social and engineering solutions is crucial to ensure families benefit from these facilities in the long run."

Question: How does the Mother's Parliament help promote education for women and children?
Answer: "There are two types of education here: formal and non-formal. Formal education happens in primary schools, but for children who can't attend school during the day, there are evening learning centers run by small NGOs with funding from the Mass Education Department. Women in the Mother's Parliament work to encourage families to send their children to school, explaining the long-term benefits of education."

Question: What opportunities exist for women to generate income through the Mother's Parliament?
Answer: "Microfinance institutions here play a big role. They lend money to women without requiring collateral and also provide training for skills like sewing or running small businesses. The Mother's Parliament acts as a connector, helping women access these resources and advocating for their needs within the community."

Question: How are urban and rural governance systems supporting local communities, and what challenges do they face?
Answer: "In urban areas, municipalities handle things like urban management and utilities, while rural areas fall under union councils, which are the lowest tier of local government. The challenge lies in connecting people with the right service providers. Many don't know where to go or who to approach for help with housing, water, or other needs. The goal is to strengthen community capacity and share knowledge so they can advocate for themselves."

Notes + Insights:

Purpose of the Mother's Parliament:

The Mother's Parliament seeks to empower women to raise their voices and address key issues in hard-to-reach areas by:

1. Advocating for health and healthcare services.
2. Advocating for the improvement of water and sanitation facilities.
3. Promoting education programs, such as informal evening schools funded by the Mass Education Department and run by NGOs.
4. Addressing public facilities (housing, food, agriculture).
5. Supporting access to finance for women through microfinance institutions.
6. Connecting communities with policymakers to gain attention and action on these issues.

Key Issues Addressed by the Mother's Parliament:

1. Water Management

During floods, water facilities (e.g., hand pumps) are often damaged, forcing women to travel longer distances to fetch water, sometimes in unsafe conditions like darkness.

2. Sanitation and Hygiene

Inadequate sanitation facilities force women and girls to stay home, leading to missed school days and reduced mobility.

3. Housing and Infrastructure

No clear local government guidelines for housing construction; residents build homes without formal plans.

4. Women's Empowerment

Women, particularly in remote areas, often have very lim-

ited access to resources and the knowledge required to seek support from the appropriate authorities.

Structure of the Mother's Parliament:

1. Five branches (three in the southwest, two in the southeast).
2. Initial group size: Nine members, expanding to a maximum of
twenty-one members through community outreach.

Activites of the Mother's Parliament:

1. Monthly community meetings at central locations for discussion and decision-making.
2. Quarterly submission of petitions and requests to higher authorities
(e.g., chiefs of administration).

Governance and Policy Advocacy

Importance of knowing the right authority to contact for specific needs.

- The Mother's Parliament connects women with service providers and mobilizes resources.
- It brings women into discussions that inspire self-reliance and action.
- It provides tailored information based on individual household needs to facilitate access to necessary resources.

Flood Resilience and Water Management

Flood-Resistant Infrastructure: Frequent flooding necessitates elevated housing designs with durable, water-resistant materials and raised plinths. Modular and flexible layouts can adapt to varying flood intensities and patterns.

Integrated Water Systems: The design could incorporate rainwater harvesting, elevated hand pumps, and resilient drainage systems to ensure access to clean water during floods.

Riverbank Stabilization: Integation of eco-friendly and community-accepted solutions for riverbank protection, using natural barriers and structural reinforcements.

Sustainable Agriculture and Livelihood Support

Home-Based Agriculture: The design could incorporate small-scale farming areas to support agricultural livelihoods and food security.

Community Storage and Diversification: Provision of flood-resilient storage facilities for crops and promotion of crop diversification with integrated training and resources.

Women's Empowerment and Gender-Inclusive Design

Dedicated Women's Spaces: Reinstate culturally sensitive spaces for women, such as inner courts, balconies, or gardens, to provide solace and support productivity.

Safe Shelters: Design flood shelters with gender-sensitive features, including private areas, secure sanitation facilities, and resources for women and children.

Economic Empowerment: Inclusion in the design of spaces for home-based income generation, such as workshops, marketplaces, and cooperatives tailored to women's needs.

Community Participation: The design sould actively involve women in the process, ensuring their voices shape spaces to enhance inclusivity and ownership.

Community and Public Spaces

Multi-Functional Community Centers: Inclusion of spaces that double as flood shelters and hubs for education, training, and social engagement.

Inclusive Public Areas: Communal areas that foster community interaction while considering safety, accessibility, and inclusivity.

Adaptation to Climate Change

Relocatable Housing: Develop lightweight, portable structures alongside permanent, flood-resilient housing.

Resource Efficiency: Reinforce traditional practices of resource reuse, such as using old materials for new purposes, while incorporating modern sustainability measures.

Stakeholder Collaboration and Education

Participatory Design Models: Foster trust through inclusive planning processes, treating local communities as collaborators rather than clients.

Training and Skill Development: The design could provide community training spaces to enhance agricultural practices, entrepreneurship, and resilience strategies.

Engagement with Policymakers: Inclusion of spaces for community dialogue with stakeholders to bridge the gap between local needs and policy implementation.

GRADUATION PLAN

Argumentation of choice of the studio

This studio provided an opportunity to shift the focus away from the West and look at the challenges and opportunities faced by the Global South, particularly Bangladesh. Bangladesh, a country in the midst ofsignificant transitions due to its deltaic geography,provides valuable insights into how architects can address pressing global issues such as housing, climate resilience,and equity. I chose the Global Housing Studio because I am passionate about housing as a basic human need and deeply concerned about the growing effects of climatechange, particularly in the Global South. This studio provides an opportunity to investigate novel solutions to these interconnected issues, with a particular emphasis on creating equitable, climate-resilient housing for the most vulnerable communities.

Title of the graduation project

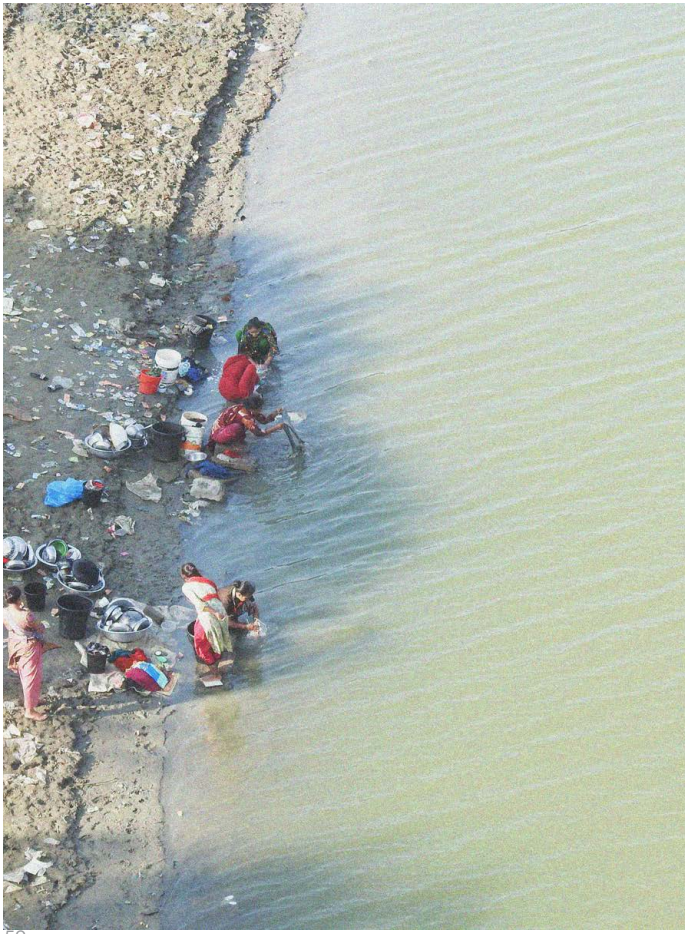
Temporary to Permanent Housing for internally displaced communities in Bangladesh

Location

Shonatola, Sylhet Division, Bangladesh

The posed problem

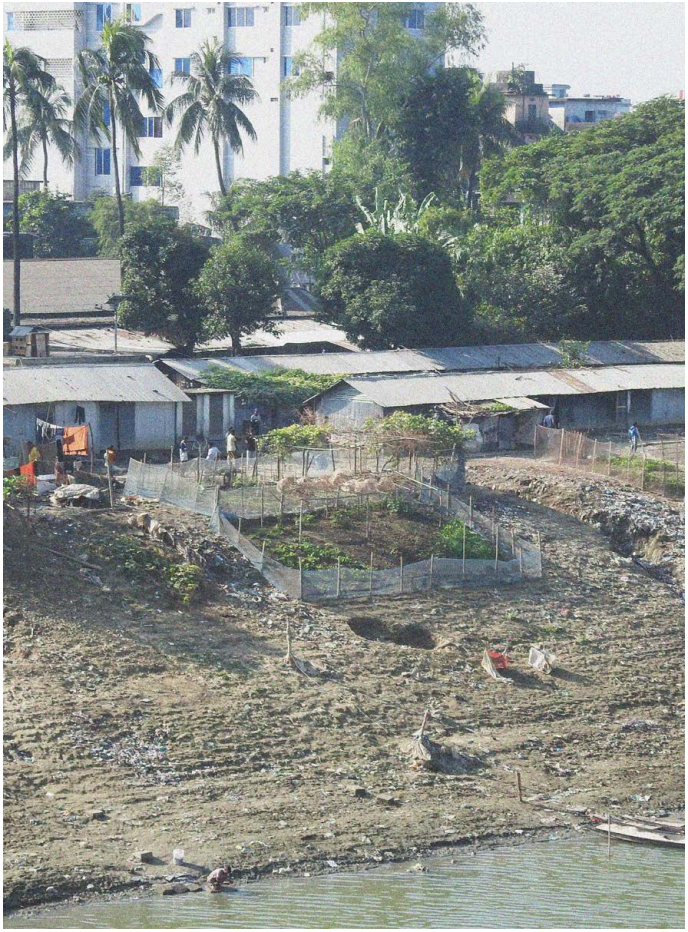
Bangladesh, shaped by the GangesBrahmaputra-Meghna River System flowing into the Bay of Bengal, faces significant climate change risks due to its low-lying topography (Van Lohuizen,2021). As a result, many inhabitants are forced to leave coastal areas and the haors and migrate to urban centers or other regions in search of safety, shelter, and live-



lihoods, leading to widespread internal displacement.
Internal displacement in Bangladesh is a complex issue requiring tailored interventions for three categories of displaced people: temporary, transitional, and permanent. These categories necessitate durable solutions such as return, local integration, and resettlement. Transitional groups, in particular, are highly vulnerable as they cannot return to their original homes and lack the resources to settle permanently. This instability exposes them to recurrent displacement, underscoring the urgent need for comprehensive and contextually relevant interventions to enhance resilience and security (Ministry of Disaster Management and Relief et al.,2021).
The Disaster Management Act (DMA) focuses on emergency shelter and resettlement after disasters but lacks comprehensive strategies to address all stages of displacement. However, government relief efforts, while targeted at affected areas, often fall short, as floods impact people across socioeconomic backgrounds, requiring a broader approach (Zahid, n.d.).
-Additionally, the recurrence of natural disasters compounds the challenge, as recovery often takes years, causing new waves of displaced individuals to overlap with those still in temporary shelters. This highlights the need for resilient, semi-permanent housing solutions capable of accommodating extended stays.

Research questions

How can a temporary housing design for climate displaced people be adapted and evolved into permanent homes, while keeping the sense of community strong? -How to address spatially the privacy and safety challenges faced by



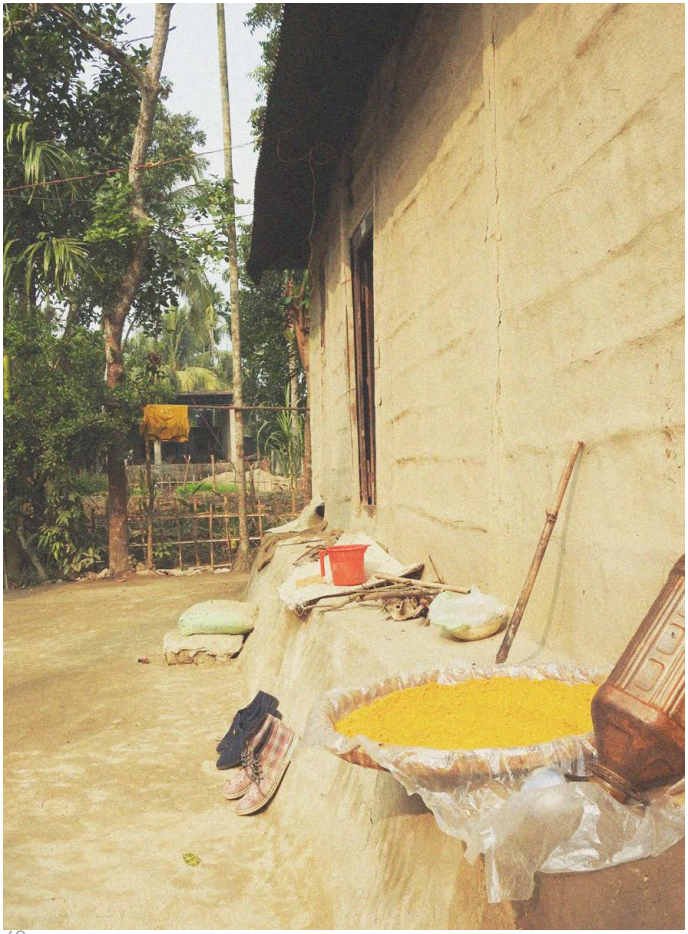
people living in temporary shelters?
-How can these solutions be protected from floods?
-How to strengthen the sense of community and belonging?
-How to incorporate the life and spaces the displaced people used to have in the new ecosystem they relocated in?
-What will the process from temporary to permanent be?

Design assignment in which these result.

This proposal will seek to create a transitional housing model that addresses the immediate needs of climate-displaced communities, especially the inbetween group, in Bangladesh while providing the adaptability required for long-term stability. The design will focus on creating structures that serve as both shelters and permanent homes if necessary in the future, fostering cultural preservation, community cohesion, and resilience to climate impacts. By prioritizing the unique needs of displaced families, the model aims to provide not just shelter but a foundation for rebuilding lives with security.

Drawing inspiration from traditional Bangladeshi architecture, the design emphasizes the integration of indoor and outdoor spaces, privacy thresholds, and communal areas. Respecting local cultural norms is central to the approach, ensuring that the housing feels familiar and supportive to those who inhabit it. By mirroring these traditional elements, the design provides displaced individuals with a sense of continuity and belonging, even in disruptive circumstances.

Adaptability is a key feature of the proposal. The housing units are modular, allowing for expansion or reconfigura-



tion to meet changing family needs or extended stays. Given the country's susceptibility to flooding and erosion, the structures will be built with durable, climate-resilient materials and incorporate features such as elevated designs to ensure safety and longevity. In addition to addressing immediate housing needs, the proposal includes spaces that promote community cohesion and support livelihoods. Communal areas will strengthen social ties among residents, while provisions for small-scale agriculture or livestock keeping will help restore livelihoods and promote self-sufficiency.

What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme(MSc AUBS)?

