



Inclusive Waters

Investigating the Catalyst Role of Urban Ponds in Mitigating Housing Challenges Amidst Rapid Urbanization in Sylhet

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Research Plan

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Amidst Rapid Urbanization in Sylhet

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Architecture in Transition in the Bangladesh Delta

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Fig. 2: Street view in Old Dhaka

Introduction

Urban areas in developing nations are rapidly growing, often at a rate exceeding the overall population growth, and this trend is intensified by waves of distress-driven migration from rural regions as they are unable to support their growing populations due to inadequate farmland (Correa, 1989).

With a population density of 1265 people per square kilometer and a total population approaching 170 million, Bangladesh is among the most densely populated lower middle-income countries (Hayes et al, 2015). The proportion of individuals residing in urban areas surged from 5.1% in 1974 to 32.8% in 2013, and projections suggest that by 2040, over half of the population will be living in urban areas (World Development Indicators, 2019). The country's rapid urbanization is characterized by inadequate housing and a critical deficiency in infrastructure, water supply, and sanitation systems (Hayes et al, 2015).

According to Rana and Ilina (2021), the future of urban development and planning is crucial in addressing climate migration in Bangladesh for three key reasons. Firstly, because of its flat land, dense population, poverty, and lack of proper environmental management, Bangladesh is at high risk of natural disasters like floods, cyclones, storms, saltwater intrusion, hailstorms,

droughts, and landslides. The impact of natural disasters on migration is notable. Bangladesh experiences frequent natural disasters, resulting in hundreds of thousands of climate migrants annually (Priovashini & Mallick, 2022). Climate change is expected to make these disasters even worse, which forces more climate induced migrants to leave their land and move to another place. Looking ahead, projections indicate that by 2050, over 35 million individuals residing in the coastal regions of Bangladesh, spanning 19 coastal districts and areas along major riverbanks such as Padma, Meghna, and Jamuna, will face compelled migration due to their pronounced susceptibility to disasters (IDMC, 2022).

In light of these challenges, Anik and Khan (2012) also emphasize the critical need for proactive measures, since their study in the low lying areas of North Eastern Bangladesh revealed that the majority of the people (41.67%) had no clear idea about climate change and their effects on the urban environment. Bangladesh's vulnerability, attributed to factors such as low elevation, high population density, poverty, and strong reliance on the natural environment, necessitates the development and implementation of robust adaptation policies. These policies should incorporate indigenous knowledge and resilience strategies to navigate the complex terrain of climate change.

Secondly, cities are hubs of economic growth and opportunities. As more people move from rural areas to cities in search of better lives, urban poverty increases. Additionally, climate-vulnerable villages push more migrants into cities, putting extra pressure on resources and making urban poverty worse (Rana & Iliina, 2021). The government of Bangladesh has been unable to fulfill its primary duty of ensuring the welfare and basic rights of its citizens. Rural inhabitants lack the same rights and amenities as their urban counterparts, driving rural residents to migrate to urban areas in pursuit of better facilities and job opportunities (Ahmed & Islam, 2014).

Thirdly, urban authorities in Bangladesh find it challenging to offer sufficient assistance, such as housing and environmental services, to climate migrants who turn to cities as their final refuge. This deficiency leads to the expansion of slum areas in urban areas and the rise of an informal economy, which significantly burdens urban governance and available resources (Rana & Iliina, 2021).



Fig. 3: Housing of the urban poor in Bangladesh (Source: UNDP, 2019)



Fig. 4: Woman doing dishes at the Laladighir Pond, Sylhet

The Problem

The effects of urbanization in Bangladesh also effects Sylhet city in specific, as this is one of the most prominent cities in Bangladesh (Das & Das, 2022). Sylhet, situated in the northeastern part of Bangladesh, is a swiftly growing urban center and ranks among the largest business hubs in the nation. The Sylhet City Corporation was founded in 2001, covering an area of 26.50 square kilometers and hosting a population of nearly 3 million. (Population & Housing Census, 2011).

