



Invisible hands behind empty plates: The Influence of Gendered labour and Structural Inequalities on Household Food Security in Rubber Plantation communities in Kalutara District, Sri Lanka

Ranaweera Mudalinayaka Charuni Pradeepika Ranaweera

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Ranaweera Mudalinayaka Charuni Pradeepika Ranaweera

Supervisor: Stephanie Leder- Büttner,
Swedish University of Agricultural Sciences, Department of
Urban and Rural Development

Examiner: Linley Chiwona-Karltun,
Swedish University of Agricultural Sciences, Department of
Urban and Rural Development

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Household food security, Feminist Political Ecology

Swedish University of Agricultural Sciences
Faculty of Natural Resources and Agricultural Sciences
Department of Urban and Rural Development
Division of Rural Development

Abstract

This study examines how gendered labour relations and structural inequalities shape women's participation in rubber plantation and influence household food security in the Kalutara district of Sri Lanka. The research process focused on qualitative data from semi-structured interviews and field observations to understand women's lived experiences, labour processes, and coping strategies, through Feminist Political Ecology (FPE). The findings show that women are at the central role in sustaining household food security, and managing a "triple burden" of productive, reproductive, and community responsibilities. Although women primarily contribute to household income, still their influence on household decision-making remains limited, which is highly shaped by deeply rooted patriarchal norms and labour inequalities in the rubber plantation systems. Structural inequalities including, low and unstable wages, limited access to land, and restricted livelihood opportunities, further increase their vulnerabilities. The findings emphasize that food insecurity in plantation households is primarily affected due to challenges in access, utilization, and stability of food. Along with these constraints, women in rubber plantations practicing multiple coping strategies such as, informal borrowing, seeking alternative income sources, and adjusting with alternative food consumption patterns. These practices offer short-term resilience rather than long-term transformation, limit women's agency. Thereby, this study suggests policy recommendations that move beyond short-term welfare support to addressing these key issues, through improved wage schemes, expanded resource access, and promote gender-responsive support systems. Addressing these challenges will enhance women's agency and support more sustainable food security outcomes among rubber plantations communities.

Keywords: Rubber plantation, Gendered inequalities, Structural dynamics, Household food security, Feminist Political Ecology

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Abbreviations

Abbreviation	Description
FPE	Feminist Political Ecology
WEF	Women's Empowerment Framework
FPFS	Four Pillars of Food Security
HHFS	Household Food Security
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
RFP	Rubber Field Officer
EM	Estate Manager
WO	Welfare Officer
GN	Grama Niladhari
ETF	Employee Trust Fund
EPF	Employee Provident Fund

1. Introduction

In Sri Lanka, rubber is the third most important plantation crop and one of the key sources of rural livelihoods in major rubber-producing districts, such as Kalutara, Kagalle, Ratnapura, Matara, and Galle (Seneviratne et al. 2009). For rubber plantation-worker households, it provides cash income and employment opportunities, and supporting 300,000 jobs along the rubber supply chain (Senevirathne et al. 2009). The rubber industry contributes significantly to the national economy through Gross Domestic Product (GDP) over 945 million dollars in 2025, including rubber export earnings (Export Development Board 2025; Central Bank Report 2024). Thereby, Sri Lanka is well established with an organized infrastructure of the natural rubber industry, collaborating with both public and private sectors (Senevirathne et al. 2009).

In Sri Lankan rubber plantation economies, both men and women are involved in primary productive tasks such as rubber tapping, field clearing, nursery management, and rubber processing (Gunetilleke et al. 2008). In rubber plantation communities, women face gendered-based challenges which are further influenced by social, cultural, and economic inequalities. For instance, patriarchal norms and institutional labour arrangements affect their food security at the household level, where decision-making power and economic vulnerabilities influence women's participation in labour (Galgamuwa et al. 2017). At the same time, women are expected to perform unpaid reproductive responsibilities of childcare, eldercare, and domestic tasks (Gunarathne 2024; Gunatilaka 2019; Samaraweera 2025). In addition, rural women participate in community-based responsibilities, such as religious and social activities (Gunetilleke et al. 2008). This combination of productive, reproductive, and community roles creates a "triple burden" (FAO 2008) represents a significant gendered challenge, as women must manage multiple responsibilities simultaneously. These overlapping responsibilities result in time poverty, physical exhaustion, and limited employment opportunities in women; further increases gender inequality and affecting their household food security.

In rubber plantation communities, women's limited access to resources and decision-making power reduces their ability to access and utilize available resources. This limitation affects their capability to secure adequate food for their households (Uyangoda 1995; Sen 1985). Previous studies also have also discussed issues related to malnutrition and food insecurity among the households in plantation communities. Especially, female-headed households are highly vulnerable to food insecurity (World Food Programme 2024; Galgamuwa et al.

2017). Overall these limitations directly and indirectly affects household food insecurity-related outcomes through high rates of nutrition-related issues across the Sri Lankan rubber plantation sector, which are not further specified (World Food Programme 2024). This perspective explains that food security is not only an economic challenge, but it is also identified as a gendered and structural problem shaped by inequalities in access, power, and capability (Uyangoda 1995; Njuki et al. 2022).

1.1 Aim and Research Questions

The overall aim of the study is to explore how gendered labour relations and structural inequalities influence women's involvement in rubber plantation and how this relates to household food security in rubber-plantation communities in the Kalutara district, Sri Lanka.

The research questions of the study are:

1. How does women's participation in productive, reproductive, and community activities shape within rubber plantation households, in Sri Lanka?
2. How do structural inequalities and patriarchal norms influence food security outcomes in the Sri Lankan rubber plantation communities?
3. What coping strategies do women practice in managing household food insecurity in rubber plantation contexts in Sri Lanka?

Thereby, this research will help fill the gap in lack of recent qualitative studies integrating food security and gendered labor in Sri Lankan rubber plantations. Also it provides valuable guidance for policy recommendations that promote structurally equitable and gender-sensitive approaches to enhance the visibility of women's contributions to plantation economies, and support sustainable food security outcomes for their households.

2. Background

2.1 Rubber plantation in Sri Lanka

Rubber (*Hevea brasiliensis*) was first introduced to Sri Lanka in 1867. The seeds were obtained from the Royal Botanic Gardens, Kew, London, UK, and planted at the Henarathgoda Botanical Garden in the Gampaha district, Sri Lanka. In the 1870s, there was a rapid expansion of rubber cultivation in the wet zone of the country, exceeding 200,000 hectares, and it became a major plantation crop by the early twentieth century (Rubber Research Institute of Sri Lanka 2001; Jayasuriya & Keembiyahetti 2017).

Currently, Sri Lanka is the world's sixth-largest rubber exporter and thirteenth-largest natural rubber producer (Export Development Board 2025). The rubber plantation sector plays a significant socio-economic role, providing employment to nearly 200,000 people in supporting livelihoods and women's participation in the rural agricultural workforce (Export Development Board 2025).

2.1.1 Rubber cultivation in Kalutara district

The major rubber cultivating regions in Sri Lanka, including Kalutara, Kegalle, Colombo, Gampaha, Matale, and Ratnapura, contribute over 80% of the national annual rubber production (Central Bank Report, 2018). Kalutara District is the second-largest rubber-growing district in Sri Lanka, spreading over 2,644 hectares. It belongs to the wet zone, which receives 3,200 mm of annual rainfall with a 75 percent probability (Kulasekera et al. 2010; Jayasuriya & Keembiyahetti 2017). The terrain in Kalutara is mainly rolling and hilly, and the land-use in this area is divided among tea, rubber, cinnamon, paddy, and other mixed crop cultivations (Jayasuriya & Keembiyahetti 2017).

Rubber was first cultivated in the Kalutara district and later spread to other regions of the country (Gamage & Udyā 2023). By 1904, rubber plantations in Sri Lanka became one of the major plantation crops that reached thirty-four tons of rubber exports (Karunanayake 2018). Over time, rubber cultivation in the Kalutara district shifted from large estate-based production to smallholder and privately owned plantations of approximately 40,000 hectares, which play a vital role in rural livelihoods (Gamage & Udyā 2023; Department of Census and Statistics, Sri Lanka 2026).

2.2 Women workers in the rubber plantation

Labor work in rubber plantations directly affects the daily routines and gender relations of the workers, which particularly makes women's everyday lives more complex and dynamic (Lindeborg 2012; Uyangoda 1995). Although women significantly contribute to local rubber production through different activities, such as rubber tapping, field cleaning, and processing, they still experience structural and institutional inequalities regarding labor tasks, wage patterns, intersectional inequalities, and gender discrimination within plantation labor systems (Gunawardane 2016). Additionally, in the Sri Lankan plantation sector, women are assigned subordinate roles and discrimination in terms of employment positions, income, and indebtedness (Kurian & Jayawardena, 2017). Consequently, these women became socially accepted subordinates and often exploited as a source of cheap labor (Kurian & Jayawardena 2017; Gunawardane 2016).

Research findings on rubber commercialization in Laos show that plantation-based systems may provide income, often increasing vulnerabilities and inequalities, including the loss of subsistence production, dependence on debts, land dispossessions, and gendered inequalities (Lindeborg 2012). Similar to the findings from Laos, women rubber workers in Sri Lanka depend on low and seasonal rubber wages that are insufficient to ensure household food security. The loss of subsistence farming and reliance on borrowed money during income shortages highlight the structural limitations that affect women's economic security and agency in related to food security in the rubber plantation livelihoods (Traldi et al. 2023; Uyangoda 1995). Along with these challenges, women's agency in household and nutrition-related decisions often prioritizes ensuring food access, nutritional characteristics, and child well-being within the household (Sarker et al. 2024; Barak et al. 2023; Clement et al. 2019).

Rubber cultivation is a labour-intensive agricultural system that human labour is considered a key requirement in maintaining efficient production. The main labor categories of women within the rubber plantation can be identified as ¹tappers and ²sundry workers within the field. Tappers are the most crucial worker category of the rubber latex production process, especially responsible for harvesting latex, which requires specific skill and precision to follow proper tapping techniques in maintaining the sustainable productivity for optimum period without damaging the bark (Liyanage 2017; Uyangoda 1995).

¹*Tapper* is a worker who is responsible for tapping rubber trees; the process of collecting latex from a rubber tree by making a cut in the bark of the rubber tree with a specialized knife

²*Sundry worker* is a non-tapping manual laborer, essential for field maintenance; including clearing weeds, applying fertilizer, digging drains, and clearing paths

As the second most significant labor category, sundry workers are involved in field maintenance activities, including weeding, nursery management, and drainage management (Pushparajah 2001; Uyangoda 1995).



Figure 1. A female sundry worker in a rubber plant nursery in a rubber estate located in Kalutara. 13.02.2026 (photograph by author), Figure 2. A female tapper is collecting latex from a tapped rubber tree in a rubber estate located in Kalutara. 13.02.2026 (photograph by author)

2.3 Gender inequality and women’s vulnerability in the rubber plantation

Gender inequality within rubber plantation communities can be identified as a key challenge, where women’s responsibilities and opportunities are shaped by deeply rooted social, cultural, and structural factors (Uyangoda 1995). Across many developing countries, including Sri Lanka, women’s labor plays a vital role in the rural economy, and gender norms strongly shape their participation and opportunities (Mukakalisa 2021). Although, both male and female workers engage in different types of activities within rubber plantation economies; female workers are frequently officially unrecognized (Uyangoda 1995; Kotikula & Solotaroff 2006). Women in rubber plantation communities in Sri Lanka are primarily contributing to rubber tapping, plantation maintenance, and latex

processing; where decision-making authority over resource access and control, often remains as male-dominated (Uyangoda 1995; Gunawardene 2016). Men typically participate in the crucial and regular labor tasks, whereas most women workers often engage in supportive and irregular tasks parallel with household responsibilities (Uyangoda 1995). This division of gendered labor limits women's time, mobility, and access to resources, and inefficiencies in production.

In addition, cultural norms play a vital role in restricting women's mobility more than men's, which results women with less access to information and make them less aware of their rights (RDI report 2009). In some cases, women often accepted their lower status as natural and justified by tradition, religion, or legal systems (Kurian & Jayawardena, 2017). Furthermore, less diversification and instability of income within the rubber plantation work, results in reducing available income for household expenses, especially in food purchases (Harshani & Shantha 2021; Mukakalisa 2021). Previous studies in gender relations highlighted that, uneven distribution of care burdens and labor responsibilities due to gendered inequalities, directly affect household food security outcomes (Clement et al. 2019). Especially, women face the dual demands of income-generating activities and reproductive responsibilities including, childcare, food preparation, and household maintenance (Galgamuwa et al. 2017). Lindeborg (2012) discusses how daily work-life consists of plantation work, caregiving, and household management; and how these are linked together within these communities. Further, she explained that both men's and women's work is influenced by place and social norms. Thereby women's roles are often neglected since they are primarily associated with household activities (Lindeborg 2012).

