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Female Smallholders and Agroforestry-Based Carbon Farming

An Ecofeminist Analysis of the Risaralda Project in Colombia

Triantafillia Pepe

Student Number: I6403503

1st Supervisor: Dr. Ron Cörvers

2nd Supervisor: Viet Anh Pham

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Abstract

The master thesis examines the role of female smallholder farmers in agroforestry-based carbon farming projects in the Global South through an ecofeminist lens. The study addresses the rooted gender disparities in agricultural developments and highlights the underlying structural barriers that female smallholder farmers are facing.

Although previous research has acknowledged the role of women in agriculture and climate mitigation, no studies have applied ecofeminism as a theoretical framework to real-world projects or climate finance mechanisms such as the voluntary carbon market. This research contributes to this research gap by applying six ecofeminist principles to the gender equity and ecological sustainability assessment within a Case Study of an agroforestry coffee farming project from Rabobank-Acorn in Risaralda, Colombia. Using qualitative methods, including a systematic document analysis and semi-structured interviews, the study finds that while women significantly contribute to agroforestry practices, systemic barriers, such as unequal land tenure, unpaid care work, and socio-cultural norms, limit their formal participation and recognition.

The findings suggest that integrating ecofeminist principles can promote more inclusive, equitable, and ecologically responsible practices in climate-smart agriculture. The study highlights the need for culturally sensitive and bottom-up empowerment strategies, revealing that ecofeminism offers a holistic framework to address both social and environmental injustices in sustainable rural development.

Keywords: ecofeminism, agroforestry, female smallholder farmer, voluntary carbon market, sustainable rural development

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List of Abbreviations

Agroforestry Systems	AFS
Carbon Removal Units	CRU
Carbon Sequestration	CS
Coffee Agroforestry Systems	CAFS
Federación Nacional de Cafeteros de Colombia	FNC
Female Smallholder Farmers	FSF
Food and Agriculture Organisation of the United Nations	FAO
Gender Equality and Social Inclusion	GESI
Greenhouse Gases	GHGs
Gross Domestic Product	GDP
Sustainable Development Goals	SDGs
United Nations	UN
Voluntary Carbon Market	VCM
Work and Opportunities for Women	WOW

1. Introduction

This chapter introduces the topic of the thesis, focusing on female smallholder farmers (FSF) in agroforestry-based carbon farming projects, studied from an ecofeminism perspective and using the Risaralda project in Colombia as a case study. It outlines the research aims, objectives, and research questions that guide the study. Finally, the chapter provides an overview of the thesis structure.

1.1 Context

In the face of accelerating climate change, rising biodiversity loss, and growing inequalities, the agricultural sector in the Global North is facing significant challenges that often conflict with rural development ambitions (IPCC, 2023; Paparrizos et al., 2023). As agriculture plays a crucial role in ensuring both food security and environmental health, the need for more sustainable and socially just alternatives has become increasingly urgent (Naik et al., 2024). One such alternative is agroforestry, a nature-based practice that integrates agriculture and forestry to enhance ecological diversity, support social well-being, and promote long-term food security and planetary health (Gold, 2024).

Key players in this agricultural transition, particularly in the Global South, are smallholder farmers who contribute significantly to both the local and global food production (NWO, 2020). Smallholders are a vulnerable group of people cultivating small fields of land (usually between 2 to 5 hectares, depending on the region) to feed their families and earn an income. They mostly live in rural areas of the Global South with limited access to financial resources and essential infrastructure (Amar & Beranek, 2023).

Among smallholders, women comprise approximately 43% of the agricultural labour force (FAO, 2012). Yet, despite their vital role, FSF frequently face significant barriers to accessing resources, training, and participation in decision-making. These disadvantages undermine their potential to contribute to a more sustainable agricultural sector (FAO, 2012). The Food and Agriculture Organisation of the United Nations (FAO) has emphasised the transformative power of gender equity in agriculture and stated, that if “women farmers had [*sic*] the same access to productive resources as men, they could increase yields on their farms by 20-30%, lifting 100-150 million people out of hunger” (FAO, 2012, p.1).

However, women’s ability to effectively contribute to the agricultural shift is heavily dependent on their access to land, which is currently still only preserved to men due to male bias in inheritance laws, social norms, land markets, and governmental land distribution (Agarwal, 2018). In Latin America, one can find a great gender gap in terms of landownership.

Women hold approximately only around 22-30% of land, which shows a discrepancy when comparing this number to the FSF who are working on the farms (Agarwal, 2018). Moreover, women have been found to have less access to credit, fertilisers, technology, new agricultural practices and marketing infrastructures, which restricts female control over land even further (Agarwal, 2018).

The structural challenges faced by FSF have not gone unnoticed in international environmental policy debates either. At the *1991 World Women's Congress for a Healthy Planet*, women from around the world emphasised their roles in planetary protection and called for a restructuring of global development models to prioritise gender equity and ecological health (Gaard, 2004). These demands resulted in the *Women's Action Agenda 21*, which in the *1992 United Nations (UN) Conference on Environment and Development* officially got included as *Chapter 24 of the Agenda 21* (UNCED, 1992; WEDO, 2002). This effort to highlight the importance of women's participation in environmental decision-making laid the foundation for the integration of gender perspectives into sustainability discourses, a connection that remains relevant in agroforestry today.

1.2 Problem Statement

The agroforestry-based carbon farming project by the international NGO *Solidaridad*¹ and the Dutch Rabobank's *Acorn* programme is centred on smallholder coffee farming in the Risaralda region of Columbia. As most of the global traded coffee is stemming from the efforts of around 25 million smallholder farmers in rural areas, who either work in forest or agroforestry systems (AFS), smallholder farmers have been found to be key actors to the global coffee supply chain and thus its sustainability (Rodriguez-Gallo et al., 2024). Moreover, Columbia is the third-largest coffee producer worldwide, after Brazil and Vietnam, with an output of approximately 846,000 tonnes between 2019 and 2021, and is therefore an important geographical region for analysis (Bureau d'analyse sociétale d'intérêt collectif, 2024).

However, the coffee industry is highly influenced by the negative effects of climate change, such as environmental degradation, including soil erosion, water scarcity, and biodiversity loss, which gets further intensified by climate-related stresses such as droughts, floods, and temperature extremes (Touch et al., 2024). Given that these conditions reduce farm productivity, increase production costs, and lead to significant income losses for smallholder households, the Risaralda project of Rabobank-Acorn² focuses on enhancing productivity and

¹ Every following mention of *Solidaridad* within the thesis refers to the Latin American section of Solidaridad.

² For the sake of readability, *Rabobank-Acorn* will henceforth be referred to as *Acorn*.

grain quality while reducing carbon emissions and preventing deforestation in the rural areas of the country (Rabobank, 2022; Rodriguez-Gallo et al., 2024). The project aims to promote the adoption of climate-smart agriculture in coffee production through agroforestry, and increasing the smallholder farmers living income, all while working in harmony with nature (Acorn, 2024a; Rabobank, 2022). In agroforestry projects such as Risaralda, the farmers are financially rewarded for their carbon-sequestering tree planting and maintenance practices (Rabobank, 2022). This financial reward is granted through the project's participation in the Voluntary Carbon Market (VCM), which provides smallholder farmers with financial incentives for adopting climate-smart practices, that remove or reduce carbon emissions (Amar & Beranek, 2023).

Although showing great efforts to promote sustainability, the Risaralda project does not include the UN's Sustainable Development Goal (SDG) SDG 5 "gender equality" on their SDG overview on the homepage, which raises the question whether the Risaralda project does take gender disparities into account or not (Acorn, n.d.-b). The societal problem that this thesis addresses is, therefore, the role and position of FSF in agroforestry-based carbon farming. Despite their essential role in sustainable agriculture, women often face discrimination in accessing land, credit, and agricultural inputs, which limits their ability to contribute to environmental sustainability and economic development (Lasco et al., 2016). The empowerment of FSF in rural areas is additionally often hindered by deeply rooted cultural norms that perceive women as weak (Gubert et al., 2020).

From an environmental perspective, the agroforestry practices can be analysed to determine the extent to which they seek to mitigate the conventional coffee monocultures' contribution to soil erosion, biodiversity loss, and increased climate vulnerability, which could contribute to sustainable rural development (De Leijster et al., 2021; Rodriguez-Gallo et al., 2024).

The thesis aims to address the knowledge gap of how ecofeminist approaches can influence agroforestry-based carbon farming. *Ecofeminism* provides a theoretical perspective that emphasises the interconnectedness of gender oppression and environmental degradation (Mies, 2014), but its application in real-world projects remains underexplored (Miles, 2013; Roy, 2024).

1.3 Research Aims and Objectives

This thesis studied the Risaralda project through an ecofeminist lens and aims to understand how the integration of ecofeminist principles in agroforestry-based carbon farming can enhance gender equality and sustainable rural development outcomes. The following objectives are central to the study:

- a) Identifying ecofeminist principles that are crucial for agroforestry-based carbon farming.
- b) Examining the role and position of FSF in agroforestry-based carbon farming to find out if there is a discrepancy between female and male farmers.
- c) Analysing how ecofeminist principles contribute to sustainable rural development. This covers facets of climate change mitigation as well as resolving poverty aspects within the rural area of the smallholder farmers.
- d) Evaluating the Risaralda agroforestry-based carbon credit project in Columbia from an ecofeminist perspective and how it could contribute to sustainable rural development.

1.4 Research Questions and Sub-Questions

To achieve the aim and objectives of this thesis the following research question (RQ) and sub-questions (SQ) are central to the study:

RQ: To what extent do ecofeminist principles play a role in agroforestry-based carbon farming in the Global South, and how does this affect sustainable rural development?

SQ1: What ecofeminist principles are essential for agroforestry-based carbon farming?

SQ2: What roles and positions are assigned to FSF in the Risaralda agroforestry-based carbon credit project?

SQ3: What is the possible impact of ecofeminist principles on pursuing sustainable rural development?

1.5 Outline of the Remaining Thesis

The next Chapter 2 Theory, discusses the main topics of this study: the VCM, agroforestry and agroforestry-based carbon farming, FSFs, and rural sustainable development. It also focuses on ecofeminism and provides an analytical framework to examine the Risaralda project.

In Chapter 3 Methodology, the research approach, methods for data collection, and analysis are explained, concluding on the limitations of the data gathering.

Chapter 4 Results, presents the main results and findings of the analysis of the Risaralda project, and answers the SQs simultaneously.

Chapter 5 Discussion compares the results and findings of chapter 4 with the insights gained from the literature review of chapter 2.

The final Chapter 6 Conclusion answers the main research question and provides recommendations for practitioners and further research.

2. Theory and Analytical Framework

This chapter presents the relevant literature and scientific knowledge on the VCM, agroforestry and agroforestry-based carbon farming, FSF, and sustainable rural development. The chapter concludes by presenting the analytical framework of ecofeminist principles that is applied to the Risaralda project.

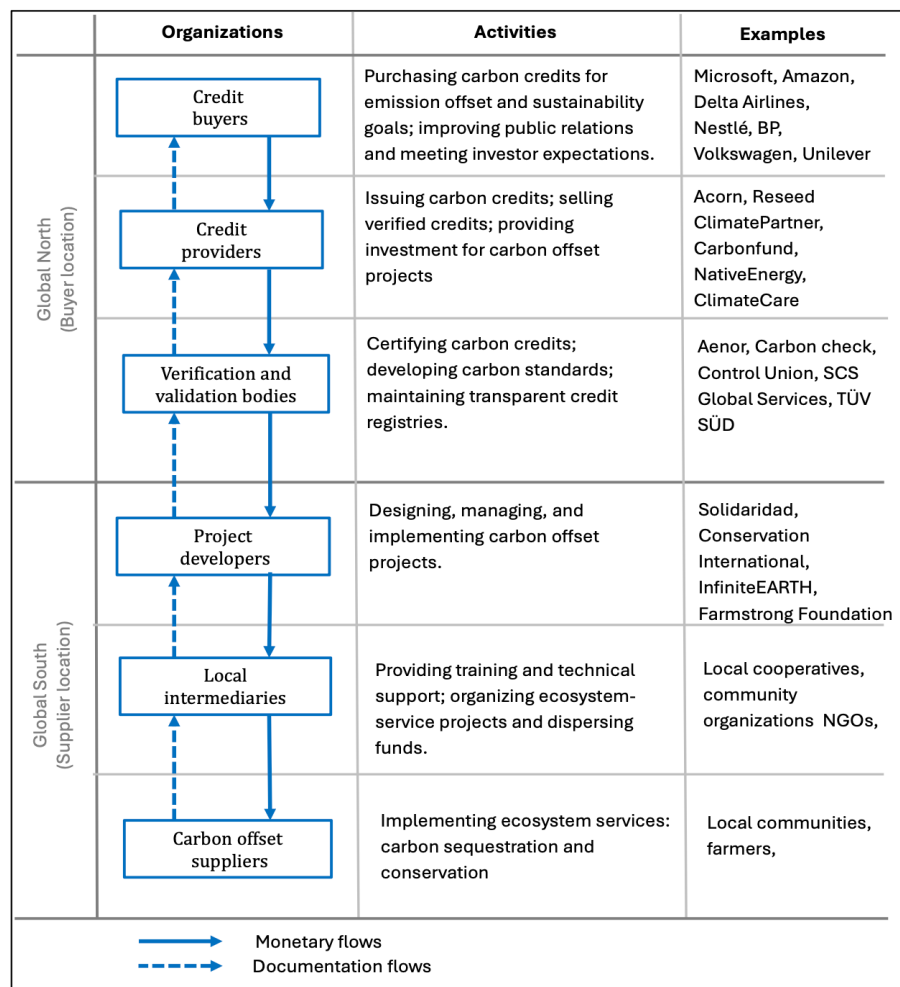
2.1 The Voluntary Carbon Market

The VCM is a platform where individuals, businesses and other entities can issue, buy, and sell carbon credits outside of regulated carbon pricing mechanisms (Streck et al., 2021). It plays a significant role in combating climate change by enabling private stakeholders to finance projects that either remove greenhouse gases (GHGs) or reduce emissions associated with large sectors (Streck et al., 2021). In recent years, the demand for carbon credits has steadily increased, as consumers have been incentivised to be more sustainable and companies have been subject to stricter carbon regulations, due to the pressing issues of climate change (Streck et al., 2021). As the global emphasis on achieving carbon neutrality intensifies, VCMs are increasingly viewed as a preferred mechanism for providing industries with both financial support and access to emissions reductions at relatively low costs (Ranjan, 2024). Currently, the VCM is valued at approximately 2.5 billion USD and expected to grow at a rate of 27% over the next decade (GMI, 2025, as cited in Ranjan, 2024).