The city is expanding at an unprecedented rate which causes the raise of pressure on building density. The effects are threatening the lives of city dwellers, particularly urban poorest dwellers, who receive only basic shelter without considerations for landscape elements. Sylhet city residents grapple with significant environmental issues such as the improper disposal of waste in nearby drains and low-lying areas, the discharge of wastewater into open roadside drains, the prevalence of pit latrines in low-income neighborhoods, annual flooding, noise pollution, and the keeping of livestock and poultry (Ahmed & Islam, 2014). Social crimes like ransacking, robbery, and toll evasion are also prevalent in the city due unplanned urbanization.

In the low income settlements, many areas lack

community garbage containers, and municipal waste disposal is not effectively managed. Additionally, the high population density, along with the use of wooden-bamboo housing structures and inadequate electrical wiring, increases the risk of fire hazards. Moreover, housing in the urban poor settlements have not adequate public space for recreational activities and walking, which is essential for a healthy public environment (Arefin, 2021).

According to Cornea et al (2016), urban ponds play a diverse and pivotal role in the urban areas of Bangladesh. These ponds are not just sources of water; they also provide urban land and communal spaces. They serve as cultural and small-scale aquaculture sites for the middle class and are essential for daily tasks, livelihoods, and social interactions for the less privileged (Cornea et al, 2016). However, the relentless expansion of urban areas, coupled with limited available space, has placed these urban ponds in jeopardy. Nowadays, they are at risk of being filled in to make way for new housing developments (Das & Das, 2022).

As stated by Suchana et al (2012), Dhaka has undergone a substantial transformation in the last four centuries. It has transitioned from its historical identity as the 'Venice of the East,' characterized by numerous water channels, to

Research Question

its current status as a ‘City of Concrete.’ This urban evolution has had a profound impact on Dhaka, notably diminishing its ability to withstand floods and its overall quality of life. Given that Sylhet is also susceptible to the impacts of climate change, including increased flood risk, it becomes imperative to restore and protect urban ponds. This action is crucial to prevent Sylhet from facing a similar fate of becoming a ‘City of Concrete’ like Dhaka.

Public spaces are essential for building community, connecting diverse individuals, and promoting shared identity, which enhances social cohesion and residents’ well-being (Francis et al., 2012). Additionally, Sepe (2017) highlights that well-designed public spaces contribute to urban happiness and sustainable development, emphasizing the importance of urban planning that prioritizes public spaces to enhance the overall quality of life in cities. According to non-formal research conducted by ECDO, around 30 diverse indigenous communities reside in the Sylhet region. The Manipuri and Khasi communities stand out as the most populous, with each group having unique linguistic and cultural traditions (Pal et al, 2017). The selected site is situated around an urban pond, featuring a diverse environment. Various communities inhabit the area, such as the Muslim group residing in informal settlements and the Hindu

population. Additionally, there is a notable diversity in building structures, ranging from single-story residences to newly constructed 4 to 5-story buildings established within the past 2-5 years. The site is distinguished by its diverse characteristics, making it a compelling location to promote inclusivity and adapt to the varied surroundings.

Since rapid urbanization is threatening the urban lives of residents in the city due to the raising pressure on the building density, the lack of attention to public space in Sylhet is a growing concern, which causes increased segregation. Given the abundance of urban ponds in Sylhet that serve as communal spaces for residents, there is potential for these environments to offer solutions for designing a more inclusive urban setting. This research aims to investigate the qualities of the urban ponds as a catalyst for an inclusive urban environment, and what lessons can be learned to design a new inclusive housing project, including adequate public space.

The urgent concern of rapid urbanization in Sylhet and thereby the increasing pressure on housing, combined with the environmental consequences in the future due to climate change, prompts the question:

What lessons can be learned from the urban ponds in Sylhet, serving as a catalyst for inclusivity, to address the inadequacies in housing and increased segregation due to rapid urbanization in a growing second-tier city like Sylhet?

To tackle this research question, it has been sub divided into two main aspects; the social aspect and the environmental aspect.