The studio focuses on the theme of 'architecture in transition', embedding itself in the context of Sylhet, a rapidly growing second-tier city in north-eastern Bangladesh.
Sylhet and the surrounding region are exposed to several challenges induced by growing industrialization, internal migration and climate change. The studio will therefore study the broad context of the Sylhet division, focusing particularly on: its material culture, urbanization trends, dwelling patterns and contemporary demands. In line with the studio description this graduation project will investigate a specific group of people that are in-between temporary and permanent displacement, in a context of a village that also floods and changes rapidly due to urbanization.
Beyond the Architecture master track, this project intersects with other tracks within the master's program, including Building Technology, Landscape, Urbanism, and Management.

What is the relevance of your graduation work in the larger social, professional and scientific framework.

The research findings from this project aim to provide a valuable resource for future designers, developers, and architects interested in creating climate-resilient dwellings in Bangladesh. By addressing the underrepresentation of Bangladeshi architecture in Western discourse, this project seeks to foster meaningful dialogue and draw attention to the innovative strategies Bangladesh has developed in response to climate challenges. The goal is to make these insights accessible to a global audience, allowing for knowledge exchange and collaboration.

Through this studio, my hope is to contribute to the long-term vision of a "safe, climate-resilient, and prosperous Delta" by 2100, promoting Bangladesh's resilience strategies as models for other regions facing similar challenges. Additionally, the issues of displacement and urbanization are not unique to Bangladesh, but are global phenomena. With this project, I aim to offer insights and potential solutions that, while rooted in the context of Bangladesh, can be adapted, reinvented, and applied to different cultures and regions around the world.

SITE ANALYSIS

Sylhet, one of the major cities in northeastern Bangladesh, sits along the Surma River and has seen rapid urban growth over the past few decades. What was once a modest city has now expanded in nearly every direction, transforming its surrounding landscapes. While this growth brings new infrastructure and economic opportunities, it also creates mounting challenges—especially when it comes to managing land, water, and flooding. As development replaces open land, there's less soil left to soak up heavy rains, which increases the risk of urban flooding (Hossain, 2023).

In recent years, the northwest part of Sylhet has become a new focal point of development. Key public projects like a Marine Academy and a new jail are shaping a fresh urban

"pole" in what was, until recently, a quiet peri-urban zone. Right in the middle of this transition lies Shonatola, a village about 6.8 kilometers from Sylhet's city center. Its location places it in a space that's neither fully rural nor entirely urban—a kind of in-between landscape, where signs of change are becoming increasingly visible.

While looking through old photos and historical documents, I noticed that the village has long adapted to the rhythms of seasonal flooding. Some areas flood deeply and for weeks during the monsoon; others just for a few days. The houses tend to sit on raised roads or embankments, arranged around ponds and canals, while the lower land is used for growing rice—a crop that can survive, even thrive, when submerged for part of the year.

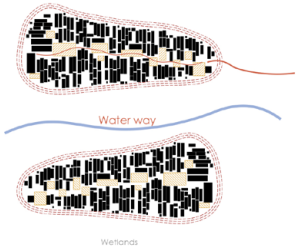
Though Shonatola is not located in the haor regions—those vast floodplains found elsewhere in northeastern Bangladesh—it shares a similar logic. Like haor villages built on elevated kandas, Shonatola's layout shows how people adapt to living with water, not against it.

Settlements in the haor regions are typically much denser than in places like Shonatola. This is mainly due to the scarcity of elevated land - embankment - that remains safe during the floods. In haor villages, homes often cluster tightly along a single main road, with narrow pathways branching off toward waterways. These connections reflect a way of life where the street and waterway are both central to daily movement.

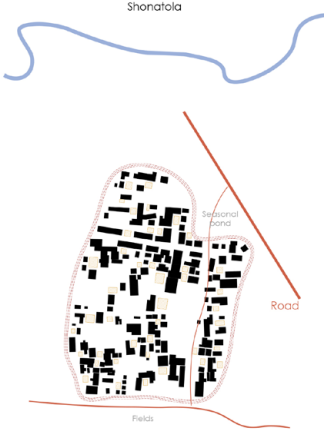
By contrast, Shonatola feels far more open. The village is surrounded by agricultural fields, and the houses are more loosely arranged. During the monsoon season, these fields fill with water, and parts of the village flood—though not as severely as in the haors. This spatial openness gives Sho-

Flooding around Sylhet based on Google Earth data from 2000-2023

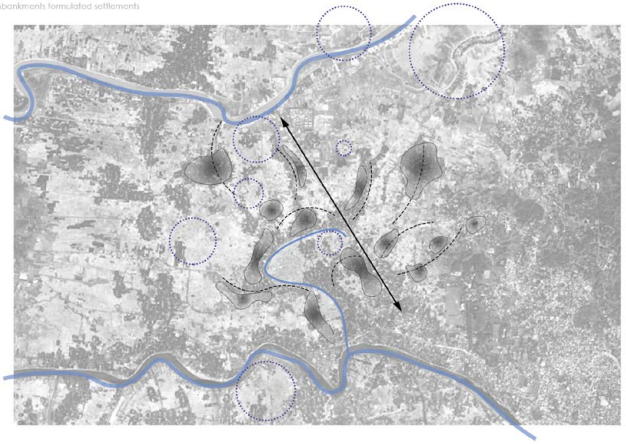
Haor Settlements

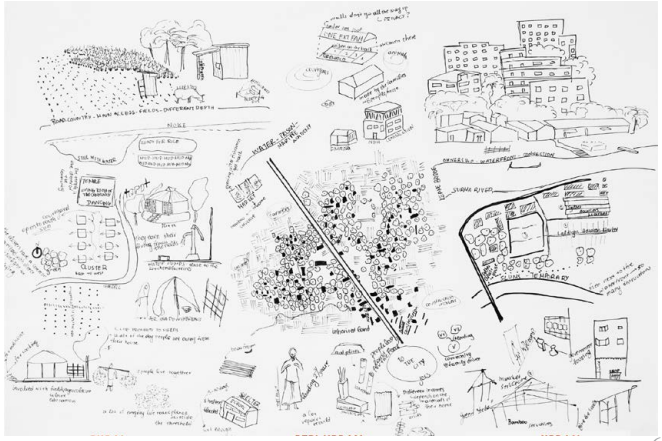


Shonatola



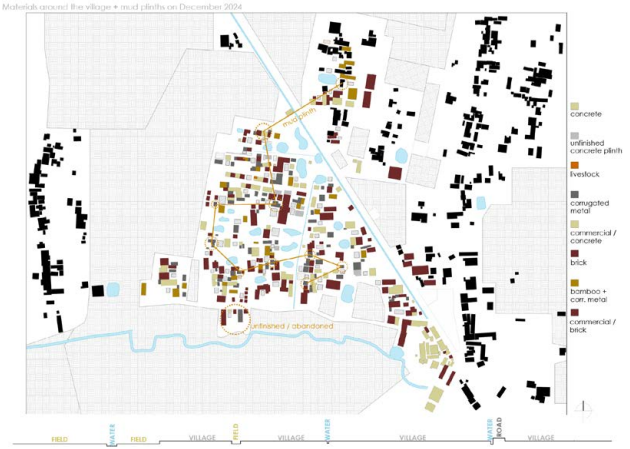
Embankments formulated settlements

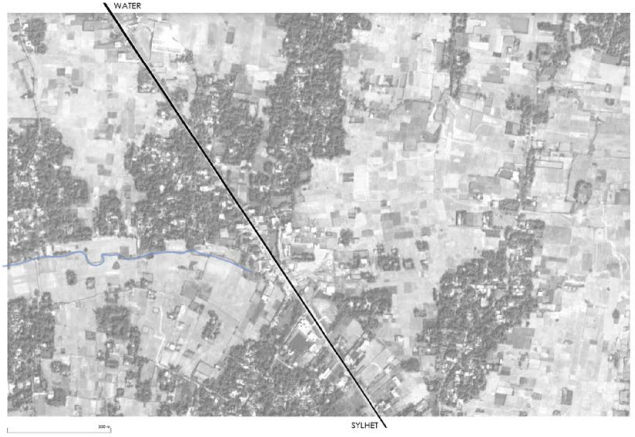




natola a different rhythm, one where water is present and powerful, but where there's still room to retreat and adapt. But change is underway. The main road through the village is being widened, and new concrete buildings are starting to replace older homes. These early signs of urbanization are carving into the traditional village fabric. Still, as you walk deeper into Shonatola, you can feel the rural life that holds strong: neighbors gathering in courtyards, people tending small gardens or fields, and a sense of closeness that's harder to find in the heart of the city.

Shonatola now finds itself at a crossroads—both geographically and socially. As Sylhet continues to grow, places like this raise important questions: How can cities expand without erasing what came before? Can we design for growth that supports resilience, memory, and local knowledge, rather than overwrite it?

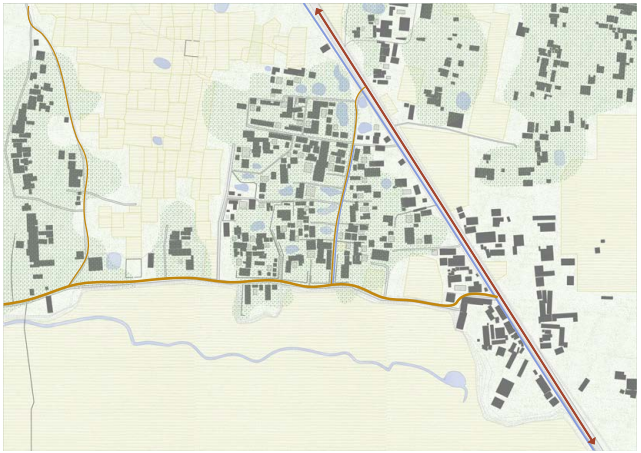


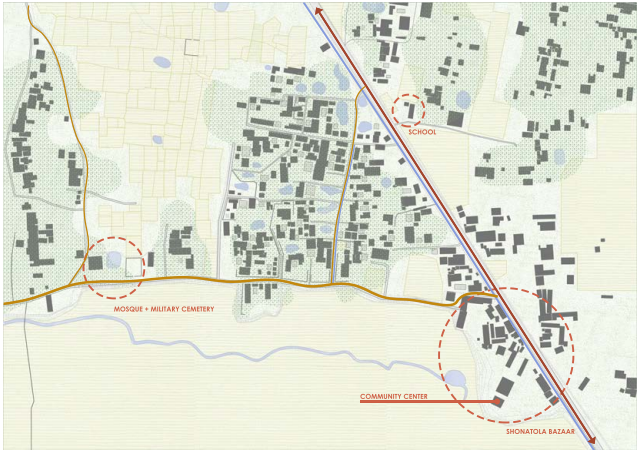


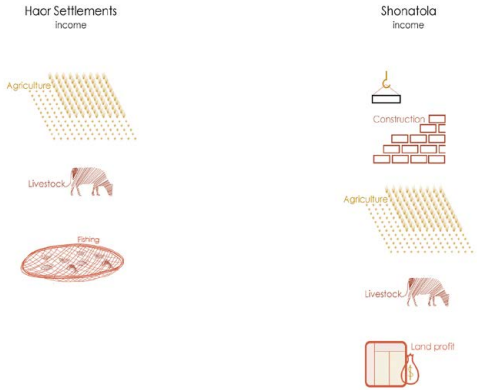
Material evolution through the years

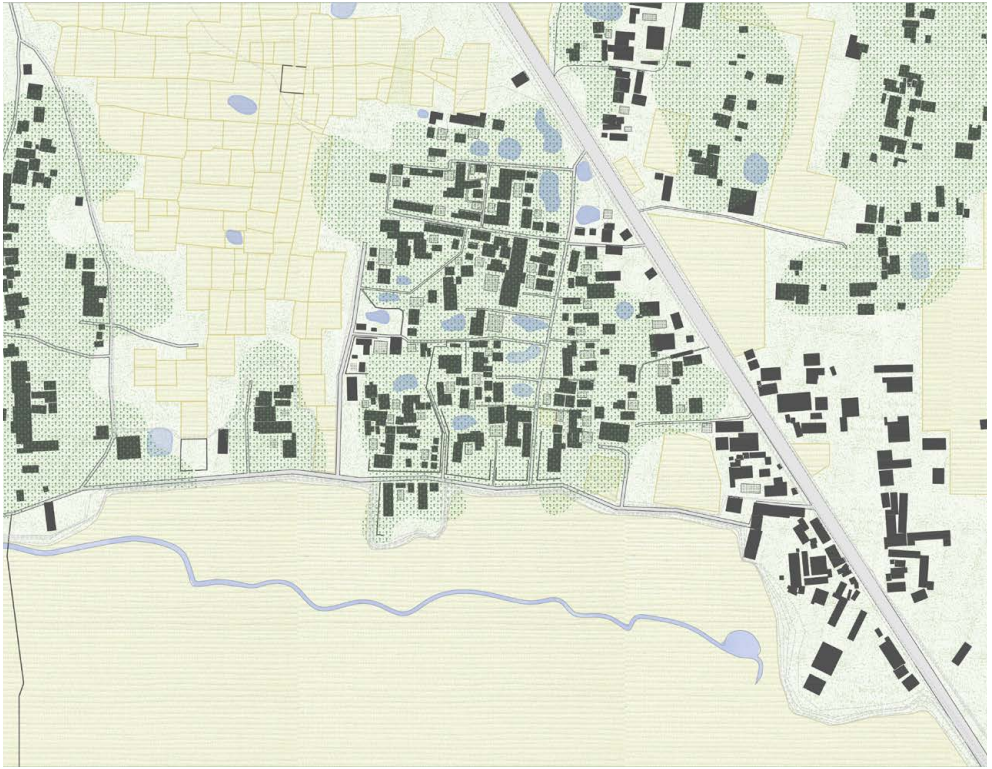
The settlemrnt goes back to 1947, when the British left and now Shonatola consists of around 250 houses and experiences flooding at least twice a year, typically lasting about 15 days each time. During these flood periods, many villagers seek shelter in the local school or mosque—key community structures that double as informal refuges. The extent of flood damage varies depending on the materials used to build each home. Earlier, houses were primarily made from mud, then bamboo, and more recently, brick. Today, many residents aspire to build with concrete—not just for durability, but also because concrete structures are seen as symbols of financial stability. This shift is creating visible contrasts between families and their perceived economic standing.

A small bazaar near the city side of the village plays a vital









DENSITY

9.03 ha

265 Households

22 hectares farm land

5-9 people per household

~ 1,988 people

FSI = 0.22

29 dwellings/ha

FLOODS

at least 2 times per year

~15 days

school as a shelter

INCOME

construction workers

selling their land

ciltivating land

role in the local economy, bringing income and foot traffic to the area. Surrounding agricultural fields—at varying elevations—remain central to Shonatola's identity, even as land use begins to shift.

For many households, farming is still a primary livelihood. However, the construction of the new road has cut through agricultural land, causing some families to lose part of their cultivated fields. At the same time, Shonatola's proximity to Sylhet has opened up new opportunities. Some residents now work in construction or trade; others have begun selling off land they no longer farm. In that way, Shonatola sits in a unique position—more economically active than remote haor communities, yet still deeply connected to the rural rhythms of land, water, and seasonal cycles.

During our visit to Shonatola, several residents pointed out that the safest homes are located near the southern road, which sits on a slightly elevated area. In contrast, the northern edge of the village—closer to the river—experiences much deeper flooding. People recalled water reaching up to their armpits during peak monsoon season in those lower-lying areas. While the main road generally remains dry, the surrounding southern fields are some of the lowest points in the village and tend to flood the most. Some homes still rest on traditional mud plinths, which makes them especially vulnerable to water damage.