Carbon credits are generated through a baseline and credit system that compares actual emissions to a hypothetical baseline scenario, with the difference then representing the verified emissions reduction (Streck et al., 2021). One carbon credit equals one metric ton (1,000kg) of reduced or removed GHG emissions (Streck et al., 2021). The price of the carbon credit unit depends on the type, quality, and demand for and of the emission reduction and is a tradable asset (Streck et al., 2021).

The VCM value chains include different stakeholders, which are spread around multiple geographic regions (Lema et al., 2025). Within the buyer location in the Global North, key actors include credit buyers, credit providers and verification and validation bodies (see Figure 1). The involved project developers, local intermediaries and carbon offset suppliers (e.g. smallholder farmers and local communities) are on the contrary situated in the Global South. The smallholder farmers and local communities are hereby considered as the “backbone of carbon offset activities by implementing carbon sequestration (CS) and conservation practices” (Lema et al., 2025, p. 23).

Figure 1: Simplified Version of the VCM Value Chains, derived from (Lema et al., 2025, p.21)



Critics of VCMs argue that carbon credit systems enable wealthier actors, found in the Global North, to bypass their environmental obligations while turning nature into a tradable commodity, an approach often associated with weak sustainability (Pelenc et al., 2015; Whitman et al., 2025). Since most carbon crediting initiatives are developed in the Global North but implemented in the Global South (Streck et al., 2021), moral concerns are increasing, wondering if carbon credits are shifting the environmental burden of the Global North onto communities in the Global South (Parsons, 2023; Whitman et al., 2025). This concern increasingly gains relevance considering that the Global South is expected to experience over 75% of climate-related damages this century, despite contributing less than 33% of global GHG emissions (Cohn et al., 2017; Whitman et al., 2025). These disparities in responsibilities and impact have contributed to the emergence of the term *carbon colonialism*, which describes practices of land appropriation and the often hidden ways in which the carbon market is exploiting people and resources (Parsons, 2023; Whitman et al., 2025). While carbon offsets

have been gaining attention for addressing emissions and contributing to environmental efforts, the control of the Global North over the resources of the Global South, is increasingly getting criticised for the neocolonial dynamics, which the VCMs are standing for (Evite & Zara, 2023).

2.2 Agroforestry and Agroforestry-Based Carbon Farming

Agroforestry encompasses diverse land-use practices that integrate trees and shrubs with crops and or pasture, either simultaneously or sequentially (Taillandier et al., 2023). Taillandier et al., (2023) defined the three most common types of agroforestry as *agrisilviculture* (combining crops and trees), *silvopastoralism* (combining pasture and trees), and *agro-silvo-pastoralism* (combining crops and pasture with trees).

AFS are aiming to build climate-resilient food systems, while promoting localised, small-scale farming that relies on ecologically sustainable and resource-efficient practices to simultaneously increase environmental sustainability and agricultural productivity (Roy et al., 2025).

Agroforestry provides a valuable opportunity for climate change adaptation and income diversification by leveraging the multiple benefits of trees on agricultural land (Lasco et al., 2016). Within the coffee industry, coffee agroforestry systems (CAFS) have emerged as an approach to mitigate the effects of climate change, while simultaneously contributing to natural pest and disease control (Rodriguez-Gallo et al., 2024). CAFS therefore have a variety of ecological benefits, including soil preservation, biodiversity conservation, and CS (Rodriguez-Gallo et al., 2024).

Due to its contribution to climate change mitigation through CS and rural microclimate improvement, agroforestry is increasingly recognised as a sustainable land management approach (Agnoletti et al., 2022; Martinelli et al., 2019). Meanwhile, it also contributes to improving smallholder farmers livelihoods in rural areas (Martinelli et al., 2019). On an environmental level, agroforestry can therefore help mitigate climate change, enhance biodiversity, and improve soil health and water quality (Awazi, 2025; Leakey, 2017). Agroforestry moreover generates public ecosystem services, such as biodiversity conservation and watershed protection (FAO, 2013a). On an economic level, agroforestry can provide additional sources of income by diversifying crops and outcomes, while simultaneously ensuring food production (Leakey, 2017). Agroforestry can therefore be considered a practical example of sustainable agriculture. The importance of sustainable agriculture is demonstrated by the fact that the three Rio Conventions, the UN Framework Convention on Climate Change,

the UN Convention on Biological Diversity, and the UN Convention to Combat Desertification, have all agreed on a high ranking of sustainable agriculture as an urgent food system issue (WWF, 2024).

Due to its high capacity for CS, agroforestry has gained attention as strategy for climate change mitigation

Agroforestry-based carbon farming involves intentionally designing integrated systems of trees, crops, and livestock to enhance carbon storage in both biomass and soil. This approach is connected the carbon credit markets, like the VCM, and climate finance initiatives (Duffy et al., 2021; Roy et al., 2025). Those projects specifically target smallholder farmers in countries of the Global South as they are the major practitioners of agroforestry (Ramachandran Nair et al., 2009). The carbon sequestered through agroforestry projects can be sold as carbon credits on the VCM. Countries and companies in the Global North seeking to offset their emissions can purchase these credits, creating an economic opportunity for the farmers (Ramachandran Nair et al., 2009). This financial support can be considered a form of payment for environmental services and can increase the income of the participating smallholder farmers (FAO, 2013a).

2.3 Female Smallholder Farmers

Agriculture remains one of the core sectors of economic and social development within countries of the Global South, as it not only provides livelihoods for a significant part of the population, but it moreover serves as the primary source of income and employment (Mbow et al., 2014; Ramachandran Nair et al., 2009). Agriculture serves not only as a means of ensuring food security, but significantly contributes to ending poverty and boosting economies in the Global South (OECD, 2023; World Bank Group, 2025). In 2023, the agricultural sector, combined with the forestry and fishing sector, contributed to 8.72% of Colombia's gross domestic product (GDP) (Statista, 2025). Notably, agricultural employment still remains the sector most strongly associated with the highest rates of workers living below the poverty line (FAO, 2012).

Within the agricultural sector, smallholder farmers, play a critical role. Smallholder farmers, or small-scale farmers, typically operate on less than one to ten hectares of agricultural land, which are usually family-operated and located in rural areas (Agarwal, 2018; Terlau et al., 2019; Wolfenson, 2013). The farms are therefore predominantly dependent on family labour, from both women and men, and parts of their produce is used for their own consumption (FAO, 2012). Smallholder farmers represent approximately 70-80% of the world's farmers and

are mainly based in the Global South (Taillandier et al., 2023). Within Colombia alone, rural smallholder farmers made up approximately 31.8% of the population in 2023 (FAO, 2023). Within the country's agricultural GDP, coffee cultivation alone makes up approximately 7%, while the sector enables employment opportunities for 26% of the total agricultural workforce in the country (Ferrucho et al., 2024).

Smallholder farmers in the Global South are responsible for producing a large share of the regions food, which not only sustains the local markets, but further contributes to global food supplies (Touch et al., 2024). Despite their limited access to resources, technology, and markets, they are key drivers in strengthening climate change resilience, reducing poverty, and promoting sustainable agricultural practices (FAO, 2002). Enhancing their productivity, and ensuring their inclusion in development strategies are therefore crucial for achieving broader goals of rural development and global food security (FAO, 2012; Touch et al., 2024).

Female farmers grow the majority of the world's food supply and make up one-third to one-half of the agricultural labour force in the Global South. They therefore play a crucial role in the agricultural labour sector (Warren, 1997; Wolfenson, 2013). Within Colombia's coffee cultivation sector, women make up 30% of the approximately 540,000 coffee farmers (Rendón et al., 2023). They contribute to agricultural labour and productivity despite facing additional barriers compared to their male colleagues (Wolfenson, 2013). These barriers are represented through various external challenges such as high vulnerability to climate disruption, limited financial resources, and difficulties in accessing agricultural inputs and resources (Dibakoane et al., n.d.). As a result of climate variability, they have a higher vulnerability to food insecurity, reduced crop yields, and financial losses (Dibakoane et al., n.d.). Additionally, women's agricultural labour is limited due to unpaid caregiving duties and other family responsibilities (Murray et al., 2016). As stated by Gannaway et al. (2022), the overall burden of FSF is constituted by the triangulation of agricultural labour, reproductive tasks in the household, and social obligations. This gendered division of labour in agriculture has typically put men in a position of power, with responsibility for cash crops, while women had to manage the food crops (Warren, 1997). As a result, women have to work longer hours, have fewer assets, and earn lower incomes, simply because of their limited access to land (Warren, 1997). Without financial support, it is difficult for them to purchase the resources to improve the productivity of their labour.

Women's roles in agriculture range from unpaid family workers, wage labourers and farm partners to farm managers (Warren, 1997). The historical failure to recognise women's

contribution to farming caused the emergence of the “invisibility of women” (Warren, 1997) in the agricultural sector.

As women represent an increasing proportion of agricultural workers, this is because a greater number of men than women are leaving the farm sector, it is all the more important for them to be equally included (Agarwal, 2018). Previous studies in rural areas have shown that empowerment processes have helped women recognise their roles in smallholder farming not just as labourers, but as stewards of their environment (Gubert et al., 2020). This shift in self-perception has contributed to meaningful changes in their social, economic, and political status (Gubert et al., 2020).

2.4 Sustainable Rural Development in Food Production

The implementation of the 17 SDGs in 2015 by the UN member states resulted in 169 targets, almost all of which are to an extent related to food or farming (Terlau et al., 2019). The Natural Resources Management and Environment Department of the FAO published a report in 2013, that specifically considered smallholder farmers, and the central role of agriculture in improving human well-being and national economic growth in rural areas (Wolfenson, 2013). The report also recognised the important role that smallholder farmers play in promoting an ecological and socially just food system, making them key actors in promoting sustainable development (Terlau et al., 2019; Wolfenson, 2013). Their contributions are part of a sustainable food production that aims to preserve the socio-cultural heritage of rural communities while improving food security, food sovereignty, and environmentally sustainable land management (Wolfenson, 2013). Implementing sustainable agriculture could furthermore increase the average crop yields by 79%, which ultimately leads to increased household food security and higher income (FAO, 2012).

Empowering FSF is an essential part of sustainable rural development, which includes providing women with access to land tenure, resources, and credit, and investing in women’s knowledge and training programmes (Wolfenson, 2013). The provision of equal access to resources and equal opportunities for female farmers has the potential to increase agricultural yields by 20-30%, thus lifting to 150 million people out of hunger (FAO, 2012).

As a climate-smart practice, agroforestry can enhance land productivity, biodiversity and resilience to climate change while supporting food security and offering economic and health benefits to rural communities (Galudra et al., 2024).

Despite women playing key roles in forestry and agroforestry, the sector remains male-dominated. Gender gaps persist due to societal norms, lacking recognition, limited access to decision-making and resources, as well as poorly adapted technologies (FAO, 2025). Empowering women in the agroforestry sector can generate development opportunities for them and trigger important spill-over effects for their households and communities (FAO, 2013b). Studies in Niger, Uganda, Chile and Vietnam are highlighting women's deep knowledge of natural resources and their role in household and community resilience which is why empowering women and addressing the underlying gender disparities in agroforestry projects is essential for sustainable development (FAO, 2013b; Galudra et al., 2024).

To analyse and understand this interconnectedness, it can be beneficial to look at such projects from an ecofeminist perspective.

2.5 Ecofeminism

Ecofeminism is a philosophical and political theory and movement that demonstrates the interrelation between ecological concerns with feminist ones, regarding both as results from male domination of society (Agarwal, 1998). It argues that the oppression of women and the degradation of the environment are interconnected and result from patriarchal and capitalist systems (d'Eaubonne, 2022). Scholars within this theory realm argue that both forms of oppression have their origin in patriarchal structures and emphasise the necessity of a feminist perspective within ecological movements (d'Eaubonne, 2022; Warren, 1997).³ The term first gained popularity as a political movement in the late 1970s and early 1980s in the West, when activists like Fraçoise d'Eubonne first drew attention to the parallels between the exploitation of women and the nature by men in the world, linking control over agriculture and female fertility (d'Eaubonne, 2022; Shrestha, 2024). The term “ecological feminism” (*écologie-féminisme*) was introduced by d'Eubonne in her 1974 book “Le Féminisme ou la mort”, in which she argued that both women and the environment are treated as submissive and subservient subjects, a phenomenon she attributed to male domination in society (Gottschlich et al., 2022; Shrestha, 2024).

The objective of ecofeminism is therefore twofold: firstly, to dismantle the prevailing oppression caused by patriarchal and male superiority ideology; and secondly, to use the movement to defend the rights of women and nature (d'Eaubonne, 2022; Shrestha, 2024;

³ For the sake of clarity, the thesis refers here to the English translation of d'Eubonne's original French work “*Le Féminisme ou la mort*” from 1974.

