



# Homestead Gardening in Rural Bangladesh

Women's Contribution to Sustainable Local Food System and Security

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Khondaker Nusrat Sharmin Tumpa

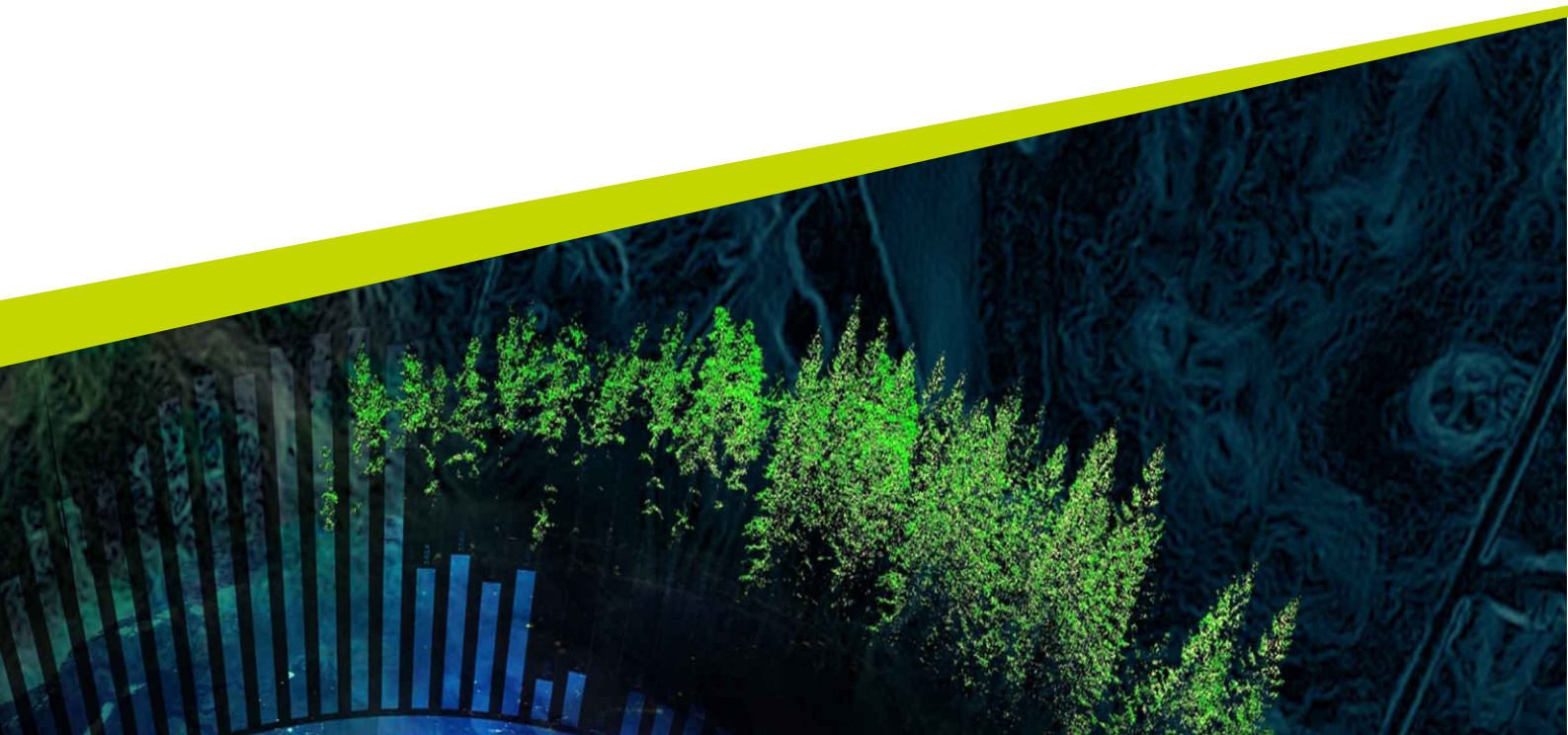
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# Homestead Gardening in Rural Bangladesh: Women's Contribution to Sustainable Local Food System and Security

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# Abstract

This thesis presents qualitative research to explore women's contribution to sustainable food systems and security through homestead gardening in rural Bangladesh. In rural Bangladesh, women frequently undertake homestead gardening, a traditional and widespread practice of producing different vegetables and rearing domestic animals in a small plot of land beside their house. The products from the homestead garden provide food nutrition for the family and income opportunities for women, which contributes to food security. However, women's roles and identities are not recognised in society despite their visible and invisible crucial social, economic, and environmental contributions. Hence, this thesis was conducted in Baneshardi village of Nagarkanda thana in the Faridpur district in Bangladesh to examine the role and contribution of homestead gardening to sustainable food production and security. The present study was undertaken by conducting 12 in-depth interviews with women managing homestead gardening and 2 Key Informants Interviews with representatives from a local government and a civil society organisation. The research indicates that women play diverse roles through different activities in homestead gardens in maintaining sustainable local food systems and security. The principal findings of this research show that through homestead gardening, women are meeting four pillars of sustainable food security (availability, access, utilisation, and stability) and maintaining an alternative local food system which has the potential of being sustainable. The research also revealed that women's traditional agricultural knowledge preserves biodiversity passed through generations by mothers. Despite these contributions, the study found that women face different challenges due to the gender division of labour in society, which creates obstacles to identifying women as farmers and limits access to the market in which area government and non-government initiatives and actions are required. Finally, this study demonstrates that women's household and homestead gardening activities are economically crucial and that it is important to recognise women's contributions and the significance of their activities. Women's role in homestead gardening has the potential to support sustainable local food systems and security.

*Keywords: Homestead gardening, sustainable, food system, food security, women.*

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## Abbreviations

CIP	Country Investment Plan
FAO	Food and Agricultural Organisations
HG	Homestead Gardening
IDP	Integrated Development Programme
KII	Key Informant Interview
NAP	National Agriculture Policy
NFNSP	National Food and Nutrition Security Policy of Bangladesh
NGOs	Non-government Organisations
NFP	National Food Policy
NNP	National Nutrition Policy
R&D	Research and Development
SFS	Sustainable Food Security
VISA	Visitors International Stay Admission
WFP	World Food Programme
WHO	World Health Organisations



# 1. Introduction

Homestead gardens are extensively adopted and practised by local communities with limited resources and institutional support (Galhena et al., 2013), significantly contributing to Bangladesh's rural food and nutrition security (Ali, 2005). However, research and policy usually do not fully recognise this contribution (Weinberger, 2013). Furthermore, the knowledge, control of resources and decision-making about food production of women, who are homestead garden producers and managers, are compromised and ignored in patriarchal rural societies (Sraboni et al., 2014). This thesis intends to reveal the role of rural women in Bangladesh in sustainable local food systems and security through homestead gardening. Furthermore, the thesis will focus on the challenges they face, recognise their contribution, and bring attention to this issue in the research.

## 1.1 Statement of the Problem

With the rising population worldwide, there is a continuous need to increase food production. According to the estimation of the Food and Agriculture Organisation of the United Nations in 2012, there will be a need to increase food output by 60% based on a business-as-usual scenario by 2050 (FAO, 2018). However, food systems are responsible for the world's third of greenhouse gas emissions, especially primary production, and agricultural yields are at risk due to continuous climate change (Dinesh et al., 2021). Besides, food security, a significant development issue, is prioritised in sustainable development goal 2. Through homestead gardening, women significantly reduce food insecurity (Suri, 2020), and it can be a role model for obtaining the country's sustainable food system and security. In rural Bangladesh, homestead gardening is a traditional practice (Biswas, 2013) and an integral part of local food systems and the agricultural landscape (Galhena et al., 2013). Women participate directly by cultivating vegetables, planting trees, and managing livestock (Akter et al., 2019). Homestead gardens can provide various social benefits by enhancing food and nutritional security, improving family health and human capacity, empowering women, promoting social justice and equity, and preserving indigenous knowledge and

culture (Mitchell and Hanstad, 2004). Moreover, existing studies illustrated that homestead gardening could increase women's income and improve their empowerment status (Bushamuka et al., 2005; Ferdous et al., 2016 & Patalagsa et al., 2015).

Despite significant food grain production achievements, food security remains a grave concern for Bangladesh (Nath, 2015). It is a fundamental factor for developing human capital and a starter for society's overall development. Most of the literature revealed women's role in securing food and nutrition for the family, women's empowerment and employment opportunities for women; however, there are a few studies concerning the significance of recognising women's contribution to the food system and security by producing organic vegetables, managing livestock, and planting trees in their homestead. Moreover, gender-desegregated data is scarce for technicians, planners, and policymakers (Quisumbing, 1996). Women in rural areas play an essential role in the four pillars of food security: availability, accessibility, utilisation, and stability by homestead gardening. However, their role and contributions as food producers and farmers are not acknowledged by the existing society due to the division of labour, while males generally dominate development activities due to the existence of traditional society (Biswas et al., 2022). Improvements in rural areas depend upon recognising men's and women's roles (Garcia, 2013).

Besides, Sraboni et al. (2014) have measured the empowerment of men and women in rural Bangladesh, capturing the roles and extent of women's engagement in the agricultural sector based on five spheres: (1) decisions over agricultural production, (2) access to and decision-making power over productive resources, (3) control over the use of income, (4) leadership in the community, and (5) time use. In case revealing the disempowerment between men and women, Sraboni (2014) in their study showed that about 77% of women in rural areas are not empowered compared to around 56% of men. The empowerment gaps for women are most extensive regarding leadership in the community and control and access to resources. Hence, based on Sraboni's above reasoning, we need to study the women's contribution to rural food systems and security, which has the potential to reveal the significance

of recognition for their work in ensuring local food systems and security. In that case, women can be self-aware of their contribution and role, which has the potential to inspire them to participate in homestead gardening as part of alternative agricultural activities. Perhaps, in the long term, women's participation in homestead gardening will ensure a sustainable local food system and security and women's empowerment (Quisumbing, 1996).

Hence, assessing women's contribution to homestead gardening is essential, particularly to create awareness about women's contribution and role in the local food system and security and for policy formulation and program interventions for their development. Women's integral role in homestead gardening is worth investigating to recognise their contribution, which may hold the potential to support changes in the agricultural sector to support alternative agricultural production methods in rural areas.

## 1.2 Background of the study

### 1.2.1 Homestead Gardening

Homestead gardening has no standard definitions (Kumar and Nair, 2004). In different kinds of literature, homestead gardening is classified as small-scale, mixed, kitchen, backyard, farmyard, compound, home food gardening or home garden (Terra, 1958; Ruthenberg, 1971; Puri and Nair, 2004; Rowe, 2009; Saediman et al., 2021). Even with a different name, this similar traditional and widespread practice of homestead gardening worldwide has been integral to family farming and local food systems for centuries (Galhena et al., 2013; Saediman et al., 2021). Different aspects of homestead gardening stood in the focus of attempts to define and analyse it, focusing on dimensions such as labour, consumption, income, land use, cultivation, types of products, nutrition etc.

Concerning labour, home gardens are considered operational farm units, which typically engage women's family labour. Rural women predominantly practise homestead gardening near their houses for household consumption, income, employment, and socioeconomic status, complementing the functions and output

of field agriculture (Marsh, 1998; Keatinge et al., 2012; Ferdous et al., 2016). Although homestead farms sustain high agricultural production, it is still regarded as supplemental rather than a primary source of family consumption and income (Ali, 2005; Galhena et al., 2013; Dash and Misra, 2001). Besides, in the case of land use, Odebode (2006) refers to homestead gardening as cultivating small-scale land surrounding a household or within walking distance from the family home. It is also defined as small areas of cultivated land immediately surrounding the home or homestead (Cuanalo de la Cerda and Guerra Mukul, 2008). Similarly, Niñez (1987) defined homestead gardens as food production on small plots adjacent to human communities, the oldest and most enduring form of cultivation.

In terms of cultivation and type of products, Galhena et al. (2013) described homestead gardening as a mixed cropping system, including the production of vegetables, fruits, plantation crops, spices, herbs, ornamental and medicinal plants, and livestock that can serve as a supplementary source of food and income for the household. It is also considered the cultivation of vegetables, fruits, and herbs for domestic consumption (Kumar and Nair, 2004). Conversely, cash crops are grown for direct sale in the market rather than for family consumption or livestock feed (Mulvaney, 2011; Mazumder et al., 2023). The main cash crops of Bangladesh are tea, jute, tobacco, sugarcane, silk, rubber etc. (Bangladesh Bureau of Statistics, 2021). So, there is an apparent difference between homestead gardening products and cash crops regarding household consumption and commercial purposes.

Along with the land use aspect, Niñez (1984) defined the homestead garden in detail, stating that the small-scale production from the household garden meets the family's needs by supplying plants and animal products which are easily affordable, obtainable and available from the homestead outside of the retail market. It reduces the inconvenience of buying expensive food from the market and closes the food insecurity gap. The small plot of land beside the house conserves biodiversity with ecological products with low capital input and simple technology. While Galhena et al. (2013) considered homestead gardens a significant alternative source for households' food, nutritional security, and livelihoods.

From the definitions mentioned above, it is found that the common classification concerns land use along with types of products. In this paper, homestead gardening refers to a small-scale land beside a house where female household members cultivate different kinds of plants and animal products for their own consumption, sharing with neighbours or also for income purposes. Besides, the cultivation of products conserves biodiversity and protects the land from chemical fertiliser, which provides safe and nutritious food for the family and maintains a local food system.

### 1.2.2 Bangladesh in Global Food System

Bangladesh has achieved immense developments in economic growth, health, poverty reduction, and food and nutrition security since its independence (Government of the People's Republic of Bangladesh, 2021). It has become self-sufficient in food grain production and attained remarkable achievements over the last decades in food grains and rice (4th largest producer in the world), vegetables (3rd largest producer in the world), and mango (7th largest producer in the world). Bangladesh is also positioned as the 3rd largest inland fish producer, followed by India (1<sup>st</sup> largest producer) and China (2<sup>nd</sup> largest producer) (FAO, 2019). The country has also eradicated extreme poverty from 48.9% to 23.2% during the previous few decades. However, despite these accomplishments, there are still gaps in per capita demand and availability of fruits, vegetables, eggs, milk, and other food products, creating a food security and malnutrition gap (Talukder et al., 2021). As a result, Bangladesh ranked 80th in the world in 2020, considering food affordability, availability, quality, safety, vital natural resources, and resilience (The Economist, 2022).