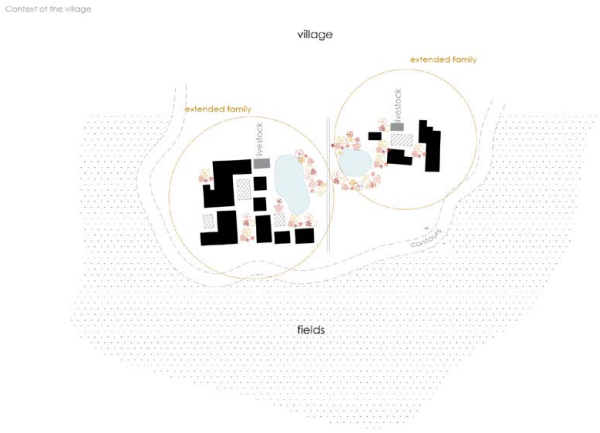
Despite growing urban pressures, the village remains relatively spacious. Its structure revolves around family courtyards, often built along embankments to avoid floodwater. The circulation network reflects an organic layering: car roads, main pedestrian paths, and smaller informal alleyways—many of which were added over time by residents themselves. This layered system of access and movement

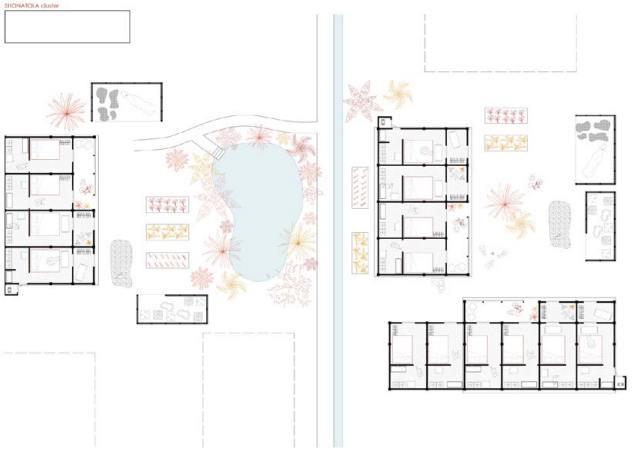
will serve as an important reference for any future development, ensuring that both community life and flood resilience are maintained.

Although Shonatola is a village where most people know each other, the layout of the housing clusters reflects a clear desire for privacy. Homes are often arranged inward, with their more closed-off façades or backsides facing the street. Occasionally, a small doorway from the kitchen opens onto the street, but more often, privacy is reinforced through landscape elements—like ponds acting as buffers between the home and public paths. These ponds, surrounded by lush vegetation, are not only practical but meaningful; families keep ducks there, which they may cook for guests or on special occasions.

Bathrooms are located outside the main house, and courtyards shared between extended family members or close neighbors—usually up to eight households—form the social heart of each cluster. These shared spaces are multipurpose: women gather there to cook, dry crops, prepare animals for meals, or form informal kitchens for heavier tasks like cleaning fish or poultry. In general, everyday life in rural Bangladesh spills into the outdoors, shaped by both climate and community.

The bonds among villagers are strong. After the devastating 2004 floods, residents pooled their resources to help one another rebuild more resilient homes. Many still dream of constructing taller, more durable buildings, but for most, financial limitations remain a barrier. During our visit, we noticed new houses being built either close to the main road—reflecting urban influence—or deeper inside the village, where construction workers were often building their own homes.





Despite having a school nearby, some families struggle to afford formal education. A few residents shared that they sometimes prefer to keep children at home to help in the fields. However, there is growing awareness of the long-term value of education, and government efforts are un-

CASE STUDIES + DESIGN PRINCIPLES

In translating my research into a design project, I drew inspiration from three key case studies that reflect the principles I wanted to carry forward: replicability, incrementality, and material economy. The first was Belapur Housing by Charles Correa, which I had already studied extensively during our design research phase. Alongside that, I looked at Correa's Squatter Housing project and Quinta Monroy Housing by Alejandro Aravena.

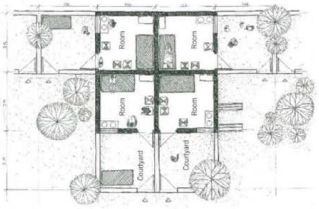
These precedents informed both the structure and spirit of my proposal. Since the development is meant to house displaced people—strangers to one another—it was crucial to create a sense of connection. I focused on shared courtyards as central organizing elements, drawing from both precedent and what we observed in the field in Bangladesh. These spaces offer not just functionality but also familiarity and community.

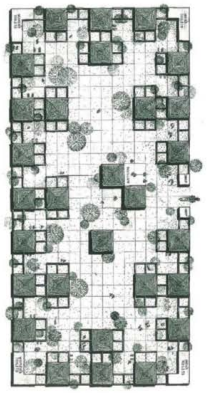
Another important concept that emerged from our housing research was the role of thresholds. In many Bangladeshi homes, thresholds aren't just physical—they are cultural and social, helping mediate the transition from public to private life. I wanted to integrate this subtle but powerful spatial language into the design, allowing for both individual dignity and communal interaction.

Squatter housing

Charles Correa

REPLICABILITY

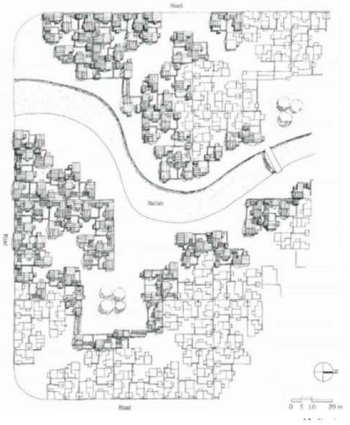




Belarur housing

Charles Correa

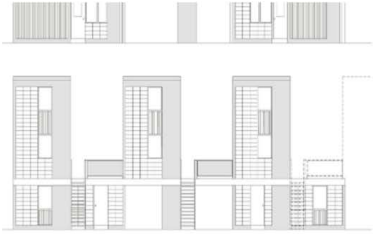
COURTYARDS - INCREMENTAL

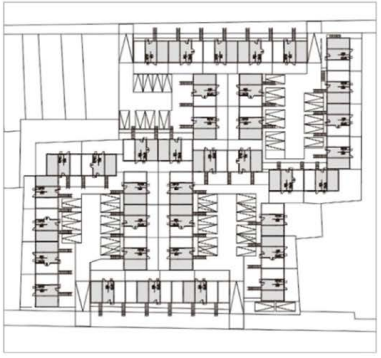


Quinta Monroy housing

Alejandro Aravena

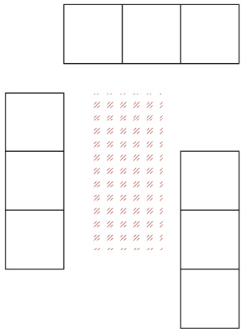
ELEMENTAL - HALF HOUSE



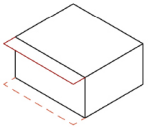


Design Principles

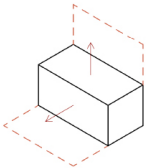
courtyard



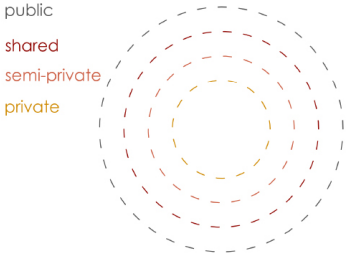
threshold



expansion



private-public



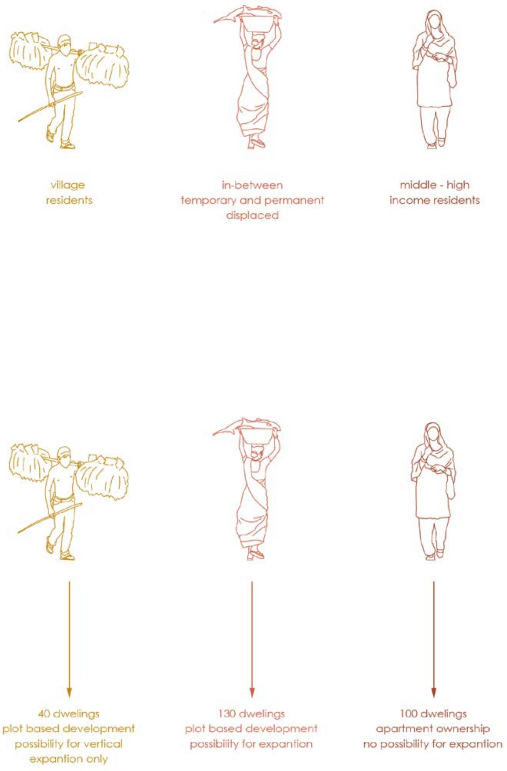
MATERIAL ECONOMY

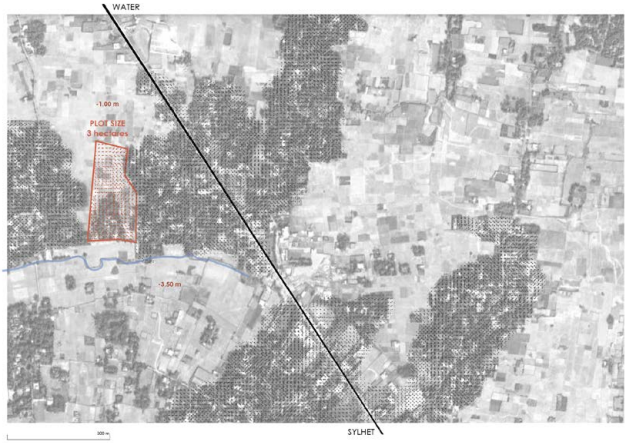
P2 PRESENTATION

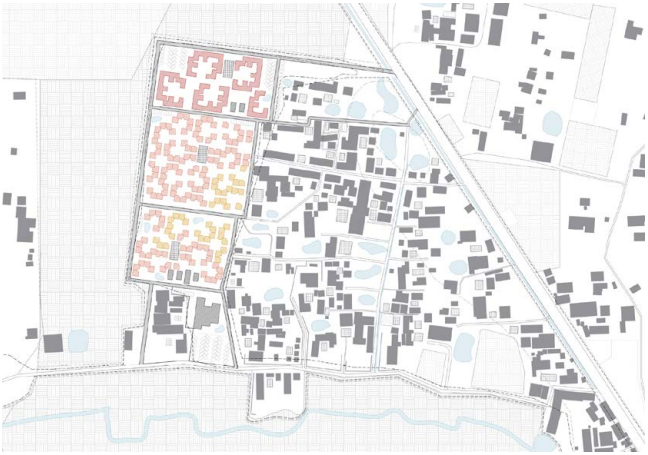
For Phase 2 of the project, I wanted to focus more deeply on the communities I aimed to house and how they relate to the broader categorization of displaced people. The idea was to locate the new development north of the South Street, in an area that's relatively safer from flooding. This location would serve as a natural extension of the existing village, rather than a separate, isolated intervention.

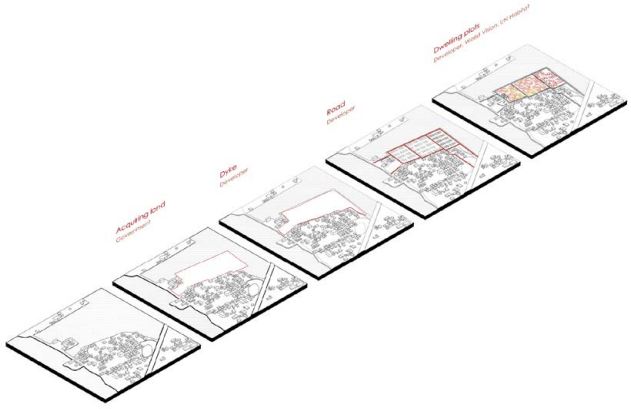
To ensure long-term resilience, the development would be built on an embankment, providing protection from future floods. The homes themselves would be organized around shared courtyards, encouraging a strong sense of community, daily interaction, and collective ownership of space.
The new neighborhood would be designed to accommodate three key groups:
-Displaced families, who would occupy the majority of the space
-Some of the existing village residents, who may want to relocate within a safer area
-middle-income group, potentially drawn by urbanization .

This mix of residents reflects the evolving socio-economic fabric of many peri-urban areas in Bangladesh, and aims to create a community that's not only inclusive but also adaptive to future demographic shifts.