Warren, 1997). In this way, ecofeminism advocates for social justice and environmental sustainability.

Ecofeminists seek a world in which the rights and well-being of both women and nature are equally valued and protected (d'Eaubonne, 2022; Shrestha, 2024). In regard of the increasing climate crisis, characterised by rising sea levels, forest degradation, ocean acidification, and more extreme weather events, the ecofeminism's long-term, systems-based perspective becomes an essential approach (Madhanagopal et al., 2022).

Beyond the oppression of women and nature, ecofeminists have broadened their analysis to include racism, homophobia, speciesism, and other forms of domination, linking them back to the dominant patriarchal systems, and thus, making the framework even more interdisciplinary (Crittenden, 2000; Gaard, 2004). By explicitly connecting patriarchy, capitalism, racism, and colonialism to environmental harm, ecofeminists follow an intersectional approach and argue that dismantling those systems is a necessity in achieving sustainability and proper equity (Madhanagopal et al., 2022).

Ecofeminists also critique anthropocentrism, which prioritises human well-being over environmental health, and instead focuses on an ecocentric worldview that recognises the intrinsic value of nature (Crittenden, 2000). This approach includes a critique of capitalist systems that are driven by competition, and economic growth while neglecting social and environmental concerns (Irving & Helin, 2018).

Like all feminist splinter groups, ecofeminists see patriarchal nature as a key foundation of capitalist systems, and therefore also link it back to environmental degradation and the oppression of women (Irving & Helin, 2018). As environmental justice movements progress globally, ecofeminism has proven especially influential in shaping activism in the Global South (mainly indigenous activism), where power imbalances rooted in both patriarchy and capitalism manifest intensely (Madhanagopal et al., 2022). Ecofeminism therefore offers both a theory and a practice, intervening in real-world struggles in which women and rural communities resist extractive and exploitative systems that threaten both ecosystems and cultural survival (Sapra, 2012). A popular example is the Chipko Movement in northern India, for which women placed their bodies between commercial loggers and their trees as a form of protest (Sapra, 2012). Their deep connection to the land, highlights the Indian women as “ultimate eco-feminists” (Madhanagopal et al., 2022). However, this characterisation has been critiqued by Sturgeon (1997), who warns that such portrayals risk reproducing white privilege by essentialising indigenous women, whenever this framing is not used by indigenous women themselves.

Other movements in Latin America, such as Ecuador, are taking a different approach to adapt the ecofeminist perspective to their communal context. Women are merging feminist theologies, decolonial feminism and community feminism, through which the indigenous women resist both patriarchal violence and environmental exploitation while reconstructing the notion of eco-political leadership (Madhanagopal et al., 2022). Their struggles to fight for leadership parity, while simultaneously confronting external threats exemplify how ecofeminism is an adaptive framework which reflects embodied resistance and communal care (Madhanagopal et al., 2022).

Ecofeminism therefore offers a powerful framework that integrates environmental, social, and gender justice, challenges binary thinking, and promotes values such as care and empathy. It brings attention to the knowledge and roles of marginalised groups, particularly women, in fostering sustainable and equitable practices.

While the theory is offering valuable insights into the intersectionality of oppression, there are also a range of scholarly critiques. Rather than undermining the theories utility, these critiques are important to take into consideration for the research design and are an important area of debate. One of the main reoccurring critiques of early Western ecofeminist theory, an approach that remains influential today, is its failure to account for the lived experiences of women in the ecologically vulnerable Global South (Madhanagopal et al., 2022). Madhanagopal et al. (2022) mention the limited accessibility of research for female scholars within the Global South (e.g. through paywalls and conferences solely based in the Global North) which emphasises a collaboration gap within the ecofeminist theory realm. In response, scholars emphasise the importance of engaging with literature and voices from these regions directly and looking further into the local movements of countries within the Global South to adapt the approach accordingly. Various strands of ecofeminism furthermore mention the risk of reinforcing essentialist notions by linking women too closely with nature, as it is done in cultural ecofeminism, which highlights gender-specific qualities and the closeness of women to nature. This approach also results in shifting the responsibility of nature protection on women, which would burden them with additional unpaid labour (Bauriedl, 2012; Sapra, 2012).

Many feminists therefore find the notion that women are inherently connected to nature outdated, and even offensive, as the image portrays women as earth mothers. This narrative not only puts women into a passive role as reproductive beings but can further be seen as a tool of oppression in itself (Plumwood, 1993). To ease the responsibility and pressure that this narrative is putting on women Madhanagopal et al. (2022) highlight that it is a societal responsibility for which it is essential that men actively participate in the ecofeminist shift by

openly verbalising and taking accountability for their part of an oppressive history and present while considering how they can contribute to ending their search for power in a patriarchal and capitalist society.

Other critiques note that the theory lacks actionable real-world applications apart from the field of resistance and social/political movements (Madhanagopal et al., 2022).

To fill this gap, the research of this thesis applied core ecofeminist principles to the analysis of the role and position of FSF in agroforestry-based carbon farming in the Global South.

2.6 Analytical Framework

Based on the ecofeminist literature, and the relationship between agroforestry, carbon farming, and FSF in the Global South, an analytical framework was developed that contains ecofeminist principles that are considered essential to examine agroforestry-based carbon credits projects from an ecofeminism perspective (see Table 1). This conceptual framework ultimately guided the research.

Table 1: Conceptual Framework Based on Ecofeminist Principles

Principles	Definition	Explanation	Application to the Risaralda project
Interconnectedness of humans, specifically women, and environmental well-being	There is an intrinsic link between the well-being of women and the natural environment, as they are both suffering under the same system (Adams, 1993; d'Eaubonne, 2022; Mies, 2014).	The concept of interconnectedness, which is rooted in ecofeminism, links the oppression of women and nature in patriarchal societies (Adams, 1993; d'Eaubonne, 2022).	The project should highlight the importance of sustainable and equitable practices, which benefit both women and the environment.
Female empowerment through knowledge and participation	Women can be empowered through the recognition and valuing of their knowledge and in implementing their participation in decision-making processes (Mies, 2014).	The concept of female empowerment can be understood as a series of interconnected processes aimed at enhancing women's status within their respective societies (Tandon, 2016). This is typically facilitated by education, raising awareness, and ensuring equal opportunities, which enables women to manage resources, and navigate risks, which ultimately enhances their well-being (Tandon, 2016).	The project needs to value women's traditional knowledge of tree species, and their role within the community decision-making while allowing them to participate in the project training initiatives.
Challenging patriarchal structures and addressing power imbalances	Ecofeminism seeks to dismantle patriarchal systems that perpetuate gender inequalities (d'Eaubonne 2022). It is therefore important to address the power imbalances within that patriarchal system, that affect women's participation and environmental initiatives (Mies 2014).	Patriarchy is defined as a system in which men exercise domination and exploitation over women and women's bodies, manifesting in structures including the household, paid employment, the state, violence, sexuality, and culture (Walby, 1990).	The project needs to address underlying barriers for women such as limited access to land, resources, and decision-making power. The goal should therefore be to create inclusive spaces where women can influence decision-making and benefit from environmental projects.
Recognising women's contribution	Ecofeminism highlights the importance of recognising and valuing women's contribution to environmental conservation and sustainable agriculture (Shiva, 1988, 2000).	Women are vital contributors to environmental conservation, offering unique insights and skills essential for sustainability (Eqan, 2023). Their local ecological knowledge, especially in rural areas, positions them to lead in managing and protecting natural resources (Eqan, 2023).	The project should acknowledge the women's roles in maintaining biodiversity and promoting sustainable land use practices.
Promoting gender equity and social justice	Ecofeminism emphasises the need for gender equity and social justice in environmental initiatives (Mies & Shiva, 2014).	Gender equity refers to the fair distribution of benefits and responsibilities across genders while addressing the historical inequalities (Shabliy, 2022). It fosters the creation of equal opportunities and the elimination of barriers, ensuring all genders are treated fairly and have equal access to resources and decision-making processes (Shabliy, 2022).	The project needs to ensure women benefit equally from the carbon credit scheme and have equal access to resources and income generated by the project.
Holistic approach to sustainability	Ecofeminism encourages a holistic approach to sustainability that considers both environmental and social dimensions (Shrestha, 2024; Starhawk, 1999).	A holistic sustainability approach encompasses economic as well as social and environmental dimensions, thereby ensuring long-term sustainability (Ruether, 1992). This approach emphasises the interconnectedness and necessity of collaboration to achieve resilient social-ecological systems, stressing the intrinsic value of nature (Crittenden, 2000).	The project should integrate environmental conservation with social equity and community well-being.

3. Methodology

This chapter outlines the research approach and specifies the methods that were used for the data collection and analysis. The chapter concludes with a reflection on the data-gathering.

3.1 Research Approach

This thesis employed a qualitative research design as this type of research approach is instrumental for the study of gender constructions, differentiations, and the related inequalities with which they are associated (Flick, 2002). This approach moreover allowed for in-depth insights into how FSF perceive and interact with agroforestry-based carbon credit initiatives, aligning with the ecofeminist principles that emphasize the interconnectedness of human and environmental well-being (Crittenden, 2000).

The research methods employed comprised a two-phase sequential design, incorporating document analysis and semi-structured interviews. The triangulated data aimed to validate the findings across both datasets to minimise the potential biases and increase the credibility of the conducted research (Bowen, 2009).

3.2 Methods for Data-Collection

For the theoretical part of this thesis, a literature review was conducted. The analysis of the Risaralda project is based on a document analysis and semi-structured interviews. Throughout the analysis, the conceptual framework was utilised as a research tool.

3.2.1 Literature Review

Relevant literature was studied after a structured review of scientific papers on the central research topics. The topics were *ecofeminism*, *sustainable rural development*, *agroforestry and the voluntary carbon market*, and *female smallholder farming*. A first systematic literature search found 2.210 results through the platform Google Scholar, which included all the keywords (visualised in Table 2 & Appendix B). As this scope was too broad, the next step was to reduce the number of papers by excluding irrelevant papers, screening the abstracts, and skimming through the newest results.

Table 2: Search String Literature Search- Google Scholar

Date of Search: March 2025			
Database: Google Scholar			
Concepts related to ecofeminist perspectives on female smallholder farmers in agroforestry-based carbon farming and their role in sustainable rural development			
Concept 1:	Concept 2:	Concept 3:	Concept 4:
<i>Ecofeminism</i>	<i>Sustainable Rural Development</i>	<i>Agroforestry</i>	<i>Female smallholder farmer</i>
Complete Search String			
<i>ecofeminism OR female empowerment OR interconnection of oppression AND Sustainable Rural Development OR Global South OR social equity AND agroforestry OR carbon sequestration OR voluntary carbon market AND female smallholder farmer OR female smallholder OR women</i>			
Number of Results: 2.210			

Furthermore, literature already known to the author to be relevant, particularly within the field of ecofeminism, was taken into account, even if it did not emerge in the systematic literature research.

3.2.2 Systematic Document Analysis

The systematic document analysis ultimately examined a total of 15 units, including Acorn project reports, Acorn's and Solidaridad's website, coffee value chain-related reports (e.g. BASIC report), as well as other communication materials provided by Acorn and Solidaridad. The documents were searched through a list of keywords (see Table 3 & Appendix C).

Table 3: Key Words Search for Document Analysis

Key Words Document Analysis						
Stakeholder 1	Research Region	Stakeholder 2	Stakeholder 3	Research Topic	Research Topic	Stakeholder 4
Rabobank-Acorn	Risaralda	Plan-Vivo	Solidaridad	Coffee Farming Colombia	Sustainable Rural Development Colombia	FNC

The selection of documents was exclusively comprised of those that were either directly linked to or authored by the stakeholders. Alternatively, they included information on coffee farming, or sustainable rural development, thereby providing a comprehensive overview of the subject matter (detailed list of documents in Appendix C). Upon inquiry, Acorn indicated that additional documentation on the Risaralda project is currently unavailable, as they are in the process of preparing a new report, which has temporarily suspended access to previous unpublished materials. The requested Risaralda reports are therefore excluded from the document analysis.

Apart from the systematically searched documents, one additional framework document was discovered during the document collection, which was significant for the analysis of the research questions. In September 2024, a new Gender Equity Guide for carbon credit projects was published by the Work and Opportunities for Women (WOW) program. Developed with contributions from Rabobank's Acorn agroforestry initiatives and key stakeholders such as Plan Vivo and the Voluntary Carbon Markets Integrity Initiative, the guide offers practical tools for integrating gender sensitivity into project designs and implementations (Acorn, 2024c). Though not specifically considering the Risaralda project, the document's involvement of key stakeholders and the guideline's alignment with ecofeminist principles led to the inclusion of the document into the analysis (Chapter 4).

3.2.3 Semi-Structured Interviews

Semi-structured interviews were conducted to add depth and validate the findings of the document analysis. The interviews were conducted online via Teams in the months of April and June 2025 and lasted 45-60 minutes. Out of the 52 contacted people, in total 3 stakeholders agreed to participate in the interviews (Table 4 & Appendix D).

Table 4: Overview Interviewees

Participant ID	Interviewee	Reference
P1	Expert for Acorn Projects	Acorn Representative I
P2	Expert in Feminist Perspectives on Agricultural Supply Chains and International Development Cooperation	GIZ ⁴ Representative
P3	Expert for Risaralda Project	Acorn Representative II

All stakeholders were contacted by email and were either knowledgeable about feminist perspectives on smallholder farming in the Global South or a project representative at Acorn. Unfortunately, the partner organisation Solidaridad could not support the research of this thesis in any form, which is why they were excluded from the list of interviewees.

