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Disappearing Forests, Can't Silence Us

A Qualitative Case Study on Deforestation and Rural Women's Livelihoods in Mbanaayili,
Ghana.

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Abstract

Deforestation has wide implications for the environment and especially for those who rely on it for survival. Rural women in many parts of the world often carry a lot of responsibility in gathering resources and maintaining the livelihoods of their families yet face disproportionate impacts due to limited control and access to these vital resources. This qualitative case study aims to give the rural women of Mbonaayili, Ghana a platform to voice their lived experiences and perspectives on deforestation and how it impacts their livelihoods. To understand the lived experiences, ten semi-structured interviews and one focus group discussion were conducted. To examine this issue a comprehensive approach was required in order to address the root causes of deforestation while applying a Feminist Political Ecology theory and the Capability Approach. The result of the study shows how intertwined deforestation and gender inequality become in the daily lives of women. It further highlights the discrepancies in society that allow such inequality to flourish. Lastly, the findings indicate the critical importance of women's involvement in decision-making processes, suggesting that their inclusion could facilitate sustainable forest management practices.

Key words: Deforestation, Livelihoods, Women, Feminist Political Ecology, Capability Approach, Forest Management, Ghana

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List of Abbreviations

MoFA	Ministry of Food and Agriculture
EPA	Environmental Protection Agency
Ha	Hectares
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
FAO	Food and Agriculture Organization of the United Nations
UNDP	United Nations Development Programme
FPE	Feminist Political Ecology
NGO	Non-Governmental Organization
SDG	Sustainable Development Goal

1. Introduction

Forests are crucial ecosystems for fighting climate change, supporting livelihoods, and protecting biodiversity (World Resources Institute, 2024). With the world facing a “final warning” on the climate crisis, reducing deforestation is critical. Deforestation, which refers to how forests are converted to another land use in long-term or permanent loss of the tree canopy below a 10% threshold, is one of the most cost-effective land-based measures for mitigating climate change (UN FAO, 2001 in Runyan & D’Odorico, 2016, World Resources Institute, 2024). 1.6 billion people, including nearly 70 million Indigenous Peoples, rely on forest resources for their livelihoods (Ibid.). Forests cover 3.8 billion hectares, roughly 30 % of the Earth’s land surface (FAO, 2010 in Runyan & D’Odorico, 2016). Furthermore, they play a major role in determining the regional and global climate and provide resources essential for the social, economic, and cultural development of several civilizations (Runyan & D’Odorico, 2016). The overuse of forests has been linked to the fall of several civilizations and it is said that it has triggered the collapse of Viking, Maya, Anasazi, and Rapa Nui civilizations (Diamond, 2005; Turner and Sabloff, 2012 in Runyan & D’Odorico, 2016). Central to deforestation remains the people it affects and how they struggle to make their lives function in the face of these rapid changes. West Africa is particularly affected, labelled as a “vulnerability hotspot”, primarily because it relies on rain-fed agriculture and its struggle to adapt to shifting climate patterns (Antwi-Agyei & Nyantakyi-Frimpong, 2021).

Recent research shows that if forest degradation and deforestation continue at the current rate, Ghana’s forests could disappear in 25 years (Addo-Fordjour & Ankomah, 2017; Ankomah et al., 2019; Boafo, 2013; Oduro et al., 2014 in Ankomah et al., 2022) Not only does deforestation affect climate conditions, but it also further impacts the people dependent on them. Disparities in society become even more prominent when external conditions such as deforestation take place. In the Upper East Region of Ghana, the land tenure system is heavily male-dominated despite decade-long government efforts to promote gender equality through the approval of laws and policies (Nuhu & Matsui, 2022). This imbalance further correlates with the lack of women’s representation in national, regional, and global politics. The disparity becomes even more visible in remote areas where women are secluded from decision-making processes (Ibid.). Thus, deforestation does not affect all people equally and the capacity to respond to it may be constrained by unequal

distribution of rights, resources, and power. In Ghana 46,4% of women work in primary agricultural production and in the Upper East Region, this number increases to 80% of women (Ibid: 2). Although women constitute most of the labour force in agriculture, they are yet to have access to and control over land. This disparity is influenced by land inheritance customarily going through a patrilineal line. Thus, the vulnerability of the area to climate extremes and deforestation is particularly affecting rural women. Given the current increased rates of deforestation and the impact it has on people's livelihoods, it is crucial to amplify the voices of those who are affected in the hope that their perspectives can help inform sustainable forest management. In this context, livelihood refers to the definition by Robert Chambers and Gordon Conway who define livelihoods as "a livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living" (Shangpliang, 2012: 479). To that extent, this thesis seeks to give insights into the lived experiences and perspectives of the affected women in Mbonaayili, Ghana.

1.1 Specific Aim and Research Questions

As the previous section illustrated, deforestation poses grave impacts worldwide, especially for those relying on it for survival in Ghana. The aim of this study is therefore to examine what shapes women's experiences of deforestation and understand how their knowledge could be integrated into natural resource management policies and practices. Thus, in this research, a case study of rural women from Mbonaayili, Kumbungu, Ghana is conducted, and the objective is to share their lived experiences and perspectives concerning the effects of deforestation on their livelihoods.

1.2 Research Question

- 1) What are the lived experiences and perspectives of rural women in Mbonaayili, Kumbungu Municipality, Ghana in relation to deforestation and its effects on their livelihoods?
 - a) What shapes women's experiences of deforestation in Mbonaayili in Kumbungu Municipality, Ghana?
 - b) How can their knowledge and perspectives be integrated into natural resource management policies and practices?

1.3 Significance of the Study

Given the current climate crisis we find ourselves in it is more critical than ever to understand how we can best mitigate the environmental degradation we are confronting. People's livelihoods in the face of deforestation are a crucial developmental concern that affects entire communities and will continue to have repercussions for generations to come. The thesis aligns with The Diversity Gap by the UNDP, a climate action that seeks to close the diversity gap by including marginalised people in climate processes (UNDP, 2024). This is in line with achieving the following Sustainable Development Goals: SDG 10 reduced inequalities, SDG 5 gender equality, SDG 11 sustainable cities and communities, SDG 13 climate action and lastly, SDG 15 life on land (UN, 2024).

1.4 Outline of Thesis

The thesis is structured into seven chapters. Chapter one introduces the topic, significance, and research questions of the study. Chapter two presents the specific contextual background of deforestation in Ghana. Chapter three presents the global deforestation trends, an understanding of the causes and contributions of deforestation, the impacts deforestation brings with it and the role women have in forest management as well as the adaptive strategies present. The fourth chapter introduces the theoretical framework that guides this study. The fifth chapter explains the methodological considerations and choices that were implemented. The sixth chapter analyses and discusses the data and findings of the research. Lastly, the seventh chapter concludes and discusses implications for future research.

2. Background

The following chapter presents the context in which the study is situated and outlines the history of deforestation in Ghana.

Ghana, situated on the Gulf of Guinea just north of the equator, covers an area of 239,535 square kilometres (Parliamentarian, 2023). Achieving independence in 1957, Ghana holds the distinction of being the first Sub-Saharan African nation to gain sovereignty (CIA, 2024). Notably, approximately 57% of its population is under the age of 25 (Ibid.). With a population of 33,846,114, Ghana's population growth rate is steadily rising at 2.19% (Ibid.). The country experiences diverse climates, with the Southeast coast characterized by warmth and dryness, the Southwest by heat and humidity, and the North by hot and arid conditions (Ibid.). Situated at the intersection of three hydroclimatic zones, Ghana faces environmental challenges intensified by changes in rainfall, weather patterns, and sea-level rise. These factors impact the salinity of coastal waters, posing threats to both agricultural practices and fisheries (Parliamentarian, 2023). In 2010, Ghana had 6.96 million hectares (Mha) of natural forest, spanning over 30% of its land area (Global Forest Watch, n.d). However, by 2023, it witnessed the loss of 110,000 hectares (kha) of natural forest, reflecting trends observed across other West African countries (Ibid.).

The degradation of moist forests in West Africa has reached critical levels, with nearly 90% of the original forest already lost, leaving fragmented and degraded remains, as highlighted by the World Resources Institute (Leach & Fairhead, 2000:19). This phenomenon, as noted by Leach & Fairhead (2000), is linked to the pressures of deforestation and population growth. If current trends persist, projections suggest a loss of 420 million acres of forest between 2010 and 2030 (Beatty et al., 2022, as cited in Nyamekye et al., 2023: 1). Globally, the exploitation of forest resources for people's livelihoods continue to erode forest reserves (Nyamekye et al., 2023).

In the specific context of Ghana, cocoa production dating back to the 1870s played a crucial role in shaping the country's forest landscape. This rapid expansion raised concern over the loss of

timber trees and the risk that deforestation could threaten cocoa production (Brobbeey et al., 2020). This spurred the establishment of forest reserves between 1927 and 1940, although not without conflict with local chiefs who contested the demarcation of lands allocated for forest preservation, having earmarked them for cocoa and other cash and food crops (Ibid.).

The 1990s witnessed a surge in deforestation driven by a complex interplay of direct and indirect factors. Indirect causes such as poverty, inadequate policies, inefficient law enforcement, and governmental corruption compounded with direct drivers including population growth, unsustainable farming methods, illegal logging, wildfires, and mining activities (Brobbeey et al., 2020). From 2002 to 2023 Ghana lost 143,000 hectares (kha) of humid primary forest, making up 8,9 % of its total forest cover loss in the same period (Global Forest Watch, n.d). This decline resulted in a 13% reduction in the area covered by humid primary forests within Ghana (Ibid.). In 2018 this meant a 60% increase in forest loss compared to 2017 (World Economic Forum, 2019). Alongside Côte d'Ivoire, this was the highest forest loss of any tropical country in the world (World Resources Institute, 2024).

