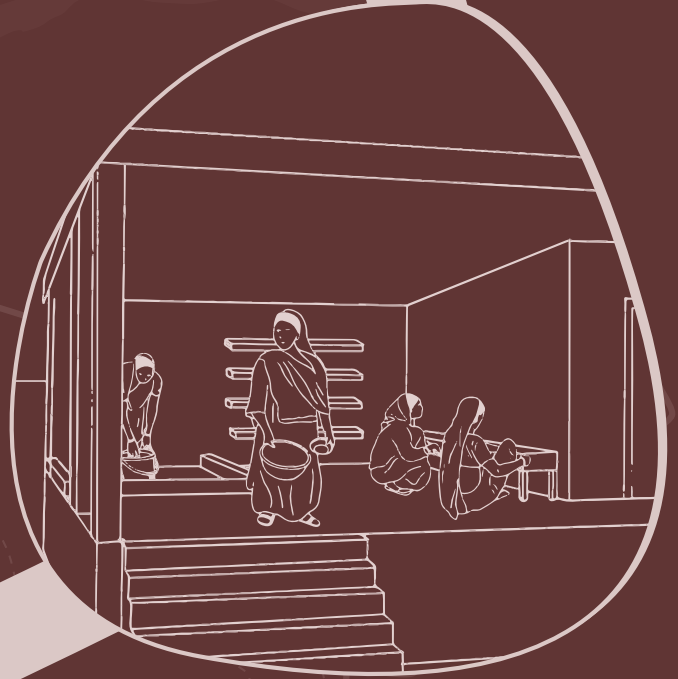# Women In Transit

Considerations for Kitchen Design for Formal Settlements in Bangladesh.

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Summary

This report, *Women in Transit: Considerations for Kitchen Design for Formal Settlements in Bangladesh*, explores the challenges and key factors in designing kitchens for women in informal settlements. The focus is on women who have migrated from rural to urban areas, driven by rapid urbanization due to climate change and economic factors. As a result of this, informal settlements are increasing in Bangladesh.

The goal of this project is to enhance awareness among NGOs regarding key factors that need to be considered when designing homes for women who are currently residing in urban informal settlements. The central focus is food preparation and cooking, which play a vital role in the daily lives of these women.

Therefore, through interviews, field research, and a literature review, the report explores the cultural, social, economic, and practical aspects of kitchen design. It examines how women in rural areas often cook on open fires in private spaces, and how this changes when they move to urban areas, where kitchens are usually shared and gas stoves are used. The shift from rural to urban living brings both challenges and opportunities as women adapt to new cooking methods, environments, and social settings.

Furthermore, based on this research, design guidelines have been developed to help NGOs understand the needs of women transitioning from informal to formal housing more effectively. These guidelines focus on creating kitchens that support women's social connections, maintain their cooking traditions, and address practical needs.

The final result of this project is a booklet that tells the story of Sadia, a woman who moves from a rural area to an urban informal settlement and eventually to formal housing. Sadia's journey highlights the challenges women face in cooking, adjusting to new social dynamics, and adapting to new living conditions, as well as the opportunities that open up for her.

The aim of the booklet is to help NGOs thoroughly understand and empathize with women like Sadia when designing formal housing. The booklet provides design ideas for kitchens that are culturally appropriate and support women in their roles of cooking and caregiving. This is achieved by offering design options for both low- and high-density housing, as well as different living environments that can influence how women cook and manage their daily tasks.

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1 Introduction

1.1 Project Motivation

Internal migration has increasingly become an issue in Bangladesh, primarily driven by climate change and economic factors, with millions having been forced to leave their homes due to rising sea levels and extreme weather (Khan et al., 2021). People have mostly fled from the south (where flooding is common) and west (the more drought-prone areas) to the north and east of Bangladesh (Hassani-Mahmooei & Parris, 2012). A large proportion of these migrants have moved from rural areas to urban areas. The migrants have hoped that in the cities they would have a chance for a better future (Rana & Ilina, 2021).

This migration has led to a rapid increase in informal settlements in urban areas like Sylhet, Dhaka, and Chittagong. With over 30 million people having been living in informal settlements, Bangladesh has ranked sixth globally in this regard (Rana & Ilina, 2021). The government's ability to manage rapid urbanization and provide essential services like housing and sanitation has been strained (Panday, 2020).

The increase in informal settlements has resulted in overcrowding, inadequate housing, poor sanitation, and waste management challenges (M. a. U. Khan et al., 2015). Women in these settlements have faced additional challenges, including gender discrimination, income inequality, limited access to healthcare and education, and a higher risk of physical violence (Haque, 2019).

My MSc project in Architecture, Urbanism, and Building Sciences, titled "A Safe Return," has aimed to improve the quality of life for women living in the informal settlements in Bangladesh, by designing housing that enhances safety, privacy, and community spaces, especially for women.

During my Design For Interaction (DFI) graduation project, I have focused on the transition of women from the informal settlements to the new housing complex I designed in my architecture project. This transition has been significant for these families, particularly for the women, as they have moved from informal settlements to a newly built house.

Figure 1: Informal settlements in Bangladesh (Connor, n.d.)

In the map shown (figure 2), Bangladesh is visible, a country located in South Asia and bordered by the Bay of Bengal, an arm of the northeastern Indian Ocean (Husain & Tinker, 2025). As previously mentioned, climate change has forced millions to leave their homes. Most migration occurs from the southern regions (where flooding is prevalent) and western regions (prone to drought) toward the northern and eastern areas of Bangladesh (Hassani-Mahmooei & Parris, 2012).

The map highlights this migration pattern, indicating areas like Dhaka, the capital, and Sylhet, where my architecture project was based. The focus of this project was on families—such as those in the district of Barisal in the south—moving to Sylhet.

Figure 3: Informal settlements in urban area (Habitat for Humanity International, n.d.)

Sylhet

Dhaka

Figure 2: Map of Bangladesh showing women's migration due to flooding (own figure).

Figure 4: Woman standing in water in rural informal settlement (Food and Agriculture Organization, n.d.).

1.2 Architecture Project

Before delving further into this project, more explanation is provided about my architecture project, which inspired the topic of my Design for Interaction (DfI) project.

As previously mentioned, my architecture project explores how design can improve the quality of life for women living in informal settlements in and around their homes in Sylhet, Bangladesh. Titled "A Safe Return," the project focuses on designing new housing for residents of the Sweepers Colony, an informal settlement in Sylhet, while also providing housing solutions for middle- and high-income groups.

The core aim of my architecture project is to enhance the lives of women by improving their living conditions. This is achieved by ensuring safety through "eyes on the street" in public spaces, maintaining privacy within homes, and creating areas where children can play freely. It also seeks to establish spaces for communal gatherings—from urban to unit scale—fostering connections with the neighboring Hindu community and providing opportunities for women's self-development.

Additionally, the design incorporates private sanitation and washing facilities and introduces greenery to improve the living environment. A critical aspect of the project is addressing the challenges posed by climate change, which plays a central role in designing the new neighborhood.

The strategy operates on multiple scales, transitioning from urban public spaces to urban clusters, and from clusters to individual units. "A Safe Return" aims to offer women a secure transition from their current living conditions in the informal settlement to their new homes, ensuring a significant improvement in their quality of life.

The story is told through the perspective of Sadia, a persona who represents the women living in informal settlements. Her journey describes how she lived in these conditions and how she eventually moved to the new housing.

Figure 5: 3D model of the plot and surroundings of my architecture project (own figure).
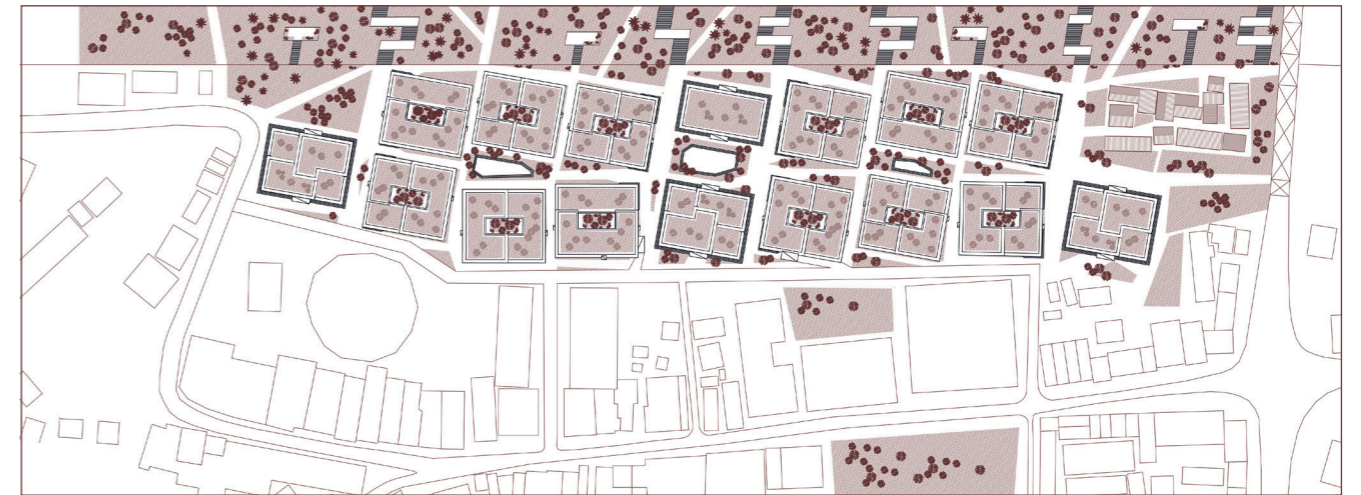
Figure 6: Masterplan with roofs of my architecture project (own figure).
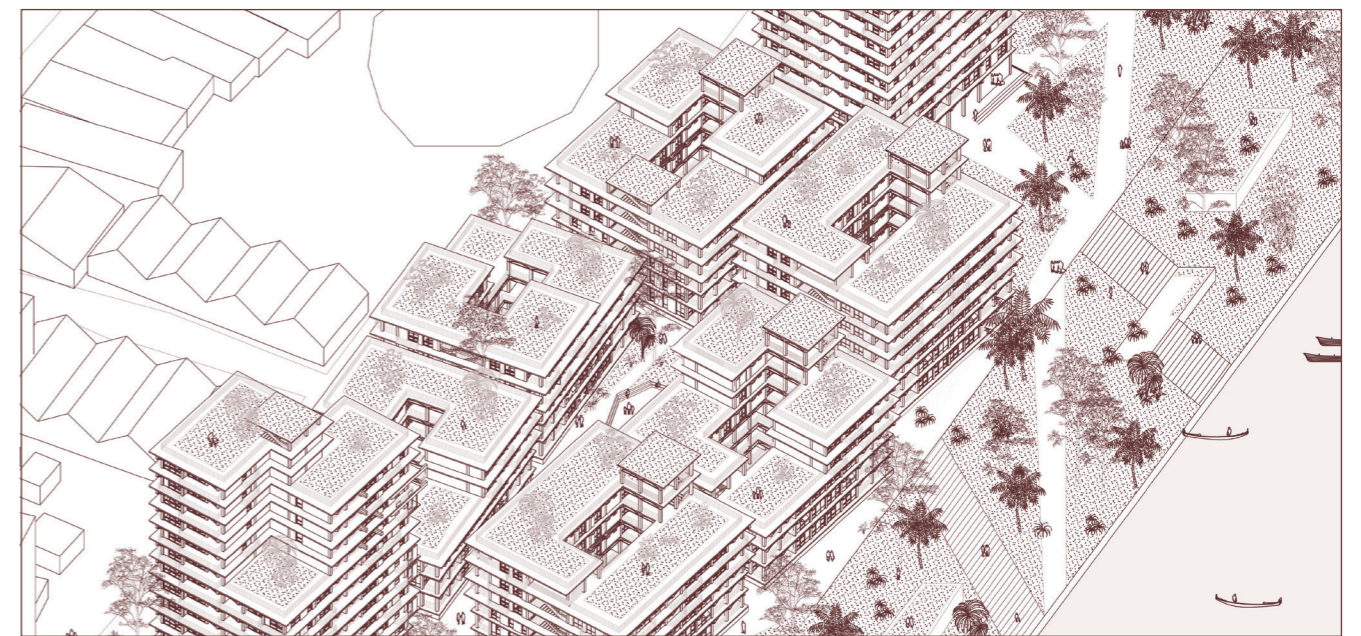
Figure 7: Axonometric view of designed buildings on the plot (own figure).
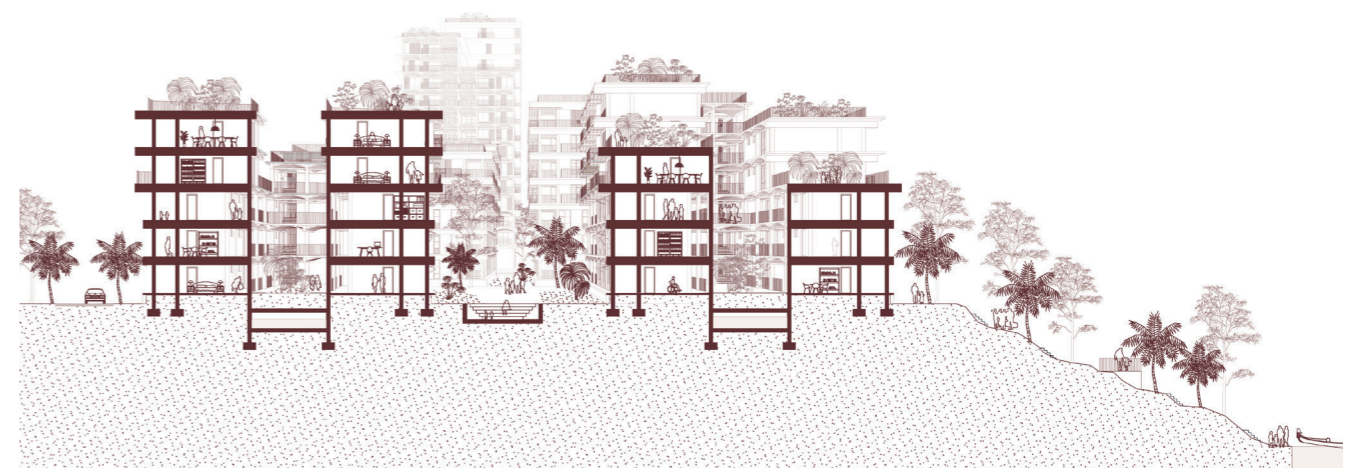
Figure 8: Section through two housing blocks (own figure).

The master plan consists of different clusters with housing blocks, and between these blocks are three towers. Sadia, who moves from the informal settlement to the formal housing that used to stand in this area, lives in the low-income housing.

The low-income housing is located on the ground floor, first floor, and second floor of the housing blocks. This way, the residents stay more connected to the ground, which they are used to from living in the informal settlements.

Below is a cluster of the housing blocks (figure 9). Between the blocks, a space has been created where women, including Sadia, can gather (figure 10). It is a comfortable place where children can play, and women can have social interactions.

When zooming in on a housing block, you can see that the homes are clustered around a courtyard (figure 11). The courtyard is designed as a safe place for Sadia and other women in the block to meet. It is a green space where children can also play (figure 12). Families can access their homes through the courtyard.

Figure 11: Groundfloor of the housing block with low-income housing (own figure).

Figure 9: Plan of cluster of six housing block with in the middle a semi-public space (own figure).

Figure 12: Impression of the courtyard of the housing block (own figure).

Figure 10: Impression of the semi-public space in the middle of the housing block cluster (own figure).
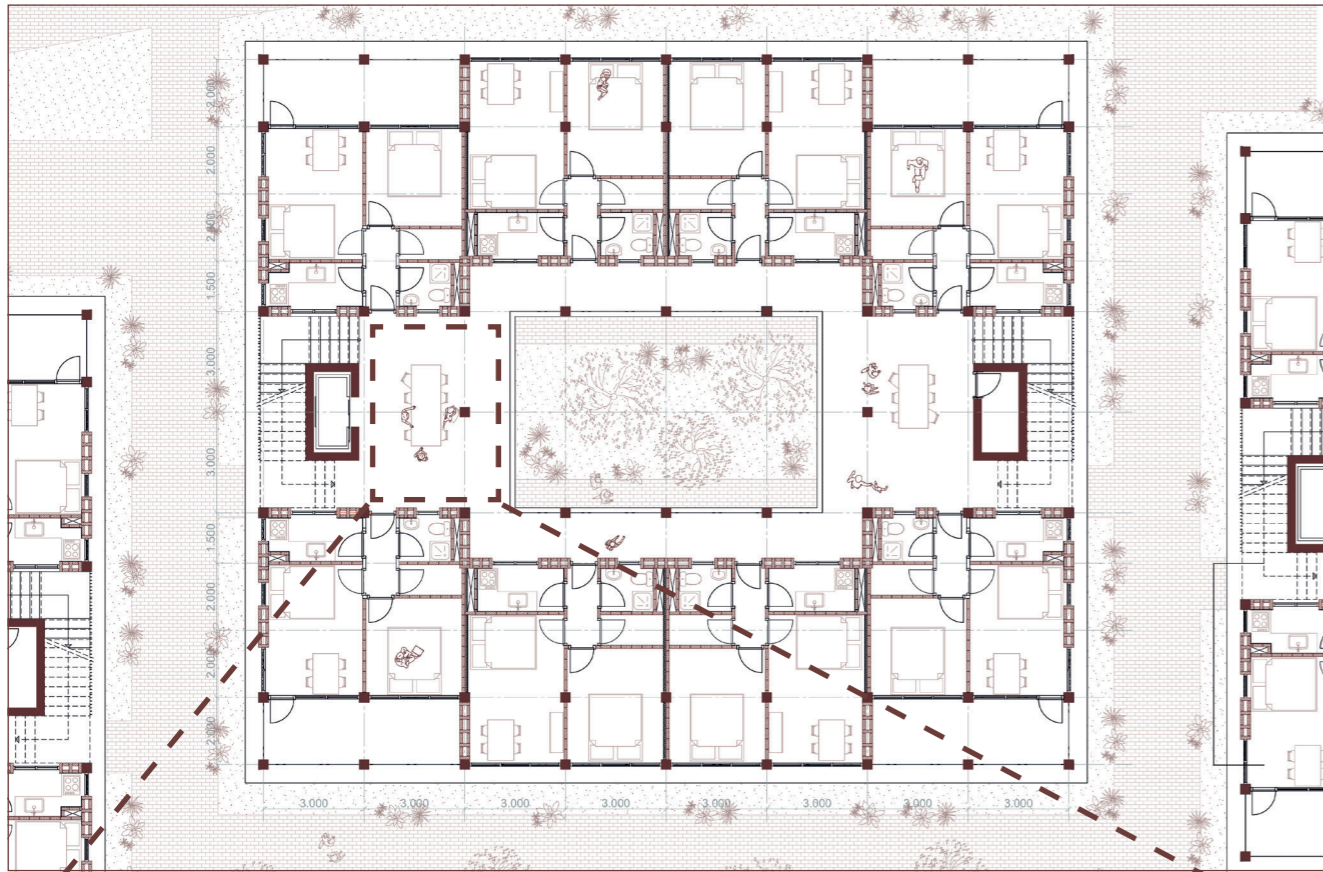
Figure 13: Second floor of the housing block with low-income housing (own figure).

Figure 14: Impression of the communal space on the second floor of the housing block (own figure).

On the first and second floors of the low-income housing, there is a space where women can gather to socialize and prepare food (figure 13). Sadia lives on the second floor and sometimes uses this space, which she shares with four other families, meaning four other women (figure 14).

Sadia's house consists of two bedrooms, a kitchen, a bathroom, a small storage room, and a balcony. The kitchen is connected to the courtyard, so Sadia can have contact with other families on the floor while cooking (figure 15). Sadia has her own kitchen (figure 16).

Later, I will discuss the possible consequences that Sadia may face in her new home in this Architecture project. While this new house offers improvements in materials, more space, and not having to share a home with others, it can also bring challenges.

Figure 15: Floorplan of a low-income house on the second floor (own figure).

Figure 16: Impression of the kitchen in a low-income house (own figure).

1.3 The Initial Project Aim

1.2.1 The Problem

The issue I identified after having completed my first graduation project, which I aimed to address in this DFI graduation project, was the assumption that transitioning from cooking outdoors over an open fire with other women to having one's indoor kitchen could be challenging.

Why Was It a Problem?

I wasn't entirely sure yet what the consequences of this transition from preparing and cooking food in an informal settlement to a new home were. Therefore, I wanted to gain a deeper understanding of this interaction and design something that could support this transition while preventing any unintended negative consequences.

I had some assumptions about the effects that might have arisen during this transition. For instance, when women had their own enclosed kitchen, they might have 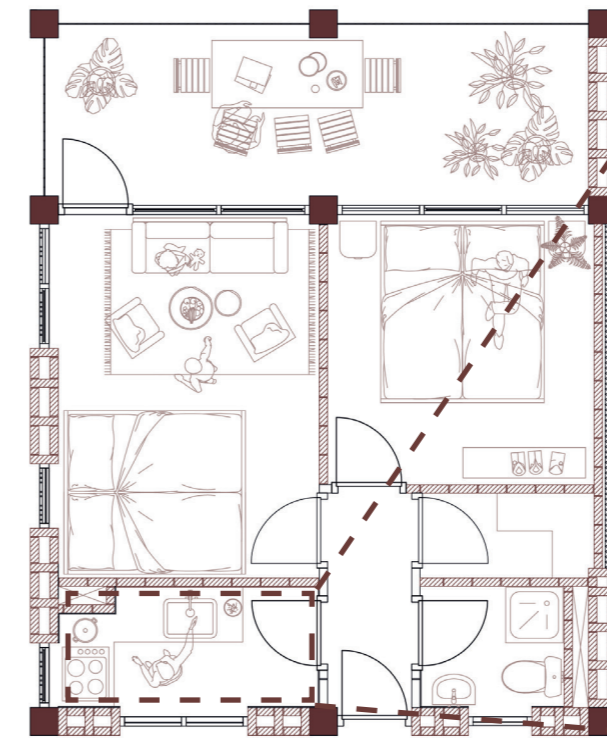felt isolated because there were fewer women around them than they were used to. Additionally, they might have needed to adapt to a different way of preparing and cooking food, which could have influenced what they could make. If they were dissatisfied with their new home and kitchen, there was a possibility they might have rented out their house and returned to live in the informal settlements (Afrin & Khan, 2015).

1.2.2 Project Goal

The goal of this project was to develop a design that supported the transition experience of women moving from the informal settlements in Sylhet to the proposed formal housing project, with a focus on improving cooking and food preparation facilities. It was created for NGOs that advocated for women in challenging situations, ensuring that the design was adaptable and adjustable so it could be implemented in various housing projects beyond just this specific Sylhet initiative.

1.2.3 Key Stakeholders

Figure 17 shows the stakeholders of this project in an onion model (Alexander & Robertson, 2004). I aimed for the design to be created for NGOs, who were working with women living in urban informal settlements to explore housing options in the newly designed formal housing.
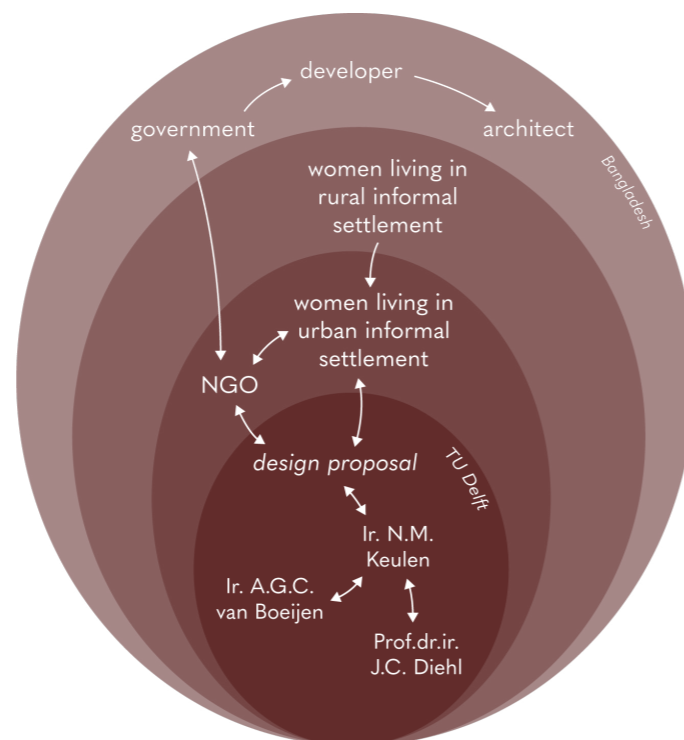
Figure 17: Main stakeholders involved in this project (own figure).