Apart from Solidaridad, the initially contacted people included:

- experts in valued coffee supply chains
- experts in sustainable rural development
- experts and professors for agricultural projects
- VCM experts
- the government of Risaralda
- ecofeminist experts and professors.

The interviews were based on a semi-structured interview guide with open-ended questions, which all related to the sub-questions of the research (see Appendix E). The semi-structured interview guide facilitated the comparison between the interviews and ensured that all important research areas were covered while allowing the researcher to ask follow-up questions if necessary.

Before the interview, participants were required to complete a consent form to ensure that they were informed of their privacy rights, and were allowed to ask questions before the interview.

3.3 Methods for Data-Analysis

The interview transcripts and documents were analysed through the structured qualitative content analysis method developed by Kuckartz (Kuckartz, 2018). This systematic approach aims to enhance objectivity, reliability, and validity in research through the creation and

⁴ Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ): the German Society for International Cooperation, which is the main development agency of Germany. They also have some projects, which focus on the inclusion of women and other marginalised groups, e.g. “Feminist and Fair” series.

assignment of categories (Kuckartz, 2018). The method combines inductive procedures through category formation and predominantly deductive processes.

The structured qualitative content analysis followed seven steps (Kuckartz, 2018). First, the material was reviewed, key observations were noted, and a case study summary was prepared. Next, main categories were derived from the research questions, the analytical framework and the interview guide. In the third step, relevant text segments were assigned to the main categories. Subsequently, all coded passages were grouped for further analysis. Subcategories were then inductively developed, refined, and clearly defined (Kuckartz, 2018). This was followed by a second round of coding, which led to the creation of the qualitative codebook (see Appendix F). In the final steps, themes and subthemes were analysed and relationships between categories and subcategories were explored (Kuckartz, 2018). This approach ensured that the interview content aligned with the findings of the document analysis and the conceptual framework of the thesis. The results of this analysis are presented in Chapter 4.

For an efficient organization and interpretation of the data and the content coding process, the software ATLAS.ti was used (ATLAS.ti, n.d.).

3.4 Reflections on Data Gathering

The data collection process presented several challenges that influenced both, the overall scope and depth of the research. One of the most significant difficulties encountered, was the limited success in securing interviews with key stakeholders. Many individuals either lacked the time to participate or expressed no interest in contributing to the study. This reduced the opportunity to gather qualitative insights beyond what was available in written documents.

In response to the low interview participation rate, an online questionnaire was proposed and shared with contacted stakeholders as an alternative means of data collection. However, this approach did not lead to any responses, further limiting the diversity and depth of stakeholder perspectives in the research.

A critical gap in the data collection process was the inability to directly engage with FSF, an essential stakeholder group and initial problem owner. Language barriers and the lack of a feasible communication channel made it impossible to include their voices.

The lack of cooperation from the partner organisation Solidaridad further restricted access to internal documents and practical context specific insights. This meant that the analysis

had to rely entirely on publicly available information, which inherently limits the depth of understanding the on-the-ground realities of the Risaralda project.

Furthermore, many of the documents obtained were general information materials produced by Acorn and not specific to the Risaralda project context. The absence of a comprehensive and accessible project report for Risaralda made it difficult to analyse certain elements of the project in sufficient detail. Consequently, some aspects of the project design and implementation could only be discussed in broader terms.

Lastly, as this study is based on qualitative methods, there is an inherent risk of researcher bias due to the interpretative nature of the research (J. W. Creswell & Creswell, 2023). Efforts were made to mitigate this risk through systematic coding procedures and continuous reflection on the research design, data interpretation and the study's limitations.

4. Results

The study focuses on ecofeminist principles and FSF in agroforestry-based carbon farming, with an analysis of the Risaralda project in Colombia. Before delving into the exploration of the research findings, the chapter begins with an introduction of the Risaralda project and the involved stakeholders. The remaining chapter is structured along the three sub-questions of this research (see Chapter 1). The analytical framework of this study, consisting of six ecofeminist principles (see Chapter 2), guided the categorisation of the results for the 1st sub-question. The results for the 2nd sub-question are built upon analysing the current state of female participation and representation within the Risaralda project, before identifying key barriers. The results for the 3rd sub-question finally break down how ecofeminist principles can potentially impact the sustainable rural development of Risaralda, while touching upon topics related to the three pillars of sustainable development.

4.1 Case Study: Risaralda Project, Colombia

The Acorn programme of the Dutch Rabobank stands for Agroforestry Carbon Removal Units (CRUs⁵) for the Organic Restoration of Nature and provides an entry point to the international VCM for smallholder farmers who are realising agroforestry projects for CS through biomass growth (Acorn, n.d.-a, 2021).

The case study region, Departamento de Risaralda, is situated in west-central Colombia. It spans a diverse landscape, with agriculture playing a significant role in the local economy. The principal crops cultivated in the region are coffee, sugarcane, beans, corn, bananas, cacao and tobacco (Editors of Encyclopaedia Britannica, 2025). The ecoregion covered by the Risaralda coffee smallholder farms cover the Cauca Valley montane forest as well as the Cauca Valley dry forests (Rabobank, 2022). With the departments Quindío, Caldas, and Valle de Cauca, Risaralda is part of the Coffee Cultural Landscape of Colombia and therefore contributing immensely to the countries coffee cultivation (De Leijster et al., 2021).

The agroforestry-based carbon farming project in Risaralda, which Acorn leads in cooperation with the Latin American section of Solidaridad, was set up in 2018 and started planting the first trees in 2019 (Rabobank, 2022). It is a Plan-Vivo⁶-certified project, which supports smallholder coffee farmers in Risaralda as they make a transition to agroforestry

⁵ Carbon Removal Units (CRUs) represent the actual carbon that is stored in the planted trees (Acorn, 2024b).

⁶ The Plan Vivo Foundation is a certification organisation that establishes the minimum standards for land-use and marine projects led by communities and smallholders (Plan Vivo, 2024).

(Acorn, n.d.). As many of those smallholder farmers do not have the necessary technical skills, resources, and finances needed for agroforestry, the Risaralda project provides the required resources and training (Acorn, n.d.-b). Key activities include tree selection based on local knowledge, community-led training sessions, nursery establishment, shade tree pruning, and pest control (Acorn, n.d.-b). Through this, the project aims to improve soil health, increase biodiversity as well as boost carbon storage, and enhance the micro-climate on the coffee plantations in the Risaralda region (Acorn, n.d.-b). The project moreover aims to improve the food security and the yields of coffee. Farmers in this area earn very low incomes (\$3.000 - \$4.000 per year) and live below the poverty line (Acorn, n.d.-b). They also face additional challenges from climate-related disruptions, like flooding, which can reduce their ability to work. To address these issues, the project supports income diversification through carbon credits and training, helping them afford nutritious food, maintain agroforestry practices, and buy essential materials (Acorn, n.d.-b).

Beginning of June 2025, the project covered a total of 33,036 hectares of land, and captured 27,655 tonnes of CO₂, based on which 27,655 CRUs were issued (Acorn, n.d.-b). Since the beginning of the project until June of 2025 a total of 20,746 farmers have been supported, of whom 33% were women (Acorn, n.d. ; Acorn Representative 2).

4.2 Essential Ecofeminist Principles for Agroforestry-Based Carbon Farming (SQ-1)

The following section will look further into the six ecofeminist principles, that have been defined within the analytical framework.

4.2.1 Interconnectedness of Women and Environmental Well-Being

Across the Acorn projects, particularly in Risaralda, the intrinsic connection between women and environmental stewardship is featured. Women are consistently portrayed as essential to the success of agroforestry and climate mitigation strategies due to their traditional knowledge of local agriculture and environmental conditions (WOW & UK Aid, 2024, p.4). Women are seen as key climate stewards with unique perspectives and the potential to drive transformative change in mitigation strategies (WOW & UK Aid, 2024). Particularly, rural women play a vital role in agricultural production and forest management, positioning them well to lead and manage projects focused on nature-based solutions and biodiversity (WOW & UK Aid, 2024, p. 10).

Expert insights emphasise this interconnectedness. One Acorn expert described the local environment relationship as follows: “[...] people relate to their forest, their trees. They have a much stronger connection to nature, which I think is the most feminist thing you can do – love nature” (Acorn Representative I, personal communication, 2025).

This highlights a view that deeply values the emotional and spiritual connection with the farm and local area. Acorn Representative II further mentioned, that the female farmers, especially the ones with children, often express a desire to leave a healthy and liveable farm for their children which results in their ambition to preserve the land for future generations (Acorn Representative II, personal communication, 2025). This reflects a rational approach to sustainability which is rooted in values such as care, legacy, and emotional connection to the land. Simultaneously this means, that women are rather valuing biodiversity through sensory and emotional connections, like hearing birds and observing wildlife, than valuing biodiversity in scientific terms (Acorn Representative II, personal communication, 2025).

Agroforestry itself is positioned as a dual-benefit strategy: enhancing ecological health and simultaneously supporting the livelihoods and well-being of local communities (Acorn, n.d.-b). Such a dual functionality aligns with ecofeminism’s central tenet of intensifying the human-nature relationship while challenging exploitative systems.

4.2.2 Female Empowerment through Knowledge and Participation

Although Acorn’s SDG’s aspirations aim to promote inclusivity, implementation gaps persist. The Acorn programme recognises the shortcomings in female empowerment and addresses this through structured approaches such as “train the trainer” models, stakeholder consultations, and capacity-building programs (Acorn, 2023, p. 3; WOW & UK Aid, 2024, p. 22-35 & p. 44-48). Gender action plans and monitoring strategies further support the institutionalisation of women’s participation (WOW & UK Aid, 2024, p. 22). Solidaridad’s initiatives go further by embedding gender-focused interventions that elevate women’s roles in agroforestry decision-making and ensure that participants are not excluded, particularly via partnerships with inclusive institutions like Federación Nacional de Cafeteros de Colombia (FNC) (FNC, n.d.; Rabobank, 2022). FNC not only promotes the active integration of women in coffee production and governance but also implements a zero-discrimination policy while promoting sustainable agricultural practices (FNC, n.d.).

The mentioned training activities directly support the empowerment of FSF (Rabobank, 2022). As FNC believes that women can play a decisive role in improving their families’

livelihoods, it is in their interests to integrate women fully into all aspects of the value chain (FNC, n.d.). Solidaridad's approach, which includes training for female leaders and entrepreneurship schools, ensures social inclusion for women and youth, making it more likely that producers from marginalised groups earn at least a living income (Rabobank, 2022). Acorn Representative II highlighted, that the training sessions and exchanges with other smallholders lead to an increase in confidence of the FSF, while simultaneously boosting their visibility and empowering them both socially and economically (Acorn Representative II, personal communication, 2025).

The new Gender Equity Guide for carbon credit projects additionally recommends ensuring women's equitable participation and leadership, providing equal employment opportunities and fair pay, promoting equitable benefit sharing and compensation, protecting women against sexual exploitation, abuse, and harassment, and establishing accessible grievance reporting mechanisms (WOW & UK Aid, 2024, p. 23).

Two interviewees further emphasise the value of education, local empowerment, and participatory design (Acorn Representative I, personal communication, 2025; GIZ Representative, personal communication, 2025). Strategies such as split community councils allow women to express themselves without the pressure of patriarchal social structures (Acorn Representative I, personal communication, 2025). According to Acorn Representative II, the female farmers further participate in the agroforestry design through applying their crucial ecological knowledge when choosing fruit or shade trees as they are mainly using cover crops for soil health (Acorn Representative II, personal communication, 2025).

The GIZ representative argues for redistributive empowerment practices like stepping aside to give marginalised groups a voice and investing in leadership skill development and long-term capacity building through education and structured baseline assessments. These align with the 3R strategy⁷ of resources, rights, and representation (GIZ Representative, personal communication, 2025). Implementing this strategy enables policies and projects to shift their approaches to be gender-transformative (BMZ, 2024).

4.2.3 Challenging Patriarchal Structures and Addressing Power Imbalances

Despite active intentions, persistent patriarchal norms remain a significant barrier. Acorn recognises systemic issues like inequitable land tenure and exclusion from decision-

⁷ The Federal Ministry for Economic Cooperation and Development (BIZ) launched a strategy for feminist development policy which entails the three 3Rs strategy of rights, resources, and representation (BMZ, 2024).

making, as well as risks of backlash and gender-based violence (WOW & UK Aid, 2024, p. 25-28). The newest WOW gender guideline acknowledges these barriers and explicitly aims to correct those through inclusive design and equitable benefit-sharing (Acorn, 2021; WOW & UK Aid, 2024).

Challenging those patriarchal structures and addressing power imbalances is essential to achieving gender equity in agricultural projects (GIZ Representative, personal communication, 2025). Experts still stress the importance of acknowledging invisible labour, while reflecting on the potential risk of imposing a western feminist perspective onto local communities (Acorn Representative I, personal communication, 2025; GIZ Representative, personal communication, 2025). Instead of applying a “one-size-fits all feminism”, they advocate for bottom-up engagement and sensitivity to the local culture. Challenging a system can only happen in a respectful manner that includes the needs and perspectives of the local cultures while strengthening the local ideas of rural development (Acorn Representative I, personal communication, 2025). As feminism means different things in different regions, involving the local context is essential (Acorn Representative I, personal communication, 2025; GIZ Representative, personal communication, 2025). Field technicians are therefore trained to consider gender dynamics respectfully, offering a subtle but meaningful challenge to patriarchal norms (Acorn Representative II, personal communication, 2025). And even though women in Risaralda often still lack legal land titles and are underrepresented in decision-making, Acorn Representative II highlights some minor progressive examples in which women manage their own plots or are consulted in the tree selection process (Acorn Representative II, personal communication, 2025).