The agro-food supply chain in Bangladesh is hugely complicated, while the agricultural goods pass through several transportation stages to reach the big cities. The supply chain expands from farm producers to end consumers via food processing, storage, and mediators (Rahman et al., 2022).

So, the situation mentioned above indicates a need to concentrate on alternative agricultural practices outside of commercial farming practices to fulfil the need of

the increasing population. Homestead gardening, as a traditional practice in rural Bangladesh, could be an alternative agricultural practice to meet food security and maintain a local food system.

### 1.2.3 Homestead Gardening in Bangladesh’s Policies

The homestead garden issue is mentioned in different policies in Bangladesh. However, there needs to be a more proper explanation of what they mean by mentioning homestead gardening. So, it is hard to understand only from the policies and initiatives what and how they can be implemented. Following are the policies mentioned about the promotion and encouragement of homestead gardens.

Policies	Policy Text
<p><b>National Food and Nutrition Security Policy of Bangladesh (NFNSP) 2019</b></p>	<ul style="list-style-type: none"> <li>• Strategy 1.2 Scale up nutrition-sensitive diversification of food production There is a case for increasing R&amp;D support for developing and disseminating improved technologies for boosting the production of nutrient-dense non-cereal crops, livestock, and fisheries through nutrition-sensitive diversification of production systems. Such a diversification strategy must include commercial and homestead production support, consumed mainly by the producing households.  The following initiatives will be implemented under this strategy:               <ol style="list-style-type: none"> <li>i. Promote diversification into horticultural, fisheries, livestock, poultry and dairy products with high nutrient and micronutrient content, including homestead production, indigenous food, and underutilised food sources.</li> </ol> </li> <li>• Strategy 3.2 Enhance nutrition knowledge, promote good dietary practices, and encourage the consumption of safe and nutritious diets.  It is also essential to ensure that complementary commercial food (including fortified food) is not promoted as a better option than the homestead or locally available whole food for complementary feeding to meet recommended nutrient intake.</li> </ul>

	<ul style="list-style-type: none"> <li>• Strategy 4.2. Improve disaster preparedness, responses, rehabilitation, and mitigation.</li> </ul> <p>ii. Support home-based farming, such as “one house, one farm”, to enhance resilience and protect livestock and poultry resources during disasters.</p>
<b>National Agriculture Policy 2018</b>	Mentioned as “cultivating vegetables and planting fruit trees all the year round in homestead land.”
<b>Bangladesh’s second country investment plan (CIP2) on nutrition-sensitive food System (2016-2020)</b>	Included a policy indicator as “Poor households raising home gardening and backyard poultry in selected vulnerable districts.”
<b>National Nutrition Policy 2015</b>	6.2.1 Encourage coordinated homestead gardening, small-scale livestock, and poultry rearing at the family level or collectively to increase the availability of diverse, safe, and nutritious food.
<b>National Food Policy 2006</b>	<p>“sub-2.1.1. Special measures for disaster mitigation for agriculture under the Objective – 2: Increased purchasing power and access to food for the people.</p> <p>iii. homestead gardening, including fruits and vegetable farming, social forestry, livestock, and backyard poultry in the homestead areas in the flood-free years.”</p>
<b>National Agriculture Policy 1999</b>	“Considering women’s involvement in agriculture, the following programmes will be taken up to enhance their role under the scope of the National Agriculture Policy: Agriculture-related activities like post-harvest operations, seed preservation, nursery business, jute stripping, vegetable cultivation, homestead gardening, floriculture, production of horticultural seeds, establishment and management of cottage industries based on locally produced agricultural commodities, etc. are very suitable for women.”

*Table 1: Homestead Gardening in various policies*

#### 1.2.4 Women and Homestead Gardening in Bangladesh Perspective

In the case of consuming both vegetables and fruits, in Bangladesh, on average, people consume 126g of vegetables and fruits, far below the minimum recommended daily consumption of 400g (FAO, 2003). However, except for potatoes and sweet potatoes, in the case of only vegetable consumption, for adult men/women, at least 220g of vegetables are needed per day, whereas on average Bangladeshi people consume around 35g/per head/per day of vegetables (WHO/FAO, 2003). This data reveals the significance of the production, availability and accessibility of vegetables for people's consumption. Besides, Household Income and Expenditure Survey (HIES) 2022 in Bangladesh revealed that the average vegetable intake is 201.9g per day per household (Bangladesh Bureau of Statistics, 2023). The food security report in Bangladesh by WFP (2023) stated that 11% of people are food insecure. The food security situation has improved slightly, the low-income group are still more food insecure, especially those with low income, disability, and women-headed households. Furthermore, 68% of the households were significantly affected by food prices, with an increase in most food items compared to last year (WFP, 2023). However, the study aims not to measure food security but instead to look for the potentiality of homestead gardening to mitigate food insecurity in rural areas.

Homestead gardening as an agricultural practice contributes to household food security by providing access to food and nutrition to families in rural Bangladesh. In their study in Bangladesh, Midmore et al. (1991) stated that homestead gardening represents a direct, cost-effective, and ecologically sound strategy for enhancing food security and household incomes as it is well adapted to local agronomic and resource conditions, cultural traditions, and preferences. Women can also ensure household nutritional status and food security and lessen the malnourished population worldwide by playing the role of food producers (Holland and Rammohan, 2019). Rahman and Islam (2014) have stated in their study in Bangladesh that women are directly involved in homestead gardening, giving them financial benefits and nutrition in malnutrition and low-income families. Ghosh et



al. (2021) also reported that women are uniquely positioned to reduce malnutrition in rural Bangladesh through household production. The study in the Moulvibazar district shows that women play a significant role in vegetable cultivation in their homestead, which helps to meet the nutritional and agricultural demands.

Women play a significant role in all home garden activities in rural Bangladesh. They prefer planting agricultural products to help meet household needs instead of cash crops in their homestead garden. Besides, with their better indigenous knowledge, women ensure natural resources and biodiversity of the different species of agricultural products (Das and Mohiuddin, 2012). Similarly, in the case of the conservation of biodiversity, the study of Uddin and Mukul (2007) revealed that the protection of cultivated plants in homestead gardens of Bangladesh not only preserves a vital resource for humankind but plays an important role in household food security, as it is a sustainable source of food, fruits, and vegetables.

In this situation, as among others, FAO (2023) report argues that tackling gender inequalities in agrifood systems and empowering women can reduce hunger, boost the economy, and reinforce resilience to climate change and the COVID-19 pandemic (FAO, 2023). In their study, Wei et al. (2021) stated that empowering the role of rural women is seen as a 'prerequisite' for achieving household and global food security. The discriminatory social norms in the agrifood system create power imbalances between men and women which restrict women's mobility and limit their choices for nondomestic work, market activities and access to and control over assets. Hence, addressing gender equality and women's empowerment means discouraging constraining social norms and rigid gender roles affecting women's participation in agrifood systems (FAO, 2023). It is found that rural women in Bangladesh from more than 50% of households voluntarily participate in homestead gardening and raising livestock and poultry, which helps them ensure household food security (Jamadder, 2018). Besides, these activities increase women's economic empowerment in rural underprivileged families by providing income opportunities from homestead products (Dupuis et al., 2022), better utilisation of the homestead resources, and caring for children and family members within the household improves with the additional sources of income and nutritious

food from the home garden (Rahman and Islam, 2014). Similarly, the study in northern Bangladesh explored that homestead gardens also create employment opportunities for both men and women members of the households, which may increase family income for a better livelihood for a large population (Roy et al., 2013). Furthermore, in their study, Kulsum et al. (2019) showed that homestead gardening creates employment opportunities for rural women which helps to increase their participation in the household decision-making process. In addition, the comparison study between homestead gardening adopters (who have homestead gardens) and non-adopter (who do not have homestead gardens) in the Comilla district in Bangladesh revealed that women's involvement in homestead gardening enhanced household food production and income, assisting them to participate in family decisions and improving their social status (Akter et al., 2021).

It is noticeable from the literature reviews that homestead gardening as an agricultural practice allows women to participate in income-generating activities to support their families. Women in rural Bangladesh provide nutritious and fresh food for the family and maintain the biodiversity of agricultural products by producing local plants. Through homestead gardening activities, women contribute to the family's food security. However, despite women's contributions in this sector, they are not recognised for their role, which needs to be addressed to make women aware of their role and the significance of their activities for the family and society, which may help to address the challenges they face.

### 1.2.5 Development Projects in Bangladesh

Food and Agricultural Organisation (2023) reported that if half of the small-scale producers benefited from development interventions that focused on empowering women, that would significantly raise the incomes of an additional 58 million people and increase the resilience of an additional 235 million around the world (FAO, 2023). The introduction of homestead gardening projects with structured forms, logistics support (providing seeds and plants), and training by government and non-government organisations (NGOs) have positively impacted food security and nutrition in rural areas in Bangladesh. Ferdous et al. (2016) revealed that the

rural Rangpur model<sup>1</sup> of year-round homestead gardening production project has helped to enhance food security and access to adequate, safe, and nutritious food among the studied farmers in that region of Bangladesh. The reason behind there was low land productivity and a lack of available quality seeds. So, the project first introduced the plantation of a quick-growing fruit tree (papaya). Further, the research centre selected locally adaptable and culturally acceptable vegetables and fruit trees with better nutritional value and market demand. The project encouraged applying organic fertilisers such as cow dung, poultry manure, compost, kitchen ash, vegetable refuse, crop residues and tree litter from their own sources, which increased the productivity and fertility of these gardens. However, during severe infestations, the pesticide was applied to control pests. The project of homestead production helped the Rangpur area solve food and nutritional problems by increasing household food availability, enabling greater physical, economic, and social access, protecting and buffering the household against food shortages, and reducing the purchase of expensive vegetables from outside sources.

Similarly, Baliki et al. (2022) explored that home garden project<sup>2</sup> with training facilities and logistics support (seeds and plants) for women in Bangladesh, which immediately increased the number of harvested vegetables. In the long term, it has shown desirable impacts in production, indicating the home garden's sustainability as alternative agriculture.

Even though homestead gardening is a traditional practice in Bangladesh, the government and NGO interventions (training and logistics support concerning providing high-quality seeds and plants) have shown the possibility of developing the production of the products and creating income opportunities among poor people in an underprivileged rural area in Bangladesh. However, it is noticeable

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<sup>1</sup> Homestead gardening project was carried out at Lahirirhat Farming Systems Research and Development site, Rangpur, under the On-Farm Research Division of Bangladesh Agricultural Research Institute during 2008–2009, resulting in the development of a year-round production model, known as the Rangpur (Syedpur) model, for Tista Meander Floodplain agro-ecological region of Bangladesh.

<sup>2</sup> The project implemented from 2012–2015 in Bangladesh by the World Vegetable Center in collaboration with two local non-governmental organisations (NGOs): BRAC implemented the intervention in Jashore and Barisal Districts, and Proshika implemented it in Patuakhali and Faridpur Districts. The project was funded by the United States Agency for International Development (USAID) and reached over 10,000 rural women.

that projects did not emphasise the local varieties of plants and traditional knowledge of women; instead, they were concerned with high-quality seeds based on the land quality and climate, which do not indicate the preservation of the biodiversity. Even though the project encouraged organic materials and local seeds, it was also mixed with hybrid seeds and the use of pesticides to control pests.

### 1.2.6 Women and Homestead Gardening in Global Perspective

A home garden is an agricultural production system that uses natural manures, and indigenous pest control methods, replacing costly inputs. For this reason, low-income families can afford to benefit from home garden plots and sustainably contribute to the family's livelihood objectives in rural areas in Indonesia and Bangladesh (Marsh, 1998). However, women's role in food production and security through home gardens is severely underestimated (Brown, 2011) and has often been neglected and under-valued (Kothari, 2003, cited in Reyes-García et al., 2010).

Different studies from different parts of the world have revealed that women play a significant role in meeting the nutritious food from their homestead garden. The study in rural Myanmar and India showed that through home gardens, women provide excellent food and nutrition outcomes, meet seasonal food shortages, and free-up cash for other essential purposes, which contribute to better household food security and the incomes of the household (Pritchard et al., 2017; Ogutu et al., 2023). The study in Kenya reveals that women are the key manager of food and nutrition safety, producing, purchasing, handling, preparing, and serving food to families and community institutions (Liru, 2014). Bhandari et al. (2021), in their study of two villages (97 households) in Nepal, revealed that 78.6% of households in Bajitpur and 68.4% of households in Musharniya have a home garden to maintain household food security, ensure food availability for most of the seasons, access to food, utilisation, and stability in production. Furthermore, the comparison study between households with and without homestead gardening in Northwest Ethiopia shows that the households practising homestead gardening are more food secure than the household that does not have homestead gardening. Through home

gardening, women contribute to household food security by providing access to food harvested by households (Motbainor et al., 2022).

Women are also preserving the biodiversity of products by managing home gardens. Ebile et al. (2022) revealed that home gardens increase the biodiversity of vegetables in rural communities, combat nutrition insecurity, and provide the availability and consumption of various nutrient-rich vegetables, which helps to prevent sickness from toxic vegetables, saving families money on food and medical care (Nguyen et al., 2017). Furthermore, in a study in three mountain areas of the Iberian Peninsula, Reyes-García et al. (2010) found that women generally focus on organic fertilisers and traditional pest control management systems in their home gardens. They also ensure the extensive diversity of uses for species and a more considerable diversity of species per unit area.