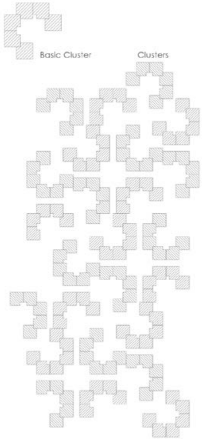

WATER
-1.00 m
PLOT SIZE
3 hectares
-3.50 m
SYLHET




Acquiring land
Dyke
Road
Dwelling plots

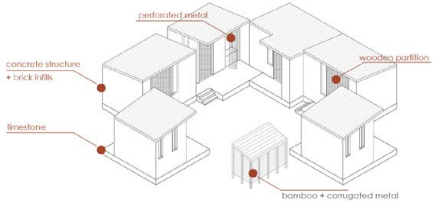

village residents
30.7 sqm
56.3 sqm

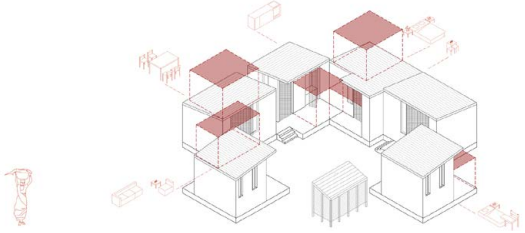

middle - high income residents
57.6 sqm
72.6 sqm

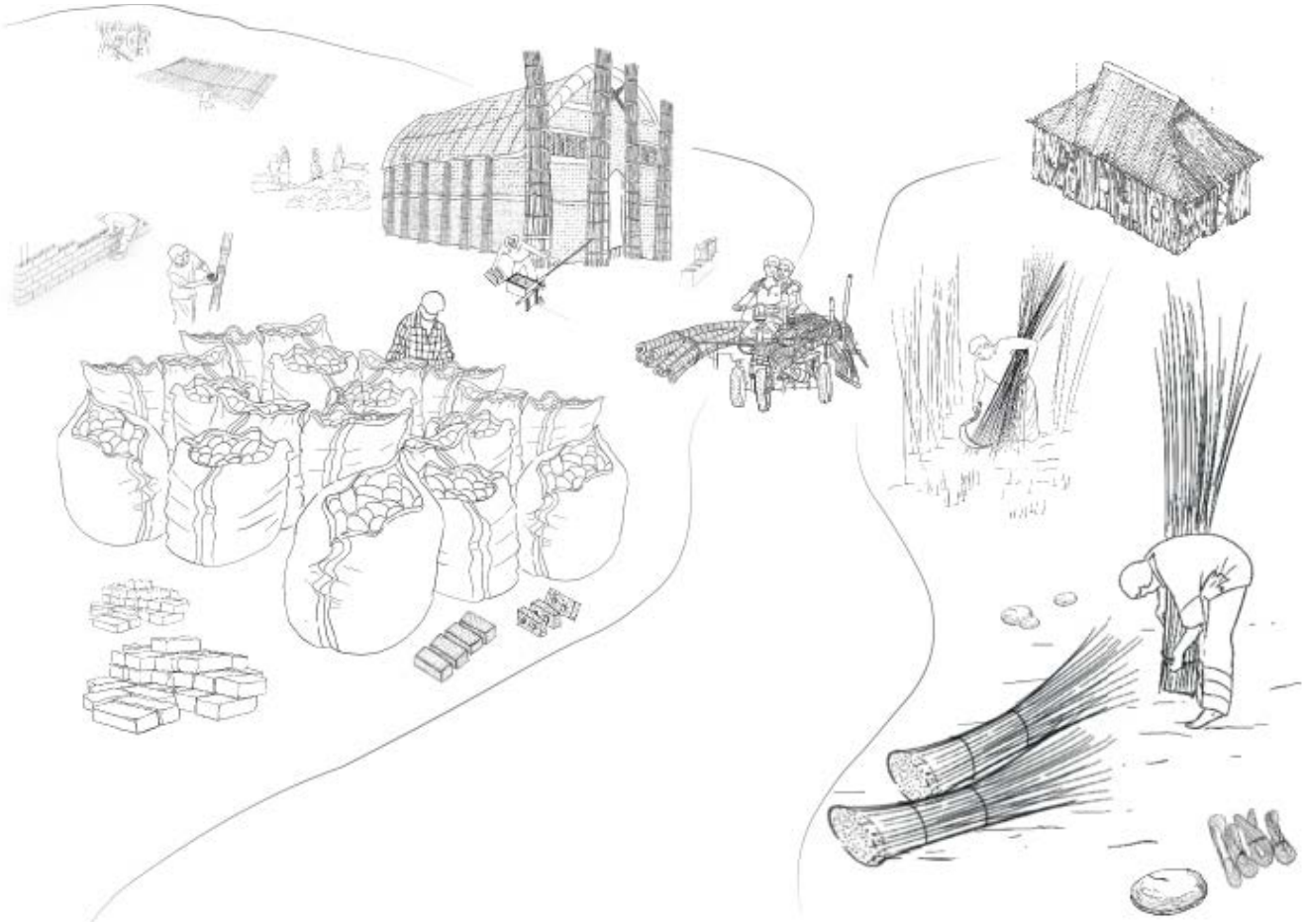

Basic Cluster
Clusters


displaced
28.2 sqm
23.6 sqm
16 sqm


91.3 sqm
120 sqm


perforated metal
concrete structure + brick infills
wooden partition
limestone
bamboo + corrugated metal



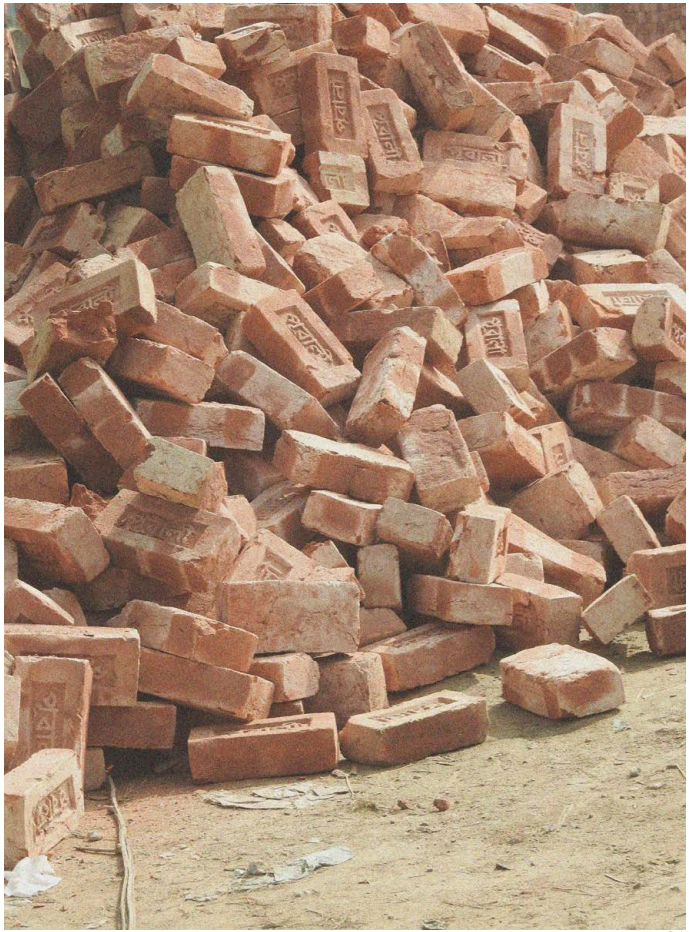


MATERIAL RESEARCH

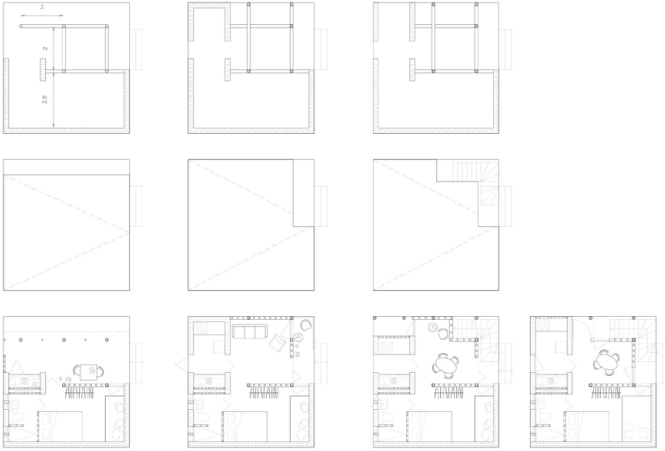
To better understand how to build responsibly and contextually in Bangladesh, we were asked to research local materials and construction techniques, divided into four main categories: baked brick, concrete and lime, bio-sourced materials (like wood, bamboo, and fibers), and geo-sourced materials (such as raw earth and stone). Each group focused on just one category, analyzing it through the lens of Sylhet's local context and expanding to the rest of Bangladesh when needed. This collective effort helped us create a shared foundation of knowledge around the materials most relevant to building in the region.

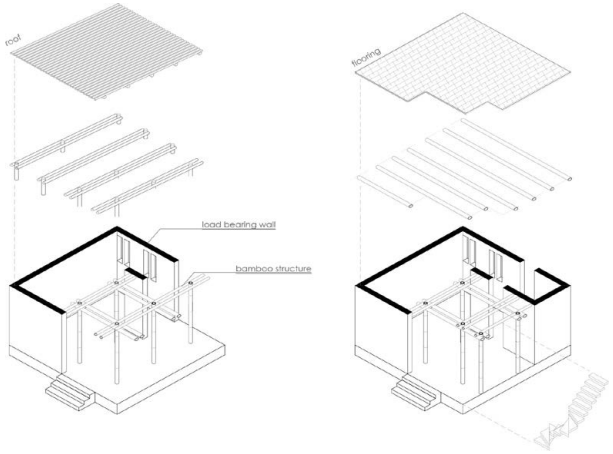
I joined the concrete and lime group because lat first I had imagined working with a column-beam concrete structure. However, through the research, we learned that almost all the concrete used in Bangladesh is imported, which raised concerns around cost, sustainability, and local accessibility. That realization made me rethink my approach.

One of my core values for the project was affordability, so I pivoted toward using locally available materials instead. I decided to work primarily with baked brick and bamboo. There are brick factories located near the village site, and bamboo grows abundantly on-site, making both materials not only practical but also environmentally and economically appropriate for the context I'm working in.



P3 PRESENTATION





PROPOSAL

Bangladesh is one of the most climate-vulnerable countries in the world. It's a low-lying delta, shaped by three major rivers. These rivers define its rapidly changing landscape—lush and fertile in the dry season, but prone to extreme flooding and erosion during the monsoon.
The tropical climate—with its hot, humid summers and heavy rainfall—makes things even more difficult.
One of Bangladesh's natural defenses is its vast wetland systems, known as haors. These wetlands act as seasonal buffers, absorbing excess water during monsoon floods. Nearly 20 million people live in and around these wetlands, adapting to yearly cycles of flooding and drought.

But the challenges don't end there. Sea level rise is an accelerating threat. In some coastal areas, sea levels are rising faster than the global average.
By 2050, sea levels in Bangladesh could rise by up to 30 cm—potentially displacing around 900,000 people.
When floods strike, families lose their homes, crops, income—and are often forced to migrate.
Though Bangladesh is the sixth-largest migrant-sending country globally, internal migration is even more significant—about three times higher. People move not only because of climate disasters, but also due to poverty, erosion, and urban pressure.
The government has defined three categories of internal displacement:
Temporary: People return within six months.
In between temporary and permanent: People leave frequently but don't settle permanently.

Permanent: People resettle far from their original homes.
A 2014 government survey across nine districts found that only 13% of people had never been displaced.

When floods come, families often leave by boat, carrying only the essentials. Emergency shelters—like multi-story schools—have become lifelines. But these are often overcrowded, with no space for livestock, leading to further loss of income.
A 2010 workshop by the Association for Climate Refugees revealed that many people prefer to stay near embankments, hoping to return home. But eventually, about 30% move to cities, adding pressure to already overburdened urban centers.
Most end up in informal settlements near water, living in

poor conditions, under bridges or in parks—hoping it's temporary.

This leads to a central question:

Why are solutions for displaced communities always temporary, when disasters happen again and again?

As Dhaka and other megacities continue to grow, the government has explored a new strategy: relocating climate-displaced people to peri-urban areas, where they can rebuild their lives with dignity.

One such place is Sylhet—a regional hub with a population that's expanded rapidly over the last 40 years.

As the city grows, it stretches into rural zones—especially toward the northwest, with developments like a new jail and Marine Academy creating a new urban "pole."

At the center of this area lies the village of Shonatola, just 6.8 km from Sylhet's city center.

Looking at historic photos and satellite data, we found that flooding patterns in Shonatola have been fairly consistent. Some fields flood deeply, others drain faster.

Settlements are built along raised roads and embankments, clustered near ponds and rivers. The village floods about twice a year, for around 15 days each time.

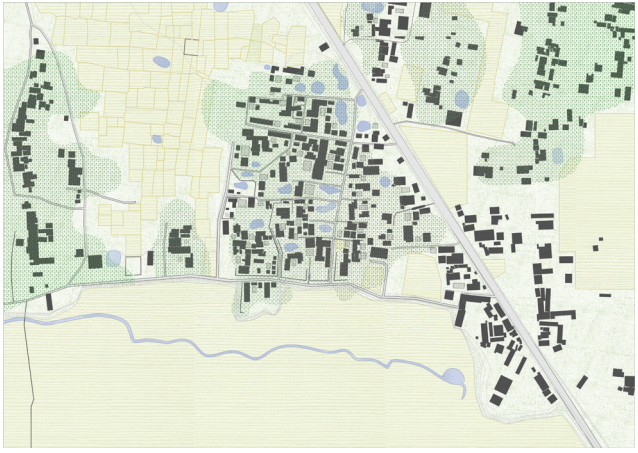
Recently, a new wide road and gutter system was built, connecting Shonatola to the city sewer network—marking a shift toward urbanization.

At key intersections, we find:

A school, also used as an emergency shelter.

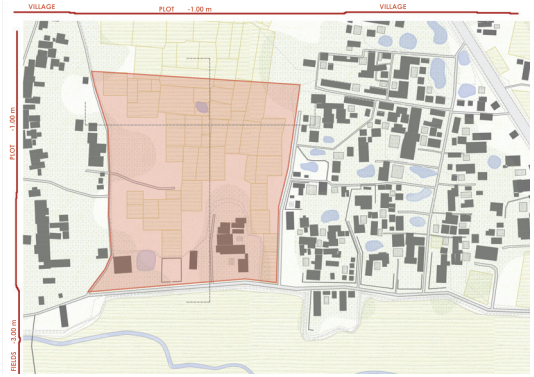
A community center for overflow shelter.

The Shonatola bazaar, a hub for local income.



Even though Shonatola isn't a haor, it shares strategies with haor villages:
Homes are built on raised plinths or stilts.
Villages form along embankments.
Fields are designed to flood seasonally.
Shonatola's proximity to Sylhet gives it an edge: Some residents now work in construction, while others sell unused farmland for income.
Climate-displaced families from haors face similar challenges:
Insecure housing
Lost livelihoods
No long-term flood protection

So what if we built new housing for climate-displaced families here? This aligns with Bangladesh's national adaptation plan:
Relocate people from overcrowded cities into resilient peri-urban settlements.



village residents

climate displaced

village residents

need for better living conditions

income generation

flood proteciton

climate displaced

need for better living conditions

income generation

safe and permanent housing solutions

Here's how the project would work—step by step:

Identify the Most Vulnerable:
A survey will assess income, housing conditions, and flood exposure.

Ensure Fair, Transparent Selection:
A neutral third party ensures priority goes to those with the highest need.

Secure Funding
Use national and climate resilience funds for land, infrastructure, and pilot units.

Start Small, Then Scale
Begin with a pilot, evaluate outcomes, then expand.

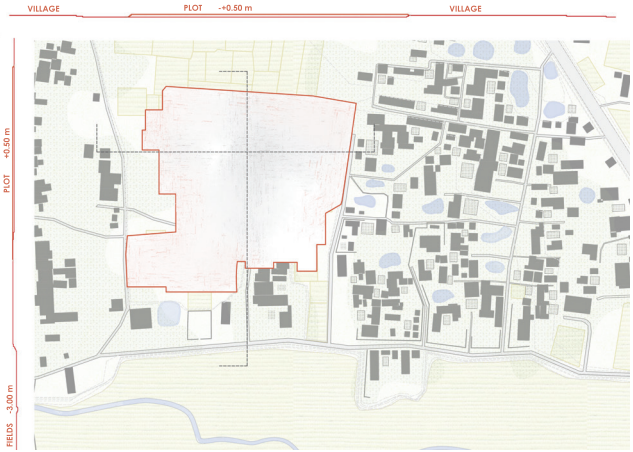
Involve the Community
Residents co-design homes. Feedback loops help improve each phase.

A quote by architect Yasmeen Lari reminds us: *"As architects, we must act with humility, learning from the traditions and lived experiences of local people."*
Though I researched and visited extensively, I'm still an outsider. So I grounded the design in ethnographic research and direct conversations with residents.

Beneficiary Identification	Selection Framework	Funding Allocation	Implementation & Scaling	Participation & Feedback
Baseline survey	Prioritize the most vulnerable households	Capital from national and climate funds to cover land, infrastructure	Pilot then scale based on impact evaluation	Establish feedback channels Co-design







Urban strategies

The site lies in a low field between two villages. It connects to the south road, with a new north-south access route. The plan is denser than the village, reflecting urbanization—yet it retains a rural rhythm.

The masterplan is denser than the existing village, reflecting increasing urbanization. But it still maintains a rural character—blending into the surrounding landscape and aligning with local ways of life.