With such concerning trends in forest loss, it is crucial to delve into the underlying causes driving deforestation in Ghana. Deforestation finds its roots in various factors including overexploitation of natural resources, illicit and unsustainable logging practices, land tenure insecurity, and the encroachment of agriculture into forested areas (Acheampong et al., 2018). Low detection rates and lenient penalties increase the likelihood of infringement due to both lack of awareness and corruption (Ankomah et al., 2022). Agriculture emerges as the primary driver of deforestation, which in turn is worsened by the elite interfering and attempting to influence law enforcement (McDermott et al., 2023; Brobbey, 2020). Friction between chiefs and forestry departments hinders collaboration, with chiefs prioritizing customary interests and engaging in illegal activities (Nyamekye et al., 2023). Limited livelihood opportunities drive illegal forest activities and informants fear giving information due to the possible retaliation they may face (Ibid.). Mismanagement of the forest reserves risks escalating if these challenges continue to persist (Menson, 2021 in Nyamekye et al, 2023). Bushfires, primarily set for hunting and land clearing,

further intensify deforestation, and deepen the distrust between local communities and the government (Acheampong et al., 2018). Land tenure insecurity and logging and cultivation fuel deforestation, particularly affecting tenant farmers due to short-term leasing arrangements (Damnyag et al., 2012). Insecure land tenure discourages tree planting and leads to overexploitation of land, thus making it crucial to develop tenure reforms and mainstreaming into forest management practices (Ibid.).

Furthermore, research has shown that there seem to be different conditions set in place for women and men and thereby also different effects of deforestation. While women are dependent on daily gathered products and mainly non-monetized such as firewood, fodder and non-timber items, men's dependence is on timber which can be purchased and is not needed regularly (Agarwal, 2009). In both cases, this further affects those who do not own land. Gender and class differences are therefore deeply present in forest dependency and worsen the conditions for those who are already struggling with the effects of climate change.

This correlates with findings in northern Ghana that show an interconnectedness between the effects of dry spells and flash floods on smallholder farmers with gender disparity, age distribution, marital status, health conditions, religion, and poverty (Nuhu & Matsui, 2022). The extent to which people are affected by climate extremes therefore depends on the intersectional conditions they are experiencing. In the Upper East Region in Ghana, women farmers were constrained by a lack of land ownership, credit access, irrigation facilities and sufficient information about climate change as well as high-yielding seeds for planting (Ibid.). As suggested by feminist political ecology there is a strong interconnection between climate change vulnerability and resource ownership and control (Yiridomoh et al., 2022). Thus, women who do not have access to or control of resources are more exposed to climate extremes. This is exemplified in the case of drought where women face difficulties feeding their children since they cannot travel to another place for an alternative livelihood because this would involve leaving their children behind. The effects of climate change on women and men therefore lead to different priorities and attitudes in mitigating the issues these extremities impact. Women's dependence on nature for their livelihoods has to a degree made

them better than men at finding solutions in response to climate extremes and other environmental disasters (Yiridomoh et al., 2022)

In 2015, the government produced a document titled ‘Ghana's Intended Nationally Determined Contribution’. Following this, Ghana signed the Paris Climate Agreement in 2016 (Parliamentarian, 2023). Ghana committed to the RED+ policy- “Reducing emissions from Deforestation and Forest Degradation in developing countries” as part of its commitment to the United Nations Framework Convention on Climate Change (UNFCCC, 2023). It is a global initiative that seeks to reduce emissions from deforestation and forest degradation while also incorporating the role of conservation, sustainable forest management and enhancement of forest carbon stocks (FAO, 2024). The policy, launched in 2016, is set to continue until 2035.

However, the state’s capacity to ensure sustainable forest management remains hampered by resource constraints and bureaucratic hurdles (Acheampong et al., 2018). Community involvement has therefore become indispensable in forest governance in Ghana and many other developing nations. Thus, recognizing the role of traditional councils in forest management has increased collaborative efforts between the Forest Commission, chiefs, and communities and functioned as a strategy to safeguard forest reserves.

Understanding the lived experiences and perspectives of those impacted, particularly rural women, is crucial to effectively address the deforestation that threatens their livelihoods. Through the lived experiences of rural women, it is possible to uncover the underlying causes of deforestation and explore how their knowledge can inform the development of resource management policies. In this sense, the same mechanisms that shape women’s experiences also hold the power to break the cycle of women being both affected by deforestation and contributing to it.

3. Literature Review

The following chapter presents research surrounding deforestation, globally, regionally, and in Ghana. The chapter aims to provide a comprehensive overview of the existing literature in this field. The following section is structured into four main subchapters: causes and contributions to deforestation, the impact of deforestation, women's livelihoods and their role in forest management and adaptation and strategies to deforestation.

3.1 Deforestation Trends

The World Resources Institute (2024) states that in 2023 3.7 million hectares of primary forest were lost, the equivalent of losing almost 10 football fields of forest per minute. This forest loss produced 2.4 gigatonnes (Gt) of carbon dioxide emissions in 2020, which is equivalent to almost half of the annual fossil fuel emissions of the United States (The World Resources Institute, 2024). Cattle pasture, oil palm, soy, cocoa, plantation rubber, coffee, and plantation wood fibre account for 57% of all tree cover loss associated with agriculture between 2001 and 2015 (Ibid.). Globally, cattle pasture resulted in 5 times more deforestation than any of the other commodities between 2001 and 2015 (Ibid.). The worldwide demand for agricultural products is said to increase by 60% from 2005/2007 to 2050 (Runyan & D'Odorico, 2016: 27). At the same time evidence seems to indicate that tropical countries will need to meet much of this increased demand (Ibid.).

The Amazon Forest which runs through nine countries has one of the highest rates of deforestation in the world leading to biodiversity loss, climate change, the spread of infectious diseases and the impact on rural and ingenious people's livelihoods (Hänggli et al., 2023). 77 million hectares (ha) of tropical forest were lost between 2001 and 2010 (Seydewitz et al., 2023). The expansion of agriculture caused 90% of the deforestation (Ibid). While in Africa 17 million ha was deforested within the period 2001 and 2010 (Ibid.). Here the primary cause of deforestation was due to the expansion of grassland (50%) and the expansion of cultivated land (25,1%) (Ibid.). Given the severity of the situation, the UNFCCC negotiations have encouraged developing countries to identify the activities that lead to deforestation in order to contribute to the mitigation of climate

change (Hosonuma et al., 2012). Gaining insight into the dynamics of forest change and the underlying causes of deforestation is essential for defining relevant policies and strategies (Ibid.).

3.2 Causes and Contributions to Deforestation

As mentioned previously, agriculture is the most pressing cause of deforestation since it accounts for 90% of forest loss (Seydewitz et al., 2023). This correlates with Hosonuma et al. (2012) stating that commercial agriculture and subsistence agriculture are the most prominent causes of deforestation. Timber extraction, logging, fuelwood collection and charcoal production, uncontrolled fires and livestock grazing are also critical causes (Ibid.). Although agriculture is the main cause of deforestation, the type of agriculture varies according to the geographical area. In Latin America, (68%) commercial agriculture is the most pressing cause of deforestation while in Asia and Africa, it accounts for 35% of deforestation (Ibid.). In the case of subsistence agriculture, it is equally distributed across the continents (27-40%) since this land use is widespread in the areas of the tropic and sub-tropic (Ibid.). Hosonuma et al. (2012) further note that mining plays a larger role in Africa and Asia than in Latin America. Furthermore, Hänggli et al. (2023) collaborate how agricultural expansion remains the main cause of deforestation. It is further emphasised that in Colombia and Brazil population size and growth were relevant underlying causes of deforestation on a regional scale. Hosonuma et al. (2012) add that urban expansion is most significant in Asia but that urban expansion is expected to further pressure tropical forests.

In Africa, fuelwood collection and charcoal production is the main degradation cause while it is of small and moderate importance for Asia and Latin America (Ibid.). When it comes to degradation caused by timber and logging activities this decreases in the late transition phase. In many woodland African countries, this is the case since forest timber resources have already been exploited and wood fuel therefore gets extra pressure (Ibid.). In the post-transition phase, it is argued that economic development will cause a decline in fuelwood collection and charcoal due to other sources of energy becoming available as well as improved management of timber leading to a decline in fires (Ritchie, 2021). On a global scale when looking at deforestation through time there is an indication that commercial agriculture is increasing (Hosonuma et al., 2012). However,

in large parts of Africa, local small-scale activities like fuelwood collection, charcoal production and livestock grazing in forests are the main causes of deforestation.

In Ghana, similar deforestation trends were observed. Ankomah et al. (2022) case study of four forest reserves in Ghana highlighted significant gaps between official forest management prescriptions and their practical implementation, along with non-compliance with logging regulations. This disconnect fosters forest encroachment, and illegal wood exploitation, and undermines sustainable forest management. The case study further questions whether forest degradation results from ineffective management prescriptions or lack of implementation, emphasizing the complexity of the issue. Ambiguous boundaries and insufficient enforcement are major contributors to forest encroachment, as well as economic incentives for agricultural expansion and land sales by local chiefs (Ankomah et al., 2022). Similarly, Hänggli et al. (2023) note that corruption and campaign funding in municipality re-election cycles further increased deforestation in Brazil. Hänggli et al. (2023) further add that land contestation also remained an unresolved issue and was continuously linked to deforestation and encroachment in the Brazilian Amazon. In the case of Brazil, federal enforcement of environmental policies through fines and embargos in the Amazon was found to be effective in decreasing deforestation (Ibid.). However, Ankomah et al., (2022) note that in the case of Ghana, financial constraints, inadequate staffing, and logistical shortcomings further hamper protection efforts across forest reserves. Thus, deforestation has deep repercussions in Ghana and on a global scale and these will be briefly explored in the following section.