Moreover, Silva and Leder (2017) explained that even when women take more responsibilities; for instance, due to male migration or an increase in economic status, they still have limited control over productive resources. This will further weaken their influence over income allocation, production decisions, and food expenditure (Silva & Leder 2017). Thereby, these structural conditions can negatively affect household food security by affecting income stability, access to food, and women's participation in decisions about nutrition.

2.4 Food (in)security in the rubber plantation sector

Food security refers to a status in which an individual's physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs for an active and healthy life all the time (Clay 2002; FAO 2008; Jayawardene 2014). Among these dimensions, economic access plays a vital role in shaping food security as it provides sufficient, stable income to purchase diverse and

nutritious food (Clay 2002). However, some researchers argue that food insecurity cannot understand alone, as a problem of insufficient cash income, where it affects by combination of inequalities. These include gendered divisions of labor, structural poverty, and the limited availability of institutional support, which are shaping resource access and distribution within households (World Food Programme 2024; Clement et al. 2019).

In the rubber plantation households, women play a central role in ensuring household food security. Kalansooriya and Chandrakumara (2014) emphasize that women's role in ensuring household food access through income generation and enhancing utilization through nutritional knowledge. They highlight that women's income, education, and traditional knowledge significantly improve household food security even within the strong patriarchal settings.

Agricultural transitions further shape household food security, particularly through income access and dietary diversity. Luo (2021) highlights how higher income from rubber plantation enables families to purchase a variety of nutritious food; thereby improving overall household nutrition. In contrast, he discusses the vulnerability of depending on a single cash crop while shifting away from mixed crop cultures in subsistence farming, where these rural communities force to purchase food from the market (Luo 2021). Similarly, rubber cultivation does not directly contribute to household food consumption and it only provides cash income for food purchases and reliance on the market. At the same time, traditional food systems, such as home gardening are currently unstable. Previous food systems through home gardening are sustainable and maintaining the availability of food crops in close proximity to the house, ensuring access and utilization. Subsistence agricultural systems provide an adequate and continuous food supply, since rural communities often manage crop cycles compatible with seasonal changes to ensure the stability of food. However, present communities in rural setting depend on market-based food purchases that are often in lower quality and higher price. As a result, this negatively affects gendered challenges within the household, forcing women to rely on lower-quality or leftover food, while men regularly consume the best-quality food (Sasson 2012). Patriarchal norms position male head of the family as the most productive and respected person within the household. In summary, these dynamics emphasize that food security is highly shaped by social and structural inequalities, rather than an economic challenge.

2.5 Structural inequalities, institutional vulnerabilities, and community resilience in the rubber plantation sector

Structural inequalities such as limited access to resources, institutional support, and historical marginalization create persistent vulnerabilities within rubber plantation communities and shape their livelihood outcomes and household food security. They are identified as deeply rooted within the social institutions resulting unequal distribution of resources, opportunities, and rights (Hanrahan et al. 2021). These inequalities are resulted from laws, policies, and social norms which increase power imbalances, and limit access to resources, especially for marginalized communities including women.

The historical plantation structure in Sri Lanka was extremely hierarchical and patriarchal, which resulted in deep social divisions and inequalities (Kurian & Jayawardena 2017). It controlled worker's mobility, labour conditions, and different aspects of domestic life, leaving them debt dependent, estate labourers. This unequal system controlled the living conditions of plantation workers, by limiting their livelihood opportunities, access to resources, and household welfare (Arachchi 2024; Kurian & Jayawardena 2017). In addition, FAO (2024) highlighted that economic vulnerability increases structural inequalities within plantation communities, due to their highly dependent nature on global market dynamics. This makes rubber plantation household income is highly sensitive to global price fluctuations. Furthermore, increase of rubber monocultures on commercial plantation lands reduces the available land to cultivate diversified food crops through subsistence agricultural systems. These structural constraints cause the continued economic marginalization of rubber plantation workers, making them severely vulnerable to securing food for household consumption (FAO 2024; Kurian & Jayawardena 2017).

Along with these challenges, women in rubber plantation communities actively engage in informal coping strategies to manage economic and social vulnerabilities (Uyangoda, 1995). For instance, community-based support networks, such as kinship systems, knowledge-sharing, saving practices, and social groups, are common in these communities to maintain stability over the above challenges (Kurian & Jayawardena 2017; Uyangoda 1995).

3. Conceptual Framework

This study applies Feminist Political Ecology (FPE) lens to examine the link between WEF and food security related outcomes, especially through Four Pillars of Food Security (FPFS) operate within broader structural and institutional challenges. Although this study initially focused on women's empowerment and gender roles in relation with household food security, the findings revealed that woman's experiences cannot be clearly understood without considering broader structural and institutional dynamics. Based on this, this analysis incorporates FPE perspectives, allowing a deeper examination of how gendered power relations and institutional arrangements are operated within the rubber plantation systems, in shaping women's access to resources, agency, and livelihood outcomes, including food security.

3.1 Feminist Political Ecology (FPE)

The FPE provides a useful framework for understanding how gendered livelihoods are shaped by power relations, institutions, and resource access. Political Ecology studies highlighted that environmental and livelihood outcomes are not simply resulted by individual actions or local practices. They are influenced by broader political, economic, and institutional factors which control workers in accessing to land, labor, and other resources (Sultana & Loftus 2020). Further, they explained that structural conditions within rural economy are highly gendered; where inequalities within labor and livelihood are further constrained by institutional intersection (Sultana & Loftus 2020). Studies on palm oil cultivation in Indonesia highlighted that limited voice and participation of female workers were observed, due to structural power relations and gendered inequalities. They discuss how women still exercise agency in different ways, even within these constraints (De Vos & Delabre 2018). Focusing on gendered experiences, hidden forms of agency, and power inequalities, helps understanding power dynamics in the plantation system (Sultana and Loftus 2020; De Vos & Delabre 2018).

Harcourt and Nelson (2015) explain the gendered intersection within the household, where women often have less power in decision-making related to household resilience and livelihood outcomes, including food security. The FPE move beyond gendered inequalities and examine other intersecting inequalities such as, class, ethnicity, and institutional power in which shaping access to

resources and opportunities. Elmhirst (2015) and Nightingale (2011) argue that power operates not only within formal institutional arrangements, but also through everyday practices, social norms, and labor relations. This approach helps to understand how structural inequalities shape livelihood vulnerabilities and food insecurity, especially among women workers in rubber plantations.

3.2 Women's Empowerment Framework (WEF): conceptualizing agency within structural inequality

Women's Empowerment Framework introduced by Kabeer (1999), explains three connected dimensions: resources, agency, and achievement, and how they support improving women's lives. She emphasizes women's empowerment as a process of expanding women's ability to make strategic life choices in a context where those choices are often controlled or challenged. Her definition will be supported by women's involvement in rubber plantations, which allows for moving beyond traditional labor roles (Kabeer 1999). This framework offers analytical dimensions to examine how women's participation in rubber cultivation and their control over resources can shape household food security.

In women's empowerment framework, resources include the material, human, and social assets such as time, income, and opportunities (Kabeer 1999). Agency refers to the ability of individuals to define their goals and act upon achieving it. This ability can be identified as observable actions such as decision-making power, and on the other hand, as internal power including motivations, meanings, etc. (Kabeer 1999). Achievements are the outcomes of empowerment, which reflect improvements in living conditions (Kabeer 1999). This study discusses women's agency and steps towards empowerment explained by WEF in achieving sustainable food security outcomes within the existing inequalities (Kabeer 1999; Clement et al. 2019). The Feminist Political Ecology framework is applied in the analysis of collected qualitative data on women's income, access to labour, household decision-making, and daily livelihood practices, to understand how different levels of agency influence household food security in rubber plantation communities.

3.3 Household Food Security (HHFS): conceptual dimensions and gendered dynamics

FAO (2008) defines Food Security as a situation that exists when all people have, all time physical, social, and economic access to sufficient, safe and nutritious food which meet their dietary needs and food preferences for an active and healthy life. According to this definition, four pillars of food security; availability, access, utilization, stability, explains analytical dimensions of the concept (FAO 2008).

Food availability can be explained as production, distribution, and exchange of food to achieved sufficient amount of food available for all the individuals (Bashir et al. 2013; FAO 2024). In the context of Sri Lanka, especially in rubber plantation areas, food availability may depend heavily on market access, because currently many plantation households rely on plantation income for food purchases rather than producing their own food. Due to this reason fluctuations in productivity and economic situations may directly affects the availability of food for plantation communities (World Bank 2020; FAO 2008).

Food access refers to the ability of individuals and households to get sufficient and nutritious food (FAO 2008). This is highly influenced by economic and social factors including household income, income distribution within the household, and cost of food items. In Sri Lanka's plantation sector, rubber plantation workers and their households usually have irregular employment position with low wages. Along with increasing living costs and low household income is limiting their purchasing power (Uyangoda 1995). Thereby, in some cases even when food is available in markets, plantation workers may struggle to access sufficient and nutritious food due to economic challenges (Uyangoda 1995; Gunetilleke et al. 2008).

Existing literature generally recognizes household economic stability as central to maintain household food security, it is deeply shaped by intra-household dynamics and gender relations (Sinclair et al. 2022). In agricultural and plantation contexts, women play a vital role in sustaining household food security (Clement et al. 2019; Odey et al. 2022). When women have higher bargaining power, they often allocate higher proportion of income towards food, children's well-being, and healthcare (Sinclair et al. 2022; Luo 2021). Household food security is also closely related to nutrition and food utilization, where women typically manage food preparation and meal arrangements within the household by maintaining quality diets and nutritional outcomes (Luo 2021; Kalansooriya and Chandrakumara 2014).

This study uses the concept of food security by focusing mainly on the dimensions of food access, utilization, and stability. Food access is examined through household income, wage conditions, and the ability to purchase food, while utilization is explored through women's role in food preparation and dietary practices within the household. Food stability is examined through the data on income fluctuations, seasonal employment, and coping strategies that affect consistent food consumption. To address these dimensions, the study uses qualitative data such as interviews and field observations in understanding how gender roles and structural issues influence household food security.

3.4 Gendered Labour, Structural Inequalities, and Household Food Security Framework

The conceptual framework below, illustrates the interaction between gendered labour relations and structural inequalities affecting household food security. This study uses an FPE lens to examine the link between WEF and food security related outcomes, especially through Four Pillars of Food Security. The two interconnected dimensions of structural inequalities and gendered labor relations explain how rubber plantation systems are organized and managed. Structural inequalities include plantation governance structures, wage systems, and debt arrangements. Institutional systems within these plantations are responsible for defining rules for accessing and maintaining of employment, income, and other livelihood opportunities (Arachchi, 2024; Kurian & Jayawardena 2017). Simultaneously, gendered labour relations, as the central concept within structural inequalities reflect the inequality in work distribution, where women often experience a triple burden and the impact of patriarchal norms (Uyangoda 1995; Kotikula & Solotaroff 2006).

In the second level it explains, how rubber plantation settings are shaped through gendered labour inequalities and structural factors in resource access and decision-making both in the household (Mukakalisa 2021). This imbalanced structure creates time poverty and limit women's ability to engage in decision-making including, employment decisions and food expenditure (Uyangoda 1995; Njuki et al. 2022). Additionally, constraints in resource access such as credits, stable income, and social protection through institutional support restrict women in achieving benefits within the household, particularly related to food security (Traldi et al. 2023; Clement et al. 2019). This study focuses the food security outcomes, mainly through the dimensions of access, utilization, and stability (FAO 2008; FAO 2024). Thereby, this framework advocate for how food

security outcomes are influenced by gendered labour relations and structural inequalities, within the rubber plantation community in the Kalutara district, Sri Lanka.