Women contribute to household consumption and food security through home gardens and selling products that benefit women economically. In a study in rural Cambodia, Nguyen et al. (2017) observed that home gardens play a vital role in women's livelihood from the perspective of income sources and toxic-free food. Besides, studying 97 households (the target population is women) in two villages in Nepal, Bhandari et al. (2021) revealed that women from around 66.67% and 58.33% of households earn money selling spare home garden products. Furthermore, another study in Zimbabwe revealed various benefits of homestead gardening, stating that homestead gardens help ensure food security to sustainable livelihoods through home-based employment, reduce household expenditure on food, income generation, and recreation, empower women, and promote social justice and equity (Charachimwe and Mangwende, 2018).

A household-based production is a unique form of production where family labour is utilised instead of paid work. This home-based agricultural production is considered a means for the reproduction of the family as a consumption unit for the household's material survival (Asztalos Morell, 1999). In the homestead garden, women are the sole labour who do most of the activities, from planting vegetables to harvesting and caring for domestic animals, while sometimes their family members also help them with the heavy tasks such as building the trellis of the

garden. In their study in rural Cambodia, Nguyen et al. (2017) reported that women do the planting, weeding, fertiliser application, and daily garden tending tasks while their husbands help them to build the garden's trellis and fence.

It is also interesting to see that interventions from the government and NGOs for homestead gardening programmes targeting women positively impact food security and economic and social conditions. Ebile et al. (2022), in their study of Cameroon's Northwest region's rural Mbororo community focusing on food and nutrition security, discovered that the home gardens programme<sup>3</sup> has increased food and nutrition security in marginalised rural communities. A study in Afghanistan concerning women's role in food security found that home food production projects<sup>4</sup> for women enhanced food and nutrition security and empowered women to express their needs openly (Wilcox et al., 2015).

Despite women's contribution to food security, nutrition, biodiversity, and family income, they are not recognised for their role. In their study in rural Cambodia, Nguyen et al. (2017) reported that women do not receive proper appreciation and recognition for their activities in homestead gardens. Besides, women have limited market access, creating obstacles to earning money from homestead gardening products. Wooten (2003), in a study in rural Mali, found that due to a lack of market access, women have limited potential to earn income from home garden products.

FAO (2023) has reported several aspects of inequalities and requires of areas to change concerning women in the agrifood system. The aspects focused on women's access to land, inputs, services, finance and digital technology, access to formal

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<sup>3</sup> The University of Hohenheim, in collaboration with an NGO called Mbororo Social and Cultural Development Association (MBOSCUA), initiated a home garden project for seven Mbororo communities in Cameroon's Northwest region as climate change and conflict increasingly threaten their food and livelihood security. The interventions incorporated horticultural training for the Mbororo women, including nursery and garden management practices, and explained the work the women had to carry out, such as planting and weeding the gardens.

<sup>4</sup> The University of Maryland's Women in Agriculture Project targeted women with unique challenges accessing training and resources to maximise small-scale agricultural output and build capacity among female extension educators to work with vulnerable women to implement and maintain kitchen gardens. The interventions included teaching vegetable gardening, apiculture, small-scale poultry production, post-harvest handling and processing, nutrition and marketing through workshops, demonstration gardens and farmer field schools.

childcare, access to agricultural extension and recognising women's roles and challenges. Further, the report addressed capacity development activities in agrifood and gender transformative change for gender equality for closing the gender gap. The report stated that 75% of policy documents concerning agriculture and rural development from 68 countries recognise women's roles and challenges in agriculture and rural development, while only 19% included policy goals related to gender. Besides, the data shows the increasing gap in food insecurity between men and women from 1.7 percentage points in 2019 to 4.3 percentage points in 2021. The reports also revealed that improving women's access to agricultural extension is vital to maximise food security and nutritional outcomes and to facilitate women's participation across agrifood systems. Finally, it mentioned government and non-government interventions to close gender inequalities, empower women, and use transformative approaches at the community and national levels to address discriminatory gender norms and attitudes. FAO estimates that employment of rural women in the agrifood system would increase global gross domestic product by 1% (or nearly USD 1 trillion) by closing the gender gap in farm activity and the wage gap in the agrifood system, which would reduce global food insecurity by about two percentage points and will reduce the number of food insecure by 45 million in the world (FAO, 2023). FAO (2023) also revealed that gender transformative approaches in Nepal and Bangladesh have changed discriminatory norms and increased both men's and women's empowerment.

The review of various literature on women and homestead gardening from a global perspective revealed that as an agricultural practice, homestead garden has the potential to meet household needs and food security. Women are the ones who are investing their time and labour to produce vegetables and rearing domestic animals for household consumption, and, in some cases, women are providing economic support by selling the products. However, due to a lack of market access, they cannot get proper benefits from selling the products, and their contribution remains unrecognised. Government and non-governmental initiatives showed a positive impact; however, it is still necessary to investigate how wider the project and programmes are worldwide. Besides, the relationship between women and the local

food system needs to be clarified due to the lack of literature about women's contribution to maintaining the local food system. The studies reviewed above also revealed women's role in providing nutritious food and economic support and protecting regional variants through their activities in the homestead garden. However, a significant gap in research has been found in the case of the knowledge and information regarding how the gender division of labour in agriculture influences farming practices and creates obstacles for women in recognition of their contribution and identity as a farmer. Addressing this gap holds the potential to improve policy interventions to support women and increase household food security through homestead gardening in rural areas.

### 1.3 Objectives of the Study

This study aims to study women's role in ensuring a sustainable local food system and security by homestead gardening. Besides, the specific objective of this study is to explore, based on the understandings of rural women engaged with homestead gardening:

- The challenges that constrain women's role and contributions to ensuring the local food system and security.
- The local food system that exists in rural areas.

The study will also examine the implications of the knowledge gained for improving government and non-government initiatives in support of women farmers and food security.

### 1.4 Research questions

The main research question is-

- How and to what extent do rural women in the study ensure a sustainable local food system and security by homestead gardening over the years?

Specific Research Questions



- What challenges constrain women's contributions to the local food system and security?
- What is the local food system in rural Bangladesh?
- What initiatives are required to recognise women's contribution to the local food system and security?

## 1.5 Thesis Outline

This paper is comprised of six chapters. The first chapter is an introductory part which includes a statement of the problem, objectives and research question of the study and background of the study comprising information about the food system and security, homestead gardening, the role of homestead gardening in the food system and women's role in Bangladesh and global perspective. The second chapter is structured with theories and concepts with food regime concept, social role theory and eco-feminism perspective. Chapter three outlines the study's methodology concerning approach, study area, the profile of the respondents, data collection process, ethical considerations, and limitations of the study. Chapter four addresses the empirical findings of the study comprising types of homestead gardening products, the local food system, the role of women in the local food system and security, challenges, and policy interventions. Chapter Five discusses the findings in connection with theories and concepts. Finally, the sixth chapter addresses the concluding remarks with the potentiality of future studies.

## 2. Theories and Concept

### 2.1 Polányi's Four Forms of Economic Integration

Polányi's four forms of economic integration are used to explore homestead gardening as an economic system. To reveal how economic processes acquire unity and stability, Polányi (1957) stated that it is achieved through a combination of four forms, which he called "forms of integration". Polányi (1957) argued that with these four forms of economic integration, we can conceptualise the economy and comprehend the institutions and processes that maintain the movement of goods and services and provide the material reproduction of society. The four forms of economic integration are 1) Reciprocity (ex: gift exchange), 2) Redistribution (in which resources are gathered in a centre which allocates and distributes them), 3) Householding (self-sufficient household economies) and 4) Market.

*Reciprocity* involves exchanging goods between people bound in non-market and non-hierarchical relationships with one another. The exchange is part of all human behaviour that allows the movement of goods and services between individuals without any commitment to monetary securities. Polányi defines *redistribution* as a systematic movement of goods towards an administrative centre and their reallocation by the authorities at the centre (Polányi, 1957). Polányi illustrates reciprocity and redistribution as the underlying organising principle of 'primitive' societies. These principles share common characteristics: 1. the purpose of profit is missing; 2. the principle of work carried out for rewards is missing; 3. the focus of the least effort is missing; and 4. any institution-based economic rationale is missing. (Polányi, 1976).

The concept of *householding* refers to production for own use. Polányi regards the household as an institution that evolves on a higher level of development in agricultural societies. Polányi detailed the concepts stating that each household is responsible for securing its own necessities, which has no relation with the motive of profit and the presence of markets. Either the family, the settlement or the estate is responsible for forming a self-sufficient unit with the same principle concerning production and storage to meet the needs of the group members (Polányi, 1976).

However, the idea of production for self-consumption does not exclude the presence of contact with a market or the sale of surplus; instead, the self-consumption production is valid if markets and money are for the welfare of the households (Polányi, 1976). On the other side, self-regulating market principles focus on an economic system where the markets rule and the system of producing and distributing goods and commodities depend on the self-regulating mechanism and is secured by the price. In this situation, all parties in the production have their own market concerning goods, labour, land, and money and their prices are called prices, wages, land rent and mortgages (Polányi, 1957).

Polányi defines a market economy as “*an economic system directed and maintained by markets alone; order in the production and distribution of goods is delegated to this self-regulating mechanism. This type of economy derives from the expectation that human beings act in such a way as to accomplish maximum money gains. It assumes markets where the supply of goods and services available at a definite price will equal the demand at that price, and the money owners have purchasing power in the market. Further, production will be controlled by prices for the producers’ profits; distribution of the goods will depend on the market prices, which form incomes distributed amongst the members of the society. Under this hypothesis, the order in producing and distributing goods and services is assured by prices alone (Polányi, 1957:68).*”

Based on the discussion above, it is apparent that Polányi’s four types of economic integration focus on market and non-market economies. According to Polányi, economic motives become prevalent in market economies at the expense of broader ‘social motives’ (honour, solidarity, moral duty, pride, civil obligation, or sense of common decency). Applying formal economics is wholly inappropriate for non-market economies as it does not have any price-making mechanisms. Nevertheless, price and enter exchange relations dominate in the market economies. The exchange is the dominant distribution mechanism which relates to the supply and demand of the distributed goods and services (Polányi, 1947). I applied four forms of integration mentioned above to analyse the existing local food system in the researched area to explore how local women maintain local food systems and

ensure food security through their market and non-market economic activities. Polányi's concepts of reciprocity and householding will be utilised to explore women's role in the economy and for maintaining the food security of the family and the local food system. Furthermore, the study explores the contribution of women to the family's food security through the ways of their engagement with the market through their household gardening.

## 2.2 Gender Perspectives

To focus on the gender perspective for the data analysis, I will use the concepts of the triple role of women and the gender division of labour. Besides, ecofeminism adds the perspectives of ecology.

### **Triple role of women**

Women play different roles in the family. Moser (1993) categorised women's work into three spheres 1) productive, 2) reproductive work and 3) community activities. Productive work is associated with paid labour, in which goods are produced and services are provided. Reproductive work involves childbearing, cooking or cleaning and caring for family, including children, the sick or the elderly. Community work is often voluntary and focuses on improvements to community resources (McLaren et al., 2020). Women's engagement in productive work is more often known as routine, less visible and less valued than men's (Nawaz and McLaren 2016). In nearly all societies, patriarchy, and women's engagement in homosociality afford men more significant opportunities in leadership, professional specialisations, "clean work", and higher earning capacities (McLaren et al. 2019; Mehta and Awasthi 2019). Women mainly perform reproductive work, usually non-monetised, hidden and discursively cast as not "real work" (Delaney and Macdonald 2018). In community activities, women most often volunteer their time to hands-on manual activities, such as visiting the infirm, fundraising, cooking, or cleaning, compared to men's community activities, which are more often political and figure heading (Moreno and Shaw 2018). Overall, women's productive,

reproductive and community activities are more often arduous, undervalued, and even hazardous to health and life.

### **Gender Division of Labour in Family**

Gender division of labour in the family indicates separate work assignments according to sex, while many women are responsible for housework and childcare. Conversely, men are responsible for non-domestic work in the economic sector and other social and cultural institutions. Nevertheless, this gender-based division of labour does not only mean that men and women do different work (Kim, 2009). According to William (2000), the division of labour entails the distinctive characterisation of ‘male type’ work and ‘female type’ work (e.g., doctors vs nurses, managers vs secretaries), expectations and ideologies (e.g., men as breadwinners vs women as homemakers) and men’s and women’s spheres (e.g., public vs private).

By making women primarily responsible for unpaid or low-paid housework and childcare and by making men primarily responsible for paid work, the gender division of labour tends to benefit men and keeps women unequal to men. Housework and childcare, which women disproportionately perform, are primarily underrated in society, and this contributes to the perception of women’s lesser worth, lesser power, and economic dependence on men within and outside the household. Through the gender division of labour, women are systemically disadvantaged relative to men in their access to values such as power, material goods, prestige-conferring roles, and educational and training opportunities. In other words, the gender division of labour causes persistent inequalities in the distribution of life chances confronted by men and women (Kim, 2009).

In this study, I will analyse the women’s household and homestead gardening activities concerning the gender division of labour to explore the women’s situation in rural Bangladesh.

## 2.3 Eco-feminism perspectives

Ecofeminism emerged from political activism and intellectual critique, combining feminism and environmentalism. Ecofeminism argues that the domination of women and the degradation of the environment are consequences of patriarchy and capitalism (Buckingham, 2015). Patriarchy<sup>5</sup> is considered responsible for both gender oppression and the fate of the poor and indigenous people and for systems of production and consumption which view nature as a commodity to be used and discarded (Woehrle, 2022). Any strategy to address one must consider its impact on the other so that women's equality should not be achieved at the expense of worsening the environment, nor should environmental improvements be gained at the expense of women. Indeed, ecofeminism proposes that society and the environment benefit only by reversing current values, thereby privileging care and cooperation over more aggressive and dominating behaviours (Buckingham, 2015). There are three types of ecofeminist positions: 1) Cultural ecofeminism, 2) Social ecofeminism, and 3) Materialist ecofeminism.