3.3 The Impact of Deforestation

According to Seydewitz et al. (2023), deforestation contributes significantly to climate change, causes biodiversity loss and degrades ecosystems. In particular, deforestation strongly affects the water cycle and reduces regional precipitation (Runyan & D’Odorico, 2016). A review by Lawrence and Vandecar (2015) highlighted that complete deforestation of the tropics could lead to a 0.1- 1.3 °C increase in temperature across the tropics and could decrease the annual rainfall up to 10-15 % (Runyan & D’Odorico, 2016: 173). Another impact of deforestation is habitat loss

which can lead to extinction. Although extinction is a natural process, data suggests that humans may have caused the extinction of 5%- 10% of the species in many groups of organisms (Ibid: 180). Thus, the change in biodiversity caused by deforestation can reduce the availability of food, fuel structural materials, medicine or genetic resources and thereby impact the economic benefits to society (Chapin et al., 2000 mentioned in Runyan & D’Odorico, 2016). Furthermore, deforestation and climate change can explain the emergence of infectious diseases in wildlife and the increase in zoonic infections affecting human health (Runyan & D’Odorico, 2016). Thus, deforestation impacts not only the functioning of ecosystems but also societies, health, and the livelihoods of those dependent upon them (Ibid.).

From 2007 to 2016, forestry and land use resulted in large amounts of greenhouse gas emissions (Seydewitz et al., 2023) To achieve climate targets forestry and land use emissions must be diminished and reach carbon neutrality by 2050. Seydewitz et al. (2023) argue that to achieve this, it is necessary to understand the drivers of deforestation. This deforestation is said to be linked to the growing food trade and it is therefore argued that a sustainable transformation of food systems is essential to reduce deforestation (Ibid.). 60 % of tropical deforestation is driven by beef, soybean, and palm oil production (Ritchie, 2021). Thus, it is necessary to not only look at where the food is produced but also at where the consumer demand is from (Ibid.). Similarly, Runyan & D’Odorico (2016) state how the globalization of food through international trade increases the demand for agricultural products and deforestation. As a result, forest loss in one country is likely to derive from consumer demand in other regions of the world (Ibid.).

In Ghana, this is seen in the link between cocoa production and deforestation. Cocoa cultivation emerges as a primary driver of agricultural deforestation in Ghana, accounting for over 80% of such activities (Acheampong et al., 2019; Forestry Commission, 2017; MLNR, 2012, as cited in Brobbey et al., 2020: 426). Thus, not only does deforestation pose grave risks to climate change, but it also impacts the livelihoods and economies of many developing countries.

3.4 Women's Livelihoods and Their Role in Forest Management

A study conducted by Yiridomoh et al. (2022) showed that women farmers contributed to the occurrence of climate extremes due to deforestation and bushfires. Women's perception and knowledge and their ability to adjust to climate extremes are seen as essential to improving the sustainability of women's livelihoods. Thus, the study concludes that to implement consistent adaptation measures, it is important to understand how climate extremes are perceived by the population it is affecting. Women in the study recognized that the ongoing deforestation in their communities contributed to climate extremes. However, they also emphasised that individuals may resort to environmentally harmful activities out of necessity to sustain their livelihoods (Ibid.). Awumbila & Momsen (1995) corroborate this by stating how women are seen as actors who play a key role in improving the environment but at the same time, they are also blamed for contributing to deforestation as their search for fuel wood becomes more desperate. Shangpliang et al. (2012) emphasize the profound link between land resources and the livelihoods of rural women. In economies experiencing decline, particularly in ecologically vulnerable regions, where women play a vital role as household providers, it becomes imperative to recognize how gender dynamics shape access to and control of resources (Ibid.).

This is collaborated by Yiridomoh et al. (2022) who state how women and men experience different responsibilities and decision-making power due to the discrepancy in access to and control over resources. This aligns with Shangpliang et al. (2012) who further state that the roles and responsibilities of men and women are different and as a result, their livelihood needs differ as well. In addition, Awumbila & Momsen (1995) argue that time is a limited resource where women often face shorter resting hours, balance many tasks and have a greater intensity of work in comparison to men. Women's involvement in institutions of forest governance could therefore make a positive difference (Agarwal, 2009). Research shows that women's participation in government structures of a common pool resource leads to better conservation and restoration (Ibid). Begum et al. (2020) study on forest co-management in the Sundarban mangrove forest shows that the involvement of local people, especially women, has helped address sustainable

forest management and improved livelihood outcomes. The FAO (2018) further notes that women's involvement in forest-based programs increases their access to natural resources, skills as well as a role in policy processes (Ibid.). It is therefore important to consider that women's vulnerability to climate change does not stem from women lacking knowledge but rather from their disadvantaged position in the patriarchal system that keeps them from having access to and ownership of natural resources (Yiridomoh et al., 2022). Begum et al. (2020) state how in Bangladesh, women's mobility has been culturally constrained by the patriarchal system and how crucial it is that policy interventions influence men's attitudes towards women working outside of the home.

Thus, vulnerability to environmental degradation also has to be understood in terms of how it affects the gender dimension of poor women (Awumbila & Momsen, 1995). The inclusion of women's associations, especially if poor women are included, could increase forest protection and lead to enhancing the strength and public presence of women, which means that women are both agents, victims and saviours in relation to environmental change (Ibid.) Begum et al. (2020) observe that the commitment and active participation of women in forest conservation efforts have resulted in improved conservation and regeneration of forest resources. In this sense, women can draw on their knowledge of forest use practices and contribute to the sustainable improvement of the forest. It is therefore critical that gender-based climate change policies are introduced to maintain the livelihoods of those most affected in the communities (Antwi-Agyei & Nyantakyi-Frimpong, 2021). To secure the prosperity of such policies it is necessary to ensure that male farmers, and especially traditional leaders, support women in gaining access to land and climate information services (Nuhu & Matsui, 2022).

3.5 Adaptation Strategies to Deforestation

Studies have shown that forest reserves are effective at reducing deforestation if they gain the necessary management (Bleher et al., 2006; Dudley et al., 2004; Jones, 1990; Naughton-Treves et al., 2005; Nepstad et al., 2006; Pelkey et al., 2000; Sánchez-Azofeifa, 1999 in Ankomah et al., 2022). In Ghana, however, the absence of basic protective measures such as boundary cleaning

and regular foot patrol of the reserves has contributed to further deforestation (Ankomah et al., 2022). In the study conducted by Ankomah et al. (2022), it was stated that forests are not being managed sustainably since they lack effective implementation on the ground. It is therefore imperative that forest managers improve their practices and ensure that the activities planned are carried out on the ground. Furthermore, the study showed that the poor outcome of forest management efforts in Ghana was due to both a lack of implementation of forest management prescription and low forest users' compliance with forest regulations (Ibid). Thus, there is a clear gap between the fundamental forest protection measurements and the rate at which deforestation is increasing.

McDermott et al. (2023) suggest achieving sustainability through an equity-based transformation which requires fundamental changes to governance structures and systems of production and consumption. This approach aims to empower human agency, values, and capacities to collectively shape desired futures and in this sense avoid costly interventions that are not understood, wanted or durable and thereby allow for a more diverse range of actors to bring systemic change (Ibid.). Furthermore, McDermott et al. (2023) state that scholarship in political ecology and related fields has emphasized the importance of “local context”, “bottom-up” and “participatory” governance to address environmental issues effectively. And yet these insights are often overlooked in target-oriented approaches. Clapp & Meckling (2013) however argue for the involvement of business actors in environmental policies. They continue to explain that although businesses contribute to environmental degradation, they can also help foster possible solutions that do not threaten their economic stability or profitability. Large transnational corporations (TNCs) are especially significant actors and have often been associated with environmental damage specifically in the developing world (Dauvergne 2001; Leighton et al. 2002 in Clapp & Meckling, 2013). At an international level lobby groups and business NGOs have increasingly gained significant roles in shaping environmental and climate policy (Clapp & Meckling, 2013). Clapp & Meckling (2013) therefore recommend analysts to pay close attention to the role of corporate influence in governance approaches and the specific design of global environmental governance mechanisms.

This is in contrast to McDermott et al. (2023) that state participation itself may become co-opted into these target-driven agendas. In their paper, they seek to question why unidimensional targets such as “zero deforestation” continue to dominate despite research showing that it is more important to focus on people’s notions of justice, livelihoods, and identity. They further add that simply implementing decentralization policies without considering the dynamics on the ground can be problematic. It is not enough to see “decentralization” as a goal in itself but instead, attention must be on how these reforms influence the social and political dynamics of inclusion and exclusion over time. In conclusion, they state that target-setting can have unintended consequences and instead, they suggest that a commitment to equity in transformational efforts could lead to better future outcomes. Thus, emphasizing equity in land use governance and acknowledging alternative models for systemic change by grassroots and networked actors worldwide would enhance the potential for sustainable transformations (Ibid.).

Brobbe et al. (2020) raise the concern that navigating between agriculture and conservation is a challenge for governments, resource managers and policymakers in Ghana and other developing countries. They further state that the fear of losing one’s livelihood or facing eviction from illegal farms are real factors that could prevent farmers from participating in efforts to reduce forest encroachment. It is therefore important to consider the needs of the local communities before engaging in land expropriation for protected forests (Ibid). In their study, they deemed that increased forest encroachment was due to the nearness of people to the forest and the reduced clearing costs. However, findings show that interventions that compensate farmers for maintaining forests are consistently associated with lower rates of deforestation (Busch and Ferretti-Gallon, 2014, in Brobbey et al., 2020).

Nyamekye et al. (2023) add that it is crucial to involve fringe communities in the conservation of forest reserves. This seeks to improve both the livelihood of the communities and ensures the protection of the forest reserves. In their study, they found that both the forestry commission, the chiefs and the communities took responsibility for the management of the forest reserve. The participants however did indicate challenges involving inadequate logistics such as motorbike and

security weapons, a lack of forestry equipment and personnel, and some friction between the chiefs and the forest department in the district. Lastly, Nyamekye et al. (2023) recommend the establishment and implementation of programs in the fringe communities to train locals on alternative livelihood opportunities to complement farming and thereby reduce their reliance on the forest reserve. Likewise, adequate logistics should be provided to fire volunteers and forest guards to ensure motivation and improve surveillance. Most importantly, laws protecting the forest reserve should be strengthened and sanctions should be effectively upheld.