The social aspect delves into the various demographic groups present at the chosen design site, exploring the current activities and uses surrounding the urban ponds and their impact on fostering or impeding social cohesion among residents. This raises the following sub questions regarding the social aspects:

How do the current uses and activities around urban ponds contribute to or hinder social cohesion among residents with diverse demographic backgrounds in Sylhet?

What valuable lessons can be learned from case studies on urban ponds, including those in West Bengal and Chongqing, regarding the significance of urban ponds in fostering inclusivity among diverse communities?

The environmental aspect explores the ramifications of climate change on the future environment and its impact on Sylhet. It is crucial to examine whether urban ponds mitigate the effects of climate change and why preserving them is essential for environmental sustainability. Therefore the subsequent sub-questions related to the environmental aspects are formulated as follows:

How does the presence of urban ponds in Sylhet contribute to the environmental sustainability and resilience of the urban ecosystem?

How can lessons from case studies, such as ‘the City of 1,000 Tanks’ project in Chennai, with its focus on decentralized Nature-Based Solutions for water balance and resilience, inform the environmental aspects of preserving urban ponds in Sylhet to address climate change impacts and potential flood risks?

Research diagram

To provide a comprehensive view of the research process, figure x presents a diagram outlining the primary issue and how this challenge is addressed. The study utilizes urban ponds in Sylhet as a case study to exemplify how urban inclusivity can be achieved in new housing projects. A key focus of the research involves

comparing various morphologies in the urban area of Sylhet and seeking a balance to contribute to an inclusive environment. In the end, the main research question formulated below will be answered.

“What lessons can be learned from the urban ponds in Sylhet, serving as a catalyst for inclusivity, to address the inadequacies in housing and increased segregation due to rapid urbanization in a growing second-tier city like Sylhet?”