Cultural ecofeminism emerged in the early 1970s, which reclaims women-nature connections as liberating and empowering expressions of women's capabilities to care for nature. While few cultural ecofeminists argue that women's reproductive capacities provide a biological tie with nature, making women closer to nature than men. Other cultural ecofeminists argue that women's closeness to nature is embedded in deep social and psychological structures, making women's ways of knowing and moral reasoning better suited to solving environmental problems. Nevertheless, all cultural ecofeminists agree that women have a special and helpful relationship with the physical world (bodies, nature), which can help end the unjustified dominations of both women and nature (Warren, 2001).

Conversely, social ecofeminists criticised cultural ecofeminism from essentialist, universalist and ahistorical standpoints about women and nature. They argue that

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<sup>5</sup> I have followed Walby's patriarchy concept. According to Sylvia Walby (1989), six main patriarchal structures constitute a system of patriarchy. These are a patriarchal mode of production in which women's labour is expropriated by their husbands; patriarchal relations within waged labour; the patriarchal state; male violence; patriarchal relations in sexuality; and patriarchal culture.

there is no essential (biological, natural, innate) nature of women, no homogenous women's experience or women's way of knowing and no ahistorical concept of women. Instead, they believe women's identities are socially constructed, historically fashioned, and materially reinforced through diverse race/ethnicity, class, sexual orientation, age, ability, marital status, and geographic factors. Furthermore, materialist ecofeminism claims that the connections between women and nature are socially constructed and biologically inclined. Women's biological identity has played a key role historically in the oppression of women and the identification of women with nature, however, women's biology is not their destiny. Instead, the social, material, and political relationships between women and nature are significant (Warren, 2001).

Shiva and Mies (1993) have complemented ecofeminism by criticising modern science and enlightenment thought. They argue that modern science is grounded in the linked material relations of patriarchal violence, capitalism and colonialism and that capitalism and colonialism constitute patriarchal violence. They stated that the violence of scientific epistemology and practice has historically been formed through the violence of colonial relations between industrialised and underdeveloped countries. As a result, women and children, especially in the underdeveloped South, face the destructive effects of science and are also reflected in the progressive destruction of 'nature'. Furthermore, Vandana Shiva has argued that in pursuit of an illusion of progress, development projects tend to replace small-scale indigenous ecological practices with large-scale degradation of the environment (Mies and Shiva, 1993). Modern technology and development continue to annihilate traditional culture and production methods (Khan, 2016).

According to Vandana Shiva's philosophy, the absence of indigenous knowledge, local communities, and female representation deteriorates our relationship with the earth. In the *Ecofeminism* book, Shiva represented women as the custodians of biodiversity and critiqued modern technology (Mies and Shiva, 1993). In her article *empowering women*, Shiva (2004) further explained that women had paid the highest price due to the green revolution. Combined with patriarchal values, this technological development devalued women's agricultural role, leading to new

violence in the form of female feticide. Shiva (2004) also argued that this displacement of women from agriculture disempowers women and reduces food security. So, it is significant to strengthen women's role in agriculture both to remove hunger and empower women. Redefining development from women's perspective will ensure no one goes hungry or thirsty.

The discussion above revealed that although various ecofeminism has different standpoints, they have a common ground that insists on ecology and environmentalism's relevance to feminism concerning women. In this paper, I used Vandana Shiva's philosophy of ecofeminism, where she concentrates on women's role in maintaining biodiversity and food security. I also used the social and materialist feminist views to examine the socially constructed women's identity.

## 2.4 Sustainable Food System and Security

I have used the concept of sustainable food systems and security to analyse the data.

### **Sustainable Food System**

The food system is considered to be the set of processes between field and fork, which can be a linear sequence, and in some cases, food systems can be at least partly cyclical. Besides, the food system is regarded as dynamics that encompasses social, economic, and biophysical interactions across multiple dimensions (Garnett et al., 2016) within the interdependent sets of enterprises, institutions, activities, and relationships that collectively develop and deliver materials inputs to the farming sector, produce primary commodities, and subsequently handle, process, transport, market and distribute food and other agro-based products to consumers (HLPE, 2014a cited in Hajer et al., 2016). However, in reality, it is difficult to find one single 'food system' instead, there are multiple 'food systems functioning at various spatial or social scales, which interact with one another to varying degrees (Garnett et al., 2016). It differs regionally regarding the actors involved and the characteristics of their relationships and activities (Hajer et al., 2016). For instance, traditional/indigenous food systems articulate patterns of living in local ecosystems with food knowledge from the past and present, which contributes to well-being



and health and can influence the implementation of more sustainable food processes that are functional for local environments. This kind of food system ensures a balance between communities and their environments where diets are related to local ecosystems and the appropriate disposition of ingredients (Kuhnlein et al., 2009). Traditional foods from native groups represent culturally significant ecological practices and often provide significant nutritional value (Joseph and Turner, 2020).

According to FAO, "a *sustainable food system (SFS)* is a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised" (Nguyen, H., 2018). The definition indicates that it is profitable concerning economic sustainability, beneficial for society, indicating social sustainability and has a positive or neutral impact on the natural environment focusing on environmental sustainability. The development of the food system requires positive or neutral outcomes of three dimensions simultaneously to be sustainable (Nguyen, H., 2018; Hajer et al., 2016).

1) Economic dimension: a food system is considered sustainable when the activities of each food system generate monetary value and food supply improvements for consumers. 2) Social dimension: a food system is considered sustainable when it contributes to advancing socio-cultural outcomes concerning nutrition and health. 3) Environmental dimension: the sustainability food system is determined by the impacts of the food system concerning biodiversity, animal, soil, water, food loss and waste, toxicity, and carbon and water footprint.

However, there is no universalised definition of a sustainable food system. In rural areas, the production of homestead gardens is not commercialised, so there are limited visible monetary outcomes; however, home consumption also saves money to buy food from the market, which is an invisible economic outcome. This invisible economic value must also be addressed in the sustainable food system. So, in this paper, I will look into the sustainable food system in the light of social, environmental, and invisible and visible economic dimensions.

## **Four Pillars of Sustainable Food Security**

Furthermore, a central question concerning the food system is how they contribute to food security? Achieving food security is not only producing enough food, instead, but is also an outcome of four essential conditions that food should be available, accessible, and utilisable, and these three factors will stay stable over time in the household (Garnett & Finch, 2018). FAO (2003) states, “*Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life*”.

Sustainable food security is a comprehensive phenomenon that requires a wide range of factors which must be well-considered in designing a strategy for that end (Aborisade and Bach, 2014). I will focus on four pillars of sustainable food security in this study to analyse the findings. 1. Availability; 2. Access; 3. Utilisation and 4. Stability. *Food availability* refers to a sufficient quality food supply through domestic production or imports (including food aid). The nationally aggregated data on the food supply are used to measure the country’s food availability concerning the total amount of food produced and imported. While *food access* concentrates on access to adequate resources to obtain appropriate nutritious foods. Household income and food prices are considered significant factors in determining family access to food. Besides, *utilisation* highlights the significance of non-food inputs in food security, such as nutritional well-being, which focuses on adequate diet, clean water, sanitation, and health care to meet all physiological needs. The indicators to measure utilisation focus on the allocation of food within households, food’s nutritional quality, good use of food and micronutrients’ bioavailability. Then *stability* refers to having sufficient food always, which will not disrupt due to sudden shocks or climate crises. The food will be stabilised when individuals and households have available food, which can always be accessed and utilised for nutritional well-being. Stability is determined by the constant flow of income and sources, expenditures and expenditure ratios, and especially assets (Giuseppe, 2015; Aborisade and Bach, 2014; Jones et al., 2013; Godfray et al., 2010; Brief, 2006; Kennedy and Peters, 1992).

## 3. Methodology of the Study

### 3.1 Approach

This thesis has followed the constructivism approach of qualitative research to highlight women's role in ensuring a sustainable local food system and security through homestead gardening. Social constructivists believe it is crucial to investigate people's lives, work, and experiences to understand the world. This type of research aims to rely as much as possible on the participant's view of the situation studied (Creswell and Creswell, 2017). Similarly, in this study, participants' views, experiences, and work have been analysed following qualitative research using primary and secondary data.

### 3.2 Selection of the Study Area

This study was conducted in Baneshardi village of Nagarkanda thana in the Faridpur district in Bangladesh. The study area was selected purposively considering the agricultural and hard-to-reach areas, the researcher's convenience, and the study's objectives. My sister is a high school teacher in this village, and when I visited her there, I found this area underdeveloped and hard to reach the area with transportation problems and a lack of market access. Besides, most of the land of this village is used for agricultural purposes. It is challenging to arrange participants in an unknown area from abroad where I have no network. As my sister is a teacher at a school in this area, it was convenient to select the participants based on the study criteria. Hence, based on the context of my study and the above criteria, I have selected Baneshardi village as my study area.

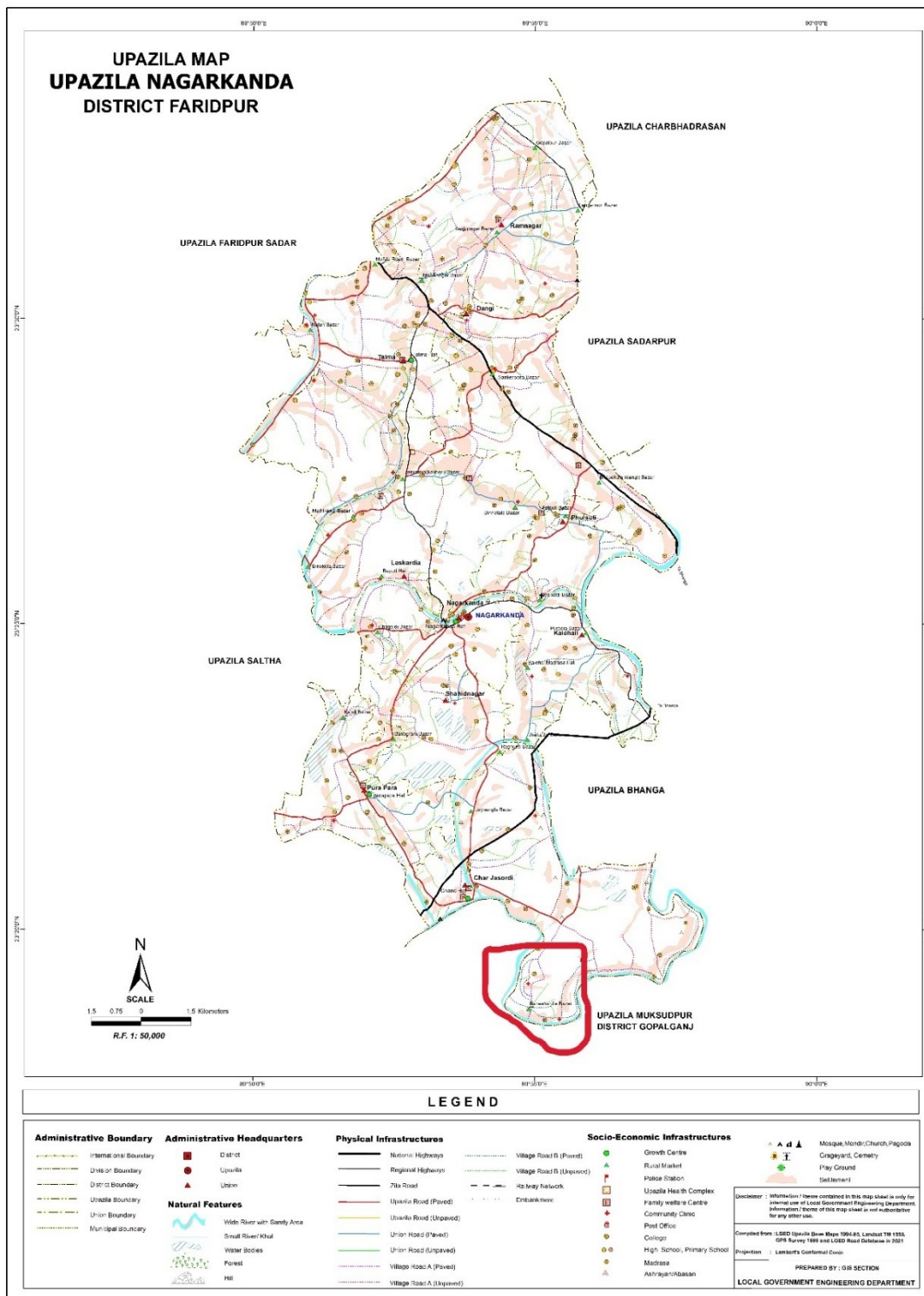


Figure 1: Map of the study area (Source: Local Government Engineering Department)

### 3.3 Selection of the Respondents

To conduct this study, I have followed the purposive sampling method in which the researcher relies on his/her judgment to choose the participants relevant to the study (Sarantakos, 2005). To select participants for in-depth interviews, I have followed two criteria: 1) Participants must have a homestead garden (Either vegetables or domestic animals or both); 2) Participants must have been doing homestead gardening for at least two years. I have maintained these criteria because I wanted real-life work, women’s experiences, and the benefits of the homestead garden over the years.

Besides, two Key Informant Interviews (KII) with a government representative (Agricultural Extension Officer) and a Civil Society Organization representative (Representative of BRAC International) to obtain their perspective on this issue, their homestead gardening project, and the role they can play in improving women’s situation.