Acheampong et al. (2018) note that the previous forest management system (e.g. the Taungya System) failed because community members did not benefit directly from their participation. Thus, direct benefits for the communities' participation in forest management is key. This can be done by ensuring that forest dwellers are given degraded forest land to inter-plant their food crops with endangering tree species so that reforestation takes place while farmers benefit from their crops on the same land. Hence, this approach could lead to more biodiversity and improvement in the livelihoods of the community.

Furthermore, Andoh & Lee (2018) conducted a comparative study between Ghana and the Republic of Korea. They demonstrated how these two countries implemented policies in different ways and tackled their respective huge deforestation issues. While Korea treated reforestation as a national priority, there were financial challenges in Ghana that resulted in a failure to implement them successfully. Andoh & Lee (2018) further stress the importance of effective reforestation policies and programs in Ghana to address the challenges of providing sufficient funding, establishing off-farm jobs, and strengthening the social and political institutions to enforce forest laws. By challenging these issues, strong institutions are created and can thereby help policies and management practices in stopping deforestation without compromises. In sum, it is crucial to recognize that forest reserves affect livelihoods and thereby engage in strategic planning to provide alternative sources of income for the affected communities (Nyamekye et al., 2023). Thus, efforts must focus on holistic approaches to mitigate deforestation's socio-economic impacts (Ibid.). This

is very much in line with Hänggli et al. (2023) stating that more research focusing on the complexity of deforestation processes and land use changes is needed.

Despite the vast amount of literature on deforestation in Ghana, including its causes, impacts, and mitigation strategies, there remains a gap in understanding the nuanced perspectives and experiences of rural women in Mbanaayili, Kumbungu Municipality, Ghana, regarding deforestation and its effects on their livelihoods. While existing studies provide valuable insights into the broader socio-economic and environmental dynamics driving deforestation in the country, there is a need for more localized research that examines how rural women in this specific community perceive and are impacted by deforestation, as well as their coping strategies and potential contributions to mitigation efforts. Thus, heightening the understanding of women's role in forest management is essential. Such research would not only fill a gap in the literature but also provide valuable insights for policymakers and practitioners seeking to develop more inclusive and effective approaches to forest conservation and sustainable livelihood development in Ghana.

4. Theoretical framework

This section presents the theoretical standpoints and framework applied in the thesis. In this research, the Feminist Political Ecology theory and the Capability Approach will be utilized to address the lived experiences and perspectives of rural women in Mbanaayili, Kumbungu, Ghana in relation to deforestation.

4.1 Feminist Political Ecology

Feminist Political Ecology (FPE) emerged from Political Ecology in the 1990s and had strong ties to gender and development studies, where it sought to understand gender dynamics in relation to the natural environment and the context of natural resource-based livelihoods (Elmhirst, 2015). FPE is a framework that integrates a feminist perspective with the examination of ecological, economic, and political power relations (Rocheleau et al., 1996). This approach perceives environmental issues as fundamental to survival, emphasizing the inseparability of ecological and

gender concerns, as they are interlinked (Ibid.). The framework further analyzes the underlying structures that work for the benefit of certain classes and groups, both at a local stage and across international boundaries. It not only acknowledges the significance of power relations but also delves into how these dynamics impact various spheres of life, including gender relations, particularly in decision-making related to the environment. The framework goes beyond surface-level analysis to scrutinize underlying structures that often favour specific classes and groups, operating both at the local level and across international boundaries. Harcourt (2023) states that FPE addresses injustices that occur due to the processes of allocation, dispossession and extractivism as well as unequal power and gender relations.

The approach contends that regardless of the origins of gendered social structures, the consequence is an unequal power dynamic that disproportionately disadvantages women. The objective of this approach is to contribute to the formulation of policies fostering a more sustainable environment, while also addressing the deeply rooted economic and political factors contributing to poverty and ecological crises. This especially relates to land rights and the far-reaching implications for women worldwide. This is collaborated by the FAO (1998) as cited in Rocheleau et al. (1996) which emphasizes the imbalance in the distribution of resource rights. Despite women bearing the responsibilities of resource gathering and environmental maintenance, their formal rights are severely limited. Consequently, they are often excluded from determining the future of resource availability and environmental quality (Ibid). FPE in this sense finds it essential to share the perspectives of those who are affected by extractivism and climate colonialism (Harcourt, 2023). Thus, by acknowledging the complexity of these narratives it becomes possible to address challenges in a way that does not oversimplify approaches to climate justice (Ibid.).

Furthermore, instead of redistributing land equitably among communities, land registration has exacerbated social stratification along both class and gender lines. The privatization of land has resulted in the wealthy acquiring more land while leaving the less privileged with fewer opportunities (Ibid). Notably, the land reform has institutionalized the customary subordination of women to men, as only men are officially recognized as the “head of household” (Ibid). This

system perpetuates a scenario where those in positions of power and wealth can easily purchase land, while the economically disadvantaged, particularly women, face exclusion (Wangari et al., 1996). This is further problematized by the fact that deforestation as a result of the intense environmental degradation has brought even more constraints on livelihood in gendered ways (Elmhirst, 2015). As a result, new development interventions and governance emerge but these risks reinforcing gender-based disparities, rather than alleviating them (Ibid.). A common theme that is present is that men and women have different interests and roles in the environment which as a result creates strict binaries and risks depicting women as vulnerable and marginalized victims.

To address this issue, coping strategies have emerged, emphasizing women's involvement in environmental matters as a crucial asset to gaining access and control over land and natural resources (Wangari et al., 1996). This often manifests through initiatives like women's self-help groups, where gendered knowledge plays a significant role in farming, resource management, and community resistance. Thus, Feminist Political Ecology challenges the notion that environmental concerns are a luxury for the affluent, asserting that these concerns lie at the core of lives, livelihoods, survival, and community well-being (Rocheleau et al., 1996).

FPE's strength is therefore that it seeks to give a platform to those voices and perspectives that have lacked acknowledgement in policy processes and mainstream knowledge production (Harcourt, 2023). This is precisely the aim of this research- to understand the lived experiences of rural women in Mbanaayili in connection to deforestation. As Harcourt (2023) states storytelling is important for feminist research since it allows women to challenge dominant narratives and tell their own story in their own words. While this holds significant potential it is also necessary to be aware of what stories are being included and excluded, as this could also lead to silencing others and their experiences (Ibid.). In this sense, the weakness is in the method itself meaning that these stories and narratives need to be understood as partial truths that give insight into the situated moments when they were told. With this being said FPE seeks to emphasise the importance of collaboration between academia, policymakers and activism in unison with the feminist perspective (Elmhirst, 2015). This promotes a self-reflective practice for researchers and

encourages them to engage with stakeholders and thereby promote gender justice and environmental sustainability. In sum, FPE in this research will be utilized to understand and shed light on how women's power dynamics are in regards to deforestation.

4.2 Capability Approach by Amartya Sen

Amartya Sen's capability approach significantly contributes to redefining development by emphasizing critical areas for change and advocating for a preferred approach to understand it (Velástegui, 2020). The framework underscores the paramount importance of human beings as the primary asset in any society, emphasizing the necessity of creating an environment that fosters freedom for individuals to pursue meaningful goals (Vijay & Yadav, 2022). It is precisely in this context that Amartya Sen argues that the degree of freedom individuals possess to pursue and fulfil valued capabilities should be the central criterion for assessing the effectiveness of social systems (Ibid).

The capability approach delves into the assessment of individuals' life quality, utilizing concepts such as "functioning" and "capability" to analyse their overall well-being (Ibid). The capability approach is therefore coined as a people-centred approach that focuses on human beings and the quality of their lives (Velástegui, 2020 & Vijay & Yadav, 2022). Consequently, development is framed within the realm of capabilities, specifically emphasizing freedom. Amartya Sen's emphasis extends beyond mere outcomes, focusing on the processes that lead to those outcomes. A key point is that individuals are not passive recipients of policies but active agents with the capacity to shape their own lives (Sen, 1999 in Velástegui, 2020).

In this context, the empowerment of women assumes crucial importance, aligning with the notion that women's freedom and capabilities are central to development. Gender justice is seen as a prerequisite for human development and the establishment of inclusive societies (Vijay & Yadav, 2022). Sen contends that enhancing women's empowerment and well-being is not only essential for their personal growth but also critical for the overall development of families and societies at large (Ibid).

The application of the capability approach to policymaking concerning the social values of nature and the assessment of environmental benefits is a focal point in a broader debate, particularly within the context of sustainable development (O’Byrne, 2022). Central to this discussion is the idea of creating an evaluative framework to assess projects based on their impacts on capabilities and functions. Notably, in this evaluative process, there is a crucial emphasis on prioritizing the capabilities of the most disadvantaged in society (Robeyns, 2017; Sen, 2001 in O’Byrne, 2022).

Consequently, the capability approach advocates for equal representation of all those affected in the decision-making process. According to O’Byrne (2022), this approach effectively serves as a logical foundation for multi-criteria ecosystem restoration. However, he also underscores that the capability approach presents both technical and political challenges, emphasizing the need for political action by citizens to achieve a more equitable decision-making process (Ibid.). In sum, the capability approach contains strengths such as being a human-centred perspective, which provides a comprehensive understanding of the factors contributing to individual well-being (Vijay & Yadav, 2022) However, it also faces challenges in operationalizing its concepts. As mentioned earlier the capability approach relies on individuals’ subjective assessment of what they need in their life, yet it provides limited guidance as to how to prioritize the competing capabilities.