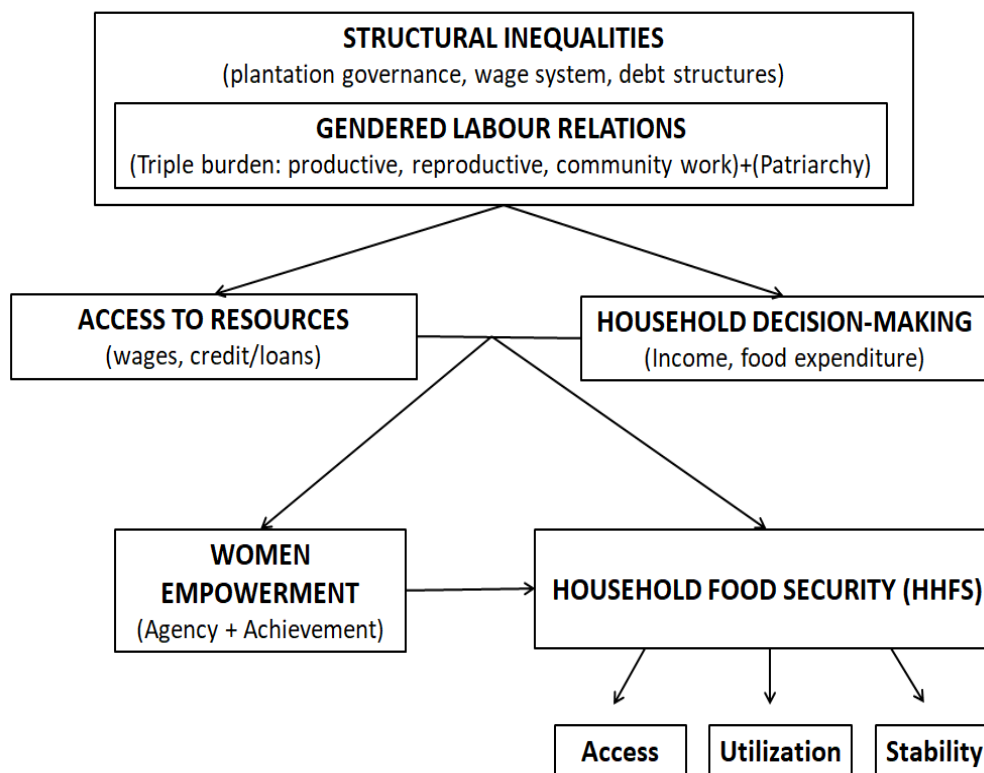


Figure 3. “Gendered Labour, Structural Inequalities, and Household Food Security Framework”

4. Methodology

4.1 Research design and philosophical worldview

In the research study, a qualitative approach was used for data collection through semi-structured interviews, and field observations. This process allows capturing rubber worker's lived experiences, perceptions, and social realities with deeper understanding. Qualitative data collection was conducted mainly with women workers, and other actors who involve in the rubber economy, about daily routines, labor patterns, care responsibilities, food practices, adaptation strategies, and expectations of institutional support (Robson & McCartan 2016).

This study is explained through a combination of interpretivist and transformative worldviews. Interpretivist worldview assumes that people develop their own understanding of the world through their experiences (Creswell and Creswell 2018). Thereby current study is based on the idea that women working in rubber production in Kalutara, which interpret and experience household food security, work, and agency. Thereby it explains how these are shaped by their social, cultural, and ecological contexts. Additionally, it follows a transformative worldview, focusing on social justice, gender equality, and empowerment of marginalized groups, particularly women in rubber plantations (Creswell & Creswell 2018).

4.2 The study area

The study was conducted in Kalutara district in the Western province of Sri Lanka. Two rubber plantation communities were selected for the study in Kalutara and Matugama. The study area was selected based on number of methodological and practical considerations.

First, the Kalutara district has a well-established history of rubber cultivation, which is identified as one of the prominent rubber-growing areas in the country. This ensures the study would be situated within an active and representative area of rubber plantation economy. Second, the level of women's involvement in rubber plantation labour was another key factor. Initially, the information was gathered from the secondary resources such as reports from Rubber Research Institute of Sri Lanka (RRISL), government authorities, and my previous experiences and academic knowledge. These resources highlighted the higher involvement of women in rubber-related activities within the Kalutara district.

Thereby this study is particularly suitable for examining gendered and structural inequalities within the rubber economy. Additionally, I selected these specific two rubber estate locations by considering the accessibility in transport arrangements, communication and practicality.

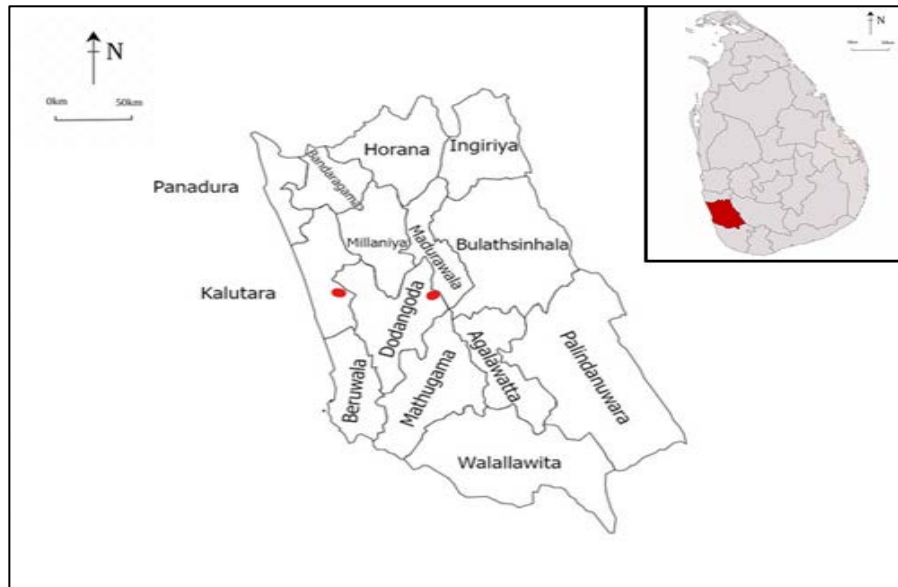


Figure 4. Map of selected research locations of rubber estates in Kalutara district, Sri Lanka (Survey department Sri Lanka, 2019)

4.3 Qualitative data collection

4.3.1 Sampling methods and access to the participants

Participants were selected through purposive sampling which varies in household compositions and who are capable of sharing insightful lived experiences for the study. Then the snowball sampling method was used to identify specific participants such as, remote communities (Roson & McCarton 2016). Participants were approached through professional and personal contacts including ³Grama Niladhari and Estate Managers who facilitated initial introduction to the participants (Creswell & Creswell 2018).

³Grama Niladhari is the public service officer who assigned for a village to conduct all the administration and related duties; who appointed by the central government

Additionally, men in rubber plantation households and other local actors who have direct and indirect connections to the rubber plantation community were interviewed for contextualization and observer triangulation, where women's accounts remain central to theme development and interpretation (Robson & McCartan 2016).

4.3.2 Semi-structured interviews

Creswell and Creswell (2018) introduce interviews as the most common approach used in qualitative research. In the current study, semi-structured interviews were used as the main method of data collection, to explore gender-based power dynamics, labor relations, and household food security among rubber plantation workers in Kalutara. Since I had the opportunity to travel to the research locations in Kalutara Sri Lanka, all the interviews were conducted in-person. Face-to-face interview method is more effective, since it allows the interviewer to build better interaction and connection with the interviewee (Robson & McCartan 2016).



Figure 5. Conversation with a rubber-tapping woman at the study location in Matugama. 22.02.2016 (photograph by Sashini Samalka)

Table 1. Summary of the participant categories in the research locations

Estate Location	Participant Category	Number of Participants	
		Female	Male
Kalutara	Rubber Tappers	04	-
	Sundry workers	03	-
	Rubber Field Officer	-	01
	Rubber Field worker	-	01
	<i>Grama Niladhari</i>	01	-
Matugama	Estate Manager	-	01
	Welfare Officer	01	-
	Rubber Tappers	02	-
	Rubber Field worker	-	01

4.3.3 Field observations

Field observation in qualitative research is a method which researcher record field notes about individual participants behaviors, activities and incidents in the study location (Creswell & Creswell 2018). A personal field diary was maintained to document the observations for further analysis. As explained by Creswell and Creswell (2018), researchers' role can be positioned between non-participants to full participant in the field observation process.



Figure 6. A female tapper is collecting latex from a tapped rubber tree in a rubber estate located in Kalutara. 13.02.2026 (photograph by author)

The current study was involved watching and recording people's behavior, social interactions, and routine activities in real life scenario, through photographs and personal field diary; where I positioned myself in a minimally involved or non-participant role (Robson & McCarton 2016).



Figure 7. Two female tappers are resting by sitting on a bench after completing rubber tapping tasks, at the latex collecting point of the rubber estate located in Kalutara. 05.02.2026 (photograph by author)



Figure 8. A female tapper is fetching drinking water from a common well in the rubber estate located in Kalutara. 13.02.2026 (photograph by author)

Initially I visited the first research location in Kalutara, and conducted few interviews there with the participants. Later I conducted remaining interviews with the other participants at the location in Matugama. Along with this interview sessions, I started observing the field activities of different actors, in both locations. I observed their day-to-day duties and general field activities; how various participants are involving, how supervisory roles are handling and managing daily work tasks, and how additional stakeholders are participating and interacting with above activities. Further, I had some informal discussions with participants about different incidents, their experiences, and their personal ideas, including routine activities, and food security concerns, which would help me in addressing research questions of the study. This method allows better understand their real-life stories which were sometimes difficult to capture through face-to-face interviews, since the participants freely expressed their own understandings and thoughts in informal discussions.

Additionally, I managed to visit different locations where these women rubber workers are spending their time for the day; for instance in the field where tappers are harvesting latex, nursery and other field areas which mostly the sundry workers are spending their time, and other locations including latex measuring and collecting center, latex loading point to the transport vehicle, field officer's/estate manager's offices, community center of the estate, and few line rooms. Finally, I noted down the details and captured photographs which I observed through their expressions, behaviors, and pattern of activities to conclude the main themes of the study.

Table 2. Summary of field observations and interviews

Time period	Location	Interview/Field observation focus	
February 2026	1st week	Kalutara	Semi-structured Interviews + Observations on daily routines in the field and line rooms
	2 rd week	Kalutara	Semi-structured Interviews + Observations on daily routines in the field and latex collecting center
	4 th week	Kalutara	Semi-structured Interviews + Observations on daily routines in the field and administration office
	4 th week	Matugama	Semi-structured Interviews + Observations on daily routines in the field and line rooms
March 2026	1 st week	Matugama	Observations on daily routines in the field, community center, and administration office

4.4 Ethical consideration and reflexivity

Ethical considerations were strictly followed throughout the research process. Participants were informed in the beginning of the data collection, about the purpose of the study and process of interviews (Creswell & Creswell 2018). Additionally, written consent was obtained from the participants including male and female workers, estate managers, rubber welfare officers, and Grama Niladhari; while verbal consent was obtained from some female and male workers who have no/lower literacy level. Participation was voluntary and they have the right to withdraw it at any time. Confidentiality and anonymity was ensured throughout the process and the reports are stored securely only for the academic purpose (Creswell & Creswell 2018; Robson & McCartan 2016).

Audio-recording of the interviews were taken with the consent of the participants to ensure the credibility and transparency. Sensitive topics such as household conflicts, abonnement and health crisis of family members were handled with care and empathy. For instance, one female tapper shared her difficulty due to her husbands' illness; thereby I approached the interview sensitively, as she looked highly emotional while discussing it (Creswell & Creswell 2018; Robson & McCartan 2016; Alasuutari et al. 2008). Moreover, interview schedules were arranged at times without affecting the daily routine/responsibilities of the participants. Further, myself as a researcher, I tried to conduct the interview process by being reflective, sensitive to local gender norms, literacy, economic levels, and cultural factors to ensure trust, respect, and validity of data (Creswell & Creswell 2018). For instance, when interviewing women workers, I used simple language, allowing pauses, and following up questions, to allow them to understand the question and express their ideas freely.

4.5 Data analysis

Data analysis was done through thematic coding analysis to identify recurring patterns of participants' narratives grounded in their lived experiences. Qualitative data analysis with thematic coding is a commonly used, flexible and accessible method which supports moving from raw textual data to codes, themes, and deeper understanding of social phenomena in empirical research (Creswell & Creswell 2018; Robson & McCartan 2016).