### 3.4 Profile of the Respondents

In this study, a total of 12 in-depth interviews were obtained with a female homestead gardener and two Key Informant Interviews (KII) were conducted with a government representative (Agricultural Extension Officer) and a Civil Society Organization representative (Representative of BRAC International). The profile of the respondents of in-depth interviews is following:

<b>In-depth Interview</b>	<b>Age</b>	<b>Education al Background</b>	<b>Occupation</b>	<b>Household</b>	<b>Occupati on of husband</b>	<b>Number of children</b>
<b>Participant 1</b>	42	6 <sup>th</sup> grade	Housewife	Nuclear	Farmer	Two daughters and one son
<b>Participant 2</b>	34	5 <sup>th</sup> grade	Housewife	Nuclear	Private Job holder	One daughter and one son
<b>Participant 3</b>	23	SSC	Housewife	Nuclear	Private Job holder	One son

<b>Participant 4</b>	20	8 <sup>th</sup> grade	Housewife	Joint family	Farmer	One son
<b>Participant 5</b>	40	Illiterate	Housewife	Nuclear	Farmer	Two daughters and two sons
<b>Participant 6</b>	27	SSC	Housewife	Nuclear	Farmer	Two daughters
<b>Participant 7</b>	30	8 <sup>th</sup> grade	Housewife	Nuclear	Imam of the Mosque	Two daughters and one son
<b>Participant 8</b>	45	Illiterate	Housewife and farmer	Nuclear	Farmer	Three daughters and three sons
<b>Participant 9</b>	29	SSC	Housewife	Nuclear	Private job holder	Two sons
<b>Participant 10</b>	32	5 <sup>th</sup> grade	Housewife	Nuclear	Business	One daughter and one son
<b>Participant 11</b>	45	6 <sup>th</sup> grade	Housewife	Nuclear	Farmer	Three daughters and one son
<b>Participant 12</b>	35	6 <sup>th</sup> grade	Housewife	Nuclear	Farmer and day labourer	No children

*Table 2: Profile of the participants*

<b>In-depth Interview</b>	<b>Quantity of land for homestead garden (hectare)</b>	<b>Owner of land</b>	<b>Origin of land</b>	<b>Type of land</b>
<b>Participant 1</b>	0.013392 (2 Katha)	Husband	In-laws	Homestead
<b>Participant 2</b>	0.013392 (2 Katha)	Husband	In-laws	Homestead
<b>Participant 3</b>	0.013392 (2 Katha)	Husband	In-laws	Homestead

<b>Participant 4</b>	0.03348 (5 Katha)	Husband	In-laws	Homestead
<b>Participant 5</b>	0.020088 (3 Katha)	Husband	In-laws	Homestead
<b>Participant 6</b>	0.020088 (3 Katha)	Husband	In-laws	Homestead
<b>Participant 7</b>	0.03348 (5 Katha)	Husband	In-laws	Homestead
<b>Participant 8</b>	0.013392 (2 Katha)	Husband	In-laws	Homestead
<b>Participant 9</b>	0.03348 (5 Katha)	Husband	In-laws	Homestead
<b>Participant 10</b>	0.020088 (3 Katha)	Husband	In-laws	Homestead
<b>Participant 11</b>	0.06696 (10 Katha)	Husband	In-laws	Homestead
<b>Participant 12</b>	0.006696 (1 Katha)	Husband	In-laws	Homestead

Table 3: Land ownership

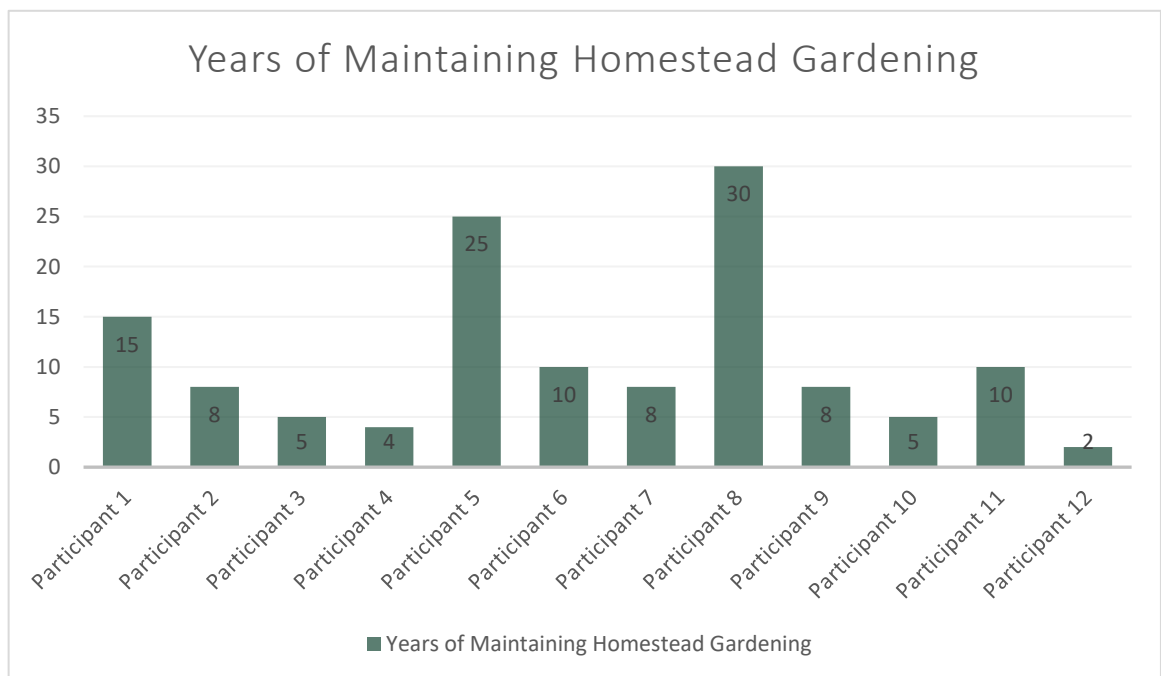


Figure 2: Years of maintaining homestead gardening.

### 3.5 Data Collection Process in Detail

Both primary and secondary sources have been conducted to collect the data and information for this study. For secondary sources, I have taken the help of the SLU library on campus and online, google scholar, and other Google websites. I have selected peer-reviewed articles, research papers, books, reports, policies, workshop papers, and conference papers, especially field data-based studies, and some are also literature review-based research work for background information and findings based on the relevant context.

To review the questionnaire for the interview, I conducted a pilot study with 4 participants. This strategy helped me to revise the questionnaire and restructure the objectives and theory of the study, accessibility of the respondents online, and technique of data collection to generate enough information from the field.

As the primary source of the data collection process, I have followed in-depth and Key Informants Interview (KII) methods. The in-depth interviews with participants helped to understand the whole picture of women's role in ensuring the food system and security and the present situation in that area. Besides, KII revealed the work of NGOs and the government in the areas of women's empowerment through homestead gardening projects. Furthermore, to better understand the policies in Bangladesh, I reviewed policies to explore the government initiatives to promote homestead gardening.

To reach the respondents, my elder sister, a high school teacher, and another sister living in that village helped me communicate with them. As I conducted the interview through an online platform like Signal App and WhatsApp for a video conference with the participants, my sisters were there to arrange the devices to communicate with the participants. At first, based on the study criteria, my sisters helped me to select the participants in which her profession as a teacher and being local were an advantage to reach the participants. As I interviewed during crop seasons (March-April) and Ramadan month, all participants were busy managing crops and religious activities. Besides, there was a time distance between Sweden and Bangladesh, so before taking the interview, I asked them their convenient time,



and based on their schedule, I conducted the interview. Two KII respondents are involved in the employment sector, so I made an appointment one week ago to take their interview via Zoom. I interviewed all the participants personally via video calls on online platforms. Each in-depth interview was conducted for 30-35 minutes, and each KII was conducted for 40-45 minutes. My sister visited the participant's household with devices, and I conducted the interviews through video call. It took around six weeks to complete the interview session.

To conduct the interview, first, I introduced myself and my thesis objectives. I have taken verbal permission to record the interview and use their information for research purposes. They permitted me to keep their real name in the study and record the interviews. However, I did not use their real name in the paper. I recorded all interviews and then transcribed them in a document in the English language as I conducted the interviews in the Bengali language (Local language). I have written my findings and analysed and collected data to keep on track.

### 3.6 Ethical Consideration

To conduct this study, I have maintained ethical issues. I have personally conducted this study and have not plagiarised. The participants had all the information and willingly participated in this study. I took their permission verbally to take the interview and record interviews. Respondent's right to confidentiality and privacy was ensured so they could voluntarily participate in an interview. I did not take any steps which could make the participants uncomfortable. Besides, even though they permitted to keep their real name, I did not mention or reveal their identity.

### 3.7 Limitations of the Study

This study had some limitations, including which financial and VISA issues are one of them. To conduct a study, financial support is essential, and as a student, I do not have the financial capability to conduct the study on a large scale. The travel cost for two from Sweden to Bangladesh and Bangladesh to Sweden is quite expensive. So, with getting funds, it is easier to travel to collect data. I had to conduct the interviews using an online platform. Due to covid-19 pandemic, we have been introduced to online platforms for research and work, which make it convenient

even to stay far away. Even though I could not conduct the interviews in person in Bangladesh, I ran the interviews personally through video calls. Furthermore, having my sister as a contact person can also be a limitation. It could have influenced the study participants not to reveal sensitive family conflicts or property issues. Then I reached the conclusions of the thesis based on the in-depth interview with 12 participants and 2 key informants' interviews, which may not be the whole picture and universal situation all over Bangladesh. So, it is significant to do more research in this area to get a complete picture of the potentiality of the homestead garden and women's contribution to sustainable food systems and security. Furthermore, to be more precise, in this study, I have only investigated the women's understanding of their roles in the food system and security and how their activities in homestead gardening have the potential to ensure a sustainable local food system and security. So, the research area surrounded women's voices concerning homestead gardening. Besides, in this paper, I am not investigating the relationships and hierarchies between various food systems, instead, I have focused on homestead gardening as an alternative agricultural practice.

When I looked into the influences of my social role and my sister's role as a teacher in the discussion and gained data, I felt that it helped a lot to be comfortable discussing the homestead gardening issues. As I did not discuss sensitive issues like violence against women, I did not feel they would say different things to other researchers, as homestead gardening is a visible activity they are doing.

### 3.8 Analysis of data

I analysed the collected data following an inductive approach that allows research findings to emerge from the systematic, dominant, or significant themes inherent in raw data without the restraints imposed by structured methodologies (Thomas, 2006). After collecting the data, I transcribed the text into a summary format. I read the transcripts several times to identify themes and categories. The themes and categories were developed based on the collected data. The repeated reading of transcripts helped to fit the context within developed categories. Then I connected the data with the research objectives to ensure a transparent link. The generated categories and themes helped to look for news theories and concepts to connect with collected data and look for the key and new findings from the study.

## 4. Empirical Findings

### 4.1 Types of homestead gardening products

The interviews with participants reveal that women actively participate in the homestead garden and contribute to fulfilling the family's nutrition through homestead gardening products. They are involved in producing local organic vegetables and rearing domestic animals by which they are keeping the biodiversity of the products. Different types of homestead products have been found in the interviews. Following is the list of these products:

<b>Vegetables</b>	<b>Spinach (<i>Palong Shak</i>)</b>
	Red Spinach ( <i>Lal shak</i> )
	Malabar Spinach ( <i>Puishak</i> )
	Red Amaranth ( <i>Data shak</i> )
	Radish ( <i>Mula</i> )
	Tomato
	Turnip ( <i>Salgom</i> )
	Green Chilli ( <i>Kacha Morich</i> )
	Bombai chilli ( <i>Bombai morich</i> )
	Bottle gourd ( <i>Lau</i> )
	Green flat beans ( <i>Shim</i> )
	Papaya ( <i>Pepe</i> )
	Sponge gourd ( <i>Dhundel</i> )
	Snake gourd ( <i>Chichinga</i> )
	Pumkin ( <i>Misti kumra</i> )
	Coriander Leaf
	Onion ( <i>Peyaj</i> )
	Capsicum
	Spearmint ( <i>Pudina pata</i> )
	Aubergine ( <i>Begun</i> )
Green Banana ( <i>Kacha kola</i> )	
Cucumber ( <i>Shosha</i> )	
<b>Domestic Animals</b>	Cow
	Goat
	Chicken
	Duck
	Pigeon

Table 4: Types of homestead garden products produced by women.

From the homestead garden's products mentioned above, it is noticeable that all year round, women produce several types of products which fulfil their family needs. So, they have at least a few vegetables each season, indicating the potentiality of sustainability of the food system and security.

## 4.2 Local Food System

The food system in the selected rural area differs from integrating the cash-crop system<sup>6</sup>. Women in rural areas fulfil most household needs from their homestead garden, indicating an alternative local food system. Based on the interviews, there are different forms of the rural food system have been found in the researched area:

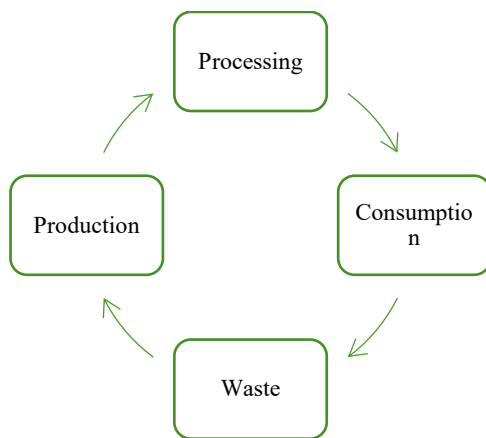


Figure 3: Alternative Food System in Rural Area – 1

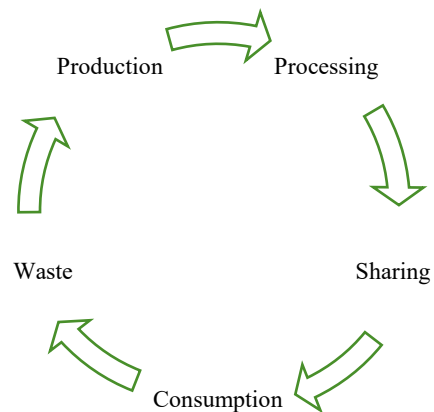


Figure 4: Alternative Food System in Rural Area – 2

Figure 3 illustrates the alternative food system in rural areas, practised widely, which does not include marketing and transportation to reach the consumer and then the food waste return to the production stage again. All participants from the in-depth interview reveal that their priority in managing homestead gardening is for their own consumption. So, the food system is narrowed with production in the household, later processing in the household, and consumed by the family members at the end. This is how the food system in the local household circle around production to own consumption where marketing is not necessary at all. Furthermore, figure 4 reveals another food system in rural areas where, after production and processing, the producer exchanges the products with relatives and

<sup>6</sup> The food system which as a set of process circled agricultural production, processing, distribution, retail and waste.

neighbours, which the consumer later consumes and then the food waste return to the production stage again. Similarly, there are no market and transport interventions in this food system. Participant 8 reveals that:

*“When I produce more vegetables, I share them with my neighbours. There are not any facilities to preserve the vegetables for later consumption. We don’t have a freeze, so we cannot preserve them in the freeze (Participant 8)”*.