1.4 Project Approach
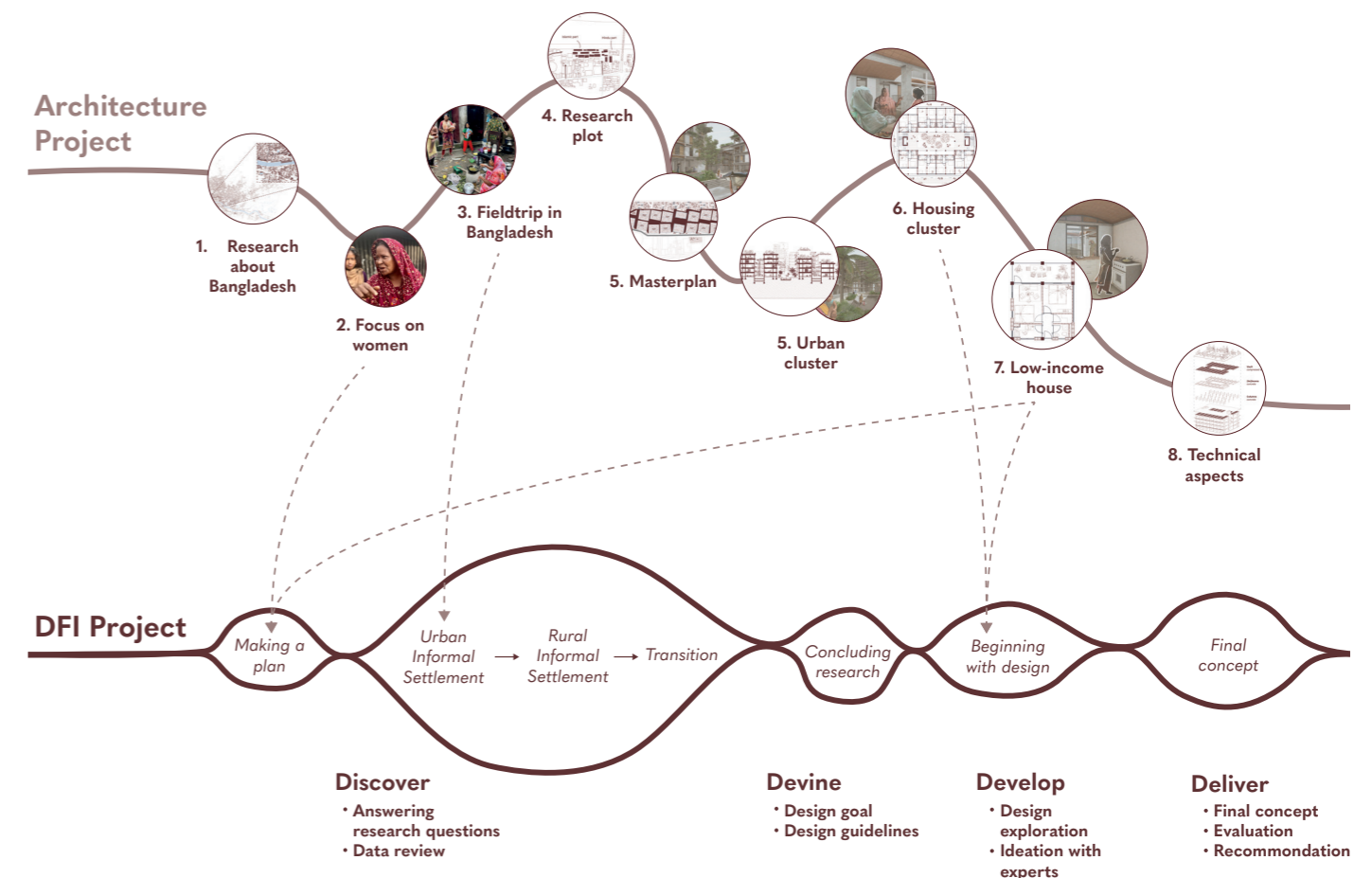
Figure 18: Project approach from Architecture and DFI project and how they are connected (own figure).

Figure 18 shows is the approach of my architecture project and this Design for Interaction (DfI) project. A dotted line indicates which elements from my architecture project I brought into this project.

I divided my DfI project into four phases using the Double Diamond method: Discover, Define, Develop, and Deliver.

Before starting these phases, I made a plan to address the concerns from architecture. For example, women might feel isolated in a kitchen designed in a Western kitchen. I determined what I needed to research to avoid this. I analyzed the low-income housing from my architecture project and kept the focus on women.

In the Discover phase, I formulated research questions, which are explained further in the report. I explored these questions through interviews and insights from the field trip I did during my architecture project.

In the Define phase, I drew conclusions from my research, which led to a design goal and design guidelines.

Next, I moved to the Develop phase, the design exploration. Here, I worked on my design and sought feedback from experts. I incorporated my knowledge from the architecture project, where I had designed housing for these women.

Finally, I entered the Deliver phase, where I created my final concept and asked for feedback from an NGO.

2 Deepened Understanding of the Defined Problem

This chapter deepens the understanding of the defined problem by exploring existing knowledge from literature about women's experiences in informal settlements in Bangladesh, with a focus on kitchen practices and living conditions. As discussed in the previous chapter, the transition from informal to formal housing can cause both opportunities and challenges, especially for women who rely on the kitchen as a space for social interaction and essential daily activities. This shift may disrupt routines, affect social ties, and requires adaptation to new cooking and food preparation methods.

The chapter is divided into three sections. The first section looks at the partnership between NGOs and the government, which is key to addressing the housing needs of urban communities. The second section discusses the cultural importance of the kitchen in informal settlements, highlighting its role beyond cooking. The kitchen is a central space for women's social connections and community support. The final section focuses on the practical side of kitchens in informal settlements, covering common challenges, safety concerns, and existing improvements that align with women's daily routines and needs.

2.1 NGOs' Role in Addressing Urban Poor Housing Needs

The final design of this project, which supported women's transition from the informal settlements in Sylhet to formal housing, was developed specifically for NGOs. This focus was important because the government of Bangladesh needed assistance from NGOs in addressing the housing needs of its urban poor (M. M. Rahman, 2002). NGOs thus played a crucial role in bridging the gap between government policies and the real needs of communities, ensuring that the housing solutions developed were practical and effective.

2.1.1 The Importance of Collaboration Between Government and NGOs

NGOs have valuable experience in helping reduce poverty and improving living conditions. They are well-positioned to develop more effective housing solutions, especially through slum upgrading and involving local communities Unlike fragmented government efforts, NGOs are often more successful and efficient because they can bring together resources and work directly with the communities they serve (M. M. Rahman, 2002).

To address the housing needs of the growing urban poor, it is essential to have inclusive policies (Baker, 2006). Government ministries, NGOs, and other organizations must work together to make the best use of limited resources. This kind of collaboration is key to achieving goals, such as the Sustainable Development Goals (SDGs). The Sustainable Development Goals (SDGs), adopted by all UN countries in 2015, aim to end poverty, inequality, and environmental degradation by 2030, ensuring health, justice, and prosperity for all without leaving anyone behind (World Health Organization, 2024). The collaboration between the government and NGOs prevents wasted efforts (duplication of work or work that doesn't align) and improves resource management, allowing for more efficient solutions to complex problems (Centre of Policy Dialogue, 2021). Partnerships between NGOs and the government are also crucial for reducing dependence on foreign aid, ensuring sustainable development, and addressing local needs more effectively. Such collaborations enable resources to be used in a way that is more aligned with local priorities and long-term goals (Sarwar, 2023).

Collaboration between the government and NGOs in Bangladesh has already led to positive outcomes in addressing housing and development issues. Committees at various administrative levels have enhanced governance, improved service delivery, and reduced duplication of efforts (Centre of Policy Dialogue, 2021). These partnerships have also fostered the inclusion of community-based organizations in local initiatives. Progress in upgrading slums, developing affordable housing, and improving access to land and services is already underway, supported by better policies and financial backing (Baker, 2006; M. M. Rahman, 2002).

An example of effective collaboration is the NGO 'Habitat for Humanity', which actively monitors housing policies and advocates for improved access to affordable housing worldwide. By engaging with lawmakers and housing regulators, Habitat aims to influence policies that promote homeownership. Additionally, the organization accepts government funding as long as it aligns with its principles (Habitat for Humanity, n.d.).

2.1.2 Examples of NGOs Improving Living Conditions in Bangladesh

Different NGOs are already improving the living conditions for the inhabitants of the informal settlements in Bangladesh. In my project, I can learn from what they have already researched and have done for these inhabitants.

NGO 'SPARC' is, among other things, committed to relocating and rehabilitating the inhabitants of the informal settlements to new housing. They are assisting residents of informal settlements with their relocation, giving them a permanent residence and a legal title to their housing (SPARC, n.d.).

The most important aspect of relocating the inhabitants of the informal settlements is to keep communities as intact as possible during the transition. SPARC uses community-led surveys to gather information about the informal settlement in question and each household living there to understand their community and collective issues. In this way, all families, including the vulnerable families, will be involved. Besides this, SPARC's support also includes evaluating available housing to ensure it is suitable for the families and provides education on how to manage and save money effectively regarding their new housing (SPARC, n.d.).

Figure 19: Women getting educated (The Stitching Project, n.d.).

2.2 Social-Cultural Aspects of the Kitchen

This section explored the socio-cultural role of the kitchen in informal settlements in Bangladesh, focusing on its impact on women's lives. The kitchen held significant value for women in these communities, serving not only as a place for cooking but also as a central area for social interaction (Afrin & Khan, 2015).

The section covered several key areas related to the social/cultural aspects of the kitchen. First, the importance of the kitchen in daily life was outlined, highlighting its essential role and influence on routine activities. Following this, the value of understanding women's needs in the kitchen was emphasized. Additionally, tools and methods to explore these cultural needs were introduced, allowing for a culturally informed approach to design. Finally, existing knowledge about the social and cultural aspects of the kitchen in these settings was reviewed.

2.2.1 The Importance of the Kitchen for Women in Bangladesh's Informal Settlements

This project focuses on improving cooking and food preparation facilities for women in informal settlements in Bangladesh. The scope of the kitchen is chosen because the kitchen holds significant importance for women living in informal settlements (Afrin & Khan, 2015).

Bangladesh' women prioritize the kitchen because they spend a lot of time at home handling household responsibilities, unlike men. Women value a house that is functional, practical, and easy to use,

especially the kitchen (Afrin & Khan, 2015). I saw this firsthand during my field trip to the informal settlements in Bangladesh in October 2023. As I walked through these neighbourhoods, I noticed that the women spent much of their time preparing food or cooking, often chatting with other women and watching over the children. When they showed me their homes, they always mentioned something about the kitchen.

2.2.2 The Value of Understanding Women's Needs When Designing Spaces

To design effective housing, it is essential to consider women's needs living in informal settlements (Afrin & Khan, 2015). Besides that, history shows how important it is to understand women's needs when designing spaces. Key examples are the Frankfurt Kitchen and another case is the affordable housing in Dhaka, which both did not meet the needs of the target group.

The Limitations of the *Frankfurt Kitchen*

A notable example of why it is important to consider women's needs and behavioural patterns while designing is the Frankfurt Kitchen, created by architect Margarete Schütte-Lihotzky (1897-2000) for women living in affordable housing. It aimed to make the kitchen more efficient, reducing women's time there. However, in practice, it did not work as planned. Because instead of saving time, women were spending even more time in the kitchen (99Pi, 2023).

This was because the kitchen was designed with practical, space-saving features and separated from the living room to minimize household tasks. However, the space was so small that it became impractical. Contrary to the original intention, women couldn't supervise their children or interact with others while working, forcing them to spend extra time ensuring their children were safe. Additionally, the promise of efficiency was misleading. While tools were easily accessible, the compact space increased pressure and expectations. The kitchen's layout often led to more multitasking, reducing efficiency rather than improving it. Finally, the rigid design allowed little flexibility, making the kitchen feel more like a sterile workspace than a comfortable, personal part of the home (99Pi, 2023).

Affordable Housing in Dhaka: Women's Return to Informal Settlements

As mentioned earlier, the government faces challenges in meeting the housing needs of residents in informal settlements. Although there have been attempts to provide affordable housing in Dhaka, these efforts have not attracted the intended residents. Many target users either resold or rented out their new homes and eventually returned to the informal settlements (Afrin & Khan, 2015).

Women returned to informal settlements for several reasons. First, their social networks were disrupted by the move, which made them feel isolated. Second, economic constraints played a role. Women found it financially difficult to maintain new homes, leading them to rent out or sell their properties as a more manageable option. Additionally, safety and security concerns played a role. Women often felt safer in familiar environments, and if the new housing projects lacked security, they chose to return to their previous homes. Furthermore, the design and space utilization of the new housing (including the kitchen) often did not meet women's specific needs, making these homes unsuitable for their lifestyles. Finally, they could miss some of the facilities they had in the informal settlements, like the kitchen that they were used to, which contributed to their decision to go back (Afrin & Khan, 2015).

The examples of the Frankfurt Kitchen and affordable housing in Dhaka show how important it is to understand the real needs and culture of users before designing spaces. Any new design must fit the daily lives of the people it aims to serve to avoid unexpected problems.

In my project, which focuses on designing spaces that support women moving from informal settlements in Sylhet to new formal housing projects, I need to first understand the current situation. This includes looking at how cooking and food preparation are done, as well as the social, cultural, and practical aspects of the lives of Bangladesh' women. This research is crucial to ensure that the design enhances cooking and food preparation facilities while truly addressing the needs of the women it aims to assist.

Figure 20: Women living in informal settlement in Sylhet, Bangladesh (own figure).

Figure 21: Woman living in informal settlement in Sylhet, Bangladesh (own figure).

Figure 22: Woman standing in front of her house in informal settlement (own figure).

2.2.3 Tools for Exploring the Cultural Aspects of the Kitchen

Cultural and societal factors influence women's roles and perceptions in and on life (Afrin & Khan, 2015). To understand the social-cultural aspects of the kitchen of women living in the informal settlements in Bangladesh, I must dive into the culture of these women. The culture of these women is quite different than my culture, being brought up in the Netherlands. There are existing tools that can be used to help designers like me towards a culture-conscious approach to design. Below is explained how the two tools were used during the research.

Design and Culture

The first tool is the website 'Crossing Culture Chasms, towards a culture/conscious approach to design', (2015) created by dr. Annemiek van Boeijen. It offers a card set aimed at promoting a culture-conscious approach to design (figure 23). The cards are divided into three categories: Eye-openers (exploring the reasons behind cultural considerations), Insights (providing essential knowledge about culture), and Activities (suggesting practical tools for implementation). This resource can help designers better understand cultural contexts and improve their design processes by integrating cultural awareness (Van Boeijen, 2014).
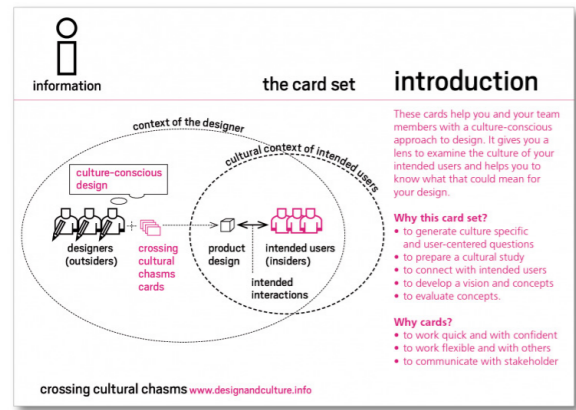
The Cultura Analysis Canvas

The papers 'Cultura Analysis Canvas' and the 'Cultura Question Card Set' (2017) by dr. Chen Hao introduce tools designed to improve intercultural understanding in design processes. The Canvas is a visual aid that helps teams identify and map out cultural influences on user behaviour by focusing on values, norms, and experiences specific to different user groups (figure 24). This process encourages a shared understanding among team members, which is essential for creating user-centred designs (Hao, 2019).

Complementing the Canvas, the Question Card Set consists of questions that stimulate discussions about various cultural factors, such as values, communication styles, and social dynamics. These questions help teams uncover important insights into user needs, especially in multicultural settings. Both tools can be utilized during user research to ensure that design concepts align with cultural considerations, promoting collaboration and dialogue among diverse team members (Hao, 2019).

For my project, I combined both tools because they overlap in useful ways. I used them alongside literature and research from, for example, interviews I conducted. The results of my exploration into the culture of women living in informal settlements, particularly focusing on food preparation and cooking, can be found later in this report.

Figure 23: Introduction card: Crossing Culture Chasms (Van Boeijen, 2014).

Figure 24: Cultura question card set (Hao, 2019).

Figure 25: Women and children gathering outside of informal settlement in Dhaka, Bangladesh (own figure).

2.2.4 Existing knowledge about the Social-cultural aspects of the kitchen

In the informal settlements in Bangladesh, the kitchen is not only for cooking but also serves as a hub for social interaction. This section explores how gender roles, the separation of public and private spaces, and cultural norms shape the kitchen's function and significance for women in these communities.

Gender Roles

In Bangladesh's informal settlements, men and women have different roles and spaces, shaped by cultural traditions. Women are usually expected to stay in private areas, like the home, and take care of cooking, childcare, and other household tasks (Jabeen, 2019). This role can be both empowering and limiting. While it allows women to manage essential aspects of home life, it also takes significant time and labour, reducing their chances of education and work outside the home (Barbieri et al., 2017). Men, on the other hand, typically have jobs that keep them away during the day, giving them more social connections and freedom to move around (Jabeen, 2019).

During my field trip to informal settlements, I saw very few men around at their house during the day. The women explained that the men were working and would return home afterward. Meanwhile, they stay at home with the children, managing household tasks like washing, cleaning, preparing food, and cooking. They also watch over young children or those who are not attending school.

Public and Private Spaces

The difference in roles also shapes the use of public and private spaces. Since men work more in public spaces, women's access to these areas is often limited (Jabeen, 2019). Safety and social norms further restrict women's presence in public spaces, as many feel uncomfortable or unsafe in these settings due to harassment risks (Hussain, 2010).

During my fieldtrip to the market, almost all sellers and buyers were men (figure 26). Seeing women at the markets was rare. When women were present, they were usually accompanied by men. As I walked through the market, which was mostly with a group of other female students, many men stared at us. This was probably because we were from the Netherlands, but it might also have been because we were a group of women walking together, without the company of a man.

Women mostly stay in private spaces, engaging in household tasks and socializing with other women. Within the community, they often gather in shared areas near their homes, where they can talk and work without being fully in public. These community spaces, somewhere between private and public, are vital for household tasks and small businesses, such as preparing food to sell. Here, women can socialize with neighbours while respecting cultural norms that limit their movement in public spaces. Such areas are essential for building support networks and allow women to earn money without going against traditional values like purdah, or seclusion (Jabeen, 2019).

While in Bangladesh, I noticed that women covered their hair in public. In public spaces, I rarely saw women, and those I did see always had their heads covered. In informal settlements, within their community, women also often wore a hijab. Some women covered their hair when they saw us approaching, though they hadn't been covering it before, likely because they felt at ease among other women and within their own community.

The Kitchen

The kitchen plays a central role in the lives of women in informal settlements, serving as a space for cooking, socializing, and sometimes income generation (Linkon, 2018). In these settlements, multiple families often share housing, sometimes with extended family members. This shared setup helps families save money by pooling resources but also brings challenges in terms of privacy and living conditions (Iqbal, 2020).

During my field trip, I got a tour of an informal settlement in Sylhet from a woman who told me that her family lived there along with two other families who were relatives. Together, twelve people shared a space of about fifteen square meters. There were three beds, with the rest of the family sleeping on the floor. They also shared a kitchen, which was located by the front door, and used the same pots and utensils.

Women adapt their kitchens to face environmental challenges. For example, they often place the kitchen near the door to reduce heat and sometimes use temporary cooking setups to deal with flooding (Linkon, 2018). Besides, the kitchen's location near the door allows women to prepare food while socializing with neighbours (Jabeen, 2019).

Cooking is a communal activity that strengthens social ties among women in informal settlements. Women often share recipes and cooking techniques, which fosters support networks. However, the lack of resources can also lead to competition and tension among households (Barbieri et al., 2017).

During my field trip, I often saw women preparing food and cooking together. I asked a woman, through a translator, about this while she was preparing food in the informal settlement. She explained that this was a time for them to talk and socialize, adding to the community's sense of closeness.

Figure 26: Men and children sitting outside and selling balloons in Dhaka (own figure).

Figure 27: Woman showing her house in informal settlement (own figure).

2.3 Practical Aspects of the Kitchen

This section focuses on the practical conditions of kitchens in informal settlements in Bangladesh. It explores the kitchen environment, including challenges with space, ventilation, and durability of construction materials. The section also examines traditional cooking methods, highlighting issues with smoke and health risks, and considers alternative stove designs developed to improve fuel efficiency and safety. Finally, it looks at the potential of gas as a cleaner cooking option and discusses the importance of understanding users' needs and daily practices when introducing new cooking technologies.

2.3.1 Kitchen Environment

In the informal settlements of Bangladesh, kitchens are often located in small, cramped spaces with limited ventilation (Jabeen, 2019). The construction of these kitchens typically uses corrugated iron sheets, supported by bamboo or wood (S. Rahman, 2018). Since the houses are not built to handle extreme climate conditions, these kitchens become fortable during high heat and humidity. Decisions regarding building materials are generally made by men, who prioritize cost over comfort, making it difficult for women to improve these spaces. Additionally, there is often a lack of funds to enhance the overall quality of the house or kitchen (Jabeen, 2019).

The floors of these homes are usually levelled with clay soil. During heavy rainfall, the houses can become flooded, allowing water to enter the home. This issue is particularly severe during periods of intense and continuous rain. The tin-roofed homes are vulnerable to storms, with strong winds potentially tearing away the roofs. Flooding also affects the kitchens, making it impossible to cook when water

enters the house and damages household items (S. Rahman, 2018).

During an interview on my field trip, I noticed holes in the walls and roofs. Natural light and cross-ventilation were also scarce, making the interiors hot. A woman in Sylhet, the city where I conducted my interviews, explained that flooding occurs a few times each year. She showed how high the water reaches—just below her knees. At that point, they can still sit on the bed but must temporarily move, as they cannot cook on the ground.

2.3.2 Traditional Cooking on Fire

Many women in these settlements cook using traditional methods (Chowdhooree, 2023). Traditional stoves, such as three-stone fires, mud stoves, metal stoves, and clay stoves, are common (figure 28). The three-stone fire is inefficient, producing a lot of smoke and exposing users to open flames. Mud stoves, made from sun-dried mud, are slightly more efficient, though performance can vary. Metal stoves, made from scrap materials, are affordable but tend to corrode and wear quickly. Clay stoves, which are fired to make them durable, are cleaner but more expensive and require skilled labour to build. Despite the differences, issues like high smoke emissions, low durability, and inconsistent quality persist across all these stove types (Barbieri et al., 2017). During my field trip, I almost only saw mud stoves built into the ground, making them immovable. Some stoves had one opening for a pot, while others had two.

Cooking with wood or traditional fuels pose significant health risks, especially for women and children who spend most of their time near the stove. The smoke and fumes released contain harmful chemicals that can lead to long-term respiratory issues. Indoor air pollution affects women and children most (Barbieri et al., 2017). Fire hazards are also common in the informal settlements, putting residents at risk. Women often lack fire safety knowledge, and since the houses are so close together, fire spreads quickly (Chowdhooree, 2023).

The environmental impact is also concerning; continuous demand for firewood leads to deforestation, harming local ecosystems and affecting the climate. The lack of safe cooking technologies also exposes women to dangers when gathering firewood, increasing their vulnerability to violence. Cooking with wood and other traditional fuels is time-consuming; lighting and maintaining a fire takes time. This is time women could also spend on other responsibilities (Barbieri et al., 2017).
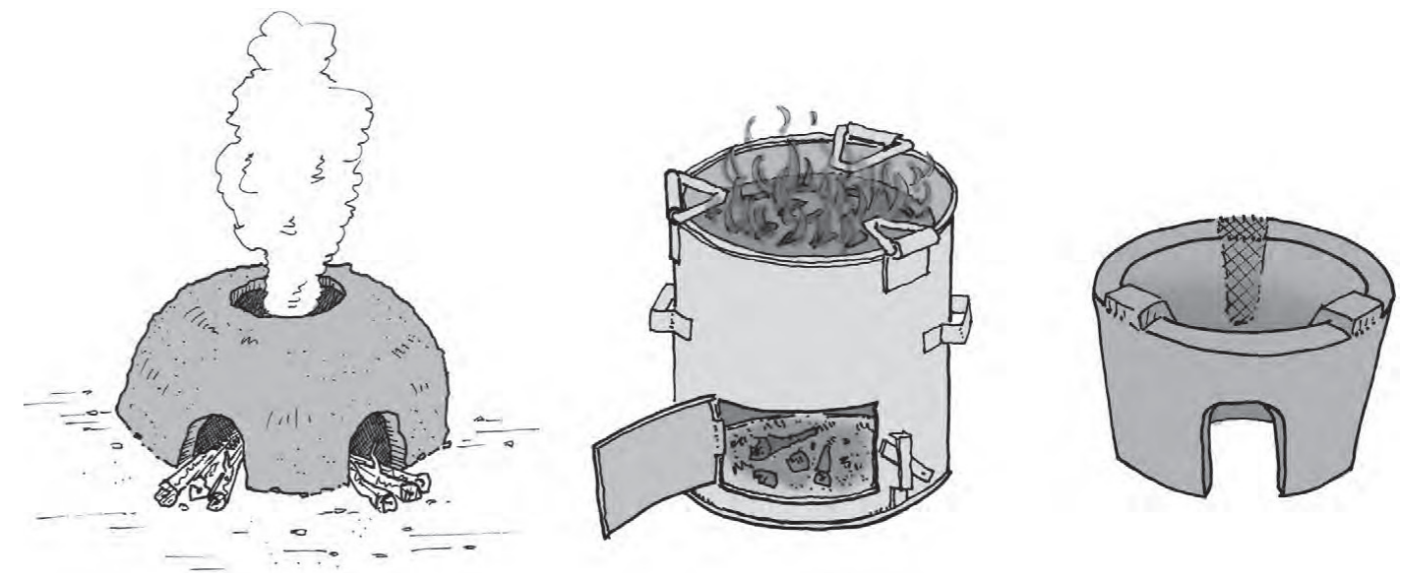
Figure 28: Cooking stoves made out of mud, metal and fired clay (Barbieri et al., 2017)

Figure 29: CharcHole stove designed by Stephanie van Spang (Van Sprang, 2017).

2.3.3 Cooking on Gas

In informal settlements, gas cooking is increasingly being used as a cleaner alternative to traditional methods like firewood or coal. This shift toward gas cooking is happening in various regions. Adopting better cooking technologies can lead to cost savings and more efficient food preparation, freeing up time and resources for women to focus on other activities. However, the initial costs and limited accessibility of these technologies remain barriers (Barbieri et al., 2017).