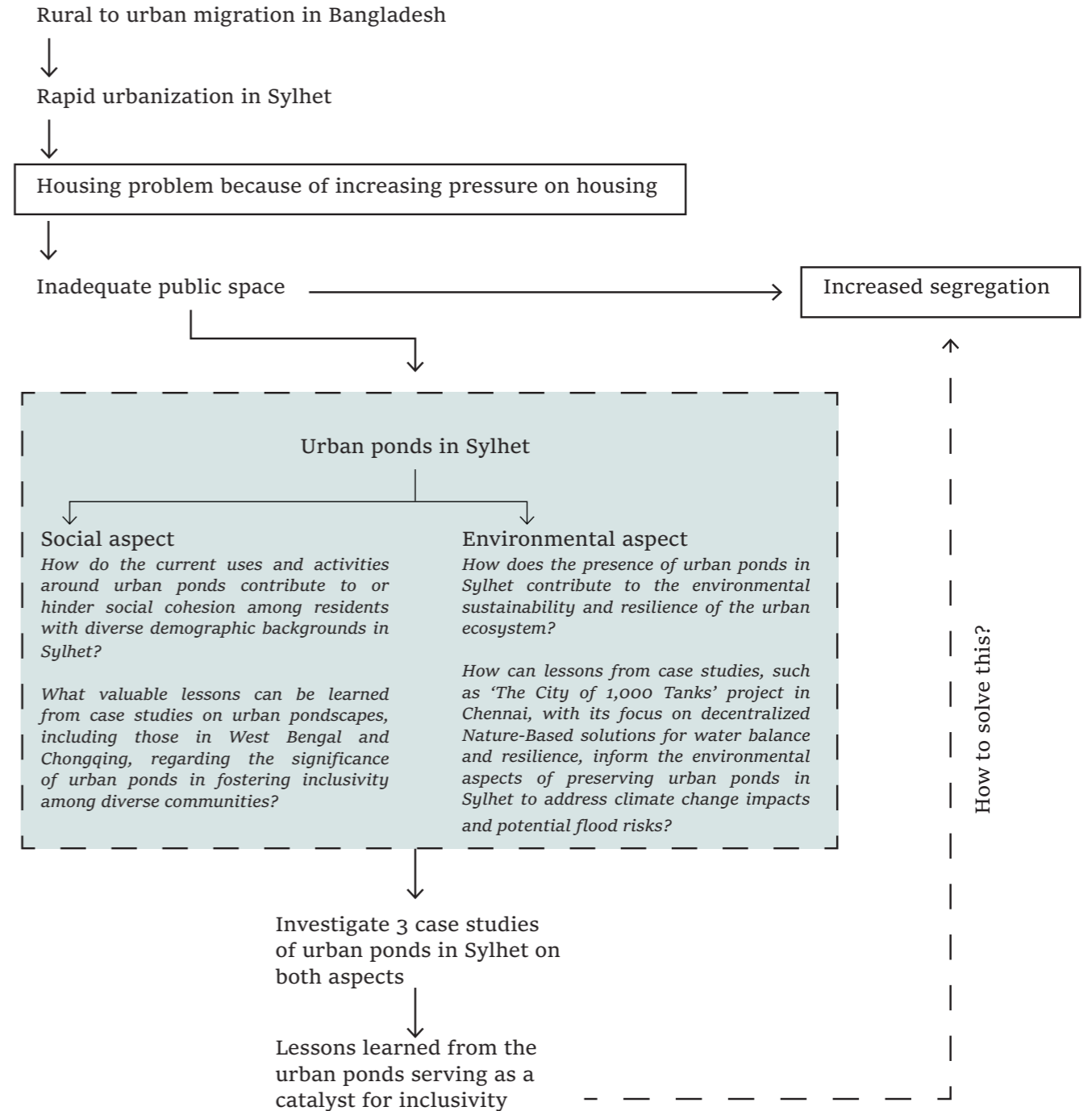


Fig. 5: Research diagram

Framework

It is widely accepted that rapid urbanization and climate change in the global south have a significant impact on the urban environment (Smit, 2021), as several scholars write about these issues. Rana and Ilina (2021) explore in their article the complex interplay between climate change, migration patterns, and their impacts on cities, with a specific focus on Bangladesh. The study delves into the lessons learned from Bangladesh, offering a nuanced understanding of how environmental changes contribute to migration dynamics and influence urban landscapes. Additionally, Priovashini and Mallick (2022) provide an overview of the diverse factors influencing environmental migration, contributing to a better understanding of this complex phenomenon.

Whereas the research question is sub divided into two main aspects; the social and environmental aspects, the framework of available scholarly discussions could be sub divided into four, based on the available literature covering the housing problem in Sylhet, urban ponds, the significance of public space, and climate resilience.

Housing problem

The research conducted by Ahmed et al. (2014) identifies the key environmental challenges experienced by Sylhet as a result of rapid urbanization. One of the problems are the improper disposal of waste in nearby drains and low-lying areas, the discharge of wastewater into open roadside drains, the prevalence of pit latrines in low-income neighborhoods, annual flooding, noise pollution, the keeping of livestock and poultry and the increasing pressure on housing and urban services.

The article “A Modular Landscape Model for Low-Cost Settlement” by Arefin et al (2021) discusses a landscape model designed for low-cost settlements, with a specific case study focused on Sylhet, Bangladesh. The modular landscape model aims to address the challenges faced by low-income settlements, such as the lack of waste management, increased risk of fire hazards due to inadequate electrical wiring and lack of public space, by providing an adaptable and cost-effective solution.

Khan et al. (2015) highlight the issues related to accessibility, narrow streets, and the lack of available land and open spaces in informal settlements as well. They also state that the inadequacy of infrastructure and services is compounded by the exceptionally high residential densities.

Urban Ponds

In the article ‘Ponds, Power and Institutions: The Everyday Governance of Accessing Urban Water Bodies in a Small Bengali City’ by Cornea, Zimmer, and Véron (2016), the authors’ attention is directed towards the urban pondscape, viewing it as a component of an intricate and segmented urban hydroscape. It is recognized as a valuable resource bundle for specific segments of urban society. Their study delves into the governance dynamics of accessing urban water bodies in a small Bengali city, employing an urban political ecology lens to illuminate how power structures and institutions shape the utilization and management of ponds, offering valuable insights into the challenges and influences of socio-political factors on urban pond governance. Additionally, Bakker’s ‘Archipelagos and networks: urbanization and water privatization in the South’ (2003) provides valuable insights into the challenges and implications of privatizing water resources, shedding light on the spatial and social dimensions of this phenomenon in the global South.