The GIZ Representative furthermore highlights the need to fight neo-colonial structures and insists that transformation must be worked out collaboratively, while immediate change needs to happen in the Global North, which holds greater historical responsibility for climate change (GIZ Representative, personal communication, 2025). All experts consequently stress working closely with civil society in the Global South and integrating local feminist ideologies into the project design (Acorn Representative I, personal communication, 2025; GIZ Representative, personal communication, 2025). Acorn specifically avoids imposing external frameworks by trusting local organisations, in the case of Risaralda, Solidaridad, and adapting based on their advice (Acorn Representative I, personal communication, 2025).

These principles are furthermore embedded into the new WOW guideline that aims to create inclusive and context-sensitive leadership opportunities for women (WOW & UK Aid, 2024).

4.2.4 Recognising Women's Contribution

The data reveals that women's contribution to agroforestry is strategic and impactful yet largely undervalued. Acorn supports women-led nurseries and incorporates traditional ecological knowledge into agroforestry design, e.g., through selecting shade trees which are beneficial for biodiversity and climate adaptation (Acorn, 2023, p. 4; Rabobank, 2022). This approach affirms women's central role in contributing to effective and inclusive climate action that advances the green economic growth agenda (WOW & UK Aid, 2024).

Acknowledging the value of unpaid and invisible labour, especially in agroforestry, is an ongoing challenge (WOW & UK Aid, 2024, p. 10-13). Non-timber forest product collection and cookstove work are examples of essential but often overlooked contributions. The World Bank data illustrates that a significant portion of rural female employment lies outside conventional agricultural paradigms, further reinforcing the necessity of recognising diverse forms of labour (World Bank, 1996).

4.2.5 Promoting Gender Equity and Social Justice

Gender equity and justice are part of Acorn's project design, as their agroforestry project framework stipulates that all project "shall not exclude participants on the basis of gender, age, income, social status, ethnicity or religion" (Acorn, 2021). Solidaridad, supported by FNC, actively ensures that policies around diversity, equity, and inclusion are not merely aspirational but operationalised, since they are acknowledging gender-differentiated impacts (FNC, n.d.; GIZ Representative, personal communication, 2025; Rabobank, 2022).

The GIZ representative emphasises the importance of adaptive project design informed by baseline assessments, while Acorn Representative I reinforces that imposing Western gender norms undermines the authenticity of locally grounded justice efforts (Acorn Representative I, personal communication, 2025; GIZ Representative, personal communication, 2025). Structural inclusivity, rather than surface-level equality, is highlighted as a path to transformative and resilient sustainable rural development. Trusting local feminists rather than enforcing Dutch or generally Western ideologies was framed by Acorn Representative I as critical for ensuring a non-imposing and authentic gender justice (Acorn Representative I, personal communication, 2025).

The World Bank report of 1996 already emphasised the need for agricultural projects to provide opportunities for women to increase the local aspirations of sustainable development (World Bank, 1996).

4.2.6 Holistic Approach to Sustainability

A comprehensive view of sustainability is embedded in the integration of the three pillars of sustainability (social, environmental, and economic) as key project goals (FNC, n.d.). All areas are hereby interconnected and build the foundation for sustainable development (Dalampira & Nastis, 2020). Acorn's and Solidaridad's initiatives touch on multiple SDGs, affirming ecofeminism's inherently holistic nature (Acorn, 2023; WOW & UK Aid, 2024). Their project model incorporates biodiversity conservation, economic empowerment, climate resilience, and the empowerment of local communities, which are all pillars of a holistic sustainability approach (Rabobank, 2022; WOW & UK Aid, 2024). Covering the three pillars of sustainability, the project aims to achieve economic support for the smallholder farmers through the carbon credit revenues, environmental recovery through the implemented agroforestry practices, and social engagement through community training and councils (Acorn Representative II, personal communication, 2025; Rabobank, 2022).

Experts frame sustainability as the product of systems-level thinking. The GIZ Representative suggests working across micro (individual), meso (community), and macro (governance) levels, while Acorn Representative I points out that the projects aim not to change lives from the outside but to support self-defined community goals (Acorn Representative I, personal communication, 2025; GIZ Representative, personal communication, 2025). This aligns with Acorn's commitment to not enforcing top-down solutions but instead co-creating sustainable pathways with local partners: "We're not changing their lives. We are supporting them to achieve the lives they want to achieve" (Acorn Representative I, personal communication, 2025).

In addition, Acorn encourages collaboration across the VCM ecosystems, engaging international developers, buyers, and investors to build a shared movement for sustainability which is based on inclusivity and gender equity (WOW & UK Aid, 2024).

These perspectives reflect ecofeminist ideals of relational sustainability grounded in equity, resilience, and ecological integrity.

4.3 The Role and Position of Female Smallholders in the Risaralda Project (SQ-2)

Although direct data on the role of women within the Risaralda project is limited, a combination of Acorn's broader project documentation and stakeholder interviews provided insight into gender dynamics, participation mechanisms, and the challenges women face in agroforestry-based carbon farming. These findings are situated within the specific socio-

cultural context of Risaralda, where traditional gender norms continue to influence land ownership, decision-making, and access to benefits.

4.3.1 Participation and Representation

33% of the smallholder farmers involved in the Risaralda project are female (Acorn Representative II, personal communication, 2025). Even though their role within the project is often overlooked and they are considered informal, Acorn Representative II highlights how crucial the tasks are to the ecological and economic success of the project (Acorn Representative II, personal communication, 2025). Not only are they in charge for maintaining the soil health and the biodiversity conservation, but they are further intercropping during coffee rejuvenation, they are running the community nurseries, and harvest the coffee cherries individually with notable skill (Acorn Representative II, personal communication, 2025). The cherry picking, which often gets done by FSF in Colombia, is a very labour-intensive task, in which women are particularly effective due to their attention to detail (Acorn Representative II, personal communication, 2025).

When choosing trees for the Risaralda project, women more often focus on planting fruit-bearing or nitrogen-fixing trees and cover crops that protect the soil, which builds upon their practical knowledge, and is vital for sustainable land use (Acorn Representative II, personal communication, 2025).

Although women begin from a position of limited agency, the Risaralda project has expanded their access to leadership roles, training, and agroforestry benefits (Acorn, 2023, p.3-4). These advances include participation in community councils and decision-making processes, facilitated through structured training initiatives (Acorn Representative I, personal communication, 2025; Rabobank, 2022). Acorn's supported activities include training women to participate in agroforestry design processes, enabling them to shape tree-planting decisions based on local environmental and social needs (Acorn, 2023; Rabobank, 2022).

Nonetheless, structural exclusions persist. The GIZ representative notes that women are often left out of training opportunities due to a lack of land ownership (GIZ Representative, personal communication, 2025). Acorn Representative I affirms that contracts follow the landholder, whether male or female (Acorn Representative I, personal communication, 2025). Although many women manage the land, or in some cases gender divided family plots, their legal ownership in Colombia is rare, which affects their ability to influence or benefit fully from project structures (Acorn Representative II, personal communication, 2025). The informal

arrangements, such as managing a separate plot within the same farm, offer some agency for FSF, but the structural inequalities remain (Acorn Representative II, personal communication, 2025).

In practice, those deeply embedded gender norms in household finances can prevent women from accessing the associated benefits. If community customs dictate that men receive financial benefits, these norms are respected to avoid cultural overreach, highlighting the ongoing tension between gender equity and cultural relativism. Moreover, Acorn Representative II notes, that the female participation is often shaped by time and household constraints, which reflects the underlying system structures, resulting in the prioritisation of women's unpaid care work (Acorn Representative II, personal communication, 2025). In its analysis of sustainable rural development in Colombia, the World Bank (1996) found that 12% of economically active women in rural areas were unable to find work, compared to just 2% of men, a disparity largely attributed to women's limited availability due to childcare responsibilities.

Despite this challenge, Acorn recognises that requiring land tenure for participation can unintentionally exclude women. To address this, the new guideline promotes joint household financial decision making, encouraging shared access to benefits such as CRU revenues (WOW & UK Aid, 2024).

A leading example in regards to female land ownership is Rosa Ines, a smallholder coffee farmer in Risaralda (Acorn, 2022). Through Acorn's agroforestry-based carbon credit project, Rosa generates nature-based carbon credits that are purchased by Microsoft. Since she owns the land, 80% of the revenue from these credits goes directly to her (Acorn, 2022).

Another area in which women are participating are the previously mentioned project councils and community nurseries, with the latter acting as spaces for empowerment and social connection (Acorn Representative II, personal communication, 2025). Through collective nursery work, though openly unpaid or symbolic in economic terms, women gain recognition for their contribution which sometimes can lead to the earning of additional smaller incomes (Acorn Representative II, personal communication, 2025). The Acorn Representative II, highlights, that creating opportunities for peer exchange and social support is as important as formal leadership roles, as it increases a sense of communal belonging and can inspire FSF (Acorn Representative II, personal communication, 2025). The trainings that Solidaridad is offering are furthermore aiming to empower women in encouraging participation and confidence-building, especially among women who are often raised to only fulfil their

reproductive and caregiving roles, which is a practical attempt for a subtle shift in community norms (Acorn Representative II, personal communication, 2025).

4.3.2 Systematic Barriers and Strategic Responses

Acorn acknowledges the systemic barriers that FSFs face, such as unequal access to land, training, and credit (WOW & UK Aid, 2024, p.13). Their response includes encouraging joint household financial decisions and creating culturally appropriate leadership pathways, which has yet to be implemented by the Risaralda project (WOW & UK Aid, 2024). According to the FNC, approximately 30% of Colombian coffee growers are women, yet they face disproportionate access constraints in terms of land, training, and finances. These constraints often result in female farmers' underrepresentation in agroforestry projects despite their substantial contributions (FNC, n.d.; WOW & UK Aid, 2024). Deeply rooted cultural norms often clash with efforts to include further women into the projects. As men are generally considered the default farm spokespeople, women in the Risaralda project often do not speak unless being approached separately or when getting the approval of their husbands (Acorn Representative II, personal communication, 2025). As pushing empowerment too forcefully may be viewed as culturally intrusive, the Acorn Representative II, emphasises a respectful, slow engagement process, like talking to women in kitchens or asking husbands for permissions, which raises the dilemma about how far and how fast gender norms should be challenged (Acorn Representative II, personal communication, 2025).

Barriers that women must overcome in order to access equal opportunities is threefold (Solidaridad, 2023):

1. Access to land: Women face both family and social barriers to inherit land and even when trying to buy land, their choices are limited to smaller plots of lower quality or land with unproductive soil.
2. Less profitable positions: Most women in the coffee sector are restricted to less profitable jobs, such as harvesting or sowing. Their contributions to the soil management or seedling nurseries, are often seen as “natural” extension of caregiving roles which is only valorised rhetorically and not materially, further increasing their unpaid work.
3. Social context: Due to the migration crisis in Colombia, many women became the heads of households and needed to learn how to manage their land, while lacking access to extension services and training opportunities.

Aiming to tackle those boundaries, Solidaridad is a key agent in shifting the persistent norms and community structures (Solidaridad, 2023). Solidaridad's partnerships with the FNC support the women of Risaralda through entrepreneurship programs, institutional advocacy, and inclusive governance structures (Rabobank, 2022). Local ecological knowledge contributed by women also directly influences agroforestry design, ensuring ecological and social relevance while empowering women through their project participation (Rabobank, 2022). Solidaridad furthermore emphasises the need to exchange with other women in order to learn from each other (Solidaridad, 2023). They recommend to give FSFs the access to follow keynote speeches, to learn about technological innovations, shared experiences on women's organisations and leadership opportunities (Solidaridad, 2023).

4.4 Possible Impact of Ecofeminist Principles on Pursuing Sustainable Rural Development (SQ-3)

Ecofeminist principles, when integrated effectively, offer transformative pathways for sustainable rural development.

4.4.1 Economic Empowerment and Community Resilience

The Acorn initiative demonstrates how ecofeminist principles can drive sustainable rural development by promoting economic empowerment and community resilience. A key mechanism is the generation of carbon revenues through agroforestry-based carbon credit systems, which allows women to invest in household needs and income diversification (Acorn, 2023). This financial independence contributes to building more climate-resilient and economically secure communities (Acorn, 2023, pp. 2-5). Additionally, 80% of the Acorn carbon revenues from the VCM return directly to farmers, providing a powerful financial incentive that enhances rural economic stability (Rabobank, 2022).

Acorn Representative I highlighted that the model attracts Western capital, which flows directly to local landowners, helping sustain long-term local economic systems (Acorn Representative I, personal communication, 2025). Carbon credit financing is thus seen as a practical implementation of climate adaptation embedded in global agricultural supply chains. Female farmers, such as Maria Rosa Betancourt Jaramillo from Risaralda, noted the “double benefit” of agroforestry: ecological sustainability and improved quality of life for families and communities (Solidaridad Network, 2021).

The project impact includes not only increased income but also enhanced affordability of diverse and nutritious foods among smallholders (Rabobank, 2022). The increased income helps address the challenge of low agricultural wages through higher yields and an increased stability of AFS. These improvements contribute to increased access to farm and livelihood resources, reduced deforestation, and greater biodiversity protection, all of which are critical to building economic and environmental resilience (Rabobank, 2022).

Importantly, the project enables women to take on informal but socially significant roles, such as participating in seed collection or organising local meetings, which serve as entry points for building confidence and strengthening peer networks (Acorn Representative II, personal communication, 2025; Rabobank, 2022). These activities, while often overlooked, are instrumental in fostering a sense of agency and bottom-up connection. In areas of Risaralda, where rural populations are grouped closely together, community-based models that empower women could reinforce mutual assistance and social solidarity, which is especially important for countering the isolation often experienced in remote rural communities (Acorn Representative II, personal communication, 2025; Rabobank, 2022). Solidaridad's and Acorn's visits to the farms of the smallholder farms, can already make them feel seen and more appreciated which strengthens the bond with the project itself.