2.3.4 Alternative Designed Stoves

Many alternative stove designs have been developed for people in informal settlements. These alternatives aim to improve fuel efficiency, reduce emissions, and increase safety. Development-oriented organizations such as GIZ (German Development Cooperation) and the World Bank designed improved cook stoves based on their ability to reduce pollutants, boost thermal efficiency, and lower fuel use. In some cases, even traditional mud, metal, and clay stoves are classified as "improved" if they offer some energy savings compared to open-fire methods (Barbieri et al., 2017).

In Bangladesh, research on alternative stoves began in 1980, led by the Bangladesh Council of Scientific and Industrial Research (BCSIR), with a focus on saving fuel, reducing smoke, and improving health. The program was discontinued in 1990 due to challenges but resumed in 2005 when GIZ introduced Improved Cook Stoves based on a clay model.

However, women in informal settlements were not enthusiastic about these stoves, as they were not used by them. BCSIR continued developing new models, resulting in the "Bondhu Chula" brand, which GIZ has promoted nationwide since 2006. Organizations such as the World Bank support these efforts, with Bangladesh's Department of Environment working to spread awareness about these stoves (bondhufoundation, n.d.).

Another example is the 'CharcHole stove', designed by Stephanie van Spang for Prakti, an Indian cookstove company (figure 29). The stove is designed to meet the needs of women in Uganda and Ghana who use portable wood or charcoal stoves. This project was Van Spang her graduation project at the TU Delft. Prakti aimed to create a cleaner, more fuel-efficient stove for the African market, using charcoal to reduce emissions and fuel use. Traditional stoves contribute heavily to indoor air pollution due to incomplete fuel combustion. Previous cookstove initiatives attempted to reduce air pollution but often failed because users reverted to traditional stoves. Van Spang's project emphasized addressing the real needs and cooking habits of users, something often overlooked when focusing only on emissions and efficiency goals. Her design was adaptable to different cooking styles, fuel types, and pot sizes, aiming to encourage long-term use by the women it was designed for (Van Sprang, 2017).

There are many other examples of alternative stoves that have been created mainly for sustainability and health reasons. It is important to consider the users' needs and cooking habits, as Van Spang did in her project, looking not only at the technical aspects but also at what the users truly need.

2.4 What I Still Don't Know

In conclusion, NGOs play a key role in helping communities who live in informal settlements transition to formal housing. By working with the government, they ensure that resources are used effectively and that policies are fair and sustainable. Successful projects with NGOs such as Habitat for Humanity and SPARC demonstrate the importance of community-centred approaches that focus on social ties and residents' rights to housing.

Additionally, kitchens are very important in the lives of women in these settlements, reflecting their roles in managing the household and maintaining social connections. However, kitchen spaces often face serious problems, such as poor ventilation and exposure to flooding. While cooking methods like gas stoves can improve health and efficiency, many women still face barriers to using them due to cost and a lack of alignment with their cooking habits. To design effective kitchen solutions, it is crucial to consider both the socio-cultural and practical needs of these women.

My design goal was to create a design that supports women's transition from the informal settlements in Sylhet to the proposed formal housing project, with a focus on improving cooking and food preparation facilities. Before I could start designing, I needed more information than was currently available in the existing literature on the subject. I needed to understand the culture, practices, and roles of women living in the informal settlements, especially their daily activities related to preparing food and cooking. To support their transition effectively, I had to look at how women currently cook and how they used to cook before moving to the city, focusing on both urban and rural experiences in Bangladesh.

By studying the current cooking practices of women in urban informal settlements and their earlier methods in rural areas, I can learn about the transitions they have already gone through. This knowledge helps me design solutions for their next step from informal settlements to formal housing. Since I cannot gather all this information from literature or my field trip, I collect it through empirical research. I delve further into this and the methods used in the next chapter.

3 Empirical Research

As concluded in the previous chapter, merely using the information gathered from literature and my field trip is not sufficient to create a thoroughly-researched design, which incorporates as much cultural understanding as possible. The information required for my research about the culture, women's practices and roles around the house (including cooking and food preparation), how women currently cook in urban informal settlements in Bangladesh, and how they cooked in rural areas before moving, as well as the transition between these, can be formulated into four research questions:

1. How does the culture in Bangladesh shape women's practices and roles around the house (including cooking and food preparation) in the informal settlements?

2. How do women prepare food and cook in informal urban settlements in Bangladesh?

3. How do women prepare food and cook in informal rural settlements in Bangladesh?

4. What changes do women experience in their cooking and food preparation practices during the transition from living in informal rural settlements to living in informal urban settlements in Bangladesh?
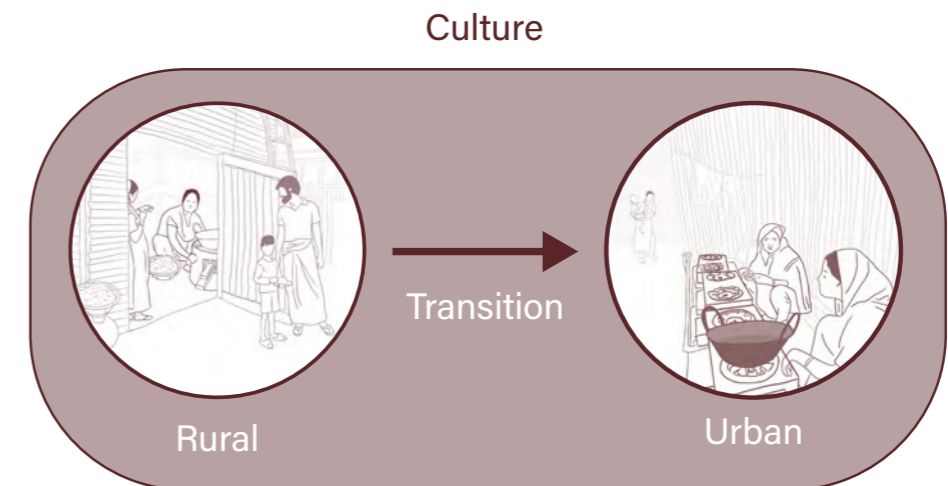

Figure 30: Connection between the research questions (own figure).

In this chapter, I started by examining the cultural aspects because culture influences how women prepare food and cook (figure 30). The cultural aspects were part of the values of women living in informal settlements in Bangladesh (figure 31). Once these values were understood, the needs of the women could be identified. From there, a vision, a design goal, and ultimately, a design proposal for the transition from informal housing to formal housing were created.

Next, I investigated the food preparation and cooking processes in both urban and rural settings. In my research, I first studied how women prepared and cooked food in informal urban settlements and then in informal rural settlements. I used the information gathered from the urban context as a reference for my research on the rural context because I was more familiar with the urban areas.

In the report, I first discussed the food preparation process in both the urban and rural contexts. After that, I discussed the cooking process in both the urban and rural contexts. The reason for this was that there was overlap in the food preparation and cooking processes between informal urban and rural settlements. If I had written about the urban context first and then the rural context, there would have been a lot of repetition, which I have now avoided.

Understanding the information from both urban and rural settings helped me explore the transition from living in informal rural settlements to living in informal urban settlements.

To answer these research questions, I used various research methods, which were discussed in the following paragraph before providing the answers to the research questions.
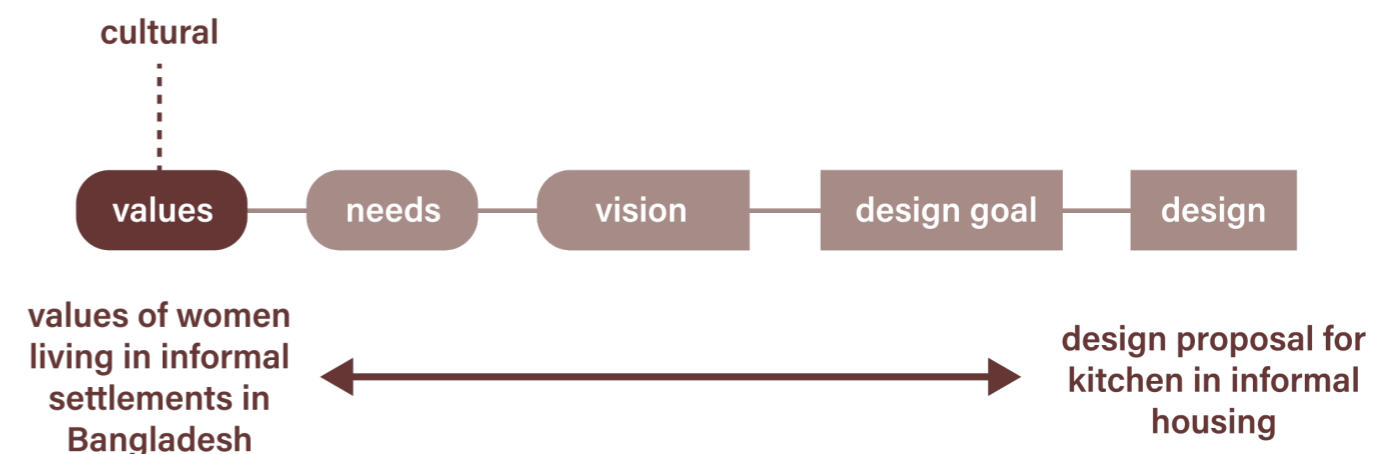

Figure 31: Visualization of the steps from researching values to the design (own figure).

Figure 32: Interview with Nasima who lives in the rural informal settlements and is holding my drawings (own figure).

Figure 33: Bilkis standing in front of her house after the interview in the urban informal settlements (own figure).

3.1 Used Research Methods

I used different methods to answer the research questions. Since my target group is in Bangladesh and I am completing my studies in the Netherlands, I conducted online interviews with experts and women living in informal settlements in Bangladesh. I did not have the opportunity to go on another field trip, but I used the gathered information from my fieldtrip to answer the research questions. Besides that, I used two different tools to explore the cultural aspects of the kitchen.

3.1.1 Interviews

I conducted interviews with two experts, Managing Director Willem Gees and Asfary Toma, as well as two women living in the informal settlements in Bangladesh. I spoke with them through a translator, Ahad Uzzaman, who works for Gees as supervisor CSEB-Production (Engineer) and regularly visits the informal settlements.

I interviewed Gees and Toma first to gain more background and general information from them. This helped me ask more in-depth and focused questions during the interviews with the women living in the informal settlements, rather than general questions that both Gees and Toma could answer.

Willem Gees

I met Willem Gees in Dhaka in 2023 during my field trip. He has been living in Bangladesh for a long time. Gees moved there to build homes and other projects for people living in informal settlements, using his own sustainable eco-blocks (ECO Home Solution, n.d.). He and his wife guided me through the informal settlements in Dhaka during my field trip. During my interview with him, I mainly asked about the informal settlements in the city because he visits them often, since he is regularly in touch with families living there. He also knows a lot about the informal settlements in the rural areas. Additionally, he is an expert on the housing transition from informal to formal because he designs and builds homes for people in informal settlements.

Asfary Toma

Asfary Toma is a woman who joined me during the field trip when I was in Bangladesh. One of my supervisors, Architect Marina Tabassum, knew her. Toma lives in Dhaka and regularly visits the informal settlements. She shared her knowledge about the informal settlements in the rural areas, which was very helpful.

Nasima

With the help of Ahad, I interviewed Nasima first (figure 32). She lives in the informal settlements in the countryside of Bangladesh. She cooks over an open fire, and during our interview she was also cooking. I asked her questions about food preparation and cooking processes, as well as the social, cultural, and practical aspects of cooking. In advance, I made sketches for the interview to help guide our conversation (see Appendix A).

Bilkis

The second woman I interviewed during my research lives in the informal settlements in the city of Bangladesh (figure 33). Bilkis cooks using gas and shares her gas stove with other women who live nearby. During the conversation with Bilkis, I created two scenarios and presented them to her to ask more focused questions and to make the discussion more visual (see Appendix B).

3.1.2 Fieldtrip

In October 2023, I went on a 2.5-week field trip to Bangladesh with fellow architecture students for my thesis project (figure 34, 35, 36). We visited Dhaka and Sylhet, where we chose a plot to design new housing. During the trip, we explored informal settlements, mostly in urban areas but also some in rural areas. We were joined by local architecture professionals from Bangladesh who spoke the language and knew a lot about these settlements. They shared cultural and living insights, especially about women's lives in the informal settlements, and helped translate my questions when I spoke to the women there.

This field trip was extremely helpful, not only for my architecture project but also for my current thesis. Seeing the conditions firsthand was eye-opening. Even though I didn't stay long and was still just a visitor, experiencing Bangladesh and visiting the informal settlements in person made a great difference. I'm using what I learned on the trip for my current thesis too.

3.1.3 Tools

The tools I used include the resources mentioned earlier for exploring the cultural aspects of the kitchen, such as the website "Crossing Culture Charms: Towards a Culture-Conscious Approach to Design" (Van Boeijen, 2014), and "The Cultural Analysis Canvas" and "The Cultural Question Card Set" (Hao, 2019).

Additionally, during the interviews, I used two tools: sketches and scenarios.

I created three sketches: one showing cooking in the informal settlements in the countryside over an open fire, one showing cooking in the city over an open fire, and one showing cooking in the city using gas. Ahad printed these sketches and brought them to the interview with Nasima, who lives in the informal settlements in the countryside. During our conversation, she looked at the sketches while I asked questions about the past, the future, living in the city, and cooking over fire and gas.

For the interview with Bilkis, I created two scenarios. One scenario was about living on the ground floor of a new home with a fire stove and having social contact. The other scenario was about living on the fourth floor in a beautiful kitchen with gas but having less social contact. I asked questions about these scenarios during the interview, which helped guide the conversation.

Figure 34: Interviewing women in informal settlements in Dahak with the help of Willem Gees (own figure).

Figure 35: Drinking coffee in an informal settlement in Sylhet, Bangladesh (own figure).

Figure 36: Interviewing women in informal settlement (own figure).

3.2 Results Research

This section presents the results of the empirical research conducted to address the key aspects of food preparation and cooking in informal settlements in Bangladesh. To answer the research questions, a combination of methods was used, as mentioned before. These methods provided valuable insights into the cultural influences, food preparation practices, and cooking processes in both settlement types.

First, the cultural aspects are discussed. Then, the food preparation and cooking processes for both urban and rural settings are presented. Afterwards, the transition from rural to urban informal settlements is explained, focusing on the key aspects that stand out during the research.

3.2.1 Cultural Aspects

This section addresses the research question, ***"How does the culture in Bangladesh shape women's roles around the house, including cooking and food preparation in informal settlements?"***

To answer this, I used tools such as the website 'Crossing Culture Charms: Towards a Culture-Conscious Approach to Design' (Van Boeijen, 2014) and 'The Cultural Analysis Canvas' and 'The Cultural Question Card Set' (Hao, 2019). Through these tools and interviews, I explored the cultural roles of women around the house.

Figure 37 presents the results by topic, offering an overview of cultural aspects, with some topics combined due to their interconnections.
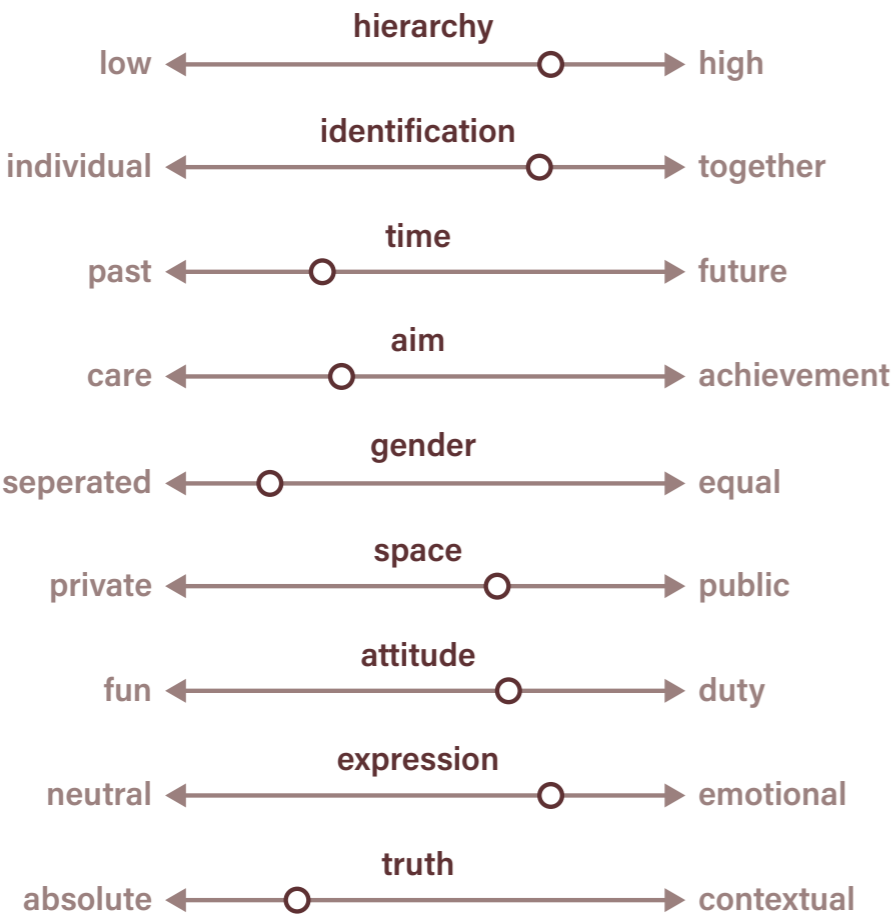
Figure 37: Overview of cultural aspects (own figure based on Van Boeijen, 2014).

Hierarchy and Gender

In the informal settlements of Bangladesh, social hierarchy plays a significant role in shaping daily life. Within these communities, especially in Islamic culture, it is common for men to work outside the home while women take care of household responsibilities, including cooking. This division of labour is viewed as the norm and is deeply accepted in their culture.

Gender roles are clearly defined in the informal settlements, with men expected to provide financially and women tasked with managing the home. This cultural norm extends to the kitchen, where it is generally not accepted for men to participate in cooking or household tasks.

In many families, the mother typically oversees the household budget. For instance, a married son living with his wife will often contribute part of his earnings to his mother. This arrangement sometimes encourages sons to seek their own homes nearby, usually within 50 to 100 meters of their mother's house. While this allows them some independence in managing their finances, they still maintain a financial connection to their mother, continuing to support her even after moving out. This structure highlights the interplay between hierarchy and gender roles, reinforcing the established dynamics within the community.

Identification and Truth

Women in this community share a strong bond and a sense of togetherness. Their main focus is on cooking and caring for their families, placing the well-being of their loved ones as their top priority. This dedication to family life fosters a strong sense of community in the informal settlements, where women support one another in times of need. They don't think only of themselves; instead, they rely on each other for help. If someone is sick or short on money, they can count on a neighbour for help. Even in poverty, it is common for people to lend money and pay it back the following month.

Cooking serves not only as a family duty but also as a social activity that brings the community together. In these close-knit neighbourhoods, people share resources and experiences, which strengthens their connections. While many women have mobile phones that allow them to see glimpses of other cultures, they remain deeply rooted in their own traditions and daily routines. Their understanding of life is clear and focused. For them, cooking and caring for their families is simply how things are done; it's a fundamental part of their culture that everyone participates in. This shared way of life reinforces their identity and community ties, creating a strong foundation of support and togetherness among the women.

Expression

Women have a lot of social interaction while cooking and preparing food, often talking to family members or neighbours. They discuss their worries, mostly about their children. They may speak openly with their husbands, but they do not do so with other men. Women are generally thankful for what they have, but they also share their concerns or frustrations, usually related to their children or family.

Aim and Attitude

The values of women in this community thus focus on care rather than personal achievement. Their main goal is to take care of their families, especially through cooking, which they see as their duty. There is a clear division of tasks, where cooking is seen as a responsibility to ensure that the family is well-fed. While cooking has a social aspect, the primary focus remains on meeting the family's needs.

Figure 38: Women at a waterpump filling pots with water (Bank, n.d.).

Women feel significant social pressure to meet cultural expectations regarding their roles as caregivers. Their aims go beyond daily care; they also seek to uphold their family's honour and maintain their status in the community. Even though they often set aside their own needs for the sake of their families, they take pride and find satisfaction in this. For them, caring for their families is a significant achievement.

When families have more money, they typically invest it in their children's education, hoping to provide them with a better future. Throughout the day, women keep a close watch on their children. In these tight-knit communities, where children cannot wander far, women feel confident that their children are safe. If kids leave the courtyard, it is usually with their mother or an older sibling, who takes on responsibilities at around the age of twelve. Children are not allowed to roam outside the courtyard alone. In Bangladesh, people cherish children, and physical punishment is rare. Parents are not overly strict, allowing children a lot of freedom to explore within safe boundaries.

Space and Time

Women in informal settlements often have little privacy because they live with their extended families in small homes. However, the kitchen and cooking tools are regarded as the woman's domain. When women cook together or side by side, men rarely enter the cooking area, and if they do, they are quickly sent away.

In public spaces, such as water pumps, which women use during the day, men typically keep their distance. This behaviour is not a formal rule but is deeply ingrained in their culture.
When women have their own kitchens and cook at or in front of their homes, family members like husbands or brothers-in-law may join them to socialize. This is different from unrelated men entering the space, which is generally not acceptable.

Women living in informal settlements tend to focus more on the present and their past experiences, rather than thinking much about the future. In the past, when they lived in rural areas, they enjoyed more space and privacy in their own kitchens, where many cooking methods and recipes were passed down from their mothers. Now, living in the city, they have to adjust to their new circumstances, often using shared gas stoves for convenience and speed.

3.2.2 Preparing Food

In this part, the following research questions are partially answered, specifically in relation to food preparation: *''How do women prepare food and cook in informal urban settlements in Bangladesh?''* and *''How do women prepare food and cook in informal rural settlements in Bangladesh?''.*

As explained in the introduction of this chapter, the food preparation processes in both rural and urban settings are discussed first to avoid repetition.

The food preparation process of women living in informal settlements is divided into four parts: buying food, fetching water, collecting pots and bowls, and cutting and washing food. For both the rural and urban contexts, an overview has been created for each of the four parts, with four aspects for each part: the task, the practical aspect, the social aspect, and the possible thoughts of the women (figure 39 and 40). A detailed explanation of these aspects can be found further along in the text.

Scenario - Preparing Food in the Urban Areas

Buying Food in the City

Task: The husband buys food at the market.

Practical: Essentials like rice and vegetables are purchased at the market.

Social: When women go to the market, they stay with other women, avoiding close contact or extended conversations with men.

Thoughts: She prefers that her husband goes to the market, as she feels uncomfortable around men at the market.

Fetching Water

Task: Fetch water in the afternoon for household use and cooking.

Practical: She uses a bottle to fetch water from a deep tube well (a type of pump) nearby.

Social: At the pump, she exchanges brief conversations with other women.

Thoughts: She enjoys the small moments of peace and social interaction while fetching water.

Collecting Pots and Bowls

Task: Gather pots and bowls for cooking rice and frying vegetables.

Practical: To save money and space she shares pots with her in-laws in the joint household.

Social: The pots and bowls are shared among family members: the mother of the family, the sons, and their wives.

Thoughts: She would prefer to have her own pots, which she wouldn't have

rice pot   bowls

Cutting and Washing Food

Task: Cutting vegetables and potatoes and washing rice.

Practical: She sits in front of her house, using the Boti to cut the vegetables and she washes the rice.

Social: This is a time to interact with her neighbors. They talk about their worries and daily problems while preparing food.

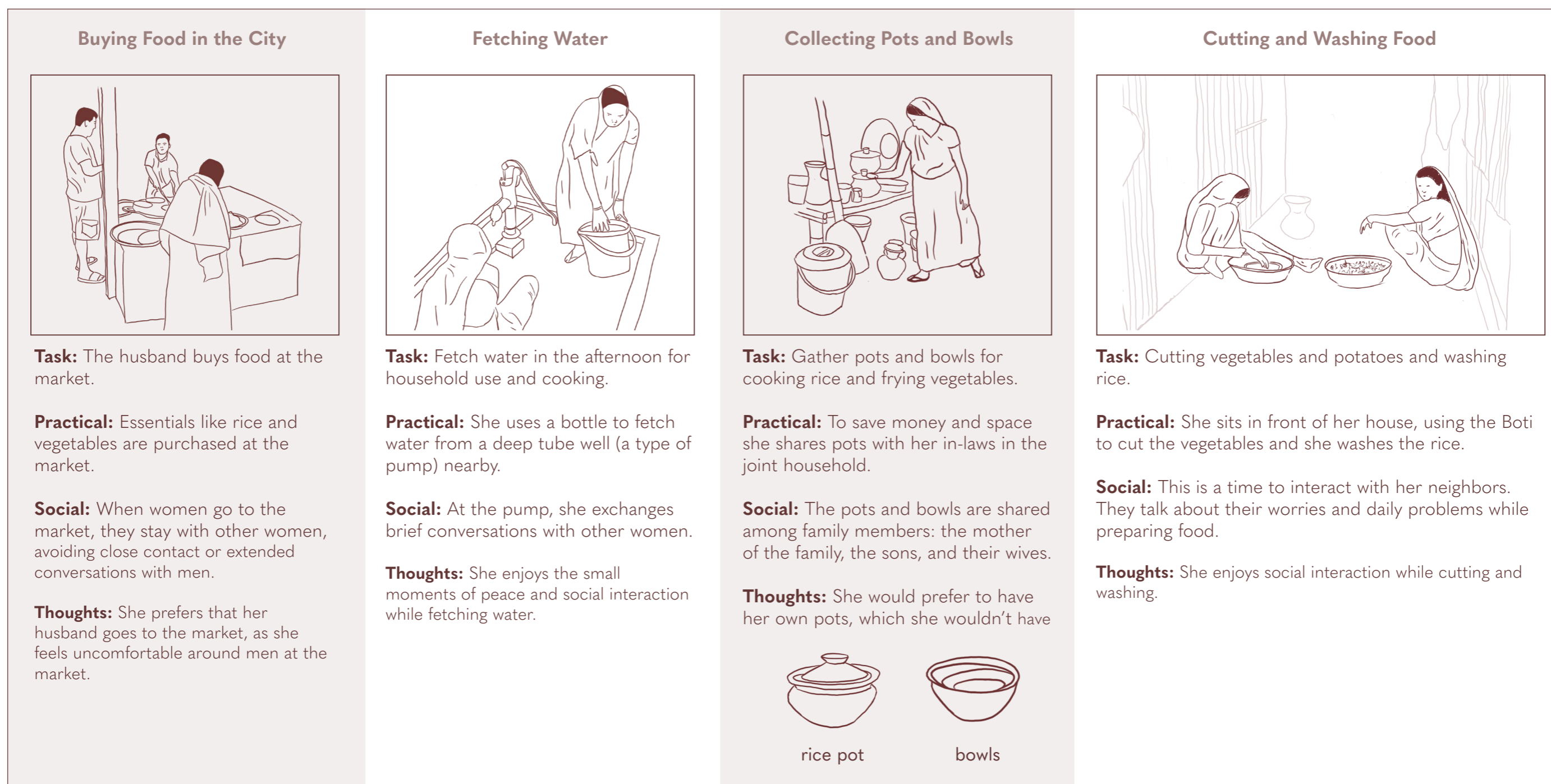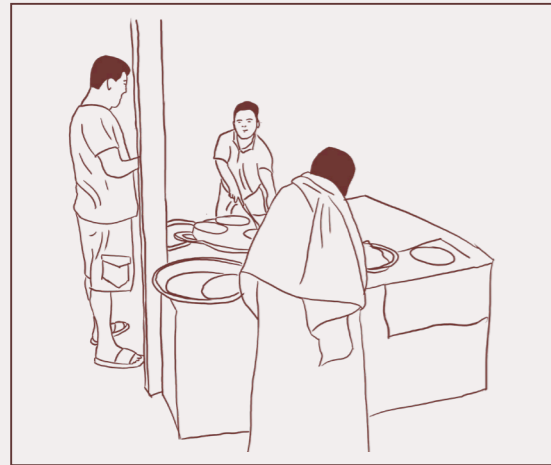**Thoughts:** She enjoys social interaction while cutting and washing.