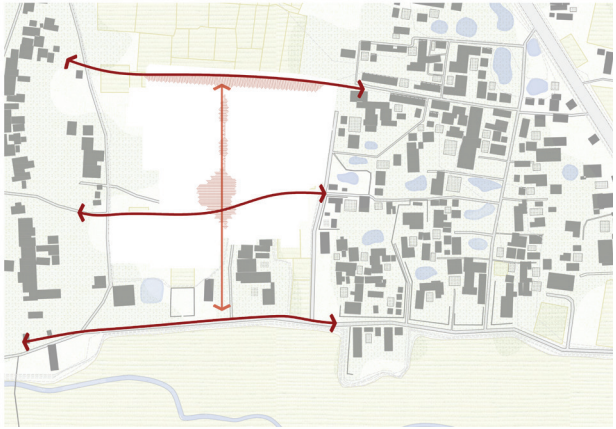
The site for the new development is between two villages, in a field that's about one meter lower than the southern road and 1.5 meters lower than the main road. The two villages will now be connected, and a new north-south connection will link the new development directly to the south road. The existing village is still not too dense. It's organized around family courtyards, mostly built on embankments. There is always space for livestock and gardens as well as natural elements that we will dive into later.

To protect against flooding, I propose building a new embankment. This embankment will be slightly higher than the village, matching the level of the main road. But if the water is blocked entirely, it may flood neighboring areas. So, there was a need for buffer zones on the sides (2 meters excavation) and a channel (4m) in the center to let excess water flow from the fields to the river. The soil excavated will be reused to build the embankment itself, keeping the process efficient and cost-effective.

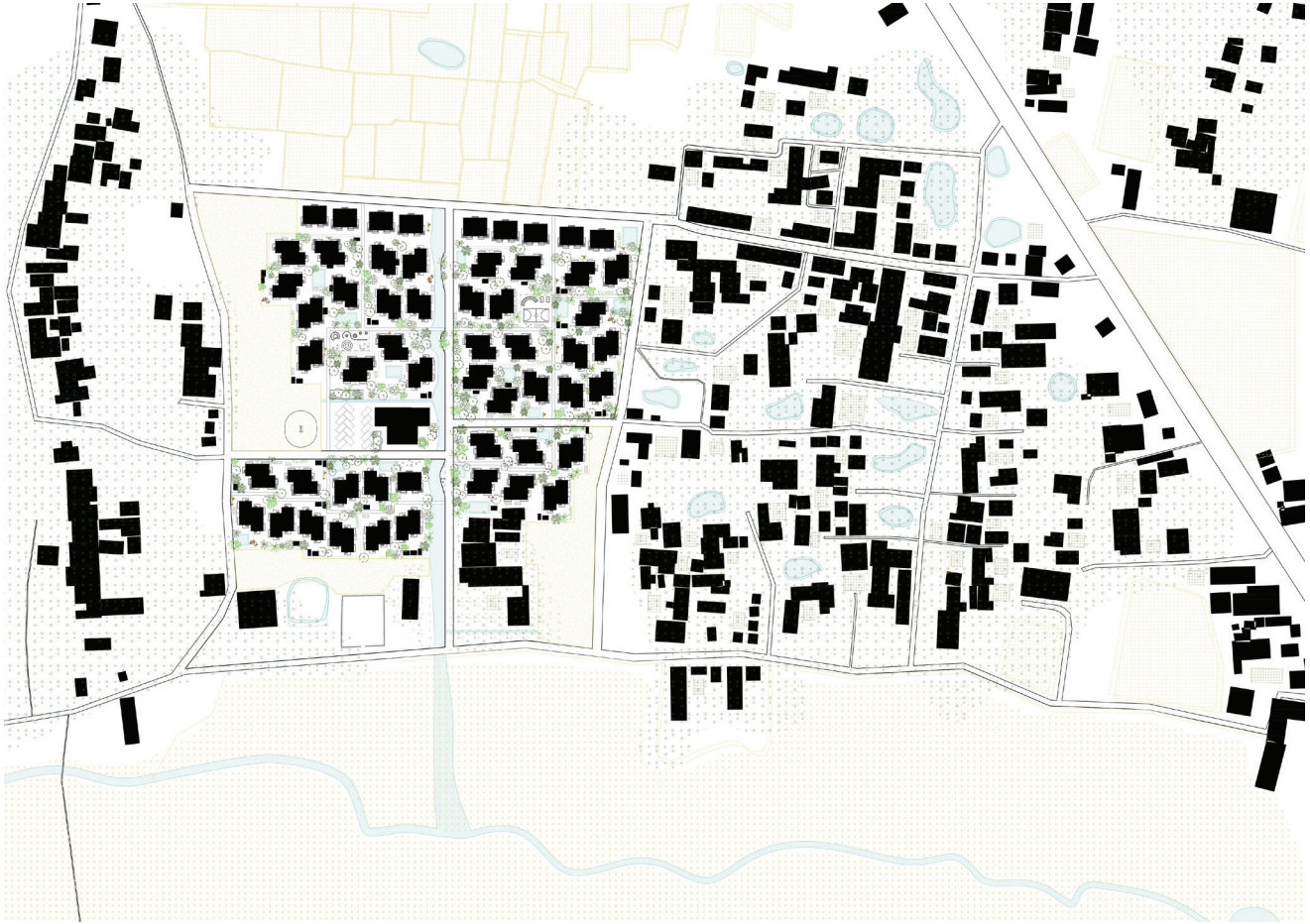
At the intersection points of the new roads, public spaces will be introduced—creating shared infrastructure and natural gathering places. The car roads will provide the fastest access and will be the only places where vehicles

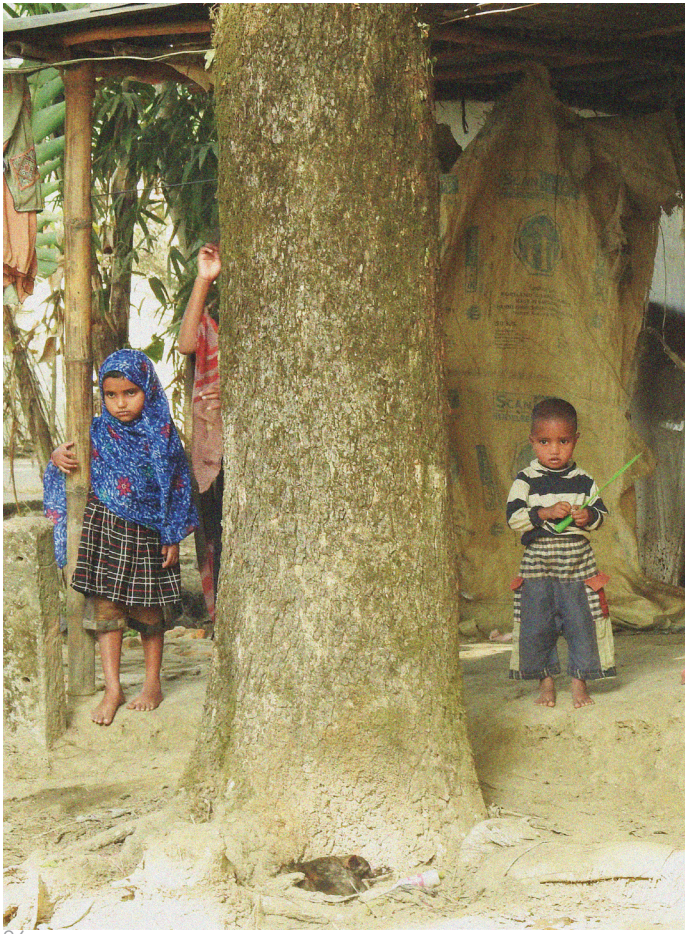
are allowed. The main pedestrian paths will cut through the settlement, with smaller and secondary paths leading to clusters and fields.
Public services will be placed near the car routes for easy access. Communal ones will be placed in the center of larger residential clusters. The northern street will become a market street. Its location near the fields and main road makes it ideal for trade and local business.
A large public building will anchor this side of the development. Its ground floor will be open to the public; the upper floor will contain community rooms, workspaces, and workshops to support income generation and housing expansion guidance. The building stands out from the east entrance and during flooding season will also be used as an emergency shelter for the neighboring villages.

existing streets profiles




market
playground
picnic area
exercise
garden
multi-purpose lawn
workshop
communal-1st floor
cafe
library
public -ground floor





Dwelling

In South Asia, the terms Kutcha and Pucca describe the materiality and permanence of housing. Kutcha houses are temporary structures—built with mud, bamboo, or tin. They are cheap and quick to construct but lack durability. Pucca houses, on the other hand, are permanent—built with brick or concrete. They offer longer-lasting shelter and greater protection, especially in flood-prone areas.
This project began by asking: How can we balance the temporary with the permanent? How can we provide both safety and flexibility?

Each family receives a 6 by 6 meter plot, raised on a flood-proof plinth. The plot is divided in half:
One half is Pucca—built and ready to move in, with all essential functions.
The other half is Kutcha—a basic frame only, allowing families to expand over time.
The design uses both brick and bamboo, balancing sustainability and affordability.

The Pucca section has load-bearing brick walls built with lime mortar, so the bricks can be reused if needed. One corner is reinforced to hold a water tank.
The Kutcha half is made with a bamboo frame, bolted together and raised off the ground on metal footings—to protect the bamboo from water. The detachable roof, made of bamboo and clay tiles, can be reused for vertical expansion in the future.

KUTCHA

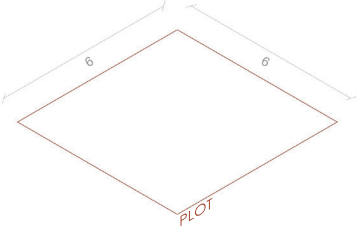
temporary or semi-permanent structure built using natural or locally available materials

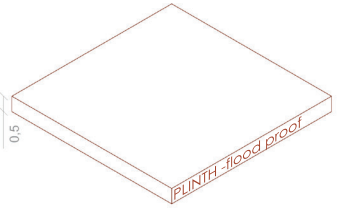
"unfinished" "temporary"

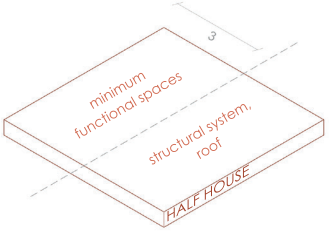
PUCCA

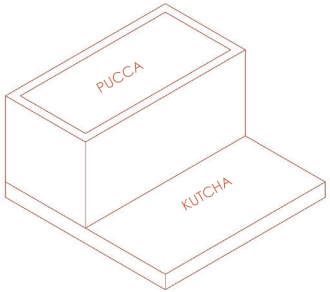
permanent structure built with durable, engineered materials

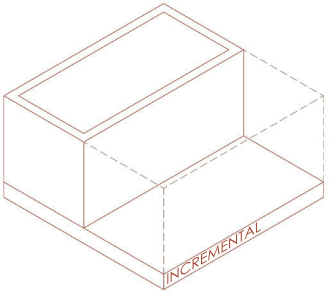
"finished" "durable" "permanent"

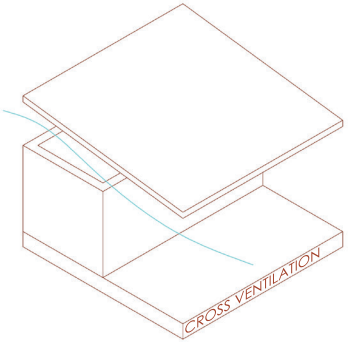

6
6
PLOT

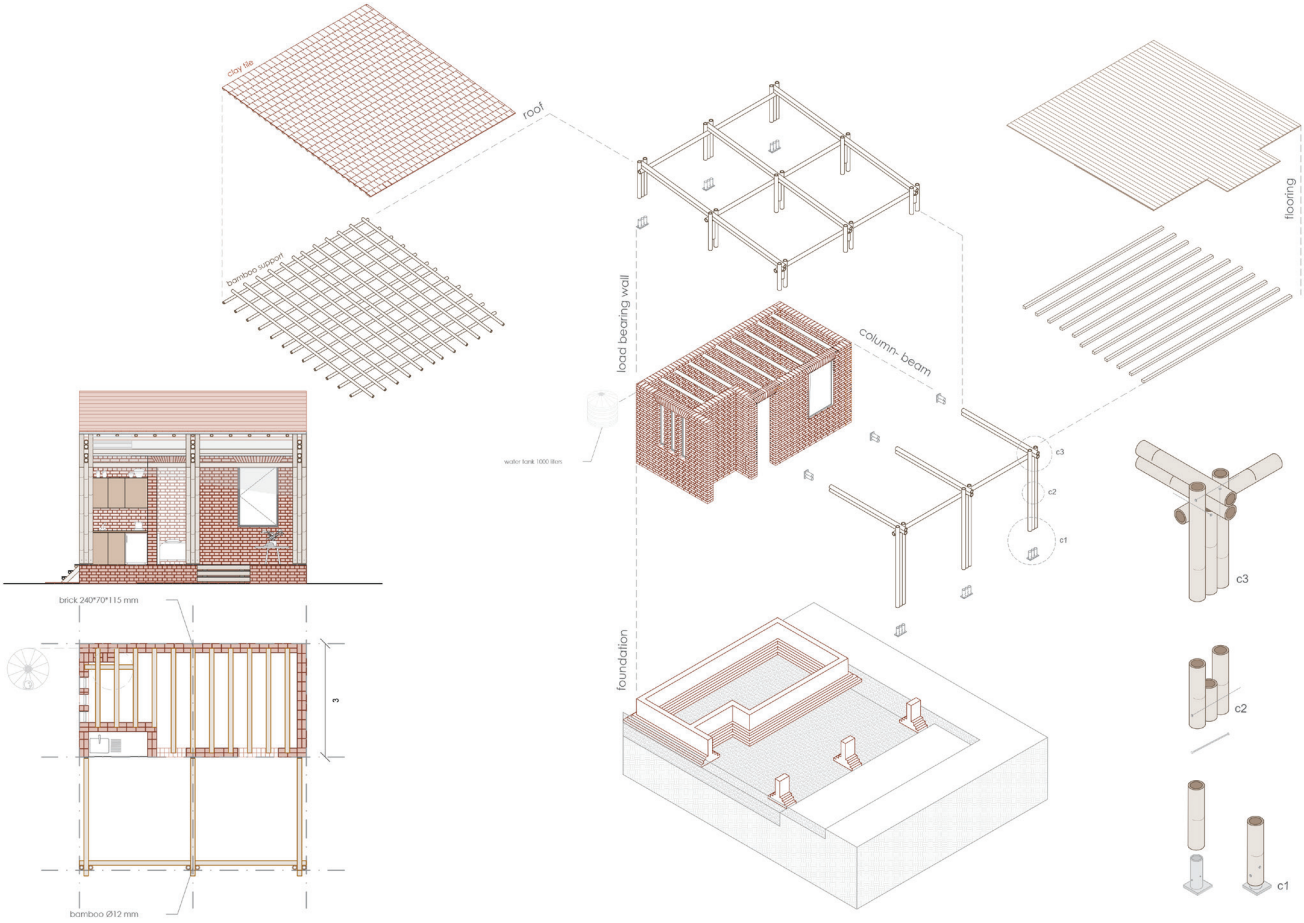

0,5
PLINTH - flood proof


3
minimum
functional spaces
structural system,
roof
HALF HOUSE


PUCCA
KUTCHA


INCREMENTAL


CROSS VENTILATION

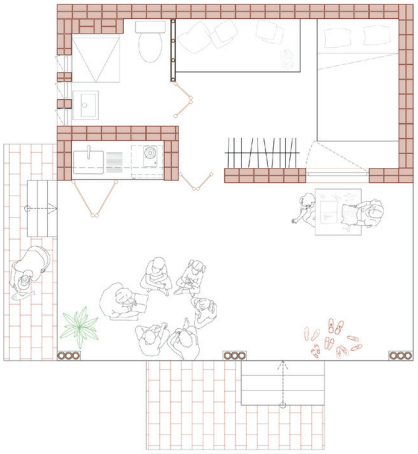

clay tile
roof
bamboo support
load bearing wall
column- beam
flooring
water tank 1000 liters
c3
c2
c1
foundation
brick 240*70*115 mm
3
bamboo Ø12 mm