Initially, interview data was transcribed into English by manual transcription followed by repeated listening to clarify any translation mistakes. Initial coding was done by reading the transcripts repeatedly, carefully identifying the meanings

and familiarization with the content. During this stage, meaningful themes were identified base on the research questions, while allowing new themes to emerge from the data (Creswell & Creswell 2018).

In the study, initial codes were compared across interviews to identify relevant ideas, similarities, and differences among participant's experiences. Through this iterative process, meaningful codes were refined, grouped and re-organized into five broader themes as, (1) Gendered labour burden in rubber plantation context, (2) Household decision-making and patriarchy, (3) Livelihood vulnerabilities and household food security, (4) Structural limitations and institutional support, and (5) Agency, adaptation, and coping strategies. Winnowing of data was done to focus on the most relevant information while cutting down the unnecessary information to ensure meaningful analysis (Robson & McCartan 2016; Bowen 2006).

After that, key themes were interpreted through the conceptual framework drawn by gendered and structural perspectives on household food security. This study was supported in amplifying marginalized voices of rubber women workers and similarly examined power relations embedded in everyday practices within the community.

5. Results and findings

In this chapter, collected data were analyzed through thematic coding. During the thematic coding, five main themes were identified, including (1) Gendered labour burden in rubber plantation context, (2) Household decision-making and patriarchy, (3) Livelihood vulnerabilities and household food security, (4) Structural Limitations and Institutional support, and (5) Agency, Adaptation, and Coping Strategies.

5.1 Gendered labour burden in rubber plantation context

The findings of the study demonstrate that women workers in rubber plantation communities experience intersecting labor burden which move beyond the conventional “double burden” framework; thereby it involves production, reproduction, and community labour roles. Unlike men, who often conduct different tasks, one by one or one after another, women must balance all these responsibilities simultaneously. This can lead them to experience time burden, stress, and lower opportunities for household wellbeing. Below participant described this as:

"[.....]I usually wake up around 4am, because I have to cook and do everything before I come here. I usually come to the estate around 6.30am. I don't have a free time. It is almost 7-8pm when I have a bath, after I finish everything at home. I need to clean the house too. Then I have a free time. [.....]I go to the temple for religious work, and also engage with programmes and functions in the village." (Participant 01 FW)

After completing plantation work, women move into unpaid domestic care work; including cooking, cleaning, childcare, water collection, washing clothes, and maintenance of the household wellbeing. These tasks are further constrained by infrastructural limitations such as challenges in access to clean water, lack of advanced cooking facilities, and limited domestic support from the other family members. This combination of women labor is further emphasized by field observations. A rubber tapping women was observed while fetching water from a well for their domestic use, after completing her estate work (Observation 01). This continuity of responsibilities results in extended working hours, from early morning until late evening cause time poverty and physical exhaustion. Participant 01 FW, also described how women engage in community activities through participation in welfare societies, informal support networks, and

religious activities. Even though these activities are often unrecognized, they contribute as another layer of labor which connects household and community resilience. Below statement of a women worker highlights that even these women try to take part in community or social activities, sometimes they often fail to continue because of the time burden.

"[.....]we don't have time to go to other things, after doing work here and go back home. I was a member of a women's society nearby our home, but we can't go for the loan discussion when we do ⁴late-tapping here. Then I resigned from that society. If not it will be a burden to other members, if we late there." (Participant 01 FW)

This illustrates how she had to leave the loan discussion group and the women society because of the work schedule. For instance, with the schedule of a late tapping day made them arrive late for the discussion meeting in the society and she felt it would be inconvenience for others. Due to heavy work responsibilities and time constraint, women workers in the rubber plantation communities are forced to give up on some social, community, or other activities even they want to participate. This situation also reflects their time constraint and limited personal freedom. Based on these findings, women's labour cannot be simply observed through productive/reproductive structure separately. Besides, observations on the reality of their lived experiences clearly explain the triple burden nature, rooted within the rural rubber plantation community. Along with these constraints women continuously engage in income-generation activities highlight, the dependency of household survival on women's labour and earnings.

Results of the study reveal that women within the rubber plantation economy are primarily engage in highly labor-intensive tapping activities alongside latex collection and transport across the field, which lead them to experience heavy physical and mental stress. A women rubber tapper explained this as;

"[.....]We have to tap 250 trees for one day. I come to work here every day. We have to walk so much because we have to walk two rounds through the field; first to tap trees, then to collect the latex..... If I have to climb up higher and its' a bit harder when compare to the flat land. After collecting all the latex into a container and then I should carry that container by the shoulder or by head. It is really difficult." (Participant 01 FW)

This experience in working in a hilly area of the rubber estate further increases their physical tiredness. I could also observe this, while I was walking along with a female rubber tapper when she was collecting latex in a hilly area of the rubber estate.

⁴ *late tapping* is the process which tapping rubber trees after optimum tapping hours, approximately between 6am to 8am

There I noticed that she barely managed to walk through the land along with a basket filled with collected latex (Observation 02). This explains the hardship of plantation work for income access; it is still identified as one role among triple roles they have to perform in parallel. Besides the physical demanding nature of these tasks, women workers are regularly work within the rubber estate, showing their central role in sustaining plantation productivity. Addition to that, women along bear the double burden of income generation and household responsibilities, while experiencing insecurities of income when men are not engaging in regular employment. Below participant responses illustrate that;

“[...]he is doing some welding work, but he doesn't go every day to work. But I come every day for work here. I am a rubber tapper here.” (Participant 11 FW)

While the male engage in irregular income generation, female worker engages in regular employment within the rubber economy to access a more stable daily income. Even though within these households, female member serves a permanent employment position she is continue to bear the primary responsibility for reproductive and care work. On the other hand, this explains that women's participation in paid labour does not reduce their domestic workload even men are not engaged in any of these roles through production or reproduction. This situation reflects persistent gendered divisions of labour, where increased economic participation does not impact on reduced labour tasks or increased autonomy for women. Although women's participation is increased in labour does not automatically improve household food security. Instead, less power over household decision-making and their continuous workload without shifting in household labour relations, leave them with limited time and energy to manage food preparation and related concerns. As a result, overall food security is challenged within the household.

Moreover, interview findings related to the labour allocation within the rubber estate, emphasize a combination of formal equality and hidden gendered inequality. Below participant described it as;

“[...]more tappers here are women. For tapping, every tapper is allocated for ⁵katti equally. But for sundry workers, we are considering the task. Harder tasks are given to male workers, but here we have no males working as sundry workers. Then we sometimes put two female workers together to complete the task. But some women, who work here, are working better than males.” (Participant 09 EO)

⁵katti/kattiya is a specific segment/slot of land area within the rubber plantation pre-assigned for a tapper for tapping

This explains heavy tasks are categorized as “male work”, still the absence of male workers in sundry worker category. Thereby, women are required to complete these tasks collectively. For instance, as two women assigned to complete single task. This reflects deeply rooted gender norms where traditional beliefs about the capabilities of men and women in labor work, even though they may not be seen in the real-world working environment, particularly in rubber plantations. Although this situation seems as positive, it actually explains as a process of labor exploitation where women experience an unbearable hard work due to absence of alternative income access.

Additionally, a female sundry worker explained her difficulty in work tasks as;

“[...]This is very difficult compared to rubber tapping, because we are working with ⁶mammoties, we have to work for 8.5 hours to finish work, but the same salary as them...we are taking a water bottle with us, going tree by tree everywhere, holding and carrying this bag, and also taking the heavy tools to clear the land too. It is very exhausting” (Participant 07 FW)

This situation makes these women workers in unhappy and exhausted situation due to physical demanding nature of the work, such as working long hours, carrying heavy tools, and moving continuously through the estate. This can negatively affect their physical health and overall well-being. For instance a female rubber worker claimed pains in her legs and back, while she was in an informal discussion with me. Similarly I observed how she was walking through the rubber field difficult way due to her leg pain (Observation 03; Participant 04 FW). This demonstrates how labor force is organized to respond in labour challenges, and explains how deeply-embedded gender norms are operated within the rubber plantation economies. This situation affects their household food security because when women face physical difficulties and tiredness reduce their motivation for food preparation.

Meanwhile, findings highlighted that unpaid household labor in the plantation community is highly gendered; still in some cases partial sharing of domestic workload between men and women can be observed. One male estate worker shared his experience as below;

“[...]Around 6:30 p.m., she's coming back home. My wife cooks in the morning and then she leaves. I sometimes help to clean the outside of the house and bring some water for the usage of house. Also I drop my kid to the school van.” (Participant 13 FW)

⁶*mammoty* is a traditional manual agricultural tool which made with a broad metal blade and a wooden handle, used for digging, soil preparation and weeding

He explains about his contribution to various household work tasks such as cleaning outside and fetching water for domestic use, while majority of domestic tasks including cooking, washing clothes, and cleaning the house are done by his wife. These realities explain the gradual shifting in traditional gender roles, when men are engaging in specific types of reproductive labor in the households. However, this participation continued to be limited and does not emphasize equal sharing of domestic labour tasks; where women continue to bear the primary burden of reproductive labour within the rubber plantation households.

In summary, findings indicate that woman's triple burden of labour, shaped by strong gender norms and structural challenges, leads to time poverty and physical exhaustion, thereby negatively affecting women's agency and household food security outcomes.

5.2 Household decision-making and patriarchy

Household decision-making is considered as a central theme in the discussion of gender based inequalities. Although women significantly contribute to household income, this does not simply lead to better control over household decisions, including financial decisions particularly related to food security. Women within the household contributes to key management activities in food security concerns, they still have a limited bargaining power over nutritional-related decisions. This situation may lead gendered food achievements, where women prioritize the needs of men's and children's over their own wellbeing. Overall, these dynamics highlight that patriarchy in household-level affects constrained women's economic autonomy, further deepening unequal power relations, although they are significantly contributing to the overall household income.

"[.....]I ask and discuss with my husband after I get the salary, on the 10th day of every month." (Participant 12 FW)

"[.....]here, the thing that male person told is implemented within the household; so yes it's very much patriarchic. But when it comes to the higher economic level community, maybe the urban area, it's different... Here the male is the one who controls everything and there are more conflicts can be seen within their households. Even this morning I went to the police station, for a case. Every day, we are handling such things here." (Participant 14 EM)

Above statements from an estate manager and a female worker emphasize, how household decision-making is strongly shaped by patriarchal authority, where

men's decisions are dominated and are expected to be followed without question. This explains the unequal power in rubber plantation households, where women have limited voice or influence on controlling over resources or household relations. This limitation in women's decision-making power over food-related matters, further reduce their ability to influence household food choices including food quantities, varieties, and qualities; which negatively affects overall household food security.

In many households, women are responsible for managing daily financial activities including budgeting, purchasing food, and ensure basic needs of the family members. Even men contribute less or irregular income, they still take important financial decisions while limiting women to manage expenses. This situation is further escalated by alcohol consumption of male members; particularly husbands. The below statement of welfare officer explains about the alcohol consumption is common among men after work, also this links with serious problems within the families including financial problems, household conflicts, and in some harassments.

“[...]the majority is using something (alcohol) in the evening after finish work. Mostly they use "kasippu" some are facing financial and household conflicts because of this alcoholism. We have to solve such incidents here.” (Participant 10 WO)

In addition, alcoholism among men directly impacts on instability and wellbeing of the household, due to reducing disposable income of the household. Thereby women often face financial challenges in securing household income for basic needs, including food purchases. Another participant described about the impact of alcoholism as;

“[...]sometimes husband's salary does not come to the family unit, because of the alcoholism. An incident happened recently like this. Our welfare officer arranged the amount of maternity leave (130,000 rupees) to be paid as installments to that female tapper. If not her husband could definitely spend all the money at once” (Participant 14 EM)

The above statement about an incident of maternity leave payment for a female tapper, explain the issue that women face, due to alcoholic husband. This directly influence on household food security, where alcoholism limits the available income within the household, especially for food purchases and related food expenses.

⁷ Kasippu is a locally produce, cheaper, illegal type of alcohol usually consumed by rural community

The involvement of welfare officer was required there to arrange the maternity payment in installments, instead of paying it in total, to ensure that the alcohol-addicted husband would not immediately spend all the money. This highlights the challenges in financial control within the household, and how women may require institutional support to secure household income, especially to manage food related expenditure.

In addition, women's employment choices within a patriarchal setting often shaped or limited by male authority and decisions. However, below response from a husband who is working in the rubber estate explains the woman was able to move beyond estate-based work with his husbands' acceptance.