Solidaridad emphasized, “carbon farming can become a way of life for the generations to come” (Solidaridad Network, 2021), indicating the long-term potential of this model for rural livelihood development rooted in ecofeminist values. This long-term vision gets reinforced by the women's desire to leave the land healthy for their children (Acorn Representative II, personal communication, 2025). This perspective exemplifies how intergenerational care and ecological stewardship are interlinked and reflects the Brundtland definition of sustainability in “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987).

Even though Solidaridad and Acorn are putting efforts into action, connecting smallholder farmers, while paying for their trips and showing them other agroforestry projects, geographically dispersed farms, especially in remote areas, are facing isolation (Acorn Representative II, personal communication, 2025; Rabobank, 2022). This makes community-building and collective empowerment harder to scale and leaves some remotely living farmers to feel forgotten, despite the efforts to include them, as meeting attendance can cost the farmers an entire day (Acorn Representative II, personal communication, 2025).

4.4.2 Gender Considerations in the Project Design

The inclusion of women in training, leadership, and decision-making is a central theme of Acorn's project structure (Acorn, 2023). There is evidence that climate outcomes are improved when gender considerations are included into the project design, which results in a more efficient use of climate finance, that is especially reflected in the project productivity and the increased impact that is linked to the female involvement (WOW & UK Aid, 2024, p.11).

These outcomes support ecofeminist ideals by emphasizing cooperation, care, and the redistribution of power.

The use of a Gender Equality and Social Inclusion (GESI)⁸ analysis ensures that projects are designed to be socially inclusive and sustainable in the long term (WOW & UK Aid, 2024, pp. 5, 29–30). When women are paid fair wages and are involved in leadership roles, communities benefit from enhanced resilience and economic inclusiveness (WOW & UK Aid, 2024, pp. 48–67). Projects designed with GESI principles encourage greater social cohesion, community well-being, and collective responsibility (WOW & UK Aid, 2024).

By integrating women's local ecological knowledge into agroforestry design, project outcomes improve in both biodiversity conservation and social equity. Such participatory approaches exemplify ecofeminist praxis by validating women's knowledge systems and recognizing their essential role in sustainable development (Rabobank, 2022).

Acorn Representative II stresses, that sustainability aspirations must include the wellbeing, visibility, and empowerment for rural women, as only focusing on technical outputs, is not enough for long term systemic change (Acorn Representative II, personal communication, 2025). Although training and council inclusion aims to empower women, there is still a risk of performative participation, where the inclusion is only symbolic rather than transformative. Women often join councils only if they have spare time (e.g. after fulfilling their domestic work) leaving the decision-making still a male dominated area (Acorn Representative II, personal communication, 2025). True empowerment might therefore require a deeper structural change, such as redistributing care responsibilities and overall land ownerships (GIZ Representative, personal communication, 2025).

⁸ Definition of the GESI Working Group: "Gender Equality and Social Inclusion (GESI) is a concept that focuses on the need for action to re-balance unequal power relations, reduce disparities and ensure equal rights, opportunities and respect for all individuals regardless of their social identity" (GESI Working Group, 2017, p.7).

4.4.3 Structural Transformation

Ecofeminism advocates for systemic change, and the participatory structure of Acorn's model exemplifies this vision. According to the GIZ Representative, structural change through bottom-up and community-driven designs leads to regional resilience, which can initiate wider transformation (GIZ Representative, personal communication, 2025). This model fosters not just immediate economic benefits but also sets the foundation for long-term sustainability and societal change.

A major ecofeminist outcome is intergenerational empowerment. Projects intentionally involve younger women in training and leadership, ensuring the continuity of both environmental and social benefits (Rabobank, 2021; WOW & UK Aid, 2024). By engaging multiple generations in sustainability work, the model promotes enduring knowledge transfer and leadership development, which is essential for maintaining resilient communities (GIZ Representative).

The redistribution of visibility and decision-making power to women aligns with ecofeminist demands for dismantling patriarchal systems and creating more just social structures. Through agroforestry and climate finance, these communities gain the autonomy to self-organize and govern their resources sustainably.

4.4.4 Ecological Sustainability and Agroforestry Practices

Agroforestry practices, central to Acorn's work, offer a direct path to ecological sustainability by aligning farming practices with nature-based solutions. These systems support biodiversity, improve soil and water health, and reduce dependency on chemical inputs (Rabobank, 2022). In doing so, they reflect the ecofeminist value of peaceful coexistence with nature rather than domination over it.

Mixed-species farms contribute to a range of ecosystem services such as habitat creation, pest regulation, and climate resilience (Rabobank, 2022). Farms designed in this way are more adaptable to environmental stresses, supporting long-term agricultural viability (Rabobank, 2022). Integrating trees for erosion control and habitat restoration, often informed by women's local knowledge, further illustrates the value of ecofeminist-informed ecological stewardship (Rabobank, 2022).

Training in shade management and biodiversity enhancement enables farmers to navigate ecological trade-offs and optimize both productivity and environmental benefits. As a result, agroforestry is not only economically viable but also environmentally regenerative,

which is a key goal of sustainable rural development (Acorn, 2023; Rabobank, 2022; WOW & UK Aid, 2024).

However, a potential short-term coffee yield drop due to tree planting can risk the livelihoods for already precarious smallholder farmers, which is a serious threat to the long-term gains in productivity and reduced input costs (Acorn Representative II, personal communication, 2025).

4.4.5 Global Dynamics

Despite the promising outcomes, the influx of international capital also reveals ongoing threats from exploitative global dynamics. Acorn Representative I pointed out that many rural communities contribute little to global emissions, yet are the most vulnerable to climate impacts, which describes a huge power imbalance. Within that context, the Acorn Representative I furthermore described how foreign companies attempted to exploit the Risaralda farmers by pushing exploitative contracts for free seedlings. Acorn intervened, advocating for fair contracts and market-value carbon credit compensation. Through this connection, the smallholder farmers are protected from being targeted by “big players” who try to trap them with contracts that they don’t understand while simultaneously forcing companies to match Acorn’s VCM prices (Acorn Representative I, personal communication, 2025). This illustrates the critical role of ecofeminist-aligned project developers in protecting vulnerable stakeholders from exploitation. By integrating carbon credit transactions into the agricultural supply chain, such as coffee roasters buying credits directly (insetting), Acorn ensures that farmers retain control and benefit in a fairly manner from their ecological efforts (Acorn Representative I, personal communication, 2025; Solidaridad Network, 2021).

Moreover, continuous carbon monitoring systems ensure transparency and data integrity, reinforcing trust and fair compensation (Acorn Representative I, personal communication, 2025).

5. Discussion

Following upon the results and findings of the Risaralda case study analysis from Chapter 4, this chapter compares the most important findings with the insights from the examined literature as shown in Chapter 2. This chapter therefore analyses how the integration of ecofeminist principles in agroforestry-based carbon farming, specifically in the Risaralda project in Colombia, address gender inequity and promote sustainable rural development. The chapter furthermore reflects on how this research contributes to closing the identified knowledge gap regarding ecofeminist applications in real-world carbon farming initiatives.

5.1 Essential Ecofeminist Principles for Agroforestry-Based Carbon Farming (SQ-1)

The results demonstrate an alignment between the six ecofeminist principles identified in the conceptual framework and their application within agroforestry-based carbon farming projects. A central theme is the **interconnectedness of women and environmental well-being**, as FSFs in Risaralda have strong emotional and spiritual ties to the land (Acorn Representative I, personal communication, 2025). Their commitment to biodiversity and preservation for future generations reflects ecofeminism's care-based and relational values (d'Eaubonne, 2022; Mies, 2014). It further aligns with claims from Galdura et al. (2024), who emphasise women's ecological knowledge and resistance power as essential for climate resilience. However, some expressions of this connection ("e.g. women are more connected to nature") risk reinforcing essentialist views of women as inherently closer to nature, which has been critiqued by ecofeminists for potentially oversimplifying women's agency (Acorn Representative II, personal communication, 2025; Bauriedl, 2012).

Female empowerment through knowledge and participation emerges through trainings, capacity-building initiatives, stakeholder consultations, and involvement in local councils (Acorn, 2023). These practices enhance visibility, integrate women's ecological expertise (e.g. tree selections) and promote peer exchanges, aligning with ecofeminist calls for participatory empowerment (Mies, 2014; Tandon, 2016). Yet, empowerment efforts remain constrained by systemic barriers. For instance, limited land tenure continues to restrict women's decision-making power and access to carbon revenue, raising concerns about the depth of their involvement (WOW & UK Aid, 2024). Addressing these gaps requires structural reforms beyond symbolic inclusion to achieve genuine gender equity (Madhanagopal et al., 2022).

Ecofeminism therefore advocates for **challenging patriarchal structures and power imbalances** that harm both women and nature (Mies, 2014; Warren, 1997). Within agroforestry-based carbon farming projects this requires a high degree of cultural sensitivity (Acorn Representative I, personal communication, 2025). Acorn's and Solidaridad's empowerment efforts are thus more subtle and indirect, reflecting the realities of gender dynamics in the local community and aim to include a bottom-up approach (Acorn Representative II, personal communication, 2025). Their approach takes into account the lived experiences of the Colombian women and avoids the unintended consequences of replicating Western models of feminism (Madhanagopal et al., 2022). This highlights a key difference between ecofeminist theory and practical implementations. Whereas the theory calls for immediate transformative change, practices rather focus on a step-by-step progress that respects local agency.

Recognising women's contributions particularly their unpaid and often invisible labour in seedling nurseries, biodiversity management, and food crop cultivation, is a key ecofeminist demand (Shiva, 1988; Warren, 1997). Although the project supports some women-led initiatives and incorporates their knowledge, these efforts fall short of embedding gender equity structurally (WOW & UK Aid, 2024). . The persistent undervaluation of women's labour underscores the need for more comprehensive recognition and compensation mechanisms (Eqan, 2023).

The principle of **promoting gender equity and social justice** within the Risaralda project is reflected in the involvement of partners like Solidaridad and FNC, who strive for inclusive development strategies (FNC, n.d.; Rabobank, 2022). Nevertheless, the responsibility for operationalising and monitoring gender equity largely falls to local actors. While this avoids top-down imposition, it also limits the project's capacity to tackle systemic disparities thoroughly. The partial implementation of ecofeminist visions for equitable benefit distribution, and addressing of historical and systemic disparities demonstrates the challenges of applying theory in practice (Mies & Shiva, 2014; Shabliy, 2022).

Lastly, the Risaralda project supports the three pillars of sustainability through the integration of social and environmental objectives along economic goals (Acorn, n.d.-c, 2023; Dalampira & Nastis, 2020). This strategy aligns with ecofeminism's **holistic approach to sustainability**, that values resilience, equity, and ecological integrity (Shrestha, 2024; Starhawk, 1999). Through bottom-up governance, biodiversity conservation, and climate resilience efforts, the project supports multiple SDGs (Acorn, n.d.-c, 2023). As the long-term impact of the Risaralda project is yet to be fully evaluated, the final contributions to holistic

sustainability are to be determined. Overcoming structural barriers (e.g., land tenure, geographical isolation, and cultural norms) is essential for achieving resilient-social-ecological systems while highlighting the intrinsic value of nature (Crittenden, 2000).

5.2 The Role and Position of Female Smallholders in the Risaralda Project (SQ-2)

The findings from the Risaralda project significantly align with previous research in regard to FSF. The observation that women constitute 33% of participants in Risaralda is consistent with the literature's figures for women in Colombian coffee cultivation (33%), though slightly increased (Acorn Representative II, personal communication, 2025; Rendón et al., 2023). The project's detailing of women's crucial but often overlooked roles, such as maintaining soil health and managing nurseries, directly echoes the concept of the "invisibility of women" (Warren, 1997) and their viral, yet often unacknowledged contributions to agriculture (Acorn Representative II, personal communication, 2025; FAO, 2013b).

The challenges faced by women in Risaralda, particularly their limited land ownership which affects their project benefits and influence, as well as the prioritisation of unpaid care work that limits their participation, are direct manifestations of the "triple burden" (Dibakoane et al., n.d.) and the systemic barriers (land, credit, training) highlighted in literature (Acorn Representative II, personal communication, 2025; FAO, 2025; Warren, 1997; World Bank, 1996). Solidaridad's acknowledgement of these issues, alongside its strategic responses like promoting joint financial decision-making, shows active effort to counteract these structural inequalities (Solidaridad, 2023; WOW & UK Aid, 2024).

A remarkable difference between the case study and ecofeminist theory, or rather a practical challenge, is the project's dilemma regarding how to respectfully address deeply rooted cultural norms without being perceived as culturally intrusive (Acorn Representative I, personal communication, 2025; Acorn Representative II, personal communication, 2025). It highlights the complex interplay between externally driven empowerment efforts and local socio-cultural contexts, for which ecofeminism suggests a context-sensitive intervention (Madhanagopal et al., 2022). While the theory outlines the problems of gendered power imbalances and the resulting need for empowerment, the analysis of the thesis provided a concrete example of the sensitive balance required in real-world application (d'Eaubonne, 2022; Mies, 2014). The project's efforts to create spaces like community nurseries for empowerment and social connection, demonstrate practical ways to foster the women's confidence and shift norms, aligning with the theoretical idea that empowerment can lead to

status shifts (Acorn Representative II, personal communication, 2025; Gubert et al., 2020). Finding more ways to highlight the contribution of the Risaralda women and improving their visibility, is therefore necessary for equal inclusion (Agarwal, 2018).