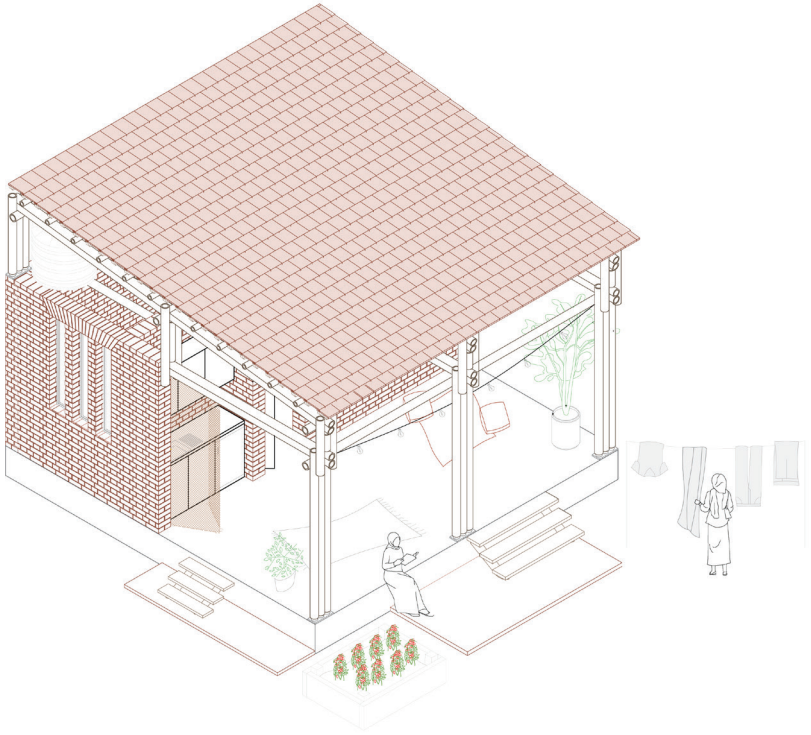
Type A: A simple, one-storey unit with essential indoor spaces. The kitchen is outside, with a paved 'dirty kitchen'—used for slaughtering animals or cleaning fish. Even though only half the plot is built, the entire space remains active and usable, especially in a context like Bangladesh, where much of life happens outdoors.

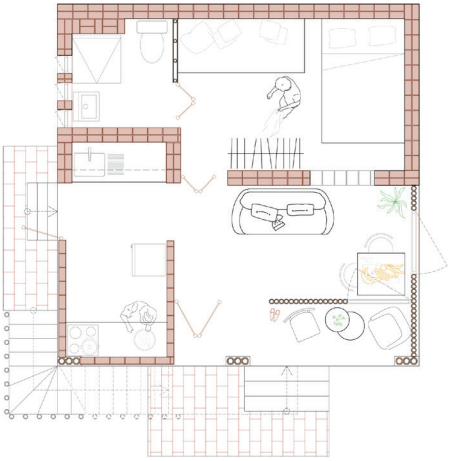
Type B: A two-storey version with an external staircase. This allows multiple families to share one plot, or for parents to build a floor for their children—or even rent out the upper unit. Each floor has a separate entrance. The base Pucca structure is the same as Type A, meaning that residents can upgrade over time.

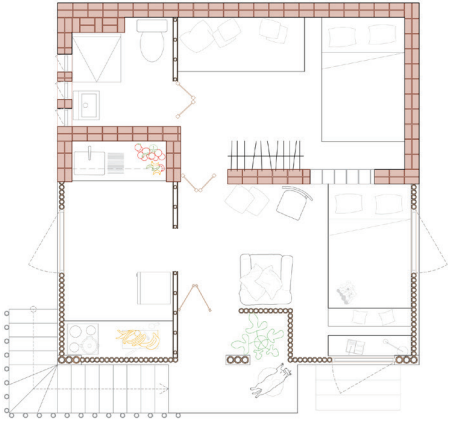
Type C: Also two-storey, but with a small shop at the rear, opening onto the market street. The shop is accessed from the Pucca side and supports small businesses and income generation. This unit is placed along a key route, where the market meets the fields—allowing people to sell their crops and handmade goods.

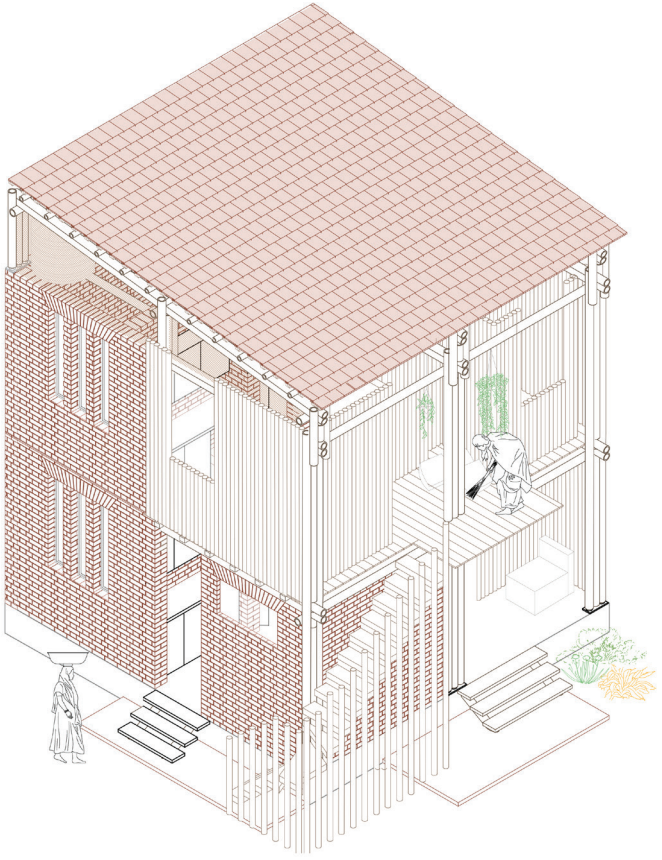
At the heart of the system is incrementality. Residents can adapt their homes over time, using bamboo for temporary extensions, or brick infills for permanence.
The base structure stays consistent, which means resources, tools, and building knowledge can be shared. This lowers costs and helps families help each other.
Blueprints and instructions for expansion will be available in the communal building, making it easier for anyone to modify their home safely and affordably.

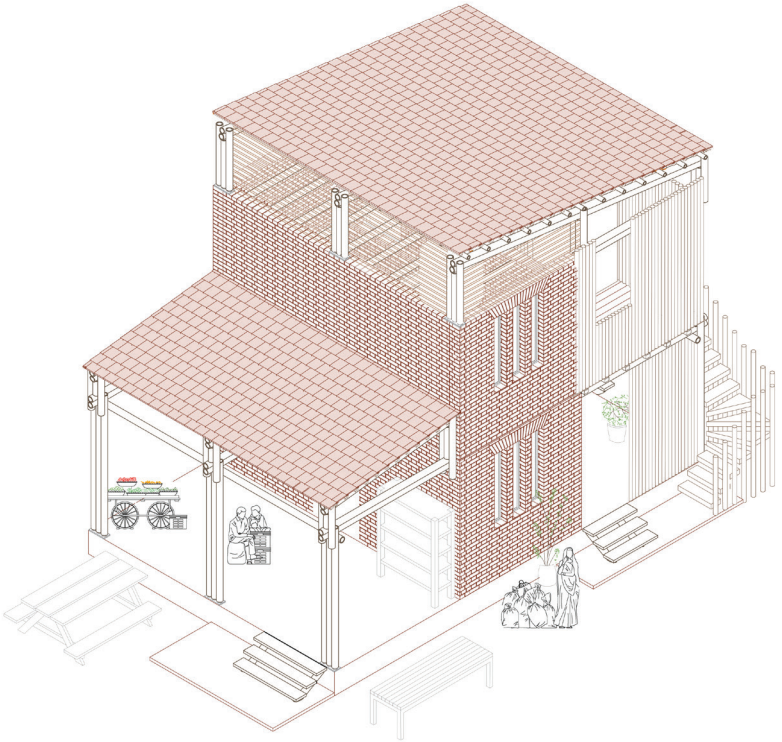






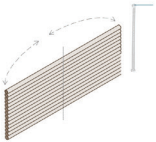




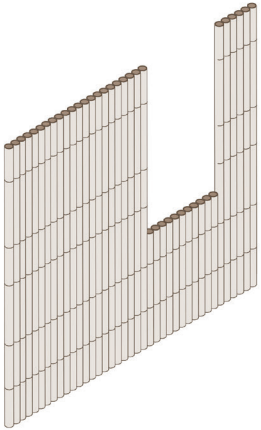


bamboo
perforated doors

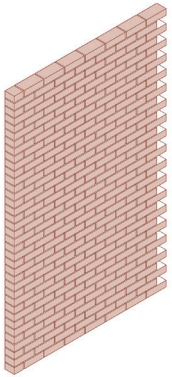
bamboo
partition wall



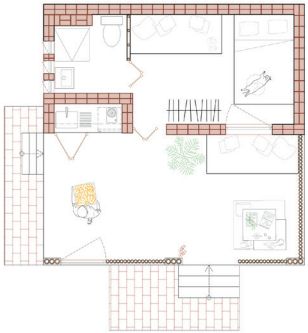
bamboo
rotated roof shutter

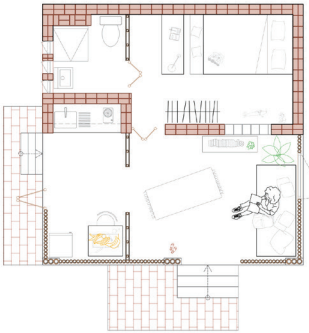


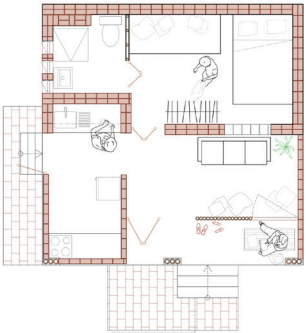
bamboo
exterior wall

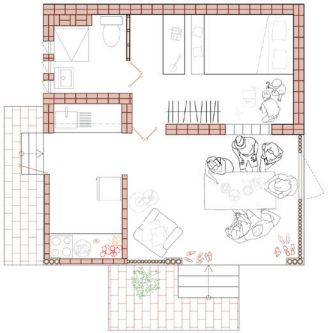


brick
exterior wall





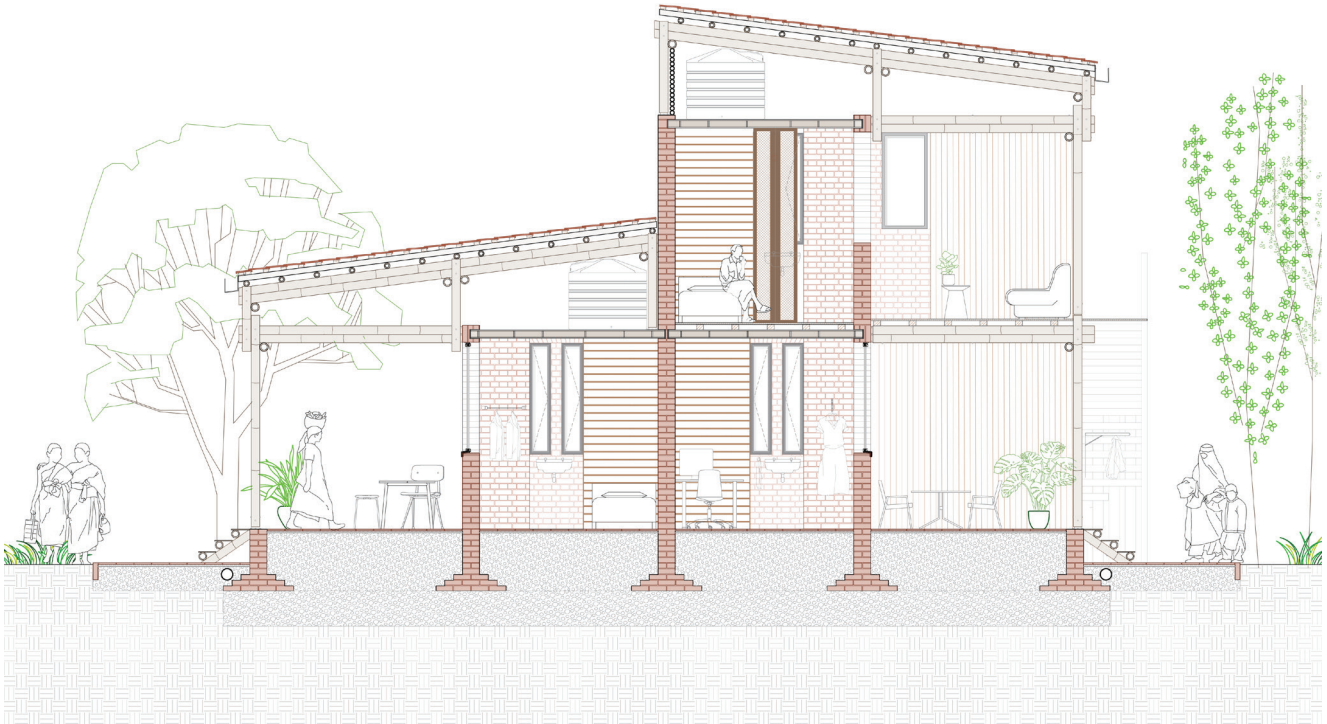




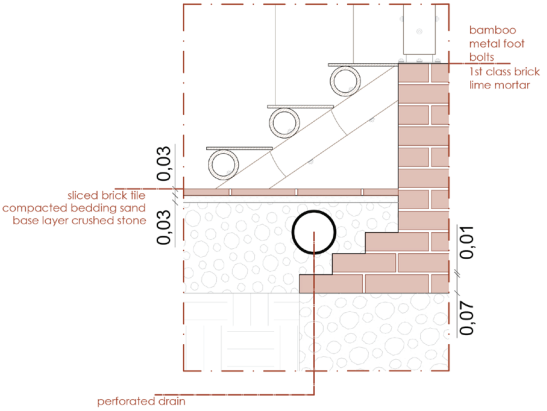
The roof is sloped to ensure rainwater flows directly into the gutters. It's also slightly lifted to allow cross ventilation, keeping the interior cool in hot weather. The foundation is made of brick, and the entire plinth is raised half a meter above ground level for flood protection. The wooden elements will be locally sourced from the wood shops in Shonatola Bazar.

Below the tiles and bricks, there are perforated layers that allow rainwater to seep through and be absorbed safely. Now, in cases where a single-storey house sits next to a two-storey one, there's a risk of rain entering through the exposed part of the roof. To address that, I use rotating bamboo shutters—these can be closed during heavy rain or opened up for extra airflow when needed.