"[.....]she worked here earlier for about 15 years. Then she left estate work and started working in the garment factory" (Participant 13 MW)

This reflects the idea of bargaining power within the household, where women can influence decisions, when their contribution to household income becomes important. This can be identified as an ideal example of a partial shifting in traditional power relations within the rubber plantation community. By taking the decision to work in the garment factory, she expressed her agency while positioning herself as a strong figure within the household economy. This increased agency and control over income can contribute to food and enabling effective allocation of resources towards household nutrition and well-being.

Even though some women obtained work in off-estate sectors, there are very limited alternative employment opportunities for women within the rubber plantation community. Below response from a women worker explained how employment decisions of majority of female members are shaped within the rubber plantation context, as;

"[.....]my mother also worked here in this estate. We used to come here with my mother, and I am so familiar with the work and environment. Then after I married, I started work here, since my husband's elder sister works here too"(Participant 01 FW)

This explains the restriction in women's mobility beyond estate work, which further influences women's continuous participation in rubber plantation work. As many women engage in rubber plantation is not a result of their decision; where it often influences by family tradition. She explained that she had no other choices before rubber labour as she grown up within the plantation environment where her mother, and later her husbands' family members were also engaged in work in the estate. Their exposure to rubber economy through family members can explain

as an intergenerational pattern of employment within the plantation sector. Marriage is also playing a key role in influencing the continuity of women's labor jobs within the rubber field; since through the marriage women often move into the household where other female family members also engage in the same plantation labor. Thereby, work within the rubber estate becomes a social norm which reduces women's opportunities for occupational mobility, individual choice of employment decisions, and income diversification. As a result, it negatively affects household food security, particularly in terms of access and stability due to constraining household income sources.

Furthermore, within the rubber plantation worker households, access to extra income-generating opportunities is highly gendered. Male workers are getting extra income through different alternative work compared to female workers, as explained below;

“[...]if there are any outside or extra work opportunities, then the male workers will have the opportunities more than females.” (Participant 14 EM)

This reflects the persistent gender inequalities in labor, where male workers get priorities; which can also be understood through patriarchal influences in rural plantation communities. This gendered access to additional income by male workers, may increase overall household income, still not be particularly allocated in increasing expenditure on food related concerns within the household. Thereby, limited opportunities in income access for women workers may restrict more income allocation for food, continuing challenges in household food security.

However, some findings emphasize a shift in household-decision making process when it comes to the current rubber plantation communities, where many of the households are female-headed. Participant 15 GN explains this as;

“[...]Sometimes, using money and taking money related decisions are taken by these women. Most of these households don't have a man. That's the strange thing that I noticed, because most of these women are widows, most are single person who lives alone, because men left, and then sometimes they started another new family. So this is the common situation here. When it comes to the household decisions, there is no one to interfere in most cases. So even they earn some low amount of money through the estate work, they are spending it efficiently and take decisions on this income by themselves.” (Participant 15 GN)

Findings of the study highlighted a common situation of the rubber plantation households, where number of female-headed household can be found, due to

widowhood, separation or abandonment. Although this reflects a shift in traditional patriarchal structures; it does not explain as complete or real empowerment within the household. It is often resulted through economic, social, or personal challenges due to absence of men, rather than a true-transformation of gender norms. Even though this empowerment is un-real, above statement emphasizes that within the female-headed household women efficiently spend money and taking money related decisions; often resulted in better household food security outcomes, when the absence of men.

In summary, although rubber worker women contribute significantly to household income and daily management tasks, their authority over key decisions such as in food security, continued to be constrained by deeply rooted patriarchal norms and power imbalances. Even though some changes in decision-making are visible, these changes are not particularly shaped by transformative gender norms. As a result, women's empowerment remains partial within the rubber plantation economies, while their control over household food security concern remains constrained.

5.3 Livelihood vulnerabilities and household food security in rubber plantation communities

The findings highlight significant livelihood vulnerabilities and constrained food security outcomes within the households in rubber plantation; especially due to combination of gendered and structural challenges in the employment.

5.3.1 Access to food

Seasonal challenges with limited structural support in the rubber plantation economy often result in vulnerabilities in food security among workers, as described below;

“[.....]we don't have work here in the rainy season, grocery shops will not allow us borrowing things in the rainy season. Then we don't have any way to eat, people are so much helpless” (Participant 02 FW)

Rubber tapping is highly sensitive to climatic conditions; such as during the rainy seasons, taping activities are frequently stopped, resulting complete income loss for rubber tappers, especially women workers who depend on daily wages. Even with the regular income from the rubber field activities, these communities do not

have sufficient money within their hands due to daily wage labour system in the rubber plantation sector. Seasonal challenges create a serious economic pressure on their households, and face difficulties in meeting basic nutritional needs. A female rubber tapper described how a temporary loss of income within the rainy season directly affects household food security, due to challenges in food access, as follows.

“[.....]In the rainy season, I can't work here. I don't have any other work to do. My husband also can't work with heavy rain and flooding the river banks, and he also stays at home. In those periods, we face difficulties both of us do not have work for those days. Sometimes I wanted to buy 5kg rice, but could buy only 1 1/2kg-2kg with the money that I have. “[.....]we don't have a balance diet, always. Sometimes like that.” (Participant 01 FW)

Participant 01 FW described her household situation in this climatic-dependent livelihood, which causes both herself and her husband to loss income in the rainy season. She further explains how the absence of income affects their ability to purchase food for their household consumption. In addition, restricted access to credit or unable to purchase food items from the shops on loan basis, further increase the challenge of food insecurity. This emphasizes that structural and gendered inequalities face by women workers; where women mostly rely on coping strategies such as informal credit systems. However, for instance, informal credit system often breaks down during economic stress, increasing vulnerability of these women workers to secure food within the household. This highlights, there is ongoing food insecurity within the rubber plantation households where people struggle every day to access food.

The findings highlight how low and irregular income directly impact food consumption, pushing households to reduce their daily intake. They revealed that many households experience significant challenges in accessing adequate amount of staple food, for instance above female tapper noted that, although she intended to buy 5kg of rice, she could only afford 1.5-2kg with the money available. Thereby, such conditions confirm the food insecurity at the most basic level where household struggle to meet their minimum daily food requirement. Moreover the findings below emphasize how economic challenges within the household affect their food security, particularly in access. According to the participant below;

“[.....]we don't have so much money and most of the money deduct for the fund, loans and all. Then we are just having something to cater the hunger. Sometimes I cook in the morning, and sometimes I don't. Then just buy a small thing from the shop for my

breakfast. If not in the morning eat a small amount of rice, then in the afternoon we are drinking tea sometimes, and then at night it depends if we can eat or we may not eat. Then after going back home and then just sleep without eating. Sometimes not because of the unavailability, but sometimes it feels frustrated and tired.” (Participant 06 FW)

These include deductions, loans, and other expenditure even though they have access to a monthly income. Thereby remaining income is insufficient to access a balanced food requirement for the household. In addition, many interviewees shared their experience which indicates irregular patterns of eating food within the household. This irregular pattern of daily meal consumption and total skipping of meals explains the lack of reliable access to food, often due to lack of nutritional education and a scarcity of food within the household. As a result, these households often experience food insecurity.

5.3.2 Utilization of food

Some respondents explain that they are often unable to maintain a balanced diet and consume whatever the food available within the household to cater hunger. This emphasizes the situation which meals are typically limited in variety and nutritional value that affects food security through utilization.

“[.....]sometimes we eat well, other times eat the things we have” (Participant 08 FW)

Along with these challenges, multiple coping strategies are practiced by women, such as reducing portion size, skipping meals, and purchasing fewer amounts of food, which help household to manage immediate hunger. However these strategies are not sustainable practices and which can be affected severe negative nutritional outcomes over time. According to the interviewee stated below;

“[.....]Then after going back home and I just sleep without eating. Sometimes not because of the unavailability of food, but sometimes I feel frustrated and tired.” (Participant 06 FW)

This highlights the emotional or psychological impacts of food insecurity; where one women worker explained that, she sometimes avoids meals not only due to lack of food, but also because of exhaustion. This exhaustion is mostly observed through women workers who are managing multiple roles simultaneously, due to gender based responsibilities. Thereby, food insecurity and related experiences within the rubber plantation move beyond physical challenges and it affects mental well-being of women. The stress occurred due to financial challenges and

food shortages can reduce the motivation to prepare or consume food, may further worsen the problem. Thereby this can be identified as a livelihood vulnerability due to low income, unpredictable expenses, and unstable employment which directly contributes to different dimensions of household food security. These include insufficient food quantity, irregular consumption patterns, poor dietary quality, and adapted in short-term coping strategies.

5.3.3 Food stability

In rubber plantation households, they have very limited area of land as their home gardens. This directly influence in maintaining stable food consumption within the household through subsistence agriculture, which provides year round harvest of multiple crops for household consumption. Even with this limited land, there are no or very low percentage of the community is engaging in cultivating food crops in their home gardens. For instance, one respondent discussed about her home garden with few spice crops including pepper, cinnamon and coconut which contribute to a small production for household consumption.

“[.....]We have some coconut trees, some pepper vines, and cinnamon is planted in our land/garden. We buy vegetables from the fair, and buy every other thing from grocery shop”. (Participant 01 FW)

Below findings emphasize multiple reasons which limit their ability to engage in subsistence agriculture, including time constraints, physical exhaustion after estate work, and limited interest.

“[.....]We buy everything from the shop. Even firewood is buying from the shop. I don't have a land to find firewood”. (Participant 06 FW)

“[.....]we have a small land space near our home, but because of the time problem and there is no one to do such work in my home. My husband is also sick. So I can't grow crops”. (Participant 02 FW)

Unexpected challenges such as health condition of a family member also heavily affect the workload of working member; which directly reduce the capacity of engagement in alternative work. Along with these challenges, these communities are gradually leaving agricultural activities, increase their dependency on food purchases with unstable estate income. Further, structural barriers such as limited

land access and household labor limitation reduce opportunities for subsistent agriculture, thereby affect in maintaining food stability.

According to the comment of Grama Niladhari shows that lack of land ownership is closely linked to livelihood vulnerability and food security among rubber estate workers. She described as;

“[.....]Most of them are still living in estate housing/line rooms, but there is no future security, especially because the younger generation is not working in the estate anymore. So they are worried about what will happen later. If they had their own land, they could live better and even grow some food, which would improve their life in many ways.”
(Participant 15 GN)

Most of the estate workers are living in ⁸line rooms without any land ownership, which creates long-term uncertainty and stress about their future residence. Because of that, estate workers are not investing in long-term living conditions or survival strategies. This emphasizes the importance of having ownership to the land, which would encourage workers to cultivate through home gardening. As a result, it helps decreasing the dependence on market-based food purchases and increase long-term food security for their household.

In summary, above findings demonstrate that household food access, utilization, and stability are strongly shaped by unstable and low-income employment in rubber plantation communities in Sri Lanka. This further intensifies by limited access to land to increase food stability through home gardening, the emotional burden due to tiredness and frustration, etc. Thereby, these challenges are identified as gendered and even more influential on women for their limited economic opportunities and decision-making, in food security concerns within the household.

⁸ Line rooms are linear, interconnected single-room housing units built during the British colonial period and currently owned by plantation estates. These units lack adequate space, proper sanitation, and basic living facilities for estate workers

5.4 Structural limitations and institutional support for workers in rubber plantation economy

Institutional support within rubber plantation systems plays a vital role in supporting well-being and livelihood of workers. Plantation management and related institutions provide different forms of assistance, for employees in order to focus better performance of the plantation process. Still, these institutional arrangements are operated within broader structural inequalities which limit their effective outcomes and sustainable development opportunities towards employees.

Plantation Human Development Trust (PHDT) is established in 1992, to provide different welfare services for estate workers and their households. Findings of the study highlight that the rubber plantation system collaborated with the PHDT provide different forms of formal welfare support to the workers, specially focusing on their key life situations and emergencies. These include maternity benefits, funeral payment, welfare loans, preschool and daycare facilities, and medical camps.

In Sri Lanka, female employees who are covered under the “Shops and Office Employees Act” are entitled for maternity leave of 84 working days with full payment, for any live child birth (Department of Labour, Sri Lanka 2026). This benefit is also applied to female workers in the rubber plantation industry, reflects a positive step towards equal labour rights. Through the access to income even during a child birth, support female workers in maintaining the financial ability and wellbeing of the household.