5.3 Possible Impact of Ecofeminist Principles on Pursuing Sustainable Rural Development (SQ-3)

The integration of ecofeminist principles in the Risaralda project demonstrates a transformative impact on sustainable rural development across several dimensions. The economic empowerment achieved through carbon revenues, in cases where women directly benefit from the CRU's payment, exemplifies the literature's emphasis on providing FSF with access to resources and income to reduce poverty and foster development (Acorn, 2023; Rabobank, 2022; Wolfenson, 2013). The WOW guideline's example of a successful improvement of climate outcomes due to gender-inclusive project designs, directly supports the theoretical argument that empowering women generates broader developmental benefits (FAO, 2013b; WOW & UK Aid, 2024). Increasing the involvement of women in the Risaralda project through an increased participatory design, which reflects a bottom-up approach of self-organisation, could enable the project to follow ecofeminism's call for systematic change and the dismantling of patriarchal structures, tackling the structural barriers that FSF are facing (GIZ Representative, personal communication, 2025; Mies & Shiva, 2014; Starhawk, 1999).

The ecological benefits observed from agroforestry practices in Risaralda, often informed by women's knowledge, show that agroforestry is a sustainable, climate-smart practice and reflects the ecofeminist value of peaceful coexistence with nature (Acorn, 2023; Acorn Representative II, personal communication, 2025; Crittenden, 2000; Rabobank, 2022). The increased effect on biodiversity, the improved soil and water health, reduced dependency of chemical inputs, and the habitat creation makes agroforestry environmentally regenerative, a key goal of sustainable rural development (Rabobank, 2021; WOW & UK Aid, 2024).

A significant aspect to look into, is the context of global dynamics. While agroforestry-based carbon farming attracts international capital, critics of the VCM highlight the risk of "carbon colonialism" through which Global North actors might exploit the Global South (Acorn Representative I, personal communication, 2025; Rabobank, 2022; Whitman et al., 2025). Dismantling those neo-colonialist perspectives on the VCM and projects like Risaralda, is essential for ecofeminist theorists (d'Eaubonne, 2022).

In order to prevent the Risaralda farmers from exploitative contracts and ensure a fair compensation, Acorn and Solidaridad actively intervene to ensure that the farmers are aware of

the contract content and can benefit long-term from project cooperations (Acorn Representative I, personal communication, 2025). And even though this does not resolve the underlying VCM dynamics of having project managers in the Global North and project implementation in the Global South, Acorn's approach shows that being aware of the dynamics, compensating the farmers in a fair manner, and acting as a crucial counter-force can translate the theoretical awareness of exploitation into practical supportive measures (Acorn Representative I, personal communication, 2025; Rabobank, 2022).

A discrepancy between theory and practice lies in the persistent challenge of “performative participation”, where women's involvement in councils might be symbolic rather than truly transformative due to underlying care responsibilities and male-dominated decision-making (Acorn Representative II, personal communication, 2025). The results show that deeper structural changes, such as the redistribution of care responsibilities and land ownership, is needed for a full empowerment realisation.

While the theory emphasises empowerment leading to shifts in status, the results indicate that deeper structural changes, such as redistribution of care responsibilities and land ownership, are still needed for full realisation (Gubert et al., 2020; Madhanagopal et al., 2022). Similarly, the isolation faced by geographically dispersed farmers highlights a practical impediment to scaled community-building, a challenge not extensively detailed in the broader theoretical discussions on collective empowerment (Acorn Representative II, personal communication, 2025; Rabobank, 2022).

6. Conclusion

6.1 Recap

The thesis explored how ecofeminist principles can enhance gender equity and constitute to sustainable rural development in agroforestry-based carbon farming projects. Through a case study of the Acorn coffee farming project in Risaralda, Colombia, the research examined how these principles are reflected in practice, identifying both the opportunities they present and the limitations they face.

The analysis revealed that ecofeminist values, such as care, the female connection with nature, as well as gender empowerment and equity, can inform project designs of carbon farming to become more gender inclusive. However, their application is uneven, and implementation gaps persist.

6.2 Answer to the Research Question

To what extent do ecofeminist principles play a role in agroforestry-based carbon farming in the Global South, and how does this affect sustainable rural development?

Ecofeminist principles, even when not explicitly stated, have been shown to be included in agroforestry-based carbon farming projects in the Global South. While there is a growing acknowledgement of women's roles in ecological stewardship, their inclusion is often disconnected from deeper structural transformation. The findings of the study therefore suggest that, when ecofeminist values are meaningfully embedded, through inclusive governance, recognition of care work, land rights reformations, and gender-sensitive policy design, they can significantly enhance both gender equity and environmental sustainability.

However, the uneven application of these principles in the Risaralda project, due to deeply rooted patriarchal systems and global economic asymmetries, limit their overall impact. For ecofeminist principles to contribute to sustainable rural development, projects must move from symbolic commitments to systemic reforms which highlight female empowerment and recognise women's contributions.

When effectively integrated, these principles lead to economic empowerment through CRU's revenues, improved food security, enhanced community resilience, and significant ecological benefits like biodiversity conservation and soil health. They enable a bottom-up approach to development, empowering local communities and women simultaneously. The

ecofeminist principles therefore foster a vision of rural development, that centres justice, inclusivity, and regeneration.

Despite those approaches, the inherent power imbalances of the VCM and the risk of carbon colonialism remain, requiring continuous vigilance from project developers to ensure a fair compensation and prevent exploiting communities in the Global South.

If projects, such as Acorn's Risaralda project, commit to more inclusive, transparent, and participatory project models, ecofeminist insights can serve as a powerful driver for regenerative and equitable development. The principles therefore provide a crucial framework for understanding and addressing the interconnected oppressions of gender and environment within agroforestry-based carbon farming projects. However, the gap between theoretical ideals of immediate structural change and the practical pace of change required in real-world cultural contexts is also evident.

6.3 Recommendations for Practitioners and Policymakers

The research provides different implications for practitioners and policymakers working in agroforestry-based carbon farming in the Global South.

Firstly, it is crucial to design project frameworks that meaningfully recognise and integrate women's ecological knowledge, contributions, and lived realities. Efforts to enhance sustainability must move beyond representation metrics and symbolic commitments to include women in all stages of project design, implementation, and evaluation (Madhanagopal et al., 2022).

Secondly, gender equality should be visibly embedded within the project's sustainability agenda, for example through explicit references to SDG 5 in project documentation and reporting. Such gestures, even if initially symbolic, can elevate gender equity as an evaluative criterion that may enable institutional change.

Finally, land tenure reforms must be a priority, particularly through joint ownership models, recognising the roles of both male and female household members (Solidaridad, 2023). Alongside this, care work, must be recognised, revalued, and redistributed. Supporting FSF through measures such as accessible childcare and flexible work arrangements can mitigate time poverty and enhances female participation.

Policymakers and Practitioners should furthermore foster collaboration with locally rooted feminist organisations, as these actors are knowledgeable about context-specific

challenges and solutions. Empowering these actors through funding, institutional partnerships, and academic collaboration, can help enhance gender equity (Madhanagopal et al., 2022).

6.4 Limitations

The study faced several limitations that influenced its findings. One of the main constraints results from the expansive nature of ecofeminism itself. As a broad and interdisciplinary theory, not all strands of ecofeminist thoughts can be fully incorporated into the analysis. The research was therefore designed to remain focused on a set of core principles, which inevitably limited the exploration of other ecofeminist contributions.

Additionally, language barriers and data access restrictions posed significant methodological challenges. Much of the Colombian literature was not available in English, which potentially excluded key local feminist insights, even though the study aimed to include as many scholars from the Global South as possible. The limited access to internal documentations, the unavailability of Solidaridad to cooperate and the missed opportunity to talk to FSF directly, lead to a primary analysis of publicly accessible reports and non-local interviews, leading to the generalisation of some project findings. Despite a bigger outreach, only three interviews were conducted, reducing the diversity of perspectives captured and limiting the triangulation of the study's insights.

Lastly, as a qualitative inquiry, the study is inherently interpretative and therefore carries a degree of researcher bias. While careful efforts were made to ensure transparency and reflexivity throughout the research process, these limitations must be acknowledged when considering the findings and their applicability.

6.5 Recommendations for Further Research

Building on the findings and limitations of this thesis, three key areas for future research emerge that could deepen and broaden the understanding of ecofeminist applications in agroforestry-based carbon farming.

Firstly, comparative research across different regions of the Global South would be valuable to assess the transferability and adaptability of ecofeminist principles in diverse socio-political and environmental contexts.

Secondly, future studies should place FSF at the centre of the research process through participatory methodologies. Direct engagement with women through interviews or focus groups would allow for a refined exploration of their lived experiences, aspirations, and constraints.

Finally, to prevent western biases to influence the research, local knowledge should be included into future research. Many communities in the Global South have traditions of land stewardship, ecological knowledge, and communal care practices that align with ecofeminist values, even if they are not labelled as such. Investigating how these knowledge systems interact with, challenge, or expand ecofeminist theory could enrich both scholarly discourse and project application effectiveness.

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8. Appendices

Appendix A: Conceptual Framework

Principles	Definition	Explanation	Application to the Risaralda project
Interconnectedness of humans, specifically women, and environmental well-being	There is an intrinsic link between the well-being of women and the natural environment, as they are both suffering under the same system (Adams, 1993; d'Eaubonne, 2022; Mies, 2014).	The concept of interconnectedness, which is rooted in ecofeminism, links the oppression of women and nature in patriarchal societies (Adams, 1993; d'Eaubonne, 2022).	The project should highlight the importance of sustainable and equitable practices, which benefit both women and the environment.
Female empowerment through knowledge and participation	Women can be empowered through the recognition and valuing of their knowledge and in implementing their participation in decision-making processes (Mies, 2014).	The concept of female empowerment can be understood as a series of interconnected processes aimed at enhancing women's status within their respective societies (Tandon, 2016). This is typically facilitated by education, raising awareness, and ensuring equal opportunities, which enables women to manage resources, and navigate risks, which ultimately enhances their well-being (Tandon, 2016).	The project needs to value women's traditional knowledge of tree species, and their role within the community decision-making while allowing them to participate in the project training initiatives.
Challenging patriarchal structures and addressing power imbalances	Ecofeminism seeks to dismantle patriarchal systems that perpetuate gender inequalities (d'Eaubonne 2022). It is therefore important to address the power imbalances within that patriarchal system, that affect women's participation and environmental initiatives (Mies 2014).	Patriarchy is defined as a system in which men exercise domination and exploitation over women, manifesting in structures including the household, paid employment, the state, violence, sexuality, and culture (Walby, 1990).	The project needs to address underlying barriers for women such as limited access to land, resources, and decision-making power. The goal should therefore be to create inclusive spaces where women can influence decision-making and benefit from environmental projects.
Recognising women's contribution	Ecofeminism highlights the importance of recognising and valuing women's contribution to environmental conservation and sustainable agriculture (Shiva, 1988, 2000).	Women are vital contributors to environmental conservation, offering unique insights and skills essential for sustainability (Eqan, 2023). Their local ecological knowledge, especially in rural areas, positions them to lead in managing and protecting natural resources (Eqan, 2023).	The project should acknowledge the women's roles in maintaining biodiversity and promoting sustainable land use practices.
Promoting gender equity and social justice	Ecofeminism emphasises the need for gender equity and social justice in environmental initiatives (Mies & Shiva, 2014).	Gender equity refers to the fair distribution of benefits and responsibilities across genders while addressing the historical inequalities (Shabliy, 2022). It fosters the creation of equal opportunities and the elimination of barriers, ensuring all genders are treated fairly and have equal access to resources and decision-making processes (Shabliy, 2022).	The project needs to ensure women benefit equally from the carbon credit scheme and have equal access to resources and income generated by the project.
Holistic approach to sustainability	Ecofeminism encourages a holistic approach to sustainability that considers both environmental and social dimensions (Shrestha, 2024; Starhawk, 1999).	A holistic sustainability approach encompasses economic as well as social and environmental dimensions, thereby ensuring long-term sustainability (Ruether, 1992). This approach emphasises the interconnectedness and necessity of collaboration to achieve resilient social-ecological systems, stressing the intrinsic value of nature (Crittenden, 2000).	The project should integrate environmental conservation with social equity and community well-being.