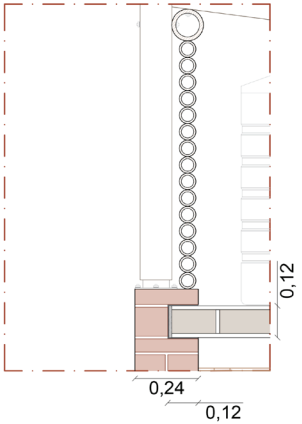
The entire dwelling system is based on low-engineering solutions that prioritize affordability, resilience, and user control. It's not just a house—it's a flexible framework that responds to both environmental risks and the changing needs of its residents over time. The total cost of one unit comes at 13k takka.



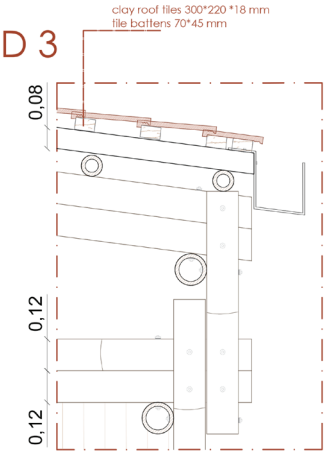
D 1

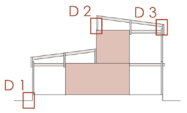

bamboo
metal foot
bolts
1st class brick
lime mortar
0,03
sliced brick tile
compacted bedding sand
0,03
base layer crushed stone
0,01
0,07
perforated drain

D 2

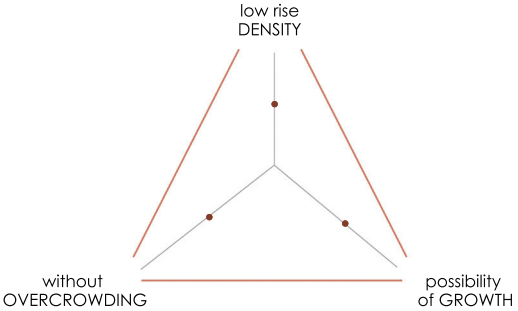

0,12
0,24
0,12

D 3

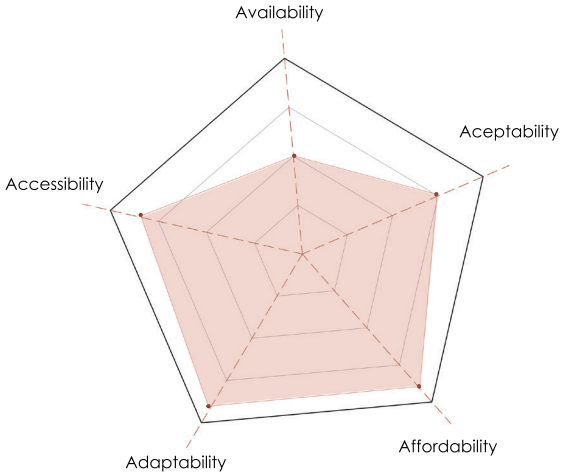

clay roof tiles 300*220 *18 mm
tile battens 70*45 mm
0,08
0,12
0,12


D 2
D 3
D 1

Social Housing



The 5 A's for
Adequate Housing



MATERIAL COST

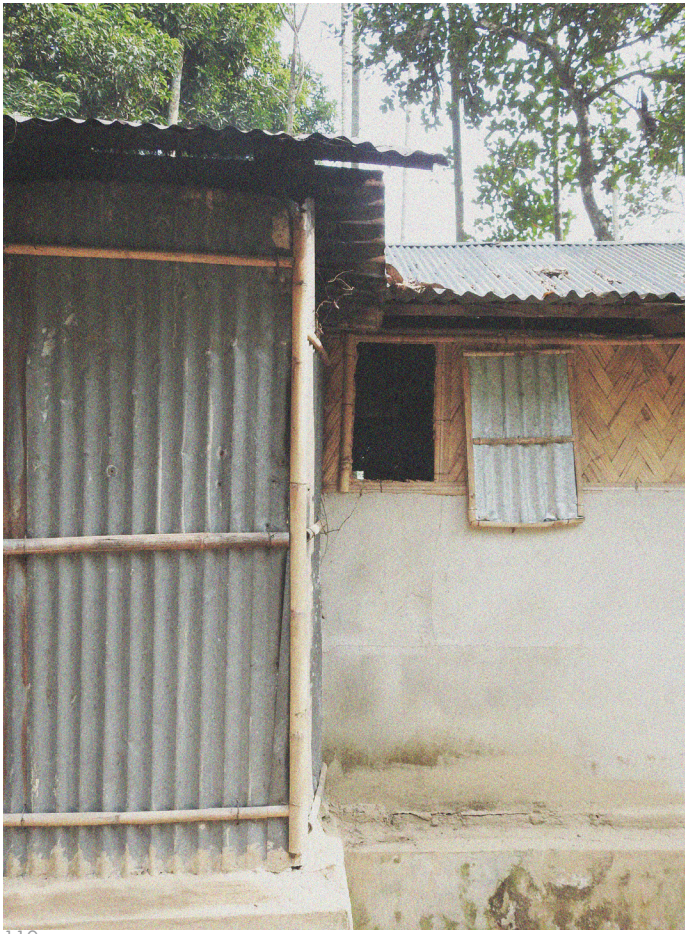
first class brick - 10 BDT

sliced brick tile - 12 BDT

flat clay tile - 15 BDT

12 feet bamboo (d 12 mm) - 30 BDT

8 feet bamboo (d 10 mm) - 20 BDT

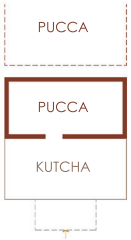


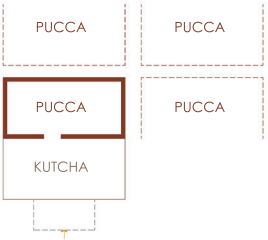
Cluster

Building on an embankment ensures that the soil remains fertile and that the new development stays in harmony with its natural surroundings. Over time, the village expansion will blend into the landscape, allowing greenery to reclaim space between structures and along the riverbanks.

To achieve both affordability and efficient use of materials, the housing types follow a mirrored layout. First, two units are mirrored along their Pucca sides, sharing the longest wall. Then this pair is mirrored again, creating a group of four. These groups are shifted three meters apart so that the Kutcha sections never touch—preserving privacy and creating clearly defined boundaries for each household.

Ethnographic research informed much of the layout. In rural Bangladesh, homes often face inward for privacy, with streets running alongside blank façades or fences. Sometimes, families use ponds as natural privacy buffers, surrounded by lush greenery. Ducks might roam these spaces—raised for food, and slaughtered on special occasions or when guests arrive. Bathrooms are typically located outside, and shared courtyards—usually shared by up to eight houses—become important social spaces. Women gather there to cook, dry fish or cow dung, and prepare meals. These spaces are practical, flexible, and deeply rooted in community life.


PUCCA
PUCCA
KUTCHA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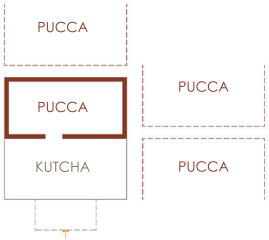
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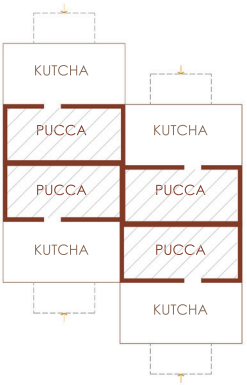
KUTCHA
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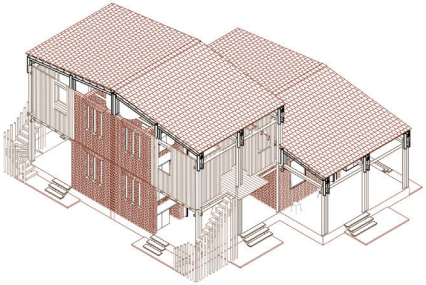
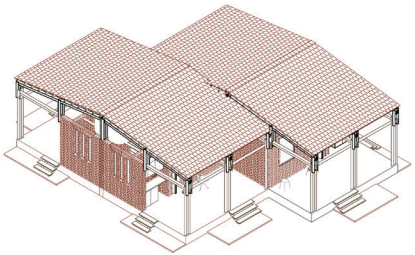
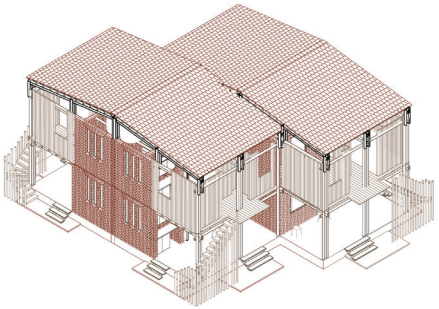


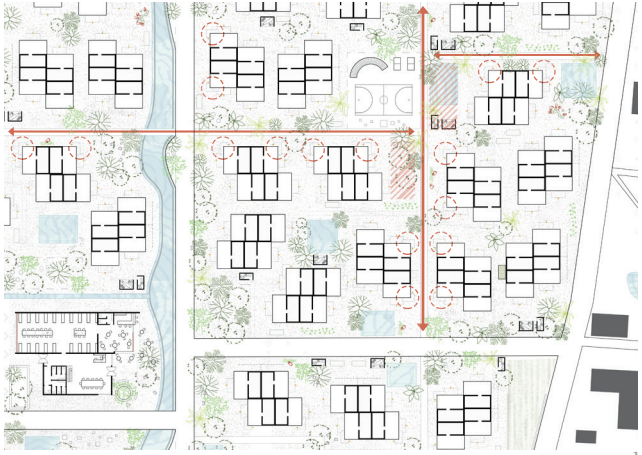




The final masterplan embraces these patterns. Organized around a 3x3 grid defined by the interplay of Pucca and Kutcha forms, it weaves together private and communal life. Ponds, green spaces, and a central water channel connect the new development to the existing village, making the transition feel organic and familiar. A car-access road runs through, but buffer zones soften the presence of vehicles. Dwellings are placed with Kutcha sides facing away from the roads, and when a side façade does face a street, gardens or sheds act as spatial filters—adding privacy and texture.

Trees are planted throughout, allowed to grow freely and define the character of the landscape over time. In some green pockets, residents can cultivate bamboo for future building needs or furniture—helping reduce long-term costs. Main pedestrian routes are paved and wide enough for gathering, while secondary paths vary in texture and size, signaling more private areas. This hierarchy of paths, from market streets to small garden trails, mirrors the hierarchy of space in the homes themselves.

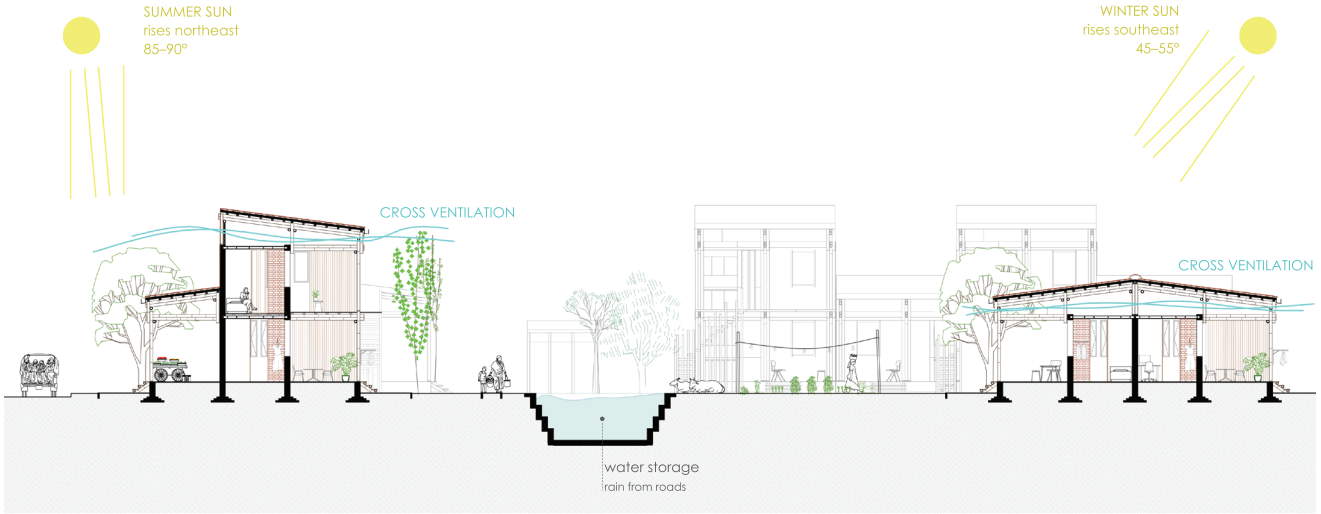
Dwelling placement follows the same logic. Two-storey homes are typically placed with their stairs toward the street, allowing for easier access and greater visibility. Meanwhile, green zones, sheds, and gardens are placed with intention—softening boundaries and creating moments of interaction without compromising privacy.

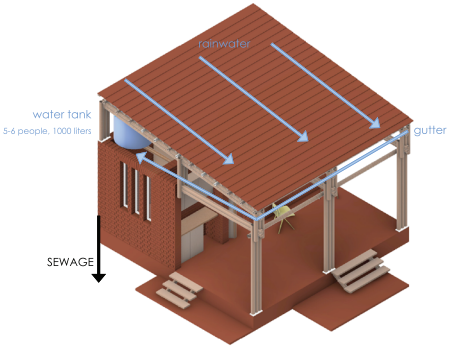


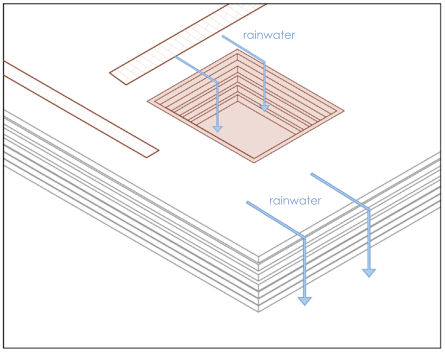
Privacy is deeply valued in Bangladeshi culture, and this project respects that. Public, private, and communal spaces interweave gradually. From the public market street in the north, one moves through a layered sequence of shared courtyards and semi-private thresholds, ending in the deeply personal Kutcha space at the rear of the home. Each unit includes a paved threshold, which residents can use in any way they choose—often as a transitional space between indoor and outdoor life.

The houses themselves are designed with sustainability in mind. All homes are cross-ventilated and harvest rainwater through sloped roofs. Water is collected in household tanks or small ponds located in the shared courtyards. During heavy rains, these ponds fill with water, absorbing runoff from surrounding paths and roads. As floods recede, their gently stepped edges reappear, transforming into spaces for gathering or resting. The collected water can be reused for livestock, cleaning, or gardening—creating a closed-loop water system rooted in traditional village practices. Just four meters below the housing level, residents can cultivate the land during the dry season.


PUBLIC
car road
SEMI PUBLIC
shop
PRIVATE
pucca
SEMI PRIVATE
kutcha
threshold
COMMUNAL
secondary road
pedestrian
courtyard
SEMI PRIVATE
threshold
kutcha
PRIVATE
pucca
pucca
SEMI PRIVATE
kutcha
threshold


SUMMER SUN
rises northeast
85–90°
WINTER SUN
rises southeast
45–55°
CROSS VENTILATION
CROSS VENTILATION
water storage
rain from roads


rainwater
water tank
5-6 people, 1000 liters
gutter
SEWAGE


rainwater
rainwater

Masterplan

Monsoon rains transform the entire landscape. Fields become waterlogged, ponds reach their full capacity, and the embankment becomes an island of safety and stability. The settlement is designed to adapt to these seasonal shifts—protecting homes while allowing nature to flow around them.