“[...]estate provides maternity payment for 84 working days with leaves. It can be, divided as two weeks before, and remaining leaves after the delivery date.” (Participant 14 EM)

There is a funeral assistant payment which is provided to support families who works in the rubber estate, during a death of an immediate family member. In addition, findings indicate that, welfare loan facilities provided by the estate welfare society play an important role as a form of institutional support for the plantation workers, particularly during their financial requirements.

“[...]We can apply for a loan through welfare society, and we can pay it in installments, it automatically deducts from the salary every monthly.” (Participant 01 FW)

“[...]They can apply for a loan up to a hundred thousand Sri Lankan rupees through estate welfare society. [...]For a funeral, if someone died in a family, we are providing a fund for the funeral. It's 50,000 rupees.” (Participant 10 WO)

This loan facility consists of two types of loan as short term and long term; which also provide immediate financial assistance in urgent expenses including food, health, or other household needs. As highlighted by the estate welfare officer, the maximum loan amount obtain is about hundred thousand Sri Lankan rupees which

depend on the requirement, decision by the estate management, and service duration of the employee within the rubber plantation. These loans are automatically deducted from their monthly salary, as installments with a lower rate of interest. In addition, findings highlight that plantation management provides childcare and healthcare services, which directly contributes to the wellbeing of the estate-worker households.

“[.....]Here in the estate we have a preschool and a daycare center, to support parent who are working here to keep their small kids until five years old....we are providing them a balanced meal....we are supporting their nutrition through the caring center....we are arranging a monthly meeting with the midwife to measure the weight and development of the estate kids....There are some kids societies to improve their skills and abilities”
(Participant 10 WO)

Preschool and daycare service can be identified as a key support system for working parents who have kids below five years old. As described by the participant, this provides care, nutrition, and pre education for small kids. Regular monitoring of child growth and development through monthly visits of midwives further support well-being of children. These activities together play an important role in reducing the care burden of working parents, thereby supporting them to effectively focusing in plantation work. Similarly, it supports enhancing children’s nutritional concerns through a balanced diet, positively influence their food security.

Estate management also organizes medical camps, which provide basic healthcare services and directing access to advanced healthcare supports for the estate workers, who may sometimes face barriers in reaching formal healthcare services. These types of institutional support through the plantation system move beyond financial assistance where heavily focus on well-being of the worker. As described below;

“[.....]We had an Ayurvedic clinic and NCD(non-communicable diseases) clinic too. We are coordinating with MOH (Medical Officer of Health), Hospital and Divisional Secretariat. We are conducting tests for TB(Tuberculosis), oral cancer, the vision tests. We keep all the records of medical reports for each and every labor, and if they need further treatments, we refer them to the hospitals and to the clinics”. (Participant 10 WO)

These support systems highlight the effort of the rubber plantation management providing some basic level, short-term social protection for workers in the context of low and unstable income. Even though institutional welfare systems are functioning, they are not providing sufficient solutions to the structural challenges within the community; in addressing livelihood vulnerabilities and food security at the household level.

Employee Provident Fund (EPF) and Employee Trust Fund (ETF) serve as important long-term institutional support mechanisms within the rubber plantation livelihoods. In below statement, women rubber worker was describing her idea about these funding schemes, as she highlighted the feeling of financial security when she access at the retirement, sometimes cannot be accessed through other casual wage labor jobs.

“[.....]When we are getting older, at the retirement we can get ETF and ETF if we work here. So it would be very helpful and very important for us. If we work somewhere as casual wage laborers we will not have something like that. So, I respect this job.”
(Participant 06 FW)

EPF is a formal saving scheme which operates to accumulate money through deducting an amount from the monthly wages of the worker 8%, and 12% from the employer, and later paid as a payment at the retirement or leaving the employment. However, this deduction from monthly wages directly reduces the available income within the household, which negatively affect households' ability to meet daily needs, including food consumption. This financial challenge is significantly affect low-income and women-headed households who are already experiencing financial struggles, which highlighted below.

“[.....]They deduct money from our salary, every month. Then they will give it to us at the retirement. [.....]When I resigned from this job because of a personal reason, I didn't get the service fund. Because there was a shortage in the service months, it should be continuous work for 5years to get the service fund. Then again, I joined; but now I have registered in a new number. I have to work complete five years to get that money again” (Participant 07 FW)

Further she shared her experience in obtaining the ETF (Employee Trust Fund) after career break situation. When a worker left the employment incomplete work duration, making them not eligible for accessing total amount of fund; and re-joining under a new employment number may forcing them to continue work for another five years in minimum. This emphasizes how strong institutional rules are acting as structural barriers, on workers in accessing benefits through employment. Particularly this has a severe impact on women workers who are often struggling to access off-estate employment or income opportunities.

Wage system within the estate further increases the economic insecurity even with a regular and permanent employment.

“[.....]If we don't cover the given target of the yield under our name, we only receive “waru” payment” (Participant 01 FW)

Above statement explains that workers are required to meet the fixed target of tapped latex (approximately 6-7kg), to receive a full daily-wage, while failure to meet this may receive half of the daily wage payment (“waru” payment). This rule of payment is not considering other external facts such as, weather condition or changes in plant metabolism, leading them accessing unpredictable and unstable income. This reflects a structural issue in the plantation labour system, how rigid wage policies create income instability and economic vulnerability for workers. Furthermore, the interaction between workers and management highlights a strong social hierarchy that move beyond economic status, as below;

“[.....]They don't normally use any safety boots, caps, or gloves. But some are using them. Because now things are different, earlier they did not have lift their head even to talk with us. They were maintaining a different status. Earlier, they were not allowed to wear

different clothes even, ⁹cheeththe and hattaya is the only dress allowed to wear, but now it's not like that. Now we can't do it anymore.” (Participant 09 EO)

According to the field officer, in the past, estate workers would not raise their heads when speaking to the estate officials, and had to wear assigned types of attire (cheeththe and hattaya) to maintain their lower social status, while officials adopted the Western styles of dress codes, emphasizing a deeply rooted hierarchical power and authority. Even though, this stratification is not fully maintaining at present, this reflects not only formal organizational hierarchy, but as a social stratification of people due to power dynamics. This marginalization negatively affects rubber plantation workers; thereby limits their opportunities in accessing resources, livelihood outcomes, and overall well-being. Below statement highlights the highly centralized nature of decision-making within the rubber estate.

Authority in decision-making is concentrated within the management, while women workers engage in labour tasks without participation in decision-making, leaving women workers with limited opportunities for their empowerment.

“[...]Field officer instructs us what to do, and then we are doing things according to his instructions.... We do what we were told for the day” (Participant 02 FW)

This emphasizes the arrangement of power inequalities within the labour system in rubber plantation economy, where women workers are often positioned in subordinate positions both within the plantation hierarchy and the patriarchal society. Due to this continuation of inequalities not only limit their autonomy and agency, but also affect household food security through restricted resource access and income control.

In addition, government-funded support mechanisms such as “Samurdhi” and “Aswesuma” act as general social protection initiatives targeting economically low income level households. Other forms of supporting arrangements such as, kidney disease allowance, disability allowance and food and subsidy distribution programmes during pandemics (COVID-19), also demonstrate the government’s role in welfare services. As described below;

“[...]Samurdhi and Aswesuma, are normally giving to the people in low income families. And there are some other funding as, kidney disease allowance, disability allowance, so on. Earlier we had some programs with the government funding to provide a nutritional sack or a pack of grocery items, in Covid 19 period”. (Participant 15 GN)

However, these programmes reflect general welfare services approaches, where assistance is provided based on income level or vulnerabilities. Thereby, specific challenges faced by rubber plantation communities including women workers, remain partially addressed. This indicates the gap between general welfare policies and actual needs of particular labour group within the rubber plantation.

⁹cheeththe and hattaya is a traditional Sri Lankan female attire, mostly common among the rural communities, which include blouse for the upper body and a wrap-around cloth for the lower body

Although, most of the rubber plantation workers are benefited from these supportive systems, underlined structural issues specifically face by these communities are not effectively resolved; thereby this identifies as short-term support rather than a sustainable solution.

Similarly, seasonal welfare support is available for workers during the rainy season as they don't have a stable income during this period. Female rubber worker shared her ideas as;

“[...]But as a loan, they will deduct money from the salary. If we have money in our welfare society account, they will give us grocery items. This time, they also gave us a pack of groceries cost around 3,000 rupees” (Participant 01 FW)

According to that, assistance through providing a pack of grocery items is the most common supportive method often connected with the loan system of the welfare society. The cost of these items is deducted from salaries of coming months of employees. This highlights the partial and conditional form of institutional support which provides a temporary relief while creains their economic vulnerability unaddressed.

In conclusion, the findings emphasize that household food security in rubber plantation livelihoods is shaped by structural and gendered inequalities, with limited and temporary relief from institutional support systems. Rigid wage rules, debt mechanisms, and limited decision-making power, especially for women workers, cause income instability. As a result, these intersecting inequalities continue to increase livelihood vulnerabilities and persistent food insecurities within rubber plantation households.

5.5 Agency, adaptation, and coping strategies in managing household food security

Household Food Security in rubber plantation livelihoods is shaped by the balance between gendered and structural constraints and women's everyday agency. Women within these communities often respond to these challenges through adaptation, negotiation, and coping strategies, instead of silently accepting these vulnerabilities. The findings on women's financial practices within rubber plantation households highlight a form of coordinated household financial management under economic uncertainty. A statement from a female worker indicates that both husband and wife contribute their income and allocate them in different complementary household needs, as below;

“[.....]I have some jewelry at the pawning, so I have to pay the money for that every month. Then, I am paying the telephone bills, electricity bill, and so on. Then, husband’s salary usually spends on other household expenses.” (Participant 01 FW)

This indicates a shared financial management, through joint decision-making and effective use of limited resources within the household. Additionally, pawning jewelries as a solution for short-term cash requirement; which can be understood as their common situation of financial difficulty and how these adaptive strategies are used to maintain stability within the household. Agency is exercised through negotiation and coordination among household members when managing household expenses, also demonstrates their mutual responsibility in supporting livelihoods under uncertain conditions. Overall this enhances women’s ability to make decisions to support household food security during financial struggles.

Within the work environment women workers sometimes show their agency through negotiation and adaptation, as described below;

“[.....]If I cannot come to work, I call the field officer and inform him, that’s all. We don’t have to ask for a leave earlier. If I want to finish work earlier, then I tap the trees, collect the latex and go. Other tappers are helping to strain the latex and hand it over to the transport even I am not here. It's really supportive and flexible here.” (Participant 01 FW)

In plantation labor work, women negotiate flexibility in their work schedules through direct communication with field officers, and rely on mutual support from other workers to manage tasks. This reflects their everyday forms of adaptation rather than sticking with institutional rules. This allows them to balance their work responsibilities with personal and household responsibilities thereby influencing time poverty through triple roles.

Along with these negotiation practices, in the rainy season, workers are adapted with coping strategies to manage income loss, since tapping is not practiced in the rainy period. Some workers are performing alternative forms of casual wage work to compensate for the lack of income from rubber estate, highlighting their active effort to secure income under vulnerabilities. However, such opportunities are not available always, or sometimes gendered which limit their ability to manage the challenges effectively.

“[.....]If it's raining, we can’t do tapping. So then we pluck some tea, if they allow us”
(Participant 11 FW)

For instance, if there any availability for sundry work or tea plucking (in the other section of the rubber estate, which is under tea plantation), few workers will have opportunities to work when tapping is not operating. Outside labour work are often available for male workers, such as in the construction field or paddy cultivation. This highlights how gendered disparities often make women more vulnerable, while allowing male workers to access more stable income generating positions. Thereby, this constrained opportunities in income access due to seasonality, women face vulnerabilities in securing food within the household. However, some workers within the rubber plantation described their strategies in managing economic challenges and food security concerns, described as follows;

“[.....]When I am in a difficult situation, I just ask some money from the person where I worked earlier. Then they give me some money. After I get the salary I repay them. Sometimes I borrow things from the grocery store, pay the money later” (Participant 06 FW)

“[.....]Sometimes I borrow money from the welfare society or from outside loaners. Then I pay it back throughout the year” (Participant 07 FW)

These women are relying on informal social networks, such as borrowing from former employers or outside lenders to access financial support highlighting the gaps between income and formal credit access. However, access to informal credit is often insecure and conflicting, which cause high-interest responsibilities and creating cycles of debt. Additionally, supportive mechanisms through welfare society, such as food subsidies make temporary relief; but often deduct the cost from the salaries of employees, pushing these workers in severe economic vulnerabilities.