Moreover, much like FPE, the capability approach may face political resistance, especially in contexts where systemic power structures have conflicting interests with those of people’s freedom and capabilities. Nevertheless, both the capability approach and FPE complement each other in addressing the lived experiences and perspectives of rural women in Mbanaayili, Ghana. FPE helps contextualize the experiences of rural women within social and environmental dynamics, heightening how gendered power relations shape their access to and use of natural resources. It further explores how women’s role in the household and community resource management intersects with broader patterns of deforestation and environmental degradation. The capability approach complements this by focusing on the capability and freedom of rural women and thereby uncover the impacts of deforestation, women’s livelihoods, well-being, and agency, establishing a

link between freedom, capability, and gender justice (Vijay & Yadav, 2022). Furthermore, FPE examines gender norms, land tenure systems and environmental policies that impact women's access to and control over natural resources. In addition, the capability approach examines how deforestation affects women's capabilities and functioning in spheres such as farming, collecting firewood, buying land, and participating in decision-making. In doing so, it highlights the intersecting inequalities that aggravate women's vulnerability to environmental degradation. Lastly, both approaches have the potential to inform policies and practices that address the gendered dimensions of environmental degradation and promote sustainable development.

5. Methodology

In the following section, the methodological considerations of this thesis will be presented. First, the research design will be outlined, followed by the data collection, hereunder the semi-structured interviews and focus group, the sampling method and selection and the data analysis. To conclude it will discuss the ethical considerations, hereunder the study's scope and limitations.

5.1 Research Design

In this thesis, a qualitative research design is adopted, focusing on a case study. The case study research explores a bounded system (a case) through in-depth data collection involving multiple sources (Creswell & Poth, 2018). This research specifically targets the women in the community of Mbanaayili situated within the Gupanarigu Area Council in the Kumbungu district. The primary economic activity in the region is peasant farming, relying on rain-fed agricultural practices (Amuda & Thomsen, 2010). The area is among one the most deprived districts in the region, with high poverty rates (Ibid.). Kumbungu is in proximity to the regional municipality of Tamale in the Northern Region of Ghana. This case study design is well-suited for understanding the lived experiences and perspectives of rural women in Mbanaayili, Ghana. Thus, a specific case is examined with the intent of illuminating the complexities of it (Ibid.). Through the case study and qualitative research design, the aim is to amplify the voices of rural women in Mbanaayili and provide an in-depth understanding of the effects on their livelihoods. Furthermore, the adoption of a feminist standpoint informs the research design, guiding both the scope of inquiry and theoretical

choices. Clearly stating how social research is organized and where one resides on the spectrum of social scientific standpoints is fundamental for thorough and ethical research (Prowse, 2010).

5.2 Data Collection

The primary data in this research consists of ten semi-structured interviews and one focus group discussion (see Appendix I for the list of respondents). The secondary sources consist of academic articles, reports, news articles, journals, policy briefs and online data webpages. The data and sampling method will be further developed in the sections below.

5.2.1 Sampling Method and Selection

The connection to the community was initiated by establishing contact with a Danish NGO named Ghana Venskab (Ghana Friendship), which then facilitated communication with a local NGO known as CLIP. Based in Tamale, in the Northern region of Ghana, CLIP concentrates its efforts on various areas including food security and livelihoods, climate change, inclusive growth and business development, water sanitation & hygiene, agro-pastoralism, and nutrition (CLIP, n.d.). The objectives of this research align closely with the organization's focus on women empowerment, deforestation, and livelihoods.

Through collaboration with CLIP, a climate officer was designated as the primary contact and served as the entry point into the field. In this research, purposeful sampling was utilized to select the interviewees and focus group participants. This approach ensured that relevant respondents were included in the case study while also respecting the community's preferred selection process (Hammet et al, 2014). As the first respondents were gathered snowball sampling was supplemented with assistance from my translator during fieldwork (Bryman, 2016). The contact person at CLIP facilitated contact with a women's shea butter working group in Mbanaayili, from which three participants were selected alongside three from outside the group for interviews. Similarly, the focus group discussion included both members and non-members of the working group. Furthermore, diversity in age groups was considered during participant selection to ensure varied

perspectives. The selection of participants took place during a meeting held at the community where they discussed among themselves who would participate. The translator, who also worked at CLIP and was acquainted with the community, facilitated the process. The initial contact person, a teacher at the local school, organized the meeting and assisted in gathering interviewees. The number of interviews was based on reaching theoretical saturation (Bryman, 2016). This was reached once there was a balanced number of women belonging to the working group, outside of the working group, a focus group discussion and interviews with individuals belonging to relevant institutions and organizations to ensure multiple perspectives from different sources.

5.2.2 Semi-Structured Interviews and Focus Group Discussion

Ten semi-structured interviews and one focus group discussion were conducted. Semi-structured interviews were preferred as they allowed interviewees to freely recount their experiences and make sense of the events around them (Ibid.). An interview guide (see Appendix II for interview guide) served as the basis for the interviews but the interviewee's individual experience dictated the order and the focus throughout the interview. My contact person at CLIP facilitated interviews with the Forestry Commission, The Ministry of Food and Agriculture (MoFA) and the Environmental Protection Agency (EPA). EPA is the leading agency that seeks to protect and improve the environment in Ghana (EPA, 2024). MoFa aims to promote sustainable agriculture and agribusiness (MoFA, 2024). The Forestry Commission is responsible for the regulation, management, and conservation of forest resources in the country (Forestry Commission, 2023). These institutions are all within Ghana and give the study the necessary knowledge and expertise to the context. More importantly, they can collaborate and contrast the reflections of the women in Mbanaayili.

Thus, triangulation was employed to strengthen the validity and mitigate risk by integrating multiple mixed methods, namely semi-structured interviews and focus group discussions (Hammet et al, 2014). A broader approach to triangulation argues that beyond employing mixed methods, researchers can also utilize multiple sources/informants to research an issue and gain more detailed and strong findings (Laws et al. 2013 in Hammet et al, 2014). In this study, comparing interviews

with rural women to institutional testimonies enhances the reliability of the argument, providing a more comprehensive perspective (Hammet et al 2014). This therefore served to gain an in-depth understanding of a complex issue.

5.3 Data Analysis and Coding

Following data collection, the interviews and focus group discussions were transcribed. Thematic analysis, which is a method for analyzing, organizing and gaining insight into patterns and themes was then conducted (Braun & Clarke, 2012). Transcribed files were uploaded to a specialist qualitative data analysis software, called NVivo- to code the main themes gathered across all interviews (Hammet et al, 2014). In this research, mainly an inductive approach was utilized to data coding. The inductive approach is a bottom-up approach that derives themes from the content of the data itself (Braun & Clarke, 2012). Thus, an inductive thematic analysis is experiential in its orientation meaning that it aims to give voice to experiences in the data (Ibid.). As stated by Braun & Clarke (2012) it is rare to conduct research that is purely inductive or deductive and it is often a combination of the two. This research thereby adopts a deductive approach as well in the sense that it draws on theoretical constructs belonging to the feminist school of thought. The process of coding and finding themes across the transcriptions allows for an in-depth exploration of the findings, illuminating the diverse experiences and perspectives of rural women in Mbanaayili, Ghana. The thematic analysis is thereby able to identify the themes that are “told” by the interviewees (Creswell, 2013). The focus of thematic analysis is more on what is said rather than how it is said (Bryman, 2016) and it follows a six-step approach outlined by Braun & Clarke (2012) consisting of familiarization of the data, developing initial codes, searching for themes, reviewing potential themes, defining, and naming themes and finally writing up the findings.

5.4 Ethical Considerations

The research focused on giving rural women in Mbanaayili a platform where they could voice and recount their own experiences and perspectives. Interviewees in this research were informed about the research objective and voluntarily provided their oral consent to participate. The recordings were stored and anonymized to ensure confidentiality (Silverman, 2017). However, it is important

to acknowledge the inherent limitations and constraints of the study. In doing so it remains important to be aware that others' stories were not given this opportunity and to understand that "it matters what stories tell stories" (Donne Harraway, 2019 in Hartcourt 2023). By taking a feminist standpoint I have sought to remain aware of the problematic power dynamics of speaking for others and have committed myself to remain reflexive throughout the research (Avishai et al., 2013). Furthermore, it is essential to honour the perspectives of the women in this study even when this could challenge feminist understanding of what is deemed progressive social change (Ibid.). Instead confronting these complexities challenges us to deepen our understanding of feminist principles and expands the scope and influence of feminist research (Ibid.). Lastly, it is important to acknowledge my own positionality as a Danish person and how this shapes my own understanding of the world and influences this research (Scheyvens, 2014).

5.4.1 Scope and Limitations

During the research, I had a translator/gatekeeper from the organization CLIP. The women in Mbanaayili mainly spoke Dagbani. This is the most widely spoken language in Northern Ghana. The interpretations of the findings were therefore dependent on my translator's understanding given that I do not speak Dagbani. This presents challenges as I have no way to check for the validity of the translations. Another important consideration to take into account is that my translator was male which could potentially introduce a power dynamic during the interview process (Creswell, 2013). Furthermore, the positionality of my translator as a man must also be acknowledged since it could have biased the study (Hammet et al., 2014). A young woman from CLIP, an intern at the organization did participate in the interviews as well. This precaution was taken in case sensitive matters or questions were raised that the women felt more comfortable discussing with another woman. Furthermore, it is important to acknowledge that there may be sampling bias in the participant selection since marginalized individuals may not have been included in the sample (Funder, 2005). Thus, while the study focuses on amplifying the voice of rural women in Mbanaayili, it may not capture the full range of experiences in the community.

6. Analysis

In the following section, data findings are presented, analyzed, and discussed, with a specific focus on exploring the lived experiences and perspectives of rural women in Mbanaayili, Ghana. Understanding their perspectives is crucial as they are often disproportionately affected by deforestation and its consequences on their livelihoods. By centering their voices and experiences, this analysis aims to shed light on the nuanced factors shaping women's experiences of deforestation in the community. Furthermore, their knowledge and perspectives serve as valuable insights that can inform more inclusive and effective natural resource management policies and practices. Thematic analysis is employed to illuminate rural women's lived experiences and discuss how societal dynamics shape their livelihoods. The analysis is structured to address the first supporting question across the initial five sections, followed by the examination of the second supporting question in the final section. By addressing both supporting questions, the study aims to offer a holistic perspective on deforestation in Mbanaayili, informed by the Feminist Political Ecology Theory and the Capability Approach.