Figure 39: Scenario of preparing food in the urban informal settlements (own figure).

Scenario - Preparing Food in the Rural Areas

Buying Food

Task: The man buys food at the market.

Practical: At the market, he mainly buy things like spices and oil.

Social: When women go to the market, they stay with other women, avoiding close contact or conversations with men.

Thoughts: She prefers that her husband goes to the market, as she feels uncomfortable around men there.

Fetching Water

Task: She fetches water from the nearby pump or river for household use and cooking.

Practical: She uses a water bottle or bucket to collect water.

Social: At the water pump or river, she talks with other women about daily concerns and experiences.

Thoughts: She enjoys the small moments of peace and social interaction while fetching water.

Collecting Pots and Bowls

Task: She gathers pots and bowls for cooking rice and curry.

Practical: To save money and space she shares pots with her in-laws in the joint household.

Social: The pots and bowls are shared among family members: the mother, sons, and their wives.

Thoughts: She would prefer to have her own pots, which she wouldn't have to share.

rice pot   bowls

Cutting and Washing Food

Task: She cuts vegetables and washes rice for meal preparation.

Practical: She sits in the courtyard, which is enclosed by a few other houses where her relatives live.

Social: While she cooks, her sister-in-law, mother-in-law, or niece often join her for company or to help.

Thoughts: She enjoys preparing food, seeing it as a way to show love for her family and hopes to improve their well-being.

Figure 40: Scenario of preparing food in the rural informal settlements (own figure).

Buying Food

In both urban and rural areas of Bangladesh, food buying practices show some similarities but also key differences. In both places, men are, due to cultural norms, usually the ones who go to the market to buy food (figure 41).

In the urban areas, men typically visit the market once a day, usually after work in the evening when the markets are busy. This is when food is often cooked, with leftovers saved for next day's meals. Educated women, even those in urban areas, often prefer to let their husbands handle the market trips. One of the interviewed women even mentioned that she does almost everything at home and refuses to go to the market out of principle.

However, there are exceptions. Women who work in textile factories often go to the market after their shifts, usually in groups of five to ten. They feel safer shopping together, and if a woman needs to go to the market, she always goes with another woman, her child, or her husband to avoid any discomfort.

In the rural areas, the situation is different. Markets are held about twice a week, which is less frequent than in urban areas. Women in rural areas usually work less outside the home, which means they have fewer chances to leave their houses. Many families grow their own vegetables and rice, so they don't need to buy products as often. They usually grow vegetables for personal use and may share their harvest during special occasions when they have a good crop. Women also help with growing vegetables, contributing to their family's food supply.

Overall, while men are usually in charge of buying food in both urban and rural areas, the frequency of market trips and the involvement of women vary between the two settings.

Figure 41: Streets in Dhaka with almost only men (own figure).

Figure 42: Waterpump in urban informal settlement (own figure).

Figure 43: Pots and pans stored in urban informal settlement (own figure).

Figure 44: Woman preparing food and holding child in urban informal settelement (own figure).

Fetching Water

In both informal settlements in urban areas like Dhaka and in the rural areas, women are mainly responsible for fetching water for their families. They usually use water pumps, like tube wells that provide drinkable water. This is an essential daily task, and women often carry large five-litre bottles of water on their shoulders when returning home, sometimes asking their daughters to help.

In urban areas, families often have access to a deep tube well, drilled 80-100 meters deep (figure 42). These are costly to build but are found in most neighbourhoods. The water pumps are often electric and may be fenced to prevent misuse or vandalism at night. Women usually fetch water in the afternoon, as there's an unwritten rule that men can use the pump in the evening when it's dark. Women prefer to stay close to home after dark, and while men can ask for water in the afternoon, they are discouraged from coming too close to the pump too often.

In rural areas, the practice is similar, as women also rely on water pumps and tube wells. However, they may also fetch water from nearby rivers, which are considered cleaner than the polluted rivers in urban areas. The cultural norms about water fetching are the same, with men generally avoiding the pumps during the day if women are there. Since there's more space in rural areas, women often share water pumps with fewer families than in urban areas. At the river, there are no strict rules about who can fetch water, which offers more freedom.

Overall, while women are mainly responsible for fetching water in both urban and rural areas, the cultural practices and availability of clean water differ.

Collecting Pots and Bowls

In both urban and rural areas of Bangladesh, women have a strong connection to their cooking pots and utensils, which are essential for preparing meals (figure 43). Common cookware includes metal pots for cooking rice and chicken, and a vertical knife called a Boti for cutting vegetables. These tools are important for daily food preparation and are often bought from local markets, where vendors sell them from carts or stalls. However, there are differences in how women in urban and rural areas manage their cooking spaces.

In urban areas, women often live in shared homes with several families, usually consisting of relatives like brothers, their wives, and children. They work as one big family unit, sharing belongings, money, and cooking utensils. The metal pots and bowls they use are often filled with rice or other dishes, reflecting their communal way of cooking and eating.

In rural areas, women generally have more personal space and are more likely to have their own kitchens. While they might share pots and pans when living with relatives, they often have their own set of cooking tools. This setup gives them more control over the cooking process.

Despite the differences in living arrangements and kitchen ownership, the types of cookware and the importance of cooking remain the same in both urban and rural settings.

Cutting and Washing Food

In both urban and rural areas of Bangladesh, food preparation is a key part of daily life, usually taking about an hour twice a day. Women cut vegetables using a Boti and wash rice as important steps in the cooking process. They press vegetables and potatoes down onto the blade, which is fixed upright on a wooden base. This method helps slice food thinly, making it look more plentiful and improving the flavour of dishes.

Washing rice is also an important task in both settings, done with water collected earlier to remove small stones. Women prefer not to leave their pots and bowls unattended while preparing meals, staying focused on the task. Though the basic practices are similar, differences emerge between urban and rural food preparation.

In urban areas, women often prepare food outside, gathering in front of their homes. This communal preparing food setup encourages social interaction as they chat and share news while preparing meals. Many women in informal settlements have limited social networks and rely on neighbours for news since they may not have access to newspapers or social media.

In rural areas, women usually prepare food in their own kitchens, sometimes involving other women or relatives in the process. This can be a social activity, with women preparing food together in open courtyards, where they can easily supervise their children. The open spaces in rural areas make it easier for women to keep an eye on their children, while in urban areas, children tend to run around closed courtyards, creating a different situation for supervision.

Overall, while cutting and washing food are similar in both settings, the social aspects and space available for preparing food differ based on whether women are in urban or rural areas.

Figure 45: Woman washing her food at a waterpump in urban informal settlement (WorldFish, n.d.-d).

Figure 46: Woman washing her pots and pans in a river in rural informal settlement (Bread for the World, n.d.).

3.2.3 Cooking Process

This part addresses the following research questions, specifically focusing on cooking: **''How do women prepare food and cook in informal urban settlements in Bangladesh?''** and **''How do women prepare food and cook in informal rural settlements in Bangladesh?''**.

The cooking process of women living in informal settlements is divided into four parts: gathering fuel, lighting a fire, putting food in the pan, and stirring over the fire. For the urban context, two scenarios have been created: one for cooking on an open fire and one for cooking with gas (figure 47 and 48). For the rural area, there is only one overview, specifically for cooking

on fire (figure 49). Just like with the food preparation process, the four parts are organized into four aspects for each part: the task, the practical aspect, the social aspect, and the possible thoughts of the women. A detailed explanation of these aspects is provided in the text.

Scenario - Cooking in the Urban Areas on Fire

| Gathering Fuel	Lighting a Fire	Putting Food in the Pan	Stirring on Fire

Gathering Fuel

Task: Searching for fuel to cook over a fire.

Practical: She collects scrap wood and bits of paper to light the fire near her home or just outside the courtyard.

Social: She often gathers fuel alone. If not alone, she goes with her children or other women.

Thoughts: She thinks about ways to save money on fuel and hopes to find enough free wood.

Lighting a Fire
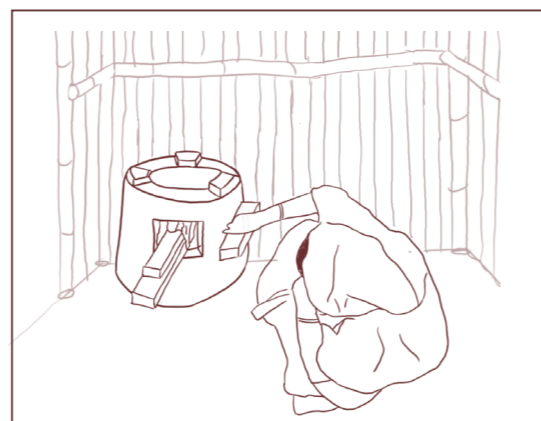
Task: Starting the fire.

Practical: She uses a simple clay oven to light the fire.

Social: When she lights the fire at home, she chats with family members nearby, mostly other women.

Thoughts: She prefers cooking with gas because it's less dangerous and faster, but food tastes better when cooked on fire.

clayoven with 2 pits   clayoven with 1 pit

Putting Food in the Pan

Task: Preparing rice, dal, and curry in the pan.

Practical: They usually make four items: rice, torcari (vegetable curry), dal (lentils), and fish or meat if they can afford it.

Social: She makes her dishes for her own family.

Thoughts: She hopes her family appreciates the meal and that there will be enough, especially during tough times.
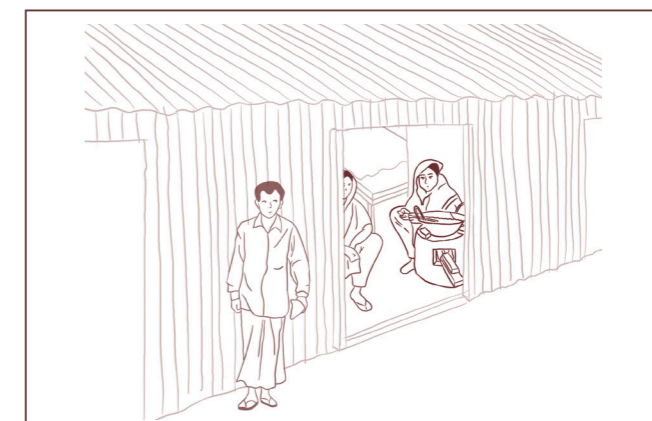
dal   rice

Stirring on Fire

Task: Cooking the meal.

Practical: She squats by the fire, making sure all the dishes are ready at the same time.

Social: Cooking by the fire is done near her home, where she interacts with family members, often women, but sometimes male relatives.

Thoughts: She feels proud of her role in the family and finds peace in knowing she contributes to her children's and husband's well-being.
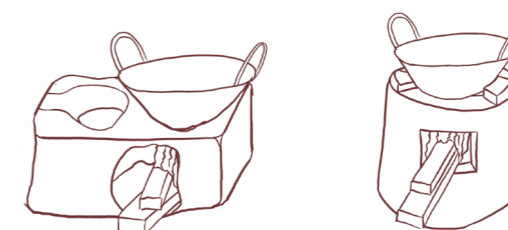
clayovens with pans

Figure 47: Scenario of cooking on fire in the urban informal settlements (own figure).

Scenario - Cooking in the Urban Areas on Gas

Lighting the Gas Burner	Putting Food in the Pan	Stirring on Fire

Task: Lighting the gas burner.

Practical: She has to cook during her designated time slot.

Social: There are six gas burners side by side. She chats with the women next to her at the gas burners.

Thoughts: She hopes the gas doesn't get cut off in the informal settlement because that would mean she has to wait.

Task: Preparing rice, dal, and curry in the pan.

Practical: They usually make four items: rice, torcari (vegetable curry), dal (lentils), and fish or meat if they can afford it.

Social: She makes her dishes for her own family.

Thoughts: She hopes her family appreciates the meal and that there will be enough, especially during tough times.

dal   rice

Task: Cooking the meal.

Practical: She squats by the gas burner, making sure everything finishes cooking at the same time.

Social: She cooks next to other women, chatting with them while each prepares her own meal.

Thoughts: She likes to cook on gas because it goes quicker and during cooking she can also prepare in the meantime. She likes the social contact with other women.
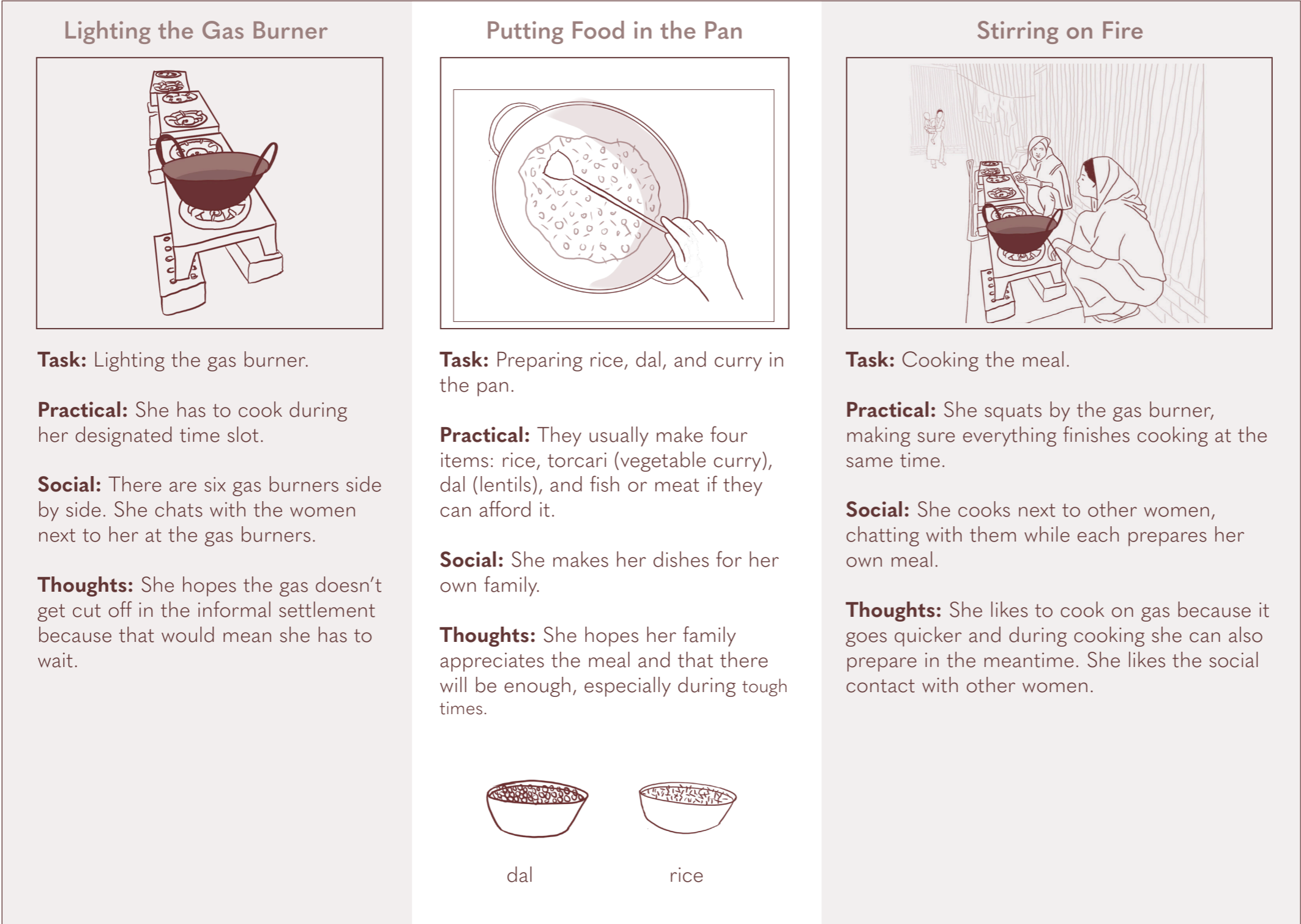
Figure 48: Scenario of cooking on gas in the urban informal settlements (own figure).

Scenario - Cooking in the Rural Areas on Fire

Gathering Fuel	Lighting a Fire	Putting Food in the Pan	Stirring on Fire

Gathering Fuel

Task: She searches for fuel for cooking.

Practical: She gathers materials like wood, bamboo sticks, and leaves.

Social: Collecting fuel is mainly the woman's task. Sometimes, she does this with other women or her children.

Thoughts: She reflects on the different natural materials she can use as fuel.

Lighting a Fire
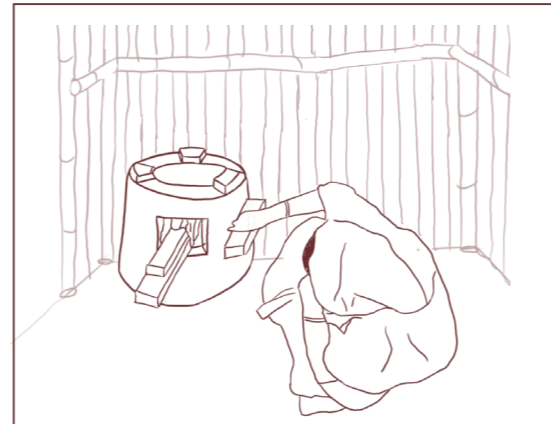
Task: She lights the fire for cooking.

Practical: She uses a simple, homemade clay oven. The kitchen is separate from the house to keep smoke out.

Social: Sometimes, her female family members join her for company while she lights the fire.

Thoughts: She thinks about how long it takes to light the fire but is happy to have her own clay oven.
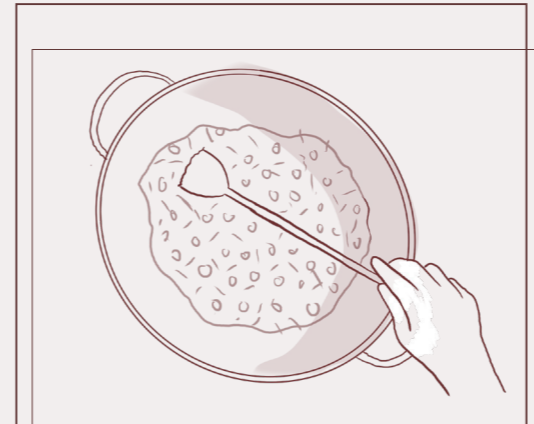
clayoven with 2 pits   clayoven with 1 pit

Putting Food in the Pan

Task: She prepares rice, dal, and curry in the pan.

Practical: They usually make four items: rice, curry, dal (lentils), and fish or meat if they can afford it.

Social: She makes the meal for her own family, but this can also be relatives.

Thoughts: She hopes her family appreciates the meal and that there will be enough food, especially during difficult times.

dal   rice

Stirring on Fire

Task: Cooking the meal.

Practical: The woman cooks in her enclosed kitchen, separate from the house. She squats by the fire, keeping an eye on the food so everything is ready at the same time.

Social: Family members often come to chat and help while she cooks, especially female relatives but sometimes male family members too.

Thoughts: She enjoys having enough space to cook and appreciates the company of her family during the process.

clayovens with pans

Figure 49: Scenario of cooking on fire in the rural informal settlements (own figure).

Searching for Fuel (Fire Only)

In both urban and rural areas of Bangladesh, women play a key role in gathering fuel for cooking, which is essential for their daily lives. In both urban and rural areas, women often involve their children in the fuel-gathering process, emphasizing the communal aspect of this essential task.

In the urban areas, women often rely on scrap wood found in their surroundings as fuel. They might break down crates, collect fallen branches, or use items like paper and old shoes. To save money, women are resourceful and make use of whatever is available, often stockpiling fuel to minimize the frequency of their searches.

In the rural areas, women also gather fuel, but the sources differ. They use natural materials such as leaves, bamboo sticks, dried rice straw, and cow dung. They dry cow dung on sticks, which provides a sustainable and readily available source of fuel.

Differences in Fuel Gathering

The process of searching for fuel presents notable differences between the urban and rural areas. In the urban areas, women typically search for scrap wood near their homes during the day, avoiding busy market areas where they might face crowded conditions, price negotiations, or inappropriate remarks from men. This helps them stay safe while ensuring they can find the materials they need for cooking.

In contrast, the rural areas provide a different environment for fuel collection. Women can often gather materials from their own land or nearby fields, making the process more straightforward and less dependent on scavenging in public spaces. Since rural areas generally have less crowding and more natural resources, women can focus on collecting the abundant materials available to them.

Overall, while both urban and rural women share the responsibility of fuel gathering and utilize their environments to meet their cooking needs, the sources and methods are different.

Starting the Fire/Gas Burner

In both urban and rural areas of Bangladesh, lighting the fire for cooking is a vital responsibility that falls to women. They play a central role in preparing meals for their families, whether using traditional clay ovens or gas burners. In both settings, women light the fire themselves, often chatting with family members nearby as they prepare to cook.

Differences in Cooking Methods

Fire Cooking in the Urban Areas:
In urban informal settlements, women often use clay ovens with one or two burners. These ovens are usually built on the ground and cannot be moved. While having two burners allows for more efficient cooking, it can also lead to heat loss if only one burner is in use. Cooking with fire, however, poses significant risks; houses can catch fire easily due to the close proximity of settlements, leading to potential dangers and health issues from smoke inhalation.

Fire Cooking in the Rural Areas:
In rural areas, women also rely on clay ovens to light their fires. The kitchens are often separate from living spaces to minimize smoke exposure. This setup reduces the risk of fires spreading to the house, as the kitchen is usually enclosed to protect against animals and theft. Women may light the fire alone, but they can also be joined by other (female) family members for company, while keeping an eye on their children playing nearby.

Gas Cooking in the Urban Areas:
In urban areas, the use of gas stoves is becoming increasingly more common in informal settlements. Women often cook on shared gas stoves, which are set up with designated cooking times. For example, one household might cook from 5 to 6 PM, while the neighbour cooks from 6 to 7 PM. Although this system works well, gas supply can be inconsistent in these areas. Women might face interruptions in gas service, especially when shortages occur, causing them to adapt by cooking late at night.

Gas Cooking in the Rural Areas:
In rural areas, access to gas stoves is not as prevalent, and women primarily rely on cooking with fire. There are fewer shared cooking facilities, and women usually prepare meals in their own kitchens, providing them with more flexibility and control over their cooking process. This independence reduces the complications associated with time slots and gas availability that urban women often face.

Overall, while the fundamental role of women in cooking remains the same across both contexts, the methods and challenges they encounter vary. In the urban areas, women navigate shared gas cooking arrangements whereas their rural counterparts typically have more space and independence in their cooking practices.

Figure 50: Woman preparing and cooking her food on fire in urban informal settlement (Taylor, 2020).

Putting Food in the Pan

In both urban and rural Bangladesh, women prepare essential meals that typically consist of dal (lentil sauce), rice, and mixed vegetable curry, known as torcari. This fundamental meal, often referred to as dal bhat, is a staple in the diets of families, reflecting the culinary practices that define both settings. Women always use onions and garlic to enhance the flavours of their dishes, believing these ingredients are essential for cooking.

Differences in Meal Preparation

Cooking in the Urban Areas:
In the urban areas, the preparation of dal can vary depending on the family's financial situation. When money is tight, women make a thinner version called patla dal, which serves more as a flavouring for rice and is often slurped up. When the budget allows, they prepare a thicker dal called dalgona, which is richer. Seasonal vegetables like okra, papayas, and carrots are commonly used in the curries. If the family can afford it, fish or chicken is added to the meal. Some women also make roti or chapati in the morning, rolling out dough and baking it to accompany their meals.

Cooking in the Rural Areas:
In rural areas, the cooking methods mirror those of the urban areas, with families also enjoying dal bhat and torcari. However, women in rural areas typically have a bit more access to fresh products, often growing their own vegetables in home gardens. This allows them to incorporate seasonal ingredients into their meals more easily. While the core components of the meal remain the same, the ability to use fresh, homegrown vegetables can enhance the flavour and nutritional value of their dishes.