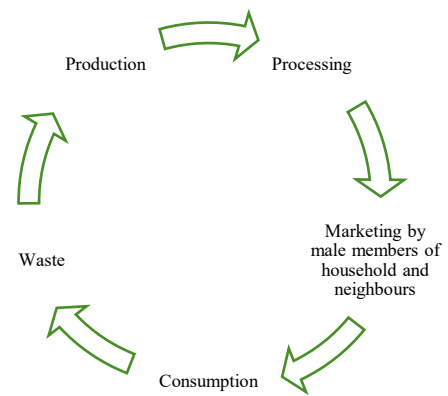
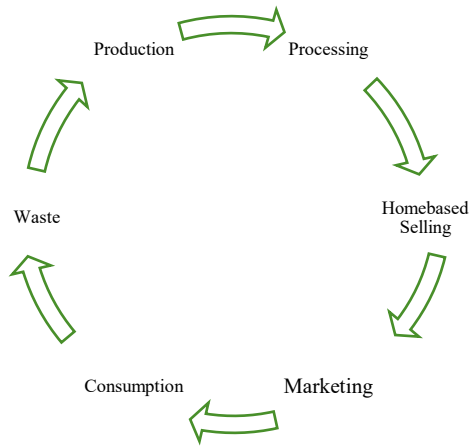


Figure 5: Alternative Food System in Rural Area – 3      Figure 6: Alternative Food System in Rural Area – 4

Figure 5 depicts the food system in a rural area where, after production and processing, buyers (local male vendors) come to the household to buy the products knowing that someone has products to sell. As homestead products are of good quality, local vendors are willing to purchase those products at reasonable prices due to the high demand for local products in the market. Later, the products reach the market and consumers and then the food waste return to the production stage.

As participants stated that:

*“People come from the market to buy the chicken and eggs. The buyer comes to the house by knowing from others that someone is willing to sell their products (Participant 8)”*.

*“People come home to buy the eggs. I don’t sell them in the market (Participant 11)”*.

Figure 6 reveals that after the production and processing of the products produced from homestead gardening, they reach the market with the help of the male family members (husband and son), and, sometimes, women take help from their

neighbours to sell their products in the market. Later it reaches to the consumer, and then the food waste return to the production stage again. One participant stated:

*“My husband takes it sometimes, and I also take help from other neighbours to sell the products (Participant 10)”*.

It is interesting to find out that in rural areas, women maintain their own local food system and meet the family’s needs through homestead gardening. Another issue is a lack of utilisation of transportation in this local food system, which reduces the food mile and greenhouse gas emissions. The quality of the homestead garden products differs from the large-scale agricultural production, which is produced in single care of women in their homestead. For this reason, it is noticed that there are variations in prices between homestead products and other large-scale agricultural products. While it is interesting to find out that there is a lack of market intervention to determine the price of homestead products, unlike large-scale production.

### 4.3 Women’s Role in Local Food System and Security

#### 4.3.1 Production for Household Use

Women have contributed to the local food system and security by homestead gardens for a long time in rural Bangladesh. They provide nutritious and fresh organic vegetable and animal protein for the family from their homestead garden. According to Participant 1, she produces the vegetables for the availability and access to fresh and chemical-free food based on the family’s needs.

*“I can collect vegetables whenever I want from my garden. If we have nothing to cook, going to the market and buying vegetables instantly isn’t easy. But as I have them in my homestead, I can pick them up anytime. I produce all of these, so they are fresh and chemical free (Participant 1)”*.

Similarly, participants 9 and 12 revealed that homestead gardening is significant for their family as the products are chemical and fertiliser free, which is good for children’s health. Besides, it also saves money to buy food from the market. As stated by Participant 12:

*“It is significant for my family. These products are not produced using chemicals and fertiliser. So, they are fresh, which is also good for my*

*children. I can also save money from buying vegetables from the market (Participant 12)”*.

While participant 11 also stated that she rears domestic animals to provide nutritious food to the family.

*“I rear domestic animals for my own consumption and family nutritious (Participant 11)”*.

On the other side, participant 8 stated that due to the high price of the eggs and chicken, her family could not afford to buy them from the market, which drove her to produce in the home garden, which can provide animal protein and financial benefits. Some households also maintain homestead gardens to meet family needs due to poverty. According to Participant 8,

*“We are poor. We cannot always buy all these things. So, if I can grow them, then we will be able to eat them (Participant 8)”*.

It is found that women’s priority for having homestead gardening is for household consumption concerning chemical and fertiliser-free fresh and nutritious food, availability, meeting the animal protein requirements and saving money.

#### 4.3.2 Production for Sale

Women earn extra money by selling the products from their homesteads. The money from the homestead products is also spent on the household’s welfare. According to Participant 10, the reason behind starting a household garden is to meet the family and children’s needs. She also stated that as she is not now involved in any paid job, her home garden is the only source of her income to fulfil her and her children’s needs.

*“I started it to fulfil the family’s and my children’s needs. And I am not working (Paid job), so I am farming and earning money from selling the products. I can spend the money earned from these for my children and myself (Participant 10)”*.

While Participants 10 and 11 revealed that animals are their safety deposit which they can use during an emergency. Even though, in a general sense, it does not seem like cash, it is an asset a family can turn into cash whenever they need cash.

*“Homestead gardening is significant for my family. For example, if we need money, we can sell a cow and manage the money during an emergency (Participant 10)”.*

*“When we need money, we can sell the animals and meet emergency needs (Participant 11)”.*

### 4.3.3 Knowledge of farming

The in-depth interview with homestead gardeners reveals that they do not have any formal education or training in homestead gardening; instead, they learned farming by watching and working with their mothers. Still, they asked their mother’s help to know which plants should be produced in which season and how they could grow vegetables in the garden. Participant 9 stated that:

*“I learned this farming from my mother. I have watched my mother have a homestead garden. I also helped my mother at that time. I did not know which type of vegetables should be planted in which seasons. I learned it from her and still ask her when I should plant which vegetables (Participant 9)”.*

This section reveals that traditional knowledge of production passes to generations through mothers. Even though they did not have formal education in agriculture, they learned knowledge by watching and doing is playing a significant role in agriculture through homestead gardens.

### 4.3.4 Production System and Process

To do homestead gardens, women spend a long time doing all kinds of activities for producing vegetables and rearing domestic animals. From soil preparation to seed preservation, women do everything. The interviews explore that women do heavy tasks like making fences, lofts, and trellis<sup>7</sup> for vegetables. Participants 2 and 9 stated that:

*“I make the fence, loft and trellis for the vegetables (Participant 2)”.*

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<sup>7</sup> A framework of light wooden or metal bars, chiefly used to support fruit trees or climbing plants.



*“After planting the seeds, I use jute chalk to keep the plants stand, then use a bamboo stick to make the fence, and net trellis (Participant 9)”*.

While participant 7 stated that along with making fences, lofts, and trellis, she also takes cows in the field and bathes them in the river, which is considered a heavy task.

*“I make the fence, loft, and trellis for the vegetables. Besides, I take the cows in the field and bath them in the river and sometimes in the yard with pump water (Participant 7)”*.

It is interesting to find out that in the homestead garden, all interviewees stated that they do not use chemical fertiliser. Instead, they focus on ecological production, using manure, chicken droppings and food waste to produce vegetables. As they want fresh foods, so they do not like chemical fertiliser. They consider chemical fertiliser used products unsuitable for health. Participant 10 stated as:

*I use manure-mixed soil and water them to plant the vegetables. Whenever you produce vegetables, it needs so much care. You need to build the loft when the plants grow. Water them regularly. I don't use any chemicals and fertiliser as the production will not be well. We want fresh and pure foods (Participant 10).*

Three different systems of seed management were found in the in-depth interviews. They are 1) Seeds preservation, 2) Buying from the market, and 3) Sharing with neighbours. All participants stated that they preserve the seeds from their production for next year to produce, and sometimes they also buy seeds and plants from the market and share the preserved seeds with their neighbours. They also grow local vegetables instead of hybrid, indicating the preservation of the biodiversity of the products. Participants 8 and 9 stated:

*“Sometimes I bought seeds from the market, also from neighbours, and I also preserve the seeds from a previous production (Participant 8)”*.

*“I preserve the seeds from the previous production to plants next season. Dry in the sun and then preserve it in a box (Participant 9)”*.

As Bangladesh is a monsoon country, there are different types of vegetables and fruits all year round, so women are busy working in the homestead garden all year. Besides, the plants need watering twice daily if it does not rain. Participant 9 stated:

*“We have different types of vegetables all the year, so all over the year, we have some work to do. When it rains, there is not any need to water the plants. If you water more than enough, the plants may die (Participant 9)”.*

Besides, participant 10 revealed that she spends half the day working on the homestead daily and thinks no one can get a holiday if they have a homestead garden.

*“I spend half of the time doing all these activities for homestead gardening. There are not any holidays if someone works on planting vegetables and rearing domestic animals (Participant 10)”.*

The exception has also been found from one in-depth interview that the reason behind homestead gardening is to pass the time productively instead of gossiping with neighbours. Participant 11 stated that:

*“I can pass my time doing all these activities. That’s why I have started rearing domestic animals and homestead gardening. If I do these activities, I don’t have to go anywhere and hang out with people (Participant 11)”.*

#### 4.3.5 Household activities

It has been found from the in-depth interviews that all participants spend long hours doing household activities besides homestead gardening, including cooking, taking care of children, cleaning, washing, and maintaining the household. All participants stated that they do not have any holidays as they are housewives. Conversely, husbands get holidays as they do not have to do household chores. Participant 8 thinks that if someone maintains a family, they cannot get a holiday as they have to do everything in the household.

*“I spend all day doing household activities. It takes an entire day. I am not working that I will get a holiday on Friday (Weekend). I am maintaining my family. So, I am doing everything (Participant 8)”.*

While participant 9 stated that a housewife and mothers have to work in their sleep also as they have to take care of their children. Participant 9 said that:

*“All day goes by doing household chores. During the afternoon, I get some time to rest. Domestic life is tough. A housewife doesn’t have any holiday. Even you have to work at night during sleep. Maybe one of the sons is sweating during summer, and during winter, maybe they are throwing the blanket (Participant 9)”.*

There are no changes in daily work for a housewife, so they think they cannot have a holiday. They have to cook food every day and also have to take care of their children. Participant 12 stated that:

*“All day, there is some work to do all day. I am taking care of my children and family members. How can we have a holiday? We have to work every day. Every day I have to cook and prepare my children for school except holidays. I have to feed my little children also (Participant 12).”*

#### 4.4 Challenges Constraining Women’s Contribution to Assure the Local Food System and Security

##### 4.4.1 Women as Farmer Identity

Even though women play a significant role in ensuring the supply of fresh and nutritious food through their homestead garden products, due to their gender identity, their contribution to agriculture, especially the local food system and security, remains on the dark side. When the participants were asked whether they consider themselves a farmer, the response revealed the gender division of labour and societal identity. Participant 7 thinks that she cannot be a farmer as she is female, and stated that if she were a male, then she would think herself a farmer. As Participant 7 said:

*“I am not a farmer. If I were a man, I would have been a farmer, but I am a woman, so I cannot be a farmer. I do all the tasks in the homestead and don’t do them in the field. I think I am doing agricultural work, but in our society, people don’t consider this work as agricultural work (Participant 7)”.*

The exception has also been found from the in-depth interview that one participant identified herself as a farmer, stating that she is doing the same thing as her husband.

So, it makes her a farmer if the same task makes her husband a farmer. Participant 8 stated that:

*“Yes, I think of myself as a farmer. I am doing farming activities like my husband, so I think I am a farmer (Participant 8)”*.

Another participant thinks homestead gardening is work besides household work which is her income source. Participant 11 said:

*“I don’t consider it as household work; instead, I think that I am doing something besides my household work. It’s a source of my income (Participant 11)”*.

On the other side, other participants considered homestead gardening as household work for women, who do it willingly to support the family. The participants could not separate homestead gardening from household work. They identified homestead gardening work as women’s responsibility as they grew up learning all the family.

*“I don’t consider myself a farmer. As a housewife, you must do everything, along with farming. Housewife means everything. I consider it household work, helping the family financially, and providing healthy and pure foods (Participant 9)”*.

Participant 7 thinks that as she knows to do everything in the household and homestead gardening, that is why her husband left all responsibilities on her shoulder. She said that:

*“As I know how to do all the tasks, he left everything on me. So, I am doing all the tasks (Participant 7)”*.

Interesting findings were also found from Participant 10, who thinks that if someone has paid job for the same task, then that paid task can be considered separate work from household activities. However, as she is not working for money, the same job cannot be separated from the household. She stated that:

*“I do the work as my household activities. It would have work (paid work) if I had done that for someone else. But it works for my family, so there is not any problem. Even nobody can tell me why you are doing that. As it is my household work, I don’t think I am a farmer (Participant 10)”*.

Women also help their husbands in their fieldwork for larger agricultural production, staying in the house, which is also considered household work for women. As participant 1 said that she waters the plants meant to be produced in the field land and processes all agricultural products from the field land staying in the house as she thinks that the work in the field land is for men. She stated that:

*“I don’t go to the field land. My husband does the fieldwork far from home. I help my husband doing the task of watering plants and processing crops. The work in the field land is for men (Participant 1)”*.