6.1 Women's experiences of deforestation

The following sections will begin by presenting the findings and discussing the identified themes and trends and thereafter it will be analysed through the Feminist Political Ecology Theory. The Capability approach will further explore how the gender disparities in access to resources and decision-making opportunities affect women's capabilities and freedoms to engage in sustainable livelihood practices and thereby shape their experiences with deforestation. As previously mentioned, gender and class dynamics further aggravate forest dependency and worsen the conditions faced by those already struggling with climate change (Agarwal, 2009). This reality becomes particularly evident when examining the land tenure system present in Northern Ghana, a topic that will be further explored in subsequent sections.

Firstly, it is important to acknowledge that urbanization and the expansion of families have contributed to the issue of deforestation and further constrained the land tenure system. Across the interviews, it is stated that due to population growth, more houses are being built. It is also

explained that while several generations used to live together, it has now become customary to move from the parental home. This phenomenon resonates with the findings of Leach & Fairhead (2000), who attribute the loss of forests in West Africa to population growth. This development compiled with the prevailing notion in the community that individuals have autonomy over their lands, allows those in position of power to gain advantages over others. This observation aligns with Hartcourt's (2023) perspective, suggesting that injustices often occur from processes such as land allocation and dispossession and extractivism which in turn intensifies unequal power and gender inequality.

Thus, this system continues to foster an environment where individuals with wealth and power can continue to buy land, while those with fewer resources, particularly women, face exclusion (Wangari et al., 1996). This concern is highlighted in the interviews with women from Mbanaayili. Respondent 2, a woman from Mbanaayili belonging to the shea butter working group states: "If you have the capability. Capability in this sense is finance, if you can pay for the land, it is not difficult but if you do not have the money, it is very difficult" (Respondent 2). Therefore, women in Mbanaayili face difficulties because while acquiring land would secure their livelihoods, without secured livelihoods, they lack the financial means to obtain land in the first place. This resonates with one of the key messages from the Capability Approach, namely that gender justice is essential for human development and the establishment of inclusive societies (Vijay & Yadav, 2022). At the moment the conditions, as described by respondent 2, pose challenges for women to be fully included in society. This sentiment is further shared by respondent 3, who notes:

Men buy the land more than the women. That covid affected their business a lot so the profit they make from the business has gone down, but the men have opportunity to travel outside of the community to farm (Respondent 3).

This reflects the gender dynamics and opportunities that women perceive to be available to them as evidenced through most of the interviews. Respondent 9, who is a representative at EPA, elaborates on this by stating:

Power is malleable. It depends on the context of the malleability. And its power is also a perceived concept. So we do not expect a man who by biblical sense is said to be the head of their family to easily give up (Respondent 9).

This resonates with Yirimodoh et al. (2020) who explains that women's vulnerability does not stem from a lack of knowledge but rather from their disadvantaged position in the patriarchal system, which restricts them from having access to and ownership of natural resources. Patriarchy in this sense is worsening the effects of deforestation by shaping gendered norms that govern women's lives. Thus, traditional gender roles and cultural norms have become part of shaping women's labour and their interactions with the environment. It is therefore difficult for women to protect their livelihoods when it challenges the perceptions and interests of other people in society. This is further supported by respondent 8, who works for the Ministry of Food and Agriculture:

Most of them, do complain and their response most of the time are not heeded to because in our society where we find ourselves, the women have...in fact, to some extent, their voices are not that loud (Respondent 8).

This resonates with Vijay & Yadav (2020) who stresses the importance of fostering an environment where all individuals can pursue meaningful goals. Thus, in Mbanaayili women's freedom is constrained, and they are not able to engage in sustainable livelihoods due to deforestation. Amartya Sen would instead contend that enhancing women's empowerment is crucial not just for their well-being but for that of the community and society as a whole. However, the data shows that the women do see opportunities for themselves to acquire land by following cultural norms. Respondent 4, the technical officer for livelihoods and business development at CLIP explains how women are able to buy land:

So one way of doing it, usually land is not controlled by women in northern Ghana, it's controlled by the men and the chiefs and traditional authorities. But that does not mean that

when women want land to do certain things they won't get. So what you do is you have to follow all the community protocols like you go to the Chief Palace. You explain your rationale, why you need the land and if they buy into it, then they allocate. A piece of land for you to do that project. So if you go through the traditional, if you follow all the traditional steps at the end of the day they give them land (Respondent 4).

This statement reflects the insights shared by the women of Mbanaayili during the interviews regarding land acquisition. These land reforms have therefore perpetuated an institutionalized customary subordination of women to men, as men are officially recognized as the “head of household” (Harcourt, 2023). When asked whether a woman can independently approach the chief to buy land, the focus group, comprising women both from and outside of the shea butter working group in Mbanaayili, responded: “That if you are a woman and you get up and walk straight to the palace they will call you a witch. You have to pass it through your husband” (Respondent 11, focus group). The notion that women cannot buy land independently of men further restricts and exposes women in Mbanaayili to vulnerability. These land rights have far-reaching implications for women, as stated by the FAO (1998) in Rocheleau et al. (1996), leading to an imbalance in the distribution of resource rights This aligns with Respondent 9 at the EPA who stated:

What is left is for the men in the community who supposedly say they own the land...to release lands to the women, so the women can now do planting. So we are lobbying government to come up with a policy (Respondent 9).

Corroborating this perspective, Feminist Political ecology aims to provide a platform for those whose voices have historically been marginalized in policy processes (Harcourt, 2023). However, it is a complex area to navigate since it contends the culture and customs in the region. To further understand these complexities it is necessary to examine the effects and impacts deforestation has on women’s livelihoods. This will be unpacked in the following section.

6.2 Effects on women's livelihoods

Deforestation affects and impacts various aspects of women's livelihoods. The data provided information on women's perspectives on gendered labour and the effects this has on them. As these effects are complex and situated in a specific context, the roles and responsibilities of women in relation to forest-related activities will be discussed below. In response to being asked about who is mostly affected by deforestation in the community, a consensus emerged indicating that women bear a disproportionate burden due to their increased workload. This is corroborated by respondent 9, a male representative at EPA stating: "They are multitasking. They have to bathe their children. They have to cook. They have to fetch the water. They have to. They are time poor" (Respondent 9). This observation finds further validation in the findings of Awumbila & Momsen (1995) who emphasize that time is a limited resource where women are left with fewer resting hours, many tasks and heavier workload compared to men. Respondent 1, a woman in Mbanaayili and part of the shea butter working group, explains that the lack of trees and shea nuts in the area means the women in the community have to go far away and that impacts the time they spend working since their tasks at home will still wait for them once they return. This highlights one of the main concerns of Feminist Political Ecology Theory, which directly addresses how unequal power dynamics disadvantage women and thereby increase their workload.

Furthermore, deforestation has also affected the women of Mbanaayili's access to resources. They observe a decrease in water availability in the area as a consequence of deforestation. This is corroborated by respondent 4, a technical officer for livelihood and business development at CLIP, who elaborates on the multifaceted impacts of deforestation:

Then the other aspect that is the negative effect on the women is also that there will be water scarcity because if there is a lot of forest cover, definitely you will see that the water... there will be the water cycle. There will be a lot of water, but as you cut down more trees you see that there won't be any cover. And this will decrease their water (Respondent 4).

The water scarcity and deforestation-induced climate changes in Mbanaayili echo broader global patterns, wherein deforestation disrupts the water cycle and reduces regional precipitation levels (Runyan & D’Odorico, 2016). Similarly, women in Mbanaayili feel the repercussions of water scarcity on their livelihoods, evident in the increased distances they must travel to fetch water and gather shea nuts. Respondent 9, a representative at the Environment Protection Agency (EPA), collaborates this by explaining that they have connected the effect of deforestation to lack of water, lack of good health and lack of good nutrition. He further states that increased tree cutting has a direct impact on climate and air quality which results in more health issues. Hänggli et al. (2023) state that according to their research in the Amazon forest deforestation has led to the spread of infectious diseases. This is further collaborated by Runyan & D’Odorico, (2016) stating that deforestation can explain the emergence of infectious diseases in wildlife and the increase in zoonic infections. However, additional research on the health effects of deforestation in the communities in northern Ghana is necessary to effectively assess its impacts. Apart from resource depletion in terms of water and risks to health, the interviewees also noted that women’s livelihoods were affected. Respondent 6, a woman from Mbanaayili who is not affiliated with the shea butter working group voices her concerns:

Crops didn’t get enough rain so out of 5 hectares they got 7 bags of maize and the one who assisted also took one bag. So there are 5 bags for the whole year. Which is not possible. So the climate change, that's how it's affecting the rain pattern. Invariable affecting the production (Respondent 6).

In the rural area of Mbanaayili, many people are dependent on agriculture. However, this heavy reliance on agriculture also contributes significantly to deforestation, intensifying climate change and worsening living conditions (McDermott et al., 2023; Brobbey, 2020). Thus, the primary source of livelihood for the community paradoxically leads to its decline. Respondent 6 further explains that insufficient rainfall results in poor crop yield leading to food shortage and thereby deteriorates health conditions. Thus, deforestation is impacting not only livelihoods but also food security in Mbanaayili. This observation resonates with the assessment by Runyan & D’ Odorico

(2016) that deforestation has far-reaching impacts on various aspects of societies, including health and livelihoods for those dependent on them. Further research would need to be conducted to assess the impact of deforestation and food security in the area. Moreover, respondent 4 at CLIP argues that it is necessary to look for alternative livelihoods and raise awareness among farmers about the consequences of deforestation, urging them to understand the deep implications it entails.