Both the women coming from the urban and rural areas share the same foundational cooking practices, emphasizing the importance of lentils, rice, and seasonal vegetables. Yet, the differences in their cooking environments, access to ingredients, and financial constraints shape the way meals are prepared and enjoyed in each setting.

Figure 51: Mola and petato cutty in pan cooked on fire (WorldFish, n.d.-b).

Figure 52: Woman cooking in her kitchen on fire (WorldFish, n.d.-c).

Figure 53: Woman cooking in informal settlement on fire (own image).

Cooking

Women typically prepare meals twice a day, around 8 AM and 8 PM. Whether in urban informal settlements or rural homes, the cooking process often involves squatting, a comfortable position many women have adopted since childhood due to the lack of chairs. When available, chairs are sometimes repurposed as tables for laying out vegetables. Regardless of the setting, the goal is to have all components of the meal—rice, dal, vegetables, and meat—ready at the same time.

Differences in Cooking Environments

Cooking in the Urban Areas:
In informal settlements, cooking usually occurs near the home, where social interaction is common. Courtyards provide a space for children to play freely while their mothers cook, fostering a communal atmosphere. If there is no courtyard, women keep an eye on their children from a distance, knowing they are safe even if they can't see them. Cooking responsibilities are often shared among household members, with meals prepared for the entire family. If a son returns home late, a separate meal may be prepared, although it's more common to set aside a portion for him.

Women cooking over an open flame interact closely with others nearby, often sharing tips and recipes. When using the increasingly more common gas stoves, they work alongside other women, facilitating conversation and camaraderie. Each woman typically spends about an hour and a half at the stove, ensuring that meals are prepared efficiently.

Cooking in the Rural Areas:
In contrast, women in rural areas usually cook in their own more spacious kitchens. The separation from the rest of the house not only provides a sense of privacy but also helps keep food safe from animals. While the kitchens are enclosed to protect food from pests, social interaction remains important. Women often cook alongside their mother-in-law, sister-in-law, or aunt, enjoying their company while preparing meals. Despite the proximity to neighbours, social visits are less frequent in the rural areas, as community interactions tend to be more contained.

Figure 54: Woman eating with her children on their bed (WorldFish, n.d.-a).

3.2.4 Transition

This section answers the following research question: ***"What changes do women experience in their cooking and food preparation practices during the transition from living in informal rural settlements to living in informal urban settlements in Bangladesh?"***. A comparison has been made between food preparation and cooking processes in rural and urban informal settlements, focusing on the transition between the two and highlighting the most notable findings from the research.

To answer this research question, the method used is the one previously mentioned for exploring cultural aspects of the kitchen, specifically from the website 'Crossing Culture Charms: Towards a Culture-Conscious Approach to Design' (Van Boeijen, 2014). For this question, three aspects—space, purpose, and time—were chosen to compare rural and urban settings and to identify differences in the transition (figure 55). Based on the research, these aspects are the most relevant and distinctive for understanding the transition from rural to urban informal settlements, offering key insights for the project. Along with these aspects, this section also covers changes in community relationships and the use of utensils during the transition.
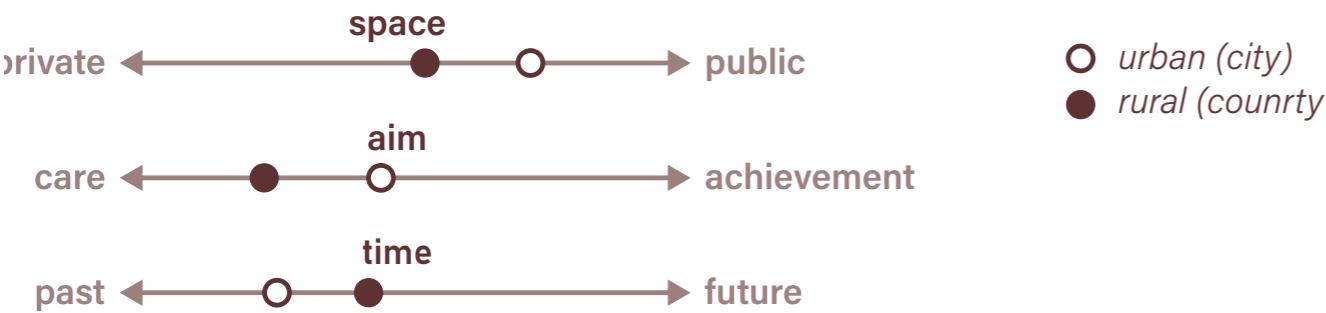
Space (private – public)

Urban

In urban areas, some women cook on wood-fired stoves, but many now use gas. The woman I interviewed, Bilkis, who lives in an urban area, said she shares a gas stove with two burners with five other women. She does not mind sharing the kitchen with other women; in fact, she enjoys the social interaction. She has her own house, but the kitchen is shared. Here, she also prepares food, often with other women.
Some women in urban areas still cook on wood stoves if there is enough space in their homes. They often share their wooden stove with relatives or sometimes other families, taking turns cooking but still having social interaction with each other. Occasionally, they cook together with the entire family, relatives, and sometimes other families in the courtyard, similar to what they do in rural areas. This is a cultural practice where they cook over an open fire, even if they usually cook on gas.

Rural

In rural areas, women often have their own kitchen where they cook on a wood-fired stove. The kitchen is a separate space away from the house, so the smoke doesn't enter the living areas. Sometimes, other women or relatives visit the kitchen. From the interview with Nasima, she mentioned that sometimes she asks relatives to come to the kitchen to help or just for the social aspect. Nasima said that they don't always have time to cook together. The women who live in rural areas, according to my research, enjoy having their own kitchen. Occasionally, they cook together with the entire family, relatives, and sometimes other families in the courtyard. They cook over an open fire and prepare meals together. This happens about three times a year.

Transition

Women in rural areas are more likely to have their own kitchen than those in urban areas. Urban women tend to share their kitchen and don't usually mind, often because of the social interaction. The woman I interviewed from a rural area enjoys having her private kitchen. The transition from rural to urban areas means going from a private kitchen to a more public one, where they also share other facilities more frequently.

Aim (care - achievement)

Urban

In urban areas, women focus more on efficiency, which I interpret as daily achievement—getting the most out of their day. Since urban women often cook on gas, they can do other things while cooking, like preparing food in advance or cleaning the house. During my interview, Bilkis said that she likes that cooking on gas is more efficient. She also said that she sometimes also does work for others, like household tasks. Urban women also have more time to watch their children, and this is seen as a positive thing.

Rural

In rural areas, women have more space and their own wood-fired kitchen. They also help with farming and growing crops that can be used for meals. If they have chickens, the women often take care of them as well. They also have to keep a close eye on their children because the rural informal settlements are often located near water and are surrounded by a lot of land.

Transition

Both in rural and urban areas, the focus is on care. Taking care of their family, mainly by preparing food, is the top priority. However, based on my research, I believe that in urban areas, daily achievement is a bit more important than in rural areas. Mainly because cooking on gas provides them with more time, so they can work more efficiently and thus accomplish more things in a day.

Figure 55: Cultural aspects compared with urban and rural (own figure based on Van Boeijen, 2014).

Time (past-future)

Urban

As mentioned before, women in urban areas often cook on gas. Bilkis, the woman I interviewed there, shares her gas stove. She doesn't think much about the future in relation to cooking and the kitchen, since she rents her house from a landlord, so she can't make many changes to the kitchen situation, but she also doesn't want to.

When I asked her about this, she said she wouldn't want her own kitchen. She values the social contact she has while cooking and preparing food. She wouldn't even want her own kitchen if it were attached to the courtyard like the shared one. She enjoys cooking on gas for several reasons, although she admits that food tastes better when cooked on wood fires.

In the interview with Bilkis, I presented her with two extreme scenarios regarding the kitchen. One was a private, beautiful kitchen, cooking on gas, on the third

floor, but far from the social life that takes place on the ground floor. The other was a shared, much smaller kitchen on the ground floor, cooking on a wood fire, but with social interaction with others. She chose the kitchen on the ground floor, mainly because of the social interaction with other women, the ability to watch her children, and the fact that she was used to the ground floor. Even if strange men walked by, she would still prefer the kitchen on the ground floor.

Rural

From the interviews I conducted, I learned that women in rural areas who cook on wood fires think more about the future. As mentioned earlier, women in rural areas almost always cook on wood fires. Nasima, the woman I interviewed who lives in the rural area, said she would like to cook on gas someday because it is cheaper and more efficient. Sometimes the wood is wet, and they have to wait a long time for it to dry before they can use it. If she cooked on gas, she would like to have her own kitchen in or attached to her house. She said she wouldn't mind if the kitchen wasn't in the courtyard. If the kitchen were

Figure 56: Women preparing food (WorldFish, n.d.-e).

3.3 Conclusion

This chapter has addressed four research questions related to how cultural practices in Bangladesh shape women's roles in and around the house, how women in rural and urban informal settlements prepare and cook food, and the changes they experience in their cooking practices when moving from rural to urban areas. These questions were answered using a combination of methods, including interviews, field research, and cultural design tools.

Cultural traditions in Bangladesh influence women's roles in informal settlements. Women are primarily responsible for cooking and caregiving, tasks that are deeply rooted in cultural expectations. In both rural and urban settings, women handle household chores, while men typically work outside the home. Cooking is an essential activity for women, not just for meeting practical needs but also as a way to connect with others, share experiences, and build a community.

The food preparation and cooking practices are quite similar in both rural and urban informal settlements. Women in both areas prepare food, socialize, and almost always take care of their children while cooking.

However, there are differences in the environment and methods used. Rural women usually cook in private kitchens with an open fire, separated from their house. They also often work on farms and take care of animals. In urban areas, women cook more often with gas instead of cooking on fire. Almost always they have to share the kitchen, which increases social interaction but reduces personal space. A woman interviewed in this study who cook with gas prefer the social connection over having a private kitchen. Cooking with gas in urban areas is more efficient, allowing women to multitask and manage household chores more easily. Despite the differences in cooking methods and spaces, the main priority for women in both rural and urban areas is still caring for their families and socialize while doing this.

The transition from rural to urban informal settlements brings changes to the cooking environment, social interactions, and women's roles. Time also plays a role in this shift. Rural women tend to focus more on the future, hoping for better cooking methods and living conditions, while urban women are more focused on the present, valuing the social aspects of their cooking environment.

4

The Design Goal

This chapter explores the design considerations for creating cooking and food preparation spaces in new formal settlements for women transitioning from informal housing. It focuses on the social, cultural, and practical needs of these women, aiming to preserve their community bonds, cooking traditions, and daily routines while adapting to new housing conditions. The chapter provides insights from interviews and my architectural project. The key areas of focus include social interaction, the preservation of cooking traditions, and practical concerns such as affordability and functionality.

4.1 Vision on the Ideal Situation

Through my research, I observed how essential the sense of community is for women living in informal settlements. The strong social bonds they share with one another are valuable and worth keeping as much as possible during the transition. While they likely cannot maintain all their social connections when they move, placing them near familiar neighbours or relatives can help reduce feelings of loneliness, which often arise with major relocations. For example, in my interviews, Biklis (a woman who moved from a rural area to the city), initially felt uncomfortable because she knew no one. However, over time she became part of a close-knit community. During a transition, these connections may change. While they might lose some existing connections, they will likely make new ones.

The kitchen remains central in these women's daily routines and social lives. Preparing food together is not only about the meal but also a social activity. By creating a space, whether in their home or nearby, where they can prepare food and interact with other women, the design can support their social and family roles. Even if the new design does not keep all aspects of their current cooking spaces, a dedicated area close to their homes can help create a familiar environment. This will enabling them to interact while still keeping an eye on their children.

Additionally, social contact during cooking is an important aspect. A woman I interviewed who cooks with gas mentioned that she wouldn't want her own cooking stove because she would miss out on social interaction. Decisions about whether to design individual or shared kitchens benefit from careful thought, considering the impact on these women. While they may not be able to keep everything the same,

maintaining social contact is a key factor to keep in mind.

Beyond daily cooking, these women also have traditional occasions when they gather and cook together over an open fire. This is a cultural practice that is a significant part of their identity. Moving to formal housing may bring challenges, but preserving a shared cooking space where they can cook on fire, even in a slightly modified form, could help keep these traditions alive and maintain their cultural connection.

In designing the homes, it is valuable to consider how women interact with their surroundings. The interviews show that the women prefer ground-floor housing, likely due to the easy access to shared spaces and their familiarity with ground-floor living. During my Architecture project, I learned that high-density urban planning often involves building upward. If the goal is to achieve high density and women end up on upper floors, providing strong community connections can help prevent feelings of isolation. While this approach may not address all community-related issues, it could lessen the isolating effects of formal housing.

Practicality and safety in the kitchen can be balanced by combining traditional practices with the design possibilities of formal housing. Ideally, these women would be able to prepare food as they have done before, using their own utensils and cookware, which helps them feel comfortable with traditional cooking habits, like squatting while cooking. If this is not possible in the new housing, they may feel uncomfortable and not feel at home in formal housing.

Affordability of cooking and living expenses also need to be carefully considered. If living in the new home is too expensive, the women may not be able to afford it and could move back to their informal homes, renting out the new house instead. Moving to eco-friendly cooking systems could make the cooking process safer and perhaps more efficient than cooking over an open flame. However, it is also important to think about the added costs, which could become a burden over time. Familiar cooking methods from informal settlements may not easily transfer to new cooking technologies. It is good to be aware and understand that there is likely no single solution and that each decision has pros and cons.

Along with the practical side of cooking, the design could offer options for them to grow their own food, which are the rural practices they miss in city life. Such opportunities could connect them to their past and might also provide a sense of independence in their food supply if this is possible.

Overall, there is not a one-size-fits-all solution but an exploration of strategies to support women's transition to formal housing; every decision has positive and negative aspects and comes with consequences. When women move from informal to formal housing, things will change. Ideally, this change will be mostly positive, but some aspects may not be as they once were.

4.2 The Design Goal

The goal of this project is to raise awareness among NGOs about key factors to consider when designing new homes for women living in urban informal settlements. It focuses on food preparation and cooking, central to their daily lives. These key factors can also guide NGOs in working with the women by exploring different design options and discussing the advantages and disadvantages from both practical and cultural perspectives.

The new design options could focus on community and social interaction, creating spaces that make it easier for women to connect while preparing and cooking meals. It's important that the design fits with the familiar ways women are used to cooking, like squatting while they prepare meals. The design can also include the same tools and methods they already use, so the transition feels natural and comfortable. These design options can be adaptable and adjustable, so they may be applied in other housing projects beyond just this specific project in Sylhet.

Figure 57: Women coming together as a cummunity (Climate, n.d.).

Figure 58: Women raising hands to support Because I Am A Girl (BIAAG) campaign (Asia, n.d.).

4.3 Guidelines Cooking Environment

Guidelines for the proposed formal housing project regarding the cooking environment have been developed based on research about food preparation and cooking for women currently living in informal settlements in urban areas in Bangladesh.

The guidelines are divided into social-cultural guidelines and practical guidelines. The practical guidelines are mainly utilitarian, but they often include a cultural core, such as squatting while cooking. The social-cultural guidelines could be deeper, reflecting more ingrained values. For example, a social-cultural guideline is designing kitchens that promote social interaction, as cooking is often a communal activity in these communities. This reflects the deeply held value of community, which is crucial for maintaining strong social bonds and support networks.

4.3.1 Social-Cultural Guidelines

Families from the same informal communities could be placed close to each other as they move into the new housing, supporting a sense of community.

A space near or in front of the home could be provided for women to prepare food, offering a familiar setting.

The kitchen could be designed to encourage conversation and interaction while cooking.

The kitchen layout might allow women to keep an eye on their children as they cook.

An outdoor area could be included for women to gather and cook over an open fire, helping keep cultural traditions alive.

Homes could be located on the ground floor, or upper floors could be designed to maintain a strong connection to the community below.

4.3.2 Practical Guidelines

Cooking options, such as eco-friendly methods, could be offered if possible.

The kitchen could allow women to cook in familiar ways, using their own pots and pans.

Traditional cooking methods, including the option to squat while cooking, might be supported in the kitchen design.

The cost of living and cooking in the new homes could align closely with current expenses in informal settlements.

4.4 Analysing My Architecture Project

The guidelines created for this project can also be applied to my architecture graduation project. By analyzing my architecture project in this way, I can check if the important guidelines for the women I designed a new home for, especially related to cooking and food preparation, have been considered. It also shows what could have been improved in the project. This way, I can learn from it and apply these lessons to the concept for my design for interaction graduation project.

4.4.1 Social-Cultural Guidelines

Families from the same informal communities could be placed close to each other

In my architecture project, I provided each family with a home and added more low-income housing than initial needed for people from other informal settlements who did not live on my plot. I did not emphasize keeping all families together. It is possible, though, because I designed blocks with 24 low-income homes each (3 floors with 8 houses on each floor).

However, I am almost certain that the entire community is larger than just their close neighbours. The families can be placed in the new homes with their close neighbours and relatives, but the whole community will be divided across different blocks (figure 9). The families from the informal settlements I designed for lived in a long, narrow plot. So, they could be placed roughly in the same area, but they won't have the same ease of movement to see everyone as they did before. This could make them feel less at home, as everyone is further apart, and women might become isolated.

A space near or in front of the home to prepare food

In my project, I created a space on each floor for the low-income homes (ground floor, first floor, and second floor). This space, near the elevator, is shared by four homes, so four women (figure 13). The idea is for the women to come out of their homes and have a place close by their front door to prepare food together (figure 14).

The question is whether the women will actually go to this place to prepare food. I think it's positive that this spot is right by their homes. In informal settlements, they often prepare food with other women and walk around. I'm not sure if they would still walk around as much if it's a designated spot with only 4 women in total. What can happen is that the women might start using the space for other purposes, such as storage, garbage, or an extra sleeping area.

The kitchen could be designed to encourage conversation and interaction while cooking

In the homes I designed, the women have their own enclosed kitchen inside the house. The kitchen is by the front door with a window so they can make contact with people passing by, for example with other women (figure 15). In my architecture research, especially on the field trip, women cooking on an open fire said they wanted their own kitchen. They also wanted to have some contact with people walking by, which is why I designed the kitchen this way.

In my research for this project, I also found that the woman I interviewed, who now cooks on gas, prefers to share her kitchen instead of having her own. Social contact is very important to her. A consequence of my architecture project is that women could become isolated in their enclosed kitchens. Even with a window, it's not the same level of contact as being able to cook and talk together. Having their own kitchen may mean they are less likely to drop by each other's homes, and this could lead to a less close-knit community and feeling isolated.

The kitchen layout might allow women to keep an eye on their children as they cook

In my architecture project, women have their own enclosed kitchen, but it does have a large window (figure 16). On the ground floor, they can watch their children playing in the courtyard of the housing block while they cook. From what I observed on the field trip and from interviews, children mainly play in courtyards with other kids. However, women on the first and second floors cannot easily watch their children while cooking if the children are playing in the courtyard below. They can watch them if they are playing near the front door or in the food preparation space on their floor.

The women also cannot watch their children if they are playing in a different room in the house. In the informal settlements, they also cannot see the children if they are far off, but they can go to them more easily since there is no door in between. In the new designed housing, the kitchen has a door and a hallway, so they would need to make more effort to go to another room in the house. The women living in the informal settlements want to watch over their children but also want their children to play freely while they cook or socialize with other women. They probably wouldn't want the children always close by, as cooking is also a time to be among other women while keeping an eye on their children. Because of this, it can be important that the women can watch their children better while cooking in the new housing.

An outdoor area could be included for women to gather and cook

In the housing block I designed, there is a courtyard on the ground floor where women can gather and cook together on an open fire (figure 11 and 12). In my architecture project, I hadn't researched the importance of the cultural tradition of cooking together over a fire.

If the women want to cook on fire together as a cultural tradition in the housing block I designed, women from the first and second floors would need to come down to the ground floor. Since they don't live on the same floor as the ground-floor women, it might feel less like a community. Women on the upper floors may not be able to continue this tradition and could feel less at home. It can't easily be done in the shared food preparation area on each floor, as this area is too small for everyone to gather with their families. Additionally, cooking on an open fire there could be a fire hazard and unhealthy, as the space that is designed to gahter, has a roof.

Homes could be located on the ground floor

In my project, I designed housing blocks with low-income housing on the ground, first, and second floors. So, for the families moving from informal settlements, about a third of them can live on the ground floor, with middle-income housing on the upper floors. The reason not all low-income families can live on the ground floor is to meet density requirements. The density requirements were needed in my project to give all the low-income families and the families whose house was demolished for this project to give them a home. Ground-floor-only homes wouldn't provide enough density to house all families. Also, an import aspect is that my project needed to attract a developer to invest, which required enough middle- and high-income units. Higher density means not everyone can live on the ground floor.

Ideally, all families would live on the ground floor. This is what they are used to, with easy contact with other women and access to courtyards. This preference came up in interviews when I showed them two scenarios, and they preferred the ground floor. Women on the upper floors might feel isolated and uncomfortable.

4.4.2 Practical Guidelines

Cooking options, such as eco-friendly methods, could be offered if possible

In my project, I provided a gas kitchen connected to a gas system, so women wouldn't have to bring in gas bottles themselves. I didn't spend much time on this, as it was a small part of the project. It would be more sustainable if the women could cook with electricity, with solar panels on the roof. However, it's unclear if this would allow them to cook in the way they are used to.

Traditional cooking methods might be supported in the kitchen design

The kitchen in the designed home has a typical setup like kitchens in the Netherlands, with a countertop at standing height and a gas stove for cooking (figure 16). In this project, I have looked more deeply into the cooking process of the women, which I didn't have the time or expectations for in the architecture project. I think it's important to focus more on the women's needs, which I've done in this project, and design accordingly a new kitchen aligns with their preferences and habits.

Examples include designing a kitchen where women can squat, as they often do now. Also, more thought can be given to how they can use their own large pots and utensils in a new kitchen. They probably can use their pots and utensils in the building I designed since it uses gas, but I hadn't considered this fully. More attention could be given to this aspect. The pots used in the informal settlements are large and it's uncertain if they can use multiple pots at once on the stove.

The cost of living and cooking in the new homes could align closely with current expenses

In my architecture project, I aimed for the families from informal settlements moving to low-income housing to pay around 10% of the cost of the home. Besides this, I hadn't thought much about making sure the other costs of living don't increase too much. If the costs will increase, families might sublet their new homes and move back to informal settlements, which has happened before in Bangladesh.

The new kitchen, as mentioned, is a standard kitchen like in the Netherlands, with a countertop at standing height and a gas stove. They can likely use their pots and pans as mentioned above, but if they need to buy new ones, this would be costly for them. They may also be attached to their current pots and pans, which they might want to bring with them to feel more at home. Requiring new ones could take this away.

A lot of women in the urban areas now cook on shared gas stoves in the informal settlements because they cannot afford their own. Also, they value the social interaction that shared cooking provides. Cooking on their own gas stove all the time would be more expensive. They would have to do in the new housing block because they would have no shared option. As a result, they might cook together in their small kitchens or find a way to cook over an open fire somewhere, which could be

dangerous. Another possibility is they may not be able to afford the gas, leading them to sublet their homes and move back to informal settlements.

They currently wash pots and pans with water from a water pump or, if they love near a river, directly in the river, which is free. In the new kitchen, connected to a water system, they would have to pay for water. They might end up sharing water, reusing it, or still getting it from elsewhere if they can't afford to pay this.

There's a lot of visible waste in informal settlements. Sometimes, they throw trash in the street, river, or occasionally in a collection spot if available. I didn't focus on waste management in my architecture project, other than that the trash will be collected in a certain place where the families will bring their trash. If they have to pay for this, they probably rather place it elsewhere.

4.5 Conclusion

In conclusion, designing homes for women moving from informal settlements to formal housing could consider both practical needs and cultural values. The strong community bonds formed around cooking and food preparation could be kept in the design of new homes. By creating spaces for socializing and allowing women to keep cooking traditions, such as shared kitchens or familiar cooking methods, these women

can stay connected to their culture. It could also be important to ensure that the new homes are affordable and practical, so women are not burdened by high costs.

This chapter shows that while change is inevitable when moving to formal housing, thoughtful design can make the transition easier and help women continue to thrive in their new environment.

Figure 59: Postcard of designed housing design for Architecture project (own figure).

5 Design Exploration

This chapter explores the design process, guided by feedback from interviews with Gees and Toma. Their input was valuable in refining ideas for the final concept. References and key design principles were used to shape the process.

Two important projects were analyzed: the Quinta Monroy Housing Project by Alejandro Aravena's firm, Elemental, and the Terwilliger Center's research on social norms and housing decisions. These provided insights into designing homes that address the challenges faced by women in informal settlements.

The chapter also presents design criteria based on research, experience, and fieldwork to create housing solutions focused on women's practical, social, and cultural needs.

5.1 Refining Design Ideas

During the design process, I interviewed Gees and Toma to gather feedback on my initial design ideas, which were based on the developed design guidelines. These ideas focused on options NGOs could implement when designing formal settlements with an emphasis on food preparation and cooking.

For nearly every design guideline, I created concept ideas, including options for both low- and high-density housing. Gees provided the first round of feedback, which I used to make improvements. Toma then reviewed the updated ideas and provided additional suggestions. The refined ideas, together with the design criteria, shaped the final concept. The sketches shown to Gees and Toma, along with their explanations, can be found in Appendix C.

5.2 Reference Projects

The first reference is the Quinta Monroy Housing project by Alejandro Aravena's firm, ELEMENTAL, which focuses on social housing. This project provides insight into how to approach the design of new formal housing. The second reference draws from research conducted on the influence of social norms in the housing market, offering valuable design principles that stem from field research and its outcomes. This example demonstrates how research can be translated into actionable recommendations that can be applied to similar projects.