#### 4.4.2 Access to Market

Furthermore, women cannot go to the market to sell the products; instead, they contact the buyers (local vendors) who come to the house and buy their products. Sometimes, buyers (local vendors) look for houses to buy household products. The findings show that women need market access. Due to women’s gender identity, women are expected to avoid the market to sell products, instead, husbands are expected to go to the market to sell the product. Participant 1 said:

*“I am a woman. I cannot go to the market to sell my products. If I have to sell anything, my husband goes to the market to sell the products (Participant 1)”*.

As women do not go to the market, local male vendors visit their houses in rural areas to buy household products, which is another form of marketing. Participant 8 said that:

*“People come from the market to buy the chicken and eggs. The buyer (local vendors) comes to the house by knowing from others that someone is willing to sell their products (Participant 8)”*.

While it is also found that some women also do not like to go to the market, instead, their male family members do things for them. As Participant 10 stated:

*“I don’t go to the market (laughing). I don’t like the market. I don’t go to the market to buy things also. I have people, so I don’t need to go to the market. My son and husband buy things for me. I only sell things from my home (Participant 10)”*.

The market access situation is different for all women. The individual woman has their own reason for not going to the market to sell products. Participant 12 said that even though she can produce more products, she cannot sell them because she needs someone to go to the market as her husband works in the city. Besides, as she lives in her in-laws' village, she fears society would not like a woman to go to the market to sell products. She stated that:

*“Even though I produce more than I can sell, I don't have anyone who can take my products to the market to sell. I am living in my in-law's village, so if I go to the market to sell anything, then people will say something bad and will not take it in a good way, and my in-law's honour will be gone (Participant 12)”.*

#### 4.4.3 Financial Decision-Making Power

Three different situations were found from the in-depth interviews about the financial decisions of earned money from homestead garden's products. 1) Spend the money for herself, 2) Give the money to the husband, and 3) Joint decision of husband and wife to spend money. Even though women can decide to spend their own earned money, both husband and wife sometimes choose between spending the money together; however, it has been found that the earning from homestead gardening is mainly spent on family members and household emergencies. As participant 7 said that even though she can spend the earned money as she wishes, but still gives the money to her husband to buy the things she wants. She stated that:

*“I can spend the money as I want, but I don't need them. So, I give the money to my husband. I tell my husband to do what he can do with the money (Participant 7)”.*

In case of a joint decision by husband and wife, the money generally spends for the family's welfare, and the husband also asks for permission to spend the money in any specific areas. Participant 6 stated that:

*“Both of us decide to spend the money based on the family's needs. If he wants to spend the money, he asked me what he wants to do with the money and if he can spend that money or not (Participant 6)”.*

Women could also spend their earned money for themselves, or as they wish nonetheless, they spend the money on children and grandchildren to support their husband financially. Participant 8 stated that:

*I can spend this money as I wish. If I need to buy clothes, I do it. My husband cannot always provide everything my children want, and my children don't ask him. So, I try to give them what they want. If we want to make any family decision, we do it together (Participant 8)".*

Besides, participant 11 said that as her husband fulfils all her needs and wishes, so does not need the money earned from homestead garden products; instead, she gives it to her husband.

*"I don't keep the money to myself as my husband gives me everything I want whenever I need that (Participant 11)."*

While participant 10 thinks that if someone maintains a family, then they cannot spend money for themselves; only even she can spend money herself. So, she gives all her earned money to her husband and decides to spend the money on the family's welfare. She stated that:

*"I don't use the money for myself. I gave the money to the family. I can also spend the money as I wish and buy things for myself. If you are maintaining a family, you cannot do things for yourself; instead, you have to do things for the other family members. Besides, we take decisions together about everything in the family, so I gave all my money to my husband so I can spend the money as I want (Participant 10)".*

## 4.5 Initiatives by Government, and NGOs

### 4.5.1 Government Initiatives

The KII, with local agricultural extension officers in Bangladesh (government representatives), revealed that the government of Bangladesh has already taken a move through the development of the HFP (Household Food Programme) model, which is called Pusti Bagans (Nutrition Garden)<sup>8</sup>. The KII, with an Agricultural

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<sup>8</sup> The project's target is to set up 5 lakh 'Pushti Bgan' in three years through this project from 2021. Under the project, vegetables, fruits and spices are targeted to cultivate in 100 unused lands of each union and municipality. The aim is to meet the family's nutritional needs and increase the target population's income.

Extension Officer, stated that as per the policy of the Bangladesh Government, in hard-to-reach and climate-vulnerable areas, they have introduced a Nutrition Garden project among women to reduce ultra poverty since 2021. The project includes orientation, training, supply of seeds and knowledge about homestead gardening. The interview also revealed that the reason behind this project was the proper utilisation of all fallow land and meeting the nutrition needs of underprivileged families. However, it was found that they emphasised climate resilience seeds instead of local seeds, as most of the targeted areas are vulnerable to climate change. KII interviewee stated:

*“Our project aims to ensure the proper use of all fallow land and meet the food nutrition. Depending on the targeted area’s climate, we provide seeds which can be climate resilient. We are not concentrating on local seeds as they cannot survive due to constant climate change. The provided seeds are genetically modified, developed in our government research centre (KII)”.*

Regarding the project’s outcome, the government representative stated that even though they started just a few years ago, the outcome is quite visible as now women are producing different vegetables in their homestead and rearing domestic animals, which provide them food. Furthermore, they are earning money by selling to their neighbours. Besides, regarding their work to identify women as farmers, the KII interviewee stated that women do not identify themselves as farmer yet due to societal gender norms in rural Bangladesh. Furthermore, in the question of women’s access to the market, the government representative stated that still, in rural areas, women do not have enough access to the market due to societal norms, which is another obstacle. There needs to be initiatives to increase access to the market in rural areas.

However, I still need field data from their projects area, so it is hard to determine whether government projects positively affect women’s livelihoods. Nevertheless, based on the statement of the government representative, there is potential for positive impacts of homestead gardening projects on rural women’s livelihoods.



#### 4.5.2 Non-government Initiatives

NGOs in Bangladesh are also working to ensure nutrition access and availability and develop women's economic empowerment through homestead gardens among underprivileged families in rural Bangladesh, targeting women. KII, with a representative of BRAC international NGO working on homestead gardening projects in different areas in Bangladesh, reveals that they have been working to develop nutrition and women's empowerment through IDP,<sup>9</sup> focusing on homestead gardening since 2013. They provide assets, technical support, hands-on training, seeds, and orientation to women members of the family to maintain a homestead garden that can ensure nutritious food for the family and create extra income opportunities to reduce ultra-poverty. Regarding conserving biodiversity and local plants, it is found that they have a seeds production and research centre from where they get the seeds and provide the targeted population. KII Interviewee stated:

*“We have a seed production and research centre where we submit the requirement of seeds, and based on the needs and climate of the targeted population, the researcher provides us with the seeds. So, it can be genetically modified and can be organic. I am not fully sure about this as we did not think this way (KII)”.*

Regarding outcomes, the representative stated that the changes are visible in their homestead and lifestyles. Women in the projected area now increased the production of land by rent and the number of domestic animals from the profit of selling the products. Buyers (local vendors) visit their houses to buy the homestead garden products at the market price. KII interviewee also stated that women are now spending money for the education of their children, which was not possible before the project interventions. Furthermore, regarding identifying the women as farmers, the representative stated that their focus is nutrition and economic empowerment.

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<sup>9</sup> The IDP concerning homestead gardening has been implemented in hard-to-reach regions such as haors (wetlands), chars (riverine islands) and plain land indigenous people, where entire communities often lack access to essential services and economic opportunities. The aim is to improve the socio-economic conditions and livelihoods of 1.1 million people from indigenous communities and people living in poverty and ultra-poverty from hard-to-reach areas such as haor areas and Char (riverine island) regions. As targeted, till now, 70% of the population was covered under the project. 96% of participants graduated from ultra-poverty, and around 52% of households have improved economic conditions.

They identified these needs based on the study of the specific areas, so they did not consider recognising women's identity as a farmer. In the question of how they perceive women's economic empowerment, the interviewee said that in the project, economic empowerment refers to having income opportunities and decision-making power of their earned money for themselves and their family, increasing their self-confidence.

Besides, regarding women's access to the market, the representative of the civil society organisation responded that there needs to be changed around women's access to the market linkage in rural areas and policy implementation to include women in the market value chain.

Similar situation in NGO projects as I still need field data from their projects area to determine whether the projects positively affect women's livelihoods. Nevertheless, based on the statement of the NGOs representative, there is potential for positive impacts of homestead gardening projects on rural women's livelihoods.

## 5. Discussion

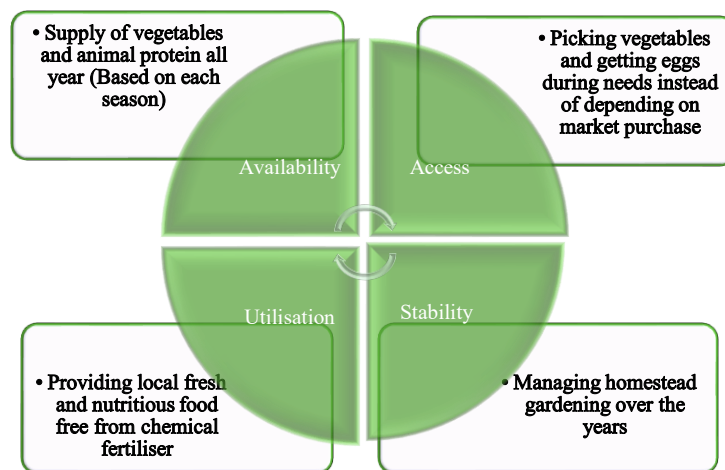
The discussion of the findings explores the women's contribution to sustainable food and security by meeting four pillars of sustainable food security, maintaining alternative local food systems, and playing diverse roles. However, in their journey, they also face several challenges that need to be addressed. In that case, government and non-government initiatives and policies can also play a significant role.

### 5.1 Meeting Four Pillars of Sustainable Food Security

Regarding availability and access (section 1.2.1) to food, the study's empirical findings reveal that rural women in a tropical country like Bangladesh produce different types of vegetables all year round and rear domestic animals in their homestead. Women can pick vegetables or eggs from their own production whenever they need something to cook instead of depending on purchasing from the market. So, there is a physical supply of animal products and vegetables all year round. Similarly, Paris et al. (2004), in their study in rural Bangladesh, explored that women produce different seasonal vegetables like beans, bottle gourd, sweet pumpkins, etc., in adjoining land of the house. Cultivation of other vegetables like red spinach, spinach, spring beans, eggplant, and cucumber on the homestead land is a significant expenditure-saving activity that allows rural households consumption of vegetables throughout the year (Paris et al., 2004).

In the case of utilisation, the data shows that women provide fresh and nutritious food to their families by producing local plants and chemical-free products in their homestead garden over the years. The empirical findings also show that the principal reason for managing homestead gardening is meeting the family's needs by providing fresh and nutritious food. Besides, according to the participants, the harvested vegetable and animal protein from their homestead is also good for their children's health. Furthermore, many households cannot afford animal products from the market due to poverty. In that situation, homestead products meet the animal protein and save money to buy from the market. Homestead gardening is also a source of income for rural women. By selling vegetables, eggs and domestic animals, women also earn money they and their husbands spend to meet the family

and children's needs. Furthermore, domestic animals are considered safety deposits which they sell during an emergency. Even though they can spend their money on themselves, they choose to spend it on their children and fulfil their household needs, indicating access to market products with increasing income. In the case of stability, there is a noticeable constant flow of income, sources, and assets to meet family needs from homestead products. So, there is a resiliency in the availability, access and utilisation of food which indicates the stability of food. In this way, homestead gardening in the study area try to meet sustainable local food security by fulfilling the four pillars of SFS. Following is the depiction of the potentiality of meeting the four pillars of sustainable food security through homestead gardening based on in-depth interviews with participants.



*Figure 7: Meeting four pillars of sustainable food security through HG*

Hence, from the above discussion, it is evident that through homestead gardening, there is huge potential for women to meet the four pillars (Availability, access, utilisation, and stability) of sustainable food security; however, there needs to be more recognition of their contribution to society.

## 5.2 Maintaining the Local Food System

The study also identified various alternative local food systems surrounding homestead gardening. The first practised alternative food system (Figure 3) circled production, processing, consumption, and waste, indicating a simple linear process. Suppose we try to look at this system in the light of Polányi's principle of

householding. In that case, homestead gardening satisfies the family's needs, where household consumption is the primary production purpose. The study's findings also revealed that the reason behind homestead gardening is to provide the family with fresh and nutritious food. Through homestead gardening, women are the one who meets the needs of the household, even if their contribution is not measured in monetary value. Then the second alternative food system (Figure 4) bounded production, processing, sharing with neighbours and relatives, consumption, and waste. We can analyse this system with Polányi's principle of reciprocity. It is found from the interviews that women share their homestead gardening products with their neighbours and relatives without the exchange of monetary value, and the market is absent. This practice is common in rural Bangladesh, where the exchange of homestead products does not create a relationship; instead, this is part of their behaviour. This reciprocal exchange with relatives and neighbours which does not have any price mechanism, supports a sustainable food system at the local and household levels.

Further, the third alternative food system (Figure 5) revolved around production, processing, home-based selling, marketing, consumption, and waste. In this process, local vendors visit the producer's house to buy the products. In addition, the fourth alternative food system (Figure 6) surrounded production, processing, marketing by male family members and neighbours, consumption, and waste. Both systems have a market entrance where products have economic value even though homestead products are not commercialised. However, in the case of the homestead garden's products, they have their market concerning the products like local fresh and chemical fertiliser-free goods. Their marketed products are sold on local markets without channelling into larger food chains and processing. In this system, it is also noticeable that women are detached from direct access to the market and do not engage with the market as autonomous agents, creating dependency on male family members/neighbours or local vendors to get market access and value for the products they produce.