Findings from the study demonstrate women’s agency and capacity to adapt in challenging situations. They are usually managing household needs and making decisions through short-term day-to-day survival strategies that ensure household resilience with limited income and external support. Below statement explains this as;

“[.....]They are not thinking about the future. They don't manage these things. They just earn and only eat for today. Then next day, they will have to earn somehow, and find something to eat. They are like that” (Participant 15 GN)

In addition, community-based adaptation and informal support networks are used by women within these communities, as a key coping strategy. A female rubber worker described as;

“[.....]We share some bunches of banana, jackfruit, or cassava with neighbors...just like that, and we have also some banana trees too, in our land” (Participant 03 FW)

The sharing of food items such as banana, jackfruit, and cassava among neighbors highlights collective resilience and mutual sharing within these communities. In addition, cultivating small crops within the limited area of home gardens shows women’s active role in enhancing food security. While visiting the area of worker’s houses, I also noted some fruit crops such as citrus trees, ¹⁰gotukola plants, and banana trees are grown within their courtyards (Observation 04). This reflects agency at the household level, but it is shaped by structural limitations such as restricted land access and low economic access.

Although this production is not sufficient to meet the food requirement for households, it still contributes in increasing food availability within the household. In addition, Grama Niladhari described about the livelihood diversification initiatives practice by these communities as an adaptive strategy mentioned below;

“[.....]They don't cultivate many things, but I have seen that these women herd some animals, like chickens, goats, or sometimes cows. Also within their limited space, they sometimes cultivate things like a banana tree or a mango tree or any small crop, but they are not in a long-term cultivation mode” (Participant 15 GN)

Engaging in animal husbandry and limited cultivation allows households to supplement both income and food consumption. However, the absence of long-term and large-scale agricultural practices indicates challenges such as lack of land ownership, capital, and institutional support. While these activities emphasize women’s agency and ability to access to food within the household, still not significantly affect their overall food security outcomes.

Along with these everyday coping strategies and adaptive practices, a type of long-term agency can be observed through gradual shifting of women and younger generations from rubber plantation sector to alternative types of employment. This explains below as;

“[.....]I can say the 10% of the people are working within the rubber estate, but all the others are working some other or outside work” (Participant 10 WO)

¹⁰Gotukola is a leafy green vegetable commonly used in Sri Lankan meals

Short-term coping strategies focus on managing immediate vulnerabilities within the existing structure, while this shift support workers to move beyond the challenges in estate-based livelihoods. This out-movement of workers suggest that, existing institutional support is not sufficient to address these challenges where diversified income sources outside the plantation sector can strengthen economic resilience and improve household food security.

6. Discussion

This study examines the dynamics in gendered dynamics in labour and structural limitations that influence women's agency in shaping household food security within Sri Lankan rubber plantation communities. The Feminist Political Ecology perspective is used in the data analysis to examine the relationship between women's agency and food security outcomes in plantation households. In the following section, the three research questions will be revisited and discussed both on the basis of the empirical findings and the reviewed literature.

The findings emphasize that women's everyday practices are strongly shaped by complex structural and gender-based inequalities, while women within the rubber plantation community exercise agency through coping strategies including informal loans, changed food consumption patterns, and rely on short-term welfare support. Thereby, food insecurity within rubber plantation households is not simply identified as a consequence of unavailability of food; but it closely connects with power dynamics which limit access, utilization, and stability of food.

6.1 Gendered labour inequalities shape women's participation in triple roles in rubber plantation communities

Addressing the first research question on how women's participation in productive, reproductive, and community roles shape within rubber plantations in Sri Lanka; findings reveal that gendered labour relations are central in sustaining household food security. Female workers are positioned in structurally constrained roles within rubber plantation livelihoods, and often marginalized within formal labour hierarchies; still, they perform a key role in maintaining household food security. Their labour extends to productive, reproductive, and community aspects, creating a persistent triple burden. This combination of labor roles affects both income generation and household management activities, ultimately impact on household food security (Intesar & Parez 2024; Gunarathne 2024).

Agarwal (1994) highlights that in many rural economies women's work is often undervalued, because of gendered divisions of labour. Similarly, in rubber plantation economies, women's labour is highly concentrated in low-paid and

physically demanding tasks, while their reproductive responsibilities often remain unrecognized within formal economic structures (Gunetilleke et al. 2008). This invisibility of reproductive labour within multiple overlapping roles along extended working hours creates time poverty and physical exhaustion in women workers (Samaraweera 2025). This situation negatively affects overall household well-being and food security outcomes.

Women's increased participation in income-generation activities within rubber plantations, compared to men, has not led to visible empowerment. Even women are regularly contributing to the household income, their control over resources and decision-making remains limited. In contrast, men's income generation within rubber plantations is often irregular, whereas women provide more consistent labour while continuing to bear the primary responsibility for unpaid care work. For instance, findings from participant 01 reveal that, she engages in regular tapping activities, while her husband depends on irregular wage-labour, leaving her to manage both income generation and household responsibilities simultaneously. This illustrates how broader gender inequalities including patriarchy, in the division of labour remain unchanged; although women have increased economic contributions in rubber plantation communities (Arachchi 2024; Kurian & Jayawardena 2017).

Findings of the study highlight the context of underlying gendered inequalities in labour allocation within rubber plantation work. In the rubber tapping process, tasks are allocated equally among workers without considering gender, highlighting a formal equality of work task division. However, when it comes to the sundry workers, this equality cannot be observed. For instance, participant 09 explains that harder tasks are typically assigned to male workers, as these are socially categorized as "male work". Even though male sundry workers are not working within the estate, these tasks are allocated to two female workers to compensate for the lack of physical strength (Elmhirst 2015).

In relation to household food security, women's role is central; as they are primarily responsible for food preparation, budgeting, and ensuring overall household food security. Findings of the study indicate that women often prioritize ensuring immediate household food security under limited financial conditions, by reducing the portion size, relying on low nutritious food with high affordability. In summary, gendered labour inequalities position women workers in sustaining household food security in rubber plantation communities, while their multiple labour roles remain undervalued; thereby limiting their time, agency and control over resources.

6.2 Structural inequalities and patriarchal power structures shape livelihoods, decision-making and household food security

In addressing the second research question on, how structural inequalities and patriarchal norms influence food security outcomes in the Sri Lankan rubber plantation communities, key structural challenges are identified as, low and unstable wages, seasonal income fluctuations, limited access to land, and inadequate institutional support. These structural challenges operated within patriarchal norms, such as male authority in household decision-making, control over household resources, gendered division of labor, etc. These inequalities create economic insecurities, thereby affecting women's ability to secure food in rubber plantation communities.

Findings of the study highlighted that, how a female rubber worker's employment decision was influenced initially by her mother, and later her husbands' family; reflecting her limited choices within rubber plantation economy. Social norms and patriarchal power relations shape women's participation in plantation labour through intergenerational patterns and family expectations, limiting their ability to make independent employment choices (Uyangoda 1995). This dependency on low-paid and inflexible plantation work restricts women's access to alternative livelihoods and more stable income sources. This constrains their opportunities in better income access and livelihood options. Thereby, these structural inequalities position women as managerial roles focusing on sustainable daily maintenance, rather than a transformative role in decision-making of resources particularly within the household (Kabeer 1999) which can negatively influence on overall household food security concerns.

Furthermore the findings emphasize limitations in land ownerships and lack of subsistence farming opportunities resulted in restricted alternative food production practices through home gardening. Thereby it increases the dependency on wage labour and market-based food purchases affecting household food security. Schling and Pazos (2024) also emphasize the requirement of land ownership for women workers to increase resource access and thereby achieving better food security outcomes within the household. Further, housing insecurity is not only identified as a challenge in living space or individual choice, but also a broader livelihood constraint which directly affecting food security through limiting resources for producing their own food (Ellis 2000; FAO 2024; Mumah et al. 2025). Uyangoda (1995) identified current plantation economies are resulted from historical labour regimes with broader structural inequalities. Thereby, in the current study FPE perspective understand this scenario, as power relations and

institutional arrangements shape access to resources and opportunities, particularly through social separation and marginalization of workers, particularly women (Kurian & Jayawardena, 2017; Gunetilleke et al., 2008; Uyangoda 1995). In addition, institutional interventions such as welfare schemes and subsidies are often identified as generalized support systems, focusing on immediate relief to plantation workers which do not specifically address plantation labour challenges (Banerjee & Duflo 2011). Thereby, social protection schemes in labour-intensive sectors often require a balance between long-term financial security and short-term livelihood needs, focusing on structural inequalities in labour roles and income distribution (FAO 2024; ILO 2023).

Findings further demonstrate that, food availability is not the primary issue in the current scenario, where access, stability, and utilization of food emerge as the most critical dimensions of vulnerability. Sen (1985) highlights hunger is not only caused by food shortage; but because of the restrictions in access due to economic, social, and institutional challenges. The Central Bank of Sri Lanka (2024) also highlights the economic vulnerability of plantation workers due to limited social protection. In summary, these structural dynamics cause unstable and insufficient incomes, creating persistent uncertainties in food security within rubber plantation economies.

6.3 Women's agency and adaptive strategies in navigating livelihood vulnerability and household food security

In related to the third research question on coping strategies in managing household food insecurity in rubber plantation contexts in Sri Lanka; findings of the study demonstrate that women are practicing a range of coping and adaptive strategies. These strategies include managing household finances, borrowing from informal networks, engaging in small-scale cultivations within the limited space, sharing food among neighbors, and seeking alternative employment opportunities in off-plantation sectors such as in apparel industry. The Feminist Political Ecology perspectives emphasize that women's everyday agency is exercised through negotiating of existing inequalities, highlighting women's central role in sustaining livelihoods and household well-being in rubber plantation communities. According to the findings, women's agency is significantly visible in decision-making in daily practical needs such as food management and household budgeting. This includes decisions on variety, amount and quality of food; for instance, which food to eat, how much to purchase, and what are the meal plans. However, their ability to influence strategic decisions such as in

employment conditions and getting institutional support remains limited. Thereby, this agency is “partial” and generally adaptive rather than transformative. This can be identified as a condition where women manage existing challenges, without addressing the underlying power structures and achieving long-term empowerment (Guérin & Venkatasubramanian 2022; Kabeer 1999).

In relation to household food security, short-term coping strategies such as borrowing money and food items, sharing food, and rely on reduced diets, play a crucial role in maintaining daily food requirements. Women within the rubber plantation households are adapting with the challenges, emphasizes their agency under constraints (Devereux 2001; Kabeer 1999). The movement of female members in rubber plantation households, towards employment opportunities in the apparel industry shows a specific step towards women's empowerment. Their choices and acts towards livelihood options with better income opportunities reflect some agency, and their adaptation to the limitations of plantation work (Kabeer 1999). This highlights how women are seeking for better opportunities with higher economic access; thereby potentially supporting households to maintain food security and well-being. Workers within rubber plantation communities often rely on daily income, and practice immediate consumption patterns due to a lack of sufficient income and long-term planning capacity. This reflects the argument which low-income households often prioritize immediate needs due to uncertainty and resource constraints (Banerjee & Duflo 2011). In summary, findings of the study emphasize that women use these coping strategies to support household food security within their limited agency due to structural and gendered constraints in rubber plantation context.

7. Conclusion

This study provides grounded empirical evidences on how household food security in the Sri Lankan rubber plantation communities is shaped by a combination of gendered labour relations, structural inequalities, and constrained women's agency. The findings of the study reflect that even when men's employment is irregular, women's relatively stable participation in income generation does not lead to a reallocation of domestic responsibilities. This emphasizes that their contribution to income does not reduce their workload or increase their influence over household decisions, including food security concerns. In the rubber plantation context, a form of hidden inequality is operating within formal gender-neutral work tasks, especially among women workers, where it is seen as "male work". Similarly, women's continuous engagement in plantation labour is particularly shaped by social expectations, family ties, and lack of alternative employment opportunities, rather than individual choice, highlighting their constrained agency. The agency of women within the rubber plantation household is situational, where it only appears in the absence of male partners due to widowhood or abandonment, and it reflects a necessity rather than a transformation. Food insecurity within these households moves beyond physical access and affects women's mental well-being. Financial pressure and income uncertainty create psychological stress in women in reducing motivation to prepare meals, which ultimately leads in irregular eating patterns and poor diets. According to the findings, food insecurity through the dimensions of access, utilization, and stability are closely linked with unstable income, limited savings, and dependence on food purchases. In addition, the lack of land ownership rights resulted by historical and hierarchical marginalization of estate workers highlights a negative effect on subsistent agriculture practices as a potential way to maintain household food security. To address these challenges, Plantation Human Development Trust is offering social supports through maternity benefits, preschool services by providing care and nutrition for kids in plantation worker families, and food aid through grocery packs, identified as short-term supports for livelihood challenges. However, these initiatives often fail to address underlying structural inequalities including unstable income, seasonal vulnerability, lack of land ownership, and lack of specified social security systems. Therefore, the study suggests for policy recommendations to ensure fair and stable wages, improved land access, and strengthen gender-responsive social support systems to enhance household food security outcomes through reduced care burdens, and meaningful empowerment among women workers in rubber plantations.