5.2.1 Quinta Monroy by Alejandro Aravena, ELEMENTAL

The Quinta Monroy Housing project is a social housing development in Iquique, Chile, designed by architect Alejandro Aravena and his firm, Elemental. Completed in 2005, the project includes 93 homes for families who had been living in poor conditions in an informal settlement on the site (Dogan, 2023). Working within Chile's housing policy, the team had to cover the cost of land, infrastructure, and building with a subsidy of just $7,500 per family (Fracalossi, 2024).

Figure 60: Quinta Monroy Housing Project, illustrating the transformation before and after residents expanded and personalized their homes (Fracalossi, 2024a).

Figure 61: Interior of a house in the Quinta Monroy Housing Project, shown before and after personalization by its residents (Fracalossi, 2024b).

Elemental created a system called "incremental design" for this project. With this approach, the homes start with a small, basic structure that families can expand over time (figure 60). The idea is to give each family a space they can add to, making it feel like their own and encouraging them to take pride and responsibility in it (Archleague, 2020) (figure 61).

To make the best use of the land, Elemental needed to build enough homes to keep costs low, but without overcrowding. They avoided high-rise buildings because these limit the potential for expansion. Instead, each home was designed to eventually double in size. While most low-income housing loses value over time, these homes were designed to increase in value, helping families improve their financial situation. Rather than designing a small house with limited space,

the project provided a middle-income-style home but initially only gave families a portion of it (Fracalossi, 2024).

The project also aimed to build a strong sense of community among residents by providing each family with private outdoor space as well as shared spaces, such as a community center and green areas (Dogan, 2023). Between private and public spaces, the project includes a collective space shared by groups of about 20 families. This semi-private area helps create a supportive community that can thrive even in challenging social conditions (Fracalossi, 2024).

Since half of each home's space would eventually be self-built by families, the original structure was designed to allow for easy expansion. The project was completed on a tight budget, using a combination of prefabricated and local materials to keep costs down (Dogan, 2023).
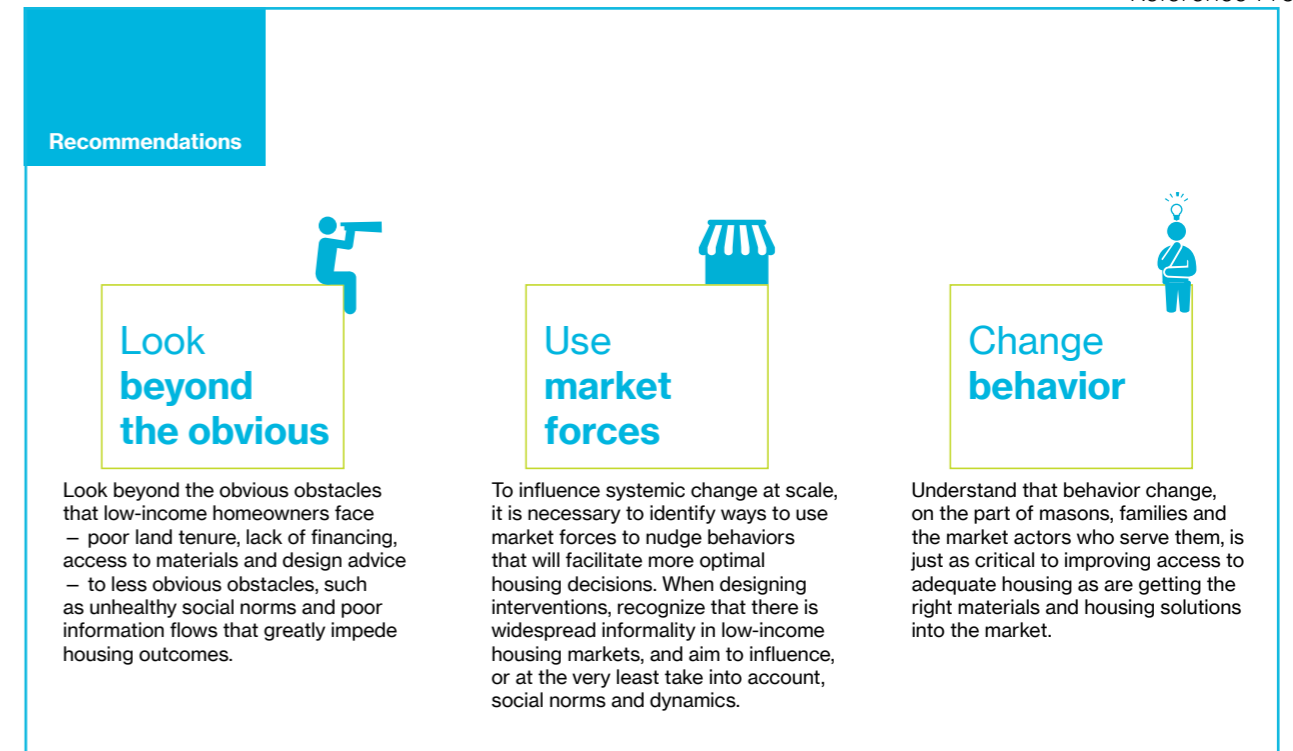

Figure 62: Recommendations from the Terwilliger Center for Innovation in Shelter research (Terwilliger Center for Innovation in Shelter & MarketShare Associates, 2019).

5.2.2 Social Norms and Housing Decisions: Research by the Terwilliger Center for Innovation in Shelter

The Terwilliger Center for Innovation in Shelter, in collaboration with MarketShare Associates, conducted research in India, Kenya, and Peru to explore how social norms influence housing decisions in low-income communities. The research aimed to achieve three primary objectives: increasing women's involvement in housing decisions, promoting disaster-resilient construction techniques, and improving the practices of masons and other construction professionals (Terwilliger Center for Innovation in Shelter & MarketShare Associates, 2019).

The study highlighted that while issues like land tenure, financing, and material access are well-known obstacles, social norms often play a hidden but critical role in shaping housing choices. These norms can lead to less optimal construction practices, such as the use of subpar materials or techniques that fail to improve long-term housing quality.

The key recommendations from this research focus on addressing social norms to improve housing outcomes (figure 62). It suggests looking beyond traditional challenges like land and financing, and tackling less obvious issues, such as unhealthy social norms and poor information flows. By leveraging market forces, interventions can nudge households, masons, and other actors toward better housing decisions. The study emphasizes the need for behavior change at both the household and community levels, encouraging the adoption of more resilient building practices. This approach can serve as an example of how initial research can be translated into practical recommendations, useful for others in similar projects (Terwilliger Center for Innovation in Shelter & MarketShare Associates, 2019).

5.3 Design Criteria

Based on research and practical experience, key design criteria have been identified to guide the final concept. While some are not easily measurable, they are essential for creating a thoughtful and effective solution that addresses the unique needs and challenges of the target audience.

Goal of the Design

The aim of the design is to raise awareness among NGOs about important factors to consider when designing homes for women living in informal settlements in Bangladesh. The goal is not only to provide guidelines but also to immerse the reader in the women's stories.

When the final design raises awareness and encourages NGOs to fully understand the lives of these women before designing formal housing, it is considered successful. This means designing homes that meet their social, cultural, economic, and practical needs so that the women feel comfortable in them and the transition from informal to formal settlements does not feel overwhelming.

Taking the Reader Through the Story of the Persona

The goal of the design could be achieved by creating a persona that shows life in the informal settlements of Bangladesh, presented in the form of a booklet.

The persona is important because it helps the reader, especially NGOs, to empathize with the women. By understanding the persona's story, the reader may feel more sympathy and awareness when designing formal housing.

Before introducing the design guidelines, it could be helpful for the reader to learn about the persona's background, including her journey from rural informal settlements to urban informal settlements. This transition could be highlighted, allowing the reader to connect with the persona before she moves to a formal settlement.

Persona Explained in a Booklet: Low Cost and Short-Term

The persona could be shown in a booklet to explain the design guidelines. Using a narrative format, the booklet would allow the reader to engage with the content more naturally, like reading a story where the narrative unfolds.

A booklet is a low-cost and short-term solution. One reason for this is the limited funding available, as the project has not been directly commissioned by any organization. A simple booklet can be produced quickly and at a relatively low cost, making it easy for NGOs to use without large investments. If the booklet proves successful, it could be expanded in the future, potentially with additional funding from NGOs or through a campaign to raise awareness. This campaign could further amplify the impact and spread the knowledge to a broader audience.

Using Both Text and Visuals in the Booklet

To capture the reader's attention, the booklet could be visually appealing while also providing information with text to explain the key concepts. It should not feel too long or overwhelming, as this could discourage people from reading it. The booklet could be clear and thorough without including unnecessary details that might distract from the main goal. One idea could be to show an image of the persona at each step of the cooking process, accompanied by text explaining each stage. This would provide both visual and textual representations of the process.

Clear and Concise Language for a Broad Audience

The language used in the booklet should be simple and easy to understand, making it accessible to a wide range of readers, including NGO workers, policymakers, and designers. If technical terms are used, they should be explained clearly, though it is best to avoid them where possible. The images and text should be readable by everyone, regardless of their background or level of knowledge.

Encouraging Reflection and Awareness

When presenting design options in the booklet, the content could help the reader reflect and raise awareness. For example, discussing dilemmas might encourage the reader to consider the impact of design choices. Since there is rarely a one-size-fits-all solution, this could prompt the reader to think about how the guidelines might apply in real situations, weighing both positive and negative aspects. Understanding that every design decision has consequences will engage the reader more deeply in the learning process.

Cultural Sensitivity and Contextual Relevance

The design of the booklet should reflect the cultural and social context of the target audience. Both the images and text should take into account the culture, customs, and challenges faced by women in informal settlements in Bangladesh. For example, the persona depicted in the booklet should be relatable to women living in informal settlements. This might include details like her name, clothing, environment, and the steps she takes when preparing food or cooking.

5.4 Conclusion

The design of housing for women transitioning from informal settlements to formal housing could consider a range of social, cultural, and practical factors to ensure that the new formal settlement foster a sense of belonging and support.

The reference projects explored in this chapter—Quinta Monroy and the Terwilliger Center's research—demonstrate how design strategies, such as incremental growth and addressing social norms, can positively influence housing outcomes.

Using clear visuals, simple language, and a relatable persona could help raise awareness and guide NGOs. Cultural sensitivity and thoughtful design choices ensure the solution is functional, supportive, and respectful of traditions.

6 Final Concept

This chapter introduces the final concept of the project, which is a booklet designed to raise awareness among NGOs about key considerations when designing homes for women in urban informal settlements in Bangladesh. The focus of the booklet is on the practical and social aspects of food preparation and cooking, as experienced by women like Sadia. The chapter explains the structure of the booklet, how it tells Sadia's story, and the design guidelines that NGOs can use when creating homes for women. It also explores different ways the booklet can be distributed and implemented to maximize its impact.

6.1 Explanation of Final Concept

The final concept is a booklet designed for NGOs to raise awareness about important considerations when designing homes for women in urban informal settlements in Bangladesh, with a focus on food preparation and cooking (figure 63).

6.1.1 Story Told from Sadia's Persona

The story is told from the perspective of a person named Sadia. In the booklet, we follow her journey from living in rural informal settlements to urban informal settlements, and eventually to a new home. The booklet focuses not only on the practical aspects but also on the social factors that are important to Sadia. Using a persona could help the reader engage with the story more deeply, allowing them to empathize with Sadia's experiences through her quotes, thoughts, and accompanying images.

The story is presented in the form of a booklet, which gives the reader an immersive experience, helping them to connect with Sadia's journey.

6.1.2 Structure of the Booklet

The booklet follows Sadia's journey, starting with her life in rural informal settlements, then her move to urban informal settlements, and finally her transition to a new formal settlement. So, it describes not only her new formal settlement but also her previous living conditions. This helps the reader understand where Sadia comes from, what she is used to, and the transitions she has gone through. It raises awareness of the complexities involved in such transitions and what can be learned from Sadia's experiences when designing formal settlements for women.

Figure 63: Cover of the booklet showcasing the final concept (own

At the bottom of the pages, a timeline indicates where Sadia is in her journey: in the rural or urban informal settlements, or a new formal settlement.

Transition: Moving from Rural to Urban Informal Settlement

Sadia's story starts in the rural informal settlements and explains what is important for her regarding preparing food and cooking. After this, she is forced to move to urban informal settlements due to flooding. This transition is a major change for her. The booklet details her experience moving to the urban area, the challenges she faces, and how she adapts (figure 64). At first, she doesn't know many people and must build a new community. Though she feels uncomfortable initially, she eventually

forms connections with new women in the community. Besides that, she learns to cook using gas, which is a new experience, but she eventually appreciates the benefits like the social aspects of it.

Transition: Moving to a Formal Settlement

Sadia is then given the option to move into a new home (figure 65). The booklet presents two options: a home in a low-density area and one in a high-density area. The design of the formal settlement can vary depending on the available space. This influences how the home is designed, which is something I learned during my architecture studies when designing housing for families in high-density areas in Bangladesh.

Figure 64: Pages in booklet of cooking process in urban informal settlement (own figure).

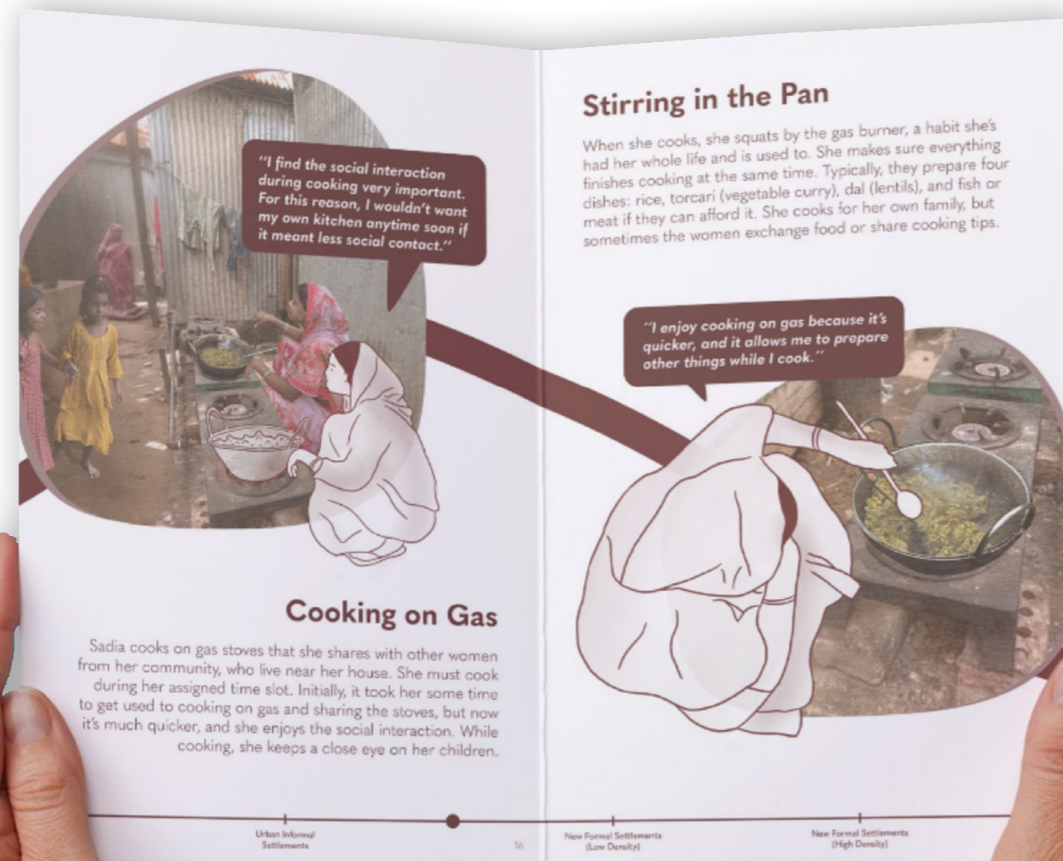Figure 65: Pages in booklet of Sadia who has the opportunity to move to new housing (own figure).

The options for the formal settlements—low and high density—demonstrate the different possibilities when designing homes for women. These are not presented as perfect solutions but as potential options that should be considered, raising awareness of what could be important for Sadia in her new formal settlement (figure 66).

The section where Sadia moves into her formal settlement also presents dilemmas for the reader, providing important considerations for NGOs. It serves as a warning to think carefully about the choices made, as each decision has consequences.

At the end of the formal settlement section, it is mentioned that Sadia could have the option to purchase her kitchen if she can afford it (figure 67).

Design Guidelines

The booklet concludes with a summary and design guidelines. These guidelines can help NGOs when designing formal settlements, and they could be crucial for raising awareness of the considerations that could be made.
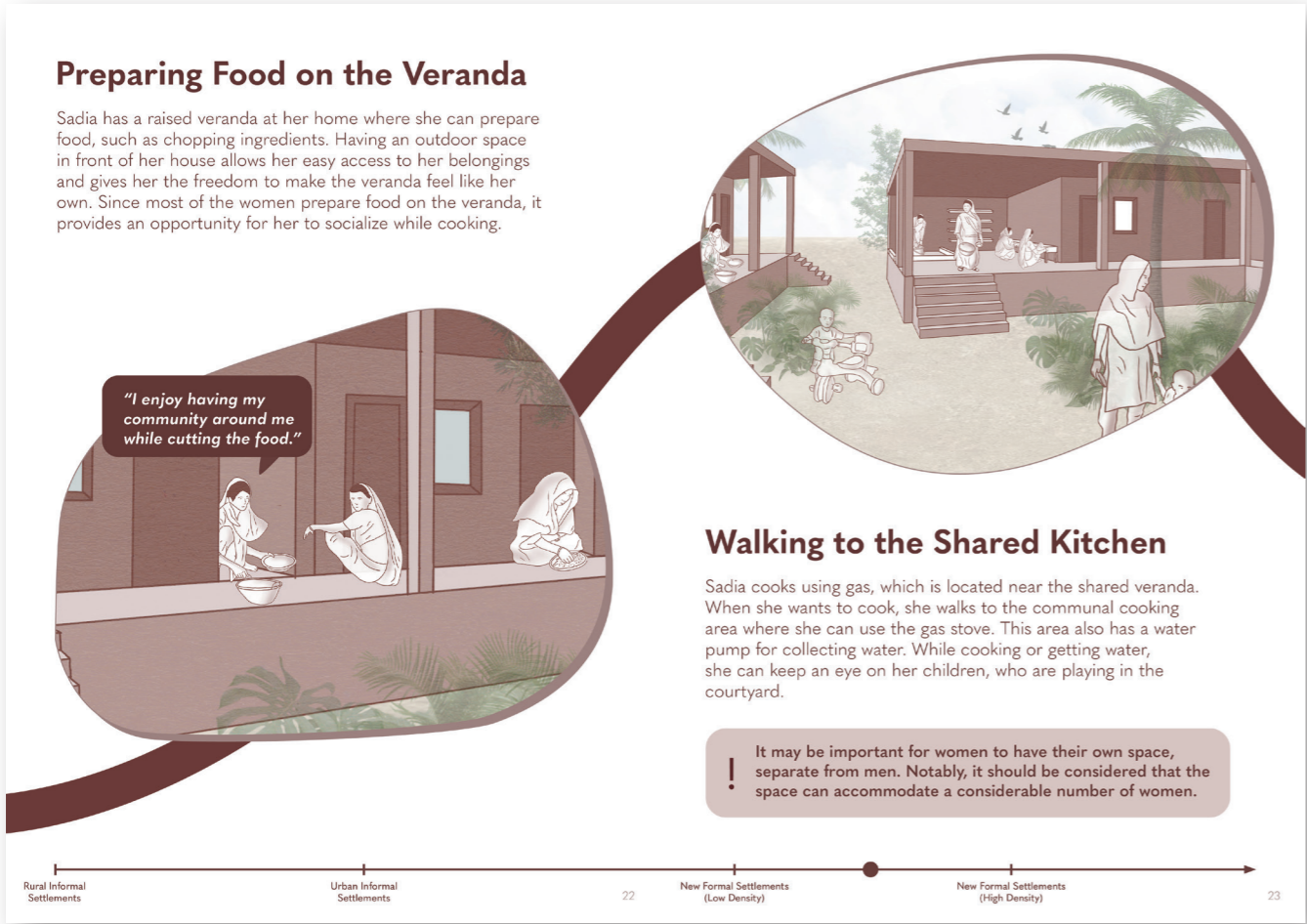
Figure 66: Pages in booklet of new formal housing options in low-density area (own figure).
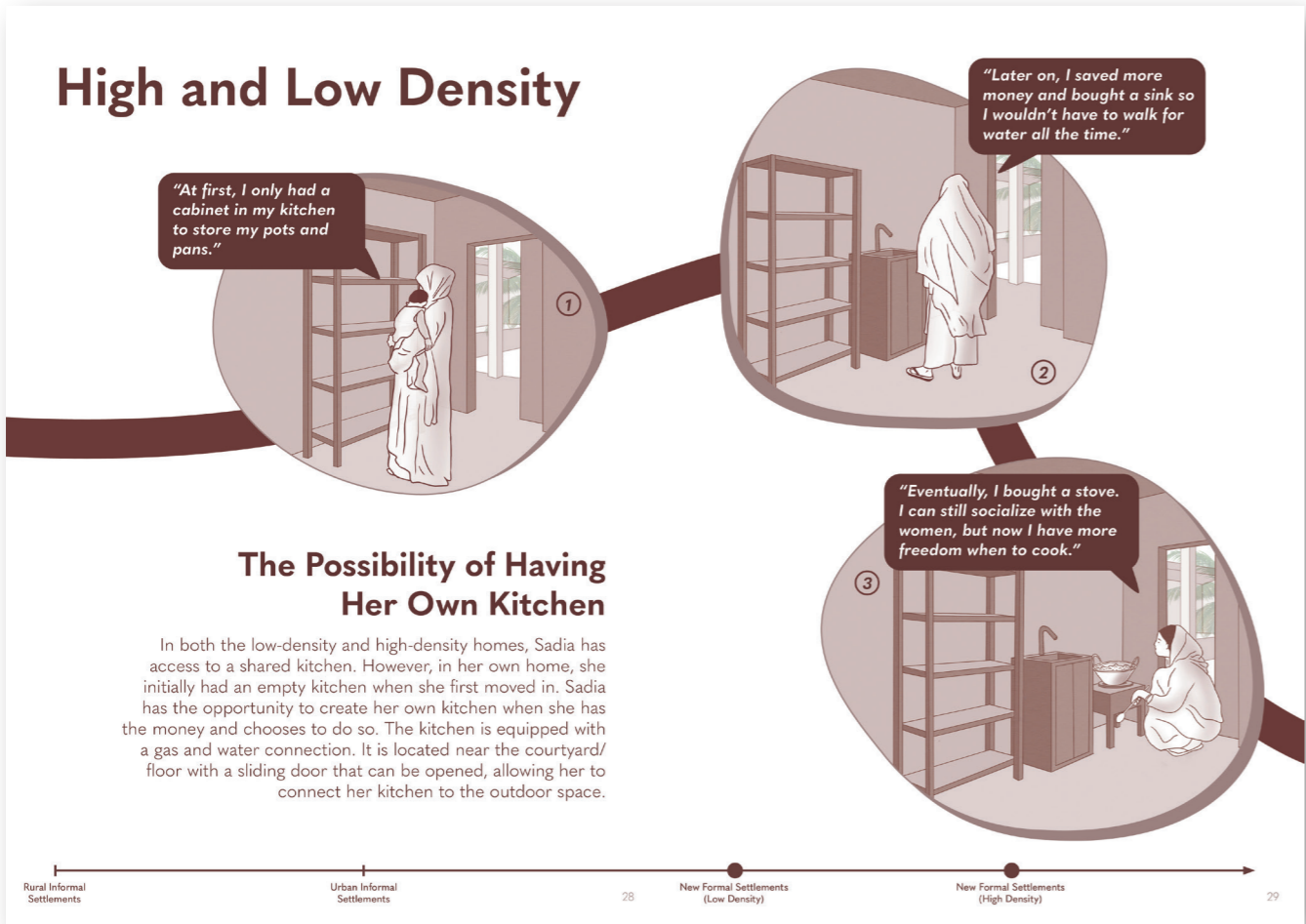

Figure 67: Pages in booklet of incremental kitchen option in low- and high-density area (own figure).

6.2 Implementation

Several options are proposed for distributing and implementing the booklet within and possibly beyond NGOs.

6.2.1 Sending Directly to NGOs for Use

The booklet can be sent directly to NGOs who can use it in their programs and projects. These can be NGOs working on designing formal settlements, such as Habitat for Humanity, or NGOs focused on women's rights and needs. Sending the booklet directly to NGOs ensures that the content reaches the staff responsible for designing and implementing formal settlement projects.

NGOs can use the booklet for staff training and to communicate with local communities about design principles and considerations for homes. By using the booklet in their work, NGOs can increase awareness of the challenges women face in informal settlements and potential practical solutions.

6.2.2 NGOs Spreading the Booklet Further

NGOs can also play a key role in sharing the booklet with other organizations, local communities, or relevant partners.

Workshops

NGOs can organize workshops with community leaders, women from Bangladesh, or others involved in housing design and planning. In these workshops, the booklet can be used to raise awareness about design principles and encourage participants to consider the specific needs of women when designing homes.

Workshops can also help participants understand how to apply the guidelines in the booklet and encourage them to spread the knowledge within their own communities and networks.

Involving the Government of Bangladesh

The government of Bangladesh can play a crucial role in implementing the booklet more widely. Relevant content and guidelines can be shared with government agencies responsible for urban planning and housing. By collaborating with the government, the booklet can be integrated into national policies and housing programs, with a focus on addressing the specific needs of women in informal settlements. The booklet can also be used for training officials and improving decision-making in housing. This collaboration can contribute to raising awareness and ensuring that the design principles presented in the booklet are applied more broadly.