Communal spaces are scattered throughout the development to help residents orient themselves and come together. To the east, a playground invites children to gather and play. Further west, along the main pedestrian path, an open exercise area offers a quiet space to pause, rest, or socialize. These spaces become the connective tissue of the community.

Ultimately, the project will provide safe, long-term housing for 253 households. By combining raised plinths with flood-proof embankments, homes are protected from rising waters for the next 50 years. As time passes, some residents will enclose their Kutcha halves, build second stories, and add sheds or shops. This built-in flexibility encourages growth and adaptation over time.

This project is meant to be more than a single settlement. It's a pilot project—a scalable model for housing displaced communities across Bangladesh. Instead of slums or temporary shelters, we aim to offer a path toward permanence—a way to build with dignity, resilience, and a deep connection to local traditions and climate.


PLot = 2.6 ha
FSI = 0.52
GSI = 0.4
Dwellings = 253
Density = 88 dw/ha

REFLECTION

The relation between the graduation project topic, the master track and the master programme.

The graduation studio is grounded in the theme of architecture in transition, set within the rapidly growing second-tier city of Sylhet, located in north-eastern Bangladesh. The Sylhet region faces multiple challenges arising from increasing industrialization, internal migration, and the effects of climate change. In response, the studio investigates the broader context of the Sylhet division, with a focus on material culture, urbanization trends, dwelling patterns, and contemporary societal demands.

In alignment with the studio's theme, my graduation project concentrates on a specific and increasingly vulnerable population—climate-displaced communities. Situated in a village that is both flood-prone and undergoing rapid urban transformation, my project aims to reimagine patterns of inhabitation rooted in rural Bangladesh. The design proposes an extension and connection between two existing villages, intended to accommodate both displaced individuals and local village residents. The goal is to foster a shared, resilient community fabric.

This approach directly reflects the objectives of the MSc Architecture, Urbanism and Building Sciences program at TU Delft, which emphasizes innovative responses to pressing global issues, including urban densification, sustainable construction, and inclusive environments. Specifically, my project supports the goals of the Architecture master track by developing a strategy for affordable housing targeted at people forced to relocate due to environmental pressures. Moreover, it shifts the prevailing narrative from temporary disaster emergency shelters to permanent structures that can be flexibly adapted to the diverse needs of inhabitants.

Beyond the Architecture track, this project intersects meaningfully with other master tracks such as Building Technology, Landscape Architecture, Urbanism, and Management. It touches on sustainable construction methods, landscape resilience, urban integration, and socio-spatial governance, making it a multidisciplinary exploration of architecture in transition.

The influence of the research on the design and vice versa.

Research played a fundamental role in shaping the foundation of my thesis project, particularly in formulating the problem statement and establishing the conceptual framework. Through qualitative and quantitative data analysis, case study evaluations, and an extensive literature review, I was able to develop a nuanced understanding of the context and challenges. This evidence-based approach enriched the project's direction and helped articulate a grounded, well-informed design response.

The issue of internal displacement in Bangladesh is multifaceted, involving three main categories of affected populations: temporary, transitional, and permanent. Each of these groups requires context-sensitive solutions, such as return, local integration, or resettlement. Among these, transitional groups are particularly vulnerable, as they are unable to return to their places of origin and often lack the means for permanent relocation. While the Disaster Management Act (DMA) provides frameworks for emergency shelter and

post-disaster resettlement, it falls short of addressing the entire spectrum of displacement stages. Government relief typically targets specific disaster zones, but the recurring nature of floods and their wide-ranging socioeconomic impact call for broader, more inclusive strategies.

The cyclical nature of disasters in Bangladesh results in overlapping waves of displacement, with new groups entering temporary shelters before previous ones have been able to move on. This reality underscores the need for semi-permanent, resilient housing solutions that can accommodate extended periods of occupation without losing adaptability or cultural relevance.

Even though there was a struggle at first to translate my research to a project, I decided to focus on the dwelling itself as the epicenter of the everyday life and the transitional stage of the displaced people. Creating a space with affordability and transformative design embedded was key to get a final design approach, were a direct result of the interactive relationship between research, documentation in the field trip and design.

Although I initially struggled to translate research findings into a concrete design, I eventually identified the dwelling as the core of everyday life for my project and as a critical anchor for transitional communities. Focusing on the design of adaptable, affordable living spaces became the key to developing a coherent architectural strategy. The final design was the outcome of a continuous feedback loop between research, field documentation, and iterative design development.

Field visits, photographic documentation, and conversations with local residents and experts significantly influenced design decisions. Images and sketches from the villages I

visited were constantly referenced to inform functional layouts, spatial organization, and urban connections. Notes and insights gathered during these interactions grounded the project in lived experiences, shaping both macro and micro-scale strategies.

The value of the personal way of working (approach, methods, how the feedback from tutors was translated into my work).

My approach to the graduation project was both structured and adaptive, shaped by the organization of the studio and my personal methodology. The design process unfolded in four main phases, which occasionally overlapped and informed one another.

The first phase centered on the formulation of a personal manifesto—a guiding framework that shaped the entire design process. During this phase, I revisited my phase one case study if Belapur housing and the documentation I had gathered during my field trip to Bangladesh, including photographs, sketches, and interviews. I also studied videos and other visual materials to better understand patterns of everyday life. At the same time, I delved into research on funding models, case studies focused on affordability, and strategies related to incrementality, which helped me explore the nuanced spectrum between permanence and temporality in housing design.

In the second phase, the focus shifted to the dwelling scale. This allowed me to translate the lived experiences of displaced and rural communities into spatial and architectural terms. I spent a significant amount of time exploring diverse possibilities for inhabitation, investigating how space could adapt to the evolving needs of its users while remain-

ing accessible and culturally relevant.
The third phase expanded the design to a larger scale, emphasizing clustering systems and unit replicability. In both the second and the third phase I worked very closely with my building technology tutor since we both thought that the way to translate my goals and my research to a project was more technical. The studio's collective material research also played a vital role during this time, offering insights into local construction techniques, material availability, and community knowledge. This research unlocked new design opportunities, enabling me to develop building systems that are grounded in local realities while offering flexibility and empowerment to future residents.
The fourth and final phase was a synthesis of the entire process—bringing together site analysis, ethnographic research, design iterations, and community insights into a cohesive masterplan. This phase connected two existing villages with the proposed development, creating a spatial and social bridge. The resulting community design offers a low-rise, high-density layout inspired by rural living patterns, while remaining adaptable to urban influences and future growth.
Throughout the entire process, trial and error was a key method in refining the design. Iteration allowed for experimentation, discovery, and critical evaluation. Due to the project's complexity and its multiple layers reaching 'design dead ends' was inevitable at times. However, these moments often became turning points. Conversations with Marina Tabassum were particularly valuable during such times. Her deep understanding of Bangladeshi culture and architectural norms offered both clarity and direction, helping me reconnect the project to its roots while maintaining

the broader vision. In essence, my working method was one of continuous reflection, responsiveness to feedback, and iterative testing, all underpinned by a strong research foundation.

Academic and Societal Relevance, Scope, and Ethical Implications

My graduation project addresses several important issues that are relevant to the wider architecture community, including incrementality, adaptability, affordability, and cultural continuity in design. These topics combine social, economic, and environmental perspectives, which makes the project valuable for further research from different academic fields. It also deals with the idea of integration into a peri-urban context, aiming to improve living conditions without changing the existing character of the area. The design builds on local patterns of life in rural Bangladesh while responding to rapid urbanization.

Academically, the project contributes to the discussion around climate-induced displacement, which is a growing challenge in Bangladesh. It uses a research-based approach that includes fieldwork, community observation, and material studies, helping turn complex problems into practical design solutions. On a societal level, the project suggests an alternative to standard emergency shelters. Instead of being temporary, the proposed solution is a permanent structure that can be adapted to people's changing needs and different ways of living. By using local materials and skills, the design supports communities and allows them to be part of the building process.

During this thesis I focused on dignity and inclusion. The proposal avoids a top-down approach and instead tries

to give displaced people the ability to shape their own homes. The goal is to create not just shelter, but homes and communities that people can grow with and that is why it was designed with respect to the culture and identity, while also offering affordable, long-term, and flexible housing.

Ethical Issues

Ethical issues play an important role in my graduation project, especially given the sensitive context of climate displacement and housing insecurity. Designing for vulnerable communities involves the risk of imposing external solutions that may not reflect their needs, values, or way of life. To address this, I grounded the project in field research, community observation, and cultural understanding, ensuring that the design respects local identities, traditions, and social dynamics. I would like to be able to work with the community together for the final design to make it with their input, something that unfortunately was not possible.
Another ethical concern is the balance between urgency and permanence—while emergency housing is often seen as short-term, my project challenges this idea by proposing a permanent yet adaptable solution that can evolve with its users. Affordability and accessibility were also key ethical priorities, as the project aims to serve people across different income levels without creating further inequality.

Time management and Studio organization

The timing and structure of the studio had a significant impact on the development of my graduation project. Our field trip to Bangladesh took place at the beginning of December, which left only about two weeks to complete both the site analysis and personal manifesto before the P2

presentation. This made the initial phase of the project very intense and rushed. Additionally, the research and design phases were quite separate in the studio's organization, which sometimes made it difficult to connect the two and benefit from more integrated feedback. Just as the design work was beginning to take shape, we had to pause again for two weeks to focus on material research. These repeated interruptions and limited time created pressure to move on to the next phase even when the design was still underdeveloped. In hindsight, it would have been more effective to conduct the material research before and during the trip, and to involve the research mentors earlier in the design process. This would have allowed us to form a more solid foundation for the project from the beginning, with clearer connections between research, materials, and design goals. It could have helped avoid many dead ends and made the process smoother and less stressful.

Transferability

The project offers a replicable model that can be used in other vulnerable areas in Bangladesh. The modular building system, use of local materials, and flexible spatial layouts allow the project to be adjusted. Furthermore, the design framework supports incremental growth, making it suitable for communities with limited resources that may need to build or expand over time. This makes the project not only a solution for climate-displaced people in Sylhet, but also a potential model for resilient housing in other vulnerable, flood-prone, or informal settlements. By focusing on long-term habitability and integration into existing communities, rather than temporary shelter alone, the project promotes a sustainable and inclusive approach to displacement

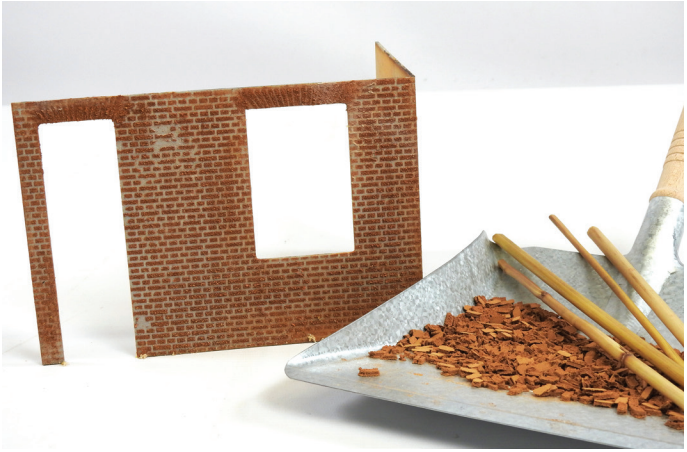
My utopic goal is for it to become a pilot project that could help house displaced communities across the country—moving away from slums and temporary shelters, and towards safer, more permanent, and dignified living environments.


EDUBASE
Study Abroad

APENDIX

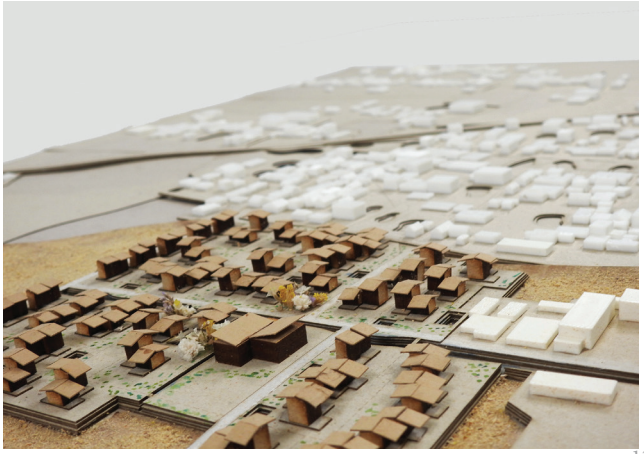
Physical models (1:20, 1:100, 1:1000)

The project's primary construction materials are brick and bamboo. The walls are built using a traditional English bond, and the bricks follow standard Bangladeshi dimensions, ensuring compatibility with local labor practices and minimizing material waste. For the bamboo structure, 12 mm diameter bamboo is used as the main structural component.



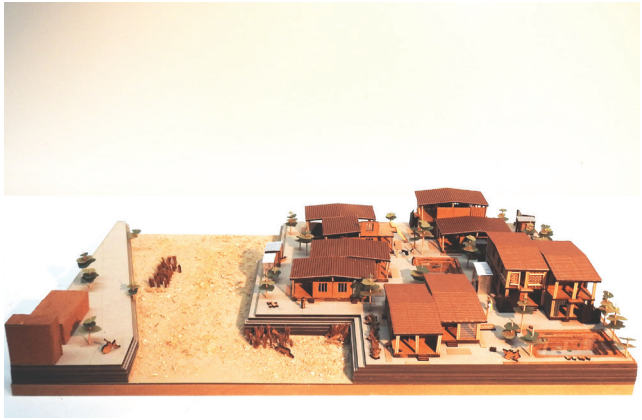
Physical models 1:20

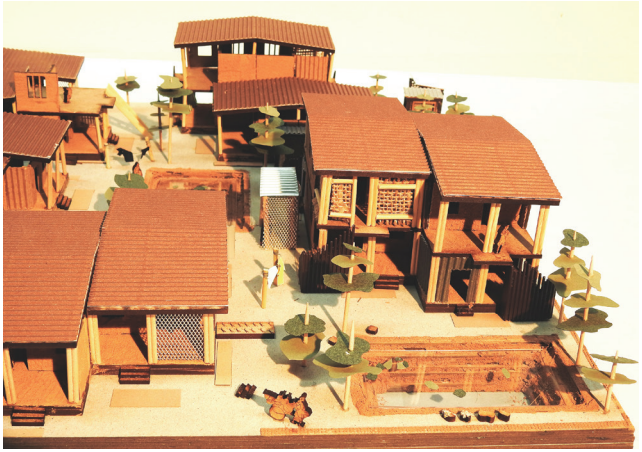
Physical models 1:20



Physical models 1:100 incrementality

Physical models 1:100





SUST students appreciation

A heartfelt thank you to the students of Shahjalal University of Science and Technology (SUST) for your generosity, time, and openness throughout this process, especially especially Rubayat Islam Rupak and Amartya Biswas. Your willingness to share insights, local knowledge, and everyday experiences helped ground this work in real, lived realities. Your thoughtful input during site visits, thetime you gave to us and the discussions added depth and context that no textbook could provide.

This project is stronger because of your contributions—thank you for being such an integral part of the journey.

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