Both Cornea et al (2016) and Jiang et al (2023), investigate case studies regarding urban ponds and their role in the urban environment. For example, Jiang et al. (2023) concentrate on a pondscape in Chongqing, examining the influence of urban development

on local perceptions of traditional landscapes. The research offers valuable insights into the intricate relationship between urbanization, traditional environments, and their perceived impact on human well-being, thereby enriching discussions on sustainable urban development and the conservation of cultural landscapes. Additionally, Cornea et al. (2016) examine how the pondscape operates as a resource and space in the daily lives of the urban population in the small city of Bardhaman, West Bengal. The study investigates access dynamics, exploring who has the ability to access the pondscape and under what conditions and circumstances this access takes place.

The article by Suchana, Soud, and Trisha (2012) explores the restoration and transformation of small stagnant urban water bodies, specifically ponds in Dhaka, emphasizing sustainability. It addresses the challenges and opportunities in revitalizing these water bodies, offering insights into strategies that can contribute to the overall sustainability of urban areas.

Furthermore, Das and Das (2022) focus on providing guidelines for sustainable urban design specific to various urban ponds, utilizing Sylhet as a case study, and offers practical recommendations for enhancing the ecological and social aspects of urban ponds.

Importance of public space

The study 'Socio economic status of the ethnic community in Bangladesh: An analysis using Socio Economic Index' by Pal et al (2017), gives insight into the different ethnic communities in Bangladesh, and specifically in Sylhet. The study contributes valuable information to the understanding of socio-economic disparities among ethnic communities in Bangladesh, fostering a nuanced comprehension of their economic conditions.

Francis et al. (2012) delve into the significance of public spaces in fostering a sense of community in their work, "Creating Sense of Community: The Role of Public Space," published in the Journal of Environmental Psychology. Through this exploration, the authors highlight the crucial role public spaces play in shaping and nurturing community bonds. Additionally, Sepe's (2017) research, "The Role of Public Space to Achieve Urban Happiness," published in the International Journal of Sustainable Development and Planning, explores the significance of public spaces in promoting urban happiness. By emphasizing the connection between public spaces and urban happiness, Sepe highlights the importance of urban planning that prioritizes these spaces, providing valuable insights for sustainable development strategies aimed at enhancing the overall quality of life in urban environments.

Climate Resilience

In 'Urbanization and Environmental Problem: An Empirical Study In Sylhet City, Bangladesh' by Ahmed et al (2014), the research explores the impact of urbanization on the environment, specifically focusing on Sylhet City. Through empirical analysis, the authors examine the environmental challenges arising from rapid urbanization, providing valuable insights into the dynamics between urban growth and environmental issues in the context of Sylhet.

The article by Anik and Khan (2012) delves into climate change adaptation in the north-eastern region of Bangladesh, focusing on the utilization of local knowledge. Additionally, the article by Pervin et al. (2019) investigates strategies for adapting to urban flooding, focusing on two cities in South Asia. The study explores the challenges and responses to urban flooding, providing insights into effective adaptation measures to mitigate the impacts of floods in urban areas.

The project 'The City of 1,000 Tanks' in Chennai, serves as a case study to investigate the solutions to make a city who is facing problems with water, water abundant again (City of 1,000 tanks, 2023). This project is relevant for this research, as Chennai is facing similar challenges with urbanization, water supply and environmental sustainability. The escalating demand for real estate in Chennai has led to

the gradual depletion of water bodies, exposing the landscape to climate-related risks such as floods and droughts, resulting in significant damage to both life and property. Furthermore, solid waste and sewage pollution and rampant in Chennai's water bodies is impacting urban and living quality even worse. The 'City of 1,000 Tanks' initiative employs green infrastructure to enhance water resilience by creating an integrated system of water infrastructure units within the city that collectively gather and treat water (Water as Leverage RVO, 2023).