7 Evaluation Final Concept

In this chapter, the evaluation of the booklet is presented, focusing on its usability, experience, and effectiveness. The evaluation process involved an interview with Eva Grevinga from Habitat for Humanity, an NGO working in Bangladesh. Her insights provided valuable feedback on how the booklet can raise awareness and serve as a tool for NGOs in designing homes for women in informal settlements. Based on the interview, this section explores the strengths and areas for improvement of the booklet, offering recommendations for further development and potential broader application.

7.1 Used Method

7.1.1 Interview with NGO

I chose to interview an NGO for this evaluation because they are my target group, and I needed to speak with someone knowledgeable for an in-depth evaluation. I wanted to focus on fewer participants but with a deeper understanding, rather than having many participants. This approach allows for more detailed insights and a more thorough understanding of the topic.

7.1.2 NGO Habitat for Humanity

For the evaluation, I interviewed Eva Grevinga, who works at Habitat for Humanity (figure 68). I reached out to her after contacting Habitat for Humanity, as her role and the organization's work are relevant to my project. Habitat for Humanity's mission, which is to "build strength, stability, and self-reliance through shelter," aligns well with my focus. Their global work, including their activities in Bangladesh, made them a suitable NGO for my research. Habitat for Humanity operates in more than 70 countries, including Bangladesh (Habitat For Humanity, n.d).

Grevinga has worked at Habitat Netherlands for over four years, following a six-month internship. She began her career in 2020, conducting research into opportunities for institutional fundraising, particularly from the government. This led to a new approach to housing, focusing on its impact on broader societal issues like health, employment, and sustainability. After her internship, she continued at Habitat Nederland in fundraising, an important part of their work.

For the past two years, Grevinga has been the Coordinator of International Projects at Habitat Nederland. In this role, she maintains daily contact with international offices and colleagues, supporting project development, proposal writing, and budget preparation. While she is not directly involved in designing the projects carried out locally, she plays a crucial role in shaping them.

Figure 68: Eva Grevinga working for Habitat for Humanity (Habitat Nederland - Habitat for Humanity, 2024).

7.1.3 Procedure

I sent Grevinga the interview booklet in advance so she could review it at her own pace. We then met online, and during the interview, I allowed Grevinga time to think about the questions beforehand. This made the conversation more thoughtful and insightful.

7.2 Evaluation

In this evaluation, I will assess the usability, experience, and effectiveness of the booklet (figure 69). Usability focuses on whether the structure of the booklet is clear and easy to follow. Experience examines whether the booklet is inviting to read and why or why not. Effectiveness considers whether the NGO, in this case, Habitat for Humanity, would apply the booklet in their work, and how it compares to similar products. This evaluation is based on an interview with Grevinga, who provided valuable insights and feedback on the booklet's usability, experience, and potential impact.

7.2.1 Usability

The structure of the booklet was found to be clear overall, with Grevinga highlighting the helpfulness of the timeline at the bottom of the page. This timeline assists readers in following Sadia's transition from the rural to the urban informal settlement and eventually to a formal home. It provides a clear overview of her journey and helps readers understand her experiences.

Raising Awareness Clearly

According to Grevinga, the booklet primarily contributes to raising awareness, especially when it comes to making NGOs more conscious of the considerations that should be taken into account when designing homes for women in informal settlements. While it may not directly lead NGOs to design social spaces, it makes them more aware of the various factors impacting women's well-being, like Sadia's, in these environments.

Social Aspects of Cooking Highlighted

Another aspect that Grevinga appreciated was the booklet's inclusion of broader contexts beyond cooking. It demonstrates how cooking is linked to other important factors, such as water access and supervising children who are playing. By connecting different aspects of women's lives in informal settlements, the booklet provides valuable insights and strengthens the reader's awareness of these issues, especially the social dimensions.
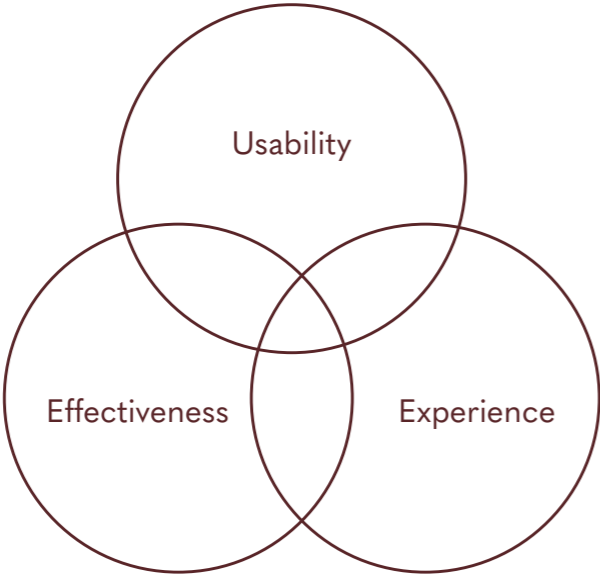
Clarifying Sadia's Preferences

It was mentioned that it was sometimes unclear what Sadia's exact preferences were. For instance, in the urban informal settlement, she initially wanted to cook together on gas but later considered having her own kitchen. This shift caused some confusion regarding her preferences. Grevinga suggested clarifying Sadia's desires at each stage of her transition, making it easier to follow her preferences, such as her earlier wish for more space in the rural settlement, and when her preferences changed once she started cooking on gas in the urban informal settlements.

Timeline Could Be Clearer

Grevinga found the timeline helpful but noted some confusion. The marker between the rural and urban informal settlements initially suggested that the rural area transformed into an urban one. The transition symbolizing Sadia's move wasn't clear at first but became understandable as she continued reading.

7.2.2 Experience

Grevinga found the booklet inviting to read, particularly because it is told from a personal perspective. This approach makes it easier for readers to empathize with Sadia's situation. The visual elements, such as the images, contribute to enhancing this experience, making the booklet more accessible.

Good Balance of Visuals and Text

The balance between visuals and text was something Grevinga appreciated. She felt that the visuals effectively supported the text and helped convey the message. This balance made the booklet engaging and easy to follow without it feeling too dense. The personal perspective of Sadia's story further added to its readability, enabling readers to connect with both the practical and emotional aspects of her transition. The combination of visuals and personal narrative made the booklet enjoyable to read and less theoretical.

Improving Informal Settlements Rather Than Creating New Formal Settlements

During a conversation with a colleague at Habitat for Humanity, Grevinga pointed out that the booklet could potentially have a broader application. The colleague emphasized that much of their work focuses on improving informal settlements rather than moving women into formal homes. NGOs may prefer improving informal settlements over creating new formal housing due to factors like cost-effectiveness, space constraints, faster implementation, community familiarity, sustainability, and political or logistical challenges.

Habitat for Humanity often works on enhancing housing, water access, and infrastructure within informal settlements to make them more formal. This concept could also be relevant for Bangladesh, even if people don't physically transition to formal housing. Improving living conditions within informal settlements could become an essential part of the process. Grevinga found this perspective intriguing and suggested that the booklet could also be useful for NGOs focused on upgrading informal settlements.

Figure 69: Evaluation of final design focused on usability, effectiveness and experience (own figure).

7.2.3 Effectiveness

The impact of the booklet, as explained by Grevinga, would primarily lie in raising awareness and enhancing the understanding of the social processes that influence the effectiveness of NGO projects, which is aligned with the booklet's goal. She believes the booklet could be a valuable tool for organizations working with technical solutions.

Use by NGO Habitat for Humanity

It was easy for Grevinga to imagine NGOs reading the booklet. Drawing from her own experience at Habitat for Humanity, she noted that there is already a good level of awareness about the social factors that play a role in upgrading or designing new homes. Both Grevinga and her colleagues would read the booklet and would recommend it to others within their organization.

Recommending to More Technical Organizations

The booklet could also be particularly beneficial for more technical organizations, according to Grevinga. She suggested that it would be useful for companies with technical expertise but limited knowledge of the social context and preferences of local communities. The insights in the booklet could help these organizations better understand social processes and tailor their technical solutions to meet the community's specific needs.

Grevinga provided an example of companies designing sustainable cooking solutions, such as clean cooking options or eco-friendly building materials. She pointed out that in some cases, these products are not effectively utilized in informal settlements because the social factors influencing their use are not taken into account. She believes the booklet could help raise awareness of these processes, allowing organizations working with technological solutions to better align their products with the needs of the local population. Based on her experience, Grevinga mentioned that technical organizations are typically open-minded to such information.

Similar Products

Grevinga recalled having seen similar materials to the booklet, but she observed that these are usually more practical and text-heavy. For example, Habitat for Humanity is currently working with a company under Philips, which is distributing sustainable lamps in informal settlements. This company had created guidelines with considerations that were not always obvious initially, which they shared with Habitat for Humanity. One guideline emphasized raising awareness: installing a lamp in an informal settlement could improve women's safety near toilets by providing more light, but it could also create unsafe spaces by attracting men who might congregate there. Grevinga found this approach interesting and noted that the booklet serves a similar purpose of raising awareness about factors to consider. However, while the Philips guidelines were more text-heavy and lacked the storytelling element, Grevinga appreciated the booklet's narrative approach through Sadia's story, which made it more relatable and enjoyable to read.

7.3 Recommondations for Further Exploration

From the evaluation with Eva Grevinga, it is clear that the booklet provides a clear structure, with a strong focus on raising awareness and offering valuable insights into the challenges faced by women in informal settlements. Its use of Sadia's journey makes the content relatable and engaging, while the balance between visuals and text enhances its accessibility.

Several recommendations could be made if there were more time:

Expanding the Target Audience: Technical Organizations

One key recommendation is to make the booklet more relevant to technical organizations. While it is valuable for NGOs working (or not working) in the social space, it could benefit from a stronger focus on the technical companies that design products or solutions used in informal settlements. Adjusting the booklet to meet the needs of these companies could help bridge the gap between technical solutions and the social context in which they are applied. This would allow technical organizations to better understand the community's preferences and adapt their products to ensure more successful and sustainable projects.

Exploring Informal Settlement Upgrades

Another suggestion is to expand the booklet's focus to include improving informal settlements, rather than only focusing on relocating women to formal homes. For example, Habitat for Humanity works more on improving housing, infrastructure, and access to services within informal settlements, without necessarily moving people to formal housing. By exploring this aspect and offering guidelines on how to improve life in informal settlements, the booklet could become more relevant for NGOs working in areas like Bangladesh, where upgrading informal settlements is a common solution. The booklet could focus on the social and infrastructural improvements needed to make informal settlements more livable and sustainable.

Involving NGOs More in the Design Process

Although the project has already researched what NGOs have done and focused on understanding women's cooking and eating processes in informal settlements in Bangladesh, a recommendation is to involve NGOs more in the research phase. By including their input early in the process, NGOs could share what they already know and provide valuable feedback. This would help ensure the booklet is more aligned with their needs and perspectives, as they are the target audience. Engaging NGOs in the initial stages could also help in gathering more practical insights beyond what is available online.

8 Afterword

8.1 Personal Reflection

My thesis gave me valuable experience in managing a project, writing academically, and understanding how I could combine what I learned in my Master's in Design for Interaction (DfI) with architecture, which I explained further below.

8.1.1 Reflection on Design for Interaction and Architecture Project

Through my DfI project and my architecture project, I explored two different perspectives on designing formal settlements for families—particularly women—currently living in informal settlements in Bangladesh. I found it very valuable to approach this issue from two angles. It helped me realize that my architecture studies and graduation project could have focused more on the user and involved them more actively during the design process. In my architecture graduation I had to work on quite a lot of different apects from a large scale to a detailed scale, so I did not have the time to continuously seek feedback from users. However, I believe doing so could have improved my architecture project, making it more focused on the needs of women.

I chose to pursue my DfI project to address gaps in my architecture project. For instance, I did not investigate how women might feel isolated if provided with individual kitchens. Additionally, I assumed that a Western-style kitchen, which I included in my architecture project, would work for these women and I did not think about other options. However, they are often accustomed to cooking in a squatting position, which is not aligned with that design.

These two projects taught me that I enjoy working on larger scales, which is why I am interested in moving toward management roles in urban development in my career. At the same time, I have learned the importance of always considering and engaging with the user, a focus I plan to carry forward. I believe these two master's programs have complemented each other well and have significantly enriched my knowledge, which I will take into my future career.

8.1.2 Reflection On Reference Project

For my DfI graduation project, I referenced the Terwilliger Center for Innovation in Shelter, which collaborated with MarketShare Associates on research conducted in India, Kenya, and Peru. This study explored how social norms influence housing decisions in low-income communities (Terwilliger Center for Innovation in Shelter & MarketShare Associates, 2019). The research provided three recommendations: look beyond the obvious, use market forces, and change behavior. I found it interesting to reflect on this reference in my project because it also focuses on low-income housing.

The study highlights the importance of behavior change at both the household and community levels. Beyond simply providing good materials, it emphasizes the need for training and awareness programs to support families in their transition.

In my project, I focused primarily on raising awareness among NGOs, understanding what is most important to the women, and determining how NGOs can best address these needs in the design of new housing. Looking back, I could have also worked more on creating awareness and encouraging behavior change among the women themselves. I understand that this can be valuable—not only providing families with a new home and the right materials but also raising awareness and promoting behavior change to help them understand why certain choices are made and motivate them to embrace these changes. This might have made the transition from informal urban settlements to formal housing feel like an even smaller and more manageable step for the women.

If I had more time, I would have explored this further and perhaps designed something specifically for the women, in addition to focusing on the role of NGOs or more technical organizations. My project focused on designing new formal settlements, while the Terwilliger Center's research emphasized families improving or constructing their own homes. This approach might have been particularly useful if I had also considered improving existing informal settlements rather than solely focusing on formal ones.

8.2 Word of Thanks

I would like to thank several people who have supported me in various ways throughout this project.

First, I want to thank Willem Gees, Managing Director of Eco Home Solution (figure 70 and 71). He guided me through the informal settlements in Bangladesh with his wife and provided me with a lot of valuable information that was very helpful for this project too. Additionally, I conducted multiple interviews with him, during which he gave me valuable feedback and tips about the lives of women living in informal settlements. He also provided feedback during my design exploration. Thanks to him, I was able to connect with women living in informal settlements in both rural and urban areas of Bangladesh.

Willem introduced me to Ahad Uzzaman, who translated the interviews with two women, Nasima and Bilkis, who live in informal settlements. I would like to thank Ahad, Nasima, and Bilkis as well. These interviews with the women were essential for conducting meaningful research and developing this project.

I would also like to thank Asfary Toma, who participated in two interviews with me. Like Willem, she provided helpful feedback and tips about women living in informal settlements and supported my design exploration.

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Finally, I would like to thank my family and friends for their help and encouragement whenever I needed it, especially Anne Janssen, who helped me multiple times with my project and my report.

Figure 70: Photo with, among others, Willem Gees, taken before departing from Bangladesh (own figure).

Figure 71: Willem Gees with his wife guiding me through the informal settlements in Bangladesh (own figure).

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Figure 72: Three generations living in informal settlements (own figure).

10
Appendices

A. Interview With Nasima

For my research, I interviewed Nasima, who lives in rural informal settlements. She cooks on an open fire and has her own separate kitchen because of the smoke released during cooking (figure 73).

During the interview with Nasima, I created three illustrations: Cooking in the countryside on fire (figure 74), Cooking in the city on fire (figure 75), and Cooking

in the city on gas (figure 76). I sent these illustrations to Ahad, who printed them out and showed them to Nasima. I made these illustrations to ask Nasima questions about her current situation, as well as whether she might consider cooking with gas in the future, and to discuss urban informal settlements. These images could help her better visualize and understand these scenarios.

Figure 73: Kitchen where Nasima cooks in rural informal settlements (own figure).

Cooking in the countryside on fire

Figure 74: Illustration of cooking in the rural informal settlement on fire (own figure).

Cooking in the city on fire

Figure 75: Illustration of cooking in the urban informal settlement on fire (own figure).

Cooking in the city on gas

Figure 76: Illustration of cooking in the urban informal settlements on gas (own figure).

B. Interview With Bilkis

The second woman I spoke with in my research lives in an informal settlement in a city in Bangladesh (figure 77). Bilkis cooks with gas and shares her stove with other women in her neighborhood. To make our conversation clearer, I showed her two different scenarios to ask more specific questions and help her visualize the situations.

Scenario 1: Bilkis would cook using gas in a beautiful kitchen located on the second floor (figure 78). However, being on the second floor would mean less contact with others, even though the kitchen itself would be very nice.

Scenario 2: Bilkis would cook using fire instead of gas, which she currently enjoys (figure 79). This setup would be on the ground floor where she lives now. Being on the ground floor would allow her to maintain social contact with others while cooking.

When presented with these scenarios, Bilkis chose the second one because she values social interaction during cooking and food preparation. This preference is further explored, explained, and described in my research.

Figure 77: Bilkis standing in front of her cooking stove (own figure).

Scenario 1

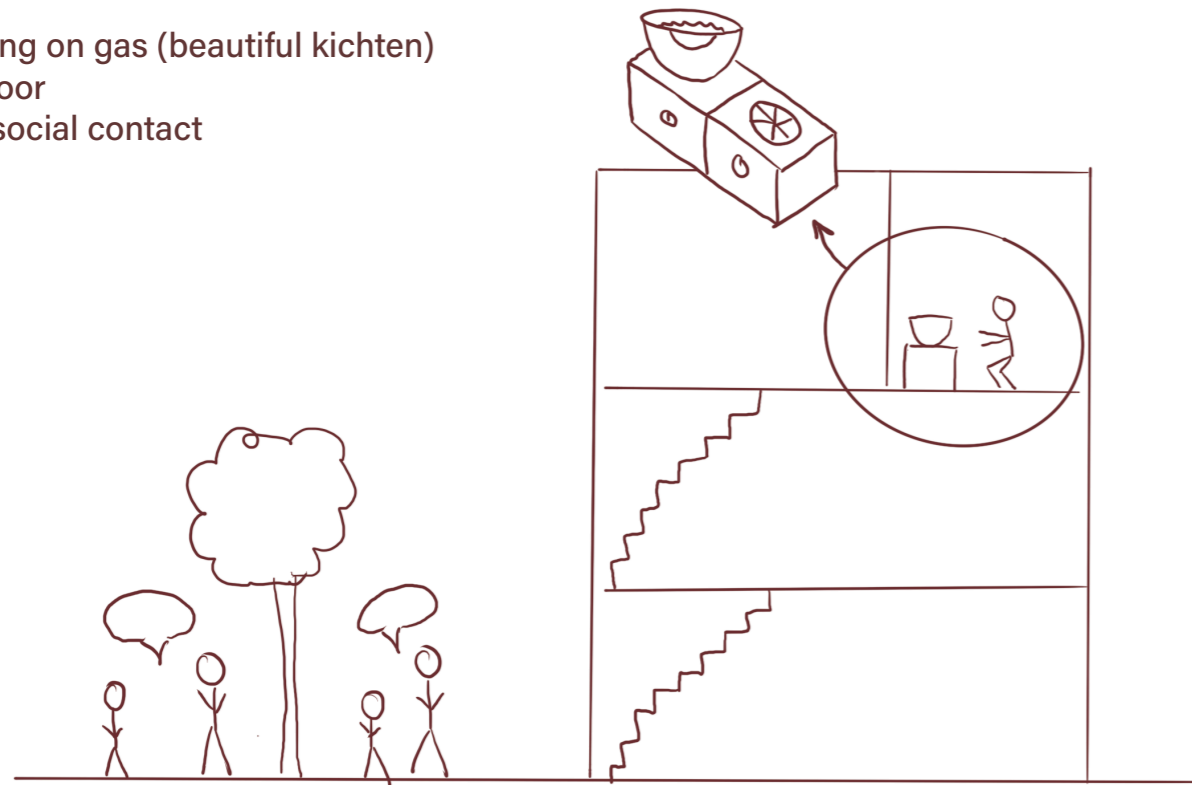Cooking on gas (beautiful kichten)
2nd floor
Less social contact

Figure 78: Scenario 1, cooking in a beautiful kichten on the second floor (own figure).

Scenario 2

Cooking on fire
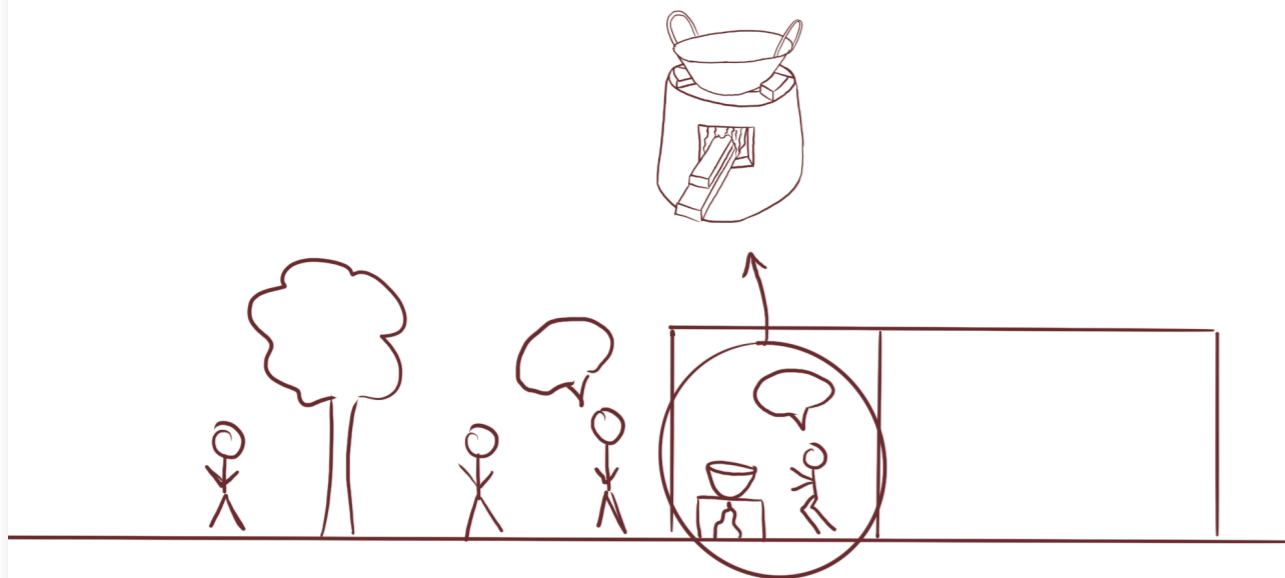Ground floor
Social contact

Figure 79: Scenario 2, cooking on fire on the ground floor (own figure).

C. Sketches Design Ideas

During the design process, I spoke with Gees and Toma to get their thoughts on my first design ideas. For almost every design guideline, I came up with ideas to meet different needs in both low- and high-density housing. Some of these ideas worked for more than one guideline, while others focused on things like cooking and food preparation. Because women interact with their environment differently in low- and high-density areas, I made sure to adjust the designs to fit each situation. This was especially important for women living on higher floors in high-density areas, as they may not have the same connection to the ground and community as women living on lower floors.

Community

In my design process, I started by focusing on the community aspect. I believe it's crucial for women to be placed in groups whenever possible, as they are used to living close to each other, especially in informal settlements.

From my fieldwork and personal experience in Bangladesh, I observed that many communities have a courtyard where people gather. In line with this, I thought it would be beneficial for women to live close together in a housing design, allowing them to maintain the connections they are accustomed to. Willem, in an interview, confirmed that a courtyard could be an essential space for women to meet and socialize (figure 80).
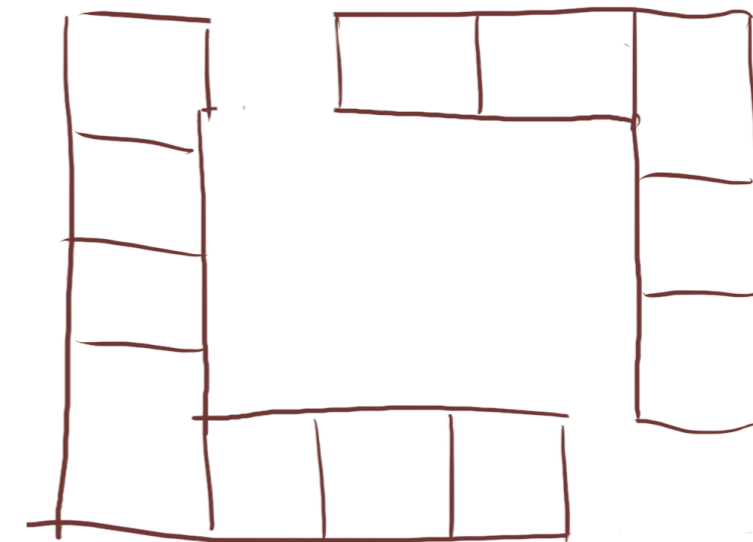

Figure 80: Simple plan with housing and a courtyard in the middle (own figure).

Preparing Food

The next guideline focuses on creating spaces for food preparation. It's vital for women to have a dedicated area near or within their home where they can prepare food. I developed sketches for both low- and high-density housing, considering the specific needs of women in these different environments.