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Popular science summary

This study shows that household food insecurity in Sri Lankan rubber plantation communities is driven by interconnected social and economic inequalities. Although women play a crucial role in household income generation through more stable employment than men, they continue to perform most household and caregiving responsibilities and have limited influence over household decisions. Their participation in plantation work is often shaped by social expectations, family obligations, and a lack of alternative jobs rather than personal choice. Household food insecurity also affects women's mental well-being, as financial stress and uncertain incomes reduce motivation and capacity to prepare nutritious meals, leading to irregular eating habits and poor diets. Insecure wages, dependence on purchased food, and lack of land ownership further weaken household food security. While existing support programmes such as maternity benefits, childcare services, and food aid provide short-term relief, which is insufficient in addressing deeper structural challenges. The findings highlight the need for fair wages, better access to land, and gender-responsive social protection policies that reduce women's care burdens and promote meaningful empowerment in plantation communities.

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Appendix 1

Interview Guide

Title: Invisible hands behind empty plates: The Influence of Gendered labour and Structural Inequalities on Household Food Security in Rubber Plantation communities in Kalutara District, Sri Lanka

Researcher: Charuni Ranaweera, Department of Urban and Rural Development, Swedish University of Agricultural Sciences, Uppsala, Sweden.

Aim/purpose of the study: This study aims to explore how gendered labour relations and structural inequalities influence women's involvement in rubber plantation and how this relates to household food security in rubber-producing communities in the Kalutara district, Sri Lanka.

Methodology: Data collection of this study will be mainly done through face-to-face interviews and participant observations. Interviews will be done with the rubber plantation workers, especially with the female workers; and additional interviews with male rubber workers, rubber field officer, estate manager, *grama niladari*, and welfare officer. This questionnaire includes daily labor activities, in both household work and rubber production work, food security related information, training and development programs for rubber workers, and other supportive systems within the rubber plantation economy.

Introduction: I am Charuni, a Master's student from Swedish University of Agricultural Sciences. I am conducting my research on women in rubber cultivation on women's agency and household food security in Kalutara District. This interview is voluntary and you can freely express your answers. If you want skip the question and stop the interview, you can withdraw participation at any time. However, if you consent verbally or written-way, you are agreed to provide information for the data collection process. Your responses will be confidential, and your information will be anonymous in the final research. The interview will take about 45-60 minutes, I will ask questions around your daily experiences on household work, rubber plantation work, and questions are connected with household food security.

(A) For female workers (10)

➤ **Introduction**

1. Can you tell me about yourself and your household?

(Open question to introduce their own-self and background if they like to share (name, age, family, other... here through purposive sampling I have already selected women who worked in rubber plantation)

2. Can you describe a typical day in your life (in the household and in the rubber plantation?) (What kind of activities, how many hours spend within the field, what are you doing in your free hours, if there are any other activities after rubber plantation work?)*

➤ **Women Empowerment Framework (WEF)**

3. Do you have income from rubber production? How do you use it?

4. Do you have access to tools and equipments in rubber tapping/production?

5. Do you have access to credit, bank services, and financial support if needed? What challenges do you face in accessing these?

6. Have you received any training/education related to rubber production? What are they?

7. Other income/livelihoods options-and related supporting programs?

8. How do you manage your time between rubber production work, household work, resting/ for personal? What issues do you face?

9. Is there an unequal labour burden on care work for your household (like childcare, cooking, cleaning, washing?) why? How do you feel about it?

10. Who decides how income from rubber is spent?

11. Who decides where rubber planted?

12. Who decides on rubber tapping?

13. Who decides when and where to sell?

14. Do you feel you can freely express your opinions in these decisions in your household? Why or why not?

15. Have you ever disagreed with a household decision related to those above? What happened? (Negotiated/ influence on it/neglected....etc.)*

16. Working in rubber changed your role or status in the household?

17. Improved your life? If yes, in which ways? Or has your workload is affected

(increased/decreased) by rubber production work?

➤ **Feminist Political Ecology (FPE)**

18. What social or cultural expectations exist about women's roles in your community? What do you think about them? (any community restrictions, norms, beliefs, other?)
19. How does this balance of plantation work/care work/community obligations ("Triple burden") affect your health (physical/mental), time, and other?
20. What changes can you see/experience between the past and present? (in the rubber plantation, related to food security, women's changing roles, solutions/supports for triple burden)
21. Is there anything else you would like to share about your experiences?

➤ **Four pillars of food security (access, availability, stability, utilization)**

22. How do you access food? (purchases/subsistence/mixed/other)
23. Have you ever experiencing in,
 - I. food unavailability in the household, insufficiency (not enough for all the members of the family,
 - II. lack of a balanced diet,
 - III. Any changed food patterns/absence food if there are any, how long?
24. Coping strategies to solve above, if there are any? How did they affect/those strategies have benefited?

(B) For male workers (03-04)

➤ **Introduction**

1. Can you tell me about yourself (your family, how long you have been working in rubber, anything else would you like to share?)
2. What does a typical day of your life? Daily routine? (rubber work, at home, rest time,

community work,...etc.)

➤ **Women Empowerment Framework (WEF)**

3. Do you and your wife earn income from rubber work? (Do you share them between you?)
4. If your household needs money, do you have access to credit, savings? How about your wife? (Who normally handle these?)
5. Have you and your wife attended/joined any training support programs? What types? (Who usually attends, why?)
6. How do you and your wife manage your time between rubber work, household work, child care, and rest?
7. Is there an unequal labour burden on care work for your household (like childcare, cooking, cleaning, washing?) why? How do you feel about it?

8. Who usually make decisions about spending money and rubber-related work (planting/tapping/selling/other?) Follow-up: how do your wife involve in these decisions?
9. Have you and your wife ever had different options about these decisions? If yes, how did you handle that? Can you give an example?

10. Do you feel rubber work has changed your wife's role in the household? In what ways-positive/negative? (workload/ financial independence/ community involvement/ other)

➤ **Feminist Political Ecology (FPE)**

11. Beside rubber work, what kind of activities does your wife usually do? (Ex. childcare, cooking, cleaning, eldercare, subsistence farming, and washing clothes- do you help with any?)
12. What are the main tasks expected for men and women in your society? What do you think about that?
13. How these tasks (triple burden) effect on household food security? (Access, availability, utilization, stability), health and wellbeing?

➤ **Four pillars of food security (access, availability, stability, utilization)**

14. How do you access food? (purchases/subsistence/mixed/other)

15. Have you ever experiencing in,

- I. food unavailability in the household, insufficiency (not enough for all the members of the family,
- II. lack of a balanced diet,
- III. Any changed food patterns/absence food if there are any, how long?

16. Coping strategies to solve above, if there are any? How did they affect/those strategies have benefited?

(C) For rubber Extension Officers (01)/ Rubber Welfare Officers (01)

➤ **Introduction**

1. Please describe your role, responsibilities, and experience in the rubber sector in Kalutara.

➤ **Women Empowerment Framework (WEF)**

2. In your opinion, do you think women have equal access to,

- I. land,
- II. training,
- III. subsidies,
- IV. financial support

3. How gendered power structures (patriarchy) affect women's access to resources?

4. What policies or programs currently support women in rubber plantation systems?
(Simplified way of questioning to get stories/lived experiences; rather than short answers for these)

5. How do you observe women's participation in rubber production and household decision-making? Do you think is there any effect on food security? (This comes under the theme "food security", connecting here will easy to answer?)

6. From your experience, which gender-based power structures (what controls women's ability to make decisions)

<p>7. Do you think women's roles and positions in rubber plantation households have changed over time? In which ways?</p> <p>8. If there are any, how do these changes affect women's wellbeing, productivity, and status within the household?</p>
<p>➤ <u>Feminist Political Ecology (FPE)</u></p>
<p>9. How do you observe women's workload in rubber farming households?</p> <p>10. How do social and cultural norms influence women's labor roles in rubber plantation community?</p> <p>11. What challenges these women face in balancing rubber work, household work, and community obligations? And how they affect women's health and everyday life?</p>
<p>➤ <u>Four pillars of food security (access, availability, stability, utilization)</u></p>
<p>12. How do gender relations within rubber plantation household influence household food security?</p> <p>13. What gaps do you see in addressing women's labor burden and food security?</p> <p>14. How do coping strategies used by women affect household food security?</p> <p>15. What recommendations and institutional changes would you suggest to improve women's participation, working conditions, and household food security?</p> <p>16. Is there anything else you would like to add from a policy or development perspective?</p>

<p><u>(D) For Estate Managers (01) and Village Administration Officers (01)</u></p>
<p>➤ <u>Introduction</u></p>
<p>1. Please describe your role, responsibilities, and experience in managing/conducting administrative functions in rubber estates in Kalutara.</p>
<p>➤ <u>Women Empowerment Framework (WEF)</u></p>
<p>2. In your opinion, do you think women workers have equal access to,</p> <ul style="list-style-type: none"> I. Land or rubber production related assets II. Training and skill development opportunities III. Subsidies or welfare programs IV. Financial services or support mechanisms

<p>3. What factors influence women’s access to these resources in rubber estates? (Household gender roles, social norms,...etc.)</p> <p>4. What policies, programs, or management practices currently support women who are working in rubber estates? Do you aware of anything offers through government, or your organization? Explain?</p> <p>(Start with simple food security related questions to get stories, focus broad information on rubber labor burden, and then gender)</p>
<p>5. Do you think these women have opportunity to express their ideas/opinions on household or rubber production decisions?</p> <p>6. If yes, do you think this relates to household well-being or food security? (This comes under the theme “food security”, connecting here will easy to answer?) From your experience, which controls women’s ability to make decisions?</p>
<p>7. Have you observed any changes over time in women’s roles or responsibilities within rubber estate households? If yes, in what ways?</p> <p>8. How do these changes appear to affect women’s wellbeing, productivity, or position within their household or community?</p>
<p>➤ <u>Feminist Political Ecology (FPE)</u></p>
<p>9. How do you describe women’s workload in rubber estate households, considering both estate work and household work?</p> <p>10. How do social and cultural norms influence women’s labor roles in rubber plantation community?</p> <p>11. What challenges these women face in balancing rubber work, household work, and community obligations? And how they affect women’s health and everyday life?</p>
<p>➤ <u>Four pillars of food security (access, availability, stability, utilization in relation to rubber)</u></p>
<p>12. From your observations, how do household roles and income patterns in rubber estate families influence food security?</p> <p>13. What gaps/challenges do you see in addressing women’s labor burden and food security?</p> <p>14. What coping strategies particularly used by women in related to income/food insecurities? How do these strategies affect household food security?</p> <p>15. What recommendations and institutional changes would you suggest to improve women’s participation, working conditions, and household food security?</p> <p>16. Is there anything else you would like to add from a policy or development perspective?</p>

Appendix 2

AI use disclosure statement for Master thesis in Rural Development- 2026

On the course EX0889

AI disclosure statement

During preparations the following AI tool has been used:

- Google Gemini
 - The purpose of the tool is to translate written documents in Sinhala to English, and to translate English interview guidelines and consent forms into Sinhala.
 - The following documents were translated using Google Gemini: “Rubber Research Institute of Sri Lanka (2001), and my own interview questions format (English-attached in Appendix 1)”
 - I have revised the translated document by re-reading the document by myself as a native Sinhala speaker to verify the correctness of the translation.

- Zotero
 - The purpose of the tool is to reference the sources used in the research.
 - I have revised the results and finally added some references manually

Reference:

Google.com (2026). *Gemini* (3.1 version) [Large multimodal model]. <https://gemini.google.com>

[Zotero \(2026\). Zotero 9 for windows.](#)

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