Appendix B: Systematic Literature Review

Date of Search: March 2025			
Database: Google Scholar			
Concepts related to ecofeminist perspectives on female smallholder farmers in agroforestry-based carbon farming and their role in sustainable rural development			
Concept 1:	Concept 2:	Concept 3:	Concept 4:
<i>Ecofeminism</i>	<i>Sustainable Rural Development</i>	<i>Agroforestry</i>	<i>Female smallholder farmer</i>
Complete Search String			
<i>ecofeminism OR female empowerment OR interconnection of oppression AND Sustainable Rural Development OR Global South OR social equity AND agroforestry OR carbon sequestration OR voluntary carbon market AND female smallholder farmer OR female smallholder OR women</i>			
Number of Results: 2.210			

Appendix C: Documents Included in the Document Analysis

Key Words Search for Document Analysis

Key Words Document Analysis						
Stakeholder 1	Research Region	Stakeholder 2	Stakeholder 3	Research Topic	Research Topic	Stakeholder 4
Rabobank-Acorn	Risaralda	Plan-Vivo	Solidaridad	Coffee Farming Colombia	Sustainable Rural Development Colombia	FNC

Detailed List of Documents Included in the Document Analysis

Document ID	Document Title	Key Words	Citation
D1	Project Report Solidaridad Colombia [Acorn Design Document (ADD) Summary] - 2022	Rabobank-Acorn	(Rabobank, 2022)
D2	The Grounds For Sharing: A study of value distribution in the coffee industry - 2024	Coffee Farming Colombia	(Bureau d'analyse sociétale d'intérêt collectif, 2024)
D3	World Bank Report: Review of Colombia's agriculture and rural development strategy - 1996	Sustainable Rural Development Colombia	(World Bank, 1996)
D4	Website: Solidaridad Latin America Colombia	Rabobank-Acorn	(Acorn, n.d.-b)
D5	Methodology for Quantifying Carbon Benefits from Small-Scale Agroforestry; Version 1.0 -2021	Rabobank-Acorn	(Rabobank, 2021)

D6	The Acorn Framework for Voluntary, Ex-Post, Agroforestry Carbon Removal Units; Version 1.0 – 2021	Rabobank-Acorn	(Acorn, 2021)
D7	Acorn Validation and Verification Cycle – Sampling Approach and Program Certification; Version 1.0 - 2024	Rabobank-Acorn	(Acorn, 2024b)
D8	CRU Calculation: A visual guide to understanding the Acorn Framework & Methodology 2.0	Rabobank-Acorn	(Acorn, n.d.-a)
D9	Video: Climate Solutions in action: ACORN platform enables farmers to capture and trade carbon emissions - 2021	Solidaridad	(Solidaridad Network, 2021)
D10	FAO Report: Coping with the food and agriculture challenge: smallholders' agenda	Smallholder Farming	(FAO, 2012)
D11	Acorn SDG Contributions - 2023	Rabobank-Acorn	(Acorn, 2023)
D12	Solidaridad: Women supporting women - 2023	Solidaridad	(Solidaridad, 2023)
D13	Integrating gender into the design, implementation and monitoring of carbon credit projects – Practical Guidance for Project Developers in the VCM; 2024	Rabobank-Acorn and Plan-Vivo	(WOW & UK Aid, 2024)
D14	FNC Website: Sustainability - Social Dimension	FNC	(FNC, n.d.)
D15	CRU courtesy of Rosa Ines	Rabobank-Acorn	(Acorn, 2022)

Appendix D: Interview Partners

Participant ID	Interviewee	Background	Citation
P1	Acorn Representative I	Expert for Acorn Projects	(Acorn Representative I, personal communication, 2025)
P2	GIZ Representative	Expert in Feminist Perspectives on Agricultural Supply Chains and International Development Cooperation	(GIZ Representative, personal communication, 2025)
P3	Acorn Representative II	Expert for Risaralda Project	(Acorn Representative II, personal communication, 2025)

Appendix E: Interview Guide

RQ: How are ecofeminist principles embedded in agroforestry projects in the Global South, and what does this mean for the sustainable development of rural areas?

SQ1: What ecofeminist principles are essential for agroforestry projects?

SQ2: What role and position is assigned to female smallholder farmers in agroforestry projects?

SQ3: How does the integration of ecofeminist principles contribute to sustainable rural development in the Global South?

- Topic: Acorn Risaralda Project and Ecofeminism
- Duration: Approximately 45 minutes (max. 60min)
- Online via Teams

I. Introduction (max 3 min)

- Introduction of **researcher**
- Explaining the **purpose of the interview**, including thesis **topic and aim**
- Ensuring consent: ask if there are any **questions about the consent form** or any other questions
- Ask for **consent to record** the interview
- Brief introduction of the **interviewee's role and relation** to the topic

II. Background of Rabobank-Acorn (max 7 min)

- How is Rabobank Acorn involved in the Risaralda Project?
- What are Rabobank's most important goals and activities in this project?
- Do you know how many farmers are involved in the project? Percentage male-female farmer?

III. Agroforestry and Carbon Credits (max 10 min)

- What **specific agroforestry practices** are promoted through the Acorn Risaralda project?
- What are the **benefits and challenges** of this carbon farming project for the involved **smallholder farmers**?

IV. Ecofeminist Principles and Gender Considerations (max 10 min)

- **Ecofeminist Principles:** → *linked to SQ1*
 - Are you familiar with **ecofeminism**?
 - Do these principles play a role in the project? (if yes: how is that demonstrated? / if no: why not?)

- | | |
|------|--|
| I. | Interconnectedness of human, specifically women and environmental well-being |
| II. | Female empowerment through knowledge and participation |
| III. | Challenging patriarchal structures and addressing the power imbalances |
| IV. | Recognising of women's contribution |
| V. | Promoting gender equity and social justice |
| VI. | Holistic approach to sustainability |

⇒ If not, I will mention some key principles such as gender equality, environmental justice, and community empowerment

Alternative Approach: If the interviewee is unfamiliar with ecofeminism, the principles will be mentioned and the following questions asked:

- Do these principles play a role in the project? (if yes: how is that demonstrated? / if no: why not?)

- **Role of Female Smallholder Farmers: (max 10 min)** → *linked to SQ2*
 - Can you explain if female smallholder farmers have a specific role or position in this project (or Acorn's projects in general)?
 - How are **needs and perspectives of female farmers integrated** into **decision-making** processes on agroforestry and carbon farming?
 - How are **benefits and risks** from the project **distributed** between the female and male farmers?
- **Empowerment of Women: (max 10 min)** → *linked to SQ1*
 - Are there **specific initiatives or strategies** in place to **empower women** within the project (or Acorn's projects in general)?
 - According to you, what can be done to **further empower** female smallholder farmers in agroforestry projects?
 - ⇒ Who's **responsibility** would this be?

- V. **Impact on Sustainable Rural Development (max 10 min)** → *linked to SQ3*
- How do you think the project **contributes to sustainable rural development**?
 - ⇒ *Particularly in terms of environmental sustainability and social equity*
 - How did the project **influence the local communities** of the Risaralda region since the start of the project?
 - According to you, how could **incorporating ecofeminist principles** (as those mentioned before) **enhance** the project's impact on **sustainable rural development** of the Risaralda region? → *linked to RQ and reflection of previous topics*

VI. **Conclusion and Follow-Up**

- Would you like to **add or emphasize** something regarding the topic?
- Opportunity for **follow-up: contact via e-mail** (used to set up the interview) or via provided **phone number**.
- **Thank you** for your time and the provided insights!

Appendix F Codebook

CODEBOOK		
Interconnectedness of Women and Nature <i>There is an intrinsic link between the well-being of women and the natural environment, as they are both suffering under the same system (Adams, 1993; d'Eaubonne, 2022; Mies, 2014)</i>		
Sub-Code	Definition	Example
Relational Environmental Ethics	Relational Environmental Ethics	Views linking women's wellbeing to environmental stewardship
Logical Ecological Knowledge	Women's embodies and local knowledge of ecosystems	Women's knowledge of trees
Empowerment Trough Knowledge and Participation <i>Women can be empowered through the recognition and valuing of their knowledge and in implementing their participation in decision-making processes (Mies, 2014).</i>		
Sub-Code	Definition	Example
Inclusion in Decision-Making	Formal/informal participation in governance or councils	Gender separated community councils to enable free speech
Access to Training and Resources	Opportunities to acquire technical, financial or leadership skills	Training programs for women
Challenging Patriarchy and Addressing Power Imbalances <i>Ecofeminism seeks to dismantle patriarchal systems that perpetuate gender inequalities (d'Eaubonne 2022). It is therefore important to address the power imbalances within that patriarchal system, that affect women's participation and environmental initiatives (Mies 2014).</i>		
Sub-Code	Definition	Example
Patriarchal Norms and Constraints	Structures limiting women's rights, voice or recognition	Land tenure restrictions, carbon payments
Strategic Resistance and Cultural Sensitivity	Culturally sensitive strategies to challenge male dominance	Creating women-only spaces
Long-Term System Change	Addressing root causes (e.g. Patriarchy, colonialism, capitalism)	References to land redistribution
Global North-South Power Dynamics	Recognition of climate responsibility	Carbon Colonialism
Recognition of Women's Contribution <i>Ecofeminism highlights the importance of recognising and valuing women's contribution to environmental conservation and sustainable agriculture (Shiva, 1988, 2000).</i>		
Sub-Code	Definition	Example
Visible Roles in Agroforestry	Tasks that are acknowledged or celebrated	Managing nurseries
Invisible or Devalued Labour	Unpaid labour in farming And/or additional care-work	Care work, soil care

Gender Equity and Social Justice <i>Ecofeminism emphasises the need for gender equity and social justice in environmental initiatives (Mies & Shiva, 2014).</i>		
Sub-Code	Definition	Example
Equal Access and Outcomes	Equitable share of project benefits and resources	CRU revenue access
Institutional Support	Supportive frameworks and anti-discrimination policies	FNC zero-discrimination policy
Holistic Sustainability Approach <i>Ecofeminism encourages a holistic approach to sustainability that considers both environmental and social dimensions (Shrestha, 2024; Starhawk, 1999).</i>		
Sub-Code	Definition	Example
Integration of Social-Environmental Goals	Project balancing economic, social, and environmental aims	Income support, training, strengthening biodiversity
Community Well-Being and Visibility	Project prioritising the community well-being and visibility, by actively including their needs	Community council meetings and farmer surveys

Declaration of Academic Integrity

Official statement of original thesis

By signing this statement, I hereby acknowledge the submitted thesis (hereafter mentioned as “product”), titled:

An Ecofeminist Analysis of Female Smallholder Farmers and Agroforestry-Based Carbon
Credit Initiatives
- A Case Study of the Risaralda Project in Colombia

to be produced independently by me, without external help.

Wherever I paraphrase or cite literally, a reference to the original source (journal, book, report, internet, etc.) is given.

By signing this statement, I explicitly declare that I am aware of the fraud sanctions as stated in the Education and Examination Regulations (EERs) of the SBE.

Place: Maastricht

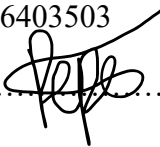
Date: June 20th, 2025

First and last name: Triantafillia Pepe

Study programme: M.Sc. Sustainability Science, Policy and Society

Course/skill: Master Thesis (SSP3021)

ID number: I6403503

Signature:

Sustainable Development Goals (SDG) Statement

Name Triantafillia Pepe
ID I6403503
Supervisor Dr. Ron Cörvers
Date June 20th, 2025

Through the research conducted for this master's thesis, I seek to contribute to one or more of the 17 SDG(s) set forth by the United Nations (<https://www.undp.org/sustainable-development-goals>). Specifically:



SDG Code(s): SDG 5 - including: SDG 10, SDG 13, SDG 15 (United Nations, n.d.)

Explanation:

The core focus of the thesis is on addressing gender disparities in agroforestry-based carbon farming, making *SDG 5 Gender Equality* the most directly relevant. The research critically examines systemic inequalities and proposes strategies for women's empowerment and gender-inclusive climate action. By identifying key barriers such as discrimination in land tenure, unequal carbon credit distribution, and limited participation in governance structures, the study highlights actionable areas to eliminate gender-based discrimination (*Target 5.1*) and to promote women's access to and control over land and natural resources (*Target 5a*). Tackling these structural barriers also supports the broader objective of *Target 10.2 (SDG 10 Reduced Inequalities)*, which aims to empower marginalised groups and promote their full social, economic, and political inclusion.

A significant finding is the lack of recognition and compensation for women's unpaid agroforestry and caregiving labour. This reflects a persistent invisibility of women's contributions, which the study critiques and seeks to address through recommendations for integrating this work into project compensation mechanisms, directly contributing to *Target 5.4*.

Furthermore, the thesis evaluates women's involvement in project design, councils, and decision-making processes. While inclusion efforts exist, the findings reveal that women's leadership remains limited, highlighting the need for more meaningful and effective participation (*Target 5.5*).

Implementing a structural empowerment strategy for rural women, would help to fulfil the needs of marginalised populations in the Global South, therefore contributing to *Target 13b*

(*SDG 13 Climate Action*). Simultaneously, the research highlights the importance of women's contribution to effective agroforestry projects, which directly ties into biodiversity conservation, fitting into *Target 15.5 (SDG 15 Life on Land)*.

Statement on the use of Generative AI (GenAI) in the master thesis

I hereby certify that I adhered to the SBE guidelines on the use of GenAI tools such as ChatGPT in the master thesis. In the box below, I document how and for what purposes I used GenAI.

During the preparation of this work, I used GenAI for the following purposes:

- Search engine:
 - SciSpace: used to find useful and content-specific scientific papers outside of the literature search string
 - Perplexity: used to ask for an overview of important scholars and theory strings, which then got searched separately
- Ideation helper:
 - Perplexity AI: used for initial topic and structure brainstorming and to evaluate own research approach
 - ChatGPT: used for topic brainstorming and to get feedback on the clarity and structure of the created interview questionnaire, no content was directly included
 - Notebook LM: helped with finding connections between papers
- Text summarizer:
 - Notebook LM: used to summarise studies and paper, in order to help with the selection of relevant literature (after first selection, based on abstracts)
- Explanation provider:
 - ChatGPT: used to break down complex concepts or sentences from papers to understand the content better
- Language assistant:
 - DeepL Write: helped with checking the grammar and phrasing of the thesis and helped with wording whenever the text used reoccurring words, without altering the meaning
- Translator:
 - DeepL: used for translations
- Other:
 - Notta AI: used to transcribe the interview recordings of the semi-structured interviews

After using any tool, I reviewed, quality-checked, and edited the content as needed and take full responsibility for the content of the thesis.

By signing this statement, I explicitly declare that I am aware of the fraud sanctions as stated in the Education and Examination Regulations (EERs) of the SBE.

Place: Maastricht

Date: June 20th, 2025

First and last name: Triantafillia Pepe

Study programme: M.Sc. Sustainability Science, Policy and Society

Course/skill: Master Thesis (SSP3021)

ID number: I6403503

Signature: 