Low-density

In low-density areas, there is enough space within the courtyard for women to prepare food, much like they currently do (figure 81). Both Willem and Toma confirmed this. I also observed during my field trip that many women had a veranda or covered outdoor space where they could prepare food while remaining sheltered from the weather. This space also allowed them to interact with other women. I envisioned that this veranda could be expanded if the women had the financial means and desired it (figure 82). Gees suggested that it would be beneficial to elevate the veranda slightly to avoid flooding, and as long as the veranda is large enough, it would provide adequate space for the women.
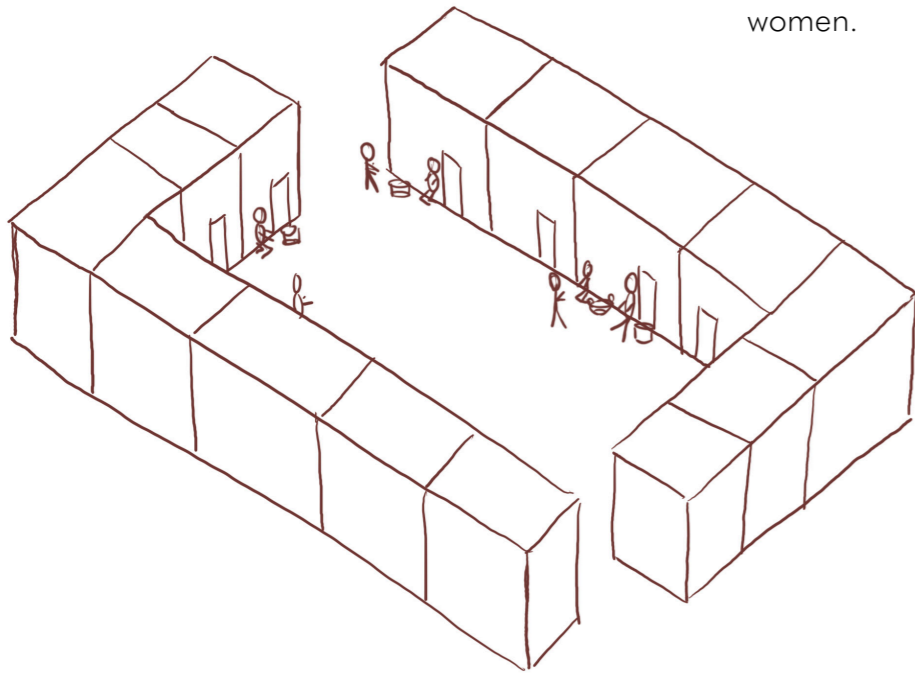

Figure 83: Women preparing food in front of their house in high-density housing (own figure).
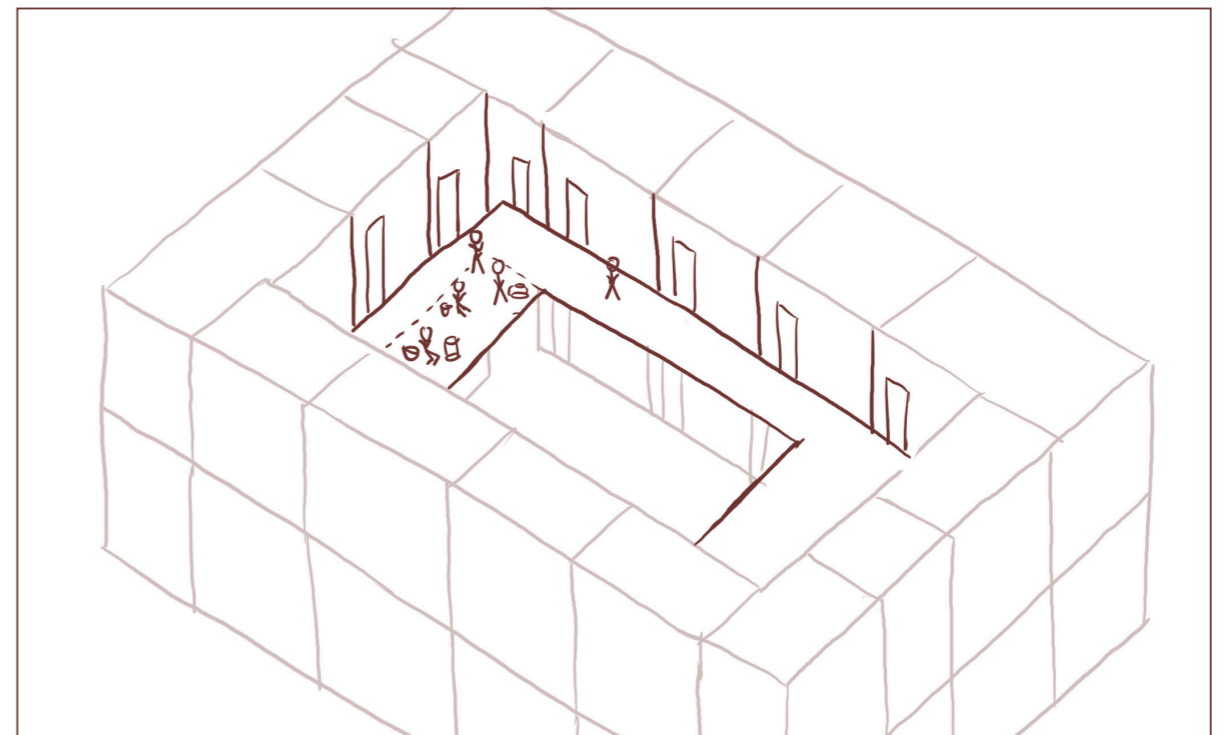
Figure 84: Women preparing food in communal space in high-density housing (own

Figure 81: Low-density housing courtyard where women can prepare food (own figure).

Figure 82: Expanded veranda idea of low-density housing (own figure).

High-density

In high-density areas, I considered the first floor, as women on the ground floor would have more space to prepare food in front of their house or in the courtyard. I also designed two options: food preparation near the house (figure 83) or a shared space on the edge of the community (figure 84).

Gees mentioned that preparing food right outside the house might be a bit cramped, especially if that is the only available space. This could also reduce the size of the courtyard, which may not be ideal. Toma agreed that a shared space for food preparation would be practical as women could work close to each other.

Cooking

For cooking, the design guidelines emphasize the importance of enabling interaction between women while cooking, as well as allowing them to keep an eye on their children. In some communities, women cook together over a fire several times a year, so I also considered incorporating a space for communal cooking.

Low-density

I envisioned a cooking area within the courtyard where women could cook and wash food together (figure 85). This would reduce the financial burden of having individual kitchens. Toma supported this idea but raised concerns about the safety of gas stoves, as children or others might get hurt. I proposed moving the cooking equipment further into the space and making the area slightly enclosed to create a designated "women's space."
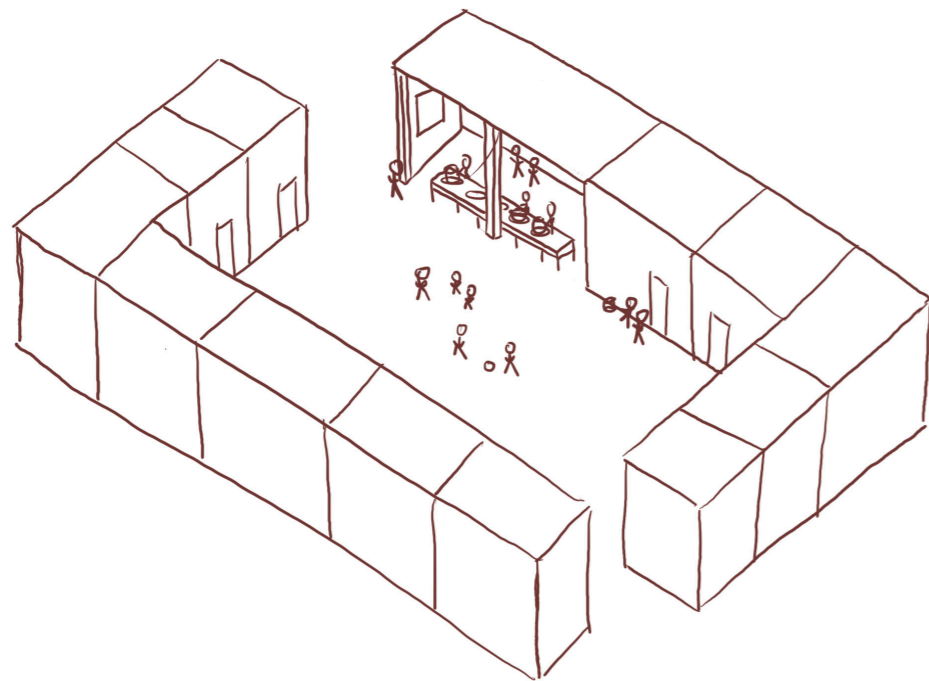
Figure 85: Low-density housing courtyard with shared kitchen (own figure).
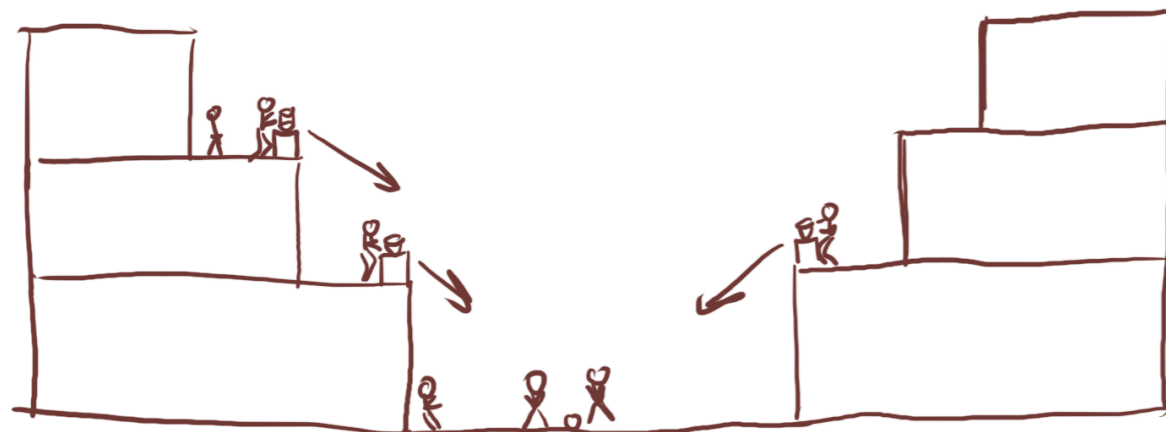
Figure 86: High density-housing idea of connection with the ground (own figure).
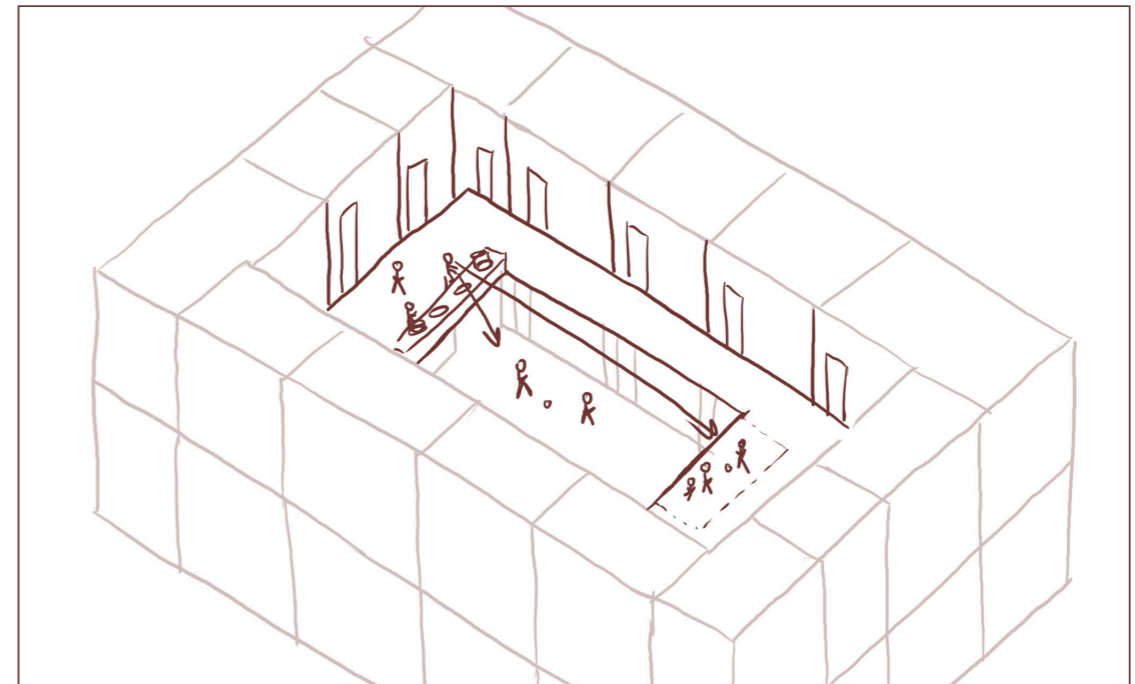
Figure 87: Women cooking on first floor and keeping an eye on their children in high-density housing (own figure).
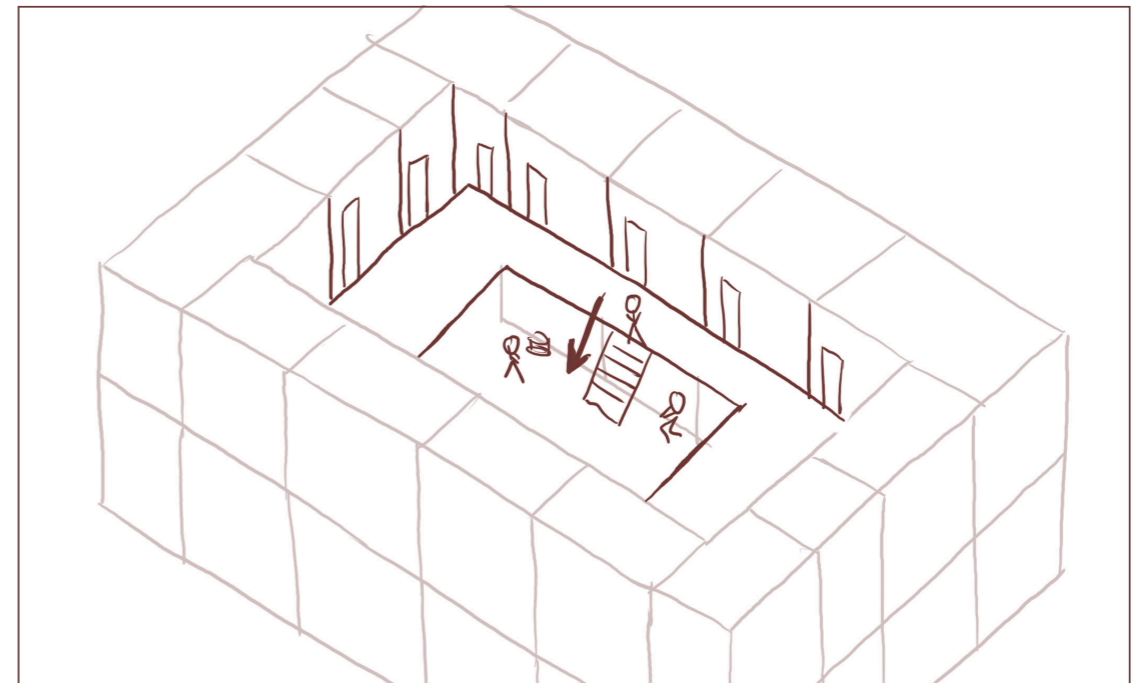
Figure 88: Connection with the ground in high-density housing (own figure).

High-density

In high-density areas, I thought about placing cooking spaces along the edge of the building so that women could still have a view of the courtyard and keep an eye on their children playing (figure 86 and 87). However, Toma mentioned that, similar to the low-density design, this could be dangerous if the cooking area is at the edge, as objects might fall. She suggested a shared kitchen space, possibly on the first floor, similar to the low-density design.

Additionally, I considered creating a play area for children on the upper floor, but Gees noted that a tall fence would be necessary for safety.

Additionally, I looked into possibilities for connecting the first floor with the ground floor. Willem said that this could be a good idea, but that the women on the ground floor would also see the courtyard as their own, so it would also be good to have a space on their own floor to prepare and cook food.

Incremental kitchen

For both low- and high-density areas, I thought about offering women the option to gradually add kitchen features as their needs evolve (figure 89). This would allow them to start with basic utilities like water and gas connections and later purchase a stove or sink when they are able to.

Gees agreed that the idea of incremental expansion was good, although he mentioned that women would likely prioritize water connections first, as they are used more frequently than a stove.

Figure 89: Different steps over time of incremental kitchen (own figure).

Figure 90: Taking a photo with children living in informal settlement (own figure).

D. Project Brief

DESIGN FOR our future

TUDelft

Personal Project Brief – IDE Master Graduation Project

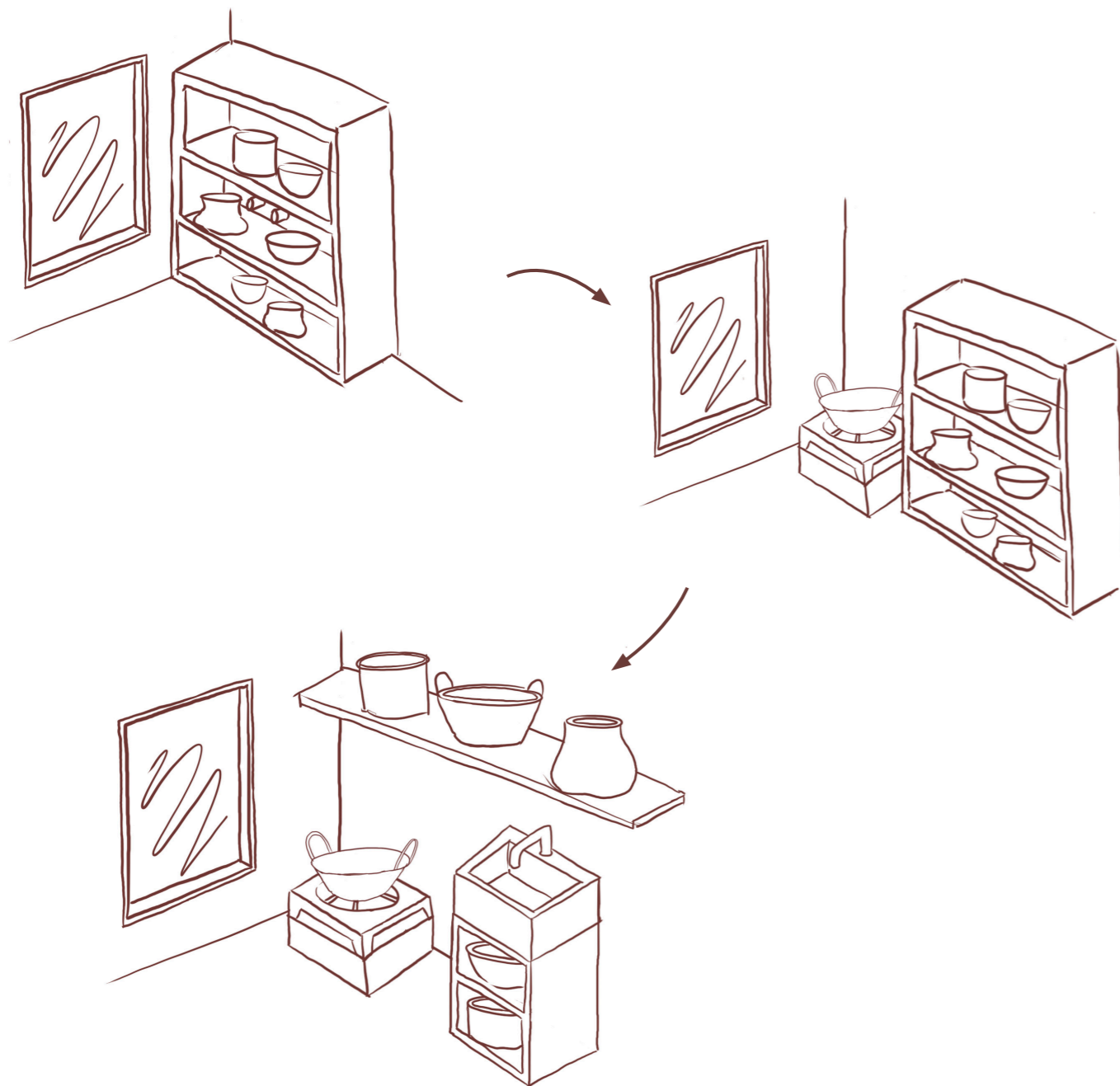**Name student** Nynke Keulen

Student number 4,654,331

PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT
Complete all fields, keep information clear, specific and concise

Project title The transition of cooking from informal settlements to formal housing in Bangladesh

Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

Introduction

Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)

Internal migration is a growing issue in Bangladesh, primarily driven by climate change and economic factors, with millions forced to leave their homes due to rising sea levels and extreme weather. This migration has led to a rapid increase in informal settlements in areas like Sylhet, Dhaka, and Chittagong, in Bangladesh, resulting in overcrowding, inadequate housing, poor sanitation, and waste management challenges.

With over 30 million people living in informal settlements, Bangladesh ranks sixth globally in this regard. The government's ability to manage rapid urbanization and provide essential services like housing and sanitation is strained. Women in these settlements face additional challenges, including gender discrimination, income inequality, limited access to healthcare and education, and a higher risk of physical violence.

My MSc project in Architecture, Urbanism, and Building Sciences, titled "A Safe Return," aims to improve the quality of life for women in the Sweepers Colony, an informal settlement in Sylhet, by designing housing that enhances safety, privacy, and community spaces, especially for women and children.

During my DFI graduation project, I will focus on the transition of women from the informal settlement to the new housing complex I designed in my architecture project. This transition will be significant for these families, particularly for the women, as they move from informal settlements to a new build house.

→ *space available for images / figures on next page*

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image / figure 1   Renders of Graduation Project Architecture

Week 2: Making plan
What social and physical aspects do I need to understand from the women in order to fully grasp their food preparation and cooking processes?

Week 4: Informal settlement
Through literature review, field trips, and interviews: What are the most important aspects for women when it comes to food preparation and cooking in informal settlements?

Week 6: Origin
Through a literature review, field trips, and interviews: What are the most important aspects for women when it comes to food preparation and cooking on their place of origin? And what methods or practices do they still use in informal settlements from the place of origin?

Informal settlement

Plan

Origin

Week 0
How can the transition experience for women moving from informal settlements in Sylhet to a new housing complex be improved, particularly by enhancing cooking and food preparation facilities?

End of week 8: Mid-Term
What are the physical and social requirements that the design must have, which are important for women currently living in informal settlements, for preparing food and cooking in a new home, to make the transition as smooth as possible and how to implement them?

Final concept
Designs that ensure the smoothest transition for cooking and food preparation, meeting the needs that are essential for women in informal settlements and their origins.

Week 18: Design
Design that facilitate a smooth transition for cooking and food preparation, adaptable to various homes and how this could be incorporated into the houses in my architecture project

Discover   **Devine**   **Develop**   **Deliver**

image / figure 2   Approach to Graduation Project Using the Double Diamond Model

Personal Project Brief – IDE Master Graduation Project

Problem Definition

What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice.
(max 200 words)

The issue I identified after completing my first graduation project, which I aim to address in this DfI graduation project, is the assumption that transitioning from cooking outdoors over an open fire with other women, to having one's own indoor kitchen, can be challenging.

I'm not entirely sure what the effects of this transition from preparing and cooking food in an informal settlement to a new home are. I want to gain a deeper understanding of this and design something that can support this transition while preventing any unintended negative consequences.

I have some assumptions about the problems that might arise during this transition. For instance, when women have their own enclosed kitchen, they might feel isolated because there are fewer women around them. Additionally, they might need to adapt to a different way of preparing and cooking food, which could influence what they are able to make. If they are dissatisfied with their new home and kitchen, there's a possibility they may rent out their house and return to live in the informal settlements.

Assignment

This is the most important part of the project brief because it will give a clear direction of what you are heading for.
Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence)
As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the green text format:

The goal of this project is to develop a design that supports the transition experience for women moving from informal settlements in Sylhet to the proposed formal housing project with a focus on improving cooking and food preparation facilities. It will be created for NGOs that advocate for women in challenging situations, ensuring that the design is adaptable and ajustable so it can be implemented in various housing projects beyond just this specific Sylhet initiative.

Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)

In this project, I will employ the Double Diamond framework (see Figure 2), which consists of four phases: Discover, Define, Develop, and Deliver. I appropiated the Double Diamond model.

The first phase, Discover, involves researching the current situation in informal settlements with a focus on food preparation and cooking. I aim to investigate how women currently prepare and cook food in these settlements and identify the key aspects. Additionally, I will explore how they used to prepare and cook food in their places of origin, examining whether there were important aspects back then and if any practices have been carried over into their current cooking rituals. I will first create a plan outlining what I need to learn to understand the cooking process from both practical and social perspectives. With this understanding of both the informal settlement and the original context, I can derive requirements for designing a solution that smooths the transition from cooking in informal settlements to a new home.

During the design process, I will in the end also look at my designed architectural project. I will assess how my design, to enhance the transition experience, can be applied to my architectural project.

Project planning and key moments

*To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a **kick-off meeting**, **mid-term evaluation meeting**, **green light meeting** and **graduation ceremony**. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).*

Make sure to attach the full plan to this project brief.
The four key moment dates must be filled in below

Kick off meeting	5 sept 2024
Mid-term evaluation	25 okt 2024
Green light meeting	18 dec 2024
Graduation ceremony	24 jan 2025

In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project

Part of project scheduled part-time	
For how many project weeks	
Number of project days per week	

Comments:

Motivation and personal ambitions

Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five.
(200 words max)

I am pursuing a double master's degree in Industrial Design and Architecture, specifically in DfI and Architecture. My DFI project will build upon my architecture graduation project, focusing more deeply on interaction, food preparation, and cooking, with a particular emphasis on women.

Through my DFI studies, I've increasingly focused on the user in design projects. However, I found that my architecture courses often overlooked this human-centered approach. Although my architecture thesis addressed user needs, the broad scope of architectural projects-ranging from urban to detailed scales-limited my focus on individual users. This project presents a unique challenge to integrate Architecture with Design for Interaction, demonstrating how these fields can complement and enhance each other.I plan to use creative methods and my knowledge to develop innovative solutions in this new context. Despite the challenge of working with a target group in Bangladesh, I will leverage existing contacts and explore ways to collaborate with users closely related to my target group, either locally or online.

Additionally, I aim to address sustainability, a growing societal concern, by employing new techniques to design a product that is as sustainable as possible, particularly for the informal settlements in Bangladesh.

My personal learning goals are to engage in co-creation with vulnerable groups, collaborate across cultures, and expand my technical and sustainability knowledge.