Besides, based on the empirical findings from KII with a civil society representative and a government representative (Local Agricultural Extension Officer), it is

revealed that government and NGOs have projects to provide logistics support (seeds, plants, domestic animals) and training for managing homestead gardening in rural Bangladesh targeting women. Suppose we try to look at it in the light of Polányi's principle of redistribution. In that case, it is apparent that in the form of services, state and NGO activities have the potential to improve household nutrition and develop women's empowerment instead of concerning the purpose of profit. To justify this statement, getting the voice from the women's project area is significant, which I did not focus on. However, in my thesis study area, I found that women are not involved in any project; they produce by themselves. In that case, it can be stated that women are investing their time in producing in the homestead garden instead of concerning the purpose of profit.

It is noticeable here that Polányi's four forms of economic integration are closely linked with gender and homestead gardening, which can describe women's economic activity. Women's production for the household provides visible and invisible economic values. Hence, it is significant to recognise women's contribution and role to the sustainable food system and security as it is economically crucial.

Furthermore, homestead gardens as alternative agricultural practices maintain a different food system than the general food system, where the existing food system shows as a set process circling agricultural production, processing, distribution, retail, and waste (Garnett et al., 2016). Conversely, the study area's alternative food system reveals no distribution and retail interventions, reducing transportation costs and greenhouse gas emissions from the transports. The local food system does not require transportation and retail interventions, so it lets the consumers eat fresh food, and generation-to-generation women in rural Bangladesh maintain this food system, indicating the sustainability of the local food system. Hence, the discussion mentioned above depicted that by meeting the visible and invisible economic, social and environmental dimensions, there is a potential to maintain a sustainable local food system through women's homestead gardening activities.

### 5.3 Women's Role

This section discusses women's role focusing on their knowledge about farming and biodiversity management through homestead gardening. Further, it explores the analysis discussing women's triple role.

#### **Knowledge of Farming and Management of Biodiversity**

The study findings revealed that women preserve the seeds for reproduction and use manure, chicken droppings and food waste as fertiliser, which protects the soil from being infertile. Producing various forms of local vegetables without chemicals and fertiliser and preserving seeds indicate the conservation and utilisation of biodiversity. Mothers passed this traditional knowledge through generations, which continued the production of local products in the homestead. So, it is significant to address this knowledge which is maintaining local species of the products and providing healthy foods. In link with these findings, Vandana Shiva also stated that women's work and knowledge are central to biodiversity conservation and utilisation. They produce, reproduce, consume, and conserve agricultural biodiversity (Mies and Shiva, 1999, 166-168), and women's knowledge is significant in using biomass for fertiliser (Mies and Shiva, 1999, p-167). It is evident here that women preserve biodiversity, bypassing their traditional knowledge from generation to generation from their mother and producing local plants in the homestead garden.

However, women's this traditional knowledge, use of local seeds and chemical-free fertiliser do not get enough attention in the government and non-government projects. The empirical data from KII showed that both government and non-government projects focused on providing seeds based on climate resilience and targeted to increase production. Similarly, Vandana Shiva has argued that in pursuit of an illusion of progress, development projects tend to replace small-scale indigenous ecological practices with large-scale degradation of the environment (Warren, 2001). Even though the homestead gardening projects of government and NGOs are not looking for large-scale production, it risks degrading women's traditional knowledge of production.

### **Triple Role of Women**

In the household role of women, it is found that women spend most of their time doing household chores, including cooking, taking care of children, cleaning, washing, and maintaining the household. Even though women spend most of their time working on homestead gardening, providing food to the family, and saving money from buying vegetables and animal protein from the market, most interviewees think of homestead gardening as part of housework. The participants also state that a housewife does not have any holiday. Women in rural Bangladesh play a triple role. They play a productive role by earning money from homestead gardening products, saving money from buying foods from the market, and reproductive role by caring for the family and community activities by sharing goods with neighbours and relatives. All these activities women are doing as part of their household for what they do not have time for and holiday. Interestingly, women are unaware or do not perceive it as extra work; instead, they consider it their responsibility. Similarly, Safilios-Rothschild and Mahmud (1989) in their study revealed that women's expenditure-saving activities within the homesteads, such as post-harvest, raising seedlings, fisheries, livestock raising and tree planting, were perceived to be extensions of their household responsibilities and not classified as "economic" and as part of agriculture. The study in Nepal also revealed that as the role of the home garden in household food security is neglected, in the same way, the role of women in household activities is overlooked in typical Nepalese rural society (Bhandari et al., 2021). In this situation, this study's results can complement the existing studies by revealing the significance of women's role and contribution to the sustainable food system and security through homestead gardening, which has visible and invisible economic values.

Furthermore, in saving money from household products, all participants said they save money every month by consuming their own production from homestead gardening, which is hard to measure in economic value. While Rahman (1991) calculated the value of all expenditure-saving activities as 20% of the total household income of landless families. His calculations include expenditure-saving activities such as gathering sticks, leaves and dung for fuel and growing or



gathering vegetables and fruit, which women mainly do. If we can calculate the economic value of women's contribution, it can also be added to the country's GDP. So, it is significant to recognise their diverse role in the family and food system and security to make them aware of their contribution to the country's economy invisibly through their activities in the household and homestead garden.

## 5.4 Challenges

This section explores the discussion concerning the gender division of labour in the context of women as farmer identity and women's access to the market.

### **Gender Division of Labour – Women as Farmer Identity**

Women's work in homestead gardens is similar to agricultural work in the field, and the products from the homestead meet the needs of the family's nutrition and add to the household income. However, participants from the study did not recognise it as agricultural work except for two participants. Besides, women do not consider themselves farmers even though the activities are agricultural work; instead, homestead gardening is considered household work by most of the participants of this study. These findings match the statement of Vandana Shiva, who said that women as farmers have remained invisible despite their contribution to agriculture (Mies and Shiva, 1999, p-166). This invisibility of women's work and knowledge arises from gender bias in society which has a blind spot for a practical assessment of women's contributions by defining women's work and contribution as natural, while it is constructed by culture and scientific practices (Mies and Shiva, 1999, p-167-168). Similar findings revealed in different studies that women play a significant role in the production of the rural economy, these activities are not recognised or accounted as economically active work, nor are they remunerated for their work (Abdullah, 1985, Asaduzzaman and Westergaard 1993 cited in Paris et al., 2004).

The reason behind this perception is the socially constructed role and division of labour between women and men, where fieldwork is supposed to be for men and only men can be farmers. While women are doing the same thing in their

homestead, it is considered women's household job as there are no more visible outcomes. Here it is noticeable that the gender division of labour creates obstacles to recognising women's contribution and identity as farmers. Hence, if women get recognition as farmers, there will significant changes in discriminated gender division of labour in the agricultural sector.

### **Gender Division of Labour - Access to Market**

In the market access area, there need to be significant changes. The study finds that women cannot go to the market to sell their products as it does not look good in the eyes of society. They depend entirely on male family members or neighbours to sell their products in the market and the local vendors (male) who come to their houses to buy them. This situation is also rooted in the socially constructed gender division of labour in society in which the division between public and private spheres controls women's mobility and makes them dependent on males. The KII interviewees also stated that there needs to be reformation for market access for women farmers in rural areas. Similarly, the Paris et al. (2004) study revealed that cultural factors and socioeconomic status determine women's domestic and homestead production roles, particularly accessibility to means of production market, technology, extension services and income-generating activities.

## **5.5 Suggestion for Government and NGOs Initiatives**

However, there are several gaps have been found in the initiated products. Both government and NGOs provide seeds to the targeted women based on the climate and area where women's traditional knowledge and production of local variants are ignored. Furthermore, the NGO and government representative also stated that they have yet to think about this and not working on making women's contributions visible. Hence, they need to work to make women's role and contribution to local food systems and security visible. Let us look into the different policies of the Bangladesh government. It is noticeable that the various policies mentioned encouraged homestead gardening even though it is hard to understand from the policies what the policymakers meant and how it would be implemented. NAP 1999 mentioned enhancing women's role in agriculture concerning homestead

gardening; however, it needs to be clarified what and how it could be done. Besides, NFP 2006 also talked about taking special measures to increase purchasing power and access to food for the people as a disaster mitigation strategy concerning homestead gardening. Similarly, the NNP 2015, Bangladesh's CIP2 on nutrition-sensitive food System (2016-2020), the NAP 2018 and the NFNSP 2019 talked about supporting, encouraging, and promoting homestead gardens; similarly, there is a lack of implementation strategy and actions in all these policies and initiatives.

The findings of this thesis can be the evidence document by revealing the significance of women's role and contribution to the food system and security by providing both visible and invisible economic benefits in the household. Besides, government and non-government organisations can use this data for further studies, projects, and reform policies to address the women's traditional knowledge in production and recognise their role and contributions to sustainable food and security through homestead gardening, which has enormous potential to meet local needs.

## 6. Conclusion

This research revealed that through homestead gardening, women provide nutritious and fresh food for the family members all year round, saving money from buying foods from the market and earning money by selling extra production, increasing the purchasing access to the market. Furthermore, producing local plants using manure, chicken droppings, and food waste from generation to generation helps to protect the soil and biodiversity of the local plants. These activities trigger meeting sustainable food security's four pillars (Availability, access, utilisation and stability). In the food system, it is noticeable that women are maintaining an alternative food system by producing for their own consumption, sharing with neighbours, selling in the local market and also from home. It reduces transportation costs, time and greenhouse gas emissions from transport, along with retailers' interventions in marketing. It is common practice in rural Bangladesh and has been practised throughout generations, indicating a sustainable local food system.

Furthermore, women also spend time in household activities, cooking and caring for family members, for which they do not have any holidays. Women play triple roles by producing food in the homestead, reproductive roles by caring for the family, and community activities by sharing food with neighbours and relatives. Despite these multiple roles, women's contributions are not recognised in the society. The gender division of labour creates obstacles to identifying women as farmers despite their agricultural activities in the homestead garden, and still now, the division between public and private spheres controls women's freedom of movement, limiting their market access to sell their products in the market. Even though the government and NGOs are providing logistics support (seeds, plants, domestic animals) and training (how to produce vegetables and rear domestic animals) for underprivileged rural women to develop homestead gardening, they still do not address the core issue of women's traditional knowledge of production and maintaining biodiversity through producing local variants, identifying women as farmers, recognising their contribution to agriculture, role in the food system and security through homestead gardening and developing women's access to the

market. So, addressing the abovementioned aspects in government and non-government policies, projects, and initiatives is significant.

Hence, in conclusion, homestead gardening as a small-scale production by women has the potential to meet the local food system and security, which may, on a broader scale, help to meet the global food system. Recognising women's roles and contributions to agricultural activities like homestead gardening is significant to achieve this goal and eradicating gender bias in society. Besides, it is economically crucial to recognise women's roles and contributions as women's activities provide visible and invisible economic values to society and families. Women's economic agency was shown to prevail primarily within the economic integration principles of householding and reciprocity, using Polányi's terms, curtailing their autonomous agency on the market. One aspect of a shift in the gender division of labour and further recognition of the importance of women's contribution could imply their participation in the market as autonomous agents. Furthermore, when women get recognition as farmers, there will not be any fixed gender role in the agricultural sector.

### **Potential for Future Studies**

There are several things which can be explored throughout this study and can be analysed. However, discussing and analysing all concepts and issues connected with the research topic is impossible in a single paper. As my focus of the study was to investigate women's contribution to sustainable food systems and security through homestead gardening, there are several issues I could not explore and analyse due to my research objectives and data shortages. So, future work can be focused on a descriptively circular economy focusing on using food waste in homestead gardening and preserving biodiversity by producing local plants. More studies can be conducted concerning homestead garden land ownership, inheritance pattern, women's dependency, and gender perspectives in rural Bangladesh, which I did not explore. Besides, I only interviewed one government official and one NGO official, which limits my reflections' generalisability. Broader research can focus on government policies and projects and NGOs' projects, interviewing the Bangladesh governments and NGO's project beneficiaries and policymakers.

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## Popular science summary

The thesis paper mainly addresses Sustainable Development Goals 1 (No poverty), 2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture), 5 (Gender equality) and 12 (Ensure sustainable consumption and production patterns).

In this study, I investigated women's role and contribution to sustainable local food systems and security in rural Bangladesh through homestead gardening. Due to covid-19 pandemic and the Russia-Ukraine war, the global food system and security were disrupted, and the food price soared higher. Bangladesh, a developing country, is also struggling with the rising food price. The agro-food supply chain in Bangladesh is hugely complicated, while the agricultural goods pass through several transportation stages to reach the big cities. The supply chain expands from farm producers to end consumers via food processing, storage, and mediators. So, reducing the long food supply chain and transportation would help to ensure food security and make less complicated the food system. In rural Bangladesh, homestead gardening is a traditional practice that women have managed for several generations. Women provide nutritious and fresh food to their families through these home garden products. Homestead gardening is also an income source for underprivileged families in which women play a crucial role. Despite women's significant contribution to family income and food supply, their contribution is unrecognised. Furthermore, even though women practise agricultural activities in their homesteads, they are not identified as farmers, which is considered a men's identity in a patriarchal society in Bangladesh.

The principal findings of this research expose how through homestead gardening, women are meeting four pillars (Availability, access, utilisation, and stability) of sustainable food security and maintaining an alternative local food system which has the potential of being sustainable. The research also revealed that women's traditional agricultural knowledge preserves biodiversity passed through generations by mothers. Despite these contributions, the study found that women face different challenges, including gender division of labour concerning women's

identity as farmers and access to the market in which area government and non-government initiatives and actions are required. The research concludes that even though women are doing agricultural activities in the form of homestead gardening and contributing to a sustainable local food system and security, due to the gender division of labour in society, their contribution and recognition as farmers are invisible in society. So, it is significant to address the potentiality of homestead gardening and women's contribution to meeting sustainable local food systems and security.

The main obstacle to this idea of making actual global change is that it would take longer to reach all local areas, and changing the perception of women to identify themselves as farmers is another challenge. However, even if it takes longer to change the perception and broadly promote the homestead gardening practises, it is worth making it happen for gender equality and the potentiality of a sustainable local food system and security to meet the food demands and SGDs.

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