This research aims to bridge existing gaps in the literature by addressing the interconnected issues of housing problem, urban pondscapes, public space, and climate resilience in the context of rapid urbanization and climate change in Sylhet. While existing studies touch upon the governance and cultural aspects of urban ponds, and emphasizes the importance of public spaces and urban happiness, this research synthesizes these perspectives.

It investigates the qualities and dynamics of urban ponds in Sylhet as potential catalysts for inclusivity within the context of rapid urbanization. The focus is on understanding how these urban ponds, functioning as communal spaces, can offer valuable lessons to address the challenges of housing inadequacies and increased segregation in a growing second-tier city like Sylhet. The investigation will explore the social, cultural, and environmental aspects of these urban ponds to derive insights for designing an inclusive housing project with adequate public space. By analyzing the existing urban pondscapes, the research aims to contribute to the development of sustainable and inclusive urban environments that prioritize the well-being of diverse communities.

Framework diagram

Housing problem



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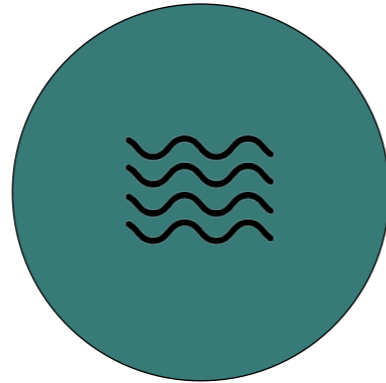
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Urban Pondscape



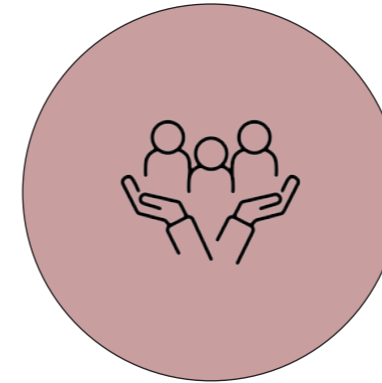
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Public Space



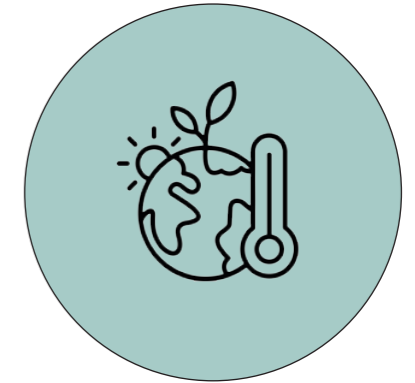
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Methodology

This research employs a combination of qualitative and quantitative research methods to comprehensively address the issue of urban pond preservation and revitalization in Sylhet, Bangladesh, within the context of rapid urbanization and climate change.

Literature review

A thorough literature encompasses an extensive exploration of global and local academic discussions and research concerning urbanization, public spaces, and climate change. By critically reviewing existing scholarly works, this research gains a comprehensive understanding of the current state of urbanization, public space and climate change consequences on global and local level.

Case study analysis

Incorporating a case study approach, this research conducts in-depth investigations of urban ponds in different locations, such as Chongqing and the small city of Bardhaman, but also in Sylhet, and project initiatives in cities facing the same challenges to create a water resilient city, such as Chennai in India. These case studies are instrumental in gaining practical insights into the urban qualities but also the challenges of designing within an environment facing pressing environmental issues, including the heightened risk of annual flooding due to climate change. The case studies offer valuable empirical data and real-world examples of architectural interventions, both within the specific context of Sylhet and globally.

Field research

Field research constitutes a critical aspect of this

methodology, contributing unique and context-specific knowledge that cannot be derived from literature alone. This approach involves a multi-faceted strategy, including:

Ethnographical Observation

By immersing in the research area, ethnographical observations are conducted to understand the social and cultural practices of residents within the chosen site. This immersive approach allows for a more profound comprehension of how urban ponds are embedded in the daily lives and rituals of the local community.