The conditions that are present in Mbanaayili for the local community reflects an environment that does not foster freedom for individuals to pursue their livelihoods. In light of this, the Capability Approach would therefore emphasise prioritizing the capabilities of the most disadvantaged in society (Robeyns, 2017; Sen, 2001 in O'Byrne, 2022). However, the women in Mbanaayili experiences with deforestation are currently constraining them and providing them with little alternative which in turn makes them more vulnerable as they struggle to sustain their livelihoods. This resonates with Feminist Political Ecology which asserts that environmental concerns lie at the core of lives, livelihoods, survival, and community well-being (Rocheleau et al., 1996)).

Furthermore, the thematic analysis noted a trend in the responses from the women in Mbanaayili, irrespective of their affiliation with the working group. The women acknowledge the significance production of shea butter has for their livelihoods even if they are not directly involved in the butter working group. This is illustrated by respondent 5, a woman who is not affiliated with the shea butter working group stating:

If you are not even doing anything in the village, you can depend on it to start what you want to do. It's like everyone knows how. The shea butter in this community. If your mother is doing, you, watch her do. So if you want to start a business. And you don't have maybe capital to start, you can rely on that and that one you don't need to start big. You can just go to the bush. Pick what is available. Come and start small. And go to your business (Respondent 5).

The translator further explains that respondent 5 ceased working with shea butter and is selling clothes, using the income generated from the former to kickstart her second-hand clothing business. This exemplifies how deforestation affects more than just the women that directly depend on it. Across the interviews with the women from Mbanaayili, there is therefore a hope that NGOs can bring positive change by supporting them with initiatives to increase their livelihoods. This is confirmed by Respondent 4, a technical officer for livelihoods and business development at CLIP who shares the initiatives that have so far supported the women in the community. Respondent 4 explains that they have provided village saving loans and some women have used them to start their businesses as the example by Respondent 5 illustrates. Furthermore, Respondent 10 from the Forestry Commission notes that they do not have initiatives to increase sustainable livelihoods but instead, this is supported mainly by NGOs.

As mentioned in the previous section women are gravely impacted by deforestation and this is especially the case when it comes to their livelihoods. This can be seen in the options and possibilities available to women. While men have the option to leave the community and search for jobs elsewhere, women are forced to remain behind. Respondent 3 explains: “no I have children. So I can’t move my children” (Respondent 3). This correlates with Yiridomoh et al. (2022) who state that women are more exposed to climate extremes since they face difficulties feeding their children as they struggle to move away and search for alternative livelihoods due to not being able to leave their children behind. This contends with the Capability Approach which stresses the importance of creating an environment that fosters freedom for individuals to pursue meaningful goals (Vijay & Yadav, 2022). In this sense the capabilities of women are constrained, and this does not only diminish their own well-being but that of the community’s development as a whole. Following Amartya Sen’s Capability Approach it is therefore possible to assess, that given women’s restricted freedom in pursuing their capabilities, this social system is not that effective. To understand this better the following section will explore the challenges and barriers that women face with deforestation drivers.

6.3 Challenges in Addressing Deforestation Drivers

Across the interviews with the women in Mbanaayili, it remains clear that they understand the severity deforestation has on their livelihoods and the community. Their contribution to addressing this challenge has been not to cut trees themselves. When asked about how they deal with this on the community level, respondents 5 and 6 stated that they ask others not to cut trees or they will be reported to the chief. As mentioned by Nyamekye et al., (2023) it may be difficult for people in the communities to report people to the chief as they may fear retaliation. So far, the respondents have not reported anyone to the chief. Across the data it was noted that cultural practices also contributed to the cutting of trees. Several respondents mentioned how naming ceremonies for newborn babies further contributed to the cutting of trees. This leads back to the importance of sensitization in the communities. In addition, many men depend on farming for their livelihoods which leads to the clearing of land and cutting of trees while women also rely on cutting down trees for cooking. Respondent 10, a representative at the Forestry Commission highlights:

The women themselves also cut it a lot for their firewood. When I see a woman on top of a tree cutting it. I become confused, so I'll ask them. Is it not the same tree you come around to take the seeds from? And you are cutting it down. To cook for the children you see. So these are the challenge they are in. In fact our locals are sometimes a bit challenged (Respondent 10).

This observation is supported by Yiridomoh et al (2022) who state how individuals can engage in environmentally hurtful activities because they lack alternative livelihood options. Brobbey et al. (2020) further state that farmers may fear losing their livelihoods and being evicted from illegal farms which prevents their participation in efforts to reduce deforestation.

Furthermore, it remains difficult for women to decide what happens to the trees as they lack ownership rights. When asked about land inheritance, respondent 1, a woman from Mbanaayili belonging to the shea butter working group states: "If you are a lady it doesn't go to you"

(Respondent 1). She explains that this belief stems from the expectation that women should marry and move to their husband's house. Thus, gender dynamics have deep implications for women, creating barriers to land access. This directly relates to Feminist Political Ecology, which suggests a strong association between climate change vulnerability and resource ownership and control (Yiridomoh et al. 2022). As mentioned previously, the interviews with the women highlight a shared belief that landowners have the autonomy to make decisions about their land. This sentiment is echoed by respondent 3, a woman from Mbanaayili belonging to the shea butter working group:

It will be difficult unless they stop selling the lands. If you sell maybe a piece of land to somebody, and that person wants to develop, can you tell that person not to cut down trees? There are so many forest plantations there, but they have sold all the place. Should they start developing today... today they pull down the trees. So unless of course, the chiefs. Maybe in the bylaws to regulate the cutting down of trees. Bust since once the selling is there, the cutting too... (Respondent 3).

The development reflects Nyamekye et al. (2023)'s point that conflicts may arise between chiefs and forestry departments, as chiefs may prioritize customary interests over following guidelines. In this context, the lack of bylaws to regulate the cutting of trees as highlighted by respondent 6 may contribute to the issue. For many women in Mbanaayili, the primary focus is to secure land ownership and thereby gain control over the trees on that land to safeguard their livelihoods. This is exemplified by respondent 6, a woman from Mbanaayili who is not affiliated to the shea butter working group: "If I have land, I won't allow anyone to come and cut a tree. And also, if I have my land, I can also get shea tree and daodao tree" (Respondent 6). Thus, by acquiring land women gain a further incentive to conserve and plant trees in an attempt to further sustain their livelihoods. In this sense land ownership has the potential to discourage the overexploitation of land and promote tree planting as noted by Damnyag et al. (2012). However, for women in Northern Ghana, acquiring land is not that simple as the sections above illustrate. The following section will explore

how to navigate these complexities and pursue change through the integration of women's perspectives into natural resource management policies and practices.

6.4 Integrating women's perspectives into natural resource management policies and practices

The following section will seek to address the following supporting question: *How can their knowledge and perspective be integrated into natural resource management policies and practices?* The data shows that women in Mbanaayili would like support from NGOs to acquire land and also gain more buyers for their shea butter. Their response shows that they understand that their limited power and ownership of natural resources are impacting their livelihoods. In turn, they wish to find a way to secure their livelihood as stated previously. This is exemplified by respondent 7, a woman not affiliated with the shea butter working group, who states: "So if we also get maybe support, we can buy land also fence around so that animals cannot destroy the trees" (Respondent 7). This example highlights women's tendency to prioritize investment in farming, driven by concerns that borrowed land may be reclaimed from them. Nuhu & Matsui's (2022) further elaborate that this often leads women to emphasize the importance of financial support, while men emphasized irrigation facilities, infrastructure, and farm machinery. Furthermore, when asked who could provide them with the given support, the respondents expressed little faith in the government. Instead, they sought support from NGOs or other civil society initiatives. They highlighted their financial constraints in the current situation. This resonates with the Capability Approach, which emphasizes the importance of enhancing women's capabilities and facilitating the process by which they can achieve their goals. The women in Mbanaayili emphasize their need for support to attract more buyers for their product and financial means to gain land for tree planting, thereby enhancing their sustainability. This echoes Sen's point that individuals are not passive recipients of policies but active agents who can shape their own lives (Sen, 1999 in Velástegui, 2020).

Across several of the interviews, another trend emerged, namely the enactment of bylaws and their official gazetting to lend them validity in court. The Ministry of Food and Agriculture, EPA and CLIP all assert that implementing these measures could help contain deforestation and safeguard the livelihoods of women. However, the main issue across the data remains the lack of financial support. When asked about the source of this support, the respondents shared the sentiments of women in Mbanaayili, emphasising the impotence of NGO assistance. This is clearly stated by respondent 8, a representative from the Ministry of Food and Agriculture:

For instance like the NGO's that we do work with, there are some of the things that you do sometimes tell them if you actually want what we are doing to work, we need to go to the assembly, assist and gazette some of these things (Respondent 8).

Respondent 4 from CLIP further elaborates that in order for the bylaws to be successful it is necessary to seek a bottom-up approach and have an advocacy plan in the community so that the policy receives the necessary backing. This is further supported by respondent 9, a representative at the EPA who states: "We need a consultative process, a consultative process that begins with the women and the men themselves" (Respondent 9). This is consistent with Nuhu & Matsui (2022) stating that to secure the success of such policies it is necessary to ensure that male farmers and traditional leaders support women in gaining access to land and climate information services. Furthermore, Respondent 10, a representative from the Forestry Commission highlights the importance of seeking information from the grassroots so that policies are well-informed. This is further supported by McDermott et al. (2023) stating the importance of "local context", "bottom up" and "participatory" governance to effectively address environmental issues. Through this process, awareness of gender norms and tree conservation can be disseminated within the community. Therefore, recognizing the importance of equity in land use governance and advocating for alternative models for systemic change by grassroots and networked actors could lead to sustainable transformations (McDermott et al., 2023). This perspective resonates well with Feminist Political Ecology which aims to formulate policies that result in a more sustainable environment while addressing the deep-rooted economic and political factors contributing to

poverty and ecological crisis. Respondent 10, the Forestry Commission representative, addresses some criticism towards the way policies and interventions have sought to address's natural resource management:

So the aspect of the sustainability is very important. When you come for loans, when the politicians come for loans from your countries, not necessarily loan doesn't mean necessarily giving money out. You can propose policies, come in to implement those policies, make sure that they are grounded. Then you see the country changes. Why give them 3 billion? Four billion? They come to do a Keke party with it. Then it ends there, we are back to square one (Respondent 10).

This resonates with respondent 9, a representative from the EPA, who also criticises the implementation of policies, arguing that they are often out of touch with the needs of the population. As mentioned earlier, it is necessary to develop policies through an approach that listens to the needs of the community. Thus, the involvement of fringe communities with forests could contribute to better conservation of forest reserves (Nyamekye et al., 2023).

Yiridomoh et al. (2022) argue that women's reliance on nature for their livelihoods has equipped them with the ability to find solutions to climate extremes. The input from the women in Mbanaayili could therefore inform the development of policies that were more aligned with their needs. Therefore, their participation in forest governance institutions could have a positive impact on conservation and lead to better conservation and restoration (Agarwal, 2009). Thus, the involvement of women in decision-making processes could enhance their capabilities and enable them to shape policies that reflect their priorities and aspirations. In light of the existing power dynamics, institutional constrains, and cultural norms that often hinder the effective integration of women's perspectives and knowledge into natural resource decision-making processes, it becomes essential to conduct awareness-raising and sensitization programs (Begum et al.,2022). These initiatives should target communities, government agencies, and other stakeholders to promote the understanding of gender equality and the significance of women's participation in natural resource

management. One approach to achieve this goal could be by collaborating with civil society organizations or NGOs as advocated by the women in Mbanaayili. These organizations can provide support, resources and advocacy to amplify women's voices and ensure their participation. These collaborative efforts hold the potential to lead to the development and implementation of policies that explicitly recognize and target the distinct needs and concerns of women in natural resource management (Ibid.).

7. Conclusion

Deforestation has had significant impacts on the environment and those who depend on it for survival. The lived experiences and perspectives of rural women in Mbanaayili, Ghana, in relation to deforestation and its effects on their livelihoods, are multifaceted. Through thematic analysis, it is evident that these women are disproportionately affected by deforestation, as it directly impacts their access to resources, livelihood opportunities, and overall well-being. Their voices highlight the interconnectedness between environmental degradation and gender inequality, emphasizing the urgent need for inclusive and gender-responsive approaches to natural resource management. Women's experiences of deforestation in Mbanaayili are shaped by a complex interplay of social, cultural, and economic factors. The expansion of families, urbanization, and changing cultural norms contribute to increased pressure on land and resources, increasing deforestation. Additionally, existing power dynamics, including patriarchal structures and unequal land tenure systems, further marginalize and shape the experiences and perspectives of women, limiting their agency and decision-making power over forest resources. This underscores the importance of understanding and addressing gender disparities in access to and control over natural resources.

Integrating the knowledge and perspectives of rural women in Mbanaayili into natural resource management policies and practices is essential for creating more inclusive and effective approaches. By centering their voices and experiences, policymakers can gain valuable insights into the nuanced challenges and opportunities faced by women in forest-dependent communities. Collaborative and participatory processes, grounded in local contexts and guided by principles of gender equity and social justice, are crucial for designing policies that address the root causes of deforestation and promote sustainable livelihoods for women. In conclusion, the lived experiences,

and perspectives of rural women in Mbanaayili underscore the pressing need for adopting gender-sensitive strategies in combating deforestation and managing natural resources. By recognizing and addressing the intersecting factors that shape women's experiences, policymakers can develop more equitable and sustainable solutions that benefit both communities and ecosystems. Through inclusive and participatory processes, women can be empowered to actively contribute to decision-making and policy formulation, leading to more resilient and thriving forests for future generations.

7.1 Consideration for Future Studies

While this thesis provides insights into the lived experiences and perspectives of rural women in Mbanaayili concerning deforestation and its impacts on their livelihoods, there are opportunities for further research. Further studies could delve deeper into the health consequences of deforestation on women and the communities in Northern Ghana. This could provide valuable insights into the impact of deforestation on human well-being. Furthermore, given the current climate situation and the continued population growth, research in alternative livelihoods is imperative, especially for future generations. Thus, exploring sustainable income-generating activities that mitigate reliance on forest resources can contribute to long-term resilience and forest conservation efforts.

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Appendices

Appendix I: List of Respondents

Respondent	Participant Role
1	Woman from Mbanayili- belonging to the working group
2	Woman from Mbanayili- belonging to the working group
3	Woman from Mbanayili- belonging to the working group
4	Technical officer for livelihood and business development at CLIP
5	Woman from Mbnayili- outside of the working group
6	Woman from Mbnayili- outside of the working group
7	Woman from Mbnayili- outside of the working group
8	Management Information Systems Officer at the Kumbungo Distric Department of the Ministry of Food and Agriculture
9	Regional Director for the Environment in the Northern Region at the Environment Protection Agency
10	Range Manager at the Forestry Comission
11	Focus group discussion with women from Mbanayili- both inside and outside of the working group

Appendix II: Interview Guide

Interview guide: for women in Mbanaayili, Kumbungu.

Introductory questions:

- What is your name?
- How old are you?
- Are you married/widowed/single?
- Where are you from?
- How long have you lived here?
- What is your job?
- What is your education?
- Are you the head of household?
- Do you own land?

Main topic: deforestation

Deforestation
<ul style="list-style-type: none">● In your own words please describe deforestation?● What are the main factors contributing to deforestation?● How has deforestation affected you personally?● Can you share any stories on deforestation and how it has affected Mbanaayili?● Does gender affect how people experience deforestation? How?● Have you seen any differences in how men/women are affected by deforestation?● In your opinion, who is mostly affected by deforestation?● How do people in Mbanayili perceive deforestation? Are there different perspectives?● How does deforestation affect access to land?● Have you noticed any decrease in natural resources? How have these changes impacted your land over time?● Are there any community led initiatives to combat deforestation? How do you contribute to these efforts?● What interventions would you recommend addressing deforestation in Mbanayili?● How do you see women address this?

Sub- topics: Land rights, resilience & challenges, Gender & power dynamics

(Questions under these themes will be asked according to responses given to the main topic)

Land Rights	Resilience & challenges	Gender & power dynamics (These questions will be asked in connection to deforestation)
<ul style="list-style-type: none"> ● How are the land rights in your area? ● Who owns the land? - Possible follow up: what happens when that person dies? ● Who does the land go to? ● Do women own land? ● How is the privatization of land in your area? Is there land registration? ● Do you own land? Do your friends own land? ● Is it possible for someone who doesn't own land to own it? ● Can women own land? ● How many women own land in this area? ● Have there been land disputes in your area? How were they resolved? ● Is it possible to get a loan to buy land? Is it hard/ easy? ● How have women bought land? Through what processes? 	<ul style="list-style-type: none"> ● Do you depend on agriculture to meet your daily needs, school fees, food? ● Has there been a food shortage due to deforestation/drought? ● Have you experienced a decline in health? ● Who do you go to for help? ● Have you taken part in any initiatives to deal with these issues? Are you part of any groups? What do you do? ● Are people migrating to other cities for work? How is this affecting those of you remaining? ● Possible follow up: Could you consider going to another city for work? ● What changes would you need for things to become better? What support would you need from the government? From programs? ● What are the forms of risks, uncertainty, and insecurity that you face as a woman/head of household in Mbanaayili? 	<ul style="list-style-type: none"> ● How have these roles and challenges changed within the context of deforestation? ● How do environmental changes affect gender dynamics within the community? ● Who has the responsibility to feed the family? ● How much do you work? ● How do you get paid for your work in the fields? ● What other tasks do you have next to your work? How much time do you spend on them? ● Are there some tasks you are constrained from doing? Possible follow up: Are there some tasks only women/ men typically do? Which ones are they? ● Possible follow up: What do you do if there is not a man you know to do these tasks? ● Who is in charge of spending the money in your household?

	<ul style="list-style-type: none"> ● How are they being addressed collectively at the community level? ● What is the impact of women's collective efforts? ● (If part of the CLIP working group) As part of a CLIP working group: is this group managing to secure the conditions needed to assure survival? Are you able to diminish risk, especially environmental risk, and create new opportunities for yourselves, your families, and your households? ● (if not part of the CLIP working group) as not being part of an organization/working group, how are you managing to diminish environmental risks? And create new opportunities for yourself? 	
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Interview guide: for CLIP Ghana

Introductory questions:

- What is your name?
- What is your position?
- How long have you worked with this organization?

Deforestation

- In your own words could you please describe what CLIP is and their mission?
- How is the work you do at your organization affecting the women you work with?
- What are the initiatives/implementations that you do to combat deforestation?
- From your perspective what have been the effects on women with deforestation?
- How are women responding to deforestation?
- How are women responding to your initiatives?
- What is the selection process for the working groups the women join? Is there a selection criterion?
- Are some women not able to take part in the projects? Why?
- What interventions would you recommend to address deforestation further in Mbanayili, Kumbungu?

Interview guide: for institutional interviews and key informants

Introductory questions:

Please introduce yourself.

- What is your name?
- What is your position?
- Where do you work?
- How long have you worked with this organization?

Deforestation

- Have you seen a change in the extent of deforestation in the area of Mbanayili, Kumbungu?
- What do you think are the causes behind deforestation in this area?
- What are the initiatives/implementations that you do to combat deforestation?
- From your perspective what have been the effects on women with deforestation?
- How are women responding to deforestation?
- How are women responding to your initiatives?
- What intervention/policy would you recommend to address deforestation further in Mbanayili, Kumbungu?
- How would you in 3 words describe the effects deforestation has on women?