Interviews

Interviews with local residents and the councilor within the chosen site are conducted to gather first-hand insights into daily life activities and the community's perspective on the built environment. These interviews serve as valuable sources of qualitative data and provide a genuine representation of the aspirations of the local community.

Context analysis

Physical exploration has been done by on-site investigations, which includes walking, documenting, and making visual records such as photographs, videos and sketches. This method offers a tangible understanding of the immediate environment of the chosen site.



Fig. 6: Interview with local residents and the Councilor at Laladighir Pond, Sylhet

Relevance

Beyond its local importance, the research carries global relevance in the face of widespread urbanization and climate change challenges. The issues faced by Sylhet are emblematic of the struggles many urban areas encounter worldwide. Rapid urbanization and climate change are universal phenomena that demand innovative and sustainable solutions. The neglect of adequate public space, a common consequence of rapid urban expansion, is a shared concern among cities globally.

Rapid urbanization is a global phenomenon, and it poses one of the most significant challenges of the 21st century. According to the United Nations estimates, the proportion of the world's population residing in urban areas increased from about 20% in 1910 to 51.7 % in 2010, with a projected further increase to 68.4% by 2050 (UNDESA, 2019). The majority of this urbanization is occurring in the Global South. Looking ahead, the global urban population is anticipated to grow by approximately 793 million people from 2015 to 2025, with an overwhelming 93.9% of this increase concentrated in the Global South (UNDESA, 2019). This rapid urbanization underscores the urgent need for comprehensive strategies to address the associated challenges and foster sustainable development (Smit, 2021). As urban areas grow and populations increase, the pressure on urban resources, public spaces,

and community well-being intensifies.

Furthermore, the escalating concern of climate change is evident as the world witnesses more frequent extreme climatic events, including storms, flooding, and extreme temperatures. The global South, with its low-lying geography, high population density, limited resource access, lack of preparedness, and insufficient infrastructure for coping strategies, faces heightened vulnerability to climate change impacts (Roy, 2018).

Additionally, with the rising threat of floods attributed to climate change, the conservation of urban water bodies becomes imperative to withstand such floods. Therefore, the neglect of urban ponds due to rapid urbanization is a growing concern not only in Sylhet, but in many urban areas across the globe, such as Chennai in India. As urbanization intensifies, cities worldwide are confronted with the complexities of safeguarding vital public spaces, fostering community well-being, and fortifying resilience to climate impacts.

The challenges faced by Sylhet are not isolated; they mirror the difficulties cities worldwide encounter. Therefore, the findings and solutions derived from this research can serve as a blueprint for other urban areas confronting similar issues, fostering a global dialogue

on sustainable urban development, climate resilience, and the importance of preserving communal spaces within cities.



Fig. 7: Global Trends of Urbanization (Source: Morphocode, n.d.)

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Bibliography images

Fig. 1: Laladighir Pond, Sylhet (cover image)

Photograph by Lisa Wassink

Fig. 2: Street view in Old Dhaka

Photograph by Lisa Wassink

Fig. 3: Housing of the urban poor in Bangladesh (UNDP, 2019)

Housing of the urban poor in Bangladesh. (2019). UNDP. <https://www.undp.org/bangladesh/blog/why-national-urban-policy-should-be-our-top-priority>

Fig. 4: Woman doing dishes at the Laladighir Pond, Sylhet

Photograph by Lisa Wassink

Fig. 5: Research diagram

Work by Lisa Wassink

Fig. 6: Interview with local residents and the Councilor at Laladighir Pond, Sylhet

Photograph by Lisa Wassink

Fig. 7: Global Trends of Urbanization.

Global Trends of Urbanization. (n.d.). Morphocode. <https://morphocode.com/global-trends-urbanisation/>

Fig. 8: Laladighir Pond house view, Sylhet (back cover image)

Photograph by Lisa Wassink

